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August 25, 1988

HAND-DELIVERED

William J. LeMay, Director
Oil Conservation Division
New Mexico Department of Energy,
Minerals and Natural Resources
State Land Office Building
Santa Fe, New Mexico 87503

Dear Mr. LeMay:

Enclosed is the Application for Rehearing of Benson-Montin-Greer Drilling Corp., Dugan Production Corp. and Sun Exploration and Production Company of the August 5, 1988 Oil Conservation Commission Orders.

Very truly yours,

WILLIAM F. CARR

WFC:mlh
Enclosure
cc w/enclosures: Bill Humphries
Erling A. Brostuen
All Counsel of Record

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION COMMISSION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR THE
PURPOSE OF CONSIDERING:

CASES NOS. 7980,
8946 and 8950
ORDER NO. R-7407-G
ORDER NO. R-6469-F

REOPENING OF CASES 7980, 8946 and 8950 FOR
FURTHER TESTIMONY AS PROVIDED BY ORDER
R-7407-E IN REGARD TO THE GAVILAN-MANCOS
OIL POOL AND ORDER R-6469-D IN REGARD TO
THE WEST PUERTO CHIQUITO-MANCOS OIL POOL
IN RIO ARRIBA COUNTY, NEW MEXICO.

CASE NO. 9111
ORDER NO. R-3401-B

APPLICATION OF BENSON-MONTIN-GREER
DRILLING CORPORATION FOR EXPANSION
OF THE PROJECT AREA FOR ITS WEST
PUERTO CHIQUITO-MANCOS PRESSURE
MAINTENANCE PROJECT,
RIO ARRIBA COUNTY, NEW MEXICO.

APPLICATION FOR REHEARING

COME NOW BENSON-MONTIN-GREER DRILLING CORPORATION ("BMG"), DUGAN PRODUCTION CORP. ("Dugan") and SUN EXPLORATION AND PRODUCTION COMPANY ("SUN") through its undersigned attorneys, and pursuant to the provisions of Section 70-2-25 hereby make application for Rehearing of the following matter determined by the above-referenced Orders and Decisions of the Commission and in support thereof state:

1. Except for one significant exception, BMG, Dugan and Sun believe the Commission has resolved the issues concerning the proper development of the Gavilan and West Puerto Chiquito Mancos Oil Pools. If the Commission's Orders are to achieve their desired results, however, BMG, Dugan and Sun submit that the authorized allowable gas rates per barrel of oil will permit a well to produce at rates that cause a reservoir voidage of 300% as much as would have occurred at the previous 600 to 1 gas/oil ratio limitation set in Case Nos. 8946 and 8950, and should be the sole subject of a rehearing because it:

A. Permits withdrawals at too rapid a rate to permit gravity drainage to work efficiently in this reservoir, thereby causing waste;

B. Allows gas production rates which can only be made by a few high capacity wells, which will thereby allow these wells to drain the reserves under the tracts of other wells thereby impairing correlative rights;

C. Allows rates of production (and consequent rates of reservoir voidage) in the non-unitized Gavilan pool, adjacent to the Canada Ojitos Unit pressure maintenance project, which will reduce the efficiency of recovery of the Canada Ojitos Unit, causing waste;

D. Is not supported by substantial evidence and is otherwise arbitrary, capricious, unreasonable and

contrary to law.

2. The rehearing in these cases should be limited to consideration of reduction of the allowable gas rates. In absence of a Rehearing on this issue, the Commission's Orders increase gas allowables which results in drainage and premature depletion of the pressure maintenance project. By granting a Rehearing based upon the foregoing and entering subsequent orders reducing the gas allowable rates the Commission will discharge its statutory obligations to all parties affected by these Orders. By granting a Rehearing limited to reconsideration of gas allowables, the Commission need not and should not rehear or accept evidence on other matters:

A. A rehearing should not be granted on the issue of a permeability barrier underlying these pools since substantial evidence in the record supports the absence of an effective permeability barrier.

