BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY
THE OIL CONSERVATION COMMISSION ON ITS
OWN MOTION FOR THE AMENDMENT OF THE
SPECIAL RULES AND REGULATIONS GOVERNING
CERTAIN POOLS IN ROOSEVELT, CHAVES, LEA,
SAN JUAN, AND RIO ARRIBA COUNTIES, NEW
MEXICO, TO PERMIT THE ESTABLISHMENT OF
ONE-YEAR PRORATION PERIODS FOR EACH OF
THE POOLS.

CASE NO. 4776
Order No. R-4367

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on July 26, 1972, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 30th day of August, 1972, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, 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 Order No. R-1670-K, dated May 11, 1972, amended the General Rules and Regulations governing the prorated gas pools of New Mexico, promulgated by Order No. R-1670, as amended, to establish one-year proration periods for each of the gas pools governed by said rules and regulations.

(3) That there are a number of other pools in the state that have proration periods for gas of less than one-year.

(4) That the establishment of one-year proration periods for said pools should permit more efficient operation of the wells.

(5) That the Special Rules and Regulations governing the following pools should be amended to provide for one-year proration periods:

Bluitt-San Andres Associated Pool
Todd-Lower San Andres Pool, both in Roosevelt County;

Double L-Queen Associated Pool
Round Tank-Queen Pool
Twin Lakes-San Andres Pool, all in Chaves County;

Mesa-Queen Pool in Lea and Eddy Counties;
North Paduca-Delaware Pool, in Lea County;

Angels Peak-Gallup Pool
Gallegos-Gallup Pool, both in San Juan County;

Escrito-Gallup Pool in Rio Arriba and San Juan Counties;

Tapacito-Gallup Associated Pool
Devils Fork-Gallup Pool, both in Rio Arriba County

(6)   That in order to establish concurrent one-year proration periods, the period from February 1, 1972, to December 31, 1972, should be considered as one proration period for the subject pools in Northwest New Mexico and the period from January 1, 1972, to December 31, 1972, should be considered as one proration period for the subject pools in Southeast New Mexico.

IT IS THEREFORE ORDERED:

(1)   That Rule 12 of the Special Rules and Regulations governing the following pools:

Double L-Queen Associated Pool
Round Tank-Queen Pool
Twin Lakes-San Andres Pool, all in Chaves County;

Mesa Queen Pool in Lea and Eddy Counties;
North Paduca-Delaware Pool, in Lea County;

Angels Peak-Gallup Pool
Gallegos-Gallup Pool, both in San Juan County;

Escrito-Gallup Pool in Rio Arriba and San Juan Counties;

Tapacito-Gallup Associated Pool in Rio Arriba County

is hereby amended to read in its entirety as follows:

"RULE 12.   The date 7:00 a.m. January 1 of each year shall be known as the balancing date, and the twelve months following this date shall be known as the gas proration period."

(2)   That Rule 13 of the Special Rules and Regulations governing the Bluitt-San Andres Associated Pool, Roosevelt County, New Mexico, promulgated by Order No. R-1670-I, is hereby amended to read in its entirety as follows:

"RULE 13   (A).   The date 7:00 a.m. January 1 of each year shall be known as the balancing date, and the twelve-months following this date shall be known as the gas proration period.

"(B)   (1). The top 80-acre unit allowable for oil wells shall be determined each month by multiplying the Southeast New Mexico Normal Unit Allowable by the 80-acre proportional (depth) factor for said pool (2.00). The final allowable for the gas area of said pool shall be determined each twelve months for the preceding twelve-month period in accordance with the following formula:

$$V = \left[Q \times \left(\frac{A + \Delta A}{a + \Delta a}\right)\right] \left[(r_1 - r_2) + \left(\frac{T_{sc}}{T_{res}} \times \frac{P_{res}}{P_{sc}} \times \frac{1}{z} \times B_o \times 5.61 \frac{ft^3}{bbl}\right)\right]$$

where:

V   =   The gas allowable for the gas area for the preceding twelve-month period and is equal to the volumetric gas equivalent of all production from the oil area during the preceding twelve-month period expressed in cubic feet rounded off to the nearest MCF.

Q   =   Total oil production from the oil area during the preceding twelve-month period, barrels.

$(A + \Delta A)$ =   Total acres dedicated to gas wells during preceding twelve-month period.

$(a + \Delta a)$ =   Total acres dedicated to oil wells during preceding twelve-month period.

(Note: "A" and "a" represent acreage dedicated to gas wells and to oil wells respectively for the entire twelve-month period. ΔA and Δa represent acreage so dedicated for only a portion of the twelve-month period. In the event a well is completed or reclassified during a twelve-month period ΔA and/or Δa shall be computed as follows:

$$\Delta A = A\left(\frac{d}{D}\right) \qquad\qquad \Delta a = a\left(\frac{d}{D}\right)$$

where:

ΔA or Δa =   acreage to be added to gas or oil area, respectively.

