dugan production corp.

January 18, 1984

Joe Ramey, Director
New Mexico Oil Conservation Division
P O Box 2088
Santa Fe, NM 87501

RE: Request for Administrative Approval to Commingle
Jerome P. McHugh - Native Son No. 2
Basin Dakota and Gavilan Mancos Pools
Unit N Sec. 27 T25N R2W, N.M.P.M.
Rio Arriba County, NM

Case 8041

Dear Mr. Ramey:

We are writing on behalf of Jerome P. McHugh and Associates to request administrative approval to commingle production within the well bore of the Native Son No. 2, from perforations within the Basin Dakota and the Gavilan Mancos pools.

The subject well was completed on November 18, 1983, testing 58 BOPD and 34 BWPD (load) plus 223 MCFGPD from perforations in the Dakota formation, 7886-7977', and 233 BOPD, 34 BWPD (load) plus 440 MCFGPD from perforations in the Mancos, 6802-7485'. The initial potential test indicates this to be among the better wells in the field to date. We have attached Table No. 1 for your information, which is a summary of wells completed to date within the boundry of the Gavilan Mancos oil pool.

The Native Son No. 2 was spudded on October 8, 1983, and 4½" casing was cemented at 8133'. The Dakota formation was perforated with a total of 21 holes throughout a 91' gross interval to develop 7 separate intervals and a total net pay of 15', with an overall average porosity of 6.7%. Within this 15 feet of net pay it is believed that 4' (averaging 8.25% porosity) will contribute a majority of the productivity and that 11' (average porosity 6.1%) will not significantly contribute to productivity in view of the shaliness and/or the fact that individual beds are so thin that lateral continuity from the well bore is very unlikely. The Mancos formation was perforated 6802-7485', an overall interval of 683', to develop 33 separate intervals with an estimated net pay of 58' and an average porosity of 14.0%. Within this 58' of pay, 25', with an average porosity of 12.6%, is believed to have reservoir characteristcs that will permit a significant contribution to productivity and 33' of pay, with an average porosity of 15.1%, is either

709 BLOOMFIELD RD. • P. O. BOX 208 • FARMINGTON, NEW MEXICO 87499 • PHONE: (505) 325-1821

too shaly or is of such thin beds that even though some productivity is expected, the contribution of this pay will not be a significant factor in total productivity. I have summarized in Table No. 2 my evaluation of the open hole logs which resulted in the above reservoir parameters. The water saturation was not calculated because it is my belief that all intervals within the Mancos and Dakota formations are not thick enough to allow the induction electric log to read true resistivity and we do not have the necessary data to make thin bed corrections on the resistivity measurements in order to approximate the true formation resistivity. In addition, the shale content of the Mancos formation also has a significant effect on the resistivity log and even though we could make a correction for shale content, I consider it to be a futile effort in view of the thinness of a majority of the beds.

With reference to Table No. 2, and the log section presented as Figures No. 3 and 4, it can be seen that during our drilling operations large amounts of mud were lost while drilling the Mancos interval and we believe this to be an indication of natural fracturing within the Mancos and is the explanation for the better than average initial potential in the Native Son No. 2. We encountered more lost circulation in the Native Son No. 2 than in any other well we have drilled to date. We have attached a copy of our daily report during the drilling and completion operations of this well for your review.

The Native Son No. 2 is located in Unit N of Section 27 and the production unit for the Dakota and Mancos formations comprises the S/2 of Section 27. With reference to Figure No. 1, ownership of offsetting leases is indicated. As a matter of interest, McHugh and Dugan Production Corp. jointly have interest in a majority of the adjoining leases totaling 775 net acres of the 1600 acres immediately adjacent to the production unit for the Native Son No. 2. With reference to Figure No. 2, we have indicated the Mancos (Gallup) and Dakota wells in the general area of the Gavilan Mancos pool and have identified those wells currently authorized to commingle Mancos and Dakota downhole as well as existing pools that permit commingling of Gallup and Dakota within the well bore. These pools are the West Lindrith Gallup-Dakota approximately 8½ miles to the west and the Ojito Gallup-Dakota approximately 8 miles to the northwest. It should be noted that the two wells located in the N/2 of Section 26, T-25 N, R-2 W, (the Gavilan No. 1 & No. 1E) are indicated on the map to be completed in the Mancos and Dakota and not commingled; however, the operator, Northwest Exploration Company, is requesting permission to commingle production from the Mancos and Dakota within the well bore (NMOCD Case No. 8042). Commingling of the Mancos and Dakota in this general area is an accepted practice in 5 of the wells in the immediate vicinity and, as mentioned, is proposed for 2 additional wells. Should the 2 wells in the N/2 of Section 26 be authorized to commingle Mancos and Dakota production, all wells currently completed in the Mancos and Dakota within the Gavilan Mancos pool area will be authorized to commingle production downhole. Our request to commingle the Mancos and Dakota in the Native Son No. 2 is mainly to permit production to occur from the Dakota formation, which will not support the economic burden of a dual completion attempt.

With reference to Figures No. 3 and No. 4, which are reproductions of the open hole log for the Native Son No. 2 through the Mancos and Dakota intervals, we have indicated the perforations in both horizons and it is our belief that all potentially productive pay has been perforated and stimulated. In addition, the intervals of lost circulation within the Mancos are indicated.

