

EXHIBIT D

PRELIMINARY RESERVOIR EVALUATION  
CHALK BLUFF DRAW UNIT

I. PRODUCTION - PRESSURE DATA: Well No. 1

Period	Production		Cumulative Production		Bottom-Hole Pressure		
	Gas: MCF	Dist: Bbls	Gas: Mcf	Dist: Bbls	Date	Hours Shut-In	Pressure Psi
July 1956	17,116	99	17,116	99	4-16-56	48	3,719
(Est to Aug 20)	(36,600)		(53,716)		8-20-56	49	3,712
August	56,697	226	73,813	325	9-24-56	68	3,702
(Est to Sept 24)	(34,500)		(108,300)				
September	43,163	219	116,976	544			
October	1,095	0	118,071	544			
November	5,753	57	123,824	601			
December	13,822	111	137,646	712			
January 1957	5,442	5	143,088	717			
February	2,419	6	145,507	723			
March	0	0	145,507	723			
April	3,016	5	148,523	728			
May	4,428	34	152,951	762			
June	2,257	7	155,208	769	7-1-57	147	3,691

II. RECOVERABLE GAS RESERVE

A. From pressure decline, assuming 95% ultimate pressure depletion

(1) Based on overall decline:

$$\text{Gas produced per unit of pressure decline} = \frac{155,208}{(3,719 - 3,691)} = 5,543 \text{ MCF/Psi}$$

$$\text{Recoverable gas} = 5543 \times 3719 \times .95 = 19,583,700 \text{ Mcf}$$

(2)\* Based on decline below 3,712 psi:

$$\text{Gas produced per unit of pressure decline} = \frac{155,208 - 53,716}{3,712 - 3,691} = 4,833 \text{ MCF/Psi}$$

$$\text{Available pressure decline below 3,691 psi} = (3,691 - .05 \times 3,719) = 3,505 \text{ psi}$$

$$\text{Recoverable gas} = 155,208 + (4,833 \times 3,505) = 17,094,900 \text{ MCF}$$

\* Considered the more representative

B. From geologic data with reservoir temperature 153° F, Gas Gravity .598, calculated volume equivalent of 0.75 bbls reservoir void per MCF at Standard Conditions, assumed connate water content of 25%, 22.5 feet of net pay, 8% porosity, and assuming recovery of 95% of gas in place.

$$\text{Recoverable gas per 640-acre area} = 22.5 \times .08 \times .75 \times 7758 \times 640 \times .95 \times 1/.75 = 8,490,000 \text{ MCF}$$

$$\text{Recoverable gas per 1280-acre area} = 16,980,000 \text{ MCF}$$

C. Reasonable agreement observed between recoverable gas as determined from pressure decline at Well No. 1 and from geologic data for 1280-acre productive area

III. APPROXIMATE ECONOMICS: ASSUMING A 1280-ACRE PARTICIPATING AREA

	<u>Pressure Decline</u>	<u>Geologic Data</u>
Recoverable gas:	17,094,900 MCF	16,980,000 MCF
Revenue (Net of \$0.10/MCF After royalty, taxes, and other operating expenses)	\$ 1,709,490	\$ 1,698,000
Less Development Costs:		
Drilling Costs *	\$ 706,600	\$ 706,600
Lease Bonuses *	324,500	324,500
Lease Rentals and Cost of Forming Unit	38,800	38,800
Ultimate Profit	\$ 639,590	\$ 628,100
Ratio Profit to Investment	0.62	0.61

\* Investment Costs

Western Division  
Petroleum Engineering Section  
JLC/va 4-21-58

Prepared by: J F Little

**OIL CONSERVATION COMMISSION**  
P. O. BOX 871  
SANTA FE, NEW MEXICO

May 21, 1958

**Hervey, Dow and Hinkle**  
P. O. Box 547  
Roswell, New Mexico

**Re: Chalk Bluff Draw Unit Area**  
Eddy County, New Mexico.

**Attention: Mr. Clarence E. Hinkle**

**Gentlemen:**

This is to advise that the New Mexico Oil Conservation Commission has this date approved the initial participating area for the Chalk Bluff Draw Unit in Eddy County, New Mexico, subject to like approval by the United States Geological Survey and by the Commissioner of Public Lands of the State of New Mexico.

Eight approved copies of the application are returned herewith.

Very truly yours

**A. L. PORTER, Jr.,**  
Secretary-Director

ALP:RLS/ga

cc State Land Office -Santa Fe  
U. S. Geological Survey-Roswell

C

O

P

Y

In reply refer to:  
Unit Division

May 20, 1958

Hervey, Dow and Hinkle  
P. O. Box 547  
Roswell, New Mexico

Re: Chalk Bluff Draw Unit Area  
Eddy County, New Mexico

Attention: Mr. Clarence E. Hinkle

Gentlemen:

The Commissioner of Public Lands has approved the initial participating area for the Chalk Bluff Draw Unit as of May 20, 1958.