A or   a   =   acreage dedicated to the well.

d   =   number of days during proration period during which well was completed as gas well or as oil well and was so classified.

D   =   total number of days in proration period.

r_1 = Average producing GOR for oil area during preceding
          twelve-month period. (Determined by dividing total
          cubic feet of casinghead gas produced by total
          barrels of oil produced.)

r_2 = Solution GOR for the oil area at P_{res}. (r_2
          determined from Solution GOR Tabulation in Special
          Rule 13(C).)

T_{sc} = Temperature at standard conditions equals 60° F
          or 520° R.

T_{res} = Initial bottomhole temperature 111° F or 571° R.

P_{res} = Average reservoir pressure based on most recent
          bottomhole pressure survey as provided in Special
          Rule 28.

P_{sc} = Pressure at standard conditions. (15.025 psia.)

Z = Deviation factor for gas at P_{res} and at 111° F.
          (Z factor determined from gas Deviation Factor
          Tabulation in Special Rule 13(c).)

B_o = Oil reservoir factor at P_{res}. (B_o determined
          from Oil Reservoir Volume Factor Tabulation in
          Special Rule 13(C).)

"(2). (a) The volumetric equivalent of gas for the gas
area determined in (1) above shall be compared with the actual
production from the gas area.

"(b) If the actual production from the gas area
exceeds such volumetric equivalent plus any permitted production
remaining as determined in (c) below, then the nominations and
purchases by gas purchasers during the succeeding twelve-month
period shall be adjusted by the Commission so that the volumetric
withdrawals from the gas area shall be restricted for the purpose
of balancing the cumulative equivalent volumetric withdrawals
from each area.

"(c) If the actual production from the gas area is
less than the volumetric equivalent for the gas area then no
adjustments will be made but the difference between the volumes
will be carried forward as permitted production of gas from the
gas area in subsequent balancing periods.

"(C). The following values of r_2, Solution Gas-Oil Ratio, Z,
Gas Deviation Factor, and B_o, Oil Reservoir Volume Factor, for

the various values of P_{res}, Average Reservoir Pressure, shall be used in computing the volumetric equivalent of gas per Special Rule 13(B):

P_{res} Average Reservoir Pressure, Psia	r_2 Solution GOR Ft^3/Bbl.	Z Gas Deviation Factor	B_o Oil Reservoir Volume Factor
1200	392	.855	1.199
1100	372	.859	1.191
1000	350	.865	1.183
900	329	.876	1.175
800	306	.884	1.166
700	283	.898	1.157
600	260	.907	1.148
500	234	.919	1.138
400	208	.927	1.127
300	180	.946	1.116
200	147	.960	1.020
100	116	.974	1.089 "

(3) That Rule 13 of the Special Rules and Regulations governing the Todd-San Andres Pool, Roosevelt County, New Mexico, promulgated by Order No. R-1670-G, is hereby amended to read in its entirety as follows:

"RULE 13. (A). The date 7:00 a.m. January 1 of each year shall be known as the balancing date, and the twelve-months following this date shall be known as the gas proration period."

"(B) (1) The top 80-acre unit allowable for oil wells shall be determined each month by multiplying the Southeast New Mexico Normal Unit Allowable by the 80-acre proportional (depth) factor for said pool (2.00). The final allowable for the gas area of said pool shall be determined each twelve-months for the preceding twelve-month period in accordance with the following formula:

$$V = \left[Q \times \left(\frac{A + \Delta A}{a + \Delta a} \right) \right] \left[(r_1 - r_2) + \left(\frac{T_{sc}}{T_{res}} \times \frac{P_{res}}{P_{sc}} \times \frac{1}{Z} \times B_o \times 5.61 \frac{ft^3}{bbl} \right) \right.$$

where:

V   = the gas allowable for the gas area for the preceding twelve-month period and is equal to the volumetric gas equivalent of all production from the oil area during the preceding twelve-month period expressed in cubic feet rounded off to the nearest MCF.

Q = total oil production from the oil area during the preceding twelve-month period, barrels.

$(A + \Delta A)$ = total acres dedicated to gas wells during preceding twelve-month period.

$(a + \Delta a)$ = total acres dedicated to oil wells during preceding twelve-month period.

(Note: "A" and "a" represent acreage dedicated to gas wells and to oil wells respectively for the entire twelve-month period. ΔA and Δa represent acreage so dedicated for only a portion of the twelve-month period. In the event a well is completed or reclassified during a twelve-month period ΔA and/or Δa shall be computed as follows:

$$\Delta A = A \left(\frac{d}{D} \right) \qquad \qquad \Delta a = a \left(\frac{d}{D} \right)$$

where:

ΔA or Δa = acreage to be added to gas or oil area, respectively.

