



RAILROAD COMMISSION OF TEXAS

OFFICE OF GENERAL COUNSEL

RULE 37 CASE NO. 0267425
Application Status No. 701843
District 05

APPLICATION OF CHESAPEAKE OPERATING, INC. FOR A SPACING EXCEPTION PERMIT FOR ITS PAPPAJOHN LEASE, WELL NO. 3H, NEWARK, EAST (BARNETT SHALE) FIELD, TARRANT COUNTY, TEXAS

APPEARANCES:

FOR APPLICANT:

Glenn E. Johnson
Richard Kastner
Bill G. Spencer
Steve Mills
Alan Jackson
Brian Boerner

APPLICANT:

Chesapeake Operating, Inc.

FOR PROTESTANTS:

David Buster
Olga Buster

PROTESTANTS:

David Buster
Olga Buster

PROPOSAL FOR DECISION

PROCEDURAL HISTORY

DATE APPLICATION FILED:
DATE OF NOTICE OF HEARING:
CONTINUANCE GRANTED:
DATE OF HEARING:
HEARD BY:

November 24, 2010
January 27, 2011
February 18, 2011
April 4, 2011
Gene Montes, Hearings Examiner
Richard Atkins, Technical Examiner
October 12, 2011

DATE PFD CIRCULATED:

STATEMENT OF THE CASE

Chesapeake Operating Inc. ("Chesapeake") seeks a drilling permit pursuant to the provisions of Statewide Rule 37 for the Pappajohn Unit, Well No. 3H, a proposed horizontal well in the Newark, East (Barnett Shale) Field, Tarrant County, Texas. This is the third well on the Pappajohn Unit.

Appendix 1 to this proposal for decision is a copy of Chesapeake Exhibit No. 7, which is a plat showing the 191.571 – acre Pappajohn Unit (191.350 leased acres), proposed Well No. 3H, the leased and participating tracts within the Unit, and the unleased tracts within the Unit. The surface location of the proposed well is within the Pappajohn Unit and the surface location of Well No. 3H is 476 feet from the southwest line of the Unit and 829 feet from the north line of the Unit. The survey perpendiculars of the surface location are as follows: 829 feet from the north line and 801 feet from the west line of the Thomas, HRS, JP survey, abstract number A-1525. The penetration point is 50 feet from the west line of the Unit and 478 feet from the south line of the Unit. The terminus of the proposed well is 188 feet from the southeast line and 361 feet from the northeast line. The survey perpendiculars of the terminus are as follows: 354 feet from the east line and 1233 feet from the north line of the Thomas, HRS JP survey, A-1525. Chesapeake is the operator of all tracts adjacent to the Unit.

