



RAILROAD COMMISSION OF TEXAS

OFFICE OF GENERAL COUNSEL

August 15, 2012

Rule 37 Case No. 0272775

Status No. 718876

District 09

APPLICATION OF CHESAPEAKE OPERATING, INC. FOR A RULE 37 EXCEPTION FOR THE SASHA LEASE, WELL NO. 2H, NEWARK EAST (BARNETT SHALE) FIELD, TARRANT COUNTY, TEXAS.

APPEARANCES:

FOR APPLICANT:

Glenn Johnson, Attorney
Erin Rolstad, Attorney
David Triana, Petroleum Engineer
Bill Spencer, Regulatory Consultant
Steve Mills, Reservoir Engineer

APPLICANT:

Chesapeake Operating, Inc.

FOR PROTESTANTS:

Edwin Bunton

REPRESENTING:

Self

PROPOSAL FOR DECISION

PROCEDURAL HISTORY

APPLICATION FILED:

December 19, 2011

NOTICE OF HEARING:

January 27, 2012

HEARD BY:

Marshall Enquist - Hearings Examiner

Brian Fancher - Technical Examiner

HEARING DATE :

April 20, 2012

PFD CIRCULATION DATE:

August 15, 2012

STATEMENT OF THE CASE

Chesapeake Operating, Inc. ("Chesapeake" or "Applicant"), seeks an amended drilling permit pursuant to the provisions of Statewide Rule 37 for the Sasha Lease, Well No. 2H, a horizontal well in the Newark, East (Barnett Shale) Field, Tarrant County, Texas. Chesapeake received a drilling permit on October 11, 2011 to drill its Well No. 2H at a Rule 37 location on its pooled unit, which consisted

of 490.63 acres at that time. The permit was restricted by three “no perforation zones” (“NPZs”) and was approved administratively. The well, a 7,233 foot lateral, included a total of approximately 2,414 feet restricted by NPZs, leaving approximately 4,819 feet of wellbore available for perforation.

On October 12, 2011, Chesapeake filed a permit application for its 491.65-acre Sasha Lease, and received a drilling permit on December 19, 2011. The unit area had increased to 498.399 acres at that time. The permit was restricted by a single NPZ 452 feet long. The same day Chesapeake received its drilling permit, December 19, 2011, it filed a new application seeking removal of the 452 foot NPZ on its Well No. 2H.

The surface location of Well No. 2H is on-unit. It is 145 feet from the northeast line and 621 feet from the north line of the lease and 765 feet from the east line and 2138 feet from the south line of the J. Walker Survey, A-1654. The proposed penetration point is 330 feet from the northeast line and 646 feet from the north line of the J. Walker Survey, A-1654. The terminus is 203 feet from the north line and 2384 feet from the south line of the J.B. York Survey, A-1754. The lateral runs on an east-west trend.

Special field rules for the Newark, East (Barnett Shale) Field provide for 330 foot leaseline 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, leaseline, or subdivision line is calculated based on the distance to the nearest perforation point 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, leaseline, 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.

A Rule 37 exception is needed for the proposed Sasha Lease, Well No. 2H, because the section of the well proposed to be perforated is closer than 330 feet to the boundary of Tract 848, which is internal to the unit and unleased. Tract 848 is owned by Edwin Bunton, who filed a Notice of Intent to Appear at this hearing.

DISCUSSION OF THE EVIDENCE

CHESAPEAKE OPERATING, INC.

Chesapeake seeks removal of the “no perforation zone” (“NPZ”) on its Sasha Lease, Well No. 2H imposed on the well by Chesapeake’s December 19, 2011 Commission-approved well permit. The NPZ is marked in red on the attached Appendix I. At the time this permit was approved, the Sasha Lease contained 498.399 acres. By the time of the present hearing, on April 20, 2012, Chesapeake had leased additional acreage for a unit total of 499.168 acres. Chesapeake notes that the unit contains a total of 519.899 acres and that the unit is 96 percent leased. Chesapeake is engaged in ongoing leasing

activities.

An isopach map derived from the logs of nearby wells indicates the Barnett Shale is roughly 332 feet thick under the Sasha Lease. Devon Energy Production Co., LLP conducted a study of the Tarrant/Denton/Wise County area which calculated original gas in place at 105 BCF per square mile in those counties, based on an average formation thickness of 433 feet, porosity of 0.04 and %TOC (Total Organic Carbon) of 4%. Using that study, and correcting for the thickness of the Newark, East (Barnett Shale) Field under the Sasha Lease and the leased acreage, Chesapeake calculated the original gas in place in the 499.168 leased acres of the Sasha Lease to be 83.13 BCF. Assuming a recovery factor of 45%, Chesapeake calculates there is 37.406 BCF of recoverable gas beneath the Sasha Lease.

