

**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. 12857
ORDER NO. R-11848**

**APPLICATION OF BURLINGTON RESOURCES OIL & GAS COMPANY L.P.,
BP-AMOCO, AND ENERGEN RESOURCES CORPORATION FOR
APPROVAL OF A PILOT INFILL DEVELOPMENT PROGRAM INCLUDING
FIVE UNORTHODOX GAS WELL LOCATIONS AND, WHERE APPLICABLE,
EXCEPTION TO DIVISION RULE 104.D (3), FOR PURPOSES OF
ESTABLISHING A PILOT INFILL DEVELOPMENT PROGRAM IN THE
PICTURED CLIFFS FORMATION TO DETERMINE PROPER WELL DENSITY
REQUIREMENTS FOR PICTURED CLIFFS GAS WELLS IN SAN JUAN,
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 May 2, 2002 at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 25th day of October, 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 Division has jurisdiction of this case and its subject matter.

(2) Burlington Resources Oil & Gas Company L.P. ("Burlington"), BP-Amoco ("Amoco"), and Energen Resources Corporation ("Energen"), herein referred to collectively as "applicants," seek exception to Division Rule 104.D (3), where applicable, for a 30-well infill pilot study program, as further described in Exhibit "A" attached to this order, that includes approval of five unorthodox gas well locations in the Pictured Cliffs formation, in order to determine proper well density requirements for Pictured Cliffs wells in San Juan, Sandoval and Rio Arriba Counties, New Mexico ("San Juan Basin").

(3) Within the San Juan Basin, Burlington currently operates approximately 1,413

active Pictured Cliff gas wells, Amoco operates approximately 814 Pictured Cliffs gas wells, and Energen operates approximately 514 Pictured Cliff gas wells.

(4) The applicants' proposed pilot program includes existing Pictured Cliffs spacing units within the following pools:

Aztec-Pictured Cliffs Pool **(71280)**
Ballard-Pictured Cliffs Pool **(71439)**
Blanco-Pictured Cliffs Pool **(72359)**
South Blanco-Pictured Cliffs Pool **(72439)**
Fulcher Kutz-Pictured Cliffs Pool **(77200)**
Gavilan-Pictured Cliffs Pool **(77360)**
West Kutz-Pictured Cliffs Pool **(79680)**
Tapacito-Pictured Cliffs Pool **(85920)**.

(5) The Aztec, Ballard, Blanco, Fulcher Kutz, Gavilan, and West Kutz Pictured Cliffs Pools are "unprorated gas pools" not subject to Part H of the Division's statewide rules entitled "*Gas Proration and Allocation*" (Rules 601 through 605). However, these six pools are currently governed by Division Rules 104.C (3) and D (3), which provide for 160-acre spacing units, require wells to be no closer than 660 feet to the outer boundary of their assigned units nor closer than 10 feet to any quarter-quarter section line or subdivision inner boundary, and preclude the drilling, recompletion, and production of a second gas well within a single 160-acre gas spacing unit.

(6) Both the South Blanco-Pictured Cliffs and Tapacito-Pictured Cliffs Pools are prorated gas pools and are therefore subject to Part H of the Division's statewide rules (Rules 601 through 605). Both pools are developed on standard 160-acre spacing with wells no closer than 660 feet to the outer boundary of their assigned units nor closer than 10 feet to any quarter-quarter section line or subdivision inner boundary. While the pool rules governing both pools (see Division Order No. R-8170, as amended) do not specifically restrict the number of wells per unit neither do they specifically permit infill development.

(7) The geologic characteristics of the Pictured Cliffs pools/formations throughout the San Juan Basin can be described as follows:

- (a) low reservoir pressure;
- (b) low sustained producing rates;
- (c) high clay content;
- (d) shallow depth;
- (e) 60-110 feet of gross sandstone thickness; and
- (f) close proximity to the Fruitland coal seams.

(8) Volumetric analysis of existing data suggests that increasing well density to two wells per 160-acre spacing unit would recover additional reserves and that the current one-well per 160-acre unit density rule may result in a low percentage of the gas in place being produced.

(9) Burlington has studied 49 pairs of Pictured Cliffs gas wells. Each pair had been drilled and produced at the same time on the same 160-acre spacing unit prior to Division Rule 104.D (3). None of these spacing units now has both wells producing concurrently.

