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*NEW MEXICO BOARD OF LEGAL SPECIALIZATION RECOGNIZED SPECIALIST IN THE AREA OF NATURAL RESOURCES-OIL AND GAS LAW

JASON KELLAHIN (RETIRED 1991)

November 5, 2001

HAND DELIVERED

Mr. Michael E. Stogner
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: NMOCD Case 12745
Application of Burlington Resources Oil & Gas Company and Conoco Inc. to amend the Basin-Dakota Pool Rules

Dear Mr. Stogner:

On behalf of the applicants, please find enclosed a proposed order for consideration in this case. I also have enclosed a wordperfect 5.1 diskette containing this draft order.

Very truly yours,

W. Thomas Kellahin

cc: Burlington Resources Oil & Gas Company
Attn: Alan Alexander
Conoco Inc.
Attn: David Wacker

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

APPLICATION OF BURLINGTON RESOURCES OIL & GAS COMPANY AND CONOCO INC. TO AMEND THE BASIN-DAKOTA POOL RULES, SAN JUAN, SANDOVAL, RIO ARRIBA AND MCKINLEY COUNTIES, NEW MEXICO

PROPOSED ORDER OF THE DIVISION

BY THE DIVISION:

This cause 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 ___ day of November, 2001, 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.

Request

(2) Burlington Resources Oil & Gas Company ("Burlington") and Conoco Inc. ("Conoco") seek an order of the Division amending the Special Rules and Regulations of the Basin Dakota Gas Pool as follows:

(a) to increase the well density from the current maximum of two (2) wells (160-acre infill) provided in Order R-8170 to a maximum of four (4) wells (80-acre infill) per gas proration and spacing unit for wells dedicated to the Basin Dakota Gas Pool provided that no more than two (2) wells be located within any 160-acre portion of a gas proration and spacing unit; and

(b) wells located outside a federal exploratory unit may be drilled anywhere within a standard 320-acre gas proration and spacing unit ("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, quarter-quarter section line or boundary;

(c) wells located within federal exploratory units shall not be closer than 10 feet to any section, quarter section, or interior quarter-quarter section line or subdivision inner boundary, plus:

(i) wells located within one-half mile of the outer boundary of a federal exploratory unit shall not be closer than 660 feet to the outer boundary of the unit;

(ii) wells located within the unit area but adjacent to an existing or prospective GPU containing any non-committed tract or partially committed tracts shall not be closer to such GPU than 2(b) above;

(iii) wells located within a non-committed GPU shall not be closer to the outer boundary of that GPU than permitted by paragraph 2(b) above.

Notice of Hearing

(3) In compliance with Division notice rules, Burlington sent approximately 64 copies of its application including its proposed rules and notice of hearing to operators in the Basin-Dakota Pool. Notice of this case was also published in the newspaper and on the Division's hearing docket which is mailed to approximately 300 operators in New Mexico.

Parties

(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 Bureau of Land Management and the Division's Supervisor-Aztec.

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

Jurisdictional issue

(7) The 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."

Background

(8) On May 22, 1979, the New Mexico Oil Conservation Commission ("Commission") issued Order R-1670-V which adopted "infill drilling" for the Basin Dakota Gas Pool by permitting in Rule 2 for the drilling of a second well within a 320-acre gas proration and spacing unit ("GPU") providing this **one optional** "infill well" to be located on the opposite 160-acres from the 160-acres containing the original well ("the initial well") **and** further providing that these infill wells were not closer than 790 feet (but subject to a 200 foot topographical allowance) to the outer boundary of the quarter section and no closer than 130 feet to any quarter-quarter section line or subdivision inner boundary and that no infill well could be drilled nearer than 920 feet to an existing Dakota well in the same GPU.

(9) On March 28, 1986, the Commission issued Order R-8170 which, among other things, promulgated the Rules and Regulations for the Prorated Gas Pools, including "reformatting" Rule 2 of the Rules and Regulations for the Basin Dakota Gas Pool.

Current rules

(10) On June 30, 2000, the New Mexico Oil Conservation Division ("Division") issued Order R-10987-B in Case 12290 which amended the well location requirements of the Rules and Regulations for the Basin Dakota Gas Pool which currently provide:

"A. WELL ACREAGE AND LOCATION REQUIREMENTS

RULE 2(a). **Standard GPU (Gas proration Unit)** in the Basin-Dakota Gas Pool shall be 320 acres.