Chesapeake reviewed the Newark, East (Barnett Shale) Field wells within a 4-mile radius of the proposed well, finding 132 wells within that radius. Plotting the estimated ultimate recovery (EUR) of each of the wells, Chesapeake developed a scatter diagram and used a least squares regression method to produce a trend line to predict the ultimate recovery of a well in the area based on its length. Based on the scatter diagram, with the drainhole length as the "x" axis and the estimated EUR in MMCF as the "y" axis, Chesapeake derived a well recovery formula of " $y = 0.899x + 998.624$ ". This formula indicates each incremental foot of wellbore will recover 899 MCF of gas. The 998.624 is the amount of gas, in MMCF, that Chesapeake would expect to recover with a vertical wellbore and no incremental horizontal drainhole length. Thus, Chesapeake calculates its proposed full-length lateral of 7233 feet will recover 7501 MMCF of gas or 7.501 BCF.

The current NPZ affects 452 feet of the Sasha Lease, Well No. 2H. Absent the removal of the NPZs, Chesapeake argues it would be left with a wellbore lateral available to perforate that is only 6781 feet in length. This would recover 7095 MMCF of gas, leaving 406 MMCF or 0.406 BCF unrecovered. Chesapeake argues that 0.406 BCF of gas is a significant quantity of hydrocarbons.

Failure to remove the NPZ would deprive Chesapeake and its lessors of the opportunity to produce their fair share of the recoverable hydrocarbons in place beneath the 499.168-acre Sasha Lease, which would be confiscation. Absent Rule 37 exceptions and the removal of the existing NPZ, Chesapeake and its lessors will not be able to recover their fair share of the recoverable hydrocarbons beneath the Sasha Lease.

Chesapeake calculated the EUR of its permitted Well Nos. 1H, 3H, 4H, 5H and 6H, plus a hypothetical drainhole totaling 2250 feet which would be impractical to drill at this time due to intervening unleased tracts. If the EURs of the permitted wells and the hypothetical well are added together, they would recover 28.383 BCF of gas for Chesapeake. This is still less than the 37.406 BCF of recoverable gas in place beneath the Sasha Lease, by 9.025 BCF of gas. If proposed Well No. 2H is approved without the NPZ, its recovery of 7.501 BCF of gas would still leave Chesapeake short 1.524 BCF of recoverable gas in place.

PROTESTANTS' POSITION AND EVIDENCE

Edwin Bunton

Mr. Bunton asserts the data used by Chesapeake has been manipulated in order to make the best case possible for Chesapeake. In addition, Mr. Bunton is concerned that perfring, fracking and the underground injection of chemicals may endanger the regional water supply. Some frac fluids may be carcinogenic. Overall, Mr. Bunton believes that Chesapeake's proposed frac of the subject NPZ may endanger Mr. Bunton's property and him personally. The amount of gas that Chesapeake will recover from fracking the NPZ, 0.406 BCF of gas, is simply not enough to justify the risk and the infringement on the Bunton property.

Mr. Bunton believes that Chesapeake does not need the gas within the NPZ. Chesapeake will probably recover some of that gas anyway, from the subject well and the surrounding wells. Ultimately, Chesapeake has not shown that fracking is not a volatile and dangerous endeavor or that it presents no hazard to the environment whatsoever.

EXAMINERS' OPINION

It is the basic right of every landowner or lessee to a fair and reasonable chance to recover the oil and gas under their property as recognized by the Texas Supreme Court in *Gulf Land Co. v. Atlantic Refining Co.*, 131 S.W.2d 73, 80 (Tex. 1939). Denial of that fair chance is confiscation within the meaning of Rule 37. *Id.* To obtain an exception to Statewide Rule 37 to protect correlative rights and prevent confiscation, the applicant must show that 1.) it is not possible for the applicant to recover its fair share of minerals under its tract from regular locations; and 2.) that the proposed irregular location is reasonable.

The examiners are of the opinion that approval of the Statewide Rule 37 exception requested by Chesapeake is necessary to prevent confiscation and protect correlative rights. Chesapeake and its lessors are entitled to recover their fair share of gas from beneath the Sasha Lease. "Fair share" is measured by the currently recoverable reserves beneath the lease, which in this case is 37.406 BCF. The evidence shows that it is not feasible for Chesapeake to recover its fair share of gas from regular locations in the unit. The Sasha Lease Well No. 2H, at its full length of 7233 is projected to recover 7.501 BCF over its useful life.

