



RAILROAD COMMISSION OF TEXAS

OFFICE OF GENERAL COUNSEL

OIL AND GAS DOCKET NO. 03-0247995

THE APPLICATION OF NETA R. GOLDSMITH TO AMEND FIELD RULES FOR THE
MADISONVILLE, W. (WOODBINE -A-) FIELD, MADISON COUNTY, TEXAS

Heard by: Margaret Allen, Technical Hearings Examiner

Procedural history

Application received: June 22, 2006

Hearing held: August 10, 2006

Appearances

Dale Miller

Representing

Neta R. Goldsmith

EXAMINER'S REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Field rules for the Madisonville, W. (Woodbine -A-) Field were adopted February 13, 1978, in Final Order No. 3-68,195. They can be summarized as follows:

1. 660'-1320' well spacing;
2. 160 acre oil proration units with 40 acre tolerance for the last well on a lease; and
3. allocation based on acreage.

Neta R. Goldsmith ("Goldsmith") is requesting amendments to the field rules particularly to govern horizontal wells. The requested amended rules can be summarized as follows:

1. Designated interval from 8510' to 9200' as shown on the log of the J.P. Goldsmith Company Benge Lease, Well No. 2;
2. 467'-0' well spacing; the penetration and terminus points of horizontal wells to be 100' from lease lines as long as they are 467' from perpendicular lease lines;
3. 160 acre oil proration units with 40-acre optional units for vertical wells; horizontal well acreage assignments based on:

$A = (L \times 0.064) + 160$ acres, where A = acres and L = horizontal displacement;

Maximum Diagonal = $475.933 \sqrt{A}$, but not less than 2000 feet plus the Horizontal Drainhole Displacement, where A = the acres actually assigned to the proration unit.

4. allocation based on acreage with the allowable based on a factor of 2.5125 barrels per acre per day.

The examiner recommends well spacing of 330' from lease lines for all wells, regardless of the orientation of any lateral. Goldsmith does not consider this to be an adverse recommendation.

DISCUSSION OF THE EVIDENCE

The Madisonville, W. (Woodbine -A-) Field was discovered in 1976, at a depth of 8696'. The field now has 16 wells, owned by eight operators, but there have been as many as 23 wells completed at one time. None of the wells now has a potential over 7 BOPD. Goldsmith operates four of the wells and plans to drill horizontal wells between the existing vertical wells. There have been some horizontal wells drilled in the Madisonville, W. (Woodbine) Field, but none yet in the Madisonville, W. (Woodbine -A-) Field.

Because these wells will be drilled as straight as feasible between vertical wells that were drilled on 660'-1320' well spacing, Goldsmith is requesting that there be no minimum between spacing. Goldsmith requested that the end points of a lateral be as close as 100' to lease lines so that it can drill the maximum length lateral on its leases. The allocation factor Goldsmith has requested is the same as is currently in place in the field for vertical wells--2.5125 barrels per acre per day. The applicant is requesting a designated interval that includes the entire Woodbine Formation, found between 8510' to 9200', as shown on the log of the J.P. Goldsmith Company Bengé Lease, Well No. 2.

The Woodbine is a low permeability reservoir that requires fracture stimulation. A reason that Goldsmith is requesting the end point of a lateral be as close as 100' to lease lines is that fracture stimulation is less effective at the terminus of a lateral. The discovery well had an initial potential of 168 BOPD and 9 MCFD. Several other wells had initial potentials near or over 100 BOPD. Wells have declined rapidly to about 5 BOPD but may be able to produce for a long time at low rates. The reservoir has a solution gas drive.

Cumulative production from the best wells is about 100,000 BO, and these wells are still producing. However, several of the wells were abandoned after producing less than 20,000 barrels. Four out of Goldsmith's five wells are depleted and they had an average ultimate recovery pf 60,000 BO. Reservoir porosity is 14%, water saturation is 40% and the net pay thickness is 14'. Assuming 17% recovery, there are 56,392 barrels of recoverable oil underneath 40 acres. Goldsmith's wells have drained 28 to 48 acres. The best wells in the field will drain only a little over 80 acres, however, better fracture techniques may allow future wells to drain more than 100 acres.

