

PARTICIPATION - INITIAL PARTICIPATING AREA
CHALK BLUFF DRAW UNIT
EDDY COUNTY, NEW MEXICO

*These interests subject to remaining unpaid balance of \$2,000.00 oil payment reserved by Helen Yeager Eaton.

8.	T-18-E, R-27-E Sec. 5: Lot 4, SW/4 NW/4, NW/4 SW/4	121.07	LC-049648 (a) Humble Oil & Ref. Co.	<u>Basic Royalty</u> <u>Working Interest</u> <u>Overriding Royalty</u> U.S.A. Humble Oil & Ref. Co. Childress Royalty Co. H. G. Watson Mary Lorena Higgins Nora B. Clayton Joe A. Clayton Fred Brainard Total	.125000 .750000 .017188 .005154 .013751 .002500 .002500 .083907 1.000000 1.8803200
11.	T-18-S, R-27-E Sec. 5: E/2 SE/4, S/2 SW/4	160	LC-055383 (a) Malco Refineries, Inc.	<u>Basic Royalty</u> <u>Working Interest</u> <u>Overriding Royalty</u> U.S.A. Malco Ref., Inc. Malco Ref., Inc. Mary Lorena Higgins Childress Royalty Co. Fred Brainard H. G. Watson Joe A. Clayton Nora B. Clayton A. W. Adkisson Lois Burnett Total	.125000 .750000 .050000 .013750 .017188 .005156 .005156 .002500 .002500 .014375 .014375 1.000000 .24849300
18.	T-18-S, R-27-E Sec. 5: Lots 1, 2, S/2 NE/4	161.81	LC-064384 Malco Refineries, Inc.	<u>Basic Royalty</u> <u>Working Interest</u> <u>Overriding Royalty</u> U.S.A. Malco Ref., Inc. Carlos L. Carter Mildred C. Hudson Total	.125000 .845000 .020000 .010000 1.000000 .03141300 .21235188 .00502608 .00251304 .25130400
20.	T-18-S, R-27-E Sec. 5: W/2 SE/4	80	LC-065600 Humble Oil & Ref. Co.	<u>Basic Royalty</u> <u>Working Interest</u> <u>Overriding Royalty</u> U.S.A. Humble Oil & Ref. Co. Lillie M. Yates Total	.125000 .750000 .125000 1.000000 .01553087 .09318526 .01553087 .12424700

RECAPITULATION

Tract No.	Participating Acreage	Percentage of Participation
4	121	.187924
8	121.07	.188032
11	160	.248493
18	161.81	.251304
20	80	.124247
5 Tracts	643.88	1.00

PARTICIPATION - FIRST EXPANDED PARTICIPATING AREA

EDDY COUNTY, NEW MEXICO

*These interests subject to remaining unpaid balance of \$2,000.00 oil payment reserved by Helen

Yeager Eaton.

6.	T-18-S, R-27-E Sec. 8: SW/4 NE/4	40			
			LC-043894	Basic Royalty	U.S.A.
			Humble Oil & Ref. Co.	Working Interest	Humble Oil & Ref. Co.
			Co.	<u>Overriding Royalty</u>	Lillie Mae Yates
					R. D. Compton
					Julian E. Simon
					Total
					1.000000
					0.03115500
					0.00389438
					0.02336625
					0.0031155
					0.0031155
					0.00327127
					0.03115500

8.	T-18-S, R-27-E Sec. 5: Lot 4, SW/4 NW/4, NW/4 SW/4	121.07	LC-049648 (a) Humble Oil & Ref. Co.	<u>Basic Royalty</u> <u>Working Interest</u> <u>Overriding Royalty</u>	U. S. A. Humble Oil & Ref. Co. Childress Royalty Co. H. G. Watson Mary Lorena Higgins Nora B. Clayton Joe A. Clayton Fred Brainard Total	.125000 .750000 .017188 .005154 .013751 .002500 .002500 .083907 1.000000 .09430000	.01178750 .07072500 .00162083 .00048602 .00129671 .00023575 .00023575 .00791244 .09430000
11.	T-18-S, R-27-E Sec. 8: N/2 NE/4, SE/4 NE/4	120	LC-054205 Malco Refineries, Inc.	<u>Basic Royalty</u> <u>Working Interest</u> <u>Overriding Royalty</u>	U. S. A. Malco Refineries Malco Refineries Lillie M. Yates Total	.125000 .825000 .040000 .010000 1.000000 .09346600	.01168325 .07710945 .00373864 .00093466 .09346600
11.	T-18-S, R-27-E Sec. 5: E/2 SE/4, S/2 SW/4	160	LC-055383 (a) Malco Refineries, Inc.	<u>Basic Royalty</u> <u>Working Interest</u> <u>Overriding Royalty</u>	U. S. A. Malco Refineries Malco Refineries Mary Lorena Higgins Childress Royalty Co. Fred Brainard H. G. Watson Joe A. Clayton Nora B. Clayton A. W. Ackisson Louis Burnett Total	.125000 .750000 .050000 .013750 .017188 .005156 .005156 .002500 .002500 .014375 .014375 1.000000 .12462300	.01557787 .09346726 .00623116 .00171456 .00214203 .00064255 .00064255 .00031156 .00031156 .00179145 .00179145 .12462300
14.	T-18-S, R-27-E Sec. 9: NW/4	160	LC-055465 (b) Mildred Crane Hudson	<u>Basic Royalty</u> <u>Working Interest</u> <u>Overriding Royalty</u>	U. S. A. Humble Oil & Ref. Co. Mildred Hudson Total	.125000 .750000 .125000 1.000000 .12462300	.01557787 .09346726 .01557787 .12462300

