

THE APPLICATION OF CHESAPEAKE OPERATING, INC. FOR PERMANENT FIELD RULES WITH INCREASED GAS OIL RATIO AUTHORITY FOR THE BIG INDIAN (DORNICK HILLS) FIELD, GRAYSON COUNTY, TEXAS

Heard by: Margaret Allen, Technical Hearings Examiner

Procedural history

Application received: March 9, 2006

Hearing held: May 19, 2006

Appearances

Bill G. Spencer
Cary McGregor
Christian Combs
Aaron Peterson

Representing

Chesapeake Operating, Inc.

EXAMINER'S REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Chesapeake Operating, Inc., ("Chesapeake") is proposing the following permanent field rules for the Big Indian (Dornick Hills) Field:

1. Designated interval from 8550' to 10,670' as shown on the log of the McKinney Lease Well No. 1;
2. 330'-660' well spacing;
3. 40 acre oil proration units with 20 acre optional units;
4. allocation based 95% on potential and 5% per well; and
5. increased net gas/oil ratio with unlimited daily gas allowables.

The examiner recommends a daily gas limit of 1500 MCF per well and the application does not consider this an adverse recommendation.

DISCUSSION OF THE EVIDENCE

The Big Indian (Dornick Hills) Field was discovered in 2004 at a depth of 9373'. Its allowable has recently been reduced from a discovery allowable of 440 BO and 880 MCF per day to the yardstick

allowable of 157 BO with 314 MCF per day. There are eight wells, all operated by Chesapeake, in this field that produces from under Lake Texoma. The field is complexly faulted and these wells are completed in several different, steeply-dipping reservoirs. Their producing characteristics are surprisingly different though all are completed in Pennsylvanian sandstones. The proration schedule shows potentials ranging from 5 to 107 BOPD and reported gas/oil ratios ranging from 897 to 37,500 MCF per barrel. The wells are perforated from -8500' to as deep as -10,500', but depth of completion appears unrelated to gas/oil ratio.

The reservoir fluid is a volatile oil and liquid production may come in slugs. All of the wells are flowing oil that has gravities of 45 to 49o. API. Some wells may eventually be reclassified as gas wells though all are now oil wells. Several of the wells have become overproduced on gas allowables. Some of the reservoirs may have had very small gas caps. Cumulative production from individual wells has ranged from 10,000 BO and 129 MMCF, up to 51,000 BO and 219 MMCF.

Chesapeake analyzed two wells to determine drainage areas. The Bryan No. 2 has 44' of pay and 11.5% porosity. The estimated ultimate recovery of this well is 80,000 BO which is equivalent to a drainage area of 32.3 acres. The Bryan-Bennett Unit No. 4 has net pay of 76' and 12.5% porosity. This well's ultimate recovery is estimated at 45,000 BO which equates to a drainage area of 9.5 acres.

Two wells were step-rate tested to determine the most efficient daily gas rates. Gas test rates of 400, 600, 800 and 1000 MCFD were tried. In general, the most efficient gas/oil ratios were associated with higher daily gas rates. When the average daily gas rate of the Bryan No. 2 was reduced below 1000 MCFD, the average daily oil rate dropped below 20 BOPD, resulting in gas/oil ratios over 40,000. At lower gas rates, the oil apparently cannot be lifted efficiently in this highly deviated wellbore. The highest average daily rate tested was 1300 MCFD which resulted in a gas/oil ratio of 24,000 cubic feet per barrel.

The McKinney No. 1 was also step-rate tested. When the gas rate was reduced below 500 MCFD, the oil rate dropped to less than 15 BOPD, which resulted in gas/oil ratios over 35,000 cubic feet per barrel. The producing trends during this well's test periods were not as clear as those of the Bryan No. 2, but the highest average daily gas rate of 750 MCFD resulted in the lowest gas/oil ratio at 31,000 cubic feet per barrel.

Well spacing of 330'-660' is standard for 20 acre optional units. Because of the multiple reservoirs in the proposed correlative interval, a two-factor allocation formula is necessary. The one proposed, based 95% on capability and 5% per well, is very close to the one now in place. The proposed correlative interval, between 8550' and 10,670' as shown on the log of the McKinney No. 1, includes all of the producing sandstones in this field.

FINDINGS OF FACT

1. Notice of this hearing was given to all operators in the Big Indian (Dornick Hills) Field, on May 11, 2006.

2. The Big Indian (Dornick Hills) Field was discovered in 2004 and has eight wells all operated by Chesapeake Operating, Inc.
3. The current allowable for the Big Indian (Dornick Hills) Field is 157 BOPD with 314 MCF of gas per day.
4. Density of 40 acres with 20 acre optional units is appropriate.
 - a. The Bryan No. 2 has an estimated ultimate recovery of 80,000 BO which is equivalent to a drainage area of 32.3 acres.
 - b. The Bryan-Bennett Unit No. 4 has an ultimate recovery estimated at 45,000 BO which equates to a drainage area of 9.5 acres.
 - c. The field has already produced 228,000 BO.
5. Well spacing of 330'-660' is standard for optional 20 acre density.
6. A two-factor allocation formula is necessary due to the multiple reservoirs in this complexly faulted field.'
7. There are several producing Pennsylvanian sandstones in the proposed interval which extends from 8550' to 10,670 as shown on the log of the McKinney No. 1.
8. A daily gas limit of 1500 MCF per well may prevent waste and will not harm correlative rights.'
 - a. Two wells were step-rate tested to determine the most efficient daily gas rates.
 - b. In general, the most efficient gas/oil ratios were associated with higher daily gas rates.
 - c. When the average daily gas rate of the Bryan No. 2 was reduced below 1000 MCFD, the average daily oil rate dropped below 20 BOPD, resulting in gas/oil ratios over 40,000.
 - d. At lower gas rates, the oil apparently cannot be lifted efficiently in the highly deviated Bryan No. 2.
 - e. The highest average daily rate tested in the Bryan No. 2 was 1300 MCFD which resulted in a gas/oil ratio of 24,000 cubic feet per barrel.
 - f. When the gas rate in the McKinney No. 1 was reduced below 500 MCFD, the oil rate dropped to less than 15 BOPD, which resulted in gas/oil ratios over 35,000 cubic feet per barrel.
 - g. The highest average daily gas rate tested in the McKinney No. 1 was 750 MCFD, which resulted in the lowest gas/oil ratio at 31,000 cubic feet per barrel.

9. Cancellation of overproduction for the wells in the Big Indian (Dornick Hills) Field will not harm correlative rights as there is only one operator in the field.

CONCLUSIONS OF LAW

1. Proper notice was given as required by statute.
2. All things have been done or occurred to give the Railroad Commission jurisdiction to resolve this matter.
3. An increase in daily gas allowable for wells in the Big Indian (Dornick Hills) Field to 1500 MCF per day, while leaving the daily oil allowable at 157 barrels, will not cause waste and will protect correlative rights within the field.
4. The permanent rules proposed for the Big Indian (Dornick Hills) Field will prevent waste, protect correlative rights and promote conservation.

EXAMINER'S RECOMMENDATION

Based on the above findings and conclusions, the examiner recommends that the proposed rules be adopted in the Big Indian (Dornick Hills) Field. An daily gas limit of 1500 MCF per day per well, without restricting the daily oil allowable to less than 157 barrels, should be adopted, as per the attached order.

Respectfully submitted,

Margaret Allen
Technical Hearings Examiner