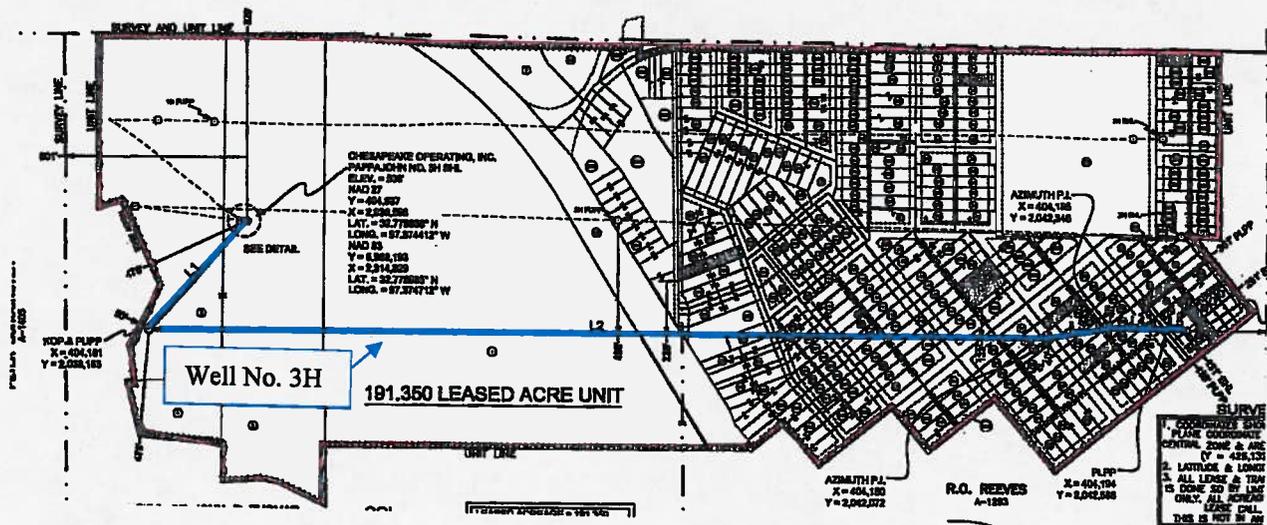
Special field rules for the Newark, East (Barnett Shale) Field provide for 330 foot lease line spacing. A Rule 37 exception is needed for the proposed Pappajohn Unit, Well No. 3H because a section of the well proposed to be perforated is closer than 330 feet to the external boundary of the pooled unit at multiple points and to the boundary of certain tracts internal to the Pappajohn Unit that are unleased. The application is opposed by owners of an unleased tract which is within 330 feet from the section of Well No. 3H proposed to be perforated. As to the external boundary Chesapeake, as the operator of those tracts, has waived objection to the Rule 37 exception requested for Well No. 3H. A hearing was held on April 4, 2011, at which Chesapeake and the protestants appeared and presented evidence.

The examiners recommend that the application be approved. As set out below, the examiners are of the opinion that Chesapeake has established that the requested Rule 37 exception is necessary to prevent confiscation. The examiners have concluded that the location of the proposed Pappajohn Unit, Well No. 3H is reasonable. This location is a continuation of Chesapeake's plan to effectively and efficiently recover gas from the Unit, and there appears to be no less irregular location in relationship to the unleased tracts that are internal to the Unit.

DISCUSSION OF THE EVIDENCEChesapeake Operating Inc.

The proposed well, Well No. 3H, is within the Pappajohn Lease Unit ("Unit") which is located within the Newark, East (Barnett Shale) field. The Unit is in the urban area of the City of Fort Worth. The surface location of the well is 476 feet from the southwest line of the unit and 829 feet south from the north line of the unit. The path of the wellbore follows a south-westerly direction and then travels from west to east along the length of the Unit. The bottom-hole location is approximately 188 feet from the southeast line of the Unit and 361 feet from the northeast line Unit. Figure 1 below provides an outline of the Unit (outlined in red) and the path of the well bore (outlined in blue). Unleased tracts within the unit are shaded. An enlarged copy of the exhibit is attached as Appendix 1. The surface of the Unit itself is occupied by mixed uses, and large areas are residential. Chesapeake is the operator of all tracts adjacent to the Unit.

