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. 10428
Order No. R-9632

APPLICATION OF ENRON OIL & GAS COMPANY FOR DESIGNATION OF A TIGHT FORMATION, LEA 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 3rd day of February, 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, Enron Oil & Gas Company (Enron), requests that the Division recommend to the Federal Energy Regulatory Commission (FERC) that the Morrow formation underlying the following lands be designated as a "tight formation" in accordance with Section 107 of the Natural Gas Policy Act, FERC Regulations in Title 18 CFR Section 271.703 and Oil Conservation Division Order No. R-6388-A:

Township 25 South, Range 33 East, NMPM
Sections 1 through 14: All
Section 15: W/2
Sections 16 through 20: All
Section 21: N/2
Sections 22 through 36: All

Township 25 South, Range 34 East, NMPM
Sections 6 and 7: All
Section 8: S/2
Sections 17 through 20: All
Sections 29 through 32: All

(3) The proposed "tight formation" area contains 29,120 acres (81% Federal, 16% State and 3% Fee), more or less, and includes portions of the Pitchfork Ranch-Morrow Gas Pool, Red Hills-Morrow Gas Pool, and Vaca Draw-Morrow Gas Pool. The applicant proposes to designate the area as the "Pitchfork Ranch Tight Formation Area" (Pitchfork Ranch Area).

(4) The type log presented by the applicant to represent the Morrow formation in the Pitchfork Ranch Area is the Compensated Density-Neutron Log run in the BTA Oil Producers Rojo 7811 JV-P Well No. 1 located 660 feet from the North and West lines (Unit D) of Section 27, Township 25 South, Range 33 East, NMPM, Lea County, New Mexico. The vertical limits of the Morrow formation in the Pitchfork Ranch Area should include the entire Morrow interval of the Lower Pennsylvanian System found to occur from the base of the Atoka formation at 14,728 feet to the top of the Mississippian shale at 16,600 feet on this type log.

(5) Enron included a geological description of the Morrow formation in its application and a witness reviewed the geological description at the hearing. A summary of the geological information is as follows:

> The Morrow formation in the Pitchfork Ranch Area is divided into three correlative units (lower, middle and upper) consisting of limestones, shales and sands with a gross thickness of approximately 1,872 feet. The measured vertical depth to the top of the Morrow increases from the Northeast to the Southwest and also East to West across the Pitchfork Ranch Area with an average depth to the top of the Morrow formation of 14,700 feet.
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> During lower Morrow time the sediments deposited over the area of application were basinal shales. Middle Morrow deposition was characterized by an increase in clastic material sourced from the Central Basin Platform which created packages of lenticular sands within the deep water shales. Upper Morrow sediments contain alternating

sequences of limestones, shales and sands, which is indicative of a regressive Morrow sea and shallower water conditions.

The clastic deposits in the middle and upper Morrow are the dominate reservoir rocks of the Morrow formation in the Pitchfork Ranch Field. The middle and upper Morrow clastics become poorly developed in a Southwest direction away from the Pitchfork Ranch Field across the area of application. Data indicates the sands are more limy and less homogeneous with greater amounts of calcareous and siliceous cement. These lithologic changes have resulted in tighter rock which is supported by production data, log calculations and permeability calculations.

(6) Applicant's data shows that there are sixteen wells that penetrated the Morrow formation in the Pitchfork Ranch Area.

(7) Applicant's witnesses testified that average in situ gas permeability for the Pitchfork Ranch Area is less than 0.1 millidarcys (md) and presented testimony in exhibits concerning two methods for determining average in situ permeability. Calculated permeability was the primary source of permeability data. Calculations based on well performance, bottomhole pressure measurements and reservoir data were used. Measured permeabilities from pressure build up analyses was used on three wells and confirmed the calculated permeabilities on the others.

(8) Permeability data from the Morrow sands was obtained from eleven wells which are well distributed over the Pitchfork Ranch Area. Calculated and measured permeabilities from the pay sections from the eleven wells established that the average in-situ permeability was 0.07585 md. or less.

(9) Applicant submitted testimony and exhibits to explain Pitchfork Ranch Area permeability calculations using the Holditch and Lee method. Applicant compared the measured permeability from four build-ups in the Pitchfork Ranch Area and in three of four cases the calculated permeability was slightly higher than the measured permeabilities, thereby confirming applicant's calculation method.

(10) To show that unstimulated producing rates for Pitchfork Ranch Area wells are not expected to exceed FERC "tight formation" limits of 5 BOPD and 2557 MCFPD, the applicant used actual flow test data from eleven wells in the Pitchfork Ranch Area, using the Holditch and Lee method, the average pre stimulation stabilized production rate at atmospheric pressure, or calculated against atmospheric pressure, in the Pitchfork Ranch Area was determined to be 1,339 MCFPD.

(11) Applicant's witness testified that wells in the Pitchfork Ranch Area produced dry gas with very little condensate and that no well in the area is expected to produce without stimulation more than 5 BOPD.

(12) No fresh water sands are known to occur in the area. However, existing State and Federal regulations relating to drilling, casing, and cementing wells and disposal of produced water, will apply to all wells in the Pitchfork Ranch Area and will provide for the protection for fresh water aquifers if any are found to exist in the area.

(13) A review of the rules for pools within the Pitchfork Ranch Area shows that Special Pool Rules have not been adopted to authorize infill drilling in the various pools.

(14) Based on evidence and testimony submitted by the applicant, the Morrow formation within the vertical intervals described in Finding Paragraph Nos. (4) and (5), underlying the area described in Finding Paragraph No. (2), meet the criteria set forth in 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) A recommendation to the Federal Energy Regulatory Commission is hereby submitted pursuant to Section 107 of the Natural Gas Policy Act of 1978 and FERC Regulations in Title 18 CFR, Section 271.703, and that the Morrow formation within the vertical limits described in Finding Paragraph Nos. (4) and (5) of this order, underlying the following described lands in Lea County, New Mexico, be designated as a "tight formation".

Township 25 South, Range 33 East, NMPM
Sections 1 through 14: All
Section 15: W/2
Sections 16 through 20: All
Section 21: N/2
Sections 22 through 36: All

Township 25 South, Range 34 East, NMPM
Sections 6 and 7: All
Section 8: S/2
Section 17 through 20: All
Sections 29 through 32: All

The above lands contain 29,120 acres (81% Federal, 16% State and 3% Fee), more or less, and are to be designated the Pitchfork Ranch Tight Formation Area.

(2) 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

WILLIAM J. LeMAY
Director

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