

Entered March 16, 1982
JDR

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION COMMISSION

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

CASE NO. 7116 De Novo
Order No. R-6747-A

APPLICATION OF SOUTHLAND ROYALTY
COMPANY FOR DESIGNATION OF A
TIGHT FORMATION, SAN JUAN COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing de novo at 9:00 a.m. on September 29, 1981, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 11th day of March, 1982, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That this case originally came on for hearing on December 30, 1980, before Division Examiner Daniel S. Nutter.

(3) That at the original hearing of this case, Consolidated Oil & Gas, Inc., hereinafter referred to as Consolidated, asked for and was granted permission to intervene in the case, and the area considered for designation as a tight formation was broadened beyond the original lands applied for by Southland Royalty Company, hereinafter referred to as Southland, to include additional lands requested for designation as a tight formation by Consolidated.

(4) That Order No. R-6747 was entered in Case No. 7116 on August 7, 1981, and said order recommended for designation as a tight formation, pursuant to Section 107 of the Natural Gas Policy Act of 1978 and 18 C.F.R. Section 271.703, certain of the lands requested by Southland and certain of the lands requested

by Consolidated, and made no recommendation for designation of the remaining lands requested by Southland and Consolidated.

(5) That on August 24, 1981, Consolidated, pursuant to Section 70-2-13, NMSA 1978 Comp., filed timely application for hearing de novo of Case No. 7116, and the case came on for hearing as noted above, on September 29, 1981.

(6) That Southland, having filed a new and separate application for designation of its area as a tight formation, withdrew from Case No. 7116 at the hearing de novo and asked that the original Southland lands be deleted from the hearing de novo and that that portion of the case relating to such lands be dismissed.

(7) That in accordance with the above, all of those lands covered by the Southland application in the original hearing of this case should be deleted and dismissed from further consideration.

(8) That henceforth in this case, this order shall be concerned with the application of Consolidated Oil & Gas, Inc., for designation of the Dakota formation as a tight formation, underlying the following described lands in San Juan County, New Mexico:

TOWNSHIP 31 SOUTH, RANGE 12 WEST, NMPM
Sections 5 through 8: All
Sections 17 through 20: All
Sections 29 through 32: All

TOWNSHIP 31 NORTH, RANGE 13 WEST, NMPM
Sections 1 through 36: All

containing 29,645 acres, more or less.

(9) That while the application was for designation of the Dakota formation as a tight formation, the Dakota formation constitutes but a portion of the "Dakota Producing Interval," which, as defined by the Division, comprises the vertical limits of the Basin-Dakota Gas Pool, being from the base of the Greenhorn Limestone to a point 400 feet below the base of said formation and consisting of the Graneros formation, the Dakota formation, and the productive upper portion of the Morrison formation.

(10) That inasmuch as practically all so-called "Dakota" wells drilled in the subject area are, or potentially are, tested in and/or completed in the entire Dakota Producing Interval, and the well data presented at the hearing of this

case involves the entire Dakota Producing Interval, the application should be broadened to cover all of said producing interval throughout the area.

(11) That the Dakota Producing Interval, hereinafter referred to as the "Dakota," is comprised of sediments formed during late Cretaceous time. These sediments contain light to dark mottled gray fine to very fine-grained quartz sands in a silt and clay-sized matrix material of very low permeability.

(12) That from the logs available at the hearing, the top of the Dakota in the area ranges from a depth of 6103 feet to 6820 feet and averages some 6544 feet beneath the surface.

(13) That the only test data for calculated stabilized flow rates prior to stimulation for wells within the area indicates that in Township 31 North, Range 13 West, the Consolidated Wilmerding Well No. 1 in the NE/4 NW/4 of Section 10 had a flow rate "too small to measure," the Consolidated Kline Well No. 1 in the NE/4 SE/4 of Section 10 had a flow rate of 12.5 MCF of gas per day, and the Consolidated Senter Well No. 1 in the NE/4 SE/4 of Section 24 had a combined flow rate from two zones of 55 MCF of gas per day. Further, that two Southland wells in the immediate area to the east but just outside the area under consideration, being in Sections 14 and 2, Township 31 North, Range 12 West, had flow rates of 22 and 224 MCF of gas per day, respectively.

(14) That none of the stabilized production rates cited above exceeds the maximum stabilized production rate set forth in 18 C.F.R. Section 271.703(c)(2)(i)(B) of 251 MCF per day for wells at the average depth to the top of the formation for this area (6544 feet), and it is not expected that the average well in the area will exceed such rate.

