

**OIL AND GAS DOCKET NO. 06-0271583**

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**THE APPLICATION OF NFR ENERGY, LLC TO AMEND FIELD RULES FOR THE HENDERSON, E. (COTTON VALLEY) FIELD, RUSK COUNTY, TEXAS**

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

**HEARING DATE:** August 17, 2011

**APPEARANCES:**

**REPRESENTING:**

**APPLICANT:**

Flip Whitworth  
Dale E. Miller

NFR Energy, LLC

**OBSERVER:**

Michael McElroy  
Rick Johnston

Forest Oil Corporation

**EXAMINER'S REPORT AND RECOMMENDATION**

**STATEMENT OF THE CASE**

Field Rules for the Henderson, E. (Cotton Valley) Field were adopted in Final Order No. 06-0240561, effective December 21, 2004. The current Field Rules in effect for the field are summarized as follows:

1. Designation of the field as the correlative interval from 9,600 feet to 11,000 feet, as shown on the log of the Taliaferro No. 1 (API No. 401-33357), Thomas L. Willshire Survey, A-843, Rusk County, Texas.
2. 467'-600' well spacing with no minimum distance requirement between vertical and horizontal wells.
3. 40 acre density with 10% tolerance and optional 20 acre units.
4. Allocation based on 95% deliverability and 5% per well with AOF status.

NFR Energy, LLC ("NFR") requests that Field Rule No. 2 be amended to allow special provisions for "take points" and an "off-lease" penetration point for horizontal drainhole wells completed in the subject field. The examiner opined the applicant's proposed first and last "take point" language of 100 feet and the "off-lease" penetration point notification through regular mail are inappropriate and inconsistent, respectively, as proposed. The applicant did not consider the examiner's opinion as adverse in this instance.

The application was unopposed and the examiner recommends that Field Rule No. 2 for the Henderson, E. (Cotton Valley) Field be amended as proposed by NFR, with the exception of the examiner's opinion.

### **DISCUSSION OF EVIDENCE**

The Henderson, E. (Cotton Valley) Field was discovered in 1980 upon completion of the T. P. Cannon No. 1 in the Taylor Sand between 10,576 feet and 10,767 feet. Subsequently, no wells were drilled in the field until 2001. The field has an average depth of 10,600 feet and is designated as non-associated with 204 producing gas wells and twelve operators carried on the July 2011 proration schedule. The allocation formula is currently suspended. Cumulative production from the field through July 2011 is 59.8 BCFG and 727.8 MBC.

NFR is requesting Field Rules to provide for "take points" in the subject field that allow for the first and last take point to be no closer than 100 feet to any property line, lease line, or subdivision line. Furthermore, NFR proposes the perpendicular distance from any take point on a horizontal drainhole between the first and last take point be a minimum of 467 feet. The applicant submitted a reservoir study<sup>1</sup> performed for the Cotton Valley formation in an effort to support the requested first and last "take point" language. The aforementioned study indicates the natural horizontal stress direction of the Cotton Valley formation used in the study area trends parallel to N80E. NFR indicated horizontal wells in the subject field are drilled perpendicular to the Cotton Valley formation's natural stress direction, in an attempt to maximize production developed through hydraulic fractures induced during the completion process of horizontal wells. As indicated through the authors' microseismic interpretation in the aforementioned reservoir study, each "wing" of the hydraulic fracture stage induced at a take point in the lateral portion of the horizontal well appears to extend at least 500 feet perpendicular to the wellbore azimuth at the point the frac is induced in the wellbore and approximately 90 feet in the direction parallel to the wellbore azimuth. The examiner opined the first and last take point language as proposed by NFR to be inappropriate in the context of the application due to the approximate extent of the frac direction parallel to the wellbore nearly equating 100 feet. The examiner opined the aforementioned technical publication indicates a horizontal wellbore drilled

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<sup>1</sup> A comparison of microseismicity induced by gel-proppant and water-injected hydraulic fractures, Carthage Cotton Valley gas field, East Texas - *Rutledge, J.T. and W.S Phillips, Los Alamos National Library*

perpendicular to the Cotton Valley formation's trend of N80E and completed through utilization of hydraulic fracture techniques, as suggested in the publication, will extend beyond a lease line in the subject field in the instance the first and/or last take points are 100 feet from a lease line. The applicant subsequently requested the first and last take point distance be changed from 100 feet, as initially proposed, to 200 feet. The applicant opined that a well drilled perpendicular to N80E, with the first and last take points at 200 feet from any lease line, will not contain fracs that propagate beyond any lease boundary.