RULE 2(b) **Well Location:**

1. THE INITIAL WELL drilled on a GPU shall be located not closer than 660 feet to any outer boundary of the quarter section on which the well is located and not closer than 10 feet to any quarter-quarter section line or subdivision inner boundary.

2. THE INFILL WELL drilled on a GPU shall be located in the quarter section of the GPU not containing a Dakota well, and shall be located with respect to the GPU boundaries as described in the preceding paragraph.

Pilot projects

(11) On February 18, 1999, the Division entered Order R-11139 in Case 12122 which authorized Conoco Inc. to conduct a pilot project within its San Juan 28-7 Unit for purposes of developing data to establish appropriate infill well density for the Basin Dakota Gas Pool.

(12) On December 29, 2000, the Division entered Order R-11503 in Case 12508 which authorized Burlington to conduct a pilot project within its San Juan 27-5 Unit for purposes of developing data to establish appropriate infill well density for the Basin Dakota Gas Pool.

(13) On February 6, 2001, the Division entered Order R-11532 in Case 12509 which authorized Burlington to conduct a pilot project within the Culpepper Martin Area (Sections 1-3, 10-15 and 22-24 of T31N, R12W) for purposes of developing data to establish appropriate infill well density for the Basin Dakota Gas Pool.

(14) On February 12, 2001, the Division entered Order R-11139-A in Case 12556 which authorized Conoco Inc. to expand its pilot project within its San Juan 28-7 Unit for purposes of developing data to establish appropriate infill well density for the Basin Dakota Gas Pool.

(15) Based upon studies of the geological and reservoir engineering data including the results from the three (3) pilot projects, Burlington and Conoco have concluded that in order to increase ultimate recovery of gas from this pool there is a need to drill more wells per GPU than is currently permitted by Rule 2(b) of the pool rules.

Burlington's study

(16) During the last year, Burlington conducted an extensive reservoir simulation study in the San Juan 27-5 Unit (Order R-11503, Case 12508) and in the Culpepper Martin Area (Order R-11532, Case 12509) to determine if the current well density of 2 wells per GPU is still appropriate for this pool and has concluded that:

(a) two additional wells per 320-acre GPU ("80-acre density") in the Culpepper Martin model area will increase the ultimate recovery factor from 65% to 71%;**See Exhibit Tab 9.**

(b) two additional wells per 320-acre GPU ("80-acre density") in the San Juan 27-5 model area will increase the ultimate recovery factor from 48% to 70%; **See Exhibit Tab 9.**

(c) an estimated 0.35 Bcf of gas will be recovered from each 80-acre well drilled in the Culpepper Martin model area of which 0.2 Bcf of gas is incremental gas that will not be recovered with existing 160-acre well density. **See Exhibit Tabs 7 and 16.**

(d) an estimated 1.23 Bcf of gas will be recovered from each 80-acre well drilled in the San Juan 27-5 model area of which 0.8 Bcf of gas is incremental gas that will not be recovered with existing 160-acre well density. **See Exhibit Tabs 7 and 17.**

(e) higher than predicted pilot well producing rates and pressures in the Culpepper Martin and San Juan 27-5 model areas demonstrate that more than 2 wells per GPU are needed in order to increase ultimate recovery. **See Exhibit 5.**

(f) development of 80-acre Dakota well locations in conjunction with the Mesaverde will result in more efficient development of each pool. **See Exhibit Tab 8.**

Conoco's study

(17) During the last twenty months, Conoco, independent of Burlington's study, conducted an extensive reservoir simulation study in the San Juan 28-7 Unit (Order R-11139 and R-11139-A, Case 12556) to determine if the current well density of 2 wells per GPU is still appropriate for this pool and has concluded that:

(a) the drilling of 2 additional wells per 320-acre GPU will increase the recovery factor from 36% (existing 160 acre well density) to 60% (80-acre well density); **See Exhibit Tab 15.**

(b) of the estimated 1.25 Bcf of gas that will be recovered by each 80-acre density well, 1.05 Bcf (84%) represents incremental reserves and 0.2 Bcf (16%) represents accelerated reserves; **See Exhibit Tab 15.**

