

**THE APPLICATION OF BURLINGTON RESOURCES O & G CO., LP TO ADOPT FIELD RULES AND CONSIDER PERMANENT GAS WELL CLASSIFICATION FOR ALL WELLS IN THE SUGARKANE (CRETACEOUS) FIELD, LIVE OAK AND KARNES COUNTIES, TEXAS**

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**HEARD BY:** Richard D. Atkins, P.E. - Technical Examiner

**HEARING DATE:** March 25, 2009

**APPEARANCES:**

Jamie Nielson  
Greg Cloud  
Yolanda Perez

**REPRESENTING:**

Burlington Resources O & G Co., LP

**EXAMINER'S REPORT AND RECOMMENDATION**

**STATEMENT OF THE CASE**

Burlington Resources O & G Co., LP ("Burlington") requests that Field Rules be adopted for the Sugarkane (Cretaceous) Field. The proposed rules are summarized as follows:

1. Designation of the field as the correlative interval from 11,360 feet to 11,662 feet as shown on the log of the Burlington Resources O & G Co., LP - Kunde Lease, Well No. 1 (API No. 42-297-34621);

Burlington also requests that all wells in the Sugarkane (Cretaceous) Field be permanently classified as gas wells, effective the date of first production for each well.

The application was unopposed and the examiner recommends approval of the Field Rules and permanent gas well classification for all wells in the Sugarkane (Cretaceous) Field.

**DISCUSSION OF EVIDENCE**

The Sugarkane (Cretaceous) Field was discovered in September 2006. The field is classified as a non-associated gas field and operates under Statewide Rules. Two wells are carried on the proration schedule with one vertical well operated by Burlington and one horizontal well operated by Texas Crude Energy, Inc. ("Texas Crude"). However, Burlington has drilled and completed one additional vertical well and three horizontal wells that are not yet listed on the schedule. Production is from a depth of approximately 11,400 feet and the initial reservoir pressure and temperature was 8,653 psia and 287 degree F. Cumulative production from the field through February 2009 is 324 MMCFG and 63.4 MBC.

Burlington requests that the correlative interval from 11,360 feet to 11,662 feet as shown on the log of the Burlington Resources O & G Co., LP - Kunde Lease, Well No. 1 (API No. 42-297-34621), be considered a single field known as the Sugarkane (Cretaceous) Field. The proposed interval is bounded above by the Pecan Gap Shale and below by the tight Buda Limestone, both of which provide reservoir pressure seals. The Cretaceous formation was deposited in a deep shelf environment and is composed of limestone with inter-bedded calcareous shales. The formation also contains natural fractures that enhance hydrocarbon production.

The discovery well for the field was the Burlington - Kunde Lease, Well No. 1. The well was a vertical well and was completed from 11,440 feet to 11,520 feet. This well was permanently classified as a gas well based on PVT analysis performed on September 12, 2006 and submitted for the well during a hearing held on February 9, 2007 in Oil & Gas Docket No. 02-0250021. The recombined fluid was evaluated during a Constant Composition Expansion ("CCE") at pressures ranging from 8,000 psia down to 500 psia. The original reservoir pressure was 8,653 psia and the results of the CCE indicates the reservoir fluid exists as a single phase gas until the reservoir pressure reaches 5,072 psia, the retrograde dew point pressure. Compositional analysis indicates the full wellstream to be 61.5 mol% methane and 10.4 mol% heptanes plus. The maximum retrograde liquid as a percent of hydrocarbon pore volume is 32.4% at 3,000 psia. The liquid sample had a gravity of 57.5 degree API and a straw color.

The second well completed in the field was the Burlington - Baker Family Trust Lease, Well No. 1. The well was a horizontal well and was completed from 12,071 feet to 12,248 feet TVD. The PVT analysis for the well was performed on a fluid sample taken from the well on April 14, 2008. The recombined fluid was evaluated during a CCE at pressures ranging from 12,022 psia down to 1,616 psia. The original reservoir pressure was 9,678 psia and the results of the CCE indicates the reservoir fluid exists as a single phase gas until the reservoir pressure reaches 4,216 psia, the retrograde dew point pressure. Compositional analysis indicates the full wellstream to be 67.1 mol% methane and 7.2 mol% heptanes plus. The maximum retrograde liquid as a percent of hydrocarbon pore volume is 13.3% at 2,014 psia. The liquid sample had a gravity of 57.0 degree API and a straw color.

The third well completed in the field was the Burlington - Kunde Lease, Well No. 3. The well was a horizontal well and was completed from 11,805 feet to 14,405 feet MD. The PVT analysis for the well was performed on a fluid sample taken from the well on June 27, 2008. The recombined fluid was evaluated during a CCE at pressures ranging from 10,000 psia down to 500 psia. The original reservoir pressure was 9,029 psia and the results of the CCE indicates the reservoir fluid exists as a single phase gas until the reservoir pressure reaches 4,669 psia, the retrograde dew point pressure. Compositional analysis indicates the full wellstream to be 61.7 mol% methane and 10.1 mol% heptanes plus. The maximum retrograde liquid as a percent of hydrocarbon pore volume is 27.5% at 3,000 psia. The liquid sample had a gravity of 52.9 degree API and a straw color.

