

**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. 10425  
Order No. R-9643*

**APPLICATION OF CONOCO, INC. FOR  
DESIGNATION OF A TIGHT FORMATION,  
SAN JUAN COUNTY, NEW MEXICO.**

**ORDER OF THE DIVISION**

**BY THE DIVISION:**

This cause came on for hearing at 9:00 a.m. on December 20, 1991, at Albuquerque, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 9th day of March, 1992, 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 applicant, Conoco, Inc., initially requested that the Division, in accordance with Section 107 of the Natural Gas Policy Act of 1978 and 18 C.F.R. Section 271.701-703, recommend to the Federal Energy Regulatory Commission (FERC) that the Pictured Cliffs formation underlying 71,192.87 acres, more or less, of lands in San Juan County, New Mexico, as described in Exhibit "A" attached to this order, hereinafter referred to as the Pictured Cliffs formation, be designated as a "tight formation."

(3) The area described in said Exhibit "A" can best be described as a rectangle measuring approximately 10 miles longitudinal and 11 1/2 miles latitudinal. Approximately one-third of the proposed area has experienced extensive development within the Pictured Cliffs formation while the remaining geographical area has almost no production and only a nominal number of bore-holes in which to obtain data. This

producing area is entirely within the Blanco-Pictured Cliffs Pool and can best be described as a right triangle extending approximately 6 1/2 miles east and 8 miles north from the southwest corner of the entire area. The resulting hypotenuse, which extends 10 1/2 miles in a northwesterly/southeasterly direction is the boundary line within the original proposed area where development of the Pictured Cliffs formation occurs.

(4) At the time of the hearing, the applicant presented extensive geological data of the surrounding area utilizing subsurface data from the producing Blanco-Pictured Cliffs Pool, data from the "tight formation area" designated as "NM-7", a small Pictured Cliffs gas producing structure just north of this area in Colorado, and data available from several wellbores in the expansive "barren area."

(5) The applicant presented evidence showing that the Pictured Cliffs formation within the proposed tight formation area has been penetrated by approximately 148 wells, most of which are situated within said developed triangular area. At the time of the hearing, the applicant concentrated its engineering support data from information obtained on wells located along the periphery of the developed and barren regions of the proposed tight formation area.

(6) At the conclusion of the hearing proceedings, Conoco, Inc. was requested to submit additional engineering data from wells within the developed area to supplement its application. The record in this case was to remain open until this additional information was submitted for review.

(7) On January 22, 1992, by letter from general counsel, Conoco, Inc. requested the Division consider an amendment to its application ("the amended area") reducing the proposed tight formation area to that portion of the Pictured Cliffs formation underlying 48,155.07 acres, more or less, of lands in San Juan County, New Mexico as described in Exhibit "B" attached hereto and made a part hereof, which comprises the barren northeastern two-thirds of the original area.

(8) The Pictured Cliffs formation underlies all of the lands described in the amended area; the formation consists of fine to very fine grain sands classified as litharenite with significant amounts of diagenetic minerals formed in the intergranular pore spaces resulting in porosity which has been significantly reduced due to compaction and mineralization of the intergranular spaces. The top of the formation is found at an average depth of 3500 feet below the surface and the gross thickness of productive sand is approximately 150 feet.

(9) The deposition of the Pictured Cliffs formation in the immediate area consists of near shore bars which are lenticular, ribbon-like deposits oriented northwest to southeast; that better production is encountered on the crests of these near shore bars where the sands appear to be better developed than the areas off the bar crests where the sands become siltier and more mineral-filled and the amended area is off the northeast side of a bar crest in largely undeveloped exploratory area.

(10) The Division and the U.S. Bureau of Land Management have previously recommended to and the Federal Energy Regulatory Commission has previously approved other portions of the Pictured Cliffs formation in this general area as "tight formation designation."

(11) The type section for the Pictured Cliffs formation is found at a depth of approximately 3500 feet, with the productive portion being the upper 70 feet of a 150-foot section as described by the State of New Mexico on the Dual Induction-SFL log from the Amoco Production Company's San Juan 32-9 Unit Well No. 102 located in the SW/4 NW/4 of Section 17, Township 31 North, Range 9 West, NMPM, San Juan County, New Mexico.

(12) The original area of application, as described in Exhibit "A", included some 133 wells which produce from the Pictured Cliffs formation, all located in the southwestern third of the area, and all required fracture stimulation to achieve commercial rates of production.

(13) According to the applicant, the amended area contains a total of fifteen wells, six of which are non-commercial Pictured Cliffs attempts.

(14) The amended area is to the northeast of the Pictured Cliffs trend and is expected to be a lower productivity area. The northern boundary of this area is correlative to Pictured Cliffs wells in Colorado with calculated in-situ gas permeability of 0.083md, 0.051md and 0.069md. The eastern boundary of this area is correlative to the previously approved "NM-7" tight formation designation recommended by Division Order R-6594 and subsequently approved by the FERC. The western boundary is defined by off trend non-commercial Pictured Cliff well attempts. The southern boundary is the Picture Cliff trend running generally northwest to southeast.

