RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL AND GAS DOCKET NO. 6E-0289942

APPLICATION OF QUANTUM RESOURCES MANAGEMENT, LLC TO AMEND FIELD RULES FOR THE EAST TEXAS FIELD, GREGG, RUSK, UPSHUR, CHEROKEE, AND SMITH COUNTIES, TEXAS

HEARD BY: Paul Dubois – Technical Examiner
Laura Miles-Valdez – Legal Examiner

DATE OF HEARING: October 21, 2014

CONFERENCE DATE: January 27, 2015

APPEARANCES:	**REPRESENTING:**
APPLICANT:	
Tim George Robert Dreyling	Quantum Resources Management, LLC
INTERVENOR:	
Colin Lineberry	Oil & Gas Division

EXAMINER'S REPORT AND RECOMMENDATION
STATEMENT OF THE CASE

This is the application of Quantum Resources Management, LLC requesting amendment of the special field rules for East Texas Field. There are two proposed amendments, both of which are intended to promote the future recovery of remaining reserves in the last stages of the depletion of the field. First, the Applicant requests that the minimum between-well spacing rule be amended to 330 feet between wells on the same lease or unit (from the current requirement of 660'). Second, the Applicant requests a procedure authorizing operators to deepen permitted wells within the field. The Applicant has coordinated with other operators and with the Commission Staff to develop the proposed amendments, and the application is un-protested.

The East Texas Field has produced 5.45 billion barrels of oil across five counties in East Texas. The discovery date is 1930, with the a discovery depth of 3,650'. Oil gravity is 39 degrees, API. Current spacing is 330'/660', with a 5-acre density rule. The penalty GOR is 500 cubic feet per barrel. The allowable allocation formula is 2.32% of original hourly potential, subject to a water oil ratio limit of 15 barrels of water per barrel of oil. There are also several allowable transfer rules.

The field is bounded by geologic pinch-outs to the east and by an oil water contact to the north, west, and south. The current productive area has now become much smaller than the original productive area because of water influx from the east, indicating that much of the field has now reach the late stages of depletion.

The production history of the field production and injection rates from 1993 to present shows steady decline over the last 20 years into the late stages of depletion. During this time, daily production dropped from more than 85,000 barrels to a current level of 9,963 barrels, and well count dropped from 7,526 to 4,735 wells. Gas production declined consistently with the declining oil production. Over that same time, water production increased, with water cut rising from 92% to more than 99%, again indicating the advanced stage of depletion.

The field is defined by both stratigraphic trap and local structural traps. The drive mechanism is solution gas and water drive. Dip is 0.5 degrees from east to west. Gross oil sand thickness averages 51 feet, with net oil sand averaging 39 feet. Original bottom hole pressure was 1,635 psi, with saturation pressure at 750 psi and solution GOR at 357 cubic feet per barrel. Porosity is about 20.9%, with initial water saturation of 14.2% and residual oil saturation of 13.6%. Permeability is very high at 1,383 md. Cumulative oil as of July 2014 was 5.45 billion barrels. Estimated remaining recovery is approximately 40 million barrels of oil. The current field production rate as of July 2014 was 9,963 barrels per day, or approximately 3.6 million barrels per year.

Although the field has declined, there are still significant remaining oil reserves to be recovered, especially from the Lower Woodbine sand within the field interval. The field contains both Upper and Lower Woodbine intervals, and it is the Lower Woodbine portion that is the target of much of the new development to be facilitated by the proposed rule amendments. The Woodbine interval that comprises the field lies in a wedge-type stratigraphic trap, below an unconformity at the base of the Austin Chalk and above the Maness Shale. There are two primary depositional environments within the Woodbine formation. The Upper Woodbine sand is thicker, more continuous, and better quality. In contrast, the Lower Woodbine sand is fluvial-deltaic and lower quality. Both intervals, however, exist across the entire field. The Upper Woodbine sands are generally continuous, thick, blocky, and connected to the downdip aquifer and, therefore, have produced under strong water drive. The Lower Woodbine sands are discontinous, thin, lenticular, shaley and less well-connected to the aquifer, producing generally under a dissolved gas drive.