(c) higher than predicted pilot well producing rates and pressures in the San Juan 28-7 pilot area demonstrate that more than 2 wells per GPU are needed in order to increase ultimate recovery. **See Exhibit Tabs 5 and 13.**

(d) an estimated 122.9 Bcf of gas represents the incremental gas component of the estimated total 146 Bcf of gas to be recovered from 117 potential 80-acre density wells in the San Juan 28-7 Unit; **See Exhibit Tab 15.**

(e) it is economic to drill additional wells at acreage densities as small as 80-acre per well. **See Exhibit Tab 15.**

Well Density Issue

(18) Based upon their respective studies of the geological and reservoir engineering data available from approximately 5,200 wells covering 1.7 million acres of this pool, Burlington and Conoco have concluded that:

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

(i) the Culpepper Martin model area originally contained 122 Bcf of gas ("OGIP") of which only 65% (79 Bcf) will be recovered under the current well density leaving approximately 35% (43 Bcf) unrecovered. **See Exhibit Tabs 5 and 16.**

(ii) the San Juan 27-5 Unit model area originally contained 111 Bcf of gas ("OGIP") of which only 48% (53 Bcf) will be recovered under the current well density leaving approximately 52% (58 Bcf) unrecovered. **See Exhibit Tabs 5 and 17.**

(iii) the San Juan 28-7 Unit model area originally contained 275 Bcf of gas ("OGIP") of which only 36% (98 Bcf) will be recovered under the current well density leaving approximately 64% (177 Bcf) unrecovered. **See Exhibit Tabs 5 and 14.**

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

(i) the Culpepper Martin model area will recover an additional 6% of the OGIP or 7 Bcf of gas. **See Exhibit Tabs 5 and 16.**

(ii) the San Juan 27-5 Unit model area will recover an additional 22% of the OGIP or 24 Bcf of gas. **See Exhibit Tabs 5 and 17.**

(iii) the San Juan 28-7 Unit model area will recover an additional 24% of the OGIP or 66 Bcf of gas. **See Exhibit Tab 15.**

(iv) based upon the pilot studies, between 57% and 84% of the production from the increased density wells is expected to be new incremental reserves which would not otherwise be recovered. **See Exhibit Tabs 15, 16, and 17.**

Entire pool

(19) Burlington and Conoco conclude that:

(a) this pool is characterized by very low matrix permeability which cannot be drained by the current well density. **See Exhibit Tab 14.**

(b) of the estimated 12.8 Tcf of gas originally in place in the Dakota formation for existing wells, only 56% (7.2 Tcf) will be recovered by current 160-acre well density. **See Exhibit Tabs 4 and 10 (remaining resources map).**

(20) Burlington's and Conoco's conclusions for the 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. **See Exhibit Tab 10.**

(b) the pilot areas were selected in such a way as to reflect the heterogeneity of the Basin-Dakota Gas Pool and to allow for the comparison of remaining recoverable gas in the pilot areas as compared to the entire pool. **See Exhibit Tab 12.**

(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. **See Exhibit Tab 6.**

Dakota development linked to Mesaverde development

(21) Conoco and Burlington demonstrated that:

(a) one of the most effective and efficient means of increasing recovery from the Dakota formation is to do so with wellbores which either downhole commingle or dually complete the Dakota formation with the Mesaverde formation;

(b) effective February 1, 1999, Division Order R-10987-A amended the Blanco-Mesaverde Pool rules to (a) change the initial and infill well locations boundary requirements from not closer than 790 feet to not closer than 660 feet to any outer boundary of this GPU, (b) from not closer than 130 feet to not closer than 10 feet to any quarter, quarter-quarter section line or subdivision inner boundary and (c) relaxed the interior well locations requirements with federal exploratory units.

(c) there is no reservoir or geologic reason in the Dakota formation to require well location rules different from those of the Blanco-Mesaverde Gas Pool.

(d) these differences require both the Division and the operator to unnecessarily process administrative non-standard location applications for the Basin-Dakota Gas Pool wells when those wells are to be downhole commingled or dually completed with production from the Blanco-Mesaverde Gas Pool.

(e) it is an unnecessary administrative burden on both the operators and the Division to process this type of gas well location exception for which there has been few, if any, objections.