(10) Burlington's study of these 49 pairs, however, represents an analysis of wells on effective 80-acre density that is inconclusive and cannot be used exclusively to determine appropriate well density for the Pictured Cliffs formations/pools.

(11) Burlington's study of pressure data from 16 redrilled Pictured Cliffs wells demonstrates a relationship between distances from the original Pictured Cliffs gas well to its respective redrilled well and pressure. Generally higher pressures were observed in the redrilled well with increasing distance from the original well; however, this relationship again is not sufficient at this time to determine the appropriate well density in Pictured Cliffs formations/pools.

(12) The applicants presented results from Pictured Cliff redrill and restimulation programs involving: (i) 374 restimulations between 1995 and 2001; and (ii) 52 redrills from 1995 to 1999. The evidence presented by the applicants again shows that these analyses and results are preliminary and are inconclusive as to the appropriate well density for the Pictured Cliffs formations/pools in the San Juan Basin; therefore, additional data, further tests, and actual demonstrations obtained from the proposed infill program will be required to determine ultimate recovery of gas from the Pictured Cliffs formations/pools and proper well spacing.

(13) Based upon a study of current geologic and reservoir engineering data, the applicants have concluded that in order to adequately determine the ultimate recovery of gas from the Pictured Cliffs formation/pools there is a need for a pilot infill development program to study the relationship between well density and ultimate gas recovery.

(14) The applicants' evidence further indicates that the currently available data is either inadequate or insufficient since:

(a) the resistivity of the Pictured Cliffs formation water is not known and may not have been accurately measured in the past;

(b) current water saturation in the Pictured Cliffs is not

known with any degree of accuracy;

(c) the productive potential of the lower portion of the Pictured Cliffs formation in some areas is not known;

(d) electrical log properties of this lower Pictured Cliffs interval are not known; and

(e) original gas in place for many productive areas is not known with any degree of accuracy.

(15) This pilot program is intended to:

(a) enable the applicants to gather layer pressure measurements;

(b) accumulate comprehensive technical data for study and reservoir simulation;

(c) accurately determine formation water saturations; and

(d) make an estimation of original gas-in-place and remaining reserves.

(16) The initial 30 pilot program wells are to be drilled or recompleted in 2002 and 2003 and will be located at standard gas well locations in accordance with Division Rule 104.C(3) except for five certain wells that are to be located at unorthodox gas well locations due to topography or because the existing wellbores slated for recompletion are non-standard for the Pictured Cliffs interval. The wells to be located at unorthodox locations, as well as the specific locations thereof, are identified in Exhibit "A" hereto.

(17) The pilot program wells were chosen based on the flowing criteria:

(a) they must each be located 900 feet or more from an existing Pictured Cliffs well;

(b) the existing Pictured Cliffs gas wells must be in good producing condition;

(c) if any Basin-Fruitland Coal (Gas) Well exists within a subject 160-acre unit, it must not have high production

rates or cumulative recoveries;

(d) offset Pictured Cliffs wells' cumulative recoveries should be between 0.7 and 1.5 BCF;

(e) they represent a variety of Pictured Cliffs pools;
and

(f) they include wells located in both high and low permeability areas.

(18) Criteria used for selecting the wellbores to be recompleted were:

(a) current well production is less than 50 MCFD;

(b) casing and cement are in good mechanical condition; and

(c) production from the current producing formation can be commingled with production from the Pictured Cliffs formation.

(19) No interested person appeared at the hearing in opposition to this application.

(20) Granting this application will afford the applicants the opportunity to gather additional data and examine various geologic and engineering factors to determine proper well density and well locations for all Pictured Cliffs Gas Pools and formations. Use of data from the pilot project could ultimately result in the recovery of additional gas reserves that may not otherwise be recovered, thereby preventing waste. Granting this application will not violate correlative rights.

IT IS THEREFORE ORDERED THAT:

(1) As an exception to Division Rules 104.C (3) and D (3), where applicable, the applicants, Burlington Resources Oil & Gas Company L.P., BP-Amoco, and Energen Resources Corporation are hereby authorized to conduct a 30-well infill pilot study program in the Pictured Cliffs formation within Rio Arriba, San Juan, and Sandoval Counties, New Mexico, as further described in Exhibit "A" attached to this order.

(2) Jurisdiction of this case 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

LORI WROTENBERY
Director

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