The issues raised by Mr. Bunton relate in large part to the possibility of environmental dangers posed by fracking. In particular, Mr. Bunton is concerned that perfring and fracking, in conjunction with some chemicals injected, may endanger the regional water supply. Chesapeake pointed out to Mr. Bunton that the horizontal wellbore at issue is approximately 7000 feet below his property and that the wells are on 500 foot spacing. The 500 foot spacing reflects the fact that the effects of fracking are not anticipated to extend any more than 250 to 300 feet beyond the wellbore. Mr. Bunton did not suggest any means by which a frack job 7000 feet deep, with frack wings no greater than 300 feet in length, might endanger regional water supplies.

Mr. Bunton also suggested that Chesapeake did not need to remove the existing NPZ, as it would recover most of the gas beneath the lease anyway, whether from the subject well or one of the surrounding wells. However, Mr. Bunton did not present any evidence supporting this view.

The well, as currently permitted, is subject to an NPZ restriction caused by Mr. Bunton's unleased tract. That NPZ is 452 feet long and reduces the effective length of the wellbore to 6781 feet, which is projected to recover 7.095 BCF. The NPZ restriction results in the loss of 0.406 BCF of gas that would otherwise be recoverable.

The examiners find that 0.406 BCF is a substantial quantity of hydrocarbons that would go unrecovered if the "no perf zone" restriction is not removed. Failure to remove the wellbore restriction would result in the confiscation of the fair share of reserves attributable to Chesapeake and its lessors.

Chesapeake demonstrated that the EUR of its currently permitted and drilled Well Nos. 1H, 3H, 4H, 5H and 6H, plus a hypothetical drainhole, would recover 28.383 BCF of gas for Chesapeake. If Well No. 2H is approved without the NPZ, its recovery of 7.501 BCF of gas would give Chesapeake a total recovery of 35.884 BCF, which is less than the 37.406 BCF of recoverable gas in place beneath the Sasha Lease, leaving Chesapeake short of fully recovering its fair share of recoverable gas in place.

Based on 500 foot well spacing, the Sasha Lease will accommodate 6 wellbores. According to Chesapeake's testimony, Well Nos. 1H, 3H, 4H, 5H and 6H have already been drilled. If the Sasha Lease Well No. 2H were moved to either the north or south, it would interfere with the recoveries of Well Nos. 1H and 3H. The location of Well No. 2H is reasonable.

The examiners recommend that Chesapeake be granted an exception to Statewide Rule 37 for its Well No. 2H on the 499.168-acre Sasha Lease in Tarrant County based on prevention of confiscation. Based on the record in this docket, the examiners recommend adoption of the following Findings of fact and Conclusions of Law:

FINDINGS OF FACT

1. At least 10 days notice of this hearing was given to the designated operator, all offset operators, all lessees of record for tracts that have no designated operator, and all owners of record of unleased mineral interests for each affected adjacent tract.
2. Chesapeake Operating, Inc. ("Chesapeake" or "Applicant"), seeks an exception to Statewide Rule 37 for the Sasha Lease, Well No. 2H, in the Newark, East (Barnett Shale) Field in Tarrant County.
3. On December 19, 2011, Chesapeake obtained a permit to drill Well No. 2H, at a Rule 37 location on the 498.399-acre Sasha Lease, approved administratively with a 7233 foot lateral and one NPZ totaling 452 feet. The plat associated with that application is attached to this proposal for decision as Appendix I, which is incorporated into this finding by reference.

4. On December 19, 2011, Chesapeake submitted an application to remove the 452 foot NPZ from the lateral of its Well No. 2H on its Sasha Lease.
5. A Rule 37 exception is needed for the proposed Sasha Lease, Well No. 2H, because sections of the well proposed to be perforated are closer than 330 feet to the boundaries of certain tracts internal to the unit that are unleased.
6. 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 point 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. 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.
7. The surface location of the Sasha Lease, Well No. 2H is located on-unit. It is 145 feet from the northeast line and 621 feet from the north line of the lease and 765 feet from the east line and 2138 feet from the south line of the J. Walker Survey, A-1654. The proposed penetration point is 330 feet from the northeast line and 646 feet from the north line of the J. Walker Survey, A-1654. The terminus is 203 feet from the north line and 2384 feet from the south line of the J.B. York Survey, A-1754. The lateral runs on an east-west trend.
8. The Chesapeake application is opposed by the owner, Mr. Edwin Bunton, of an unleased tract internal to the Sasha Lease. His tract is within 330 feet of the proposed lateral.
9. The Barnett Shale formation is present and productive under the entirety of the Sasha Lease.
10. At the time of the hearing, the leased acreage in the Sasha Lease had increased to 499.168 acres. The unit contains a total of 519.899 acres within its boundaries and is 96 percent leased.
11. To establish the currently recoverable reserves under the 499.168-acre Sasha Lease, Chesapeake used a volumetric calculation:
 - a. Available well logs in the vicinity of the Sasha Lease indicate the thickness of the Barnett Shale locally to be 332 feet.
 - b. A study conducted by Devon Energy Production Co., LLP for the Tarrant/Denton/Wise County calculated original gas in place at 105 BCF per square mile in those counties, based on an average formation thickness of 433

