



RAILROAD COMMISSION OF TEXAS

OFFICE OF GENERAL COUNSEL

RULE 37 CASE NO. 0267849
STATUS NO.700367
DISTRICT NO. 09

APPLICATION OF TITAN OPERATING, L.L.C. FOR A RULE 37 EXCEPTION FOR ITS HILLIARD NORTH UNIT, WELL NO. 1-H, NEWARK, EAST (BARNETT SHALE) FIELD, DENTON COUNTY, TEXAS

APPEARANCES:

FOR APPLICANT TITAN OPERATING, L.L.C.:

Flip Whitworth
John Hicks
Chris Hammack, P.E.
William Butch Ford
Rick Johnston, P.E.

FOR PROTESTANTS JOSEPH A. ROUGRAFF, et al:

George C. Neale
Eric Jellison
Tammi Vaida

FOR PROTESTANT DAVID WILSON:

David Wilson

PROPOSAL FOR DECISION

PROCEDURAL HISTORY

DATE REGULAR PERMIT GRANTED:	September 20, 2010
DATE ORIGINAL RULE 37 APPLICATION FILED:	October 5, 2010
DATE PENDING RULE 37 APPLICATION FILED:	December 8, 2010
DATE OF NOTICE OF HEARING:	November 17, 2010
DATE OF HEARING:	December 8, 2010

HEARD BY:	Marshall Enquist, Hearings Examiner Richard Atkins, Technical Examiner
PFD PREPARED BY:	Colin K. Lineberry, Hearings Examiner
DATE TRANSCRIPT RECEIVED:	December 23, 2010
DATE PFD CIRCULATED:	July 29, 2011

STATEMENT OF THE CASE

Titan Operating, LLC (“Titan”) seeks an amended drilling permit pursuant to the provisions of Statewide Rule 37 for the as-drilled location of the Hilliard North Unit, Well No. 1H (the “Well”), a horizontal well in the Newark, East (Barnett Shale) Field (“Field”), Denton County, Texas, to prevent confiscation and waste. The Hilliard North Unit lies within the Town of Flower Mound. Titan initially received a drilling permit for the Well on August 9, 2010, in order to initiate the permitting process with the Town of Flower Mound. Titan received an amended permit for the Well on September 20, 2010. The plat accompanying the September 20, 2010 permit included a 4,421-foot no perforation zone (“NPZ”).

On October 5, 2010, Titan filed an amended application seeking a Rule 37 exception to remove the 4,421-foot NPZ restriction. On November 24, 2010, Titan filed an application amending its request to remove the NPZ and also reducing the size of the drilling unit from 551.662 acres to 204.024 acres. Although the size of the drilling unit changed with the November 24, 2010 amended application, the location of the well did not change, and the persons potentially affected by the Rule 37 exception also did not change. At the hearing, Titan offered an amended W-1/W-1H application with an accompanying plat reflecting additional leased acreage that Titan had obtained from the Texas General Land Office, which changed the unit size to 204.157 acres but did not change the location of the well or the persons potentially affected by the Rule 37 exception.

The removal of the 4,421-foot NPZ would allow Titan to perforate the Well at points closer than the 330-foot minimum spacing distance provided by the field rules from various unleased lots within the perimeter boundaries of Titan’s proposed 204.157 acre drilling unit (the “Unit”). Appendix 1 to this PFD is Titan Exhibit 7, which is a copy of the plat associated with the present application, showing that Titan proposes to perforate the well in the section of the well from the proposed upper perforation (“1H PP/UP”) to the proposed bottom perforation (“1H BH/BP”). The surface location of the Well is outside the Unit, 1536 feet from the east line and 2879 feet from the north line of the J. White Survey, A-1341, Denton County, Texas. The penetration point location is 1705 feet from the east line and 1203 feet from the north line of the J. White Survey, A-1341. The terminus location is 1391 feet from the east line and 4025 feet from the south line of the H. Murphy Survey, A-822, Denton County, Texas. With the proposed removal of the NPZ, the distance to the nearest lease line is 11 feet.

