



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL AND GAS DOCKET NO. 10-0286972

THE APPLICATION OF APACHE CORPORATION TO ADOPT FIELD RULES FOR THE
PAINT RIDGE (CANYON GRANITE WASH) FIELD OLDHAM COUNTY, TEXAS

HEARD BY: Karl Caldwell - Technical Examiner
Laura Miles-Valdez - Legal Examiner

HEARING DATE: February 25, 2014

APPEARANCES: REPRESENTING:

APPLICANT:

Jim Clark
Bill Spencer

Apache Corporation

EXAMINERS' REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

The current Field Rules for the Paint Ridge (Canyon Granite Wash) Field, Oldham County, Texas were adopted in Final Order No. 10-0283059, dated September 24, 2013. The current Field Rules in effect for the field are summarized as follows:

1. Designation of the field as the correlative interval from 9,186 feet to 9,600 feet as shown on the log of the Apache Corporation's, Bivins LIT AC Lease Well No. 1155;
2. Well spacing of 467'-1200';
3. 80 acre oil units, 40 acre tolerance. No individual proration plats required;
4. The maximum daily oil allowable for a well in the field shall be determined by multiplying the MER Allowable of 1,700 barrels of oil per day by a fraction, the numerator of which is the acreage assigned to the well for proration purposes and the denominator which is the maximum acreage authorized by

these rules for a vertical well for proration purposes, exclusive of tolerance acreage

Apache Corporation ("Apache") requests that the Field Rules be amended to include provisions for drilling and completing horizontal drainholes in the field by introducing rules for first and last take points, offsite penetration points, no perf zone provisions, and a 50 foot box rule. Apache also requests to change the proration units from 80 acres to 160 acres.

The application is unopposed and the examiners recommend that the Field Rules be amended for the Paint Ridge (Canyon Granite Wash) Field, Oldham County, Texas as requested by Apache.

DISCUSSION OF THE EVIDENCE

The Paint Ridge (Canyon Granite Wash) Field, Oldham County, Texas was discovered in March, 2010 at an average depth of 9,175 feet. Field Rules were adopted in Final Order No. 10-0283059, dated September 24, 2013. There are currently three operators in the field, and cumulative production to December 2013 is 2,733 MBO and 3,389 MMCF gas.

There is a specific area of the Paint Ridge (Canyon Granite Wash) Field where Apache has been focusing development and have drilled 25 wells on 2809 productive acres, with a well density of 112 acres per well. Apache had planned to develop this field on 80 acre density as per the current field rules, but this core area has shown that development on 112 acre density is causing between well pressure interference. This observed pressure interference has caused Apache to re-evaluate their parameters for determining pay zones in the wells.

The need for larger drilling units is supported by drainage radius calculations for three wells: the Boy's Ranch Well Nos. 116-1 and 116-10, and the Bivins-Lit AC Well No. 401. The Boy's Ranch Well No. 116-1 had an estimated drainage area of 153 acres. This calculation was based on an average porosity of 8.8%, water saturation of 50.9%, net pay thickness of 124.25 feet and a recovery factor of 6.8%. The estimated ultimate recovery for the Boys Ranch Well No. 116-1 is 288 MBO. The Boys Ranch Well No. 116-10 had an estimated drainage area of 159 acres. This calculation was based on an average porosity of 10.4%, water saturation of 48.5%, net pay thickness of 110.5 feet and a recovery factor of 6.8%. The estimated ultimate recovery for the Boys Ranch Well No. 116-10 is 334 MBO. The Bivins-Lit AC Well No. 401 had an estimated drainage area of 144 acres. This calculation was based on an average porosity of 8.9%, water saturation of 52.3%, net pay thickness of 56 feet and a recovery factor of 6.8%. The estimated ultimate recovery for the Bivins-Lit AC Well No. 401 is 120 MBO.

The Boys Ranch No. 116-3 well was drilled in February 2013 and encountered a virgin reservoir pressure of 3350 psi when drilled. The Boys Ranch No. 116-10, located

to the northeast of the Boys Ranch 116-3 well, was drilled in June 2013 and encountered an initial reservoir pressure of 2184 psi (normalized to a sub-sea depth of 5700 feet), or approximately 65% of the virgin pressure of 3350 psi. The nearest well to the Boys Ranch No. 116-10 is the Boys Ranch No. 116-3, and the distance between the wells is 1277 feet. If the wells were draining radially 80 acres, they would be draining 1053 feet from their location. The Boys Ranch No. 116-10 is 1277 feet from the nearest well and encountered approximately 65% of virgin reservoir pressure when drilled, which indicates that wells in this field are draining more than 80 acres.