Figure 1
Pappajohn Unit and Path of Well No. 3H



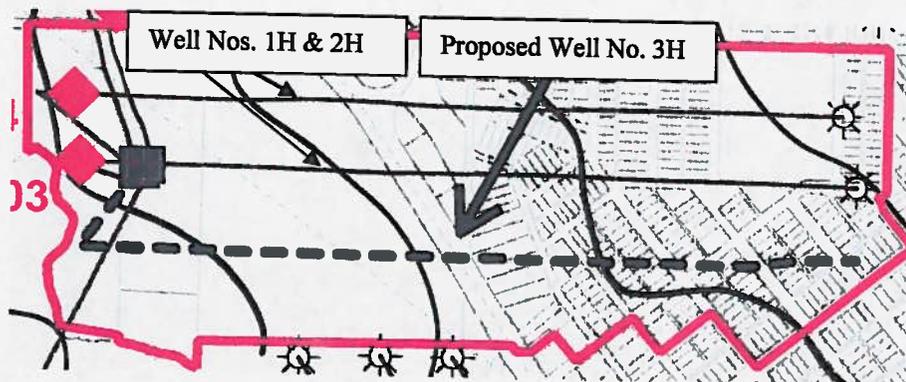
As stated above, special field rules for the Newark, East (Barnett Shale) Field provide for 330 feet lease line spacing. As to horizontal wells, where the horizontal portion of the well is cased and cemented back above the top of the Barnett Shale formation, the distance to any property line, lease line, or subdivision line is calculated based on the distance to the nearest perforation in the well, and not based on the penetration point or terminus. Where an external casing packer is placed in a horizontal well and cement is pumped above the external casing packer to a depth above the top of the Barnett Shale formation, the distance to any property line,

lease line, or subdivision line is calculated based on the top of the external casing packer or the closest open hole section in the Barnett Shale.

At the time of filing of Chesapeake's Form W-1 application, Chesapeake had 191.09 acres under lease within the boundaries of the Unit. Since that time, additional acreage has been leased within the unit. In terms of total acreage, there are 193.571 acres within the perimeter of the unit, of which 191.350 acres are now leased. The total leased acreage represents 98.9% of the entire Unit. The unleased acreage totals 2.221 acres, or 1.1% of the entire Unit. In terms of tracts, there are a total of 288 separate tracts within the Unit. Of the total number of tracts, 288 are leased and 9 are unleased. Chesapeake made lease offers to landowners of all tracts in the area. Chesapeake noted at the hearing that it was willing to lease the remaining unleased properties at the time the hearing was held.

The Unit contains two other existing wells: Well No. 1H and Well No. 2H. These wells are horizontal wells north of the proposed Well No. 3H and parallel to the proposed well. The schematic set out below as Figure 2 illustrates the general location of those wells relative to the proposed Well No. 3H.

Figure 2
Schematic Showing General Location of Three Wells within Pappajohn Unit*



* These are also shown on the plat that is attached as Appendix I and appear as the dashed lines above the proposed path for Well No. 3H.

Steven Mills, a reservoir engineer, calculated the total recoverable gas in place within the Unit. He testified that the total gas in place was approximately 37.803 Bcf. This calculation was based upon consideration of the total area of the Unit of 193.571 acres and an average thickness of the Barnett shale within the Unit of 320 feet. To the total gas in place Mr. Mills applied a recovery factor of 35 percent. Thus, he calculated 13.231 Bcf of recoverable gas in place.

Mr. Mills also identified the remaining recoverable gas within the Pappajohn Unit taking into account the historic production of Well No. 1H and Well No. 2H. As noted above those two wells have been drilled and are producing. Chesapeake produced evidence that the historic production, as of the date of the hearing, within the Pappajohn Unit from these wells was 0.151

Bcf and 0.118 Bcf, respectively. As a result, the remaining recoverable gas in place within the Unit is 12.962 Bcf.

Finally, Mr. Mills calculated the total amount of natural gas expected to be recovered from Well No. 3H. He testified that ultimately the total amount of reserves to be recovered from Well No. 1H and Well No. 2H would be 8.665 Bcf. Thus, based upon his calculation of a total recoverable reserve of 13.231 Bcf, Mr. Mills testified that another well, proposed Well No. 3H, was necessary to recover the remaining 4.566 Bcf. Consequently, absent the well, 4.566 Bcf of gas would remain unrecovered. Mr. Mills presented data that provided an evaluation of the expected ultimate recovery, in MMcf, as a function of the drainhole length, in feet. Based upon this calculation he concluded that the proposed well would recover 4.424 Bcf of the identified recoverable reserves.