A Notice of Intent to Appear in Protest of Titan’s application was filed by David & Rebecca Wilson, Joseph & Susan Rougraff, David & Joanne Dinwoodie, Quincy Neal, Olivette Whipple, Michael & Susan Lampa, John & Alice Cameron Holmes, Andrew & Josephine Morris, Stephen Purol, and Ronald Reeh, each being an owner of a tract within 330 feet of the

section of the Well now within the NPZ. David Wilson appeared pro se at the hearing, and the rest of the protestants were represented by counsel.

DISCUSSION OF THE EVIDENCE

Titan Operating, L.L.C.'s Evidence and Arguments

Titan presented testimony and exhibits from three expert witnesses—two engineers and one landman. Titan's evidence demonstrated that the outside boundaries of the Hilliard North drilling Unit proposed by Titan in its amended application encompass 226.822 acres. Titan has leases covering 204.157 acres, or 90% of the acreage within the Unit boundaries. The combined acreage of protestants' tracts is 3.276 acres, or 1.44% of the acreage within the Unit boundaries. In its attempts to lease all of the acreage within the boundaries of the Unit, Titan offered to lease all of protestants' tracts. All unleased owners within the Unit were offered leases by Titan. At the hearing, Titan repeated its willingness to enter into a lease with any unleased owner, offering a 25% royalty with a lease bonus of \$5,000 per acre. The Unit is inside the boundaries of the Town of Flower Mound, Texas, and, other than the Well's surface location tract, the Unit is heavily developed with residential housing.

Titan employed an expert petroleum engineer to perform a study of the Newark, East (Barnett Shale) Field in and around the Well. Based on a cross-section of well logs in the vicinity of the Unit, Titan's engineering expert testified that the Field is productive and present at an approximate thickness of 370 feet under the entirety of the proposed Unit. Titan's consulting engineer also calculated the recoverable reserves in the Field under the Unit. Based on Titan's application and considering the reservoir thickness of 370 feet and the 204 acres included in the Unit, the expert concluded that the total gas in place beneath the Unit was approximately 37.9 BCF. Using a recovery factor of 30%, the recoverable gas in place beneath the Unit is approximately 11.4 BCF, while the total recoverable gas in place beneath the protestants' tracts is approximately 0.182 BCF.

Titan's consulting engineer presented an area map showing gas wells drilled in the Field within five miles of the Well terminus. For those gas wells within five miles for which adequate production data was available, Titan's engineer determined the estimated ultimate recovery ("EUR") for each well. Using completion reports on file with the Commission, Titan's engineer determined the effective drainhole length for these wells. He then generated a plot of EUR vs. drainhole length and used a least squares regression of the data to fit a line through the plotted points. Titan's engineer concluded from this study that each foot of horizontal drainhole would ultimately recover 644 MCF of gas, and the removal of the 4,421-foot NPZ would result in the recovery of 2.8 BCF of gas that would otherwise not be produced. Titan's engineering expert testified that, in his opinion, the removal of the NPZ is necessary to afford the mineral interest owners within the Unit a reasonable opportunity to recover their fair share of the gas that underlies their acreage, and to avoid the physical waste of 2.8 BCF of gas. The protestants did not controvert Titan's evidence regarding the recoverable gas in place beneath the unit as a whole or beneath the protestants tracts.

The engineer further testified that Titan designed the Well's path to maximize the lateral length that could be drilled without trespassing under unleased tracts in order to maximize the production of gas underlying Titan's and its lessors Unit. Titan also designed the Well to minimize the number of unleased tracts within 330 feet of the wellbore while accounting for technical drilling limitations and to provide room for additional wells for future development. In his opinion, the location of the proposed Well is reasonable because there is no alternative location in the Unit that could be feasibly drilled that is as long as the proposed Well, and any wells drilled in a different location would negatively affect Titan's ability to drill subsequent wells to fully develop the Unit.

