



# RAILROAD COMMISSION OF TEXAS

## HEARINGS DIVISION

### PROPOSAL FOR DECISION

**Rule 37 Case No. 0279993**

**Status No. 753418**

**District 09**

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**APPLICATION OF CHESAPEAKE OPERATING, INC. FOR A RULE 37 EXCEPTION FOR THE LITTLE BEAR A LEASE, WELL NO. 3H, NEWARK, EAST (BARNETT SHALE) FIELD, TARRANT COUNTY, TEXAS**

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### APPEARANCES

**FOR APPLICANT:**

Glenn Johnson  
Erin Rolstad  
Bill Spencer  
David Triana  
Rachel Pollard

**REPRESENTING:**

Chesapeake Operating, Inc.

**FOR PROTESTANTS:**

Gary Calahan

**REPRESENTING:**

Himself, George and Catherine Kougias, Joel and Kimberly Dickinson, Carlos Macho, Thomas and Donna Swan, Steven and Jacquelyn Dazey, Ronald and Jaclyn Harlos, Antonio and Joan Moreno, David Gray

### PROCEDURAL HISTORY

DATE APPLICATION FILED:	JANUARY 1, 2013
DATE OF NOTICE OF HEARING:	MARCH 4, 2013
DATE OF HEARING:	APRIL 3, 2013
DATE TRANSCRIPT RECEIVED:	APRIL 7, 2013
HEARD BY:	Michael Crnich, Hearings Examiner Andres Trevino, Technical Examiner
PREPARED WITH:	Richard Atkins, Technical Examiner

### STATEMENT OF THE CASE

By this application, Chesapeake seeks a Rule 37 exception for the as-drilled location of the Little Bear A Lease, Well No. 3H, a horizontal well in the Newark, East (Barnett Shale) Field

in Tarrant County, Texas. The Little Bear A No. 3H (the “well” or “subject well”) has an existing drilling permit, which was issued on December 21, 2012, and is subject to four no perforation zones (“NPZ’s”). This well has been drilled, but not fully completed. At the time of hearing, the Little Bear A Lease also contained Well Nos. 1H and 2H. The purpose of Chesapeake’s application is to obtain a first amended drilling permit unencumbered by any NPZs and allow Chesapeake to complete the entire 8,174 feet of the No. 3H’s drainhole. Appendix 1 to this Proposal for Decision is a copy of the a plat admitted into evidence as Chesapeake Exhibit No. 15, which shows the Little Bear A Lease, tracts within the unit that are leased and unleased, the as-drilled location of the well, and the NPZ’s that Chesapeake seeks to remove.

## **DISCUSSION OF THE EVIDENCE**

### *Chesapeake’s Case*

Chesapeake’s retained regulatory consultant, Mr. Bill Spencer, explained the permitting history of the No. 3H. Chesapeake filed its original drilling permit application on December 18, 2012, and the Commission issued the drilling permit on December 21, 2012. The first permit application was for a long lateral with four NPZ’s. Once the Commission approved the application and the surface location was permitted, Chesapeake was able to commence the permitting process required by the City of North Richland Hills. The Form P-12 Certificate of Pooling Authority filed with the first application indicated there were 359.88 acres in the pooled unit.

Chesapeake filed the present application for a first amended permit on January 3, 2013. This current application seeks to permit the well at the as-drilled location and remove the NPZ’s. The Form P-12 and plat for the present application indicate that the pooled unit contains 360.146 leased acres, 8.314 unleased acres, and 368.46 total acres. The surface location of the well is 626 feet from the west line and 524 feet from the north line of the Stephen Richardson Survey, A-1266, and 310 feet from the north line and 1,062 feet from the east line of the unit. The terminus, or bottom hole, location is 317 from the south line and 1,607 feet from the west line of the William Cox Survey, A-321, and 236 feet from the east line and 308 from the south line of the unit. The upper, or first, perforation point is 500 feet from the north line and 198 feet from the east line of the unit. The lower, or last, perforation point is 234 feet from the east line and 398 feet from the south line of the unit.

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.

A Chesapeake reservoir engineer, Ms. Rachel Pollard, presented a two-well stratigraphic cross section hung on top of the Barnett Shale formation. The wells on the cross section are two pilot wells drilled through the Barnett Shale at locations to the east and southwest of the Little Bear A Unit. Pollard also presented a gross isopach map demonstrating that the thickness of the Barnett Shale is about 347 feet in the area of the Little Bear A Unit. The thickness indicated by

the isopach mapping and cross section were then used in making volumetric calculations of reserves.

