

County Eddy

Pool Nash Draw-Delaware/Bone Spring (Avalon Sand)

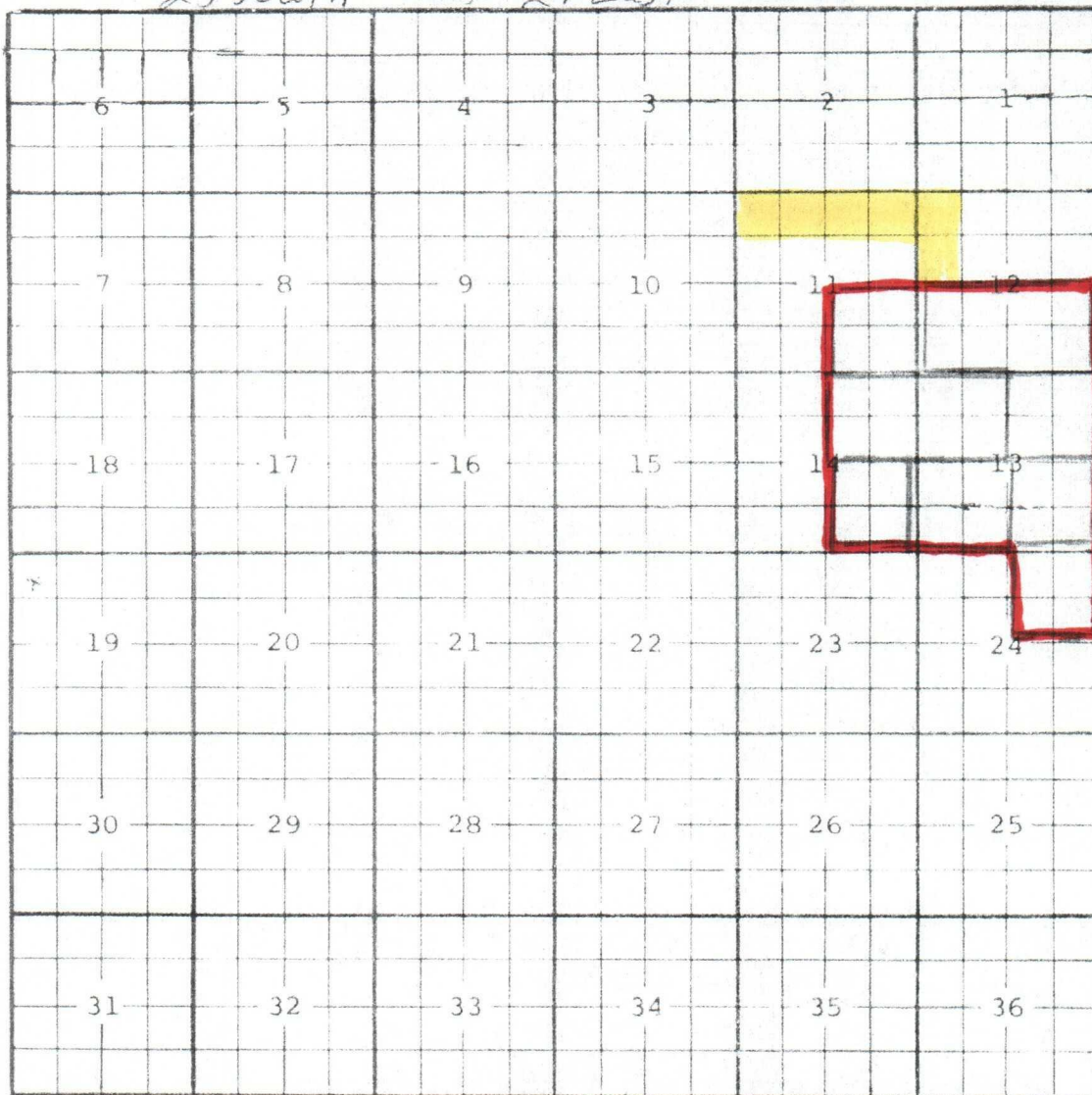
TOWNSHIP

23 South

Range

29 East

NMPM



Description: NE 1/4 Sec. 13 (R-9771, 11-19-92)

Ext: SE 1/2 Sec. 12 (R-9938-A, 11-23-93) Ext: SE 1/4 Sec. 13 (R-10042, 12-28-93)

Ext: NE 1/4 Sec. 24 (R-10343, 4-24-95) Ext: NW 1/4 Sec. 13, NE 1/4 Sec. 14 (R-10420, 7-17-95)

Ext: SE 1/4 Sec. 14 (R-10664, 9-16-96) Ext: SW 1/4 Sec. 13 (R-11005, 7-24-98)

Extend vertical limits to include all of Delaware Mountain Group from top of Lamar formation to base of Brushy Canyon formation and redesignate as Nash Draw-Delaware Pool (R-11534, 2-8-01) Ext: SE 1/4 Sec. 11 (R-11729, 2-22-02)