The fourth well completed in the field was the Texas Crude - Kennedy Lease, Well No. 1H. The well was a horizontal well and was completed from 12,232 feet to 12,253 feet TVD. The PVT analysis for the well was performed on a fluid sample taken from the well on November 20, 2008. The recombined fluid was evaluated during a CCE at pressures ranging from 9,000 psia down to 500 psia. The original reservoir pressure was 7,975 psia and the results of the CCE indicates the reservoir fluid exists as a single phase gas until the reservoir pressure reaches 4,435 psia, the retrograde dew point pressure. Compositional analysis indicates the full wellstream to be 61.5 mol% methane and 10.2 mol% heptanes plus. The maximum retrograde liquid as a percent of hydrocarbon pore volume is 29.5% at 3,500 psia. The liquid sample had a gravity of 57.8 degree API and a straw color.

The fifth well completed in the field was the Burlington - Baker Family Trust Lease, Well No. 2. The well was a horizontal well and was completed from 12,165 feet to 12,316 feet TVD. No PVT analysis was performed on this well.

The sixth well completed in the field was the Burlington - Marlene Olson Lease, Well No. 1. The well was a vertical well and was completed from 12,026 feet to 12,213 feet. The PVT analysis for the well was performed on a fluid sample taken from the well on December 18, 2008. The recombined fluid was evaluated during a CCE at pressures ranging from 12,015 psia down to 2,430 psia. The original reservoir pressure was 9,439 psia and the results of the CCE indicates the reservoir fluid exists as a single phase gas until the reservoir pressure reaches 4,422 psia, the retrograde dew point pressure. Compositional analysis indicates the full wellstream to be 67.7 mol% methane and 7.0 mol% heptanes plus. The maximum retrograde liquid as a percent of hydrocarbon pore volume is 16.5% at 2,430 psia. The liquid sample had a gravity of 54.0 degree API and a straw color.

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.”

Burlington believes that because the liquid hydrocarbons in this reservoir are essentially non-existent, any 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 used as a basis for classification of the wells as oil wells.

Burlington also believes that all wells in the field should be permanently classified as gas wells, based on the available data for current wells in the field. All five of the wells that had PVT analysis performed in the field have passed most of the requirements for administrative classification as gas wells. Any additional wells completed in the field are expected to exhibit similar fluid characteristics and additional PVT analysis is unnecessary for classification of wells as gas wells.

### **FINDINGS OF FACT**

1. Notice of this hearing was given to all persons entitled to notice and no protests were received.
2. Burlington applied for and received a new field designation for the Sugarkane (Cretaceous) Field in September 2006. The new field is classified as a non-associated gas field and operates under Statewide Rules. A total of six wells have been completed in the field.
3. Burlington requests that the correlative interval from 11,360 feet to 11,662 feet as shown on the log of the Burlington Resources O & G Co., LP - Kunde Lease, Well No. 1 (API No. 42-297-34621), be considered a single field known as the Sugarkane (Cretaceous) Field. The proposed interval is bounded above by the Pecan Gap Shale and below by the tight Buda Limestone, both of which provide reservoir pressure seals.
4. All wells in the Sugarkane (Cretaceous) Field should be permanently classified as gas wells.
  - a. The original reservoir pressure and temperature in the discovery well was 8,653 psia and 287 degree F.
  - b. The PVT analysis for the Kunde Lease, Well No. 1, indicates that the original reservoir pressure was 8,653 psia and the results of the CCE indicates the reservoir fluid exists as a single phase gas until the reservoir pressure reaches 5,072 psia, the retrograde dew point pressure.

- c. The PVT analysis for the Baker Family Trust Lease, Well No. 1, indicates that the original reservoir pressure was 9,678 psia and the results of the CCE indicates the reservoir fluid exists as a single phase gas until the reservoir pressure reaches 4,216 psia, the retrograde dew point pressure.
  - d. The PVT analysis for the Kunde Lease, Well No. 3, indicates that the original reservoir pressure was 9,029 psia and the results of the CCE indicates the reservoir fluid exists as a single phase gas until the reservoir pressure reaches 4,669 psia, the retrograde dew point pressure.
  - e. The PVT analysis for the Kennedy Lease, Well No. 1H, indicates that the original reservoir pressure was 7,975 psia and the results of the CCE indicates the reservoir fluid exists as a single phase gas until the reservoir pressure reaches 4,435 psia, the retrograde dew point pressure.
  - f. The PVT analysis for the Marlene Olson Lease, Well No. 1, indicates that the original reservoir pressure was 9,439 psia and the results of the CCE indicates the reservoir fluid exists as a single phase gas until the reservoir pressure reaches 4,422 psia, the retrograde dew point pressure.
5. Liquid hydrocarbons produced at the surface from the subject wells are the product of condensation and should not be classified as crude petroleum oil.
  6. Because the liquids produced from the wells are not crude petroleum oil, the subject wells should be classified as a gas wells.

#### **CONCLUSIONS OF LAW**

1. Proper notice of this hearing was issued.
2. All things have been accomplished or have occurred to give the Commission jurisdiction in this matter.
3. Adopting Field Rules for the Sugarkane (Cretaceous) Field is necessary to prevent waste, protect correlative rights and promote development of the field.
4. All wells ever completed in the Sugarkane (Cretaceous) Field are gas wells, effective the date of first production, based on the definition of a gas well pursuant to Statewide Rule 79 (a) (11) (C).

**RECOMMENDATION**

Based on the above findings of fact and conclusions of law, the examiner recommends that the Commission adopt Field Rules for the Sugarkane (Cretaceous) Field, as proposed by Burlington, and approve permanent gas well classification for all wells ever completed in the Sugarkane (Cretaceous) Field.

Respectfully submitted,

Richard D. Atkins, P.E.  
Technical Examiner