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RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL AND GAS DOCKET NO. 08-0278425

THE APPLICATION OF DEVON ENERGY PRODUCTION CO, LP TO AMEND FIELD RULES FOR THE SALLIE ANN (SPRABERRY-WOLFCAMP) FIELD, CRANE, ECTOR AND MIDLAND COUNTIES, TEXAS

✓ OIL AND GAS DOCKET NO. 08-0278426

THE APPLICATION OF DEVON ENERGY PRODUCTION CO, LP FOR BLANKET AUTHORITY TO STATEWIDE RULE 10 FOR THE SALLIE ANN (SPRABERRY-WOLFCAMP) AND VARIOUS ATOKA AND STRAWN FIELDS, CRANE, ECTOR AND MIDLAND COUNTIES, TEXAS

HEARD BY: Richard D. Atkins, P.E. - Technical Examiner
Michael Crnich - Legal Examiner

DATE OF HEARING: October 31, 2012

APPEARANCES:

REPRESENTING:

APPLICANT:

John Soule
Owen Broyles
Bernard C. Lucas, Jr.

Devon Energy Production Co, LP

OBSERVER:

Tim George

Chevron USA, Inc.

EXAMINERS' REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Field Rules for the Sallie Ann (Spraberry-Wolfcamp) Field were originally adopted in Final Order No. 08-0242896, effective July 22, 2005, as amended. The Field Rules currently in effect for the field are summarized as follows:

1. Correlative interval from 7,052 feet to 10,240 feet as shown on the log of the Henry Petroleum LP - Sallie 23 Lease, Well No. 3 (API No. 42-135-39322);
2. 660'-1,320 well spacing;
3. 160 acre oil units with optional 80 acre density;
4. Allocation based on 75% acres and 25% per well with an MER top allowable of 515 barrels of oil per day;

Devon Energy Production Co, LP ("Devon") requests that the Field Rules be amended to provide for 660'-500' well spacing with special provisions for "take points", 100' leaseline spacing for the first and last take points, a 70' "tolerance box", "off-lease" penetration point and "stacked lateral" provisions for horizontal drainhole wells. Devon proposes optional 40 acre density with special provisions for 20 acre Rule 38 exceptions after notice and that proration unit plats not be required for individual wells, but that Form P-15 be filed to designate the number of acres to be assigned to each well. Devon also requests blanket authority for exception to Statewide Rule 10 for all wells in the Sallie Ann (Spraberry-Wolfcamp) and various Atoka and Strawn Fields.

The application is unopposed and the examiners recommend that the Field Rules for the Sallie Ann (Spraberry-Wolfcamp) Field be amended and blanket authority for exception to Statewide Rule 10 for all wells be approved for the Sallie Ann (Spraberry-Wolfcamp) Field and various Atoka and Strawn Fields, as proposed by Devon.

DISCUSSION OF EVIDENCE

The Sallie Ann (Spraberry-Wolfcamp) Field was discovered in December 2004 at an average depth 7,100 feet. There are 366 producing oil wells and 11 operators carried on the proration schedule. Field Rules currently provide for 660'-1,320 well spacing and 160 acre oil units with optional 80 acre density. The top MER oil allowable is 515 BOPD with an allowable gas-oil ratio of 2,000 cubic feet per barrel. Cumulative production from the field through September 2012 is 19.1 MMBO and 31.2 BCFG.

The Sallie Ann (Spraberry-Wolfcamp) Field is located in the Midland Basin and is composed of submarine deposits of sandstones, siltstones, limestones and shales. The correlative interval is over 3,000 feet thick and includes the Clearfork, Spraberry, Dean, Wolfcamp, Cisco and Canyon formations. Though these formations are correlative across the entire area, the sand lenses are lenticular and the porosity and permeability change quickly over short distances due to formation shaliness. The quality of the sandstones are generally characterized as poor with an average porosity of less than 10% and an average permeability of less than 1.0 millidarcy. Additionally, most zones would not be economic to produce as separate completions.

Devon is proposing to drill vertical and horizontal drainhole infill wells and requests Field Rules to promote the efficient and effective development of the remaining hydrocarbons. Devon requests 660'-500' well spacing with special provisions for "take points", 100' leaseline spacing for the first and last take points, a 70' "tolerance box" and "off-lease" penetration point for horizontal drainhole wells. The proposed Field Rules are similar to the Field Rules that have been adopted in the adjacent Spraberry (Trend Area) Field.

Micro-seismic data analyzed from multiple vertical wells in the adjacent Spraberry (Trend Area) Field suggests that the micro-seismic events are located within a narrow corridor running generally east-west centered on the wellbore. The orientation of hydraulically induced transverse fractures in these low permeability formations is generally east-west. The orientation of the maximum stress appears to be uniform across the field. Horizontal wells in the field are drilled generally north-south to more effectively stimulate the rock with transverse fractures and therefore maximize recovery. The very low permeability of the formations limits the effective drainage in the north-south direction of individual stages. Consequently, the drainage in a north-south direction from the first and last take points will be minimal. The 100' leaseline spacing for the first and last take points will result in an additional recovery of reserves.

