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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:

RECEIVED
OCT 28 1997

OIL CON. DIV.
DIST. 8

CASE NO. 11815
ORDER NO. R-10476-B

APPLICATION OF CONOCO INC. FOR THE ESTABLISHMENT OF A
DOWNHOLE COMMINGLING REFERENCE CASE PURSUANT TO DIVISION
GENERAL RULE 303.E AND FOR AN EXCEPTION TO DIVISION GENERAL
RULE 303.C(1)(b)(ii), RIO ARriba COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on July 24 and August 21, 1997 at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 17th day of October, 1997, 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) By Order No. R-10476, issued in Case 11349 and dated October 6, 1995, the Division authorized Conoco, Inc. ("Conoco") to commingle gas production from the Basin-Dakota and Blanco-Mesaverde Pools within fourteen (14) existing Basin-Dakota Pool gas wells, and within seventeen (17) wells to be subsequently drilled and initially completed as Dakota/Mesaverde commingled wells, all located within its San Juan "28-7" Unit located in portions of Townships 27 and 28 North, Range 7 West, NMPM, Rio Arriba County, New Mexico. Two of the proposed seventeen wells were authorized to be drilled at unorthodox gas well locations therein.

(3) By Division Order No. R-10476-A, dated April 23, 1996, an amendment was issued for Order No. R-10476 which addressed the location of one particular well

affected by this action.

(4) Pursuant to the provisions of Division General Rule 303.E, Conoco at this time seeks to establish a downhole commingling "reference case" for its San Juan "28-7" Unit in Rio Arriba County, New Mexico and the adoption of special administrative rules therefor including provisions whereby all administrative applications for downhole commingling of gas production attributed to the Blanco-Mesaverde, Basin-Dakota, Basin-Fruitland Coal (Gas), Otero-Chacra, Blanco-Pictured Cliffs, and South Blanco-Pictured Cliffs Pools within its San Juan "28-7" Unit submitted subsequent to the filing of this application in this case shall be required to complete the information blanks on Division Form C-107-A but shall not be required to submit additional supporting evidence or data for the following criteria:

- (a) marginal economic criteria;
- (b) pressure criteria;
- (c) allocation formulas; and,
- (d) notice to owners of any production within spacing units where the ownership is not common and offset operators who also own an interest in this unit.

(5) Applicant further seeks an exception from the pressure limitation criteria set forth in Rule 303.C(1)(b)(ii) for all future "new drills" for Basin-Dakota and Blanco-Mesaverde gas production within the "28-7" Unit and for four (4) specific Dakota/Mesaverde wells described as follows:

- (a) the San Juan "28-7" Unit Well No. 224M (API No. 30-039-25697), to be drilled at a standard gas well location 1450 feet from the South line and 790 feet from the East line (Unit D) of Section 28, Township 28 North, Range 7 West, NMPM, Rio Arriba County, New Mexico;
- (b) the San Juan "28-7" Unit Well No. 226M (API No. 30-039-25694), to be drilled at a standard gas well location 790 feet from the North and West lines (Unit D) of Section 36, Township 28 North, Range 7 West, NMPM, Rio Arriba County, New Mexico;
- (c) the San Juan "28-7" Unit Well No. 227M (API No.

30-039-25661), located at a standard gas well location 1745 feet from the South line and 1850 feet from the East line (Unit J) of said Section 36; and,

(d) the San Juan "28-7" Unit Well No. 232M (API No. 30-039-25693), to be drilled at an unorthodox gas well location (approved by Division Administrative Order NSL-3784, dated April 3, 1997) 2425 feet from the South line and 500 feet from the East line (Unit I) of Section 20, Township 28 North, Range 7 West, NMPM, Rio Arriba County, New Mexico.