The locations of the unleased tracts in the Unit are such that there are no regular locations for a horizontal well in the entire western half of the Unit, and there can be no take points in the western portion of the Unit without a Rule 37 exception. The only locations for drilling an alternate well without a Rule 37 exception are found in the eastern portion of the Unit. Although Titan could, in theory, drill directional S-curve vertical wells from the off-Unit surface location to regular locations in the eastern portion of the Unit, such wells would not be economic and are not a viable alternative to allow Titan and its lessors a reasonable opportunity to recover their fair share of the gas underlying the Unit. The Barnett Shale in the general vicinity of the Unit is developed with horizontal wells. According to Titan, the maximum length horizontal well that it could drill without a Rule 37 exception would have a drainhole length of between 1300 and 1500 feet, and such a well would not pay back its drilling and completion costs.

Titan has leases on acreage to the south, north, and west of the 204.157-acre Unit proposed in the current application. To the south, Titan has drilled the Hilliard South Unit 1H well. In earlier versions of the current application for the Well, Titan's application and plat had included some of the adjacent leased acreage to the north and west on the current Unit. Titan's expert witness testified that, even considering a theoretical expanded unit of 683.026 acres—formed by combining the 204.157-acre Unit with Titan's additional leased acreage to the north and west of the Unit—there is no way that Titan could drill an economic well from its surface location without a Rule 37 exception. Titan's surface location for the Hilliard North Unit is located off the Unit to the south.

Within the theoretical expanded unit, there are areas to the north and northwest of the current Unit where a regular horizontal well of significant length could theoretically be drilled. For convenience, these regular areas outside the Unit are referred to in this PFD as the "Theoretical Regular Areas." Titan's expert witnesses testified that there is no surface location available for drilling a well to the Theoretical Regular Areas. Titan analyzed the possibility of drilling from its surface location south of the Unit to the Theoretical Regular Areas. Titan's expert witnesses testified that Titan could not drill a well from its surface location into the Theoretical Regular Areas without trespassing through unleased tracts. To avoid unleased tracts, a well drilled into the Theoretical Regular Areas from the Well's surface location would require angles and turns that are technically not possible to drill.

In addition, Titan's witnesses testified that there are no other surface locations available from which a well could be drilled into the Theoretical Regular Areas. Titan's engineers analyzed all of the surface tracts in the Unit and in the vicinity of the Unit to determine whether

they could be permitted with the Town of Flower Mound and determined that no other locations could be permitted. The Town of Flower Mound has a drilling ordinance that limits the available surface locations for a well. Under these ordinances, there are various setbacks from numerous classifications of buildings and properties. For example, the ordinances provide for a 1000-foot setback for a gas well from public parks and public buildings and from property the owner of which does not have a mineral interest in the well itself, and a 500-foot setback from property the owner of which does have a mineral interest in the well. The Town of Flower Mound's Oil and Gas Board of Appeals has discretion to issue variances to these setback distances, but the distances can never be reduced, even with a variance, below certain minimum distances. For example, even with a variance, a well must be 500 feet from any religious institution, public building, hospital, school, or any residence the owner of which does not have a mineral interest in the well; and 300 feet from any residence the owner of which does have a mineral interest in the well and from any building used, or designed and intended to be used, for human occupancy.

Titan's witness testified regarding its recent experience attempting to obtain variances from the Town of Flower Mound's Oil and Gas Board of Appeals ("Board of Appeals"). In October 2009, before permitting its current surface location on the Hilliard tract, Titan had requested a permit for a surface location that would have required variances from the Board of Appeals. The location requiring variances would have been further away from homes and from a major arterial city street, so both Titan and the surface owner believed the location was a better site for Flower Mound and its residents. The Town's Board of Appeals, however, denied all four of Titan's variances in May 2010. This action compelled Titan to obtain a permit at its current surface location, which required no variances but is closer to homes and a major street.