Mr. Mills evaluated other alternatives to the proposed Well No. 3H that would avoid unleased tracts. These alternatives, however, would not recover all of the identified reserves of natural gas within the Pappajohn Unit. Mr. Mills prepared an exhibit that evaluated a hypothetical well that followed the same path as the proposed well but was not perforated within 330 feet of all unleased tracts in the unit. The result would be 1.173 Bcf of gas that would remain unrecovered. Mr. Mills also evaluated a lateral well that followed a different path than the path proposed by Chesapeake. That hypothetical well would simply avoid the unleased tracts. He noted that there were several problems with the hypothetical alternative. First, the hypothetical alternative included several turns which would be difficult to control and would increase the risk of successfully completing the well. Second, it would be difficult to have casing reach the bottom of the well. Third, this alternative would recover .57 Bcf natural gas less than the proposed path of the well. One final alternative would be to drill vertical wells. Due to intensive surface development and because of the unique nature of the Barnett Shale formation, however, vertical wells would not be practical to recover the reserves identified under this Unit.

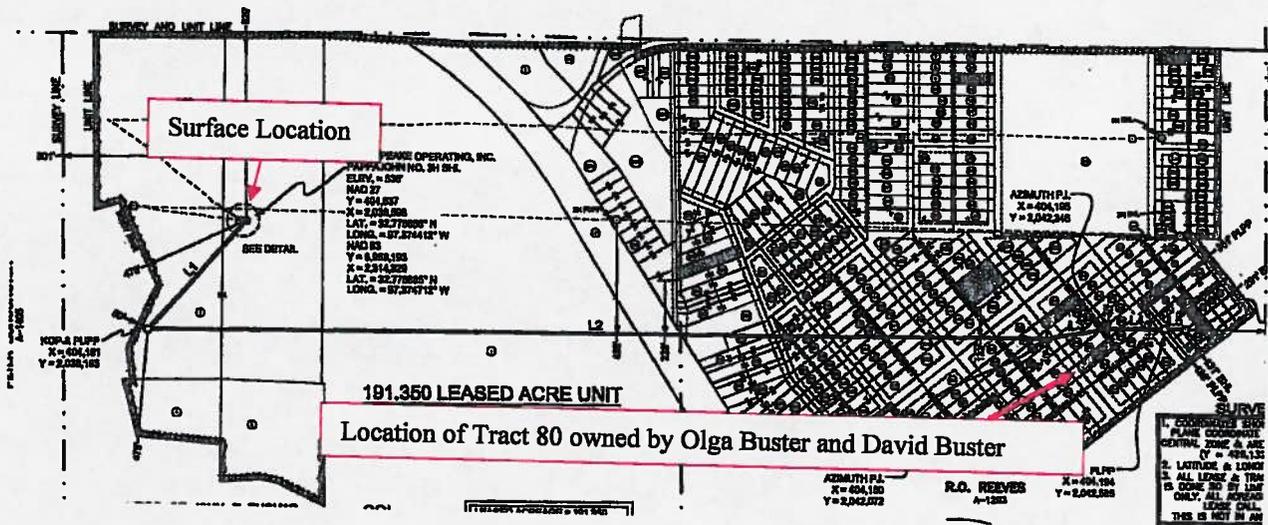
Mr. Mills testified that the proposed well is situated to prevent confiscation or waste of hydrocarbon resources. He also noted that the orientation of the Unit is designed to maximize recovery from the Barnett Shale formation. He also noted that if the well is not allowed to be drilled as proposed that there is no current feasible alternative for the production of Chesapeake's fair share of hydrocarbons beneath the Unit. Thus, the Pappajohn Well No. 3H is necessary to prevent confiscation of the resources leased by Chesapeake.