Devon also requests that a Field Rule be adopted which includes language relevant to the measurement of distances to lease lines for horizontal drainhole wells. Devon's proposed rule specifies that, for purposes of lease line spacing, the nearest "take point" in a horizontal well be used. This take-point could be a perforation in a horizontal well that is cased and cemented, an external casing packer in a cased well, or any open-hole section in an uncased well. Similar rules have been adopted in other tight reservoirs, including the Spraberry, Eagle Ford, Wolfcamp, Bone Springs, Cotton Valley and Barnett Shale formations.

Devon proposes a "tolerance box" for horizontal drainhole wells that would allow drainholes to deviate 70 feet from either side of their permitted track without the necessity of obtaining a Statewide Rule 37 exception. As drilled wells for which all points are located within the "box" would be considered in compliance with their drilling permits.

In some cases, it is beneficial to penetrate the reservoir off lease, while still having "take points" no closer to lease lines than allowed under the field rules. Devon requests that Field Rules for the subject field provide for an "off-lease" penetration point. Statewide Rule 86 requires that the penetration point of a horizontal drainhole be on the lease. In this field, a well generally requires approximately 600 feet of horizontal displacement to make the 90 degree turn from vertical to horizontal. If the penetration point is required to be on the lease, then the first point of production would be about 600 feet from the lease line. The proposed rule will allow approximately 500 feet of additional producing drainhole, which will result in the recovery of additional reserves. The Commission has adopted similar rules allowing offsite penetration points in other fields, after the operator has given

notice to the mineral owners of the off-lease tract on which the penetration point is to be located and received no protest. For purposes of the assignment of additional acreage pursuant to Statewide Rule 86, it is proposed that the distance between the first and last take-point in a horizontal drainhole well be used.

Devon proposes optional 40 acre density with special provisions for 20 acre Rule 38 exceptions after notice. From log analysis, Devon estimated an average porosity of 7.5%, an average saltwater saturation of 20%, a net pay thickness of 302 feet and a recovery factor of 11.5%. The primary drive mechanism is a solution gas drive. Devon provided drainage area calculations for over 40 vertical wells in the field. The drainage areas range from 13 acres up to a maximum of 23 acres. The average drainage area was calculated to be approximately 17 acres.

Devon also requests that a Field Rule be adopted to accommodate the drilling of stacked horizontal lateral wells. The gross thickness of the field interval is over 3,000 feet. Devon believes that several separate laterals may be necessary to effectively develop the reservoir with horizontal wells. The rule would allow stacked horizontal laterals within the correlative interval that are drilled from different surface locations to be considered a single well for regulatory purposes. It is proposed that a stacked lateral be defined to be multiple horizontal drainholes which are drilled from different surface locations.

Devon requests blanket authority for exception to Statewide Rule 10 for all wells in the Sallie Ann (Spraberry-Wolfcamp) and various Atoka and Strawn Fields. The current designated interval for the Sallie Ann (Spraberry-Wolfcamp) Field includes the Clearfork, Spraberry, Dean, Wolfcamp, Cisco and Canyon formations which extend to the top of the Strawn formation. Devon has identified Atoka and Strawn fields that lie within the boundaries of the Sallie Ann (Spraberry-Wolfcamp) Field. These fields are shown below:

<u>FIELD NO.</u>	<u>FIELD NAME</u>
04605 080	Azalea (Atoka)
04605 666	Azalea (Strawn)
11240 500	Bradford Ranch (Atoka)
11240 600	Bradford Ranch (Strawn)
23129 375	Darlin (Strawn)
25395 830	Dora Roberts (Strawn)
85448 150	STA (Atoka)

Devon submitted four Rule 10 exceptions which have been previously approved by the Commission for the Sallie Ann (Spraberry-Wolfcamp) and Darlin (Strawn) Fields now proposed for blanket authority for exception to Statewide Rule 10. Devon stated that the reservoir fluids were similar in all of the fields and any commingled completion would require artificial lift, so cross-flow between the fields is not expected. As a result of commingling two zones, Devon calculated that incremental reserves of approximately 3,000 BO will be produced due to the lower combined economic limit. This incremental

reserve amount would be attributed to every field interval that was completed in an individual well. A stand-alone completion in any Atoka or Strawn field is not economic in most cases.

Devon requests that wells which are downhole commingled in the subject fields be assigned to the Sallie Ann (Spraberry-Wolfcamp) Field for proration purposes. However, if a well is not initially completed in the Sallie Ann (Spraberry-Wolfcamp) Field, then Devon requests that the field assignment be at the operators discretion. Additionally, Devon requests that proration unit plats not be required for individual wells, but that Form P-15 be filed to designate the number of acres to be assigned to each well.