(6) Division General Rule 303.E, amended by Division Order R-10470-A, issued by the New Mexico Oil Conservation Commission on March 12, 1996 in Case 11353, currently states:

"If sufficient data exists on a lease, pool, formation, geographic area, etc., so as to render it unnecessary to repeatedly provide such data on Form C-107-A, an operator may except any of the various criteria required under Paragraph 303.D of this rule by establishing a "reference case". The Division, upon its own motion, or by application from an operator, may establish "reference cases" either administratively or by hearing. Upon Division approval of such "reference cases" for specific criteria, subsequent applications to downhole commingle (Form C-107-A) will be required only to cite the Division order number which established such exceptions and shall not be required to submit data for those criteria."

(7) In the absence of the establishment of a "reference case" as provided in Division Rule 303.E, Division Rule 303.C requires that administrative applications for downhole commingling of gas production be submitted, processed, and approved on a well by well basis including submittal of the following:

(a) economic criteria to support that at least one zone to be commingled is marginal;

(b) pressure criteria to demonstrate that the bottomhole pressure of each zone to be commingled is less than the original bottomhole pressure of the lowest pressured zone;

- (c) allocation formulas;
- (d) notification in writing to each interest owner where ownership is not common in the zones to be commingled; and,
- (e) notification in writing to each offset operator.

(8) In accordance with its evidence and testimony presented at the time of the hearing, Conoco seeks to establish a "reference" case for:

- (a) **marginal economic criteria:** to support that the Dakota, Chacra, Pictured Cliffs and Fruitland Coal gas formations/pools may be identified as "Marginal" on Form C-107-A's subsequently filed for wells within the San Juan "28-7" Unit. The applicant further proposes that the data provided in the immediate case serve as supplemental data for confirmation that these formations and/or pools should be classified as "marginal";
- (b) **allocation formulas:** whereby the Division utilizes the data presented in the immediate case to endorse or approve that each interest owner shall receive its fair and equitable share of production by the use of either the subtraction method or the fixed percentage method of allocation and whereby the applicant need not submit additional data or justification when proposing these methods of allocation production on Form C-107-A;s subsequently filed for wells within the San Juan "28-7" Unit;
- (c) **elimination of unnecessary notice:** such that any future or further notice concerning downhole commingling applications within this unit shall not be required to (a) any owner (including royalty, overriding royalty or working interest owners) in instances where ownership are not common or percentages are not identical in the zones to be commingled or to (b) each offset operator who is also an interest owner in this unit;

(d) **notice to offset operators:** notification to each offset operator, except as provided in paragraph (c) above, will continue to be made provided those offset operators are operators other than applicant;

(e) **pressure limitation:** for an exception to Rule 303.C(1)(b)(ii), and to establish a pressure exception for the downhole commingling of Dakota with Mesaverde production for new wells drilled in the San Juan "28-7" Unit based upon data presented in the immediate case which demonstrated that downhole commingling of the Dakota formation with the Mesaverde formation can be approved even if the bottomhole pressure of the Dakota formation (the higher pressured reservoir) exceeds the original bottomhole pressure of the Mesaverde formation (the lowest pressured reservoir) because engineering data and analysis has shown that there is no possibility of damage to the Mesaverde formation, nor will there be any loss of reserves, waste or violation of correlative rights; and,

(f) **for an administrative procedure** for the submittal of Form C-107-A for wells in the San Juan "28-7" Unit directly to the Aztec Office of the Division for approval and thereby eliminating the necessity to review/approve said applications at the Santa Fe Office of the Division.

(9) Conoco is the current operator of the Dakota, Mesaverde, Chacra, and Pictured Cliffs producing intervals in the San Juan "28-7" Unit which encompasses the following described 30,684.76 acres, more or less, in Rio Arriba County, New Mexico:

TOWNSHIP 27 NORTH, RANGE 7 WEST, NMPM

Sections 1 through 12:	All
Section 15:	W/2
Sections 16 through 21:	All
Section 22:	W/2
Section 27:	NW/4
Section 28:	N/2
Sections 29 and 30:	All

TOWNSHIP 28 NORTH, RANGE 7 WEST, NMPM

Sections 7 through 36: All.