Although water has moved across the entire field from West to East in the Upper Woodbine that is connected to the aquifer, it has not swept the Lower Woodbine, and there are portions of the Lower Woodbine that have not been adequately drained and depleted. Operators can conduct several types of operation to optimize future depletion of the Lower Woodbine, including infill drilling, re-entry of plugged and abandoned wellbores, deepening existing wells that are not drilled through the total field interval, and recompletion of wellbores producing from deeper fields. The proposed changes to the special field rules are intended to facilitate further development of Lower Woodbine reserves, using each of these available development methods.

The proposed amendments will increase ultimate recovery, encourage economic development of the remaining reserves (especially in the Lower Woodbine) and, reduce administrative burdens. By amending the between-well spacing rule to 330', operators will be able to add wells (re-entries, plug backs, or new drills) to produce portions of the Lower Woodbine that have not been adequately drained and depleted by wells permitted under the current rule. The same will be the case for the proposed procedures authorizing operators to deepen permitted wells within the field interval to reach reserves in the Lower Woodbine that have not been drained and depleted.

FINDINGS OF FACT

The testimony and evidence in the record support the following findings of fact:

1. Notice of this hearing was sent to all operators in the subject field at least ten (10) days prior to the hearing. The Commission Staff was notified and consulted, and does not oppose the proposed rules.

2. Applicant requests amendment of the special field rules for the East Texas Field. Applicant proposes that the minimum between-well spacing rule be amended to 330 feet between wells on the same lease or unit (from the current requirement of 660'). Applicant also proposes adoption of procedures to approve deepening of permitted wells within the field. Applicant has coordinated with other operators and with the Commission Staff to develop the proposed amendments. The application is un-protested.

3. The evidence proves that the East Texas Field is in an advanced stage of depletion:

    a. The strong water drive has now advanced to the point that the water influx has swept across the entire field in the Upper Woodbine.

b. The field continues to cover a large area in five counties, with approximately 4,735 currently producing wells and daily oil production of approximately 9,963 barrels.

c. Most wells in the field typically produce only a few barrels of oil per day.

d. Most wells in the field produce with a 99% water cut.

4. The evidence proves that portions of the Lower Woodbine within the field have not yet been inadequately drained and depleted by producing wells under current rules.

a. Although water influx has moved across the entire field in the Upper Woodbine portion of the field that is connected to the aquifer, it has not swept the Lower Woodbine.

b. Sands in the Upper Woodbine are generally continuous, thick, blocky, and connected to the downdip aquifer; therefore the Upper Woodbine has produced under a strong water drive.

c. Sands in the Lower Woodbine are discontinous, thin, lenticular, shalely, and less well-connected to the aquifer; therefore. the Lower Woodbine has produced under a dissolved gas drive.

d. Additional operations can be conducted to optimize future depletion of the Lower Woodbine, including infill drilling, re-entry of plugged and abandoned wellbores, deepening existing wells that are not drilled through the total field interval, and recompletion of wellbores producing from deeper fields.

5. The evidence proves that the proposed amendments will promote conservation and facilitate development of Lower Woodbine reserves.

a. Amendment of the between-well spacing rule to 330' will allow wells to produce portions of the Lower Woodbine that have not yet been adequately drained and depleted under the current rule.

b. The proposed procedures for authorizing operators to deepen existing permitted wells within the field interval will allow wells to produce portions of the Lower Woodbine that have not yet been adequately drained and depleted under the current rules.

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. The proposed field rules amendments will protect correlative rights, prevent waste and promote the orderly development of the field.

EXAMINERS' RECOMMENDATION

Based on the above findings and conclusions of law, the examiners recommend the Field Rules for the East Texas Field be amended as requested by Quantum.

Respectfully submitted,

Paul Dubois
Technical Examiner

Laura Miles-Valdez
Legal Examiner