1. Contrary to the dissent of Commissioner Brostuen, clear and substantial evidence exists in this record that there is no effective barrier in this reservoir.

a. Frac pulse generated in the COU C-34 source well with response in the COU B-32 observation well clearly supports communication between these wells through the area Commissioner Brostuen considers a barrier.

(1) A pressure build-up test in the observation well conducted 60 days prior to the frac pulse showed no change in slope over the same shut in time period. Had a barrier actually existed, it would necessarily have influenced the build-up data recorded in both surveys (Case 9111, June 13, 1988, BMG Exhibit 8-A).

(2) If the change in slope of the build-up curve was the reflection of a barrier, the change in slope would have been 100%. In the subject test it was only 30%.

(3) The magnitude of the pressure response in the observation well during the frac pulse test was approximately that to be expected given the reservoir characteristics, frac treatment size and distance between wells (Case 9111, March 17, 1988, BMG Exhibit 3, Section B, first graph for wells 10,000' apart).

b. Pressure gradients within a reservoir are not necessarily evidence that a barrier

exists.

(1) Pressure gradients across the postulated barrier are not significantly greater than those found in other portions of the West Puerto Chiquito and Gavilan pools.

(2) Since all Mancos pools in the eastern side of the San Juan Basin had equalized virgin pressures (Case 7980, November 1983, BMG Exhibit 2, Section F, third graph) and Gavilan's initial pressure was 100 psi below this equalized virgin pressure, it clearly demonstrates communication between the COU pressure maintenance area and Gavilan.

c. A barrier is not established by marginally productive wells. Mr. Brostuen, in his dissenting opinion, cites the COU F-20 well as a non-productive well in the area of the postulated barrier. The proponents' testimony of low productivity for this well was in error, since their data was for production from a different formation. Opponents' testimony showed that this well has not been perforated or

tested in the Mancos formation. To conclude that there are sufficient non-productive wells in the area to constitute an effective barrier requires a selective and inaccurate review of the evidence.

d. Finally, again contrary to Mr. Brostuen's dissent, a change in field boundaries based upon the postulated barrier would not affect the interests of any owner in the pool for a change in the pool boundary will not change the terms of the Unit Agreement.

B. A rehearing should not be granted on the issue of dual porosity in this reservoir since the preponderance of evidence in the record shows an absence of dual porosity.

1. Proponents' position is that a dual porosity system exists with a very low permeability matrix, whose pressure is several hundred pounds higher than that of a high capacity fracture system. Under such circumstances, the build-up pressure of high capacity wells on extended shut in times would continue to rise and such behavior would occur at all times during the reservoir's depletion cycle when wells over large areas of the reservoir are

shut in. Such did not occur. When pressures throughout the reservoir (Gavilan and West Puerto Chiquito Pools) were approximately equalized, there was no continued build-up on extended shut in time of high capacity wells (Case 9111, March 17, 1988, BMG Exhibit 1, Section H, Pages 1 through 4 and supporting statistics).

It is only when large pressure differences exist across the reservoir that pressures of the same high capacity wells, when in the low pressure area, exhibit pressure increases on extended shut in times (Case 9111, March 17, 1988, BMG Exhibit 1, Section H, Pages 5 and 6 and supporting statistics and Case 9111, June 17, 1988, BMG Exhibit 7).

2. The state's own consultant found only one well, a build-up test on Mobil's Lindrith B-37, which could possibly reflect dual porosity. The shape of this build-up test curve could also have been caused by a stratified reservoir (as we know exists here), the well's proximity to the edge of a reservoir (as we know is the case with this well), or by phase redistribution (as found in other wells in the reservoir) in addition to the possibility of reflecting dual

porosity. To conclude that dual porosity exists in this reservoir, the Commission would have to take this single example and apply it to all wells in the reservoir contrary to actual build-up performance of all the other tests.