18.	T-1E-S, R-27-E Sec. 5: Lots 1, 2, S/2 NE/4	161.81	LC-064384 Malco Refineries, Inc.	Basic Royalty <u>Working Interest</u> <u>Overriding Royalty</u>	U. S. A. Malco Refineries Carlos L. Carter Mildred C. Hudson Total	.125000 .845000 .020000 .010000 1.000000	.01575412 .10649788 .00252066 .00126034 .12603300
20.	T-1E-S, R-27-E Sec. 5: W/2 SE/4	80	LC-065600 Humble Oil & Ref. Co.	Basic Royalty <u>Working Interest</u> <u>Overriding Royalty</u>	U. S. A. Humble Oil & Ref. Co. Lillie M. Yates Total	.125000 .750000 .125000 1.000000	.00778887 .04673326 .00778887 .06231100
26.	T-1E-S, R-27-E Sec. 8: S/2 SE/4	80	LC-070678 (a) Malco Refineries, Inc.	Basic Royalty <u>Working Interest</u> <u>Overriding Royalty</u>	U. S. A. Malco Refineries Malco Refineries Mildred C. Hudson Mary Lorena Higgins Lee Vandag Riff Total	.125000 .750000 .050000 .028750 .014063 .032187 1.000000	.00778887 .04673325 .00311555 .00179145 .00087627 .00200561 .06231100
28.	T-1E-S, R-27-E Sec. 9: SW/4	160	LC-070938 Hugo A. Anderson	Basic Royalty <u>Working Interest</u> <u>Overriding Royalty</u>	U. S. A. Malco Refineries Malco Refineries Total	.125000 .825000 .050000 1.000000	.01557787 .10281397 .00623116 .12462300
32.	T-1E-S, R-27-E Sec. 8: NW/4 SE/4	40	NM-04175 (a) Mildred Crane Hudson	Basic Royalty <u>Working Interest</u> <u>Overriding Royalty</u>	U. S. A. Humble Oil & Ref. Co. Lee Vandag Riff Mildred C. Hudson Total	.125000 .750000 .032188 .092812 1.000000	.00389437 .02336625 .00100282 .00289156 .03115500
33.	T-1E-S, R-27-E Sec. 8: NE/4 SE/4	40	NM-04175 (a) Mildred Crane Hudson	Basic Royalty <u>Working Interest</u> <u>Overriding Royalty</u>	U. S. A. Malco Refineries Lee Vandag Riff Mary Lorena Higgins Mildred C. Hudson Total	.125000 .800000 .032188 .014062 .028750 1.000000	.00389438 .02492400 .00100282 .00043810 .00089570 .03115500

RECAPITULATION

<u>TRACT NO.</u>	<u>PARTICIPATING ACREAGE</u>	<u>PERCENTAGE OF PARTICIPATION</u>
4	121	.09424500
6	40	.03115500
8	121.07	.09430000
10	120	.09346600
11	160	.12462300
14	160	.12462300
18	161.81	.12603300
20	80	.06231100
26	80	.06231100
28	160	.12462300
32	40	.03115500
33	40	.03115500
TOTALS	1,283.88 Acres	1.00

EXHIBIT "C"
SECOND GEOLOGICAL REPORT ON
THE CHALK BLUFF DRAW AREA
EDDY COUNTY, NEW MEXICO

INTRODUCTION AND HISTORY

The Chalk Bluff Draw Unit, located in north-central Eddy County, New Mexico, was approved December 29, 1955. Since approval, three exploratory wells have been drilled within the Unit area, resulting in two small Pennsylvanian gas producers and one dry hole. (See Exhibit "A")

The Chalk Bluff Unit No. 1 well (located 1980' from the South and West lines, Section 5, T-18-S, R-27-E) drilled and tested 595 feet of barren Devonian dolomite to a total depth of 10,400 feet. The well was completed as the discovery well from the Pennsylvanian Bend sand, with an initial potential of 8482 MCF gas per day.