Chesapeake's reservoir engineer presented her estimate of gas in place and current recoverable gas in the Newark, East (Barnett Shale) Field beneath the Little Bear A Unit. She based her estimate on a traditional volumetric calculation performed by Devon Energy & Production Company, L.P. in a 2005 Barnett Shale field rules hearing before the Commission in Oil & Gas Docket No. 09-0243843. Devon's study developed a gas in place calculation of 139 BCF per square mile (640 acres) for Tarrant County based on reservoir thickness of 433 feet. The Commission accepted Devon's volumetric calculation and relied upon it in the 2005 Barnett Shale field rules hearing, and the results of the Devon study have been presented and relied upon in several subsequent Rule 37 cases involving the Barnett Shale. Adjusting for an average thickness of 347 feet, Pollard calculated that original gas in place beneath the 360.146 leased acres in the unit is 62.684 BCF. Assuming a recovery factor of 37 percent, the original recoverable gas in place beneath the leased acreage of the unit is 23.193 BCF. Pollard testified that she arrived at a 37 percent recovery factor based on studying fully-developed units within the same area as the Little Bear A Unit. She used decline-curve analysis to determine the EUR for each well in the surrounding fully-developed units. Then she divided the total EUR for each unit by the total gas in place for each unit and averaged the resulting recovery factors to arrive at 37 percent. At the time of the hearing, the Little Bear A No. 1H had produced cumulative gas of 0.584 BCF; therefore, the remaining recoverable gas in place was calculated to be 22.609 BCF.

To determine the EUR for wells within the Little Bear A Unit, Pollard chose to use a decline curve – instead of the typically employed plot of estimated ultimate recovery versus drainhole length for producing Barnett Shale wells – because Chesapeake had substantial production data from the Well No. 1H. Applied to the actual production from the No. 1H, the decline curve predicted an EUR of 5.053 BCF for the 5,633 feet of the lateral that have been perforated. Thus, the reservoir engineer determined that a well on the Little Bear A Unit would be expected to have an EUR equal to 0.897 MCF per foot of producing lateral. Applying this figure to the No. 1H (8,095 feet of productive lateral), the No. 2H (7,534 feet of permitted lateral), and the No. 3H (2,604 feet of permitted lateral), Chesapeake expected to recover 16.335 BCF of the estimated 23.193 BCF of original recoverable gas in place. This calculation shows that 6.838 BCF of the 23.193 BCF would go unrecovered without additional productive lateral length.

The No. 3H's current permit allows Chesapeake to complete 2,064 feet of the drainhole; completion of only this amount of drainhole would yield an EUR of 2.336 BCF. If Chesapeake's Rule 37 application is granted, allowing it to complete the full 8,174 feet of drainhole, the No. 3H will have an EUR of 7.332 BCF. Therefore, in the absence of Rule 37 relief, Chesapeake estimates that 4.996 BCF of gas – a significant amount of gas in the engineer's opinion – would go unrecovered. Chesapeake also presented a calculation of the amount of the gas that would go unrecovered if NPZ's were retained around the tracts of only those Protestants who were represented at the hearing.<sup>1</sup> Retaining such NPZ's would enable 3,882 feet of drainhole to be completed and result in an EUR of 3.482. Under this scenario, 3.850 BCF – out of the 7.332

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<sup>1</sup> Those are Tracts 5, 27, 82, 263, 264, 265, 487, 527, and 733.

BCF that could be recovered if all NPZ's were removed – would go unrecovered if Rule 37 relief is not granted.

### *Gary Calahan's Case*

Calahan did not present independent evidence or cross-examine Chesapeake's witnesses. He did state the reasons that he and the tract owners that he represents did not sign leases with Chesapeake and oppose the Rule 37 application. They are concerned that statewide drilling of wells may have a long-term environmental impact. In specific, they are concerned that a large volume of water is being used in the fracking process while the state experiences drought conditions.