(10) Within the above-described San Juan "28-7" Unit, Conoco currently operates approximately: (i) 133 gas wells within the Basin-Dakota Pool; (ii) 118 Blanco-Mesaverde gas wells; (iii) 10 Otero-Chacra wells; (iv) 76 Pictured Cliffs gas wells within both the Blanco-Pictured Cliffs and South Blanco-Pictured Cliffs Pools; and, (v) no Basin-Fruitland Coal gas wells.

(11) Within the above-described San Juan "28-7" Unit area Amoco Production Company operates the Fruitland Coal gas interval where they currently have approximately 15 completed wells. Amoco Production Company, the Basin-Fruitland Coal (Gas) Pool, and the San Juan "28-7" Unit were the subject of a nitrogen injection pilot project authorized by Division Order No. R-10113, issued in Case 10954 and dated May 9, 1994.

(12) Since the Basin-Fruitland Coal gas interval within the San Juan "28-7" Unit area, as described above, is not currently operated by Conoco, the Basin-Fruitland Coal (Gas) Pool should be eliminated from inclusion in any order issued in this matter.

(13) In support of its request to establish pressure limitation criteria and an exception from Rule 303.C(1)(ii), the applicant presented geologic and petroleum engineering evidence and testimony which demonstrates that within the San Juan "28-7" Unit:

- (a) the average initial (original) reservoir pressure and average current reservoir pressures in existing wells, adjusted to a common datum of 5,000 feet from the various formations within the San Juan "28-7" Unit are summarized as follows:

<u>Formation</u>	<u>Original Pressure</u>	<u>Current Pressure</u>
Dakota	2866 psia	713 psia
Mesaverde	1238 psia	457 psia
Pictured Cliffs	1072 psia	360 psia
Chacra	1206 psia	400 psia
Fruitland Coal	1089 psia	734 psia;

- (b) the Mesaverde formation is "under-pressured" and

both the Dakota and Mesaverde formations are low permeability reservoirs and have previously been qualified as "tight sand gas reservoirs";

(c) the average initial pressure of recently drilled Dakota wells has been 1959 psia while the initial pressure of recently drilled Mesaverde wells has been 858 psia at a 5,000 foot datum;

(d) there exists the possibility that a newly drilled well will encounter current reservoir pressure in the Dakota formation of 2,072 psia which is higher than the average original reservoir pressure of the Mesaverde formation of 1238 psia which would preclude the downhole commingling of those two formations unless an exception to Rule 303.C(1)(b)(ii) is granted;

(e) based upon pressure buildup calculations, if the Dakota formation is flowed for at least 30 days and then shut-in, it would take more than 10 days for the Dakota pressure to buildup to 1238 psia which is the original Mesaverde pressure; and,

(f) it is highly unlikely that any Dakota well in this unit would be shut-in for more than 10 days. However, in the event of that occurrence, fracture gradient data demonstrates that average fracture gradient for the Mesaverde formation is 0.52 psi/ft which means the Mesaverde formation can withstand a pressure of 3,850 psia before any fractures would be initiated; the maximum pressure the Dakota could possibly exert on the Mesaverde is 1959 psia.

(14) In support of its request to establish a "reference case" deleting the requirement that each application for downhole commingling be sent to each interest owner affected, the applicant provided evidence and testimony which demonstrated that:

(a) because this is a "divided" unit with various participating areas, the interest ownership between any zones to be downhole commingled within a given wellbore in the Unit will not be common;

(b) pursuant to Division Rule 303.D, applicant is currently required to notify all interest owners in the unit every time a Form C-107-A is submitted to the Division which can involve as many as 272 different owners; and,

(c) providing notice to each interest owner in the unit of subsequent downhole commingling application is unnecessary and is an excessive burden to the applicant.