Extend vertical limits to include top of the Lamar of the Delaware Mountain Group and continue to the base of the Avalon sands in the Upper Bone Spring formation and redesignate the pool as the Nash Draw-Delaware/Bone Spring (Avalon Sand) Pool (R-12507, 2-13-06)

County EddyPool Nash Draw-Delaware/Bone Spring (Avalon Sand)

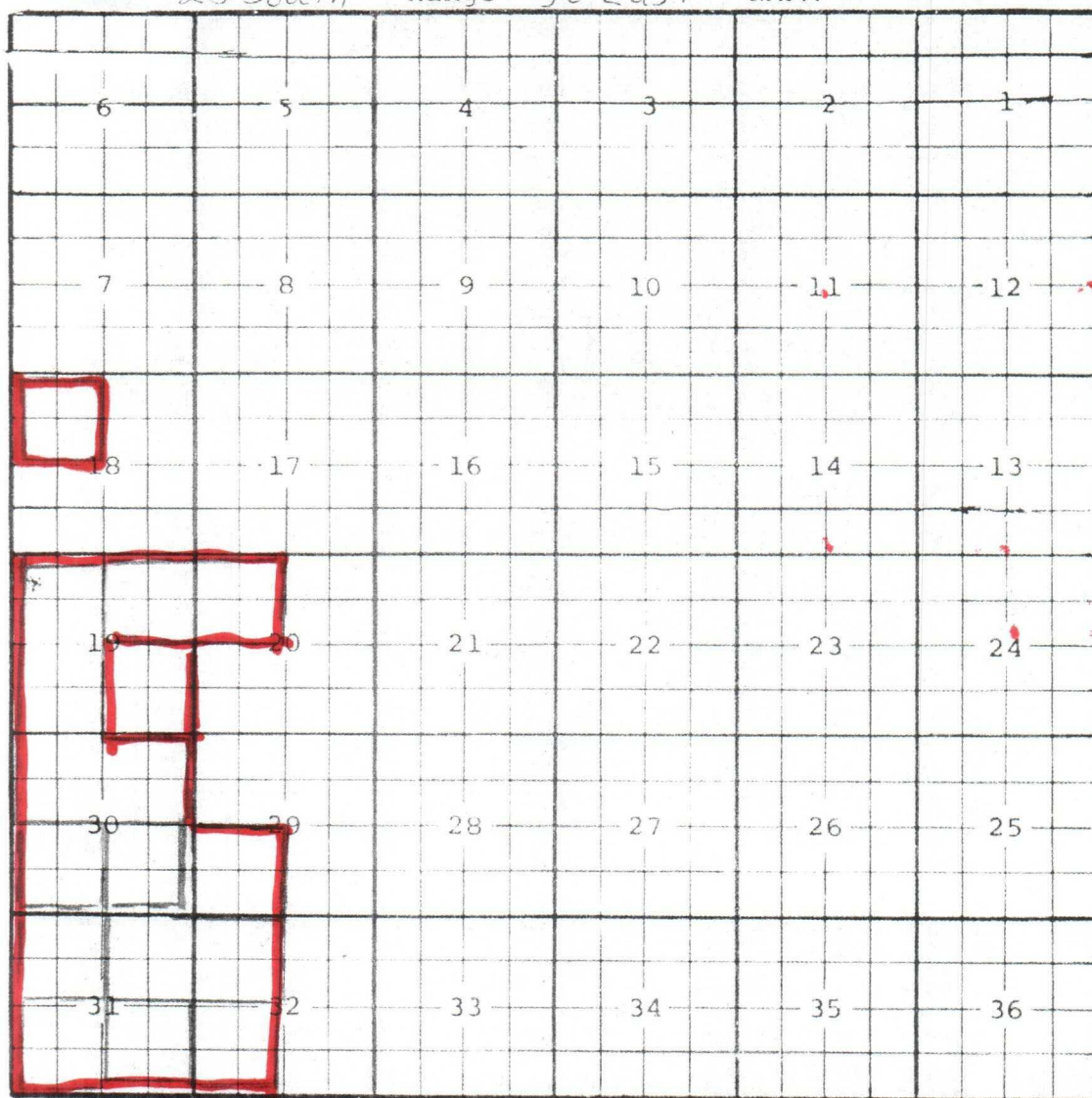
TOWNSHIP

23 South

Range

30 East

NMPM

Ext: $\text{NW}\frac{1}{4}$ Sec. 18 (R-10042, 12-28-93) Ext: $\text{W}\frac{1}{2}$ Sec. 19, $\text{N}\frac{1}{2}$ Sec. 30 (R-10459, 9-11-95)Ext: $\text{SW}\frac{1}{4}$ Sec. 30 (R-10590, 5-8-96) Ext: $\text{SE}\frac{1}{4}$ Sec. 30 (R-10642, 8-19-96)Ext: $\text{NE}\frac{1}{4}$ 31, $\text{NW}\frac{1}{4}$ Sec. 32 (R-10335, 1-9-98)Ext: $\text{NE}\frac{1}{4}$ Sec. 19, $\text{NW}\frac{1}{4}$ Sec. 20 (R-11005, 7-24-98) Ext: $\text{SE}\frac{1}{4}$ Sec. 31 (R-11359, 4-12-00)