### **EXAMINERS' OPINION**

An owner of oil and gas is entitled to a reasonable opportunity to recover the reserves underlying his tract, and any denial of that opportunity amounts to confiscation. *Atl. Ref. Co. v. Railroad Commn. of Tex.*, 346 S.W.2d 801 (Tex. 1961); *Imperial Am. Resources Fund, Inc. v. Railroad Commn. of Tex.*, 557 S.W.2d 280 (Tex. 1977). To obtain an exception to Rule 37 for the purpose of preventing confiscation and protecting correlative rights, an applicant must show that (1) it is not feasible to recover its fair share of hydrocarbons from regular locations and (2) the proposed irregular location is reasonable.

The examiners believe that the Chesapeake application should be granted as necessary to prevent confiscation. Chesapeake and its lessors within the Little Bear A Unit are entitled to a reasonable opportunity to recover their fair share of hydrocarbons from the reservoir, and it is not feasible for Chesapeake to recover its fair share of hydrocarbons from regular locations on the unit. Their "fair share" of gas, within the context of the legal confiscation theory, is measured by the recoverable gas beneath the drillable portion of the Little Bear A Unit that is under lease to Chesapeake. The evidence shows that the recoverable gas beneath the leased acreage of the unit was originally 23.193 BCF, and at the time of hearing, remaining recoverable gas was 22.609 BCF due to production from the No. 1H on the unit.

The Little Bear A No. 3H is one of three drilled wells on the unit. Even under optimal circumstances, under which the full lateral drainhole of each unit well is completed and each well recovers its EUR predicted by Chesapeake, the three wells will not recover Chesapeake's entire "fair share" of 23.193 BCF.<sup>2</sup> Retention of the NPZ's on the existing permit for the No. 3H would cause a further "fair share" deficit. If the NPZ's around the tracts of Protestants who were represented at the hearing were retained, leaving 3,882 feet of drainhole available for completion, the ultimate recovery of the No. 3H would be 3.482 BCF. If this well can be completed along its entire 8,174-foot drainhole, the well ultimately will recover about 7.332 BCF. This comparison indicates that 3.850 BCF of gas that otherwise could be recovered by the No. 3H would go unrecovered if the NPZ's opposite Protestants' tracts were retained. Recovery of this 3.85 BCF is necessary to give Chesapeake and its lessors a reasonable opportunity to recover as much as possible of their fair share of gas.

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<sup>2</sup> If the complete lateral drainhole of each well on the unit is perforated, the aggregate EUR would be 21.971 BCF.

The examiners believe that the location of the Little Bear A No. 3H is reasonable. The well is located along the eastern side of the unit. There is no regular location on the unit where a comparable horizontal well, unencumbered by NPZ's, could be drilled. There is no less irregular location that is more reasonable or that would give Chesapeake and its lessors an opportunity to recover their fair share of gas. Given the between-well spacing that must be observed to avoid interference with other drilled horizontal wells and the spacing relative to the external unit boundary, the No. 3H is reasonably located.

Based on the evidence in the record of this case, the examiners recommend adoption of the following Findings of Fact and Conclusions of Law.

### **FINDINGS OF FACT**

1. The Commission provided at least ten days notice of this hearing 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. Chesapeake Operating, Inc. ("*Chesapeake*") seeks a Rule 37 exception for the as-drilled location of the Little Bear A Lease, Well No. 3H, a horizontal well in the Newark, East (Barnett Shale) Field, Tarrant County, Texas.
3. The Little Bear A No. 3H has an existing drilling permit issued December 21, 2012, which is subject to four no-perforation-zones ("*NPZ's*").
4. The No. 3H has been drilled but not completed.
5. The No. 3H is located within the City of North Richland Hills, Texas. The surface location of the well is 626 feet from the west line and 524 feet from the north line of the Stephen Richardson Survey, A-1266, and 310 feet from the north line and 1,062 feet from the east line of the unit. The terminus, or bottom hole, location is 317 feet from the south line and 1,607 feet from the west line of the William Cox Survey, A-321, and 236 feet from the east line and 308 feet from the south line of the unit. The upper, or first, perforation point is 500 feet from the north line and 198 feet from the east line of the unit. The lower, or last, perforation point is 234 feet from the east line and 398 feet from the south line of the unit.
6. The Little Bear A Unit is composed of 368.460 total acres. As of the date of the hearing, Chesapeake had 360.146 of these acres – about 97 percent – under lease.
7. The purpose of this application is to obtain a first amended drilling permit for the Little Bear A No. 3H that is unencumbered by the NPZ's, which will allow Chesapeake to complete the entire 8,174 feet of drainhole. Appendix 1 to this proposal for decision is a copy of a plat presented as Chesapeake's Exhibit No. 17, which shows the Little Bear A Unit, tracts within the unit that are leased and unleased, the as-drilled location of the well, and the NPZ's that would be retained if the current Rule 37 application is not approved. Appendix 1 is incorporated into this finding by reference.

