

**STATE OF NEW MEXICO  
DEPARTMENT OF ENERGY, MINERALS AND NATURAL RESOURCES  
OIL CONSERVATION DIVISION**

**APPLICATION OF APACHE CORPORATION AND COG OPERATING LLC TO AMEND ORDER NO. R-13382-E ESTABLISHING TEMPORARY SPECIAL POOL RULES AND REGULATIONS FOR THE ARTESIA-GLORIETA-YESO POOL, BEAR GRASS DRAW-GLORIETA-YESO POOL, CEDAR LAKE-GLORIETA-YESO POOL, EMPIRE-GLORIETA-YESO POOL, EAST EMPIRE-GLORIETA-YESO POOL, FREN-GLORIETA-YESO POOL, EAST FREN-GLORIETA-YESO POOL, GRAYBURG JACKSON-YESO POOL, NORTH LEAMEX-PADDOCK POOL, LOCO HILLS-GLORIETA-YESO POOL, AND WEST MALJAMAR-YESO POOL, LEA AND EDDY COUNTIES, NEW MEXICO, AND TO MAKE THE AMENDED RULES PERMANENT.**

**CASE NO. 14613 (RE-OPENED)  
ORDER NO. R-13382-I**

**ORDER OF THE DIVISION**

**BY THE DIVISION:**

This case came on for hearing on September 18, 2014, at Santa Fe, New Mexico, before Examiner Richard I. Ezeanyim.

NOW, on this 20<sup>th</sup> day of October, 2014, the Division Director, having considered the testimony, the record and the recommendations of the Examiner,

**FINDS THAT:**

(1) Due public notice has been given, and the Division has jurisdiction of this case and of the subject matter.

(2) By Order No. R-13382-E issued in Case Nos. 14613 and 14647 on September 8, 2011, the Division promulgated Temporary Special Pool Rules for twelve (12) Glorieta Yeso Pools.

(3) Pursuant to Ordering Paragraph (11) of Order No. R-13382-E, Apache Corporation ("Apache") and COG Operating, LLC ("COG"), (collectively called "Applicants"), applied to the Division in August, 2014, to amend this Order to increase the Depth Bracket allowable from 300 to 600 barrels of oil per day per 40-acre oil spacing and proration unit, and also to make the Temporary Special Pool Rules permanent.

(4) The horizontal boundaries of the pools with the Temporary Special Pool Rules are described below:

- a. Artesia-Glorieta-Yeso Pool (**Pool Code 96830**) was created by Division Order No. R-11244, dated October 1, 1999, and currently covers the following lands:

**Township 17 South, Range 28 East, NMPM**

Section 25: S/2  
Section 26: S/2  
Section 27: S/2  
Section 28: All  
Section 29: S/2, NW/4  
Section 32: N/2  
Section 33: All  
Section 34: NW/4  
Section 35: W/2, NE/4  
Section 36: NW/4

**Township 18 South, Range 28 East, NMPM**

Section 4: NW/4  
Section 5: N/2  
Section 6: W/2, NE/4

- b. Bear Grass Draw-Glorieta-Yeso Pool (**Pool Code 97534**) was created by Division Order No. R-12619, dated September 1, 2006, and currently covers the following lands:

**Township 17 South, Range 29 East, NMPM**

Section 27: E/2, E/2 W/2, W/2 NW/4

- c. Cedar Lake-Glorieta-Yeso Pool (**Pool Code 96831**) was created by Division Order No. R-11067, dated November 1, 1998, and currently covers the following lands:

**Township 17 South, Range 30 East, NMPM**

Section 13: E/2, SW/4  
Section 24: NE/4

**Township 17 South, Range 31 East, NMPM**

Section 17: S/2  
Section 18: All  
Section 19: N/2  
Section 20: All

- d. Empire-Glorieta-Yeso Pool (**Pool Code 96210**) was created by Division Order No. R-10124, dated June 1, 1994, and currently covers the following lands:

**Township 17 South, Range 28 East, NMPM**

Section 23: E/2  
Section 24: S/2

**Township 17 South, Range 29 East, NMPM**

Section 18: S/2  
Section 19: All  
Section 30: All

- e. East Empire-Glorieta-Yeso Pool (**Pool Code 96610**) was created by Division Order No. R-10724, dated January 1, 1997, and currently covers the following lands:

**Township 17 South, Range 29 East, NMPM**

Section 17: SE/4  
Section 20: All  
Section 29: All

- f. Fren-Glorieta-Yeso Pool (**Pool Code 26770**) was created by Division Order No. R-2313, dated October 1, 1962, and currently covers the following lands:

**Township 17 South, Range 31 East, NMPM**

Section 9: E/2  
Section 14: SW/4  
Section 15: S/2  
Section 16: S/2, NE/4  
Section 21: NE/4, W/2  
Section 22: NW/4

- g. East Fren-Glorieta-Yeso Pool (**Pool Code 97213**) was created by Division Order No. R-11824, dated September 1, 2002, and currently covers the following lands:

**Township 17 South, Range 31 East, NMPM**

Section 14: NE/4

- h. Grayburg Jackson-Yeso Pool (**Pool Code 28509**) was created by Division Order No. R-12256, dated January 3, 2005, and currently covers the following lands:

**Township 17 South, Range 29 East, NMPM**

Section 10: E/2, E/2 W/2  
Section 11: All  
Section 14: All  
Section 15: E/2

Section 22: SE/4, SE/4 SW/4, E/2 NE/4, SW/4 NE/4

- i. North Leamex-Paddock Pool (**Pool Code 97549**) was created by Order No. R-12646, dated October 1, 2006, and currently covers the following lands:

**Township 17 South, Range 33 East, NMPM**

Section 3: N/2, SW/4  
Section 4: S/2

- j. Loco Hills-Glorieta-Yeso Pool (**Pool Code 96718**) was created by Order No. R-10822, dated July 1, 1997, and currently covers the following lands:

**Township 17 South, Range 30 East, NMPM**

Section 9: SE/4  
Section 10: SW/4  
Section 11: All  
Section 12: NW/4  
Section 14: S/2, NW/4  
Sections 15-17, 20: All  
Section 21: N/2, SE/4  
Section 22: All  
Section 23: N/2, SW/4

- k. West Maljamar-Yeso Pool (**Pool Code 44500**) was created by Order No. R-27, dated July 28, 1950, and currently covers the following lands:

**Township 17 South, Range 32 East, NMPM**

Section 17: S/2  
Section 19: All  
Section 20: N/2, SW/4  
Section 21: All  
Section 22: W/2, NE/4

- l. North Maljamar-Paddock Pool (Pool Code 97647) was created by Order No. R-12899, dated January 30, 2008, and currently covers the following lands:

**Township 17 South, Range 32 East, NMPM**

Section 5: SW/4

**Division Order No. R-13382-E created the Mar Loco-Glorieta-Yeso Pool which contained five pools including the North Maljamar-Paddock Pool. Division Order No. R-13382-H dissolved the Mar Loco-Glorieta-Yeso Pool and redesignated**

**all the previous pools including the North Maljamar-Paddock Pool. Accordingly, the North Maljamar- Paddock Pool should be included in this application.**

The Applicants appeared at the hearing through counsels and presented the following testimony:

(5) The Depth Bracket allowable was increased in Order No. R-13382-E from 187 to 300 barrels of oil per day per 40-acre oil spacing and proration unit. The current 300 barrels of oil per day is still not sufficient because operators in the pools are exceeding this Depth Bracket allowable.

(6) Apache Corporation and COG Operating, LLC seek to amend this order to increase the Depth Bracket allowable from 300 to 600 barrels of oil per day for a 40-acre oil spacing and proration unit. and to make this amendment permanent.

(7) Notice of this application was provided to all the operators in the listed pools and within one (1) mile from the horizontal boundaries of these pools.