Both Titan and the Protestants introduced a map from the Town of Flower Mound that showed "Areas of No Drilling," which are areas that Flower Mound's drilling ordinances would not allow to be used for drillsites, even with variances. The "Areas of No Drilling" map shows a small area north of the Unit where drilling might theoretically be allowed if the Board of Appeals granted a variance down to a 300-foot setback and a small area south of the Unit where drilling might theoretically be allowed without a variance. For convenience, the small area north of the Unit is referred to as the "Theoretical Northern Drillsite," and the small area south of the Unit is referred to as the "Theoretical Southern Drillsite." Titan's expert witness testified that Titan's engineers had analyzed all potential surface locations in the area in and surrounding Titan's leased acreage, including the Theoretical Northern Drillsite and the Theoretical Southern Drillsite, and had determined there were no surface locations that Titan could legally permit, even with the minimum setbacks allowed with a variance, other than the current surface location.

Around the Theoretical Northern Drillsite are (i) a school; (ii) tracts owned by parties who do not have a mineral interest in the Well; and (iii) tracts owned by those who could not have a mineral interest in a well because the mineral estate has been severed from the surface estate. From each of these properties, the minimum setback is 500 feet, even with a variance. The "Areas of No Drilling" map, however, shows the Theoretical Northern Drillsite as a no-drilling area if the variance is only 500 feet. In addition, the Theoretical Northern Drillsite is not available as a surface location because Titan does not have permission from the surface owner to drill in that area, and the surface owner cannot grant such permission because, according to

documents filed in the property records of Denton County, the property is subject to a conservation easement that requires it to be left in its natural state.

Titan's witness testified that Titan had not been able to obtain surface access from the owner of the surface of Theoretical Southern Drillsite. In addition, this expert concluded that the Theoretical Southern Drillsite would not allow a well to be drilled across the Unit to the Theoretical Regular Areas, which are north of the Unit.

In summary, Titan's position is that the requested Rule 37 exception for the as-drilled location of the Well is necessary to prevent confiscation and waste—to provide Titan and its lessors a reasonable opportunity to recover their fair share of gas beneath the Unit, or their equivalent in kind, and to prevent the ultimate loss of approximately 2.8 BCF of otherwise recoverable gas. Titan believes that the location of the Well is reasonable because it is designed to minimize the number of unleased tracts within 330 feet while maximizing lateral length and accommodating potential future wells necessary to develop the Unit.

Protestants' Evidence and Arguments

Protestant David Wilson stated that Flower Mound is a bedroom community and that he does not want it industrialized for the sake of profit. He also stated his concern that drilling puts his family and his property at risk, and stated there are other places to drill. He also stated his opinion that the people of Flower Mound are staunchly against drilling and that elected officials who had approved drilling in Flower Mound were "unelected" in the last election.

Titan's witness testified that Titan had not been able to obtain surface access from the owner of the surface of Theoretical Southern Drillsite. In addition, this expert concluded that the Theoretical Southern Drillsite would not allow a well to be drilled across the Unit to the Theoretical Regular Areas, which are north of the Unit.

In summary, Titan's position is that the requested Rule 37 exception for the as-drilled location of the Well is necessary to prevent confiscation and waste—to provide Titan and its lessors a reasonable opportunity to recover their fair share of gas beneath the Unit, or their equivalent in kind, and to prevent the ultimate loss of approximately 2.8 BCF of otherwise recoverable gas. Titan believes that the location of the Well is reasonable because it is designed to minimize the number of unleased tracts within 330 feet while maximizing lateral length and accommodating potential future wells necessary to develop the Unit.

Protestants' Evidence and Arguments

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The Protestants presented testimony and exhibits from Eric Jellison, a software-company owner who serves on Flower Mound's Oil & Gas Advisory Board. Mr. Jellison testified that he was very familiar with the process for obtaining a permit for a surface location in Flower Mound and with the procedures for seeking a variance to Flower Mounds ordinance requirements. He used the map from the Town of Flower Mound showing the "Areas of No Drilling" based on the town's ordinances to identify an alternative site, the Theoretical Northern Drillsite, which is outside of Titan's current Unit. This witness testified that the Theoretical Northern Drillsite "is possibly a legally permittable site" that would require "some variances" from the City of Flower Mound. Although the Theoretical Northern Drillsite and its associated well would both be outside the 204.157-acre Unit in Titan's current application, they would be inside the 551.662-acre unit shown on the plat submitted by Titan in the prior version of its application. The well suggested by the protestants would be approximately 3900 feet long and would not require a Rule 37 exception.