8. The Chesapeake application is protested by the owners of Tracts 5, 27, 82, 263, 264, 265, 487, 527, and 733 (the “*Protestants*”) within the Little Bear A Unit. Gary Calahan appeared in protest at the hearing and represented the Protestants.
9. 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.
10. The stratigraphic cross section and isopach map prepared by Chesapeake’s reservoir engineer demonstrate that the Barnett Shale is present and productive throughout the area of the Little Bear A Unit. Average Barnett Shale thickness beneath the Little Bear A Unit is about 347 feet.
11. Volumetrically calculated gas in place beneath the 360.146 leased acres in the Little Bear A Unit is 62.684 BCF.
12. Assuming a recovery factor of 37%, the original recoverable gas in place beneath the leased acreage within the Little Bear A Unit is 23.193 BCF. The 37% recovery factor used to estimate recoverable reserves is based on the average of estimated ultimate recoveries, determined by decline curve analysis, for Chesapeake’s other fully developed units in the area of the Little Bear A Unit.
13. Chesapeake’s “fair share” of gas, within the meaning of the legal confiscation theory, is measured by the amount of recoverable gas beneath the drillable portion of the Little Bear A Unit that is under lease to Chesapeake.
14. The estimated ultimate recovery (the “*EUR*”) for horizontal wells on the Little Bear A Unit completed in the Barnett Shale is 0.897 BCF (897 MMCF) per foot of drainhole.
  - a. Chesapeake’s reservoir engineer presented a decline curve analysis based on actual production from Well No. 1H on the Little Bear A Unit. The decline curve predicted an estimated ultimate recovery of 5.053 BCF for the 5,633 feet of the No. 1H’s lateral that have been perforated.
15. In addition to the No. 3H, Chesapeake has also permitted and drilled the No. 1H and No. 2H wells on the Little Bear A Unit.
16. If the entire lateral length of the No. 1H – 8,095 feet – can be completed without any NPZ restrictions, then the No. 1H’s EUR is expected to be 7.261 BCF.
17. If the entire lateral length of the No. 2H – 8,225 feet – can be completed without any NPZ restrictions, then the No. 2H’s EUR is expected to be 7.378 BCF.

18. If the Little Bear A No. 3H well can be completed along its entire 8,174-foot drainhole, without any NPZ restrictions, the well ultimately is expected to recover about 7.332 BCF.
19. If the Nos. 1H, 2H, and 3H are completed along their entire unrestricted lateral lengths and yield the EUR's as predicted by Chesapeake, the aggregate EUR would be 21.971 BCF. This amount is less than the fair share calculation of 23.193 BCF – the amount of original recoverable gas in place beneath the leased acreage within the Little Bear A Unit.
20. If the NPZ's around the tracts of the Protestants were retained, the estimated ultimate recovery of the Little Bear A No. 3H would be 3.482 BCF. This means that 3.85 BCF of gas that otherwise could be recovered by the No. 3H would go unrecovered if the NPZ's were retained.
21. Retention of these NPZ's would deny Chesapeake and its lessors a reasonable opportunity to recover as much as possible of their fair share of gas from beneath the Little Bear A Unit.
22. The NPZ's on the existing permit for the Little Bear A No. 3H prevent the well from producing gas beneath tracts of land under lease to Chesapeake.
23. The location of the Little Bear A No. 3H is reasonable.
  - a. There is no regular location on the unit where a comparable horizontal well, unencumbered by NPZ restrictions, could be drilled and completed.
  - b. There is no alternative location for a comparable horizontal well that would be less irregular to surrounding mineral property lines or that would afford Chesapeake and its lessor a reasonable opportunity to recover as much as possible of their fair share of gas.
  - c. The No. 3H is reasonably located given the between-well spacing that must be observed to avoid interference with other drilled horizontal wells and the spacing relative to the external unit boundary.