Extend vertical limits to include all of Delaware Mountain Group from top of Lamar formation to base of Brushy Canyon formation and redesignate as Nash Draw-Delaware Pool

(R-11534, 2-8-01) Ext: $\text{SW}\frac{1}{4}$ Sec. 32 (R-11583, 5-7-01) Ext: $\text{NW}\frac{1}{4}$ Sec. 31 (R-11678, 10-23-01)Ext: $\text{SW}\frac{1}{4}$ Sec. 31 (R-11729, 8-22-02) Ext: $\text{SE}\frac{1}{4}$ Sec. 19 (R-12257, 1-8-05)Ext: $\text{SW}\frac{1}{4}$ Sec. 29 (R-12447, 10-27-05)

Extend vertical limits to include the top of the Lamar of the Delaware Mountain Group and continue to the base of the Avalon sands in the Upper Bone Spring formation and redesignate the pool as the Nash Draw-Delaware/Bone Spring (Avalon Sand) Pool (R-12507, 2-13-06)

County Eddy

Pool Nash Draw-Delaware/Bone
Spring(Avalon Sand)

TOWNSHIP 24 South, RANGE 29 East, NEW MEXICO PRINCIPAL MERIDIAN

6	8	4	3	2	1
7	9	9	10	11	12
13	17	18	13	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Ext. ^{NE} 1/4 Sec. 36 (R-12548, 5-8-06)

