

**OIL AND GAS DOCKET NO. 01-0263175**

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**THE APPLICATION OF PETROHAWK OPERATING COMPANY TO ADOPT  
TEMPORARY FIELD RULES FOR THE HAWKVILLE (EAGLEFORD SHALE) FIELD, LA  
SALLE COUNTY, TEXAS**

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**Heard by:** Andres J. Trevino, P.E. on November 4, 2009

**Appearances:**

John Soule  
Rick Johnston

Dale E. Miller  
Dustin Morrow  
Susan Young

**Representing:**

Petrohawk Operating Company

Cabot Oil & Gas Corp.  
Lewis Petro Properties  
ConocoPhillips

**EXAMINER'S REPORT AND RECOMMENDATION**

**STATEMENT OF THE CASE**

Petrohawk Operating Company requests that temporary field rules be adopted for the Hawkville (Eagleford Shale) Field. The proposed rules are summarized as follows:

1. Designation of the field as the correlative interval from 11,050 feet to 11,290 feet as shown on the log of Petrohawk's STS Well No. 1;
2. 330'-660' well spacing, no between well spacing between vertical and horizontal wells, no between well spacing restriction on laterals that overlap by less than 500 feet and take points provisions;
3. 320 acre density, with special provisions for assignment of acreage to horizontal wells and a maximum acreage assigned to a well of 640 acres;
4. Allocation based on 10% acreage and 90% deliverability.

Petrohawk had originally requested a "box rule" for horizontal laterals and that the temporary rules be in place for 24 months. Due to the potential delay in approving and

probable denial of the "box rule" Petrohawk withdrew this request. Additionally, Petrohawk amended their 24 month temporary rules request for the standard 18 months. Petrohawk was informed that an allocation formula for oil wells was not needed and would not be included as there are currently no oil wells in the field. This application was unopposed and the examiner recommends that the rules proposed and amended by Petrohawk Operating Company be adopted on a temporary basis for the Hawkville (Eagleford Shale) Field.

### **DISCUSSION OF EVIDENCE**

The Hawkville (Eagleford Shale) Field was discovered in October 2008 at a depth of 11,141 feet. There is currently two wells on the proration schedule with five additional wells completed by Petrohawk. The field is currently undergoing rapid development. The Petrohawk well is a horizontal well and Petrohawk plans to drill only horizontal wells in the field. Cumulative production from the field is approximately 3.5 BCF and 50 MBC.

Petrohawk is in the early stages of development for the Hawkville (Eagleford Shale) Field and believes it should be developed with similar field rules as other shale gas fields like the Newark, East (Barnett) Field and the Waskom (Haynesville) Field. Additionally, Petrohawk believes some field rules adopted in the Austin Chalk are appropriate as the Eagleford Shale lies directly underneath the Austin Chalk and will have similar production characteristics of the naturally fractured Austin Chalk once the Eagleford is artificially fractured stimulated.

The Eagleford Shale in the Hawkville Field area is found at a depth of 11,100 feet with a thickness of 200 to 350 feet thick. At this depth the shale is expected to produce a dry gas or a gas rich in condensate. The STS Well No.1 produces a gas rich with condensate. The initial potential for the STS No.1 was 5,513 MCFPD, 168 BCPD flowing thru a 25/64" choke at 2,064 psia FTP. Other wells in the field produce a dry gas. The Dora Martin No. 1 initial potential at 8,355 MCFPD, the Dora Martin 1716 No. 1H initial potential at 9,464 MCFPD and the Henderson-Cenizo 874 No. 1H initial potential at 6,261 MCFPD. The wells had flowing tubing pressures of 4,033psia to 4,640 psia.

PVT fluid studies performed on the Donnell Minerals No.1 and the STS 241 No. 1H indicate the wells produce from a retrograde condensate reservoir with retrograde dew points of 3,892 psig and 2,814 psig, respectively. The Donnell Minerals No.1 had static reservoir conditions of 9,300 psig at 290 degrees F. The STS 241 No. 1H had static reservoir conditions of 6,235 psig at 250 degrees F.

Petrohawk request initial proration units be 320 acres with additional acreage assigned based on lateral lengths. The maximum acreage assigned to any well will be limited to 640 acres regardless of lateral length. Petrohawk also requests take point language be included to allow the lateral greater contact with the reservoir within the lease boundaries. The horizontal rules proposed by Petrohawk for purposes of assigning acreage and allowing take points are similar to those which have been adopted in several Barnett,

Haynesville and Austin Chalk fields.