(15) That the calculated in situ permeability of the Dakota formation in the five wells cited in Finding No. (13) above is as follows: Wilmerding No. 1, less than 0.1 md; Kline No. 1, 0.0049 md; Senter No. 1, 0.0146 md in the Upper Dakota and 0.00068 md in the Lower Dakota; and the two Southland wells in the immediate area to the east, 0.0011 md and 0.0877 md, respectively.

(16) That the average in situ permeability for all wells in the area is not expected to exceed 0.1 md, the limit set forth in 18 C.F.R. Section 271.703(c)(2)(i)(A).

(17) That prior to stimulation, the average well in the area is expected to produce far less than the maximum five

barrels of crude oil per day as set forth in 18 C.F.R. Section 271.703(c)(2)(i)(C).

(18) That 18 C.F.R. Section 271.703(c)(2)(i)(D) provides that "if the formation or any portion thereof was authorized to be developed by infill drilling prior to the date of recommendation and the jurisdictional agency has information which in its judgment indicates that such formation or portion subject to infill drilling can be developed absent the incentive price established in paragraph (a) of this section then the jurisdictional agency shall not include such formation or portion thereof in its recommendation."

(19) That the Division, by its Order No. R-1670-V, dated May 22, 1979, and effective July 1, 1979, approved infill drilling for the Basin-Dakota Gas Pool in San Juan and Rio Arriba Counties, New Mexico, and said pool includes the Dakota Producing Interval in the area under consideration here.

(20) That the Division, in approving infill drilling for the Basin-Dakota Gas Pool, based its approval on the premise that the reservoir was of low permeability and that 320-acre wells were not draining more than the 160-acre tract upon which they were located.

(21) That the remaining reserves under the 160-acre tract upon which the unit well is not located should be similar to, if not equal to, the original reserves under the 160-acre tract upon which the unit well is located.

(22) That according to Consolidated's Exhibit No. 8A, the average cost of a Dakota well completed in the area under consideration, hereinafter referred to as the area," is \$475,400, and according to its Exhibit No. 12, operating costs may be expected to total some \$61,740 during the first 20 years of a well's life and approximately \$3600 per year thereafter.

(23) That according to Consolidated's Exhibit No. 12, under Section 103 prices, a Dakota gas well in the area, with reserves recoverable over a 20-year period as indicated in Column 1 below, may be expected to yield a net income above well costs and operating costs, but before federal income taxes, as shown in Column 2 below and yield a rate of return on investment as shown in Column 3.

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| <u>COLUMN 1</u> <u>Reserves, MMCF</u> | <u>COLUMN 2</u> <u>Net Income</u> | <u>COLUMN 3</u> <u>Rates of Return</u> |
|--|--------------------------------------|---|
| 180 | \$ 120,297 | 3.18% |
| 270 | \$ 479,860 | 9.54% |
| 350 | \$ 837,754 | 15.78% |
| 435 | \$1,200,854 | 22.12% |
| 555 | \$1,778,604 | 30.32% |

(24) That according to Consolidated's Exhibit No. 12, under Section 107 incentive prices, a Dakota gas well in the area, with 20-year reserves as indicated in Column 1 below may be expected to yield a net income above well costs and operating costs, but before federal income taxes, as shown in Column 2 below and yield a rate of return on investment as shown in Column 3.

| <u>COLUMN 1</u> <u>Reserves, MMCF</u> | <u>COLUMN 2</u> <u>Net Income</u> | <u>COLUMN 3</u> <u>Rates of Return</u> |
|--|--------------------------------------|---|
| 180 | \$ 550,345 | 14.47% |
| 270 | \$1,107,833 | 27.29% |
| 350 | \$1,679,273 | 38.16% |
| 435 | \$2,255,196 | 49.52% |
| 555 | \$3,110,619 | 65.71% |

(25) That according to Consolidated's Exhibit No. 13, under Section 103 prices, a Dakota gas well in the area with 20-year reserves as indicated in Column 1 below may be expected to yield a rate of return on investment plus operating expenses and after taxes as shown in Column 2 and obtain a payout as shown in Column 3.

| <u>COLUMN 1</u> <u>Reserves, MMCF</u> | <u>COLUMN 2</u> <u>Rate of Return, %</u> | <u>COLUMN 3</u> <u>Payout In Years</u> |
|--|---|---|
| 180 | 2.25 | 17.37 |
| 270 | 6.65 | 9.33 |
| 350 | 10.47 | 6.57 |
| 435 | 14.44 | 5.14 |
| 555 | 19.72 | 4.09 |

(26) That according to the aforementioned Exhibit No. 13, under Section 107 incentive prices, a Dakota gas well in the area with 20-year reserves as indicated in Column 1 below may be expected to yield a rate of return on investment plus operating expenses and after taxes as shown in Column 2 and obtain a payout as shown in Column 3.

| COLUMN 1 | COLUMN 2 | COLUMN 3 |
|-----------------------|--------------------------|------------------------|
| <u>Reserves, MMCF</u> | <u>Rate of Return, %</u> | <u>Payout In Years</u> |
| 180 | 9.27 | 6.69 |
| 270 | 17.41 | 4.37 |
| 350 | 24.39 | 3.47 |
| 435 | 31.80 | 2.89 |
| 555 | 42.13 | 2.42 |

(27) That from the data shown in Finding No. (23) above, 20-year recoverable reserves in the range of 435 million cubic feet will yield a rate of return before taxes of 22.12 percent under Section 103 gas prices.

