

STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
DIVISION FOR THE PURPOSE OF  
CONSIDERING:

APPLICATION OF MERIDIAN OIL INC. FOR DOWNHOLE  
COMMINGLING, SAN JUAN COUNTY, NEW MEXICO.

*Case No. 10918*

APPLICATION OF MERIDIAN OIL INC. FOR AN  
UNORTHODOX GAS WELL LOCATION AND DOWNHOLE  
COMMINGLING, SAN JUAN COUNTY, NEW MEXICO.

*Case No. 10919*

APPLICATION OF MERIDIAN OIL INC. FOR AN  
UNORTHODOX GAS WELL LOCATION AND DOWNHOLE  
COMMINGLING, SAN JUAN COUNTY, NEW MEXICO.

*Case No. 10920*

APPLICATION OF MERIDIAN OIL INC. FOR DOWNHOLE  
COMMINGLING, SAN JUAN COUNTY, NEW MEXICO.

*Case No. 10921*

**Order No. R-10090**

**ORDER OF THE DIVISION**

**BY THE DIVISION:**

This cause came on for hearing at 8:15 a.m. on February 17, 1994, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 4th day of April, 1994, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

**FINDS THAT:**

(1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) At the time of the hearing Case Nos. 10918 through 10921 were consolidated for the purpose of presenting testimony.

(3) The applicant in each of the four aforementioned cases is Meridian Oil Inc. ("Meridian") and due to the similarity, relatively close proximity, and nature of each, a single directive issued by the Division is deemed appropriate:

- (a) in Case No. 10918 the applicant seeks approval to downhole commingle Aztec-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Neudecker Well No. 2 (API No. 30-045-07698), located at a standard gas well location for both intervals, 1650 feet from the North and East lines (Unit G) of Section 35, Township 29 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 320-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being the N/2 of said Section 35 and the NE/4 of said Section 35 shall remain the dedicated acreage in the Aztec-Pictured Cliffs Pool, being a standard 160-acre gas spacing and proration unit;
- (b) also in Case No. 10918 the applicant seeks approval to downhole commingle Aztec-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Zachry Well No. 11 (API No. 30-045-07564), located at a standard gas well location for both intervals, 990 feet from the South and West lines (Unit M) of Section 10, Township 28 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a non-standard 259.20-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being all of said Section 10, which is irregular in size and shape, and the previously approved 193.75-acre non-standard gas spacing and proration unit (Division Order No. R-702, dated October 13, 1955) comprising Lot 1 and the SE/4 SE/4 of Section 9 and Lots 3 and 4 and the S/2 SW/4 of Section 10, both in Township 28 North, Range 10 West, NMPM, San Juan County, New Mexico shall remain the dedicated acreage in the Aztec-Pictured Cliffs Pool;
- (c) also in Case No. 10918 the applicant seeks approval to downhole commingle Aztec-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Pierce Federal "A" Well No. 1 (API No. 30-045-07729), located at a standard gas well location for both intervals, 990 feet from the North and East lines (Unit A) of Section 34, Township 29 North, Range 10 West, NMPM,

San Juan County, New Mexico. Said well is to be dedicated to a standard 320-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being the N/2 of said Section 34 and the NE/4 of said Section 34 shall remain the dedicated acreage in the Aztec-Pictured Cliffs Pool, being a standard 160-acre gas spacing and proration unit;