Petrohawk requests a spacing rule that requires a minimum of 330 feet from lease lines and 660 feet between wells. This proposed spacing is similar to other fields being developed using horizontal wells. Petrohawk requests that the first and last take points be no closer than 100 feet from the lease lines. This will allow at least one additional frac stage to take place at each end of the lateral to recover additional reserves that would otherwise remain unrecovered. Reservoir drainage is expected to occur along the perpendicular fractures from the laterals and not in a radial pattern as in a conventional gas reservoir. Petrohawk also requests that there be no minimum between well spacing requirement between a horizontal and a vertical well or two horizontal drainholes that are parallel or subparallel (within 45 degrees of parallel) and that overlap each other by no more than 500 feet.

It is requested that the field be defined as the correlative interval from 11,050 feet to 11,290 feet as shown on the log of Petrohawk's STS Well No. 1. The interval includes the entire Eagleford Shale. Petrohawk requests that the allocation formula be based on 10% acreage and 90% deliverability.

#### **FINDINGS OF FACT**

1. Notice of this hearing was given to all persons entitled to notice and no protests were received.
2. The Hawkville (Eagleford Shale) Field was discovered in October 2008. There have been seven gas wells completed in the field and the field is currently undergoing rapid development.
3. The Hawkville (Eagleford Shale) Field should be defined as the correlative interval from 11,050 feet to 11,290 feet as shown on the log of Petrohawk's STS Well No. 1.
4. Wells in the Hawkville (Eagleford Shale) Field produce both dry gas or condensate rich gas.
  - a. The Dora Martin No. 1 had an initial potential of 8,355 MCFPD, dry gas with a flowing tubing pressure of 4,465 psia.
  - b. The Dora Martin 1716 No. 1H had an initial potential of 9,464 MCFPD, dry gas with a flowing tubing pressure of 4,033 psia.
  - c. The Henderson-Cenizo 874 No. 1H had an initial potential of 6,261 MCFPD, dry gas with a flowing casing pressure of 4,640 psia..
  - d. The STS No.1 was flowing thru a 25/64" choke had an initial potential of 5,513 MCFPD, 168 BCPD with a flowing tubing pressure of 2,064 psia.

- e. PVT fluid studies performed on some wells indicate the wells produce from a retrograde condensate reservoir with retrograde dew points between 3,892 psig and 2,814 psig.
5. Adoption of a 320 acres with additional acreage and a maximum of 640 acre density rule for the field is appropriate.
    - a. The Hawkville (Eagleford Shale) Field is a shale gas field that will be developed with horizontal wells with multiple stage fracs.
    - b. There are no vertical wells in the field and production decline data from horizontal wells is limited.
    - c. Other shale fields including the Newark, East (Barnett Shale), Toyah, NW (Shale) and the Waskom (Haynesville) fields have large proration units between 640 to 320 acre units.
    - d. Increasing acreage using a formula of  $\text{acreage} = 320 \text{ acres} + (L \cdot .16249)$  is based on Austin Chalk fields that have tight reservoirs and have natural fractures versus the Hawkville's artificial fracture stimulation.
  6. A spacing rule providing for a minimum of 330 feet from lease lines and 660 feet between wells will allow maximum recovery from the shale reservoir and will accommodate development with horizontal wells.
  7. Adoption of the proposed horizontal rules are similar to field rules adopted in other shale fields and are appropriate for this field.
    - a. Allowing no between well spacing restriction on laterals that overlap by no more than 500 feet will allow maximum hydrocarbon reserve to be recovered that would otherwise be left in place.
    - b. Take points allow recovery to occur closer to the lease line and prevent waste.
    - c. Allowing the first and last take points to be as close as 100 feet from the lease lines will allow at least one additional frac stage to take place at each end of the lateral to recover additional reserves that would otherwise remain unrecovered.
  8. Allocation based on 10% acreage and 90% deliverability is a reasonable formula which will protect correlative rights of mineral owners in the field.

**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. Adoption of the proposed field rules for the Hawkville (Eagleford Shale) Field on a temporary basis is necessary to prevent waste, protect correlative rights and promote development of the field.

**RECOMMENDATION**

Based on the above findings and conclusions of law, the examiner recommends that the Commission adopt the field rules proposed by Petrohawk Operating Company for the Hawkville (Eagleford Shale) Field on a temporary basis, subject to review in 18 months.

Respectfully submitted,

Andres J. Trevino, P.E.  
Technical Examiner