A or a = acreage dedicated to the well.

d = number of days during proration period during which well was completed as gas well or as oil well and was so classified.

D = total number of days in proration period.

r_1 = Average producing GOR for oil area during preceding twelve-month period. (Determined by dividing total cubic feet of casinghead gas produced by total barrels of oil produced.)

r_2 = Solution GOR for the oil area at P_{res}. (r_2 determined from Solution GOR Tabulation in Special Rule 13(C).)

T_{sc} = Temperature at standard conditions = 60° F or 520° R.

T_{res} = Initial bottom-hole temperature 125° F or 585° R.

P_{res} = Average reservoir pressure based on most recent bottom-hole pressure survey as provided in Special Rule 28.

P_{sc} = Pressure at standard conditions. (15.025 psia.)

Z = Deviation factor for gas at P_{res} and at 125° F. (Z factor determined from gas Deviation Factor Tabulation in Special Rule 13(C).)

B_O = Oil reservoir factor at P_{res}. (B_O determined from Oil Reservoir Volume Factor Tabulation in Special Rule 13(C).)"

"(2) (a) The volumetric equivalent of gas for the gas area determined in (1) above shall be compared with the actual production from the gas area."

"(b) If the actual production from the gas area exceeds such volumetric equivalent plus any permitted production remaining as determined in (c) below, then the nominations and purchases by gas purchasers during the succeeding twelve-month period shall be adjusted by the Commission so that the volumetric withdrawals from the gas area shall be restricted for the purpose of balancing the cumulative equivalent volumetric withdrawals from each area."

"(c) If the actual production from the gas area is less than the volumetric equivalent for the gas area then no adjustments will be made but the difference between the volumes will be carried forward as permitted production of gas from the gas area in subsequent balancing periods."

"(C) The following values of r_2, Solution Gas-Oil Ratio, Z, Gas Deviation Factor, and B_O, Oil Reservoir Volume Factor, for the various values of P_{res}, Average Reservoir Pressure, shall be used in computing the volumetric equivalent of gas per Special Rule 13(B):

P_{res} Average Reservoir Pressure, Psia	r_2 Solution GOR Ft^3/Bbl.	Z Gas Deviation Factor	B_O Oil Reservoir Volume Factor
1680	275	0.841	1.160
1600	265	0.844	1.155
1500	253	0.850	1.149
1400	241	0.856	1.142
1300	229	0.863	1.136
1200	217	0.871	1.129
1100	205	0.880	1.122
1000	193	0.889	1.116
900	181	0.899	1.109
800	169	0.909	1.103
700	157	0.919	1.097
600	145	0.930	1.089
500	133	0.942	1.081
400	119	0.953	1.076
300	101	0.965	1.070
200	79	0.976	1.058
100	51	0.988	1.040	"

(4)   That Special Rule 13 of the Special Rules and Regulations governing the Devils Fork-Gallup Pool, Rio Arriba County, New Mexico, promulgated by Order No. R-1670-B, is hereby amended to read in its entirety as follows:

"RULE 13.   The date 7:00 a.m. January 1 of each year shall be known as the balancing date, and the twelve months following this date shall be known as the gas proration period.

"SPECIAL RULE 13(a) (1)   The top 80-acre unit allowable for oil wells in the Devils Fork-Gallup Pool shall be determined each month by multiplying the Northwest New Mexico Normal Unit Allowable by the 80-acre proportional (depth) factor for said pool (2.33).   The final allowable for the gas area of said pool shall be determined each twelve-months for the preceding twelve-months period in accordance with the following formula:

(a)

$$V = \left[Q \times \left(\frac{A + \Delta A}{a + \Delta a} \right) \right] \left[(r_1 - r_2) + \left(\frac{T_{sc}}{T_{res}} \times \frac{P_{res}}{P_{sc}} \times \frac{1}{z} \times B_o \times 5.61 \frac{ft^3}{bbl} \right) \right]$$

where:

V   = the gas allowable for the gas area for the preceding twelve months period and is equal to the volumetric gas equivalent of all production from the oil area during the preceding twelve months period expressed in cubic feet rounded off to the nearest MCF.

Q   = total oil production from the oil area during the preceding twelve months period, barrels.

$(A + \Delta A)$ = total acres dedicated to gas wells during preceding twelve months period.

$(a + \Delta a)$ = total acres dedicated to oil wells during preceding twelve months period.