(8) There are approximately forty-eight (48) operators within the listed pools. Most of them wrote to the Division requesting that the application of Apache Corporation and COG Operating, LLC be approved. No operator within and outside the horizontal boundaries of these pools appeared at the hearing to oppose the granting of this application.

(9) In Order No. R-13382-E, the Division correctly analyzed and characterized the Glorieta-Yeso Pools in this area of the Yeso Shelf, and accordingly approved the application of COG Operating, LLC in Case No. 14613 which increased the allowable from 187 to 300 barrels of oil per day for a 40-acre oil spacing and proration unit.

(10) Apache Corporation, COG Operating, LLC, and other operators in these pools are currently developing 160-acre oil spacing and proration units or project areas with up to four (4) horizontal wells in order to effectively and efficiently drain this very tight reservoir. With such horizontal well configuration, the 300 barrels of oil per day or 1,200 barrels of oil per day for the 160-acre oil spacing and proration units or project areas are easily being exceeded.

(11) The operators in these Yeso pools are using super-pads or multi-pads to enable them to develop two, three, or four landing zones in the Yeso formation to maximize hydrocarbon recovery, and minimize environmental and surface impact.

(12) The Yeso formation is characterized by low permeability, low porosity and high heterogeneity across the formation. The oil and gas lenses are stratigraphic and highly compartmentalized within the reservoir. Aggressive horizontal well development is necessary in order to drain this tight and heterogeneous reservoir.

(13) The granting of Apache Corporation and COG Operating, LLC application is in the best interest of conservation, the prevention of waste, and the protection of correlative rights.

**THE DIVISION CONCLUDES AS FOLLOWS:**

(14) The vertical limit of these pools is established as from the top of the Glorieta formation, as found at a drilled depth of 4,519 feet in the EOG Resources Inc. Oak Lake 11 Federal Well No. 1 (API No. 30-015-31111, currently renamed the Gissler A Well No. 29)) located 1070 feet from the South line and 860 feet from the East line, Unit P, of Section 11, Township 17 South, Range 30 East, Eddy County, New Mexico, as shown on the Baker-Hughes Induction Electric Log of this well, to the top of the Abo formation or base of the Yeso formation, found at the drilled depth of 6,674 feet as shown on the same electric log.

(15) The Yeso formation in this area includes the Paddock, Blinebry, Tubb and the Drinkard members. The Yeso formation consists of several pools covering at least three townships and six ranges in Eddy and Lea Counties, New Mexico. Oil production occurs mostly in the Paddock and the Blinebry members within these pools.

(16) The Yeso reservoir is characterized by very low porosity and low permeability with high degree of heterogeneity. It is thick, stratigraphic, lenticular and highly compartmentalized. The lower permeability in this reservoir decelerates recovery and protracts depletion.

(17) The reservoir produces by solution gas drive or dissolved gas drive mechanism. There is no primary or pre-existing gas cap; further, upon depletion, there is no secondary or developed gas cap. As a result, there is no segregation or gravity drainage in this reservoir. In this type of solution gas drive or dissolved gas drive reservoir, the available predominant energy is the expansion of the solution gas, probably aided initially by connate water expansion or pore volume contraction. Without gravity drainage, typical primary recovery range by solution gas drive mechanism of this type is between ten (10%) to twenty-five (25%) percent of the original oil in place (OOIP) by pressure depletion.

(18) The reservoir pressure is very close to or at the bubble point pressure in the area covered by these pools. The solution gas drive mechanism applies once the pressure falls below the bubble point pressure

(19) In these low permeability solution gas drive reservoirs without gravity drainage, high production rate does not affect ultimate recovery. High production rate does not damage or harm the reservoir. On the other hand, lower production rates will result in lower ultimate recoveries. At lower production rate, gas migrates rapidly out of solution resulting in rapid dissipation of reservoir energy.