We are retaining one copy and handing, under copy of this letter, nine copies to Mr. Pete Porter, Director of the Oil Conservation Commission for their approval.

Our approval is subject to like approval being obtained from the United States Geological Survey and the Oil Conservation Commission and upon receipt of full approval, may we have a fully executed copy for our files.

Very truly yours,

MURRAY E. MORGAN,  
Commissioner of Public Lands

BY:

Ted Bilberry, Supervisor  
Oil and Gas Division

MEM/MGR/s  
cc:

Oil Conservation Commission  
Attention- Mr. Pete Porter  
Santa Fe, New Mexico

United States Geological Survey  
Roswell, New Mexico

COPY

HERVEY, DOW & HINKLE, ATTORNEYS  
ROSWELL, NEW MEXICO

May 19, 1958

*File*

*Case 960*

Mr. Murray Morgan  
Commissioner of Public Lands  
P. O. Box 791  
Santa Fe, New Mexico

Re: Chalk Bluff Draw Unit Area

Dear Murray:

We enclose herewith ten copies of application of the Humble Oil & Refining Company for approval of the initial participating area for the Pennsylvanian Bend formation in which production has been obtained in the Chalk Bluff Draw Unit Area. This is to be approved by the New Mexico Oil Conservation Commission and I am sending a copy of this letter to Pete Porter. I would appreciate your getting together with the Commission as quickly as possible and approving the designation of the area as set forth in the application as the initial participating area.

This would, in effect, assign 640 acres to each of the two gas wells which have been completed as shown on Exhibit "A" attached to the application and which Humble regards as reasonably proven to be productive. Humble is working out a pipe line connection for the sale of the gas and for that reason is anxious that the application be approved as quickly as possible.

We would appreciate your approving all ten copies and you can retain one copy for your files. Please hand one approved copy to the Oil Conservation Commission for their files and return all the rest to us.

Anything you can do to expedite this matter will be greatly appreciated.

Yours very truly,

HERVEY, DOW & HINKLE

By *James Hinkle*

CEM/bp  
Encl.

cc: Mr. M. L. McMillen  
Mr. A. L. Porter  
Mr. R. M. Richardson

RECEIVED  
STATE LAND OFFICE  
SANTA FE, N.M.  
1955 MAY 20 10 30 A.M.

RE: Chalk Bluff Draw Unit Area  
Eddy County, New Mexico

TO: Executive Secretary  
New Mexico Oil Conservation Commission  
Santa Fe, New Mexico

Commissioner of Public Lands  
State Land Office  
Santa Fe, New Mexico

Director,  
United States Geological Survey  
Washington 25, D. C.

APPLICATION FOR APPROVAL  
OF INITIAL PARTICIPATING AREA  
FOR THE PENNSYLVANIAN BEND FORMATION

Comes the undersigned, Humble Oil & Refining Company, as unit operator for the Chalk Bluff Draw Unit Agreement, approved by the Director of the United States Geological Survey effective December 29, 1955, and pursuant to the provisions of Section 11 thereof, respectfully submits for the approval of the New Mexico Oil Conservation Commission, the Commissioner of Public Lands of the State of New Mexico, and the Director of the United States Geological Survey the selection of the following described lands regarded as reasonably proved to be productive of unitized substances in paying quantities to constitute the initial participating area for the Pennsylvanian Bend producing zone or formation, to-wit:

Township 18 South, Range 27 East, N.M.P.M.

Section 5: All  
Section 8:  $E\frac{1}{2}$   
Section 9:  $W\frac{1}{2}$

containing 1,280 acres, more or less,

Section 5 and said lands in Sections 8 and 9 containing 640 acres, respectively, to constitute spacing units for the allocation of unitized substances produced therefrom on a pro rata acreage basis.

In support of this application, the following numbered items are attached hereto and made a part hereof:

(1) An ownership map showing thereon the boundaries of the unit area and showing in red the proposed initial participating area, marked Exhibit "A".

(2) A schedule showing the lands entitled to participate in the unitized substances produced from the Pennsylvanian Bend sand formation with the percentage of participation of each lease or tract indicated thereon, marked Exhibit "B".

There is also submitted herewith in triplicate a geological report, marked Exhibit "C", prepared by Mr. J. B. Waid, Division Unitization Geologist of applicant, together with accompanying geologic maps supporting and justifying the proposed selection of the participating area; and also a preliminary reservoir evaluation or engineering report, marked Exhibit "D", prepared by Humble's reservoir engineer.