(28) That from the data shown in Finding No. (25) above, 20-year recoverable reserves in the range of 435 million cubic feet may be expected to pay out all drilling and operating costs, after taxes, in approximately 5.14 years under Section 103 gas prices.

(29) That in the judgment of the Commission, lands indicating 435 or more million cubic feet of gas reserves recoverable over a 20-year period can be developed absent the incentive price of Section 107 of the Natural Gas Pricing Act of 1978.

(30) That in the judgment of the Commission, land indicating less than 435 million cubic feet of gas reserves recoverable over a 20-year period are less likely to be developed without the incentive price of Section 107 of the Natural Gas Pricing Act of 1978 and therefore should be recommended for designation as a tight formation eligible for the incentive price.

(31) That Consolidated's Exhibit 1 shows the location of Dakota wells in the area, their 1980 production, and their cumulative production since completion, and the cumulative production (over a period of approximately 20 years or less) ranges from very low obviously non-commercial wells to almost three billion cubic feet of gas.

(32) That in accordance with the Commission's previous findings that the Dakota is of low permeability and the original wells on 320-acre tracts were not draining more than the 160-acre tract upon which they were located, and that the reserves under the 160-acre upon which the original unit well is not located should be similar to, if not equal to, the original reserves under the 160-acre tract upon which the unit well is located, it is reasonable to assume that the infill wells in the area should recover gas reserves similar to, if not equal to, the cumulative reserves indicated on Consolidated's Exhibit 1.

(33) That pursuant to previous Findings Nos. (20) and (21), and to Findings Nos. (31) and (32) above, and to Consolidated's Exhibit 1, it is reasonable to assume that the average infill well drilled in the following described area will encounter recoverable reserves of 435 million or more cubic feet of gas:

TOWNSHIP 31 NORTH, RANGE 12 WEST, NMPM

Sections 5 through 8: All

Sections 17 through 20: All

Sections 29 through 32: All

TOWNSHIP 31 NORTH, RANGE 13 WEST, NMPM

Section 13: All

Sections 22 through 27: All

Sections 33 through 36: All

containing 14,482 acres, more or less.

(34) That it is the judgment of the Commission that the above-described lands can be developed absent the incentive price established in 18 C.F.R. Section 271.703(a) and should not be further considered for recommendation for designation as a tight formation.

(35) That there are fresh water aquifers underlying the lands being considered, and these aquifers extend to a depth of approximately 1000 feet.

(36) That there is a vertical distance of some 5500 feet between the base of the lowermost of said aquifers and the top of the Dakota, and this distance, combined with the required casing and cementing program for wells in the area, will assure that development of the Dakota will not adversely affect the fresh water aquifers (during both hydraulic fracturing and waste disposal operations) that are or are expected to be used as a domestic or agricultural water supply.

(37) That the Dakota Producing Interval underlying the following lands meets all of the guidelines set forth in 18 C.F.R. Section 271.703(c)(2)(i), subsections (A), (B), (C), and (D), and should be recommended for designation as a tight formation:

TOWNSHIP 31 NORTH, RANGE 13 WEST, NMPM

Sections 1 through 12: All

Sections 14 through 21: All

Sections 28 through 32: All

containing some 15,163 acres, more or less, all in San Juan County, New Mexico.

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IT IS THEREFORE ORDERED:

(1) That 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 18 C.F.R. Section 271.703, that the Dakota Producing Interval, being from the base of the Greenhorn Limestone to a point 400 feet below the base of said formation and consisting of the Graneros formation, the Dakota formation and the productive upper portion of the Morrison formation, underlying the following described lands in San Juan County, New Mexico, be designated as a tight formation:

TOWNSHIP 31 NORTH, RANGE 13 WEST, NMPM
Sections 1 through 12: All
Sections 14 through 21: All
Sections 28 through 32: All

containing approximately 15,163 acres, more or less.

(2) That no recommendation is made as to those lands described in Finding No. (8) of this order which are not included in Order No. (1) above.

(3) That 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 COMMISSION


EMERY C. ARNOLD, Chairman

ALEX J. ARMIJO, Member


JOE D. RAMEY, Member & Secretary

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