- (d) in Case No. 10919 the applicant seeks approval to downhole commingle Fulcher Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Lodewick Well No. 1 (API No. 30-045-06564), located 990 feet from the North and West lines (Unit D) of Section 18, Township 27 North, Range 9 West, NMPM, San Juan County, New Mexico. The location of said well is standard for the Fulcher Kutz-Pictured Cliffs Pool, it is however unorthodox for the Basin-Fruitland Coal (Gas) Pool. Further, said well is to be dedicated to a standard 322.40-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool comprising Lots 1 through 4 and the E/2 W/2 (W/2 equivalent) of said Section 18 and the 161.32 acres comprising Lots 1 and 2 and the E/2 NW/4 (NW/4 equivalent) of said Section 18 shall remain the dedicated acreage in the Fulcher Kutz-Pictured Cliffs Pool;
- (e) in Case No. 10920 the applicant seeks approval to downhole commingle Fulcher Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed C. M. Morris Well No. 100 to be drilled 1340 feet from the North line and 1405 feet from the East line (Unit G) of Section 10, Township 27 North, Range 10 West, NMPM, San Juan County, New Mexico. The proposed location of said well is standard for the Basin-Fruitland Coal (Gas) Pool, it is however considered to be unorthodox for the Fulcher-Kutz Pictured Cliffs Pool. Further, said well is to be dedicated to a standard 320-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being the E/2 of said Section 10 and to a standard 160-acre gas spacing unit for the Fulcher Kutz-Pictured Cliffs Pool being the NE/4 of said Section 10;
- (f) also in Case No. 10920 the applicant seeks approval to downhole commingle West Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed Huerfano Unit Com Well No. 509 (API No. 30-045-29066) to be drilled at an unorthodox gas well location for both the West Kutz-Pictured Cliffs

Pool and the Basin-Fruitland Coal (Gas) Pool, being 775 feet from the North line and 545 feet from the West line (Lot No. 1 or Unit D) of Section 30, Township 27 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 327.40-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being Lots 1 and 2, the NE/4, and the E/2 NW/4 (N/2 equivalent) of said Section 30 and to a 167.40 acre gas spacing unit for the West Kutz-Pictured Cliffs Pool being Lots 1 and 2 and the E/2 NW/4 (NW/4 equivalent) of said Section 30 (Note: The applicant originally requested the Pictured Cliffs completion for this well be included in the "Fulcher Kutz-Pictured Cliffs Pool"; however, all of said Section 30 is within the "West Kutz-Pictured Cliffs Pool" and is therefore the proper pool placement for this well); and,

- (g) in Case No. 10921 the applicant seeks approval to downhole commingle Fulcher Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Huerfano Unit Well No. 74 (API No. 30-045-06321), located at a standard gas well location for both intervals, 851 feet from the South line and 1057 feet from the West line (Lot No. 4, Unit M) of Section 19, Township 27 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 334.08-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool comprising Lots 1 through 4 and the E/2 W/2 (W/2 equivalent) of said Section 19 and the 167.19 acres comprising Lots 3 and 4 and the E/2 SW/4 (SW/4 equivalent) of said Section 19 shall remain the dedicated acreage in the Fulcher Kutz-Pictured Cliffs Pool; and,
- (h) also in Case No. 10921 the applicant seeks approval to downhole commingle West Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Huerfano Unit Well No. 18 (API No. 30-045-06110), located at a standard gas well location for both intervals, 990 feet from the South and West lines (Unit M) of Section 32, Township 27 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 320-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool comprising the S/2 of said Section 32 and the 160 acres comprising the SW/4 of said Section 32 shall remain the dedicated acreage in the West Kutz-Pictured Cliffs Pool.

(4) At the time of the hearing the applicant requested dismissal of the C. M. Morris Well No. 100 in Case 10920.

(5) The Aztec, West Kutz and Fulcher Kutz-Pictured Cliffs Pools are governed under the spacing provisions of the Division's General Rules and Regulations [Rule 104.C(3)] which provides for 160-acre drilling tracts. The Basin Fruitland Coal (Gas) Pool is spaced on 320-acre spacing, pursuant to the provisions of Rule 4 of the Special Rules and Regulations for the Basin Fruitland Coal (Gas) Pool, as promulgated by Division Order No. R-8768, as amended.

(6) The unorthodox location of the proposed Huerfano Unit Com Well No. 509 (Case 10920) is necessitated by both topographic limitations and restrictions imposed by the U. S. Bureau of Land Management, being the federal surface management agency. The applicant further requested this off-pattern coal gas well location in the NW/4 equivalent of Section 30, Township 27 North, Range 10 West, NMPM, San Juan County, New Mexico in order to recover marginal Pictured Cliffs gas reserves in this particular quarter section.