(20) Since rate of withdrawal or rate of oil production in this type of solution gas drive reservoir does not harm or damage the reservoir, it is then very beneficial to employ production schemes or practices that will recover more oil than gas. At lower production rates, the producing gas-oil ratio rises much more rapidly.

(21) This reservoir is heterogeneous and tight, with very low permeability, low porosity and produces essentially by solution gas drive mechanism. These reservoir characteristics indicate that the reservoir will not be damaged or harmed by high production rates. Correlative rights will be protected by the setback requirements. Under these circumstances, it is advantageous to produce as much liquid hydrocarbons as possible from this tight reservoir before and after the bubble point pressure of the reservoir is reached. The wells in these pools should be allowed to produce at their **Maximum Efficient Rate (MER)** in order to effectively and efficiently produce the reserves in these pools.

(22) The application of Apache Corporation and COG Operating, LLC should be approved in order to prevent waste and protect correlative rights.

**IT IS THEREFORE ORDERED THAT:**

(1) The application of Apache Corporation ("Apache"), and COG Operating, LLC ("COG") (collectively called the Applicants), requesting amendment to Division Order No. R-13382-E to increase the Depth Bracket allowable from 300 to 600 barrels of oil per day per 40-acre oil spacing and proration unit is hereby approved.

(2) The request to make the Temporary Special Pool Rules permanent and to cancel any overproduction is also approved.

(3) All past overproduction by all the operators in these pools is hereby cancelled up to the effective date of this order, since most of the operators overproduced from these pools in one form or the other.

(4) The following **Permanent** Special Pool Rules are promulgated for the Glorieta-Yeso Pools with the horizontal boundaries described in Finding Paragraph 4 (a) through (l)

**PERMANENT SPECIAL POOL RULES**  
**FOR**  
**THE GLORIETA-YESO OIL POOLS LISTED BELOW:**

**Artesia-Glorieta-Yeso Pool (96830)**

**Bear Grass Draw-Glorieta-Yeso Pool (97534)**

**Empire-Glorieta-Yeso Pool (96210)**

**East Empire-Glorieta-Yeso Pool (96610)**

**Grayburg Jackson-Yeso Pool (28509)**

**North Leamex-Paddock Pool (97549)**

**West Maljamar-Yeso Pool (44500)**

**Cedar Lake-Glorieta-Yeso Pool (96831)**

**Fren-Glorieta-Yeso Pool (26770)**

**East Fren-Glorieta-Yeso Pool (97213)**

**Loco Hills-Glorieta-Yeso Pool (96718)**

**North Maljamar-Paddock Pool (97647)**

**Rule 1:** Any well completed in the Glorieta-Yeso formations within the horizontal boundaries of these Glorieta-Yeso oil pools, or within one mile of the outer boundaries of said pools, and not within, or closer to, another Glorieta- Yeso Pool, shall be governed by these special rules.

**Rule 2:** The allowable for the Glorieta-Yeso production from units dedicated to wells in the pools shall be 600 barrels of oil per day, per standard 40- acre spacing and proration unit. The gas-oil ratio (GOR) in these Pools shall remain at 3,000 standard cubic feet of gas per barrel of oil produced.

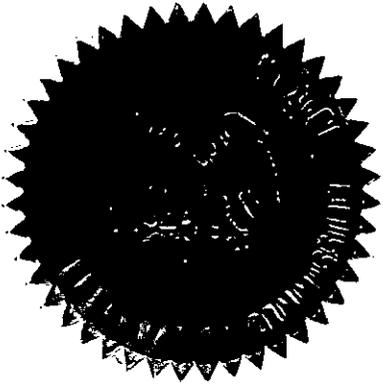
**Rule 3:** In all other respects, the wells in these Glorieta-Yeso Pools shall remain subject to the statewide rules.

(5) These permanent Special Pool Rules shall be effective retroactively from September 1, 2014.

(6) All other provisions of Order No. R-13382-E shall remain in full force and effect.

(7) Jurisdiction of this case 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.



SEAL

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

JAMI BAILEY  
Director