

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

RECEIVED  
FEB 10 1998

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

OIL CON. DIV.  
DIST. 3

CASE NO. 11880

ORDER NO. R-10949

APPLICATION OF BURLINGTON RESOURCES OIL & GAS COMPANY FOR APPROVAL OF A PILOT PROJECT INCLUDING AN EXCEPTION FROM RULE 2(b) OF THE SPECIAL RULES AND REGULATIONS FOR THE BLANCO-MESAVERDE GAS POOL TO INSTITUTE A PILOT INFILL DRILLING PROGRAM WITHIN A FOUR SECTION AREA INCLUDING SIX UNORTHODOX GAS WELL LOCATIONS FOR PURPOSES OF ESTABLISHING A PROGRAM TO DETERMINE PROPER WELL DENSITY AND WELL LOCATION REQUIREMENTS FOR MESAVERDE WELLS, SAN JUAN COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on November 6, 1997, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 3<sup>rd</sup> day of February, 1998, 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) The Blanco-Mesaverde Gas Pool is currently governed by the General Rules for the Prorated Gas Pools of New Mexico/Special Rules and Regulations for the Blanco-Mesaverde Gas Pool as contained within Division Order No. R-8170, as amended. Rule Nos. 2(a) and 2(b) of the Special Rules and Regulations for the Blanco-Mesaverde Gas Pool require that a standard gas proration unit (GPU) comprise 320 acres, that the initial well on a GPU be located no closer than 790 feet from the outer boundary of the quarter section on which the well is located nor closer than 130 feet from any quarter-quarter section line or subdivision inner boundary, and that the infill well within a standard GPU be located in the quarter section not containing a Mesaverde well at a location which conforms to the setback requirements described above.

(3) The applicant, Burlington Resources Oil & Gas Company (Burlington), seeks authority to institute a pilot infill drilling program within a four section area, described as follows, whereby up to four wells may be drilled on a standard 320-acre gas proration unit:

INFILL PILOT PROJECT AREA

Section 1, Township 30 North, Range 11 West, NMPM  
Section 36, Township 31 North, Range 11 West, NMPM  
Section 31, Township 31 North, Range 10 West, NMPM  
Section 6, Township 30 North, Range 10 West, NMPM

(4) The applicant further seeks:

- a) to establish a ½ mile buffer zone within the outer boundary of the four section pilot project area in which area standard well density for the Blanco-Mesaverde Gas Pool shall apply in order to protect the correlative rights of offset operators;
- b) an exception to Rule No. 2(b) of the Special Rules and Regulations for the Blanco-Mesaverde Gas Pool whereby it may locate and drill six infill wells at the proposed unorthodox gas well locations described as follows:

Well Name & Number

Well Location

|                        |                                          |
|------------------------|------------------------------------------|
| Pubco State Com No. 1B | 325' FSL & 2510' FEL, Unit O, 36-31N-11W |
| Atlantic "C" No. 4C    | 1385' FSL & 445' FWL, Unit L, 31-31N-10W |
| Atlantic "C" No. 6B    | 380' FNL & 2190' FWL, Unit C, 6-30N-10W  |
| Atlantic "C" No. 6C    | 2240' FNL & 2005' FWL, Unit F, 6-30N-10W |
| Sunray "C" No. 1B      | 2135' FNL & 395' FEL, Unit H, 1-30N-11W  |
| Sunray "C" No. 1C      | 2220' FNL & 2520' FEL, Unit G, 1-30N-11W |

- c) no increase in the gas allowable or in the method of calculating gas allowables in the Blanco-Mesaverde Gas Pool for any of the standard gas proration units targeted for the proposed infill drilling.

(5) The applicant proposes to locate its six infill wells on the following described Blanco-Mesaverde Gas Pool proration units within the subject four section area:

| <u>Gas Proration Unit</u>    | <u>Infill Wells</u>                          | <u>Current Operator</u>           |
|------------------------------|----------------------------------------------|-----------------------------------|
| W/2 Section 31, T-31N, R-10W | Atlantic "C" No. 4C                          | Burlington                        |
| W/2 Section 6, T-30N, R-10W  | Atlantic "C" No. 6B<br>Atlantic "C" No. 6C ✓ | Burlington                        |
| N/2 Section 1, T-30N, R-11W  | Sunray "C" No. 1B<br>Sunray "C" No. 1C       | Burlington                        |
| S/2 Section 36, T-31N, R-11W | Pubco State Com No. 1                        | Great Western<br>Drilling Company |

(6) According to applicant's evidence and testimony, the working interest ownership within the W/2 of Section 31, the W/2 of Section 6 and the N/2 of Section 1 is owned 100% by Burlington. There are, however, additional various royalty and overriding royalty interest owners within these subject proration units.

