



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL AND GAS DOCKET NO. 08-0296650

THE APPLICATION OF APACHE CORPORATION AND DEVON ENERGY PRODUCTION CO., LP, TO CONSOLIDATE THE KEYSTONE (CLEAR FORK), KEYSTONE (HOLT), AND KEYSTONE (TUBB) FIELDS INTO THE KEYSTONE (CONSOLIDATED) FIELD, AND TO ADOPT FIELD RULES FOR THE KEYSTONE (CONSOLIDATED) FIELD, WINKLER COUNTY, TEXAS

HEARD BY: Paul Dubois – Technical Examiner
Ryan Larson – Director

HEARING DATE: June 30, 2015

CONFERENCE DATE: August 25, 2015

APPEARANCES: REPRESENTING:

Brian Sullivan
Michael Paluso
Erin DeBooy
Elizabeth Culp
Ryan Taylor
Christine Smith
Mark Henkhaus
Charles Willie

Apache Corporation and Devon Energy Production Co., LP

EXAMINERS' REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

This matter is the joint application of Apache Corporation (Apache) and Devon Energy Production Co., LP (Devon)(collectively, the Applicants) to consolidate the Keystone (Holt), Keystone (Clear Fork), and Keystone (Tubb) Fields into a new field named the Keystone (Consolidated) Field (ID No. 49129 150) and to adopt field rules for the new field. A letter from BOPCO, L. P., a large operator in the field was received expressing full support of the application.

Two potential notice issues were identified at the hearing. First, the hearing notice dated May 29, 2015 incorrectly stated the top of the proposed correlative interval as 5,119

feet; the correct interval top is 4,750 feet. Second, the proposed stacked lateral field rule provision identified a lateral path width of 660 feet; the correct width requested by the Applicants was 300 feet. To remedy potential defects associated with these two issues, the Examiners issued a letter to all operators in the three fields, notifying them of the discrepancies and offering a 15-day period in which to protest the changes. No protests were received.

The Examiners recommend the Keystone (Holt), Keystone (Clear Fork), and Keystone (Tubb) Fields be consolidated into the new Keystone (Consolidated) Field (ID No. 49129 150) and field rules be adopted as requested by the Applicants.

DISCUSSION OF EVIDENCE

The proposed correlative interval for the new Keystone (Consolidated) Field is in the depth interval from 4,750 feet to 6,714 feet as indicated on the dual laterolog of the Chevron USA (now Devon) W. E. Baird 18-44 well (API No. 42-495-31050) located at 990 feet from the north line and 990 feet from the east line of Section 18, Block B-3, Abstract 1321, PSL Survey, Winkler County, Texas. The interval includes the Holt, Glorieta, Clear Fork, and Tubb Formations, and a part of the underlying Wichita Albany Formation. All of these formations were deposited in Permian time as shallow water limestone strata on the Central Basin Platform. Most of these sediments were subject to diagenesis and converted to dolomite, enhancing formation porosity and reservoir quality. Each of these formations contains hydrocarbon producible intervals established in existing Commission-designated fields:

- The Keystone (Holt) Field was discovered on September 8, 1942, at a depth of 4,800 feet. The field has produced more than 50 million barrels of oil. Special operating rules were established in Special Order No. 8-6533 on August 1, 1944. The field rules were most recently amended on July 7, 1975 (Order No. 8-65,147). Current field rules provide for 330-foot lease line spacing, 660-foot between well spacing, 40-acre standard units and 20-acre optional units. There are currently about 59 producing oil wells in the field.
- The Keystone (Clear Fork) Field was discovered on July 31, 1958, at a depth of 5,739 feet. The field has produced more than 6.5 million barrels of oil. Special operating rules were established in Special Order No. 8-41,932 effective October 26, 1959. The field rules were most recently amended on August 1, 1987 (Order No. 8-87,886). Current field rules provide for 550-foot lease line spacing, 1,100-foot between well spacing, and 40-acre standard units. There are currently about 34 producing oil wells in the field.
- The Keystone (Tubb) Field was discovered on September 26, 1985, at a depth of 6,250 feet. The field has produced 999 barrels of oil. The field is on statewide rules, and there are currently no wells in the field.

Structurally, the field area contains two structural highs, both of which have four way closure. Each of these structural highs is developed with well clusters. In addition, off the eastern flank of the northern structure there is a stratigraphically-controlled development of producing wells. The average porosity in the consolidated field is estimated to be about 12 percent, and permeability ranges between 0.7 and 9.2 millidarcies. The average water saturation is about 47 percent. The current gas-oil ratio is about 4,300:1 standard cubic feet per barrel, with historical ratios as high as 7,000:1. The water cut is about 90 percent. Water injection has occurred since at least the 1990s, with about 2,800 barrels of water injected daily. The cumulative voidage replacement ratio is about 0.6, and the recent instantaneous voidage replacement ratio is about 1.0. Most of the current development is recovering new oil from infill drilling, but secondary oil from the water injection is also being recovered.