Protestants' witness also opined, based on Flower Mound's "Areas of No Drilling" map, that there are other surface locations available to Titan to the south of the Unit that would be permissible under the Town's ordinances, one of which would not require a variance ("Theoretical Southern Drillsite"). In the case of the Theoretical Southern Drillsite, protestants' witness acknowledged on cross-examination that the area is currently platted as a subdivision and that use of that surface location would require that the current surface owner replat the area and obtain approval of the Flower Mound city council of the replat. Mr. Jellison further testified that there have been 19 applications for pad site variances to the City of Flower Mound and that only one of these was ultimately denied. On cross-examination, Mr. Jellison acknowledged that the current variance review board had recently taken office and had not yet approved any variances for surface locations.

Regarding the "Areas of No Drilling" map, Mr. Jellison acknowledged that the map does not include all setbacks for property lines, storage tanks, public roads, water wells, and environmentally sensitive areas. He also acknowledged that he did not know when the map was prepared other than sometime after 2007, and that the map would not reflect restrictions based on new housing construction since the map was prepared.

In summary, protestants' position is that there are alternative surface locations for which Titan could possibly obtain permits from the Town of Flower Mound, although variances and/or approval of a replat would likely be required. Protestants therefore argued that there is the possibility that Titan could drill an alternative well from an alternative surface location with a lengthy lateral that would not require a Rule 37 exception.

EXAMINERS' OPINION

An owner of oil and gas is entitled to a reasonable opportunity to recover the reserves underlying his tract or their equivalent, and any denial of that 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*, 557 S.W.2d 280 (Tex. 1977). The Supreme Court has stated that the proper test of confiscation under Rule 37 is,

... whether an owner, with wells that already exist, has been accorded a fair and equal opportunity with other producers of surrounding tracts within the drainage area to recover his fair share of the oil in place beneath his tract. If he has, no confiscation results.¹

In determining correlative rights, the Commission does not consider past production.² Fair share is based on current recoverable reserves and not original reserves.³

There are two primary elements that must be demonstrated by an applicant seeking a Rule 37 exception base on confiscation/correlative rights:

1. It is not feasible for the applicant to recover his fair share by placing the well at any regular location.
2. That the proposed irregular location is reasonable and is necessary due to surface or subsurface conditions.⁴

The examiners are of the opinion that Titan proved that the requested Rule 37 exception is necessary to prevent confiscation. The uncontroverted evidence showed that the current recoverable reserves beneath the 204.157-acre Unit are about 11.4 BCF of gas. Titan and all of its lessors in the Unit are entitled to a reasonable opportunity to recover their fair share of gas beneath the Unit, and any denial of that opportunity would amount to confiscation.

The drilling permit issued for the Well on September 20, 2010, required that the Well not be perforated at any point within a NPZ having a length of 4,421 feet. The purpose of the present application is to eliminate this NPZ so that the Well will have an opportunity to recover gas along the entire length of the horizontal drainhole from the upper perforation to the lower perforation. The Well, as presently permitted with NPZ restrictions will not afford Titan and its lessors with a reasonable opportunity to recover their fair share of gas from beneath the Unit. The evidence shows that encumbering the Well with a NPZ of 4,421 feet would cause about 2.8 BCF of producible gas to be unrecovered.

It is not feasible to drill vertical wells to develop the Field in and around the Unit because multiple vertical wells, at a substantially increased cost, would be required to produce the same reserves that can be produced by a single horizontal well. Modern development of the Field is

¹ *Railroad Commission v. Williams*, 356 S.W.2d 131, 136 (Tex. 1961).