(7) The Lodewick Well No. 1 (Case No. 10919) is a recompletion from a deeper horizon in which the well location is standard to a shallower interval where it now becomes an unorthodox coal gas well location.

(8) The non-standard 259.20-acre gas spacing and proration unit in the Basin-Fruitland Coal (Gas) Pool for the existing Zachry Well No. 11 (Case No. 10918) results from a variation in the U. S. Public Lands Survey. Its approval should be incorporated in this order for convenient and for record purposes.

(9) The applicant's engineering testimony indicates Pictured Cliffs production from the six existing wells is marginal and each is nearing its economic life. Additional Pictured Cliffs reserves can be obtained economically by downhole commingling Basin-Fruitland Coal gas production with this marginal Pictured Cliffs gas production.

(10) The proposed Huerfano Unit Com Well No. 509 (Case 10920) is located within an area that was the subject of Division Order Nos. R-9921 and R-9921-A, issued in Case Nos. 10735 and 10855, respectively, which addressed downhole commingling of conventional Pictured Cliffs gas and Fruitland coal gas production within Meridian's Huerfano Unit Area. The technical evidence presented by the applicant in this matter substantiates the findings and conclusions in both aforementioned cases.

(11) Further, the Division has recently considered similar request by Meridian to downhole commingle conventional Pictured Cliffs gas and Fruitland coal gas production in Northwest New Mexico in seven other cases, which resulted in the issuance of Division Order Nos. R-9920, R-9920-A, and R-10002.

(12) The records in the following Cases heard before the Division should be incorporated into this case:

Application of Meridian Oil, Inc. for an unorthodox gas well location and downhole commingling, San Juan County.	Case No. 10721 (R-9920)
Application of Meridian Oil, Inc. for downhole commingling, San Juan County.	Case No. 10722 (R-9920)
Application of Meridian Oil, Inc. for an unorthodox gas well location and downhole commingling, San Juan County.	Case No. 10723 (R-9920)
Application of Meridian Oil, Inc. for an unorthodox gas well location and downhole commingling, San Juan County.	Case No. 10724 (R-9920)
Application of Meridian Oil, Inc. for an unorthodox gas well location and downhole commingling, San Juan County.	Case No. 10725 (R-9920)
Application of Meridian Oil, Inc. for downhole commingling and for an administrative downhole commingling procedure within the Huerfano Unit Area, San Juan County.	Case No. 10735 (R-9921)
Application of Meridian Oil, Inc. for an unorthodox gas well location and downhole commingling, Rio Arriba County.	Case No. 10745 (R-10002)
Application of Meridian Oil, Inc. for an unorthodox gas well location, non-standard gas proration units, and downhole commingling, Rio Arriba County.	Case No. 10754 (R-10002)
Application of Meridian Oil, Inc. for an unorthodox gas well location and downhole commingling, San Juan County.	Reopened Case No. 10721 (R-9920-A)
Application of Meridian Oil, Inc. for downhole commingling, San Juan County.	Reopened Case No. 10722 (R-9920-A)
Application of Meridian Oil, Inc. for an unorthodox gas well location and downhole commingling, San Juan County.	Reopened Case No. 10723 (R-9920-A)

Application of Meridian Oil, Inc. for an unorthodox gas well location and downhole commingling, San Juan County.	Reopened Case No. 10724 (R-9920-A)
Application of Meridian Oil, Inc. for an unorthodox gas well location and downhole commingling, San Juan County.	Reopened Case No. 10725 (R-9920-A)
Application of Meridian Oil, Inc. to amend Division Order No. R-9921, San Juan County.	Case No. 10855 (R-9921-A)

(13) The issues in this matter being essentially identical as to those in the above-described cases in which it was demonstrated that:

- (a) there will be no cross-flow between the two commingled pools;
- (b) neither commingled zone exposes the other to damage by produced liquids;
- (c) the fluids from each zone are compatible with the other;
- (d) the bottomhole pressure of the lower pressure zone should not be less than 50 percent of the bottomhole pressure of the higher pressure zone adjusted to a common datum; and,
- (e) the value of the commingled production is not less than the sum of the values of the individual production.