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

(g) in order to increase the recovery of gas from this pool, it is necessary to locate wells in the optimum position to drain those additional reserves and it will be necessary to either (i) process numerous cases for unorthodox Dakota well locations or (ii) relax the interior footage setback requirements.

Federal Units

(22) Burlington and Conoco recommend the following well location requirements affecting federal exploratory units:

wells located within federal exploratory units shall not be closer than 10 feet to any section, quarter section, or interior quarter-quarter section line or subdivision inner boundary, plus:

(i) wells located within one-half mile of the outer boundary of a federal exploratory unit shall not be closer than 660 feet to the outer boundary of the unit;

(ii) wells located within the unit area but adjacent to an existing or prospective GPU containing any non-committed tract or partially committed tracts shall not be closer to such GPU than 2(b) above;

(iii) wells located within a non-committed GPU shall not be closer to the outer boundary of that GPU than permitted by paragraph 2(b) above.

(23) Burlington and Conoco contend that the Division may relax well location requirements for wells in the Basin-Dakota Gas Pool within the interiors of federal exploratory units in the San Juan Basin because these units contain provisions in either the unit agreement or the unit operating agreement, or both, which protect the correlative rights of all working interests owners and royalty owners in all circumstances except as described in paragraph 22(a) (i), (ii) and (iii) above.

(24) Further, Burlington and Conoco contend that the 10 foot setback can be allowed in the following two circumstances without adversely affecting correlative rights:

(a) in the case where the 320-acre non-participating GPU is in the federal unit but the Dakota Participating Area ("PA") has not been expanded to include this GPU because its well was deemed non-commercial **and** (i) a well is proposed closer than 660 feet to the outer boundary of the GPU; or (ii) is proposed closer than 660 feet to the outer boundary of the PA. **See Drill Block A. Exhibit 3**

(b) in the case where the 320-acre undeveloped GPU is in the federal unit but the Dakota Participating Area ("PA") has not been expanded to include this GPU because there is no Dakota well within the GPU **and** (i) a well is proposed closer than 660 feet to the outer boundary of the GPU; or (ii) is proposed closer than 660 feet to the outer boundary of the PA. **See Drill Block B. Exhibit 3.**

(25) Burlington and Conoco contend no correlative rights are impaired because:

(a) the unit agreement contains provisions for expanding the PA by geologic inference to include the prospective Dakota drill block being encroached upon without having to drill another Dakota well in that drill block;

(b) in the alternative, the interest owners in the prospective drill block being encroached upon may drill a Dakota well at any location within 10 feet of the outerboundary of that drill block and if it is deemed commercial, the PA will be expanded to include this drill block.

(c) if the new well is deemed non-commercial, then it poses no serious risk for uncompensated drainage, or it may have condemned the probability for a commercial well on its own drill block, but in either event, there is minimal potential drainage and no substantive correlative rights issues.

(d) the unit operator is required to submit an annual Plan of Development (POD) to all working interest owners and regulatory agencies (BLM, OCD, State Land Office). This provides the working interest owners and regulatory agencies the opportunity to review the unit activity and to object if they are opposed to a potential well location.

(e) because the PA will be constantly expanding, if the Paragraph (2) situations are included in the 660 footage set back rule, then a current unorthodox well location will become standard as the PA is expanded.

(f) relaxing the interior footage setbacks will not impair correlative rights due to the low reservoir permeability and low reservoir pressure. Due to the very low reservoir permeability, reservoir drainage is unlikely to affect offsetting spacing units in a reasonable time frame. Any potential adverse impact that may occur to offsetting GPUs by relaxing the interior setback requirements may be accelerated by only a few months during which time those working interest owners will have an opportunity to best chose when and where to locate their own wells or to seek an expansion of the PA.

