

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:

CASE NO. 12745
ORDER NO. R-10987- B (2)

APPLICATION OF BURLINGTON RESOURCES OIL & GAS COMPANY AND
CONOCO, INC. TO AMEND THE SPECIAL RULES AND REGULATIONS FOR
THE BASIN-DAKOTA POOL TO INCREASE WELL DENSITY AND AMEND
THE WELL LOCATION REQUIREMENTS, SAN JUAN, MCKINLEY,
SANDOVAL, AND RIO ARriba COUNTIES, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on October 18, 2001 at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 29th day of January, 2002, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner,

FINDS THAT:

(1) Due public notice has been given, and the New Mexico Oil Conservation Division ("Division") has jurisdiction of this case and its subject matter.

(2) The applicants in this case, Burlington Resources Oil & Gas Company ("Burlington") and Conoco Inc. ("Conoco"), seek an order of the Division to amend the special rules currently governing the Basin-Dakota Pool as follows:

(a) to increase the well density from the current maximum of two (2) wells (effective 160-acre spacing) to a maximum of four (4) wells (effective 80-acre spacing) per standard 320-acre gas spacing and proration unit ("GPU") in the following manner:

(i) the first infill well on a GPU shall be located in a quarter section not containing the initial Dakota gas well;

(ii) the second infill well on a GPU shall be

located in a quarter-quarter section not containing a Dakota gas well and within a quarter section not containing more than one Dakota gas well; and

(iii) the third infill well on a GPU shall be located in a quarter-quarter section not containing a Dakota gas well and within a quarter section not containing more than one Dakota gas well;

(b) to provide that wells located outside a federal exploratory unit may be drilled anywhere within a standard 320-acre GPU provided such wells are located no closer than 660 feet to the outer boundary of the GPU nor closer than 10 feet from any interior quarter or quarter-quarter section line or subdivision inner boundary; and

(c) to further provide that wells located within federal exploratory units may not be closer than 10 feet to any section, quarter section, or interior quarter-quarter section line or subdivision inner boundary, provided however that:

(i) wells shall not be closer than 660 feet to the outer boundary of a federal exploratory unit;

(ii) wells located within the unitized area but adjacent to an existing or prospective GPU containing any non-committed tract or partially committed tract shall be no closer than 660 feet to the outer boundary of such GPU; and

(iii) further, wells located within the unitized area but within a non-committed or partially committed GPU shall not be closer than 660 feet to the outer boundary of that GPU.

(3) In compliance with Division notice rules, Burlington sent approximately 64 copies of this application including the proposed rules and notice of hearing to operators in the Basin-Dakota Pool. Notice of this case was also published in the appropriate newspapers and on the Division's hearing docket.

(4) The following parties of record entered their appearances in this case and participated at the hearing:

(a) Burlington, an applicant, is the operator of approximately 1530 wells currently producing from the Basin-Dakota Gas Pool.

(b) Conoco, an applicant, is the operator of approximately 517 wells currently producing from the Basin-Dakota Gas Pool.

(c) BP Amoco, Phillips Petroleum Corporation, Pure Resources, L.P. and Williams Production Company appeared in support of the applicants.

(5) In addition to the parties of record, the hearing was attended by representatives of the U. S. Department of the Interior's Bureau of Land Management and the Division's Aztec district office.

(6) No interested person has appeared in opposition to approval of this application.

(7) On the day of the hearing, Ken Stanley, a resident of Cedar Hill, New Mexico, entered an objection to this application in writing.

(8) The New Mexico Oil & Gas Act specifically provides in Section 70-2-17.B, NMSA (1979) that:

"The Division may establish a proration unit for each pool, such being the area that can be efficiently and economically drained and developed by one well, and in so doing the Division shall consider the economic loss caused by the drilling of unnecessary wells, the protection of correlative rights, including those of royalty owners, the prevention of waste, the avoidance of the augmentation of risk arising from the drilling of an excessive number of wells and the prevention of reduced recovery which might result from the drilling of too few wells."