Additionally, NFR requests "take point" language to include that in the instance a horizontal well has a No-Perf Zone (NPZ), the take points nearest the NPZ be restricted from perforating closer than 100 feet but less than 467 feet from any unpooled or unleased tract. The examiner opined the closest take points be required to conform to the lease line spacing of 467 feet. The applicant did not consider the examiner's opinion as adverse in this instance.

NFR is proposing to further develop the subject field by drilling horizontal wells in the future and also requests Field Rules to allow for an "off-lease" penetration point for horizontal drainhole wells. In certain instances, it is beneficial to penetrate the reservoir off lease while still having "take points" no closer to lease lines than allowed under specific field rules. Statewide Rule 86 requires that the penetration point of a horizontal drainhole be located on the associated lease. NFR indicated a well completed in the subject field requires approximately 500-600 feet of horizontal displacement to build a ninety (90) degree angle from vertical to horizontal in the subject field. The proposed rule will allow operators to drill horizontal wells with the penetration point, as defined by Rule 86, off of the lease, as long as the first and last take-points are no closer than 200 feet to any lease line and all take-points between the first and last take-points are no closer than 467' to any lease line. The applicant testified the proposed field rule will allow for the increased recovery of hydrocarbons in the field by maximizing the production from the lateral portion of a horizontal well completed in the subject field. NFR proposes that an offsite penetration point be allowed after notice to the mineral owners of the off-lease tract is administered and if no protest is received. The applicant's proposed language to allow for an "off lease" penetration point annotates a applicant of such a drilling permit administer notice to affected parties by regular mail. The examiner opined such notice to be inconsistent with field rules approved for similar fields in Texas. The applicant did not consider the examiner's opinion as adverse in this instance.

To satisfy state statutes, NFR requests the allocation formula remain unchanged. The applicant requests the allocation formula remain suspended, as there is a 100% market demand for all of the gas produced from the field.

### **FINDINGS OF FACT**

1. Notice of this hearing was given to all persons entitled to notice and no protests were received.
2. The Henderson, E. (Cotton Valley) Field was discovered in 2008 upon completion of the T. P. Cannon No. 1 in the Taylor Sand between 10,576 feet and 10,767 feet.

- a. The field has an average depth of 10,600 feet and is designated as non-associated with 204 producing gas wells and twelve operators carried on the July 2011 proration schedule.
  - b. The field operates under Field Rules that provide for a designated interval, 467'-600' well spacing and 40 acre density with 10% tolerance and 20 acre optional units.
  - c. The allocation formula is currently suspended.
3. The subject Cotton Valley field is actively being developed with horizontal drainhole wells.
  4. Field Rules that provide for 200' lease line spacing for the first and last take points with special provisions for "take points" and an "off-lease" penetration point will provide greater flexibility in selecting future drilling locations.
  5. The 200' lease line spacing for the first and last take points will result in additional gas recovery of the original gas in place.
  6. Continued suspension of the allocation formula is appropriate, as there is a 100% market demand for all of the gas produced from 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. Amending Field Rule No. 2 for the Henderson, E. (Cotton Valley) Field is necessary to prevent waste, protect correlative rights and promote development of the field.

**RECOMMENDATION**

Based on the above findings of fact and conclusions of law, the examiner recommends that the Commission amend Field Rule No. 2 for the Henderson, E. (Cotton Valley) Field, as proposed by NFR Energy, LLC, with the exception of the 100' distance for the first and last take points.

Respectfully submitted,

Brian K. Fancher  
Technical Examiner