(14) The ownership within the Basin-Fruitland Coal (Gas) Pool and the Aztec-Pictured Cliffs Pool, Fulcher Kutz-Pictured Cliffs Pool or West Kutz-Pictured Cliffs Pool underlying each respective proration unit is not common.

(15) The applicant has notified all interest owners owning an interest in either the Pictured Cliffs or Fruitland formation within the subject proration units of its proposed downhole commingling.

(16) No offset operator and/or interest owner appeared at the hearing in opposition to the proposed downhole commingling and/or unorthodox well locations.

(17) In the interest of prevention of waste and protection of correlative rights, each of the subject wells in this application should be approved.

(18) Due to the nature of gas production from the Basin-Fruitland Coal (Gas) Pool, straight allocation of gas volumes from both zones is not appropriate. The applicant therefore seeks the adoption of a monthly allocation formula, based on initial production test and known/assumed parameters from the Pictured Cliffs zone whereby its initial rate, estimated ultimate recovery, and decline rate can be determined. Any production rate over what is calculated for the Pictured Cliffs utilizing the applied formula can be attributed to the Fruitland coal gas interval. See Exhibits "A, B, and C" attached hereto and made a part hereof for additional references.

(19) The operator should consult with the Supervisor of the Aztec Office of the Division to insure the validity and scientific accuracy of the initial test on each well.

(20) The operator should be responsible for reporting the monthly gas production from each of the subject wells by utilizing the proposed allocation formula.

(21) An annual report should be submitted by the operator for each well to both the Aztec and Santa Fe offices of the Division showing the complete computations for each month.

(22) Any condensate production should be allocated entirely to the Pictured Cliffs interval. Water production should be reported in a manner acceptable to the supervisor of the Aztec district office of the Division.

(23) Any change in the method of gas allocation between the two pools for any of the subject wells should be made only after due notice and hearing.

(24) To afford the Division an opportunity to assess the potential of waste and to expeditiously order the appropriate remedial action, the operator should notify the Aztec district office of the Division any time one of the five subject wells is shut-in for seven consecutive days.

**IT IS THEREFORE ORDERED THAT:**

(1) The applicant in Case Nos. 10918, 10919, 10920, and 10921, Meridian Oil Inc., is hereby authorized:

- (a) to downhole commingle Aztec-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Neudecker Well No. 2 (API No. 30-045-07698), located at a standard gas well location for both intervals, 1650 feet from the North and East lines (Unit G) of Section 35, Township 29 North, Range 10 West,



NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 320-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being the N/2 of said Section 35 and the NE/4 of said Section 35 shall remain the dedicated acreage in the Aztec-Pictured Cliffs Pool, being a standard 160-acre gas spacing and proration unit;

- (b) to downhole commingle Aztec-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Zachry Well No. 11 (API No. 30-045-07564), located at a standard gas well location for both intervals, 990 feet from the South and West lines (Unit M) of Section 10, Township 28 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a non-standard 259.20-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being all of said Section 10, which is irregular in size and shape, and the previously approved 193.75-acre non-standard gas spacing and proration unit (Division Order No. R-702, dated October 13, 1955) comprising Lot 1 and the SE/4 SE/4 of Section 9 and Lots 3 and 4 and the S/2 SW/4 of Section 10, both in Township 28 North, Range 10 West, NMPM, San Juan County, New Mexico shall remain the dedicated acreage in the Aztec-Pictured Cliffs Pool;
- (c) to downhole commingle Aztec-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Pierce Federal "A" Well No. 1 (API No. 30-045-07729), located at a standard gas well location for both intervals, 990 feet from the North and East lines (Unit A) of Section 34, Township 29 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 320-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being the N/2 of said Section 34 and the NE/4 of said Section 34 shall remain the dedicated acreage in the Aztec-Pictured Cliffs Pool, being a standard 160-acre gas spacing and proration unit;
- (d) to downhole commingle Fulcher Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Lodewick Well No. 1 (API No. 30-045-06564), located 990 feet from the North and West lines (Unit D) of Section 18, Township 27 North, Range 9 West, NMPM, San Juan County, New Mexico. The location of said well is standard for the Fulcher Kutz-Pictured