(9) The Basin-Dakota Pool lies within a large geographical area commonly referred to as the "San Juan Basin" and currently comprises all of San Juan and Rio Arriba Counties, New Mexico and all of Section 21, Township 23 North, Range 5 West, NMPM,

Sandoval County, New Mexico, but excludes any other pool that has the word "Dakota" in its name. The vertical limits of the Basin-Dakota Pool extend 400 feet below the base of the Greenhorn Limestone, consist of the Graneros, Dakota, and Burro Canyon formations and include the productive upper portion of the Morrison formation.

(10) The following is an historical summary of the well spacing and location rules applicable to the Basin-Dakota Pool:

(a) By Order No. 850 issued in Case No. 189, dated December 9, 1949, and made effective January 1, 1950, the New Mexico Oil Conservation Commission ("Commission") adopted rules and regulations for statewide application, which in Rule 104. (c) established 160-acre spacing for wells in defined gas pools with wells located not closer than 660 feet to the outer boundary of the unit nor closer than 1320 feet to any other well in the pool. Prior to this order spacing for all oil and gas wells in New Mexico, unless otherwise provided for by special pool rules, was on 40-acre spacing and proration units (see Commission Order No. 1 issued on June 29, 1935) with wells to be located no closer than 330 feet from any unit boundary nor closer than 660 feet to any other well (see Commission Order No. 538 issued in Case No. 39 and dated June 22, 1943).

(b) By Order No. R-238, issued in Case No. 226 and dated December 29, 1952, the Commission required a 330-foot setback from any quarter-quarter section or subdivision inner boundary [see Rule 104. (d)].

(c) By Order No. R-855, issued in Case No. 1104 and dated August 10, 1956, the Commission retained the 160-acre spacing and the 1320-feet between-well spacing for gas wells in northwest New Mexico, but changed the set-back requirements to allow wells to be no closer than 990 feet from the outer boundaries of the 160-acre unit provided, however, that a tolerance of plus or minus 200 feet was permissible. The internal setbacks from interior quarter-quarter sections or subdivision inner boundaries were changed from 330 feet to 130 feet.

(d) By Order No. R-1287, issued in Cases No. 1508 and 1523 and dated November 21, 1958, the Commission granted the application of El Paso Natural Gas Company, which created and

defined the Dakota producing interval in northwest New Mexico, and established special rules and regulations that provided for 320-acre spacing with wells to be located no closer than 790 feet to the boundary line of the unit and no closer than 130 feet to a governmental quarter-quarter section or subdivision inner boundary. This order deleted the distance-between-wells requirement.

(e) On November 4, 1960, by Order No. R-1670-C issued in Case No. 2095 and made effective February 1, 1961, the Commission on its own motion created and designated the Basin-Dakota Pool. Its horizontal limits were defined and gas prorationing was instituted. This order adopted the same well spacing and location requirements as established by Order No. R-1287.

(f) On May 22, 1979, by Order No. R-1670-V issued in Case No. 6533, the Commission granted the application of El Paso Natural Gas Company for an optional second well (infill well) on a 320-acre gas spacing and proration unit in the Basin-Dakota Pool with both the original and infill well to be located in opposite quarter sections and with wells to be located no closer than 790 feet to any outer boundary of the quarter section on which the well is located, and no closer than 130 feet to a governmental quarter-quarter section or subdivision inner boundary. This order reintroduced a distance-between-wells requirement, but changed the previous distance of 1320 feet to 920 feet.

(g) Order No. R-8170, issued in Case No. 8749 and dated March 28, 1986, and Order No. R-8170-H, issued in Case No. 10009 and dated December 10, 1990, are the two primary orders in the R-8170 series issued by the Commission to recodify and amend New Mexico's gas prorationing rules. The well spacing and location requirements for the Basin-Dakota Pool remained intact.

(h) By Order No. R-10987, issued in Case No. 11705 and dated May 7, 1998, the Commission again recodified and amended the gas prorationing rules but kept the well spacing and location requirements for the Basin-Dakota Pool intact.