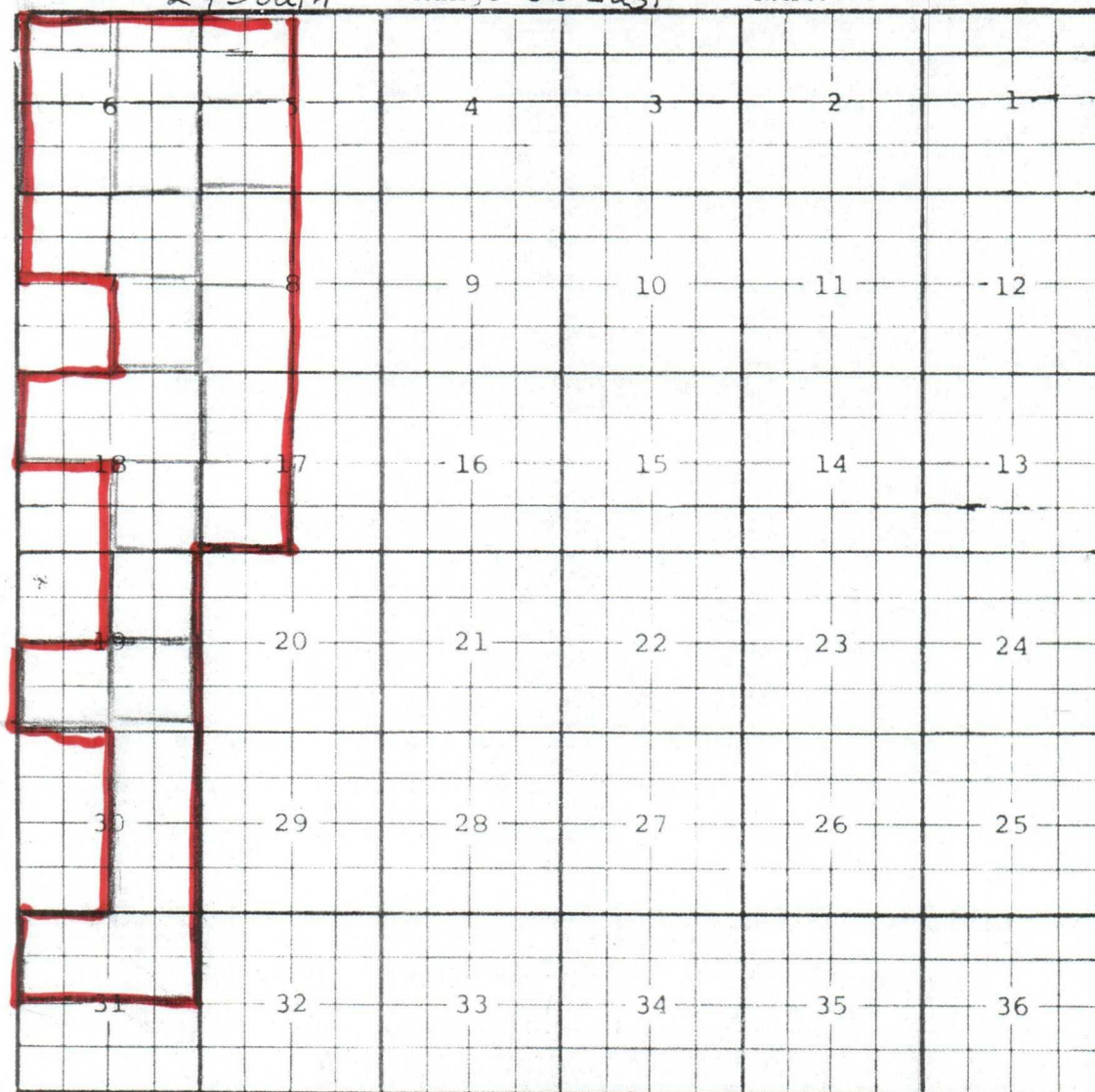
County Eddy

Pool Nash Draw-Delaware/Bone Spring/Avalon Sand

TOWNSHIP 24 South

Range 30 East

NMPM



Ext: NW 1/4 Sec. 5, 1/2 Sec. 6 (R-11678, 10-23-01) Ext: NE 1/4 Sec. 7 (R-11908, 2-12-03)

Ext: NW 1/4 Sec. 7 (R-11963, 5-18-03) Ext: SW 1/4 Sec. 5, SE 1/4 Sec. 7 (R-12003, 8-11-03)

Ext: SW 1/4 Sec. 8, NW 1/4 Sec. 17 (R-12083, 1-14-04) Ext: N 1/2 Sec. 18 (R-12153, 6-7-05)

Ext: NW 1/4 Sec. 8 (R-12222, 10-25-04) Ext: SE 1/4 Sec. 18 (R-12298, 2-22-05)

Ext: NE 1/4 Sec. 19 (R-12420, 10-6-05) Ext: SE 1/4 Sec. 19 (R-12448, 10-27-05)

Extend vertical limits to include the top of the Lamar of the Delaware Mountain Group and continue to the base of the Avalon Sands in the Upper Bone Spring formation and redesignate the pool as the Nash Draw-Delaware/Bone Spring (Avalon Sand) Pool (R-12507, 2-13-06) Ext: W 1/2 Sec. 6, SW 1/4 Sec. 17, SW 1/4 Sec. 19, E 1/2 Sec. 30, N 1/2 Sec. 31 (R-12530, 3-30-06)

NASH UNIT AREA

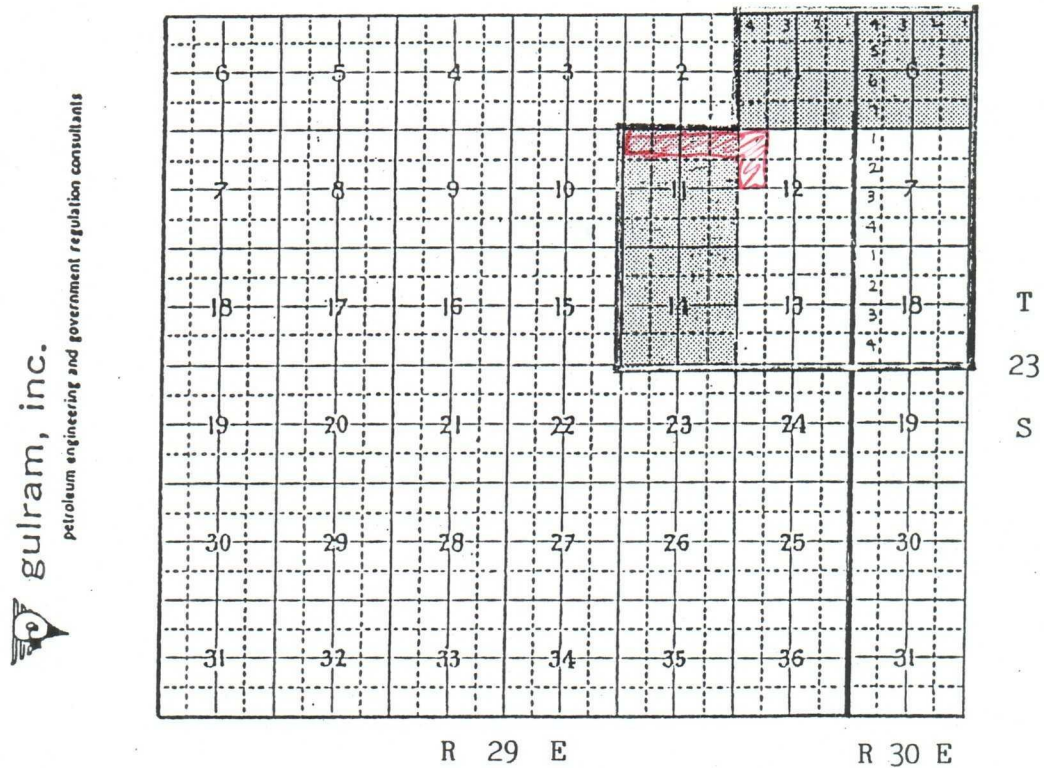
No. 14-08-0001-14168

APPROVED: July 25, 1974

EFFECTIVE: July 25, 1974

EXPLORATORY

Eddy County, New Mexico



Federal Lands	4,842.40 acres
State Lands	240.46 acres
Fee Lands	<u>40.00</u> acres
Total	5,122.86 acres