(7) Further testimony indicates that the working interest ownership within the S/2 of Section 36 is owned by Great Western Drilling Company, Davoil Inc., Taurus Exploration and Conoco Inc..

(8) At the time of the hearing, the applicant testified that it has made arrangements with the working interest owners in the S/2 of Section 36 whereby it will drill the proposed Pubco State Com No. 1B and will operate the well for a period of approximately six months at which time it will turn over operations of the well to Great Western Drilling Company.

(9) Due to current Division policy which prohibits having two operators within a single proration unit, the applicant, subsequent to the hearing, advised the Division that it will drill and complete the Pubco State Com Well No. 1B, and will subsequently turn over operations of the well to Great Western Drilling Company.

(10) Applicant testified that it has notified all interest owners, including working, royalty and overriding royalty interest owners within the four section pilot project area of its application in this case. In addition, applicant has notified the only affected offset operator, Amoco Production Company.

(11) The evidence and testimony presented indicates that the applicant has undertaken a study to analyze the drainage efficiency of Mesaverde gas wells in the San Juan Basin. As part of this study, the applicant has examined various geologic and engineering factors which may affect ultimate gas recoveries.

(12) In its investigation, the applicant gathered initial shut-in wellhead pressure data from both the initial and infill wells on approximately 1,200 standard gas proration units within the San Juan Basin. Applicant then utilized this data to construct pressure drop maps.

(13) Applicant's data indicates that there are considerable pressure drop differences between areas in the San Juan Basin. Pressure drops range from greater than 30 psi/year to less than 5 psi/year.

(14) The pressure drop within the four section pilot project area is relatively low ranging from approximately 5-15 psi/year.

(15) Applicant, utilizing core data from the Mesaverde formation taken from wells in both the high and low pressure drop areas of the basin, as well as other geologic data, has reached the following geologic conclusions:

- a) the calculated pressure drops are a good indication of effective permeability in the Mesaverde reservoir;
- b) areas with low pressure drops are most likely not being efficiently and effectively drained by existing well density;
- c) the difference between areas of high and low pressure drop cannot be attributed to differences in matrix porosity and permeability, reservoir structure or reservoir thickness;
- d) the presence and density of natural fractures in the Mesaverde reservoir appear to account for the differences between areas of high and low pressure drop, and resulting differences in drainage efficiency;
- e) data from applicant's Mesaverde Strat Test Well No. 2, a pressure observation well, indicates that the Menefee interval, one of the primary producing intervals in the Mesaverde formation, exhibits near virgin reservoir pressure even though this interval has been produced in offset wells for a considerable period of time; and,
- f) the Menefee, Cliffhouse and Point Lookout to a lesser extent, can be laterally discontinuous from one well location to another.

(16) Applicant testified that in its reservoir modeling for the proposed pilot project, it will utilize geostatistics and stochastic modeling to input geologic parameters. According to applicant's evidence and testimony, this method of analyzing geologic data allows you to capture and quantify the correlatability and directionality of existing data, and distribute this data in a non-averaging method between data points.

(17) Utilizing geostatistics and stochastic modeling allows the input of more realistic geologic data which should ultimately result in a much more accurate and realistic flow simulation within the Mesaverde reservoir.

(18) Applicant presented engineering evidence and testimony which indicates that:

- a) in high pressure drop areas, (i.e. those areas containing natural fractures in the Mesaverde formation), the recovery rates of gas, based upon volumetric and decline curve analysis, range from approximately 60-80 percent of the original gas in place. Correspondingly, those areas of low pressure drop typically exhibit low recovery rates of gas in the range of approximately 20-50 percent of original gas in place;
- b) given the current well density, the recovery rate of gas from the four section pilot project area will be approximately 31 percent of the original gas in place.

(19) Due to the low recovery rates within the four section pilot project area, applicant has determined this to be an ideal location to conduct the pilot infill drilling study.