(i) By Order No. R-10987-B, issued in Case No. 12290 and dated June 30, 2000, as amended by Division Order No. R-10987-B

(1), the Division again changed the location requirements for wells in the Basin-Dakota Pool allowing wells to be no closer than 660 feet to any quarter section line and no closer than 10 feet to a governmental quarter-quarter section or subdivision inner boundary. This order also deleted the 920 feet distance-between-wells requirement reintroduced by Order No. R-1670-V. The special pool rules under this Order are the rules that currently govern the Basin-Dakota Pool and are included as Exhibit "A" to Division Order No. R-10987-B.

(11) In early 1999 the Division authorized infill development with a maximum of four wells per 320-acre GPU (effective 80-acre spacing) within the shallower Blanco-Mesaverde Pool, which, like the Basin-Dakota Pool, also encompasses a large area of the San Juan Basin in northwest New Mexico (see Division Order No. R-10987-A, issued in Case No. 12069 and dated February 1, 1999).

(12) During the last year, both Burlington and Conoco conducted extensive reservoir simulation studies within the following pilot infill project areas in the San Juan Basin to determine if the Basin-Dakota Pool's current well density of two wells per 320-acre GPU (effective 160-acre development) is still appropriate and to measure the effect on the reservoir when well density is increased up to four wells per 320-acre GPU (effective 80-acre spacing):

(a) Conoco's initial San Juan "28-7" Unit infill project in Townships 27 and 28 North, Range 7 West, NMPM, Rio Arriba County, New Mexico, which included six wells approved by Division Order No. R-11139, issued in Case No. 12122 on February 18, 1999;

(b) Burlington's San Juan "27-5" Unit infill project area in Township 27 North, Range 5 West, NMPM, Rio Arriba County, New Mexico approved by Division Order No. R-11503, issued in Case No. 12508 on December 29, 2000;

(c) Burlington's Culpepper Martin infill project area comprising Sections 1, 2, 3, 10, 11, 12, 13, 14, 15, 22, 23, and 24, all in Township 31 North, Range 12 West, NMPM, San Juan County, New Mexico approved by Division Order No. R-11532, issued in Case No. 12509 on February 6, 2001; and

(d) Conoco's expansion within its San Juan "28-7" Unit infill project with eight additional wells approved by Division Order No. R-11139-A, issued in Case No. 12556 on February 12, 2001.

(13) From these three pilot infill projects evidence was submitted showing that:

(a) increasing well density on existing 320-acre GPU's from two wells (effective 160-acre spacing) to four (effective 80-acre spacing) will increase the ultimate recovery factor:

(i) from 65 % to 71 % in Burlington's Culpepper Martin model area;

(ii) from 48 % to 70 % in Burlington's San Juan "27-5" model area; and

(iii) from 36 % to 60 % in Conoco's San Juan "28-7" model area;

(b) an estimated 0.35 Bcf of gas will be recovered from each 80-acre well drilled in Burlington's Culpepper Martin model area of which 0.2 Bcf (57 %) is incremental reserves that will not be recovered with existing 160-acre well density and 0.15 Bcf (43 %) is accelerated reserves;

(c) an estimated 1.23 Bcf of gas will be recovered from each 80-acre well drilled in Burlington's San Juan "27-5" model area of which 0.8 Bcf (65 %) is incremental reserves that will not be recovered with existing 160-acre well density and the remaining 0.43 Bcf (35 %) is accelerated reserves;

(d) an estimated 1.25 Bcf of gas will be recovered from each 80-acre well drilled in Conoco's San Juan "28-7" model area of which 1.05 Bcf (84%) is incremental reserves that will not be recovered with existing 160-acre well density and 0.2 Bcf (16%) is accelerated reserves; and

(e) higher than predicted pilot producing well rates and pressures within all three of the infill pilot project areas demonstrate that more

than two wells per 320-acre GPU are needed to increase ultimate recovery.