### **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 occurred.
3. Approval of a Rule 37 exception for the Little Bear A Lease, Well No. 3H, Newark, East (Barnett Shale) Field, Tarrant County, Texas, is necessary to prevent confiscation and protect the correlative rights of mineral owners.

**RECOMMENDATION**

The examiners recommend that the application of Chesapeake Operating, Inc. for a Rule 37 exception for the Little Bear A Lease, 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 on this 20<sup>TH</sup> day of December 2013.



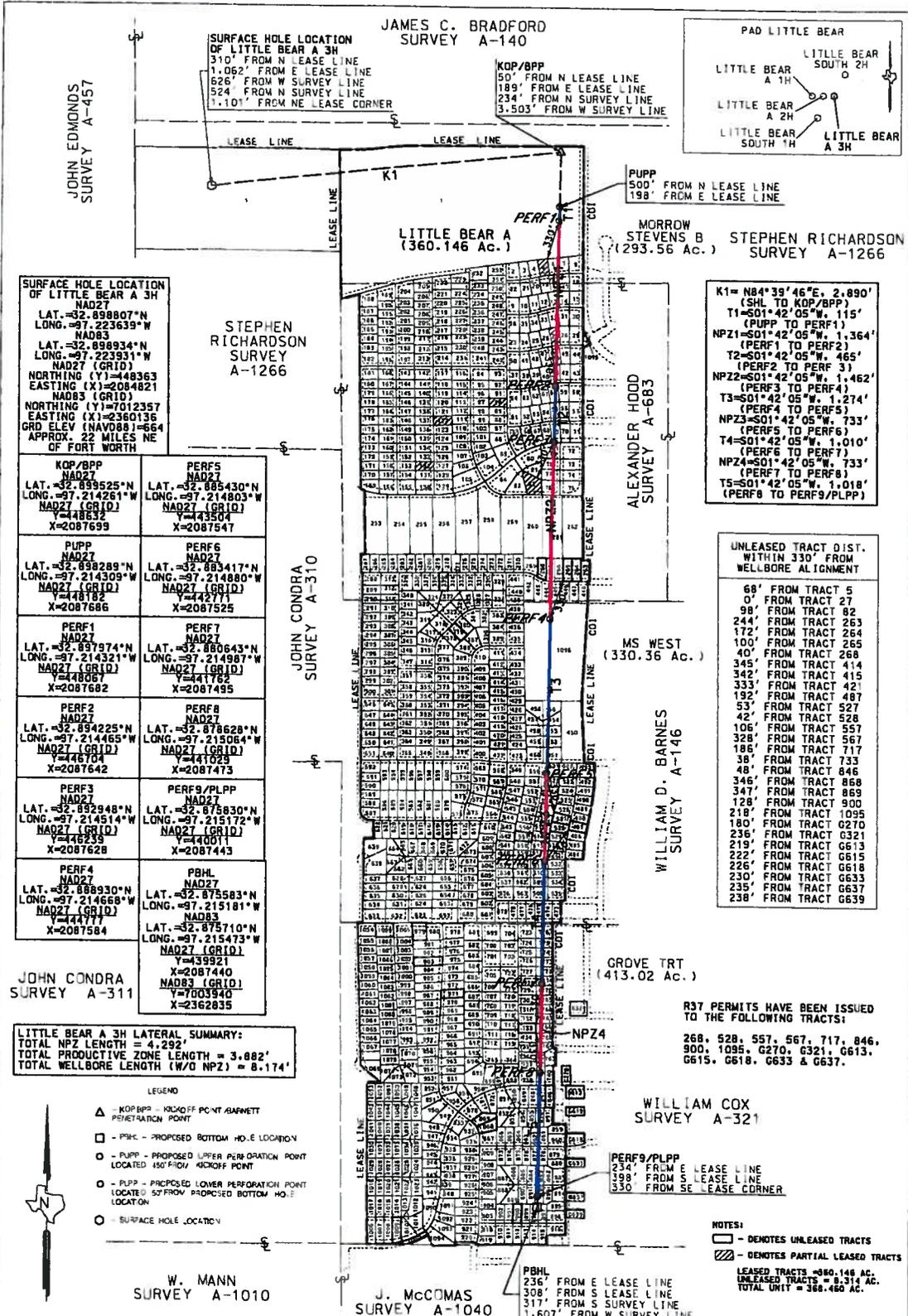
Michael R. Cmich  
Hearings Examiner



Richard Atkins, PE  
Technical Examiner

**Appendix 1**  
**To Proposal for Decision**  
**Rule 37 Case No. 0279993**

JAMES C. BRADFORD SURVEY A-140



**SURFACE HOLE LOCATION OF LITTLE BEAR A 3H NAD27**  
 LAT. = 32.898807°N  
 LONG. = 97.223639°W  
 NAD83  
 LAT. = 32.89934°N  
 LONG. = 97.223931°W  
 NAD27 (GRID)  
 NORTHING (Y) = 448363  
 EASTING (X) = 2084821  
 NAD83 (GRID)  
 NORTHING (Y) = 7012357  
 EASTING (X) = 2360136  
 GRD ELEV (NAVD83) = 664  
 APPROX. 22 MILES NE OF FORT WORTH

STEPHEN RICHARDSON SURVEY A-1266

<p><b>KOP/BPP NAD27</b>                  LAT. = 32.899525°N                  LONG. = 97.214261°W                  NAD27 (GRID)                  Y = 448362                  X = 2087699</p>	<p><b>PERF5 NAD27</b>                  LAT. = 32.885430°N                  LONG. = 97.214803°W                  NAD27 (GRID)                  Y = 4473504                  X = 2087547</p>
<p><b>PUPP NAD27</b>                  LAT. = 32.892889°N                  LONG. = 97.214309°W                  NAD27 (GRID)                  Y = 448182                  X = 2087686</p>	<p><b>PERF6 NAD27</b>                  LAT. = 32.883417°N                  LONG. = 97.214880°W                  NAD27 (GRID)                  Y = 4472711                  X = 2087525</p>