Cliffs Pool, it is however unorthodox for the Basin-Fruitland Coal (Gas) Pool. Further, said well is to be dedicated to a standard 322.40-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool comprising Lots 1 through 4 and the E/2 W/2 (W/2 equivalent) of said Section 18 and the 161.32 acres comprising Lots 1 and 2 and the E/2 NW/4 (NW/4 equivalent) of said Section 18 shall remain the dedicated acreage in the Fulcher Kutz-Pictured Cliffs Pool;

- (e) to downhole commingle West Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its proposed Huerfano Unit Com Well No. 509 (API No. 30-045-29066) to be drilled at an unorthodox gas well location for both the West Kutz-Pictured Cliffs Pool and the Basin-Fruitland Coal (Gas) Pool, being 775 feet from the North line and 545 feet from the West line (Lot No. 1 or Unit D) of Section 30, Township 27 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 327.40-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool being Lots 1 and 2, the NE/4, and the E/2 NW/4 (N/2 equivalent) of said Section 30 and to a 167.40 acre gas spacing unit for the West Kutz-Pictured Cliffs Pool being Lots 1 and 2 and the E/2 NW/4 (NW/4 equivalent) of said Section 30; and,
- (f) to downhole commingle Fulcher Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Huerfano Unit Well No. 74 (API No. 30-045-06321), located at a standard gas well location for both intervals, 851 feet from the South line and 1057 feet from the West line (Lot No. 4, Unit M) of Section 19, Township 27 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 334.08-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool comprising Lots 1 through 4 and the E/2 W/2 (W/2 equivalent) of said Section 19 and the 167.19 acres comprising Lots 3 and 4 and the E/2 SW/4 (SW/4 equivalent) of said Section 19 shall remain the dedicated acreage in the Fulcher Kutz-Pictured Cliffs Pool; and,
- (g) to downhole commingle West Kutz-Pictured Cliffs Pool and Basin-Fruitland Coal (Gas) Pool production within the wellbore of its existing Huerfano Unit Well No. 18 (API No. 30-045-06110), located at a standard gas well location for both intervals, 990 feet from the

South and West lines (Unit M) of Section 32, Township 27 North, Range 10 West, NMPM, San Juan County, New Mexico. Said well is to be dedicated to a standard 320-acre gas spacing and proration unit for the Basin-Fruitland Coal (Gas) Pool comprising the S/2 of said Section 32 and the 160 acres comprising the SW/4 of said Section 32 shall remain the dedicated acreage in the West Kutz-Pictured Cliffs Pool.

(2) The allocation of gas produced from the Pictured Cliffs and Fruitland Coal intervals in each of the existing wells (the Neudecker Well No. 2, Zachry Well No. 11, Pierce Federal "A" Well No. 1, Lodewick Well No. 1, Huerfano Unit Well No. 74, and the Huerfano Unit Well No. 18) shall be in accordance with the adopted allocation formula, as further referenced in Exhibit "A" attached hereto and made a part hereof.

(3) The allocation of gas produced from the West Kutz-Pictured Cliffs Pool and the Basin-Fruitland Coal (Gas) Pool in the proposed Huerfano Unit Com Well No. 509 shall be in accordance with the adopted allocation formula, as further referenced in Exhibit "A" attached hereto and made a part hereof. However, in the event the Economic Limit plotted for production from either pool in the Huerfano Unit Com Well No. 509 is less than the curve for the dual completion case as plotted on Exhibit "C" [being a plot of costs compared to both maximum average daily producing rate against pipeline pressure ("Initial Rate") and an estimated ultimate gas recovery ("EUR")] attached hereto and made a part hereof, then and in that event, downhole commingling shall be allowed in the effected well. In the event the Economic Limit plotted for production from both pools in said Huerfano Unit Com Well No. 509 initially exceeds the curve for the dual completion case, then downhole commingling shall not be allowed in the well until such time as the Economic Limit in that well for production from either pool drops below the dual completion curve plotted on Exhibit "C".