(14) Based upon their respective studies of the geological and reservoir engineering data available on the Basin-Dakota Pool, both applicants presented evidence which establishes:

(a) under current pool rules (2 wells per GPU density):

(i) the Burlington Culpepper Martin model area originally contained 122 Bcf of gas ("OGIP") of which only 65% (79 Bcf) should be recovered under the current well density leaving approximately 35% (43 Bcf) unrecovered;

(ii) the Burlington San Juan "27-5" model area contained 111 Bcf OGIP of which only 48% (53 Bcf) should be recovered under the current well density leaving approximately 52% (58 Bcf) unrecovered; and

(iii) the Conoco San Juan "28-7" model area contained 275 Bcf OGIP of which only 36% (98 Bcf) should be recovered under the current well density leaving approximately 64% (177 Bcf) unrecovered; and

(b) under the proposed pool rules (4 wells per GPU density):

(i) the Burlington Culpepper Martin model area should recover an additional 6% of the OGIP or 7 Bcf of gas;

(ii) the Burlington San Juan "27-5" model area should recover an additional 22% of the OGIP or 24 Bcf of gas; and

(iii) the Conoco San Juan "28-7" model area should recover an additional 24% of the OGIP or 66 Bcf of gas.

(15) Burlington and Conoco presented evidence obtained from their studies, which establishes that:

- (a) gas production from the Basin-Dakota Pool is confined to four distinct intervals, identified as the: (i) Two Wells; (ii) Paguate; (iii) Cubero; and (iv) Lower Cubero;
- (b) the Basin-Dakota Pool is characterized by very low matrix permeability which cannot be adequately drained by the current well density (effective 160-acre spacing); and
- (c) of the estimated 12.8 Tcf of gas originally in place in the Basin-Dakota Pool for existing wells, only 56% (7.2 Tcf) will be recovered by the current 160-acre well density.

(16) Burlington's and Conoco's conclusions for the infill pilot areas are applicable to the entire pool for the following reasons:

- (a) sufficient data was gathered from each of the four intervals of the Basin-Dakota Gas Pool to calibrate a basin-wide OGIP model;
- (b) the pilot areas were selected to reflect the heterogeneity of the Basin-Dakota Gas Pool and to allow for the comparison of remaining recoverable gas in the pilot areas and the entire pool; and
- (c) based upon a comparison of estimated ultimate recovery ratios and initial infill well pressures, a strong correlation was established between the pilot areas that may be applied to the entire pool to determine incremental recovery for the third and fourth well per GPU.

(17) Both applicants further presented testimony demonstrating that:

- (a) one of the most effective and efficient means of increasing recovery from the Dakota formation is to utilize wellbores that can produce from both the Dakota formation and the Mesaverde formation either by downhole commingling or dual completion [see Finding Paragraph No. (11) above];

(b) there is no reservoir or geologic reason in the Dakota formation to require well density rules different from those of the Blanco-Mesaverde Gas Pool; and

(c) future Dakota ("stand alone") wells drilled in the pool are expected to be marginal; accordingly, with few exceptions, future development can be economically accomplished only if the wellbore is used to produce this pool in combination with other pools.

(18) Burlington's and Conoco's reservoir and production studies demonstrate that it is now appropriate to adopt and amend rules and regulations for this pool in order to increase well density to an effective 80-acre spacing while maintaining 320-acre GPU's to maintain the integrity of the Basin-Dakota Pool and to promote orderly depletion of the remaining reserves.

(19) Allowing operators the option on a pool-wide basis to increase well density up to four wells per 320-acre GPU and amending the internal footage set-back requirements within a GPU will create an opportunity to substantially increase ultimate recovery from this pool and serve to prevent waste and protect correlative rights.

(20) While the applicants' proposal for well locations within federal exploratory units serves to maintain the integrity of the units by creating a 660-foot buffer area around the outer boundary of such units and protects non-committed parties to a unit agreement, their proposal does not adequately protect all interests, both working and royalty, when wells are permitted to encroach toward boundary lines separating participating and non-participating areas within the unitized area.