The Chalk Bluff Draw Unit No. 2 well (located 1930' from South and 1880' from West lines, Section 32, T-17-S, R-27-E) drilled to a total depth of 9425 feet in Pennsylvanian Bend sand, and was dry and abandoned after extensive testing failed to recover unitized substances.

The Chalk Bluff Draw Unit No. 3 well (located 2310' from North and 330' from East line, Section 8, T-18-S, R-27-E) was completed as the second producer in the Unit area from the Bend sand with an initial potential of 2107 MCF gas per day. A recent workover in which the well was stimulated by sand fracturing has increased the productivity to 4580 MCF gas per day.

At the request of the Supervisor and in view of recent development in the area, revised structure maps contoured on the top of the San Andres and the top of the Bend sands (attached) have been prepared for comparisons with the original structure maps submitted in "Report for Designation of a Federal Exploration Unit" dated December 1954.

LITHOLOGY OF PENNSYLVANIAN
BEND GAS ZONE

The Bend sand zone has a thickness of 100 to 145 feet (see Cross Section attached), and consists of interbedded sandstones, gray shales and tan to brown limestones. The zone exhibits blanket characteristics which can be correlated over north-central Eddy County, New Mexico. Correlation of the individual sand members which occur within the zone indicate their lenticular nature over the area in general; however, the No. 1 and No. 3 Unit wells produce from the same member. In exploration for and development of the Bend sand reservoirs in the area, all wells having porosity and permeability development have been gas producers.

EXHIBIT "C"

STRUCTURE IN THE CHALK BLUFF DRAW AREA

The San Andres structure map (attached) reflects the same favorable northeast trending structural nose (refined by recent drilling) as was described in the "Initial Report for a Unit Area"; however, this structural feature is absent in the deeper formations penetrated by recent exploratory drilling and is probably the result of middle Permian reefing or carbonate buildup.

The Pennsylvanian Bend sand structure map (attached), revised by recent drilling, differs radically from the initial interpretation and now reflects only regional southeast dips of from 75 to 150 feet per mile. The dips are verified by Schlumberger dipmeter information.

The regional position of the Chalk Bluff Draw reservoir, as compared to other Pennsylvanian Bend sand fields in the area, emphasizes stratigraphic accumulation instead of structural closure. The Chalk Bluff Draw Unit wells (the largest developed reservoir in the area) produce gas in paying quantities at an average subsea depth of 5865 feet. The Empire Pennsylvanian field (a one-well field), approximately six miles northeast, produces gas from the Bend sand zone at a subsea depth of 6435 feet, 670 feet lower than in the Chalk Bluff Draw reservoir. The Duffield Pennsylvanian field (a one-well field), nine miles north, produces at a subsea depth of 5040 feet, 825 feet high to the Chalk Bluff Draw reservoir. The recent discovery of Standard of Texas (No. 1 Everest) located four miles to the southwest, produces from the Bend sand zone at a subsea depth of 5639 feet, 126 feet high to the Chalk Bluff Draw reservoir.

RESERVOIR DISCUSSION

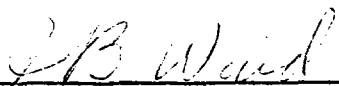
To determine the thickness of pay in the Chalk Bluff Draw area, the No. 3 Unit well cored the Bend sand zone from 9470-9561 feet. The cores analyzed by Core Laboratories, Inc. indicated 29 feet of pay with an average porosity of eight (8%) per cent and an average permeability of one and four-tenths millidarcys. Correlation of MicroLogs of the No. 1 and No. 3 Unit wells indicated that the No. 1 well has 16 feet of pay, and average 22.5 feet for the two wells.

In an attempt to estimate the size of the Chalk Bluff Draw reservoir, analyses were made using the pressure-production decline and geological data. (See Exhibit "D") Analysis based on the production decline indicates a recoverable gas volume of 17,094,900 MCFG, while an analysis using geologic data indicates a slightly smaller volume of 16,980,000 MCFG. This information indicates a small reservoir of approximately two productive sections characteristic of the small Pennsylvanian fields in the area, all of which are reasonably developed and controlled by dry holes.

CONCLUSIONS

Humble Oil & Refining Company as Unit Operator, with the approval of the other working interest owners involved, requests the approval of a two-section participating area as defined in Exhibit "A" for the following reasons:

1. Geology of the area indicates the gas accumulation is due to stratigraphic traps in which porosity and permeability are the governing factors.
2. Geologic and reservoir data available at this time indicate 640 acres surrounding each producer is reasonably proved to be productive of unitized substances.
3. Economics (See Exhibit "D") suggests drilling on a spacing pattern of less than 640 acres to be unfavorable.
4. After the Chalk Bluff Draw reservoir is produced for a period of time, more reservoir data will be obtained which will influence a future development program.



J. B. Waid
Division Unitization Geologist