feet, porosity of 0.04 and %TOC (Total Organic Carbon) of 4%. Using that study, and correcting for the thickness of the Newark, East (Barnett Shale) Field under the Sasha lease and the leased acreage, Chesapeake calculated the original gas in place in the 499.168 leased acres of the Sasha lease to be 83.13 BCF. Assuming a recovery factor of 45%, Chesapeake calculates there is 37.406 BCF of recoverable gas beneath the Sasha Lease.

12. Chesapeake plotted drainhole length versus estimated ultimate recovery for 132 wells within a 4 mile radius of the applied-for well on a scatter diagram. Using the least squares regression method, Chesapeake derived a well recovery formula of " $y = 0.899x + 998.624$ ", with drainhole length represented by "x" and estimated EUR in MMCF represented by "y". This indicates that each incremental foot of horizontal wellbore will recover an additional 899 MCF of gas, while a purely vertical well would recover 998.624 MMCF.
13. The total usable length of the Well No. 2H drainhole, after removal of the 452 foot NPZ placed on the subject well under the permit granted on December 19, 2011, is 7233 feet. Applying Chesapeake's calculated well recovery formula, Well No. 2H will have an estimated ultimate recovery of 7.501 BCF of gas.
14. As permitted on December 19, 2010, Well No. 2H had one 452 foot NPZ. Removal of the NPZ would result in the recovery of 406 MMCF of gas, or 0.406 BCF that would otherwise not be recoverable.
15. The amount of gas that would go unrecovered absent removal of the 452 foot NPZ, 0.406 BCF, is a significant quantity of hydrocarbons.
16. Chesapeake's fair share of gas in place beneath the Sasha lease is 37.406 BCF of gas.
 - a. The calculated EUR of Chesapeake's permitted wells on the Sasha Lease, Well Nos. 1H, 3H, 4H, 5H and 6H, plus the EUR of a hypothetical well which cannot be drilled at this time, would allow Chesapeake to recover 28.383 BCF.
 - b. The proposed Sasha Lease, Well No. 2H, with NPZ removed, would recover 7.501 BCF.
 - c. Chesapeake's Well Nos. 1H, 3H, 4H, 5H, 6H, its hypothetical well, and its proposed Well No. 2H, with NPZ removed, would recover 35.884 BCF, an amount of gas less than Chesapeake's fair share, 37.406 BCF of gas, underlying the Sasha Lease.
17. The proposed location of the Sasha Lease Well No. 2H is reasonable.
 - a. Based on 500 foot well spacing, the Sasha Lease will accommodate six wells.
 - b. Well Nos. 1H, 3H, 4H, 5H and 6H on the Sasha Lease have already been drilled.

c. If the location of the Sasha Lease, Well No. 2H were moved to the north or south, it would interfere with the recoveries of Well No. 1H or Well No. 3H.

18. Chesapeake continues its attempt to sign unleased mineral interest owners in the Sasha Lease.

CONCLUSIONS OF LAW

1. Proper notice of hearing was timely given to all persons legally entitled to notice.
2. All things have occurred to give the Commission jurisdiction to decide this matter.
3. Approval of a Rule 37 exception for the proposed location of the Sasha Lease, Well No. 2H, as proposed by Chesapeake Operating, Inc. is necessary to prevent confiscation and protect the correlative rights of the mineral owners.

RECOMMENDATION

The examiners recommend that the application of Chesapeake Operating, Inc., for a Statewide Rule 37 exception for the proposed location of the Sasha Lease, Well No. 2H in the Newark, East (Barnett Shale) Field, Tarrant County, be granted as necessary to prevent confiscation and protect correlative rights.

Respectfully submitted,



Marshall Enquist
Hearings Examiner



Brian Fancher
Technical Examiner