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.
2. The Sallie Ann (Spraberry-Wolfcamp) Field was discovered in December 2004 at an average depth 7,100 feet.
 - a. There are 366 producing oil wells and 11 operators carried on the proration schedule.
 - b. Field Rules currently provide for 660'-1,320 well spacing and 160 acre oil units with optional 80 acre density.
 - c. The top MER oil allowable is 515 BOPD, with an allowable gas-oil ratio of 2,000 cubic feet per barrel.
 - d. The field is actively being developed with vertical and horizontal drainhole wells.
3. Field Rules providing for 660'-500' well spacing with 100' leaseline spacing for the first and last take points in horizontal drainhole wells will provide consistency in developing the field and will allow greater flexibility in selecting future drilling locations.
 - a. Micro-seismic data analyzed from multiple vertical wells in the adjacent Spraberry (Trend Area) Field suggests that the micro-seismic events are located within a narrow corridor running generally east-west centered on the wellbore.
 - b. The orientation of hydraulically induced transverse fractures in these low permeability formations within the Sallie Ann (Spraberry-Wolfcamp) Field is generally east-west.

- c. The orientation of the maximum stress appears to be uniform across the field.
 - d. Horizontal wells in the field are drilled generally north-south to more effectively stimulate the rock with transverse fractures and therefore maximize recovery.
 - e. The very low permeability of the formations limits the effective drainage in the north-south direction of individual stages.
 - f. The 100' leaseline spacing for the first and last take points will result in an additional recovery of reserves.
4. A spacing rule which utilizes "take-points" in a horizontal well for determination of distances to lease lines will prevent waste and will not harm correlative rights.
- a. A take-point in a horizontal well in this field may be a perforation in a horizontal well that is cased and cemented, an external casing packer in a cased well, or any open-hole section in an uncased portion of the wellbore.
 - b. Adoption of the proposed rule will allow the horizontal drainhole length on a lease to be maximized.
 - c. For purposes of assignment of additional acreage pursuant to Statewide Rule 86, the distance between the first and last take-point in a horizontal well should be used.
5. The proposed 70' "tolerance box" is necessary to allow operators reasonable minor deviations from the wellbore track that has been permitted.
6. Allowing an "off-lease" penetration point will result in maximum producing drainhole length, thereby increasing ultimate recovery from horizontal drainhole wells. To protect correlative rights, prior notice and opportunity to object should be given to the mineral owners of "off-lease" surface locations.
7. The proposed "stacked lateral" rule will allow stacked horizontal laterals within the field correlative interval that are drilled from different surface locations to be considered a single well for regulatory purposes, which will facilitate the additional recovery of oil and gas reserves.

8. Similar rules have been adopted in other tight reservoirs, including the Spraberry, Eagle Ford, Wolfcamp, Bone Springs, Cotton Valley and Barnett Shale formations.
9. Blanket authority for exception to Statewide Rule 10 for all wells in the Sallie Ann (Spraberry-Wolfcamp) and various Atoka and Strawn Fields is appropriate.
 - a. Various Atoka and Strawn fields lie within the boundaries of the Sallie Ann (Spraberry-Wolfcamp) Field.
 - b. The reservoir fluids are similar in all of the fields and any commingled completion would require artificial lift, so cross-flow between the fields is not expected.
 - c. As a result of commingling two zones, incremental reserves of approximately 3,000 BO will be produced due to the lower combined economic limit. This incremental reserve amount would be attributed to every field interval that was completed in an individual well.
 - d. A stand-alone completion in any Atoka or Strawn field is not economic in most cases.
10. The filing of Form P-15 to designate the number of acres to be assigned to each well for proration purposes with no proration plats will eliminate unnecessary paperwork.

CONCLUSIONS OF LAW

1. Notice of this hearing was given as specified in the provisions of all regulatory codes.
2. All things have occurred or been accomplished to give the Commission jurisdiction in this matter.
3. Amending the Field Rules for the Sallie Ann (Spraberry-Wolfcamp) Field is necessary to prevent waste, protect correlative rights and promote development of the field.
4. Approval of the requested blanket authority for exception to Statewide Rule 10 for all wells in the Sallie Ann (Spraberry-Wolfcamp) and various Atoka and Strawn Fields will prevent waste and will not harm correlative rights.

RECOMMENDATION

Based on the above findings of fact and conclusions of law, the examiners recommend that the Commission amend the Field Rules for the Sallie Ann (Spraberry-Wolfcamp) Field and approve blanket authority for exception to Statewide Rule 10 for all wells in the Sallie Ann (Spraberry-Wolfcamp) Field and various Atoka and Strawn Fields, as requested by Devon Energy Production Co, LP.

Respectfully submitted,



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