<p><b>PERF1 NAD27</b>                  LAT. = 32.894974°N                  LONG. = 97.214321°W                  NAD27 (GRID)                  Y = 448067                  X = 2087682</p>	<p><b>PERF7 NAD27</b>                  LAT. = 32.880643°N                  LONG. = 97.214987°W                  NAD27 (GRID)                  Y = 441762                  X = 2087495</p>
<p><b>PERF2 NAD27</b>                  LAT. = 32.894225°N                  LONG. = 97.214465°W                  NAD27 (GRID)                  Y = 446704                  X = 2087642</p>	<p><b>PERF8 NAD27</b>                  LAT. = 32.878628°N                  LONG. = 97.215064°W                  NAD27 (GRID)                  Y = 441023                  X = 2087473</p>
<p><b>PERF3 NAD27</b>                  LAT. = 32.892848°N                  LONG. = 97.214514°W                  NAD27 (GRID)                  Y = 446239                  X = 2087628</p>	<p><b>PERF9/PLPP NAD27</b>                  LAT. = 32.878830°N                  LONG. = 97.215172°W                  NAD27 (GRID)                  Y = 440011                  X = 2087443</p>
<p><b>PERF4 NAD27</b>                  LAT. = 32.888930°N                  LONG. = 97.214658°W                  NAD27 (GRID)                  Y = 444777                  X = 2087584</p>	<p><b>PBHL NAD27</b>                  LAT. = 32.875583°N                  LONG. = 97.215181°W                  NAD83                  LAT. = 32.875710°N                  LONG. = 97.215473°W                  NAD27 (GRID)                  Y = 439921                  X = 2087440                  NAD83 (GRID)                  Y = 7003940                  X = 2362835</p>

JOHN CONDRA SURVEY A-311

**LITTLE BEAR A 3H LATERAL SUMMARY:**  
 TOTAL NPZ LENGTH = 4.292'  
 TOTAL PRODUCTIVE ZONE LENGTH = 3.882'  
 TOTAL WELLBORE LENGTH (W/O NPZ) = 8.174'

- LEGEND
- ▲ KOP/BPP - KICAD OFF POINT/ARNETT PENETRATION POINT
  - PPK - PROPOSED BOTTOM HO.E LOCATION
  - PUPP - PROPOSED UPPER PERFORATION POINT LOCATED 150' FROM KICAD OFF POINT
  - PUPP - PROPOSED LOWER PERFORATION POINT LOCATED 50' FROM PROPOSED BOTTOM HO.E LOCATION
  - SURFACE HOLE LOCATION