(15) In support of its request to establish marginal economic criteria, the applicant presented geologic and petroleum engineering evidence and testimony which demonstrates that within the San Juan "28-7" Unit:

(a) the Pictured Cliffs Pool has been substantially depleted such that the most economic method to maximize recovery in existing wells is by recompleting them as downhole commingled wellbores;

(b) the Pictured Cliffs, Dakota, and Mesaverde formations/pools have been substantially developed such that any new wells to be drilled would only be economic if drilled as wellbores downhole commingled with production from one or more of these other formations/pools; and,

(c) the average recoverable gas reserves and average initial producing rates from the various formations within the San Juan "28-7" Unit are summarized as follows:

<u>Formation</u>	<u>Average Estimated Per Well Ultimate Recovery (MMCFG)</u>	<u>Average Initial Per Well Producing Rate (MCFPD)</u>
Dakota	852	437
Mesaverde	1702	675
Pictured Cliffs	419	248
Chacra	203	158
Fruitland Coal	415	130

(16) There is insufficient data available on gas production from the Chacra formation within the "28-7" Unit to include this zone within the provisions of this

application.

(17) However, the evidence and testimony presented by the applicant demonstrated that the Dakota and Pictured Cliffs formations within the San Juan "28-7" Unit should be properly classified as "marginal".

(18) The evidence and testimony presented by the applicant demonstrated that the economic life of the Dakota, Mesaverde, and Pictured Cliffs Pools within the San Juan "28-7" Unit can be extended by downhole commingling with other production in the unit.

(19) The evidence and testimony presented by the applicant demonstrates that the Dakota and Mesaverde formations can be downhole commingled without causing waste and therefore an exception from the pressure limitation set forth in Rule 303.C(1)(b)(ii) should be granted.

(20) In support of its request for approval of various allocation methods for this unit, applicant submitted at hearing proposed formulas for the allocation of production to each of the commingled zones and a description of the factors or data used in determining such formulas which included:

(a) utilizing a fixed allocation formula in those instances where a newly drilled well involves any zones other than the Fruitland Coal Gas Pool; and,

(b) justifying the fixed allocation formula as fair, accurate and reasonable because normalized production data from all wells in each pool in the San Juan "28-7" Unit demonstrates that production from all formations and pools declines at virtually the same rate and therefore a fixed percentage can be established which will continue to be accurate and reliable for the producing life of the well.

(21) The proposed allocation method is routinely utilized by the industry and approved by the Division and therefore, the proposal to establish these allocation methods for the San Juan "28-7" Unit should be approved.

(22) The downhole commingling of gas production attributed to the Blanco-Mesaverde, Basin-Dakota, Blanco-Pictured Cliffs, and South Blanco-Pictured Cliffs Pools from wells within this Unit area will benefit working, royalty, and overriding royalty interest owners. In addition, the downhole commingling of these three zones within this unit will not violate the correlative rights of an interest owners.

(23) All interest owners in this unit were sent a copy of the application and notice of hearing in this case and no interest owner appeared at the hearing in opposition to the establishment of an exception to Rule 303.D.

(24) The administrative process now in effect for handling downhole commingling applications is adequate; however it can be modified for wells within the San Juan "28-7" Unit for obtaining approval for subsequently downhole commingled wells without notice to unit interest owners.

(25) Conoco's request for the adoption of a summary administrative procedure for the necessary exceptions to Division Rule 303.C authorizing the Supervisor of the Aztec District Office of the Division to approve the downhole commingling of said production within this unit is unwarranted since such a procedure is currently in effect.

(26) The approval of downhole commingling of the Dakota, Mesaverde, and Pictured Cliffs intervals within this Unit area will extend the economic life of the existing wells and thereby increase ultimate recovery from these formations.

(27) It is anticipated that new wells, recompleted wells or existing wellbores in this unit will be most economically completed if there is a summary administrative procedure by which those wells may be downhole commingled.

(28) The processing of downhole commingling application for this unit in the absence of adopting a reference case will be an administrative burden to the Division and to the operator.