- Lands subject to Automatic Elimination January 25, 1985
(not officially approved)

Remaining Unit Land - Federal	2,320.86 acres
State	<u>240.46</u> acres
Total	2,561.32 acres

Unit Name: Nash

Contract Number: 14-08-0001-14168

Automatic Elimination Date: January 25, 1985 (not approved officially)

Operator: Mesa Petroleum Company

PARTICIPATING AREAS (PA)

Name: Initial Delaware (Cherry Canyon)

Well Name: Nash Unit No. 4

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 13, T. 23 S., R. 29 E.

Legal PA Description: NE $\frac{1}{4}$ Sec. 13, T. 23 S., R. 29 E.

Effective Date: June 22, 1976

PA Total Acres: 160.00



Unit Name: Nash

Contract Number: 14-08-0001-14168

Automatic Elimination Date: January 25, 1985 (not approved officially)

Operator: Mesa Petroleum Company

PARTICIPATING AREAS (PA)

Name: Initial Atoka

Well Name: Nash Unit No. 2

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 18, T. 23 S., R. 30 E.

Legal PA Description: Lots 1,2,3,4,E $\frac{1}{2}$ W $\frac{1}{2}$, E $\frac{1}{2}$ Sec. 18, T. 23 S., R. 30 E.

Effective Date: April 21, 1976

PA Total Acres: 640.84

Name: 1st Revision Atoka

Well Name: Nash Unit No. 3

Location: NE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 12, T. 23 S., R. 29 E.

Legal PA Description: All Sec. 12, All Sec. 13, T. 23 S., R. 29 E., Lots 1,2,3,4,
E $\frac{1}{2}$ W $\frac{1}{2}$, E $\frac{1}{2}$ Sec. 7, T. 23 S., R. 30 E. - 1920.48 acres

Effective Date: October 1, 1976

PA Total Acres: 2,561.32



Unit Name: Nash

Contract Number: 14-08-0001-14168

Automatic Elimination Date: January 25, 1985 (not approved officially)

Operator: Mesa Petroleum Company

PARTICIPATING AREAS (PA)

Name: Initial Morrow

Well Name: Nash Unit No. 1

Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 13, T. 23 S., R. 29 E.

Legal PA Description: All Sec. 13, T. 23 S., R. 29 E., Lots 1,2,3,4, E $\frac{1}{2}$ W $\frac{1}{2}$,
E $\frac{1}{2}$ Sec. 18, T. 23 S., R. 30 E.

Effective Date: January 22, 1975

PA Total Acres: 1,280.84

Name: 1st Revision Morrow

Well Name: Nash Unit No. 7

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 7, T. 23 S., R. 30 E.

Legal PA Description: Lots 1,2,3,4, E $\frac{1}{2}$ W $\frac{1}{2}$, E $\frac{1}{2}$ Sec. 7, T. 23 S., R. 30 E. -
640.48 acres

Effective Date: July 1, 1980

PA Total Acres: 1,921.32



BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 5231
Order No. R-4794

APPLICATION OF MESA PETROLEUM COMPANY
FOR APPROVAL OF THE NASH UNIT AGREE-
MENT, EDDY COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on May 8, 1974,
at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 28th day of May, 1974, 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 the applicant, Mesa Petroleum Company, seeks
approval of the Nash Unit Agreement covering 5,123.57 acres,
more or less, of State, Federal, and Fee lands described as
follows:

EDDY COUNTY, NEW MEXICO
TOWNSHIP 23 SOUTH, RANGE 29 EAST, NMPM
Sections 1, 11, 12, 13, and 14: All

TOWNSHIP 23 SOUTH, RANGE 30 EAST, NMPM
Sections 6, 7, and 18: All

(3) That approval of the proposed unit agreement should
promote the prevention of waste and the protection of correla-
tive rights within the unit area.

IT IS THEREFORE ORDERED:

(1) That the Nash Unit Agreement is hereby approved.

(2) That the plan contained in said unit agreement for
the development and operation of the unit area is hereby approved
in principle as a proper conservation measure; provided, however,
that notwithstanding any of the provisions contained in said

unit agreement, this approval shall not be considered as waiving or relinquishing, in any manner, any right, duty, or obligation which is now, or may hereafter be, vested in the Commission to supervise and control operations for the exploration and development of any lands committed to the unit and production of oil or gas therefrom.

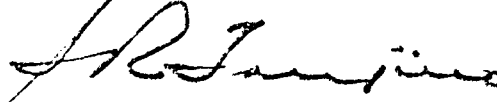
(3) That the unit operator shall file with the Commission an executed original or executed counterpart of the unit agreement within 30 days after the effective date thereof; that in the event of subsequent joinder by any party or expansion or contraction of the unit area, the unit operator shall file with the Commission within 30 days thereafter counterparts of the unit agreement reflecting the subscription of those interests having joined or ratified.