W. MANN SURVEY A-1010

J. McCOMAS SURVEY A-1040

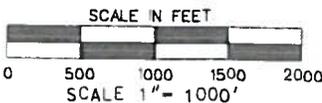
- K1 = N84°39'46"E, 2.890'**  
 (SHL TO KOP/BPP)  
 T1 = S01°42'05"W, 115'  
 (PUPP TO PERF1)  
 NP21 = S01°42'05"W, 1.364'  
 (PERF1 TO PERF2)  
 T2 = S01°42'05"W, 465'  
 (PERF2 TO PERF3)  
 NP22 = S01°42'05"W, 1.462'  
 (PERF3 TO PERF4)  
 T3 = S01°42'05"W, 1.274'  
 (PERF4 TO PERF5)  
 NP23 = S01°42'05"W, 733'  
 (PERF5 TO PERF6)  
 T4 = S01°42'05"W, 1.010'  
 (PERF6 TO PERF7)  
 NP24 = S01°42'05"W, 733'  
 (PERF7 TO PERF8)  
 T5 = S01°42'05"W, 1.018'  
 (PERF8 TO PERF9/PLPP)

- UNLEASED TRACT DIST. WITHIN 330' FROM WELLBORE ALIGNMENT**
- 68' FROM TRACT 5
  - 0' FROM TRACT 27
  - 98' FROM TRACT 82
  - 244' FROM TRACT 263
  - 172' FROM TRACT 264
  - 100' FROM TRACT 265
  - 40' FROM TRACT 268
  - 345' FROM TRACT 414
  - 342' FROM TRACT 415
  - 333' FROM TRACT 42
  - 192' FROM TRACT 487
  - 53' FROM TRACT 527
  - 42' FROM TRACT 528
  - 106' FROM TRACT 557
  - 328' FROM TRACT 567
  - 186' FROM TRACT 717
  - 38' FROM TRACT 733
  - 48' FROM TRACT 846
  - 346' FROM TRACT 858
  - 347' FROM TRACT 859
  - 128' FROM TRACT 900
  - 218' FROM TRACT 1095
  - 180' FROM TRACT G270
  - 236' FROM TRACT G321
  - 219' FROM TRACT G613
  - 222' FROM TRACT G615
  - 226' FROM TRACT G618
  - 230' FROM TRACT G633
  - 235' FROM TRACT G637
  - 238' FROM TRACT G639

R37 PERMITS HAVE BEEN ISSUED TO THE FOLLOWING TRACTS:  
 268, 528, 557, 567, 717, 846, 900, 1095, G270, G321, G613, G615, G618, G633 & G637.

- NOTES:
- - DENOTES UNLEASED TRACTS
  - ▨ - DENOTES PARTIAL LEASED TRACTS

- NOTE
1. PRIMARY COORDINATES AND BASIS OF BEARING ARE THE 1983 STATE PLAT TEXAS NORTH CENTRAL ZONE 40Z
  2. PREPARED FROM A PARTIAL ON THE GROUND SURVEY
  3. RECORD RESEARCH WAS PROVIDED BY CHESAPEAKE ENERGY CORPORATION
  4. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY



I, THE UNDERSIGNED, DO HEREBY CERTIFY THAT THIS PLAT ACCURATELY DEPICTS THE SURFACE LOCATION OF THE SUBJECT WELL AS STAKED ON THE GROUND UNDER MY SUPERVISION.

PRELIMINARY. THIS DOCUMENT SHALL NOT BE RECORDED FOR ANY PURPOSE.

JOSEPH S. BENITEZ, RPLS  
 TEXAS NO. 5834



ARREDONDO, ZEPEDA & BRUNZ, LLC  
 11355 MACREE ROAD  
 DALLAS, TX, 75238  
 PH. 214-341-8900 FAX 214-341-9925  
 email - office@azb-engr.com

LITTLE BEAR A 3H  
 PROPOSED WELL LOCATION PLAT  
 CITY OF NORTH RICHLAND HILLS,  
 TARRANT COUNTY, TEXAS



S:\Chesapeake\20024\_HAD33\_LITTLE-BEAR\_A\OpnWell\Plot\AST\Hearing\Plat\LITTLE-BEAR-A-3H\_NP2\_R37\_E\HAD33-Plot-2.dwg

Exhibit No. 17  
 CHESAPEAKE OPERATING, INC.  
 Rule 37 Case No. 0279993  
 April 3, 2013