² *Texaco Producing, Inc. v. Fortson Oil Company*, 798 S.W.2d 622, 625 (Tex. App. -- Austin 1990, *no writ*) **citing**, *Railroad Commission v. Texas Company*, 298 S.W.2d 666, 668 (Tex. Civ. App. -- Austin 1957, *writ ref'd n.r.e.*).

³ *See Railroad Commission v. Magnolia Petroleum Co.*, 169 S.W.2d 253, 255 (Tex. Civ. App. -- Austin 1943, *no writ*).

⁴ *Railroad Commission's Discussions of Law, Practice and Procedure*, p. 32 (Oil & Gas Division 1992).

almost exclusively by horizontal wells. Vertical wells drilled at the regular locations on the eastern portion of the Unit would not give Titan and its lessors a reasonable opportunity to recover their fair share of the gas underlying the Unit. Similarly, a short horizontal well on the eastern portion of the Unit is not feasible because it too would not recover the gas in the western portion of the Unit.

The examiners believe also that the as-drilled location of the Well is reasonable. The location minimizes the number or unleased properties within 330 feet of the wellbore while maximizing total length and leaving room for future development of the Unit. There is no location on the Unit for a horizontal well of comparable length that would be less irregular. The location of the Well is also reasonable for the configuration of the Unit, the location of unleased tracts, and the need to drill from a surface location south of the eastern portion of the Unit.

The examiners are not persuaded by protestants' argument that the application should be denied due to Titan's theoretical ability to obtain alternative surface locations near the Unit. Titan analyzed all of the potential surface locations on or near its leased acreage, and found that they were not viable alternatives. Protestants' argument is based on a map from the Town of Flower Mound's website that shows only a subset of restricted drilling areas. As protestants' witness testified, the map on its face states that it does not include the setbacks associated with property lines, storage tanks, public roads, water wells, and environmentally sensitive areas. Accordingly, because there are known setbacks that are not shown on the map, the map only provides evidence of where drilling is restricted, not evidence of where drilling may be permitted. Protestants presented no persuasive evidence that their proposed alternate surface locations would be permissible by the Town of Flower Mound. Moreover, even if one of protestants' alternative surface locations would be permitted by the Town of Flower Mound, Titan has already gone through a time-consuming process of acquiring a permitted surface location that is adjacent to the Unit and is appropriate for drilling the Well in order to develop the Unit.

The examiners are also not persuaded by protestants' argument that Titan's 204.157-acre Unit in its current application should be disregarded in favor of the larger 551.662-acre unit that was part of an earlier version of this application. Operators have the right to permit their wells based on whatever acreage they wish, as long as they comply with the Commission's rules and regulations and their lease authority.

The examiners have considered the correlative rights of the protestants. The evidence shows that the protestants have two concerns with Titan's Rule 37 application. One concern is that drilling the Well places the protestants' families and property at risk. This proceeding is simply to determine whether a spacing exception to remove an NPZ restriction should be approved. While the Commission does not take safety concerns lightly, a hearing for a lease-line spacing exception is not the proper venue to address drilling safety concerns. Further, in this case, the well has already been drilled.

Second, the protestants are concerned that the approval of a Rule 37 exception will result in the drainage of minerals underlying their tracts. But protestants' position that a well should not be authorized if it may drain hydrocarbons from beneath a neighboring tract owned by a

person who has not consented to the well is directly in conflict with the well-established Rule of Capture adopted long ago by Texas courts. While any potential drainage of unleased tracts should be considered in determining the reasonableness of the proposed Rule 37 exception, the fact that there may be some drainage does not necessarily preclude the granting of a Rule 37 exception.

While the protestants' correlative rights associated with their mineral interests must be considered, so must the correlative rights of Titan and all of its lessors throughout the Unit. Although retention of the NPZ might serve to protect the protestants' interests, at the same time it would adversely impact the correlative rights of Titan and its lessors by depriving the Well of the opportunity to recover 2.8 BCF of recoverable gas. Moreover, if the NPZ is not removed, this recoverable gas could be left in the ground, as there is no evidence that the protestants plan to, or could, drill their own wells to recover this gas.