3. Attempting to support the proponents' position that a dual porosity system exists, Mr. Brostuen cites a paper authored by Mr. Greer and others. This paper is not a part of the record, so opponents had no opportunity to respond to Mr. Brostuen's reading of the paper. Further, Mr. Brostuen has grossly misinterpreted the authors' conclusions. For oil to be produced from a postulated tight reservoir matrix, it must be solution gas drive which would require a significant reduction in reservoir pressure. This reduction of reservoir pressure did not occur. During the test period discussed in the paper, the subject test well (COU C-34), produced an additional 160,000 barrels of oil with <u>no decline</u> in reservoir pressure. Accordingly, and as concluded by the authors of the paper, the production mechanism must necessarily be that of gravity drainage or pressure maintenance gas

drive, or both - but in no way can it be solution gas drive.

The reservoir pressure behavior during this test was carefully monitored by the operator through pressure measurements in observation wells which reflected reservoir pressure in the vicinity of the COU C-34, as proven by earlier tests. Pressures in the observation wells actually increased 20 pounds over the test period. Data obtained during the continuous monitoring of the reservoir pressure is in the Commission's records. (Case 6997, August 6, 1980, BMG Exhibit 1, Section F).

C. A rehearing should not be granted on the issue of reservoir performance and recovery efficiency of the gas injection - pressure maintenance efforts at the Canada Ojitos Unit: the reservoir performance of the Canada Ojitos Unit has been properly monitored and is well documented in Commission records and does show a substantial improvement in the ultimate recovery as a result of gas injection and the gravity drainage recovery mechanism.

1. Mr. Brostuen states that pressure data on the Canada Ojitos Unit has not been taken or reported to the Oil Conservation Commission. This statement is inaccurate for this data has

been taken and repeatedly presented to the Commission. See for example Case 6997. In the most recent hearings, data was presented to the Commission on injection and gas cap pressures as well as operating pressures which were obtained from the recent Commission Ordered tests. Earlier bottom hole pressures in downdip wells in the unit would have served no useful propose in managing the unit. A complete review of the records shows that adequate pressure data is, and has been available to determine the fluid flow across the postulated barrier. Furthermore, the low gas oil ratios in the Canada Ojitos Unit expansion area are the result of gravity drainage and pressure maintenance in the unit - not, as Mr. Brostuen states, simply due to low structural position, since there are twenty or more wells in the reservoir at lower structural positions than the Canada Ojitos Unit expansion area wells that produce with higher gas oil ratios than the structurally higher Canada Ojitos Unit expansion area wells.

2. The efficiency of the BMG pressure maintenance project has been clearly established with the recovery of oil in place being 3 to 4 times

greater in West Puerto Chiquito than in Gavilan. (Case 9111, June, 1988, BMG Exhibit 10).

3. Pressure support from gas injection into the expansion area of the Canada Ojitos Unit is clearly evidenced by production from expansion area wells with minimal decline in reservoir pressure, (Case 9111, March 17, 1988, BMG Exhibit 1, Section K, blue sheets, showing recovery of 10,000 barrels per pound and Case 9111, June 13, 1988, BMG Exhibit 2, Section M).

3. The record in this case establishes that while the West Puerto Chiquito Mancos Oil Pool and the Canada Ojitos Unit have derived the benefits of unit operations, pressure maintenance and gravity drainage, Gavilan has not been developed in an orderly manner. It is a classic example of chaos that results from ever-changing regulations. The pool was developed initially on 40-acre spacing, then 320-acre spacing and now 640-acre spacing, resulting in erratic development patterns and impaired correlative rights.

WHEREFORE, BMG, Dugan and Sun request that the above referenced cases be set for Rehearing before the Oil Conservation Commission to permit all interested parties to present testimony on the reduction of the gas production limitations imposed by the August 5, 1988 Oil Conservation Commission Orders.

Respectfully submitted,

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ATTORNEYS FOR DUGAN
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SUN EXPLORATION AND
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CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing Application for Rehearing were mailed to all counsel of record on this 25th day of August, 1988.

_____
William F. Carr