**OIL AND GAS DOCKET NO. 04-0235375**

**THE APPLICATION OF SPINNAKER EXPLORATION COMPANY LLC. FOR NEW FIELD DESIGNATION, TWO-FACTOR ALLOCATION FORMULA AND PERMANENT GAS CLASSIFICATION FOR THE (PROPOSED) MU 861-L (MIDDLE FRIO S-2 S-3 FB-A) FIELD, KLEBERG COUNTY, TEXAS**

**Heard by:** Margaret Allen, Technical Hearings Examiner

**Procedural history**

Application received: June 16, 2003
Hearing held: August 6, 2003

**Appearances**

| | Representing |
|---|---|
| George C. Neale | Spinnaker Exploration Company |
| Tom Becnel | |
| Tom Jones | |
| Bob Tierney | |

## EXAMINER'S REPORT AND RECOMMENDATION

## STATEMENT OF THE CASE

Spinnaker Exploration Company is requesting that its Stirrup/State Unit Lease, Well No. 2, be designated as the discovery well for the (proposed) MU 861-L (Mid Frio S-2 S-3 FB-A) Field. The requested field rules are summarized as follows:

1. Designated interval from 15,352' TVD to 15,966' TVD as shown on the log of the its Stirrup/State Unit Lease Well No. 2; and

2. allocation based 95% on deliverability and 5% per wells.

The applicant requested that wells in this field be permanently classified as gas wells and that all overproduction for the discovery well be canceled.

## DISCUSSION OF THE EVIDENCE

The proposed new field was discovered with the completion of Spinnaker's Stirrup/State Unit Well No. 2, in April, 2003. The well has two sets of perforations--from 15,352' to 15,372' TVD, and from 15,946' to 15,966' TVD. The highest deliverability on the initial test was 5390 MCF/D at a bottom-hole pressure of 10,000 psi. Cumulative production is 210 MMCF and the well is now producing about 500 MCF and 10 BCPD.

This field is found on a small anticline bounded by a fault on the southeast side. The only field below 10,000' within 2-1/2 miles is the MU 861-L (Middle Frio S-2 FB-B) Field which produces from the same offshore platform. The Stirrup/State Unit Well No. 1, the only well in the MU 861-L (Middle Frio S-2 FB-B) Field, was completed from 15,400' to 15,560'. Seismic lines show fault separation between Well No. 1 and Well No. 2.

On a Form G-5, the applicant indicated that the initial gas/oil ratio for Well No. 2 was 20,651 cubic feet per barrel and the initial boiling temperature was 146°. Commission guidelines require gas wells to have an initial boiling temperature of 120° or less.

A fluid sample, collected May 18, 2003, was recombined at initial reservoir temperature (340EF) and pressure, and the recombined fluid was evaluated at various pressures. The reservoir fluid was single phase gas until the reservoir pressure reached 4230 psig (the retrograde dew point pressure), when small amounts of liquid began to condense from the gas. The highest percentage of liquid in the reservoir, 1.26%, would be reached when the bottomhole pressure declined to 1500 psi.

It is widely accepted that oil in a reservoir is essentially immobile until it reaches a saturation of 10 to 20%[1]. Spinnaker believes its well should be permanently classified as a gas well because the small volume of liquid in the reservoir below approximately 4230 psig is not mobile and will not be recovered as liquid.

Statewide Rule 79 defines a gas well as:

> ....a well which produces hydrocarbon liquids, a part of which is formed by a condensation from a gas phase and a part of which is crude petroleum oil, shall be classified as a gas well unless there is produced one barrel or more of crude petroleum oil per 100,000 cubic feet of natural gas; and that the term "crude petroleum oil" shall not be construed to mean any liquid hydrocarbon mixture or portion thereof which is not in the liquid phase in the reservoir, removed from the reservoir in such liquid phase, and obtained at the surface as such.