Apache conducted a microseismic study to evaluate the fracture stimulation effects on wells in the field. This study indicated the primary stimulated fracture orientation was 78° east of north. The average fracture height was about 105 feet, and the average fracture length was about 475 feet.

The Applicants estimate an initial oil in place of 423.24 barrels per acre-foot, which corresponds to about 3.9 million barrels per 40-acre unit, or about 1 million barrels per 10-acre unit. Apache conducted a study demonstrating no production interference between wells on 10-acre spacing. Further, Apache has applied for at least 15 drilling permits requiring exceptions to Statewide Rules 37 and 38 for smaller unit sizes and closer spacing. Recently, Apache's Seth Campbell Lease (No. 13866) Well No. 82, drilled on a 10-acre unit, reported an initial potential test of 539 barrels of oil in a 24-hour test. Apache estimates 20-acre units will yield an ultimate recovery of 6 percent of original oil in place, but that 10-acre units will yield an ultimate recovery of 12 percent of original oil in place.

The Applicants request 330-foot lease line well spacing and no minimum between well spacing requirement. For horizontal wells, the Applicants request dual lease line spacing provisions allowing 100-foot spacing for the first and last take points, and 330-foot spacing for all take points when measured perpendicular from the lateral to the nearest lease line. This request is consistent with the microseismic study results and drainage area calculations.

FINDINGS OF FACT

1. Notice of this hearing was given to all parties entitled to notice at least ten days prior to the date of hearing and no protests were received.
2. The Keystone (Holt) Field was discovered on September 8, 1942, at a depth of 4,800 feet. The field has produced more than 50 million barrels of oil. Current field rules provide for 330-foot lease line spacing, 660-foot between well spacing, 40-acre standard units and 20-acre optional units. There are

currently about 59 producing oil wells in the field.

3. The Keystone (Clear Fork) Field was discovered on July 31, 1958, at a depth of 5,739 feet. The field has produced more than 6.5 million barrels of oil. Current field rules provide for 550-foot lease line spacing, 1,100-foot between well spacing, and 40-acre standard units. There are currently about 34 producing oil wells in the field.
4. The Keystone (Tubb) Field was discovered on September 26, 1985, at a depth of 6,250 feet. The field has produced 999 barrels of oil. The field is on statewide rules, and there are currently no wells in the field.
5. The proposed correlative interval for the new Keystone (Consolidated) Field is the depth interval from 4,750 feet to 6,714 feet as indicated on the dual laterolog of the Chevron USA (now Devon) W. E. Baird 18-44 well (API No. 42-495-31050) located at 990 feet from the north line and 990 feet from the east line of Section 18, Block B-3, Abstract 1321, PSL Survey, Winkler County, Texas. The interval includes the Holt, Glorieta, Clear Fork, and Tubb Formations, and a part of the underlying Wichita Albany Formation.
 - a. The average porosity in the consolidated filed is estimated to be about 12 percent, and permeability ranges between 0.7 and 9.2 millidarcies.
 - b. The average water saturation is about 47 percent.
 - c. The current gas-oil ratio is about 4,300:1 standard cubic feet per barrel, with historical ratios as high as 7,000:1.
 - d. The water cut is about 90 percent, and water injection has occurred since at least the 1990s.
6. The primary stimulated fracture orientation is 78° east of north. The average fracture height was about 105 feet, and the average fracture length was about 475 feet.
7. The initial oil in place is estimated to be 423.24 barrels per acre-foot.
8. 20-acre units will yield an estimated ultimate recovery of 6 percent of oil in place, and 10-acre units will yield an estimated ultimate recovery of 12 percent of original oil in place.

CONCLUSIONS OF LAW

1. Resolution of the subject application is a matter committed to the jurisdiction of the Railroad Commission of Texas. Tex. Nat. Res. Code § 81.051

2. All notice requirements have been satisfied. 16 Tex. Admin. Code § 1.45
3. Consolidation of the Keystone (Holt), Keystone (Clear Fork), and Keystone (Tubb) Fields into the Keystone (Consolidated) Field and adopting field rules for the Keystone (Consolidated) Field will prevent waste, protect correlative rights, and promote the orderly development of the field.

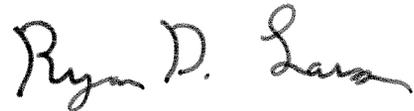
RECOMMENDATION

Based on the above findings of fact and conclusions of law, the Examiners recommend the Commission enter an order granting the application of Apache Corporation and Devon Energy Production Co., LP to consolidate the Keystone (Holt), Keystone (Clear Fork), and Keystone (Tubb) Fields into a new field named the Keystone (Consolidated) Field (ID No. 49129 150) and to adopt field rules for the new field.

Respectfully submitted,



Paul Dubois
Technical Examiner



Ryan Larson
Director