Protestants Olga Buster and David Buster

Of the 297 tracts within the Pappajohn Unit, only 9 were unleased. Of those nine, the owners of one tract protested this application. Only two individuals filed a protest: Olga Buster and David Buster. They are the owners of tract number 80 (Tract 80) on the eastern side of the Unit. The surface location of the well is approximately 3,500 feet from the tract owned by Olga and David Buster. The wellbore is forty feet south of the property and approximately 7,000 feet below the surface. Fracking will result in fissures around the wellbore that do not extend beyond 800 feet. Thus, the surface location of the property owned by the protestants is 6,000 feet from

the drilling activities of the applicant. Figure 3 below, and Appendix 1, illustrate the location of the unleased tracts.

Figure 3
Unleased Tracts within the Pappajohn Unit
(Unleased Tracts Shaded)*



* The shaded units are more clearly visible in Appendix I.

The Protestants main objection relates to alleged environmental concerns posed by the proposed drilling. No evidence regarding the environmental issues was presented by the Protestants. In a lengthy statement made at the hearing, however, the Protestants expressed concern regarding air emissions and the protection of groundwater supplies. Additionally, the Protestants raised concerns regarding the safety record of the energy industry in general and the oil and gas industry in particular. No evidence was provided regarding drainage from the Protestant's tract.

EXAMINERS' OPINION

An owner of oil and gas is entitled to a reasonable opportunity to recover the remaining recoverable hydrocarbons underlying his tract, and any denial of that reasonable opportunity amounts to confiscation. *Atlantic Refining Co. v. Railroad Commission*, 346 S.W.2d 801 (Tex. 1961); *Imperial American Resources Fund, Inc. v. Railroad Commission*, 355 S.W.2d 280 (Tex. 1977). When the subject tract contains regular locations, the applicant for a Rule 37 exception based on confiscation must prove that the proposed irregular location is necessary to provide it the required reasonable opportunity to recover its fair share of recoverable hydrocarbons and that the proposed location is reasonable.

The examiners are of the opinion that Chesapeake proved that the requested Rule 37 exception is necessary to prevent confiscation. Proposed Well No. 3H is the third well on the 191.571 – acre Pappajohn Unit. Gas-in-place beneath the entire Pappajohn Unit is estimated to be 37.803 Bcf. The fair share of gas of Chesapeake and its lessors is measured by the current recoverable gas beneath the Unit. Assuming a recovery factor of 35%, the current recoverable gas beneath the Unit is about 13.231 Bcf.

Assuming that the proposed Pappajohn Unit, Well No. 3H will recover 1349.6 MMcf plus .6947 MMCF for every foot of perforated lateral, as predicted by Chesapeake's plot of estimated ultimate recovery ("EUR") versus perforated lateral length for 25 Barnett Shale wells within a four-mile area, the well will recover about 4.424 Bcf of the 13.231 Bcf of gas-in-place beneath the Pappajohn Unit. There are two other wells on the Unit, Well Nos. 1H and 2H. Chesapeake argued that the expected EUR for the Pappajohn 1H would be approximately 4.059 Bcf, and for the Pappajohn 2H the expected EUR would be approximately 4.606 Bcf. Together, the total gas expected from the existing wellbores would be 8.665 Bcf. Therefore, additional wells are required to recover the remaining 4.566 Bcf of recoverable gas (13.231 Bcf minus 8.665 Bcf). The proposed Pappajohn Unit Well No. 3H is necessary to provide Chesapeake and its lessors with a reasonable opportunity to recover their fair share of gas, and, given the existing wells and the location of unleased tracts, no alternative regular location will provide the same, or as good as, an opportunity.

The examiners have considered the correlative rights of the protestants on their unleased tract, but these rights must be weighed against the correlative rights of Chesapeake and the hundreds of its lessors that have been pooled into the Pappajohn Unit. Chesapeake made an attempt to lease the protestants' tract, and based upon the statement made by the protestants at the hearing the only reason the protestants' interests are not leased is the protestants' general environmental concerns regarding oil and gas development. No evidence was produced at the hearing that the proposed well would harm the environment. None of the issues raised by the protestants were issues that are a factor in a Rule 37 proceeding. This point was conceded by the protestant.¹ Furthermore, evidence was presented at the hearing that the fracture stimulation would not impact freshwater and that the casing is adequate to protect fresh water. Chesapeake has demonstrated that confiscation of gas belonging to Chesapeake and its lessors will occur unless the exception is granted.