(21) Burlington's and Conoco's proposal to allow Basin-Dakota gas wells to be drilled and completed virtually anywhere along these lines separating participating and non-participating areas within the unitized area is inappropriate. Such encroachments towards these common lines potentially violate correlative rights and do not adequately protect the mineral, royalty, and overriding royalty interests in a fair and equitable manner.

(22) Both applicants presented arguments that interests in non-participating GPU's would not be impaired because unit agreements contain provisions for expanding the participating area by geologic inference to include the prospective Dakota GPU or some portion thereof being encroached upon without having to drill a Dakota well in that GPU.

(23) Such provisions were never intended to cover this situation where well

locations would be allowed and even encouraged to be placed in a manner that would drain properties with different ownership. The opportunity exists for the violation of correlative rights with these unit provisions in place. Therefore, under the provisions of Section 70-2-11.A, NMSA (1979) of the New Mexico Oil and Gas Act, such provisions contained within unit agreements do not adequately protect all mineral interests.

(24) In order to incorporate the amendments proposed by the applicants and those additional provisions described above into the "WELL ACREAGE AND LOCATION REQUIREMENTS" portion of the "*Special Rules for the Basin-Dakota Pool*" set forth in Exhibit "A" of Division Order No. R-10987-B, it will be necessary to incorporate minor changes to other parts of these rules and procedures; therefore, the "*Special Rules for the Basin-Dakota Pool*" set forth in Exhibit "A" of this order should supersede those found in the previous order.

(25) These newly adopted "*Special Rules for the Basin-Dakota Pool*" set forth in Exhibit "A" should not apply to Indian Lands. As used in this order "Indian Lands" are any mineral estate or mineral resources of an Indian Tribe or Pueblo or an Indian allottee, which are held in trust by the United States or which are subject to Federal restrictions against alienation.

IT IS THEREFORE ORDERED THAT:

(1) Pursuant to the application filed jointly by Burlington Resources Oil & Gas Company ("Burlington") and Conoco, Inc. ("Conoco"), the "*Special Rules for the Basin-Dakota Pool*" set forth in Exhibit "A" of this order shall supersede the special rules for the Basin-Dakota Gas Pool in Division Order No. R-10987-B, issued in Case No. 12290 and dated June 30, 2000.

(2) All provisions applicable to the Basin-Dakota Pool contained in Division Order No. R-10987, issued in Case No. 11705 and dated May 7, 1998, and the Division's gas prorationing rules (see Division Rule 605) not in conflict with this order shall remain in full force and effect until further notice.

(3) The newly adopted "*Special Rules for the Basin-Dakota Pool*" set forth in Exhibit "A" do not apply to Indian Lands. Until further order, Indian Lands in the Basin-Dakota Pool shall continue to be governed by Division Order No. R-10987, issued in Case No. 11705 and dated May 7, 1998.

(4) Burlington's request to apply special setback requirements to federal exploratory units along lines that separate participating areas and non-participating areas is

hereby denied.

(5) Jurisdiction 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

LORI WROTENBERY
Director

SEAL

EXHIBIT "A"
Case No. 122745
Order No. R-10987-B (1)

**SPECIAL RULES FOR THE
BASIN-DAKOTA POOL**

- I. VERTICAL LIMITS OF THE BLANCO-MESAVERDE POOL** shall be from the base of the Greenhorn Limestone to a point 400 feet below the base of the Greenhorn Limestone formation, consisting of the Graneros formation, the Dakota formation, the Burro Canyon formation and the productive upper portion of the Morrison formation.
- II. ACREAGE AND WELL LOCATION REQUIREMENTS**
- A. Standard GPU (Gas Proration Unit):** A standard GPU in the Basin-Dakota Pool shall be 320 acres, more or less, comprising any two contiguous quarter sections of a single section that is a legal subdivision of the U. S. Public Land Surveys.
- B. Well density:**
- (1)** Up to four (4) wells may be drilled on a standard GPU, as follows:
- (a)** the FIRST OPTIONAL INFILL WELL drilled on a GPU shall be located in the quarter section not containing the INITIAL Dakota well;
 - (b)** the SECOND OPTIONAL INFILL WELL drilled on a GPU shall be located in a quarter-quarter section not containing a Dakota well and within a quarter section of the GPU not containing more than one (1) Dakota well;
 - (c)** the THIRD OPTIONAL INFILL WELL drilled on a GPU shall be located in a quarter-quarter section of the GPU not

containing a Dakota well and within a quarter section of the GPU not containing more than one (1) Dakota well;