Based on the record in this case, the examiners recommend adoption of the following Findings of Fact and Conclusions 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) Field.
2. Titan Operating, LLC ("Titan") seeks an exception to Statewide Rule 37 for the as-drilled location of the Hilliard North Unit, Well No. 1H, Newark, East (Barnett Shale) Field, Denton County, Texas.
3. On September 20, 2010, Titan obtained a permit to drill the Hilliard North Unit, Well No. 1H. This permit authorized Titan to drill the well with a no perforation zone. With the no perforation zone in place, Titan's application met the applicable spacing rules and was approved administratively. A plat associated with the Form W-1 (Application for Permit to Drill, Recomplete, or Re-Enter) that resulted in issuance of the permit, which shows the Hilliard North Unit and Well No. 1H with the no perforation zone, is attached to this proposal for decision as Appendix 1, which is incorporated into this finding by reference.
4. The purpose of the present application for an amended Rule 37 exception permit for the as-drilled location of the well is to remove the no perforation zone included in the well's permit issued on September 20, 2010.
5. Special field rules for the Newark, East (Barnett Shale) Field provide for 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 in the well, and not based on the penetration point or terminus or any other non-perforated portion of the drainhole between the

penetration point and terminus. 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.

6. A plat showing the 204.157-acre Hilliard North Unit and the location of Well No. 1H is attached to this proposal for decision as Appendix 1, which is incorporated into this finding by reference.¹
7. The surface location of the Well is outside the Unit, 1536 feet from the east line and 2879 feet from the north line of the J. White Survey, A-1341, Denton County, Texas. The penetration point location is 1705 feet from the east line and 1203 feet from the north line of the J. White Survey, A-1341. The terminus location is 1391 feet from the east line and 4025 feet from the south line of the H. Murphy Survey, A-822, Denton County, Texas.
8. Well No. 1H is the first well on the Hilliard North Unit.
9. A Rule 37 exception is needed for Well No. 1H because the well's drainhole from the proposed upper perforation to the proposed lower perforation is closer than allowed by the lease line spacing rule to certain unleased tracts internal to the Hilliard North Unit.
10. The Titan application is opposed by David & Rebecca Wilson, Joseph & Susan Rougraff, David & Joanne Dinwoodie, Quincy Neal, Olivette Whipple, Michael & Susan Lampa, John & Alice Cameron Holmes, Andrew & Josephine Morris, Stephen Purol, and Ronald Reeh, each being an owner of a tract within 330 feet of the section of the Well now within the no perforation zone. Of these protestants, David Wilson appeared at the hearing. Joseph Rougraff and the other protestants were represented at the hearing by their attorney and by their non-attorney representative.
11. The outside boundaries of the Hilliard North Unit proposed by Titan in its amended application encompass 226.822 acres. Titan has leases covering 204.157 acres, or 90% of the acreage within the Unit boundaries. The combined acreage of protestants' tracts is 3.276 acres, or 1.44% of the acreage within the Unit boundaries.
12. The Barnett Shale formation is present and productive under the entirety of the Hilliard North Unit. The formation is about 370 feet thick in the area of the Unit.
13. Barnett Shale gas wells within five miles of the terminus of the Hilliard North Unit, Well No. 1H ultimately will recover an estimated 644 MCF of gas per foot of horizontal drainhole.

¹ See Titan Ex. 7.