The proposed initial participating area is predicated upon the knowledge and information obtained from the completion of the following wells capable of producing gas in paying quantities under the terms of the unit agreement, to-wit:

(1) The Chalk Bluff Draw No. 1 well (located 1,980 feet from the South and West lines of Section 5, Township 18 South, Range 27 East, N.M.P.M.) which was completed April 13, 1956, as the discovery well capable of producing gas and condensate from the Pennsylvanian Bend sand at a depth of from 9,390 feet to 9,515 feet with an initial potential of 8,482 mcf of gas per day. This well is now shut-in.

(2) The Chalk Bluff Draw No. 3 well (located 2,310 feet from the North line and 330 feet from the East line of Section 8, Township 18 South, Range 27 East, N.M.P.M.) which was completed on July 8, 1957, at a depth of approximately 9,505 feet to 9,555 feet with an initial potential of 2,107 mcf of gas per day. A recent workover of this well in which the sand was fractured has increased the productivity to 4,580 mcf of gas per day. This well is now shut-in.

After the completion of the initial test well the drilling of a subsequent well was deferred in order to make a reasonable test of the initial well. A temporary pipe line connection was obtained and gas produced and sold from the No. 1 well from July 23, 1956, to September 21, 1956. The total production during said period was approximately 116,341 mcf of gas and 444 barrels of condensate.

The Chalk Bluff Draw Unit No. 2 well (located 1,930 feet from the South and 1,880 feet from the West lines of Section 32, Township 17 South, Range 27 East, N.M.P.M.) was drilled to a total depth of 9,425

feet and plugged and abandoned as a dry hole on February 27, 1957.

The above three mentioned wells were drilled at a cost of approximately \$706,600.00.

An effort has been made by applicant to secure a satisfactory contract for the sale of the gas. Under date of April 15, 1958, a firm proposal for the purchase of gas from the two wells above referred to capable of producing gas was received from Malco Refineries, Inc. Interest in the purchase of gas has also been evidenced by El Paso Natural Gas Company and Southern Union Gas Company. However, tentative proposals from these two possible purchasers have been contingent on the purchasers being able to secure commitments for the purchase of other gas produced in the general area. A fourth possible market outlet may be afforded by the proposed pipe line of Transwestern Pipe Line Company. It now appears reasonably certain that a satisfactory market outlet can be secured. The date, on which gas sales will be commenced, is dependent on the outcome of final negotiations to sell the gas; however, it is anticipated that satisfactory contracts will be negotiated within the near future.

Due to the fact that gas was test produced from the No. 1 well for the period from July 23, 1956, to September 21, 1956, it would appear to be equitable that the allocation of the proceeds from the sale of this gas for said period should be made on an acreage basis to the leasehold interests embraced within Section 5, Township 18 South, Range 27 East, and for such purpose a separate schedule, marked Exhibit "B-1", is submitted herewith showing the interests entitled to participate in the unitized substances produced from the No. 1 well.

WHEREFORE, applicant respectfully requests that the New Mexico Oil Conservation Commission, the Commissioner of Public Lands of the State of New Mexico and the Director of the United States Geological Survey approve the hereinabove selection of lands to constitute the initial Pennsylvanian Bend sand participating area to be effective as

to Section 5 from July 23, 1956, to September 21, 1956, and as to the entire area from the time of the sale of the first gas after a pipe line connection is obtained.

Respectfully submitted,

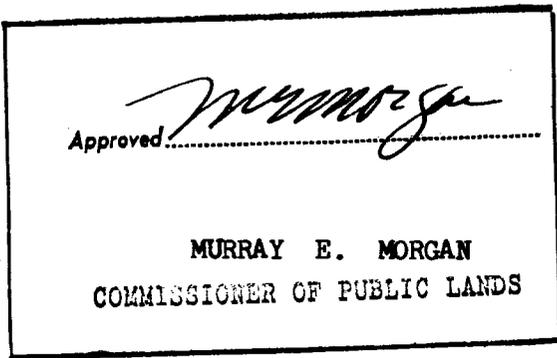
HUMBLE OIL & REFINING COMPANY

By *R. M. Richardson*

HERVEY, DOW & HINKLE

By *[Signature]*

Attorneys for  
Humble Oil & Refining Company



THIS APPROVAL GRANTED SUBJECT TO LIKE APPROVAL BEING GRANTED BY THE UNITED STATES GEOLOGICAL SURVEY AND BY THE COMMISSIONER OF PUBLIC LANDS OF THE STATE OF NEW MEXICO.

Approved May 21 1958

*[Signature]*  
Secretary-Director

NEW MEXICO OIL CONSERVATION COMMISSION