The production performance of the Gavilan No. 1, operated by Northwest Exploration approximately 1.7 miles to the northeast, is presented on Figure No. 5. As of December 1, the Gavilan No. 1 had produced 21 months and cummulative production amounted to 22,162 BO plus 180.8 MMCF of gas. The production data plotted on Figure No. 5 represents production from the Mancos only through July, 1983, and commingled Gallup-Dakota production during August, September and part of October, with only the Dakota being produced during the latter part of October and during November. On Figure No. 5 we have also indicated our anticipated production performance for the Native Son No. 2, beginning in January, 1984, at a rate of approximately 3700 BO per month, which represents a sustained production rate equal to 42% of the combined initial potential of 291 BOPD. We would expect production to decline at an annual rate of 40% for 3½ years and then stabilize at a 9% annual decline. This production forecast was developed by averaging production data from 4 wells in the West Lindrith Gallup-Dakota and 2 wells in the Ojito Gallup-Dakota fields. A similar production projection was utilized on the 5 wells previously authorized to commingle production from the Mancos and Dakota and the data supporting this projection is presented on Figure No. 6. As can be seen from production performance of the Gavilan No. 1, it is very difficult to make any projections as to how future production should perform; however, it can be seen that our projection for the Native Son No. 2 is not an unrealistic forecast considering that a majority of the performance from the Gavilan No. 1 occurred with very little influence from offset wells. None of the 5 wells operated by McHugh had any significant production until May, 1983. The Gavilan No. 1E, located in the NW of Section 26, did not start producing until August, 1983, and is averaging 51 BOPD. The Rucker Lake No. 2 and No. 3, located to the NE and SE respectively, commenced producing in September and August, averaging approximately 100 BOPD per well. We would expect performance of the Gavilan No. 1 to begin a decline in the near future. As you are aware, this is an area of fairly recent development and very little is known about the reservoir to date.

Utilizing the production projection presented in Figure No. 5, it is estimated that ultimate recovery from the Native Son No. 2 will be 147,400 BO. The ultimate recovery is split between the Dakota and Mancos utilizing a volumetric calculation for the ultimate recovery in the Dakota. It is estimated that the Dakota reserves will be 19,500 STB, which will result in 127,900 BO being produced from the Mancos interval. Utilizing these reserve figures along with an estimate of an overall GOR of 10,200 and 3,500 for the Mancos and Dakota respectively, gas reserves are estimated to be 1,304.6 MMCF for the Mancos and 68.2 MMCF for the Dakota. Utilizing these reserve estimates, ultimate recoveries will be split between the Mancos and Dakota as follows:

	Mancos	Dakota
Oil	87%	13%
Gas	95%	5%

The details in support of these reserve calculations and allocation factor calculations are presented in Table No. 3. For your reference, the allocation factors for the 5 wells operated by McHugh and previously authorized to commingle production downhole are summarized on Table No. 4 along with the proposed factors for the Native Son No. 2.

The Mancos and Dakota Formations are each productive of hydrocarbons that are compatible with each other and it is our belief that any water associated with each zone is also compatible and that there will be no damage to either zone as a result of this commingling. Both formations were stimulated utilizing a water based fluid. Cross flow of fluid between each zone is not anticipated to be a serious problem. The BHP in the Mancos at a datum of 7144' (mid perf) is estimated to be 1,690 psig and the BHP in the Dakota at a datum of 7932' (mid perf) is estimated to be 2,674 psig. These pressures were determined from pressure build-up data in each zone in the Gavilan No. 1, located in the NE of Section 26, and are believed to be representative of each formation.

In summary, we are requesting permission to commingle production from the Mancos and Dakota formations within the well bore of the Native Son No. 2. To date very little production has actually occurred from this well, as it will not flow up the tubing; however, it will flow up the casing-tubing annulus. It is our plan to install artificial lift equipment in the well in order to produce the Native Son No. 2 since flowing the well up the casing-tubing annulus is not a practical option in view of the fact that both formations have a tendency to deposit paraffin. It is our belief that production from the Dakota will be a fairly minor part of the productivity and should this commingling not be permitted, the economics of dually producing both zones will likely prohibit producing the Dakota and an additional well to produce the Dakota only cannot be justified. Therefore, in order to allow the working interest owners in the S/2 of Section 27 to benefit from what productivity exists in the Dakota and to protect their correlative rights as the Dakota is being produced in other wells in the area, it is requested that the NMOCD authorize this commingling. Any revenue generated as a result of production from the Dakota will be in addition to revenues that will be generated from producing the Mancos only and therefore this commingling will result in an increase in ultimate hydrocarbon recoveries and revenue from this well.

The ownership of both horizons is common. The offset operators indicated on Figure No. 1 have been notified in writing of this application and by copy of this application we are notifying the Bureau of Land Management, since this well is located on Federal Lease No. 23038.

January 18, 1984

Should you have any questions regarding our application or need additional information, please do not hesitate to contact me.

Sincerely,

John D. Roe

John D. Roe
Petroleum Engineer

fp

cc: NMOCD, Aztec
Jerome P. McHugh, DE & Fmn
BLM, Fmn