The requested density rule is modeled after horizontal rules governing the Austin Chalk and Buda Formations. Under the proposed rules, a horizontal well will be entitled to assign a proration unit based on the following formula:

$A = (L \times 0.064) + 160$ acres, rounded up to the next highest 40 acres, where A = acres and L = horizontal displacement

The maximum diagonal that can be assigned will be $475.933 \sqrt{A}$, but not less than 2000' in addition to the length of the lateral, where A = the acres actually assigned to the proration unit.

EXAMINER'S OPINION

The Austin Chalk and Buda Formations are carbonates with oriented fractures, while the Woodbine is an isotropic sandstone. In a carbonate reservoir with oriented fractures almost all the drainage is along the fractures and there is little contribution from the matrix in a perpendicular direction. A wellbore can be presumed to be drilled to encounter the maximum number of fractures and therefore be perpendicular to fracture direction. The end points of such a lateral will not drain over 100' from the matrix in a direction perpendicular to fracture direction. This Woodbine reservoir is not a fractured carbonate and laterals may be drilled with varying orientations depending on lease configurations.

Because the reservoir is isotropic, it is unreasonable to have different spacing requirements in different directions, particularly when the laterals will have no preferred orientation. Wells with different orientations on opposite sides of a lease line might be required to be different distances from that lease line. Therefore a single minimum distance for any point on a lease line to any point on a horizontal lateral seems more reasonable. Because fracture stimulations may vary throughout the length of a lateral, a minimum lease line distance of 330' seems reasonable.

FINDINGS OF FACT

1. Notice of this hearing was mailed to all operators in the Madisonville, W. (Woodbine -A-) Field on July 26, 2006.
2. The Madisonville, W. (Woodbine -A-) Field now has 16 wells, owned by eight operators, but there have been 23 wells completed at one time.
3. Not requiring any minimum between-well distance will facilitate Neta R. Goldsmith's drilling horizontal wells between the existing vertical wells in the Madisonville, W. (Woodbine -A-) Field.
4. Allocation on acreage protects correlative rights and the existing allocation factor for vertical wells--2.5125 barrels per acre per day--is appropriate for horizontal wells.
5. A designated interval between 8510' to 9200', as shown on the log of the J.P. Goldsmith Company Benge Lease, Well No. 2, includes all of the producing Woodbine Formation.
6. Density of 160 acres with optional 40 acre units is appropriate for vertical wells.
 - a. Volumetric calculations show there are 56,392 barrels of recoverable oil underneath 40 acres.

- b. Four of the applicant's wells are depleted, after draining 28 to 48 acres.
 - c. The best wells in the field have cumulative production near 100,000 barrels and are continuing to produce.
 - d. Better fracture techniques may allow future wells to drain more than 100 acres.
7. The proposed rules for horizontal wells are modeled on other horizontal rules which allow proration units based on similar formulas to this one:
- $$A = (L \times 0.064) + 160 \text{ acres, rounded up to the next highest 40 acres,}$$
- where A = acres and L = horizontal displacement
8. The lithology and fracture development in the Buda and Austin Chalk are different from those in the Woodbine; and different minimum lease line spacing depending on the orientation of the lease line and lateral is not appropriate.
 9. Minimum lease line spacing of 330' in all directions from a lateral will increase flexibility in this isotropic reservoir where fracture stimulations may vary throughout the length of a lateral.
 10. The same well spacing of 330-0' is appropriate for vertical wells as it is for horizontal wells in this isotropic reservoir.


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. Adoption of the proposed field rule amendments, with 330' lease line spacing, will prevent waste, protect correlative rights and promote orderly development of the Woodbine Formation.

EXAMINER'S RECOMMENDATION

Based on the above findings and conclusions, the examiner recommends approval of the application of Neta R. Goldsmith to amend field rules for the Madisonville, W. (Woodbine -A-) Field. The requested rules, with 330' lease line spacing, should be adopted, as per the attached order.

Respectfully submitted,


for Margaret Allen
Technical Hearings Examiner