

HOBBS OCD

OCT 28 2013

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

OCD Hobbs

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED  
OMB No. 1004-0137  
Expires October 31, 2014

5. Lease Serial No. SHL: NMNM0036100  
Producing Area:  
Sec 8 UL "K & N": NMNM092771  
Sec 8 UL "C & F": NMNM095641  
Sec 5 UL "K & N" (BHL): NMNM107391  
6. If Indian, Allottee or Tribe Name

1a. Type of Work: ☒ DRILL ☐ REENTER

7. If Unit or CA Agreement, Name and No.

1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone

8. Lease Name and Well No. **<40109>**  
King Air 8 Federal Com #3H

2. Name of Operator

COG Operating LLC.

9. API Well No.

**30-025-41476**

3a. Address  
2208 West Main Street  
Artesia, NM 88210

3b. Phone No. (include area code)  
575-748-6940

10. Field and Pool, or Exploratory  
Lusk; Bone Spring **<41450>**  
**North**

4. Location of Well (Report location clearly and in accordance with any State requirements. \*)  
At surface 410' FNL & 1960' FWL Unit Letter C (NENW) SHL Sec 17-T19S-R32E  
At proposed prod. Zone 2310' FSL & 2260' FWL Unit Letter K (NESW) BHL Sec 5-T19S-R32E

11. Sec., T.R.M. or Blk and Survey or Area  
Section 17 - T19S - R32E

14. Distance in miles and direction from nearest town or post office\*  
Approximately 12 miles from Maljamar

12. County or Parish  
Lea County

13. State  
NM

15. Distance from proposed\* location to nearest property or lease line, ft.  
(Also to nearest drig. Unit line, if any) 410'

16. No. of acres in lease  
SHL: 867.85, BHL: 80  
Section 8 UL "K & N": 680  
Section 8 UL "C & F": 160

17. Spacing Unit dedicated to this well  
240

18. Distance from location\* to nearest well, drilling, completed, applied for, on this lease, ft.  
SHL: 206' BHL: 693'  
Approximately closest to the wellbore: 129'

19. Proposed Depth  
TVD: 9,305' MD: 17,102'

20. BLM/BIA Bond No. on file  
NMB000740 & NMB000215

21. Elevations (Show whether DF, KDB, RT, GL, etc.)  
3609.4' GL

22. Approximate date work will start\*  
9/1/2013

23. Estimated duration  
30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form:

1. Well plat certified by a registered surveyor.
2. A Drilling Plan
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).

4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the authorized officer.

25. Signature  
**Mayte Reyes**

Name (Printed/Typed)  
Mayte Reyes

Date  
3/8/2013

Title

Regulatory Analyst

Approved by (Signature)

Name (Printed/Typed)

Date

**/S/ STEPHEN J. CAFFEY**

**OCT 22 2013**

Title

FIELD MANAGER

Office

CARLSBAD FIELD OFFICE

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1241, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

\*(Instructions on page 2)

Capitan Controlled Water Basin

Approval Subject to General Requirements  
& Special Stipulations Attached

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

**NOV 04 2013**

*Surface Use Plan*  
*COG Operating, LLC*  
*King Air 8 Federal Com #3H*  
*SL: 410' FNL & 1960' FWL      UL C*  
*Section 17, T19S, R32E*  
*BHL: 2310' FSL & 2260' FWL      UL K*  
*Section 5, T19S, R32E*  
*Lea County, New Mexico*

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**STATEMENT ACCEPTING RESPONSIBILITY FOR OPERATIONS**

The undersigned accepts all applicable terms, conditions, stipulations, and restrictions concerning operations conducted on the leased land or portion thereof, as described below:

Date:            July 23, 2013

Lease #:        SHL: NMNM 0036100,  
                  Producing Area: Section 8 Unit Letters K & N: NMNM092771,  
                  Section 8 Unit Letters C & F: NMNM095641  
                  Section 5 Unit Letters K & N (BHL): NMNM107391  
                  King Air 8 Federal Com #3H

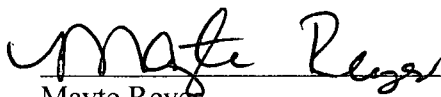
Legal Description:    Sec. 17 – T19S – R32E  
                          Lea County, New Mexico