- a. Titan studied production data, effective drainhole length obtained from completion reports, and decline curves to develop estimated ultimate recoveries for about 40 Barnett Shale gas wells within five miles of the terminus of Well No. 1H.
 - b. Titan generated a plot of estimated ultimate recovery versus drainhole length for the 40 study wells.
 - c. Titan's study showed that every foot of horizontal drainhole will ultimately recover approximately 644 MCF of gas.
14. Encumbering the drilling permit for Well No. 1H with no perforation zones sufficient to prevent perforation of the well any closer than 330 feet to the protestants' tracts would not provide Titan and its lessors a reasonable opportunity to recover their fair share of gas.
- a. To preclude perforating Well No. 1H any closer than 330 feet to protestants' tracts, a no perforation zone of 4,421 feet would be necessary.
 - b. Based on the engineering calculation that Barnett Shale gas wells in the area ultimately will recover 644 MCF of gas per foot of drainhole, the inability of Titan to perforate 4,421 feet of drainhole would result in about 2.8 BCF of recoverable gas not being produced.
15. Current recoverable reserves in the Newark, East (Barnett Shale) Field beneath the Hilliard North Unit are about 11.4 BCF.
16. There are no regular locations on the 204.157-acre Hilliard North Unit where a feasible well could be drilled.
- a. The specific locations of the unleased tracts in the Hilliard North Unit eliminate all take points in the western portion of the Unit without a Rule 37 exception. The only locations for drilling an alternate well without a Rule 37 exception are found in the eastern portion of the Unit.
 - b. Horizontal wells limited only to the regular locations on the eastern portion of the Hilliard North Unit are not feasible because they would have very short laterals and not produce sufficient hydrocarbons to afford a reasonable opportunity to recover the reserves under the Unit.
 - c. It is not feasible to drill a vertical well to develop the Barnett Shale in the Unit because such a well would not produce sufficient hydrocarbons to afford a reasonable opportunity to recover the reserves under the Unit. This area of the Barnett Shale is developed by the drilling of horizontal wells, not vertical or directional wells.

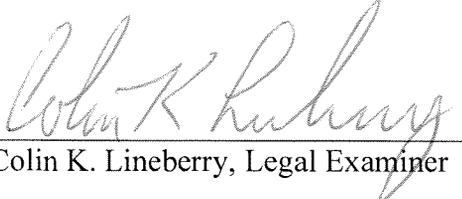
17. Precluding Titan from perforating 4,421 feet of Well No. 1H's drainhole would prevent about 2.8 BCF of recoverable gas from being produced by Well No. 1H.
18. A Rule 37 exception for the Hilliard North Unit, Well No. 1H as proposed by Titan is necessary to enable Titan and its lessors within the Unit to recover their fair share of gas from the Newark, East (Barnett Shale) Field.
19. The as-drilled location of the Hilliard North Unit, Well No. 1H is reasonable.
 - a. The location minimizes the number of unleased tracts within 330 feet of the well while maximizing lateral length and also accommodating potential future wells necessary to develop the Unit.
 - b. There is no location on the Unit for a horizontal well of comparable length that would be less irregular.
 - c. The location of the well is reasonable for the configuration of the Unit, the location of unleased tracts, and the need to drill from the available surface site located off the Unit.
 - d. Expected ultimate recovery from the well, even with the exception, will be less than half of the current recoverable reserves in the Newark, East (Barnett Shale) Field beneath the Hilliard North Unit of about 11.4 BCF.

CONCLUSIONS OF LAW

1. Proper notice of hearing was timely issued by the Railroad Commission to appropriate persons legally entitled to notice.
2. All things necessary to the Commission attaining jurisdiction over the subject matter and the parties in this hearing have been performed.
3. Approval of a Rule 37 exception for the as-drilled location of the Hilliard North Unit, Well No. 1H as proposed by Titan, is necessary to prevent confiscation and to protect the correlative rights of mineral owners.

RECOMMENDATION

The examiners recommend that the application of Titan Operating, LLC for a Rule 37 exception for the applied-for drilled location of the Hilliard North Unit, Well No. 1H in the Newark, East (Barnett Shale) Field, Tarrant County, Texas, be granted as necessary to prevent the confiscation of 2.8 BCF of recoverable gas and protect correlative rights.



Colin K. Lineberry, Legal Examiner



Richard Atkins, Technical Examiner