(4) That this order shall become effective upon the approval of said unit agreement by the Commissioner of Public Lands for the State of New Mexico and the Director of the United States Geological Survey; that this order shall terminate ipso facto upon the termination of said unit agreement; and that the last unit operator shall notify the Commission immediately in writing of such termination.

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

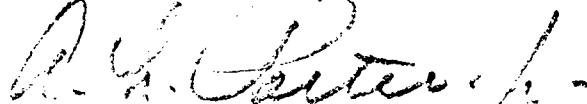
DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION



I. R. TRUJILLO, Chairman

ALEX J. ARMIJO, Member



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

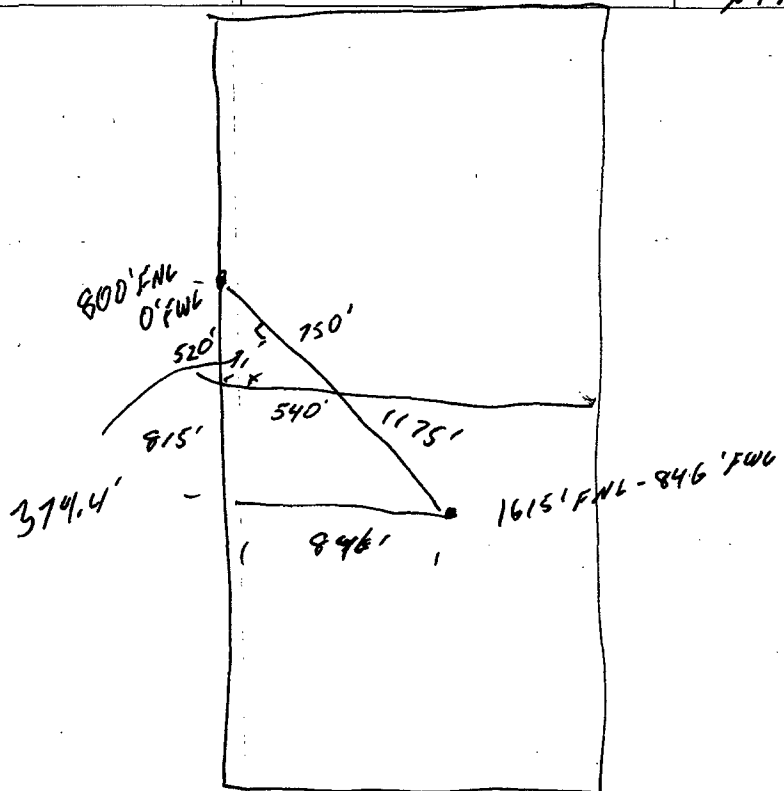
S E A L

jr/

Chapman

7-19-06

PTASO-615D58446



$$520^2 + x^2 = (1175 \times .6380)^2$$

$$270400 + x^2 = 561975$$

$$x^2 = 291575$$

$$x = 540$$

$$520^2 + 540^2 =$$

$$270400 + 291575 = 750'$$

- the closest point to the looking line of the Project Area will be northeast from the corner of the far SW corner of Unit 10

$$hc = 46$$

$$h(750) = 520(540)$$

$$L = 374.4'$$

13-782 500 SHEETS FILLER 5 SQUARE
42-381 50 SHEETS EYE-EASE 5 SQUARE
42-382 100 SHEETS EYE-EASE 5 SQUARE
42-383 100 SHEETS EYE-EASE 5 SQUARE
42-384 100 SHEETS EYE-EASE 5 SQUARE
42-385 100 SHEETS EYE-EASE 5 SQUARE
42-386 100 SHEETS EYE-EASE 5 SQUARE
42-387 100 SHEETS EYE-EASE 5 SQUARE
42-388 100 SHEETS EYE-EASE 5 SQUARE
42-389 100 SHEETS EYE-EASE 5 SQUARE
42-390 200 RECYCLED WHITE 5 SQUARE
Made in U.S.A.



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. 10935
ORDER NO. R-10096*

**APPLICATION OF STRATA PRODUCTION COMPANY FOR SPECIAL POOL
RULES, EDDY COUNTY, NEW MEXICO.**

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on March 17, 1994, at Santa Fe, New Mexico, before Examiner Jim Morrow.