There appears to be no regular or less irregular location where a feasible horizontal or vertical well could be drilled that would enable Chesapeake and its lessors to recover their fair share of gas. In fact, if Chesapeake is not granted the Rule 37 exception, the NPZ restricted drainhole available for completion would be only 2,736 feet in length, which would only recover approximately 3.250 Bcf of gas. Conversely, allowing Chesapeake the full drainhole length of 4,425 feet would result in a possible recovery of 4.424 Bcf. Not granting the exception would reduce the recovery of Chesapeake and its lessors by 1.173 Bcf and thereby prevent Chesapeake from recovering its fair share of the recoverable reserves beneath the unit.

¹ Tr. p. 78.

The examiners have concluded that the location of the proposed Pappajohn Unit, Well No. 3H is reasonable. This location is a continuation of Chesapeake's plan to effectively and efficiently recover gas from the Unit, and there appears to be no less irregular location in relationship to the unleased tracts that are internal to the Unit. Accordingly, the examiners recommend that the Chesapeake application be approved. Based on the evidence in the record in this docket, the examiners recommend adoption of the following Findings of Fact and Conclusion of Law.

FINDINGS OF FACT

1. At least ten (10) days notice of this hearing was provided to all affected persons as defined by Statewide Rule 37(a)(2) and 37(a)(3) and the special field rules for the Newark, East (Barnett Shale) Fields.
2. Chesapeake Energy, Inc. ("Chesapeake") seeks a drilling permit pursuant to the provisions of Statewide Rule 37 for the Pappajohn Unit, Well No. 3H, a proposed horizontal well in the Newark, East (Barnett Shale) Field, Tarrant County, Texas.
3. Special field rules for the Newark, East (Barnett Shale) Field provide for a 330-foot lease line spacing. As to horizontal wells, where the horizontal portion of the well is cased and cemented back above the top of the Barnett Shale formation, the distance to any property line, lease line, or subdivision line is calculated based on the distance to the nearest perforation of the well, and not based on the penetration point or terminus. Where an external casing packer is placed in a horizontal well and cement is pumped above the external casing packer to a depth above the top of the Barnett Shale formation, the distance to any property line, lease line, or subdivision line is calculated based on the top of the external casing packer or the closest open hole section in the Barnett Shale. The standard drilling and proration Unit for the Newark, East (Barnett Shale) Field is 320 acres. An operator is permitted to form optional drilling units of 20 acres.
4. The surface location of the well is 829 feet from the north line and 801 feet from the west line of the Thomas, HRS JP, A-1525, in Tarrant County. The surface location is within the Pappajohn Unit, 476 feet from the southwest line of the Unit and 829 feet from the north line of the Unit. The penetration point is 50 feet from the west line of the Unit and 478 feet from the south line of the Unit. The terminus of the proposed well is 354 feet from the east line and 1233 feet from the north line of the Thomas, HRS JP, A-1525, in Tarrant County, within the Pappajohn Unit, 188 feet from the southeast line of the Unit and 361 feet from the north east line of the Unit. Appendix 1 to this proposal for decision, incorporated into this finding by reference is a plat showing the Pappajohn Unit and Proposed Well No. 3H, the tracts that comprise this pooled unit, and the unleased tract.