(4) The operator shall consult with the Supervisor of the Aztec Office of the Division to insure the validity and accuracy of the initial test on each well.

(5) Further, as part of the procedure for obtaining authorization to produce the Huerfano Unit Com Well No. 509 as a downhole commingled well, the operator shall submit to the Supervisor of the Aztec Office of the Division a sworn certificate verifying the cost, the Initial Rate and the EUR for that well. The Supervisor of the Aztec Office of the Division shall approve the downhole commingling and authorize the operator to produce the well if the Economic Limit for production from either pool in that well is less than the curve for the dual completion case as plotted on Exhibit "C". In the event the well initially fails to qualify for downhole commingling, the well can still qualify at some future date if and when the Economic Limit in that well for production from either pool drops below the dual completion case curve plotted on Exhibit "C".

(6) Further, the operator is responsible for reporting the monthly gas production from each of the five wells to the Division utilizing said allocation formula. An annual report for each well shall be submitted by the operator to both the Aztec and Santa Fe offices of the Division showing the complete computations for the previous twelve month period.

(7) Any condensate production from a well shall be allocated entirely to the appropriate Pictured Cliffs Pool. Water production shall be reported in a manner acceptable to the supervisor of the Aztec district office of the Division.

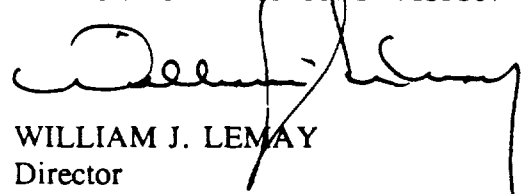
(8) Any variance in the method of gas allocation between the two pools for any of the subject wells shall be made only after due notice and hearing.

(9) The operator shall immediately notify the supervisor of the Aztec District Office of the Division any time one of the five subject wells has been shut-in for seven consecutive days and shall concurrently present, to the Division, a plan for remedial action.

(10) Jurisdiction of this cause is hereby retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION



WILLIAM J. LEMAY  
Director

S E A L

Exhibit "A"

CONSOLIDATED CASE NOS. 10918, 10919, 10920, and 10921  
Division Order No. R-10090

MONTHLY GAS PRODUCTION ALLOCATION FORMULA  
GENERAL EQUATION

$$Q_t = Q_{ftc} + Q_{pc}$$

WHERE:

$Q_t$  = TOTAL MONTHLY PRODUCTION FROM WELL (MCF/MONTH)  
 $Q_{ftc}$  = FRUITLAND COAL (FTC) MONTHLY PRODUCTION (MCF/MONTH)  
 $Q_{pc}$  = PICTURED CLIFFS (PC) MONTHLY PRODUCTION (MCF/MONTH)

REARRANGING THE EQUATION TO SOLVE FOR  $Q_{ftc}$ :

$$Q_{ftc} = Q_t - Q_{pc}$$

ANY PRODUCTION RATE OVER WHAT IS CALCULATED FOR THE PICTURED CLIFFS (PC) USING THE APPLIED FORMULA IS FRUITLAND COAL (FTC) PRODUCTION.

ICTURED CLIFFS (PC) FORMATION PRODUCTION FORMULA IS:

$$Q_{pc} = Q_{pci} * e^{\{-(D_{pc}) * (t)\}}$$

WHERE:

$Q_{pci}$  = INITIAL PC MONTHLY FLOW RATE (DETERMINED FROM LAST MONTH OF PICTURED CLIFFS ONLY PRODUCTION, PRIOR TO RECOMPLETION AND COMMINGLING).  
 $D_{pc}$  = PICTURED CLIFFS MONTHLY DECLINE RATE CALCULATED FROM DECLINE CURVE AND MATERIAL BALANCE ANALYSIS:

NOTE: Insert in the above formula the following "Dpc" value for each of the following wells:

(a)	Neudecker Well No. 2	-	0.00356
(b)	Zachry Well No. 11	-	0.00366
(c)	Pierce Federal "A" Well No. 1	-	0.00347
(d)	Lodewick Well No. 1	-	0.00102
(e)	C. M. Morris Well No. 100	-	n/a
(f)	Huerfano Unit Well No. 509	-	n/a
(g)	Huerfano Unit Well No. 74	-	0.00119
(h)	Huerfano Unit Well No. 18	-	0.00304

THUS:  $Q_{ftc} = Q_t - Q_{pci} * e^{\{-(D_{pc}) * (t)\}}$

WHERE: (t) = TIME (MONTHS) FROM INITIAL PRODUCTION

REFERENCE: Thompson, R. S., and Wright, J. D., "Oil Property Evaluation", pages 5-2, 5-3, 5-4.

Exhibit "B"  
CONSOLIDATED CASE NOS. 10918, 10919, 10920, AND 10921  
DIVISION ORDER NO. R-10090

**HUERFANO UNIT COM WELL NO. 509**  
**MONTHLY GAS PRODUCTION ALLOCATION FORMULA**  
**GENERAL EQUATION**

$$Q_t = Q_{ftc} + Q_{pc}$$

**WHERE:**

**Q<sub>t</sub>** = TOTAL MONTHLY PRODUCTION FROM WELL (MCF/MONTH)  
**Q<sub>ftc</sub>** = FRUITLAND COAL (FTC) MONTHLY PRODUCTION (MCF/MONTH)  
**Q<sub>pc</sub>** = PICTURED CLIFFS (PC) MONTHLY PRODUCTION (MCF/MONTH)

REARRANGING THE EQUATION TO SOLVE FOR Q<sub>ftc</sub>:

$$Q_{ftc} = Q_t - Q_{pc}$$

ANY PRODUCTION RATE OVER WHAT IS CALCULATED FOR THE PICTURED CLIFFS (PC) USING THE APPLIED FORMULA IS FRUITLAND COAL (FTC) PRODUCTION.

ICTURED CLIFFS (PC) FORMATION PRODUCTION FORMULA IS:

$$Q_{pc} = Q_{pci} * e^{\{-(D_{pc})*(t)\}}$$

**WHERE:**

**Q<sub>pci</sub>** = INITIAL PC MONTHLY FLOW RATE (CALCULATED FROM FLOW TEST)  
**D<sub>pc</sub>** = PICTURED CLIFFS MONTHLY DECLINE RATE CALCULATED FROM:  
(Q<sub>pci</sub>-Q<sub>pcabd</sub>)/N<sub>p</sub>(pc)  
See Determination of Q<sub>pci</sub> and Pictured Cliffs Estimated Ultimate Recovery (N<sub>p</sub>(pc))  
Q<sub>pcabd</sub> = 300 mcf/d

**WHERE:**

**N<sub>p</sub>(pc)** = PICTURED CLIFFS ESTIMATED ULTIMATE RECOVERY (EUR)  
**P \* 0.62 MMCF/psi \* R<sub>f</sub>**  
P = INITIAL RESERVOIR PRESSURE (SIBHP)  
R<sub>f</sub> = RECOVERY (FIELD ANALOGY): = 0.86  
"0.62": IS DETERMINED FROM MATERIAL BALANCE (FIELD ANALOGY) AND VOLUMETRIC RESERVES (LOG ANALYSIS)

By calculating N<sub>p</sub>(pc) from SIBHP and determining Q<sub>pci</sub>, D<sub>pc</sub> can then be calculated utilizing the previously described parameters.