(15) Within the amended area, there are three core analysis which measured in-situ permeability of 0.014md, 0.028md and 0.007md.

(16) Within the amended area, a pressure buildup analysis on the San Juan 32-9 Unit Well No. 106 located in the SE/4 of Section 17, Township 31 North, Range 9 West, San Juan County, results in a calculated in-situ permeability of 0.007md.

(17) The typical Pictured Cliffs well in the San Juan Basin produces dry methane gas with little or no well head condensate and no water. No Pictured Cliffs well in the area is known to produce volumes of oil or condensate greater than one barrel per day.

(18) The evidence presented in the Case demonstrated that no well formerly or currently completed in the Pictured Cliffs formation within the amended proposed area exhibited permeability, gas productivity, or crude oil productivity in excess of the following parameters:

(a) average in-situ gas permeability throughout the pay section of 0.1 millidarcy; and

(b) stabilized gas production rate, without stimulation, against atmospheric pressure, of 91 MCFPD, the FERC maximum allowable production gas rate for an average formation depth of 3500 feet; and

(c) crude oil production rate of 5 barrels per day.

(19) Based on analysis of available data from existing wells within the proposed area and utilizing generally and customarily accepted petroleum engineering techniques and measurements:

(a) the estimated average in-situ gas permeability, throughout the pay section of the Pictured Cliffs formation, is expected to be 0.1 millidarcy or less; and

(b) the stabilized production rate, against atmospheric pressure, of wells completed for production in the Pictured Cliffs formation, without stimulation, is not expected to exceed 91 MCFPD, the FERC maximum allowable production rate for an average formation depth of 3500 feet; and

(c) no wells drilled into the Pictured Cliffs formation is expected to produce, without stimulation, more than 5 barrels of crude oil per day.

(20) Within the amended area the deepest fresh water aquifer that is expected to be used as a domestic or agricultural water supply is the Ojo Alamo which is found at an average depth of 1900 feet; and existing State of New Mexico and Federal regulations relating to casing and cementing of wells will assure that development of the Pictured Cliffs formation will not adversely affect the fresh water zones.

(21) The Pictured Cliffs formation within the amended area is governed by statewide rules which require 160-acres spacing for gas wells. Currently, no special rules authorizing infill drilling exist in the area.

(22) Based on evidence and testimony submitted by the applicant, the Pictured Cliffs formation within the vertical intervals described in Finding Paragraph No. (6), underlying the area described in Exhibit "B", meets the criteria set forth in the FERC Regulations in Title 18 CFR, Section 271.703 and should therefore be recommended for designation as a "tight formation".

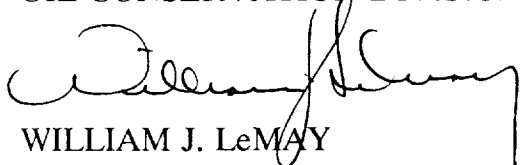
**IT IS THEREFORE ORDERED THAT:**

(1) It be and hereby is recommended to the Federal Energy Regulatory Commission pursuant to Section 107 of the Natural Gas Policy Act of 1978 and FERC Regulations in Title 18 C.F.R. Section 271.703 that the Pictured Cliffs formation within the vertical limits described in Finding Paragraph Nos. (8), (9), and (11) of this order, underlying certain lands in San Juan County, New Mexico, as shown on Exhibit "B" attached to this order, be designated a tight formation.

(2) That jurisdiction is hereby retained for 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

**Exhibit "A"**  
**Case No. 10425**  
**Order No. R-9643**

*Original area requested by Conoco, Inc.  
for the designation of the Pictured Cliffs  
formation as a Tight Formation.*

**SAN JUAN COUNTY, NEW MEXICO**

**TOWNSHIP 30 NORTH, RANGE 9 WEST. NMPM**

Sections 1 through 6:       All

**TOWNSHIP 30 NORTH, RANGE 10 WEST. NMPM**

Sections 1 through 4:       All

**TOWNSHIP 31 NORTH, RANGE 9 WEST. NMPM**

Sections 1 through 36:     All

**TOWNSHIP 31 NORTH, RANGE 10 WEST. NMPM**

Sections 1 through 4:       All

Sections 9 through 16:     All

Sections 21 through 28:    All

Sections 33 through 36:    All

**TOWNSHIP 32 NORTH, RANGE 9 WEST. NMPM**

Sections 7 through 36:     All

**TOWNSHIP 32 NORTH, RANGE 10 WEST. NMPM**

Sections 9 through 16:     All

Sections 21 through 28:    All

Sections 33 through 36:    All

The proposed "tight formation" as described above includes portions of the Blanco Pictured Cliffs Pool. Said area comprises a total of 71,192.87 acres, more or less, and consists of the following (more or less):

Federal:	56,322.97 acres
State:	8,769.76 acres
Fee:	6,100.14 acres