Division's conclusions

(26) The Division finds:

(a) Burlington's and Conoco's studies are based upon substantial evidence utilizing data and modern methodologies of data collection and analysis which were not available in 1979 when the Commission authorized 2 well density per GPU for this pool;

(b) Burlington's and Conoco's studies demonstrate that it is now appropriate to adopt and amend rules and regulations for this pool in order to drill more wells per GPU than is currently permitted by Rule 2(b) of the pool rules;

(c) the current well density is inadequate for the pool because only 56% of the recoverable reserves will be recovered in areas already developed;

(d) by allowing operators the option on a pool wide basis to increasing well density up to 4 wells per GPU creates an opportunity to substantially increase ultimate recovery from this pool which will prevent waste and protect correlative rights;

(e) that wells shall be located as follows: (i) the FIRST OPTIONAL INFILL WELL drilled on a GPU shall be located in the quarter section of the GPU not containing a Dakota well; (ii) the SECOND 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; (iii) 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; (iv) at the discretion of the operator, the Second or Third Optional Infill Well may be drilled prior to the First Optional Infill Well being drilled.

(f) The current pool rules which require 660 foot interior setbacks from the quarter section lines has resulted in the "undrained" portions of gas reserves being located between the original and first infill well within a GPU and between GPUs

(g) in order to increase the opportunity to locate wells in the optimum position to drain those additional reserves it is either necessary to process numerous cases for unorthodox well locations or relax the footage setback requirements in drill blocks and federal exploratory units.

(h) relaxing the footage setbacks will not impair correlative rights because in most of the pool the drainage areas per well are less than 160 acres, and due to the lower permeability of the reservoir, it takes many months before any potential adverse impact will occur to offsetting GPUs during which time those operators will have an opportunity to best choose when and where to locate their own wells.

(i) The Division finds that adopting Burlington's and Conoco's proposed well density and well location "footage" setback proposal will be in the best interest of conservation, the prevention of waste and the protection of correlative rights.

(j) The approval of special well location requirements within the federal exploratory units will not violate correlative rights because the unit agreements provide for approved annual plans of development and the establishment of "Participating Areas" as an equitable method for the allocation of production of Basin-Dakota Gas Pool production to all interest owners within the unit's Dakota participating area regardless of the number of wells drilled or where those wells are located.

Division's Additional Findings and Conclusions

(27) The **Division finds that:**

(a) All parties appearing before the Division were in support of modifying current well density and well location rules.

(b) the amendments of the Rules and Regulations of the Basin-Dakota Gas Pool as set forth in Exhibit "A" will prevent the economic loss caused by the drilling of unnecessary wells, will avoid the risks associated with the drilling of an excessive number of wells, will increase the opportunity to produce new reserves and improve recovery of gas from this pool, will provide a workable, fair and efficient regulation of well locations and spacing units while preventing waste of valuable hydrocarbons and the protection of the correlative rights of the owners of that production.

IT IS THEREFORE ORDERED THAT:

(1) Effective on the first day of the month following the issuance of this order, the Rules and Regulations of the Basin-Dakota Gas Pool are hereby amended to conform to the rule changes as set forth in Exhibit "A" attached hereto and made part of this order.

(2) 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 hereinafter designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

LORI WROTENBERY, DIRECTOR

EXHIBIT "A"
ADOPTED RULE CHANGES

"A. WELL ACREAGE AND LOCATION REQUIREMENTS

RULE 2(a). **Standard GPU (Gas Proration Unit)** in the Basin-Dakota Gas Pool shall be 320 acres.

RULE 2(b) **Well density for all acreage in the pool:**

(i) the FIRST OPTIONAL INFILL WELL drilled on a GPU shall be located in the quarter section of the GPU not containing a Dakota well;

(ii) the SECOND 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;

(iii) 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.

(iv) At the discretion of the operator, the SECOND or THIRD OPTIONAL INFILL WELL can be drilled prior to the drilling of the FIRST OPTIONAL INFILL WELL.

(v) No more than two wells shall be located within either 160-acre tract of a GPU

RULE 2(c) **Well Locations outside federal exploratory units:**

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

RULE 2(d) **Well Locations inside federal exploratory units:**

wells located within federal exploratory units shall not be closer than 10 feet to any section, quarter section, or interior quarter-quarter section line or subdivision inner boundary, plus:

(i) wells located within one-half mile of the outer boundary of a federal exploratory unit shall not be closer than 660 feet to the outer boundary of the unit;

(ii) wells located within the unit area but adjacent to an existing or prospective GPU containing any non-committed tract or partially committed tracts shall not be closer to such GPU than 2(c) above;

(iii) wells located within a non-committed GPU shall not be closer to the outer boundary of that GPU than permitted by paragraph 2(c) above.