THUS:  $Q_{ftc} = Q_t - Q_{pci} * e^{\{-(D_{pc})*(t)\}}$

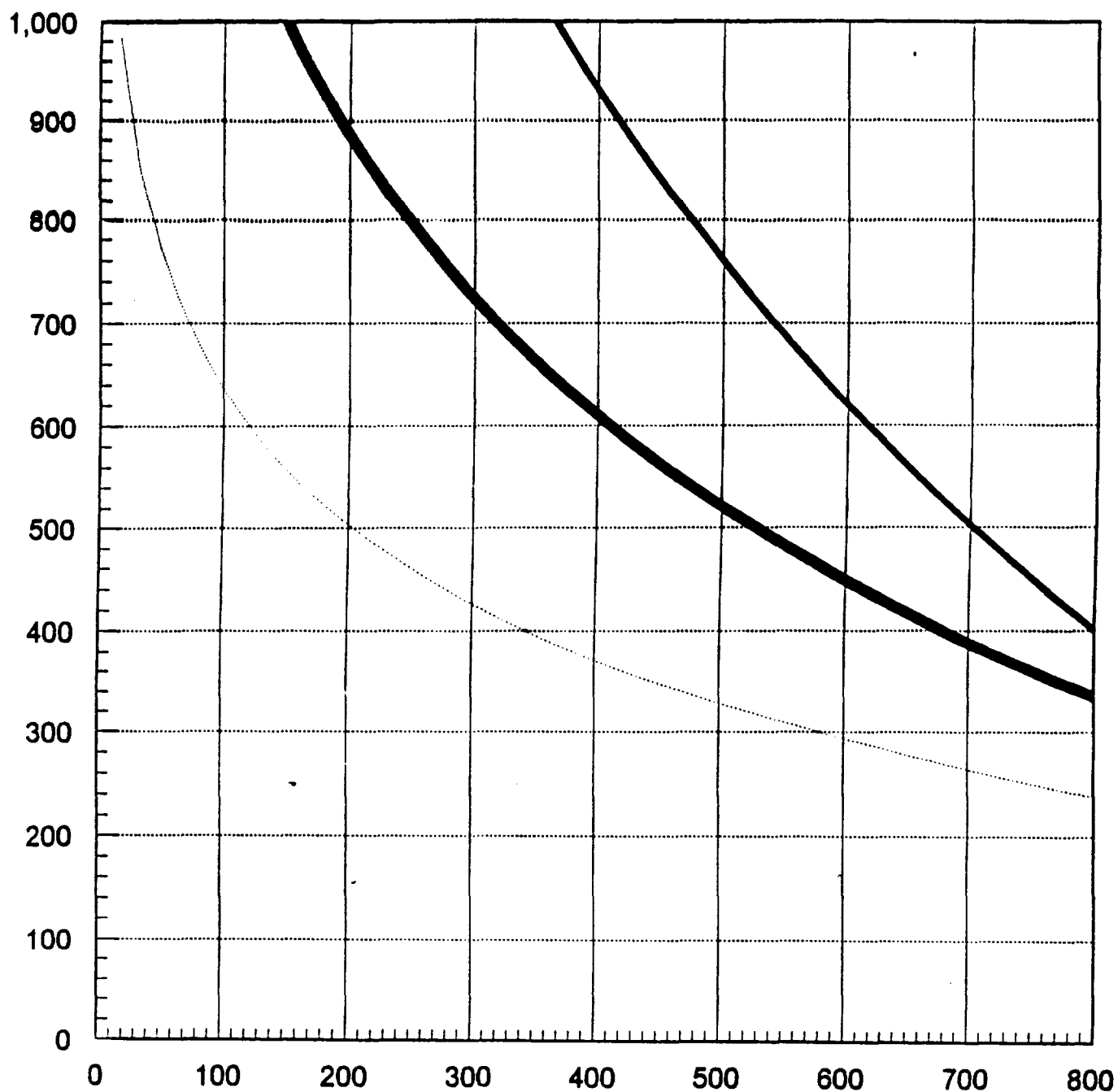
WHERE: (t) = TIME (MONTHS) FROM INITIAL PRODUCTION

REFERENCE:Thompson, R. S., and Wright, J. D., "Oil Property Evaluation", pages 5-2, 5-3, 5-4.

## PICTURED CLIFFS / FRUITLAND COAL

### ECONOMIC EVALUATION COMPLETION TECHNIQUE SENSITIVITY

EUR (MMCF)



SINGLE      DUAL      COMMINGLE  
15% ROR   15% ROR   15% ROR

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