Now, on this 11th day of April, 1994, 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, Strata Production Company (Strata), seeks an order promulgating special rules and regulations for the Nash Draw-Brushy Canyon Pool, including a provision for a gas-oil ratio limitation of 10,000 cubic feet of gas per barrel of oil. Said pool is located in portions of Township 23 South, Ranges 29 and 30 East, NMPM, Eddy County, New Mexico.
- (3) The Nash Draw-Brushy Canyon Pool was created by Division Order No. R-9771 on December 1, 1992 and currently includes the S/2 of Section 12 and the E/2 of Section 13, Township 23 South, Range 29 East, and the NW/4 of Section 18, Township 23 South, Range 30 East, NMPM, Eddy County, New Mexico. The pool is currently governed by General Statewide Rules and Regulations including an oil allowable of 142 barrels per day, a gas-oil ratio (GOR) of 2000, and a daily gas limit of 284 MCF.
- (4) There are currently nine wells producing from the Nash Draw-Brushy Canyon Pool. All are in the 8 Section Nash Unit, which is operated by Strata.

(5) The applicant presented cross sections and structure and isopach maps to depict the Delaware producing formations in the pool. The evidence shows that the main producing interval in the Nash Draw-Brushy Canyon Pool is similar to that in the East Loving-Brushy Canyon Pool which is located 7 miles west of the Nash Draw-Brushy Canyon Pool. The East Loving-Brushy Canyon Pool is developed with 110 wells, has recovered over 4 million barrels of oil, and is currently producing with a GOR limit of 8,000.

(6) Geologic evidence and well test information also shows that producing GORs are not related to structure. Wells lower on the structure produce at slightly lower ratios than those wells located higher structurally. Applicant's witnesses concluded that this indicates there is no gas cap in the pool.

(7) Engineering evidence was presented to show that the initial producing GOR in the Nash Draw-Brushy Canyon Pool was approximately 1000. The current average GOR is 4,000 with some individual wells as high as 8,000. Bubble point pressure in the pool is 2463 psia, and current reservoir pressure is 2963 psia.

(8) Evidence was also submitted to show that water cut has decreased from a high of 58% to the present rate of 40%.

(9) The applicant presented the results of a study of all the Delaware wells completed in Southeast New Mexico between 1986 and 1990. From this study a typical decline curve for Delaware wells was developed. It indicates that typically, Delaware wells decline at 50% the first year, 25% the next two years, and 12% thereafter. The typical decline curve was applied to the East Loving-Brushy Canyon Pool and other Delaware pools in the area with a good match, and was used to predict future performance for the Nash Draw-Brushy Canyon Pool.

(10) The applicant's engineering witness testified that the increasing GOR, declining water cut, and well test information which shows that GORs are not related to structure, proves that the Nash Draw-Brushy Canyon Pool is a typical solution gas drive reservoir, with ultimate recovery not related to producing rates.

(11) The applicant submitted economic data for the Nash Draw-Brushy Canyon Pool comparing reserves, projected life, operating expense, and cash flow for 2000 to 1 and 10,000 to 1 GOR limits. For the same ultimate recovery, economics were greatly improved with the 10,000 to 1 limit.

(12) Based on the applicant's evidence, a GOR limit of 8000 (daily gas limit of 1136 MCF per well per day) should be established rather than the 10,000 to 1 limit requested. As requested by the applicant, the increased GOR limit should be temporary, subject to review in 18 months.

IT IS THEREFORE ORDERED THAT:

(1) Temporary Special Rules for said Nash Draw-Brushy Canyon Pool are hereby promulgated as follows:

**SPECIAL RULES AND REGULATIONS
FOR THE
NASH DRAW-BRUSHY CANYON POOL**

RULE 1. Each well completed or recompleted in the Nash Draw-Brushy Canyon Pool or in the Brushy Canyon formation within one mile thereof, and not nearer to or within the limits of another designated Brushy Canyon Pool, shall be produced in accordance with the Special Rules herein set forth.

RULE 2. The limiting gas/oil ratio for said Nash Draw-Brushy Canyon Pool shall be 8,000 cubic feet of gas per barrel of oil produced; each proration unit in said pool shall produce only that volume of gas equivalent to 8,000 multiplied by the top oil allowable for the proration unit (top allowable remains at 142 barrels of oil per day for a 40-acre proration unit).

IT IS FURTHER ORDERED THAT:

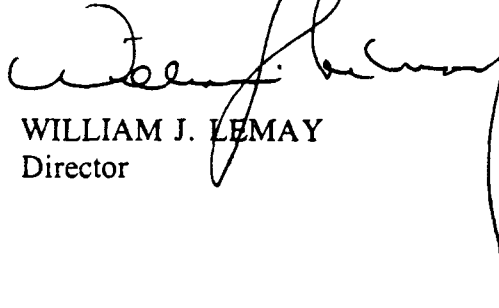
(2) The above temporary rules shall be reviewed at a hearing called by the Oil Conservation Division on its own motion on or about November 1, 1995.

(3) Jurisdiction of this cause is retained for entry of such further orders as the Division may deem necessary.

Case No. 10935
Order No. R-10096
Page 4

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

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

A handwritten signature in dark ink, appearing to read 'William J. Lemay', is written over the printed name and title. The signature is fluid and cursive, with a long vertical stroke extending downwards from the end of the name.