In examining wells in Section 115 of the field, the wells exhibited a similar trend with regard to reservoir pressure. The oldest wells in this area are the Bivens Lit 115-4 and 115-5, located in the northern area of Section 115. Both wells encountered near virgin reservoir pressure of 3350 psi, normalized to a sub-sea TVD of 5700 feet when drilled and completed, which is to be expected when wells are not in pressure communication. The Bivens Lit 115-4 was completed in August 2011, and the Bivens Lit 115-5 was completed in August 2012.

The Bivens Lit 115A was completed in May 2013, and is located north of the Bivens Lit 115-5 and southeast of the Bivens Lit 115-4. This well encountered an original reservoir pressure of 1959 psi, approximately 58% of the virgin reservoir pressure. The nearest well is the Bivens Lit 115-5, which is located 1331 feet away. Radial drainage for 80 acre density is 1053 feet in all directions from the well location, and since no wells are located closer than 1331 feet to the Bivens Lit 115A it should have encountered a virgin pressure of 3350 psi if wells in this field were draining 80 acres. Reservoir pressure data is indicating that the wells are draining greater than 80 acres.

At the present time only vertical wells have been drilled in the field. Apache plans to drill horizontal wells to develop the area of the north of the Boys Ranch No 116 Lease, and there is a need to include rules governing horizontal drainholes in the field.

Apache proposes to amend Field Rule No. 2 to include provisions for horizontal drainholes as follows:

- Provide for 200 ft. spacing from the first and last take points to the lease lines;
- Provide for no-perforation zones;
- Provide for a 50 ft. box rule; and,
- Provide for off-lease penetration points.

The proposed rule changes will encourage horizontal well development of the field by allowing the wells to access more of the reservoir, allowing the field to be developed more efficiently and effectively, increasing the recovery of hydrocarbons and reducing waste.

FINDINGS OF FACT

1. Notice of this application and hearing was provided to all persons entitled to notice at least ten (10) days prior to the date of the hearing;
2. The Paint Ridge (Canyon Granite Wash) Field was discovered in March, 2010 at an average depth of 9,175 feet;
 - a. The field operates under Field Rules that were adopted in Final Order No. 10-0283059, dated September 24, 2013;
 - b. There are currently three operators in the field;
 - c. Cumulative production to December 2013 is 2.7 million BO and 3.4 BCF gas;
3. A density rule providing for 160 acre units is appropriate for the field.
 - a. The calculated drainage area for the Apache's, Boy's Ranch Well No. 116-1, is approximately 153 acres based on 288,000 BO estimated ultimate recovery.
 - b. The calculated drainage area for the Apache's, Boy's Ranch Well No. 116-10, is approximately 159 acres based on 334,000 BO estimated ultimate recovery.
 - c. The calculated drainage area for the Apache's, Bivins-Lit AC Well No. 401, is approximately 144 acres based on 120,000 BO estimated ultimate recovery.
 - d. Pressure depletion was encountered when wells were spaced at a density of 80 acres, further indicating the wells will drain more than 80 acres.
4. Apache proposes to amend Field Rule No. 2 as follows:
 - a. Provide for 200 ft spacing from the first and last take points to the lease lines;
 - b. Provide for no-perforation zones;
 - c. Provide for a 50 ft box rule;
 - d. Provide for off-lease penetration points.

5. The proposed rule changes will further encourage horizontal well development of the field by allowing wells to contact more of the reservoir which will increase the recovery of hydrocarbons and reducing waste.

CONCLUSIONS OF LAW

1. Proper notice of this hearing was issued.
2. All things have been accomplished or have occurred to give the Commission jurisdiction in this matter.
3. Amending Field Rules for the Paint Ridge (Canyon Granite Wash) Field is necessary to prevent waste, protect correlative rights, and promote development of the field.

EXAMINERS' RECOMMENDATION

Based on the above findings of fact and conclusions of law, the examiners recommend that the Commission amend the Field Rules for the Paint Ridge (Canyon Granite Wash) Field, as requested by Apache Corporation.

Respectfully submitted,



Karl Caldwell
Technical Examiner



Laura Miles-Valdez
Legal Examiner