5. The surface location of this well shown on Appendix 1 to this proposal for decision is an appropriate surface location available to Chesapeake for the drilling of a well in the Pappajohn Unit.
6. A Rule 37 exception is needed for the proposed Pappajohn Unit, Well No. 3H because the section of the well proposed to be perforated is closer than 330 feet to the boundary of the Unit and to the boundary certain tracts internal to the Unit that are unleased.
7. There was no evidence that the original gas-in-place beneath the Pappajohn Unit has been drained by wells that are on adjacent tracts.
8. The recoverable gas in place beneath the Pappajohn Unit is 13.231 Bcf.
9. The two existing wells on the Pappajohn Unit will ultimately recover approximately 8.665 Bcf of gas, leaving approximately 4.566 Bcf unrecovered without any additional wells.
10. Chesapeake, as the operator of all tracts adjacent to the Unit, has waived objection to the Rule 37 exception requested for Well No. 3H.
11. The Chesapeake application is opposed by an owner of one unleased tract internal to the Pappajohn Unit closer than 330 feet to the drainhole of the proposed well. Chesapeake made an attempt to lease the protestant's tract, but was unsuccessful.
12. The Barnett Shale has an average thickness in this area of 320 feet and is present and productive throughout the area of the Pappajohn Unit.
13. Barnett Shale gas wells within four miles of the proposed Pappajohn Unit, Well No. 3H recover an average of 1,349.6 MMCF of gas plus .6947 MMCF per foot of horizontal drainhole.
 - a. Chesapeake studied production data, effective drainhole length, and decline curves to develop estimated ultimate recoveries for 25 Barnett Shale gas wells within four miles of the pad site proposed for Well No. 3H.
 - b. Chesapeake generated a plot of estimated recovery versus drainhole length for the 25 study wells. A computer generated least squares regression of the data point on the plot developed a line through the data points with a positive slope of .6947 and an intercept of 1,349.6.
 - c. The implication of Chesapeake's study is that a horizontal well in the area will have an estimated ultimate recovery of 1,349.6 MMCF of gas plus .6947 MMCF per foot of horizontal drainhole.

14. Due to the size and configuration of the Pappajohn Unit and the location of tracts internal to the Unit that have unleased interests, there is no regular location on the Unit, 330 feet or more away from the surrounding mineral property lines, where a feasible horizontal well might be drilled. A vertical well is not feasible due to limited recovery and vertical well could not be drilled at a surface location on the Pappajohn Unit due to intensive surface development and restrictions in Chesapeake's oil and gas leases.
15. The proposed Pappajohn Unit, Well No. 3H will have perforated lateral length of 4,425 feet. Assuming, as predicted by Chesapeake's plot of EUR versus perforated lateral length, this well will recover 1,349.6 MMCF of gas plus .6947 MMCF for every foot of lateral drainhole, the well will recover approximately 4.424 Bcf.
16. A well that followed the identical path of the proposed well but was not perforated to avoid the unleased tracts would result in approximately 1.173 Bcf of unrecovered gas reserves.
17. Drilling of the Pappajohn Unit, Well No. 3H at the location proposed by Chesapeake is necessary to provide Chesapeake and its lessors with an opportunity to recover their fair share of gas from the reservoir.
18. The proposed location of the Pappajohn Unit, Well No. 3H is reasonable. There is no less irregular location in relationship to the unleased tracts that are internal to the Pappajohn Unit.

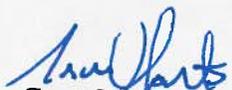
CONCLUSIONS OF LAW

1. Proper notice of hearing was timely issued by the Railroad Commission to appropriate persons legally entitled to notice.
2. The Commission has jurisdiction over the subject matter and the parties in this proceeding.
3. Approval of the Rule 37 exception for the Pappajohn Unit, Well No. 3H, as proposed by Chesapeake Energy, Inc. is necessary to prevent confiscation and protect the correlative rights of mineral owners.

RECOMMENDATION

The examiners recommend that the application of Chesapeake Energy, Inc. for a Rule 37 exception for the Pappajohn Unit, Well No. 3H, in the Newark, East (Barnett Shale) Field, Tarrant County, Texas, be granted as necessary to prevent confiscation and protect correlative rights.

Respectfully submitted


Gene Montes
Hearings Examiner


Richard D. Atkins
Technical Examiner