As liquid hydrocarbons in the reservoir are immobile even when the reservoir pressure decreases below the dew point, the liquid produced at the surface does not meet the definition of 'crude petroleum oil'. Instead, the produced liquid is a product of condensation and should not be considered in determining the gas-oil ratio nor used as a basis for classification of the well as an oil well.

The top of the productive Middle Frio in Well No. 2 is 15,352' TVD in the S-2 sandstone and the base of the productive interval is at 15,966' in the S-3 sandstone. Because the proposed designated interval includes multiple reservoirs that are not in natural communication, a two-factor allocation formula is required by statute. One based 5% per well and 95% on deliverability will satisfy statutory requirements. No additional wells will be drilled to this fault block.

## FINDINGS OF FACT

[1] Craft and Hawkins, 1954, *Applied Petroleum Reservoir Engineering*

1. Notice of this hearing was mailed to all operators offsetting the discovery well for the (proposed) MU 861-L (Mid Frio S-2 S-3 FB-A) Field on July 25, 2003.

2. The MU 861-L (Mid Frio S-2 S-3 FB-A) Field was discovered with the completion of the Spinnaker Exploration Company, LLC., Stirrup/State Unit Well No. 2 in April of 2003.

3. The discovery well is perforated in two sandstones in the Middle Frio formation: from 15,352' to 15,372' TVD, and from 15,946' to 15,966' TVD.

4. This Middle Frio reservoir is on a structural high and separated by faulting from other fields in the Middle Frio.

5 The interval from 15,352' TVD to 15,966' TVD in the Spinnaker Exploration Company, LLC., Stirrup/State Unit Lease, Well No. 2, includes the two productive Middle Frio sandstones.

6. A two-factor allocation formula, such as the proposed one based 5% per well and 95% on deliverability, will protect correlative rights and satisfy statutory requirements.

7. The discovery well is the only well in the field and cancellation of overproduction will not harm correlative rights.

8. The Stirrup/State Unit Lease Well No. 2 produces from a retrograde condensate reservoir and all the liquids produced by this well are the product of condensation after the hydrocarbons left the reservoir.

    a. The well was tested April 8, 2003, at a maximum rate of 5390 MCF/D, with a gas/liquid ratio of 20,651 cubic feet per barrel.

    b. The initial reservoir pressure was 10,000 psia and reservoir temperature was 340°.

    c. The fluid in the Middle Frio sandstones was a single-phase gas until the reservoir pressure reached 4230 psig (the retrograde dew point pressure), when small amounts of liquid began to condense from the gas.

    d. The highest percentage of liquid in the reservoir, 1.26%, will be reached when the bottomhole pressure declines to 1500 psi.

9. The maximum percentage of hydrocarbon pore space occupied by retrograde liquid will be less than 2%, and the liquid will not be mobile.

10. All of the liquid hydrocarbons produced at the surface from this well will be the product of condensation and should not be classified as crude petroleum oil.

11. Because little or no crude petroleum oil will be produced, the Stirrup-State Unit Well No. 2 should be classified permanently as a gas well.

## 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. The requested new field and field rules will prevent waste, protect correlative rights and promote orderly development of the field.

4. The Spinnaker Exploration Company, LLC. Stirrup/State Unit Lease, Well No. 2 in the MU 861-L (Mid Frio S-2 S-3 FB-A) Field, is completed in a gas reservoir based on the definition of gas wells pursuant to Statewide Rule 79(a)(11)(C).

## EXAMINER'S RECOMMENDATION

Based on the above findings and conclusions, the examiner recommends that the MU 861-L (Mid Frio S-2 S-3 FB-A) Field be approved as a new field with the requested field rules, as per the attached order. All overproduction for the discovery well should be canceled. The Spinnaker Exploration Company, LLC. Stirrup/State Unit Lease, Well No. 2 should be classified permanently as a gas well.

Respectfully submitted,

Margaret Allen
Technical Hearings Examiner