- (d) at the discretion of the operator, the second or third optional infill well may be drilled prior to the drilling of the first optional infill well;
 - (e) no more than two wells shall be located within either quarter section in a GPU; and
 - (f) any deviation from the above-described well density requirements shall be authorized only after hearing.
- (2) The plat (Form C-102) accompanying the "*Application for Permit to Drill ("APD")*" (Form C-101 or federal equivalent) for subsequent wells on a GPU shall have outlined the boundaries of the GPU and shall show the location (well name, footage location, API number) of all existing Dakota wells on the GPU plus the proposed new well.

C. Well locations:

- (1) Except as provided in subparagraph II.C (2) below, wells drilled on a GPU shall be located not closer than 660 feet to the outer boundary of the GPU and not closer than 10 feet to any interior quarter or quarter-quarter section line or subdivision inner boundary.
- (2) **Well locations inside federal exploratory units:** Wells located within federal exploratory units are permitted an exception to the 660-foot setback requirement to the outer boundary of a GPU and shall be permitted to be no closer than 10 feet to any section, quarter section, or interior quarter-quarter section line or subdivision inner boundary, provided however:
 - (a) wells shall not be closer than 660 to the outer boundary of the federal exploratory unit;
 - (b) a well located within the unit area but adjacent to an existing or prospective GPU containing a non-committed tract or partially committed tract shall not be closer than 660 to the outer boundary of its GPU;

- (c) a well located within a non-committed or partially committed GPU shall not be closer than 660 to the outer boundary of its GPU;
 - (d) a well located within a participating area but adjacent to an existing or prospective GPU that is not within the same participating area shall not be closer than 660 to the outer boundary of the participating area; and
 - (e) a well located within the unit area but in an existing or prospective GPU that is a non-participating GPU shall not be closer than 660 to the outer boundary of its GPU.
- (3) The operator filing an APD for any well within a unit area that is closer to the outer boundary of its assigned GPU than 660 feet shall provide proof in the form of a participating area plat that such well meets the requirements of II.C (2) above.

III. ADMINISTRATIVE EXCEPTIONS:

The Division Director, in accordance with Division Rule 104, may administratively grant an exception to the well location requirements of II.C above upon application to the Division which includes notification by certified mail-return receipt requested to affected parties [see Division Rule 1207.A (2)].

IV. ALLOCATION AND GRANTING OF ALLOWABLES:

A. **Non-Marginal GPU Allowable:** The pool allowable remaining each month after deducting the total allowable assigned to marginal GPU's shall be allocated among the non-marginal GPU's entitled to an allowable in the following manner:

- (1) Forty percent (40 %) of the pool allowable remaining to be allocated to the non-marginal GPU's shall be allocated among such GPU's in the proportion that each GPU's AD Factor bears to the total AD Factor for all non-marginal GPU's in the pool.

When calculating the allowable for a GPU containing one or more infill wells, the deliverability of the wells shall be added in

calculating the AD Factor and the allowable may be produced from all wells.

- (2) Sixty percent (60 %) of the pool allowable remaining to be allocated to non-marginal GPU's shall be allocated among such GPU's in the proportion that each GPU's acreage factor bears to the total acreage factor for all non-marginal GPU's in the pool.

- B. **Minimum Allowable:** A minimum allowable of 250 MCF per month per GPU is assigned to prevent the premature abandonment of wells.
- C. **A GPU in the Basin-Dakota Pool** shall be classified as marginal unless reclassified by the Director pursuant to Division Rule 605.F (2). Any operator in the Basin-Dakota Pool may request a reclassification of a GPU in that pool.