WILLIAM J. LEMAY
Director

S E A L

**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. 10935 (Reopened)
Order No. R-10096-A**

**IN THE MATTER OF CASE NO. 10935 BEING
REOPENED PURSUANT TO THE PROVISIONS OF
DIVISION ORDER NO. R-10096, WHICH
ORDER PROMULGATED SPECIAL RULES AND
REGULATIONS FOR THE NASH DRAW-BRUSHY
CANYON POOL IN EDDY COUNTY, NEW MEXICO.**

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on November 16, 1995, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 1st day of December, 1995, 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) By Order No. R-10096 entered in Case No. 10935 on April 11, 1994, the Division, upon application of Strata Production Company, established a limiting gas-oil ratio of 8,000 cubic feet of gas per barrel of oil for the Nash Draw-Brushy Canyon Pool, Eddy County, New Mexico.

(3) The aforesaid limiting gas-oil ratio for the Nash Draw-Brushy Canyon Pool was established for a temporary period of eighteen months.

(4) Pursuant to the requirements of Order No. R-10096, this case was reopened to allow the operators in the subject pool to appear and present evidence and testimony as to whether the limiting gas-oil ratio for the Nash Draw-Brushy Canyon Pool should remain at 8,000:1 or revert back to the statewide gas-oil ratio limitation of 2,000:1.

(5) Strata Production Company, one of two current operators in the pool, appeared and presented evidence and testimony to support its request that the Temporary Special Rules and Regulations for the Nash Draw-Brushy Canyon Pool be made permanent.

(6) The Nash Draw-Brushy Canyon Pool currently comprises the following described area in Eddy County, New Mexico:

TOWNSHIP 23 SOUTH. RANGE 29 EAST. NMPM

Section 12: S/2
Section 13: N/2, SE/4
Section 14: NE/4
Section 24: NE/4

TOWNSHIP 23 SOUTH. RANGE 30 EAST. NMPM

Section 18: NW/4
Section 19: W/2
Section 30: N/2

(7) There are fifteen wells currently producing from the Nash Draw-Brushy Canyon Pool.

(8) Thirteen of the fifteen producing wells in the pool are located within Strata Production Company's Nash Unit, a federal exploratory unit.

(9) The engineering evidence and testimony presented by Strata Production Company in this case indicates that:

- a) the main producing intervals within the Nash Draw-Brushy Canyon Pool are the "K" and "L" sand intervals located within the Basal Brushy Canyon member. The "K" and "L" sand intervals contain numerous separate producing "reservoirs";

- b) the Nash Draw-Brushy Canyon Pool is produced from the same Basal Brushy Canyon member and exhibits the same producing characteristics as the East Loving-Delaware Pool which is located approximately six miles to the west in Township 23 South, Range 28 East. The East Loving-Delaware Pool is currently governed by Special Rules and Regulations including a limiting gas-oil ratio of 8,000 cubic feet of gas per barrel of oil;
- c) the Nash Draw-Brushy Canyon Pool is a solution gas-drive reservoir which has no gas cap and no water drive;
- d) the subject reservoir does not appear to be rate sensitive; and,
- e) continued production at a gas-oil ratio limitation of 8,000 cubic feet of gas per barrel of oil should not decrease ultimate oil recovery from the pool.

(10) BK Petroleum, the only other operator in the pool, did not appear at the hearing either in support of or in opposition to the continuation of the current limiting gas-oil ratio.

(11) The evidence and testimony presented by Strata Production Company in this case indicates that continued production at a gas-oil ratio limitation of 8,000 cubic feet of gas per barrel of oil should not decrease ultimate oil recovery and should otherwise not be detrimental to the reservoir.

(12) The Temporary Special Rules and Regulations for the Nash Draw-Brushy Canyon Pool should be made permanent.

IT IS THEREFORE ORDERED THAT:

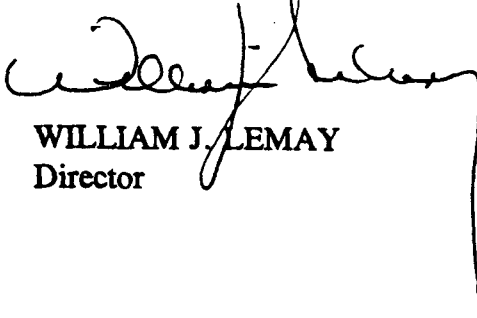
(1) The Temporary Special Rules and Regulations for the Nash Draw-Brushy Canyon Pool, including the provision for a limiting gas-oil ratio of 8,000 cubic feet of gas per barrel of oil, as promulgated by Division Order No. R-10096, are hereby continued in full force and effect until further order of the Division.

(2) Jurisdiction is hereby retained for the entry of such further orders as the Division may deem necessary.

CASE NO. 10935 (Reopened)
Order No. R-10096-A
Page -4-

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

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

A handwritten signature in dark ink, appearing to read 'William J. Lemay', is written over the printed name and title.

WILLIAM J. LEMAY
Director

S E A L