(29) Approval of a downhole commingling reference case within the above-described Unit area for the Dakota, Mesaverde, and Pictured Cliffs intervals is in the best interest of conservation, the prevention of waste and the protection of correlative rights.

IT IS THEREFORE ORDERED THAT:

(1) The application of Conoco Inc. to establish a "reference case" for marginal economic criteria and modification of notification rules on a unit-wide basis for downhole commingling of Dakota, Mesaverde, and Pictured Cliffs formation gas production within existing and future drilled wells within the San Juan "28-7" Unit which encompasses the following described 30,684.76 acres, more or less, in Rio Arriba County, New Mexico is hereby approved:

TOWNSHIP 27 NORTH, RANGE 7 WEST, NMPM

Sections 1 through 12:	All
Section 15:	W/2
Sections 16 through 21:	All
Section 22:	W/2
Section 27:	NW/4
Section 28:	N/2
Sections 29 and 30:	All

TOWNSHIP 28 NORTH, RANGE 7 WEST, NMPM

Sections 7 through 36: All.

(2) However that portion of Conoco's request to include Chacra and Fruitland Coal gas production within the provisions of any order issued in this matter is hereby denied.

(3) The application of Conoco Inc. to establish an exception to Rule 303.D and for modification of notification rules on a unit-wide basis for downhole commingling of Dakota, Mesaverde, Pictured Cliffs, Chacra and Fruitland Coal Gas production within existing and future drilled wells within the San Juan 28-7 Unit is hereby approved.

(4) The application of Conoco Inc. to establish an exception from Rule 303.C(1)(b)(ii) to establish a "reference case" for pressure criteria on a unit-wide basis for downhole commingling of Dakota and Mesaverde formation gas production within existing and future drilled wells within the San Juan 28-7 Unit and for four (4) specific Dakota/Mesaverde wells currently being drilled described below is hereby approved:

(a) the San Juan "28-7" Unit Well No. 224M (API No. 30-039-25697), to be drilled at a standard gas well location 1450 feet from the South line and 790 feet from the East line (Unit D) of Section 28, Township 28 North, Range 7 West, NMPM, Rio Arriba County, New Mexico;

(b) the San Juan "28-7" Unit Well No. 226M (API No. 30-039-25694), to be drilled at a standard gas well location 790 feet from the North and West lines (Unit D) of Section 36, Township 28 North, Range 7 West, NMPM, Rio Arriba County, New Mexico;

(c) the San Juan "28-7" Unit Well No. 227M (API No. 30-039-25661), located at a standard gas well location 1745 feet from the South line and 1850 feet from the East line (Unit J) of said Section 36; and,

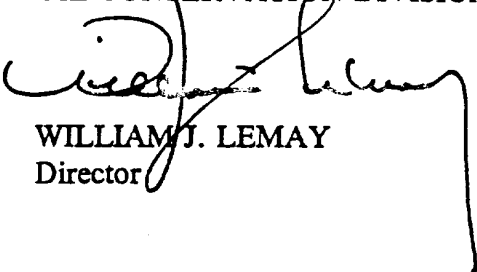
(d) the San Juan "28-7" Unit Well No. 232M (API No. 30-039-25693), to be drilled at an unorthodox gas well location (approved by Division Administrative Order NSL-3784, dated April 3, 1997) 2425 feet from the South line and 500 feet from the East line (Unit I) of Section 20, Township 28 North, Range 7 West, NMPM, Rio Arriba County, New Mexico;

(5) Upon filing of Division Form No. C-107-A's for wells subsequently downhole commingled within the San Juan 28-7 Unit, the applicant shall not be required to submit supporting data to justify classification of the Dakota and Pictured Cliffs gas production as "marginal", supporting data to verify the Dakota and Mesaverde pressure information when those two formations are downhole commingled, and support or justification for utilizing a given method or formula for allocation of production.

(6) Jurisdiction of this cause is 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

SEAL