(Note: "A" or "a" represent acreage dedicated to gas wells and to oil wells respectively for the entire twelve months period. ΔA and Δa represent acreage so dedicated for only a portion of the twelve months period.   In the event a well is completed or reclassified during a twelve months period ΔA and/or Δa shall be computed as follows:

$$\Delta A = A \left(\frac{d}{D} \right) \qquad\qquad \Delta a = a \left(\frac{d}{D} \right)$$

where:

ΔA or Δa = acreage to be added to gas or oil area, respectively.

A or a = acreage dedicated to the well.

d = number of days during proration period during which well was completed as gas well or as oil well and was so classified.

D = total number of days in proration period.

r_1 = average producing GOR for oil area during preceding twelve months period. (Determined by dividing total cubic feet of casinghead gas produced by total barrels of oil produced.)

r_2 = Solution GOR for the oil area at P_{res}. (r_2 determined from Solution GOR Tabulation in Special Rule 13(b).)

T_{sc} = Temperature at standard conditions = 60° F or 520° R.

T_{res} = Initial bottom-hole temperature, assumed to remain constant at 147° F or 607° R.

P_{res} = Average reservoir pressure based on most recent bottom-hole pressure survey as provided in Special Rule 28.

P_{sc} = Pressure at standard conditions = 15.025 psia.

Z = Deviation factor for gas at P_{res} and at 147° F. (Z factor determined from gas Deviation Factor Tabulation in Special Rule 13(b).)

B_O = Oil reservoir factor at P_{res}. (B_O determined from Oil Reservoir Volume Factor Tabulation in Special Rule 13(b).)

Substituting known constant values in Formula (a) above,

$$V = \left[Q \left(\frac{A + \Delta A}{a + \Delta a} \right) \right] \left[(r_1 - r_2) + \left(\frac{520}{607} \times \frac{P_{res}}{15.025} \times \frac{1}{Z} \times B_O \times 5.61 \frac{ft^3}{bbl} \right) \right]$$

$$V = \left[Q \left(\frac{A + \Delta A}{a + \Delta a} \right) \right] \left[(r_1 - r_2) + \left(\frac{0.32 \times P_{res} \times B_O}{Z} \right) \right]$$

"(2) The volumetric equivalent of gas for the gas area determined in (1) above shall be compared with the actual production from the gas area.

"(a) If the actual production from the gas area exceeds such volumetric equivalent plus any permitted production remaining as determined by (b) below, then the nominations and purchases by gas purchasers during the succeeding twelve month period shall be adjusted by the Commission so that the volumetric withdrawals from the gas area shall be restricted for the purpose of balancing the cumulative equivalent volumetric withdrawals from each area.

"(b) If the actual production from the gas area is less than the volumetric equivalent for the gas area then no adjustments will be made but the difference between the volumes will be carried forward as permitted production of gas from the gas area in subsequent balancing periods.

"SPECIAL RULE 13 (b). The following values of r_2, Solution Gas-Oil Ratio, Z, Gas Deviation Factor, and B_o, Oil Reservoir Volume Factor, for the various values of P_{res}, Average Reservoir Pressure, shall be used in computing the volumetric equivalent of gas per Special Rule 13(a):

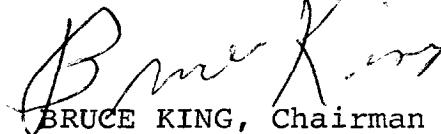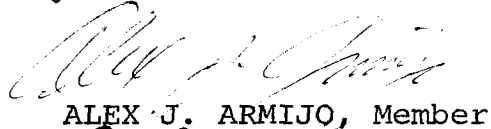| P_{res} Average Reservoir Pressure	r_2 Solution GOR ft^3/bbl.	Z Gas Deviation Factor	B_o Oil Reservoir Volume Factor
2000	935	.785	1.434
1900	890	.789	1.424
1800	850	.795	1.414
1700	805	.801	1.404
1600	765	.806	1.393
1500	725	.814	1.382
1400	685	.823	1.371
1300	647	.832	1.360
1200	610	.842	1.347
1100	570	.853	1.335
1000	535	.864	1.322
900	498	.876	1.309
800	463	.889	1.295
700	429	.902	1.280
600	396	.915	1.262
500	365	.927	1.245
400	335	.941	1.227
300	300	.954	1.208
200	255	.968	1.190
100	195	.982	1.160

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    (5)   That the period from February 1, 1972, to December 31, 1972, shall be considered as one proration period for the above-described pools located in Northwest New Mexico; and that the period from January 1, 1972, to December 31, 1972, shall be considered as one proration period for the above-described pools located in Southeast New Mexico.

    (6)   That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

    DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

BRUCE KING, Chairman

ALEX J. ARMIJO, Member

A. L. PORTER, Jr., Member & Secretary

S E A L

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