(20) The applicant presented the results of a reservoir simulation study conducted on the four section pilot project area. The simulation was conducted using runs which assume 1, 2, 3 and 4 additional wells are drilled per section. The results indicate that significant increases in ultimate gas recovery are achieved by drilling additional infill wells per section.

(21) Applicant estimates that by drilling an additional two wells per section within the four section pilot project area, ultimate gas recovery from the project area will increase from approximately 42.0 BCFG to approximately 61.4 BCFG.

(22) No offset operator and/or interest owner appeared at the hearing in opposition to the application.

(23) Preliminary geologic and engineering data indicates that the proposed infill drilling program within the four section pilot project area will allow the applicant the opportunity to test the effectiveness of its geostatistics and stochastic modeling, will allow the applicant the opportunity to gather additional geologic and engineering data to determine proper well density in this portion of the Blanco-Mesaverde Gas Pool, will allow the recovery of additional gas reserves from the pilot project area which may otherwise not be recovered, thereby preventing waste, and will not violate correlative rights.

(24) The applicant should be authorized to drill infill wells within the four section pilot project area with the exception of the following described "buffer zone":

Township 31 North, Range 10 West, NMPM  
Section 31: E/2, NW/4

Township 31 North, Range 11 West, NMPM  
Section 36: W/2, NE/4

Township 30 North, Range 11 West, NMPM  
Section 1: W/2, SE/4

Township 30 North, Range 10 West, NMPM  
Section 6: E/2, SW/4

**IT IS THEREFORE ORDERED THAT:**

(1) The applicant, Burlington Resources Oil & Gas Company, is hereby authorized to conduct a pilot infill drilling program within a four section area, described as follows, whereby up to four wells may be drilled on a standard 320-acre gas proration unit:

**INFILL PILOT PROJECT AREA**

Section 1, Township 30 North, Range 11 West, NMPM  
Section 36, Township 31 North, Range 11 West, NMPM  
Section 31, Township 31 North, Range 10 West, NMPM  
Section 6, Township 30 North, Range 10 West, NMPM

(2) The pilot project area shall comprise the entire four section area as described above with the exception of the following described "buffer zone", in which area standard well density for the Blanco-Mesaverde Gas Pool shall apply:

Township 31 North, Range 10 West, NMPM  
Section 31: E/2, NW/4

Township 31 North, Range 11 West, NMPM  
Section 36: W/2, NE/4

Township 30 North, Range 11 West, NMPM  
Section 1: W/2, SE/4

Township 30 North, Range 10 West, NMPM  
Section 6: E/2, SW/4

(3) As an exception to Rule No. 2(b) of the Special Rules and Regulations for the Blanco-Mesaverde Gas Pool, the applicant is hereby authorized to drill the following described six infill wells within the pilot project area, all of which are located at unorthodox gas well locations, also hereby approved.

| <u>Well Name &amp; Number</u> | <u>Well Location</u>                     |
|-------------------------------|------------------------------------------|
| Pubco State Com No. 1B        | 325' FSL & 2510' FEL, Unit O, 36-31N-11W |
| Atlantic "C" No. 4C           | 1385' FSL & 445' FWL, Unit L, 31-31N-10W |
| Atlantic "C" No. 6B           | 380' FNL & 2190' FWL, Unit C, 6-30N-10W  |
| Atlantic "C" No. 6C           | 2240' FNL & 2005' FWL, Unit F, 6-30N-10W |
| Sunray "C" No. 1B             | 2135' FNL & 395' FEL, Unit H, 1-30N-11W  |
| Sunray "C" No. 1C             | 2220' FNL & 2520' FEL, Unit G, 1-30N-11W |

(4) The wells and/or standard gas proration units within the pilot project area shall not receive a gas allowable greater than that which would normally be assigned a proration unit containing two wells in the Blanco-Mesaverde Gas Pool.

(5) As per the agreement with the various working interest owners within Section 36, including Great Western Drilling Company, the applicant is hereby authorized to drill and complete its Pubco State Com No. 1B, as described above. Subsequent to the completion of drilling and completion operations, the applicant shall turn over operations of the Pubco State Com No. 1B to Great Western Drilling Company.

(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



KATHLEEN A. GARLAND  
Acting Director

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