Formation(s): Bone Spring

Bond Coverage: Statewide

BLM Bond File #: NMB000740 & NMB000215

COG OPERATING LLC

  
\_\_\_\_\_  
Mayte Reyes  
Regulatory Analyst

**COG Operating LLC**  
**DRILLING AND OPERATIONS PROGRAM**  
**King Air 8 Fed 3H**  
**SHL: 190' FSL & 1980' FWL**  
**BHL: 330' FNL & 2260' FWL**  
**Section 8 T19S R32E**  
**Lea County, New Mexico**

In conjunction with Form 3160-3, Application for Permit to Drill subject well, COG Operating LLC submits the following eleven items of pertinent information in accordance with BLM requirements.

1. Geological surface formation: Permian
2. The estimated tops of geologic markers & estimated depths at which anticipated water, oil or gas formations are expected to be encountered are as follows:

|              |         |     |
|--------------|---------|-----|
| Fresh Water  | 225'    |     |
| Rustler      | 912'    |     |
| Top of Salt  | 990'    |     |
| Base of Salt | 2,430'  |     |
| Yates        | 2,689'  |     |
| Seven Rivers | 2,899'  |     |
| Capitan Reef | 2,992'  |     |
| Delaware     | 4,651'  | Oil |
| Bone Spring  | 7,051'  | Oil |
| TD TVD       | 9,245'  |     |
| TD MD        | 13,861' |     |

No other formations are expected to give up oil, gas or fresh water in measurable quantities. The surface fresh water sands will be protected by setting 13-3/8" casing at 937' and circulating cement back to surface. All intervals will be isolated by setting 5 1/2" casing to total depth and tying back cement to a minimum of 50' above the Capitan Reef.

**3. Proposed Casing Program: All casing is new and API approved**

| Hole Size | Depths                                     | Section                    | OD Casing | New/Used | Wt    | Collar | Grade | Collapse Design Factor | Burst Design Factor | Tension Design Factor |
|-----------|--------------------------------------------|----------------------------|-----------|----------|-------|--------|-------|------------------------|---------------------|-----------------------|
| 17 1/2"   | 0' - 937'                                  | Surface                    | 13 3/8"   | New      | 54.5# | STC    | J-55  | 1.125                  | 1.125               | 1.6                   |
| 12 1/4"   | 0' - 3500'                                 | Intrmd                     | 9 5/8"    | New      | 36#   | BTC    | J-55  | 1.125                  | 1.125               | 1.6                   |
| 12 1/4"   | 3500' - 4550'                              | Intrmd                     | 9 5/8"    | New      | 40#   | BTC    | J-55  | 1.125                  | 1.125               | 1.6                   |
| 7 7/8"    | 0' - <sup>17,102'</sup> <del>13,861'</del> | Production Curve & Lateral | 5 1/2"    | New      | 17#   | LTC    | P-110 | 1.125                  | 1.125               | 1.6                   |

- While running all casing strings, the pipe will be kept a minimum of 1/3 full at all times to avoid approaching the collapse pressure of casing.

*See COA*

#### 4. Proposed Cement Program

- a. 13-3/8" Surface
- Lead: 375 sx Class C + 4% Gel + 2% CaCl<sub>2</sub>  
(13.5 ppg / 1.75 cuft/sx)
- Tail: 250 sx Class C + 2% CaCl<sub>2</sub>  
(14.8 ppg / 1.34 cuft/sx)
- \*\*Calculated w/50% excess on OH volumes
- b. 9 5/8" Intermediate:
- 1<sup>st</sup> Stage:
- Lead: 225 sx 35:65:6 C+ Salt+ Gilsonite+ CFR-3+ HR601  
(12.7 ppg / 1.89 cuft/sx)
- Tail: 250 sx Class C + 2% CaCl<sub>2</sub>  
(14.8 ppg / 1.34 cuft/sx)
- 2<sup>nd</sup> Stage: DVT/ECP @ +/- 2850'
- Lead: 600 sx Class C + 4% Gel + 2% CaCl<sub>2</sub>  
(13.5 ppg / 1.75 cuft/sx)
- Tail: 100 sx Class C + 2% CaCl<sub>2</sub>  
(14.8 ppg / 1.34 cuft/sx)
- \*\*Calculated w/35% excess on OH volumes
- c. 5 1/2" Production
- Lead: 800 sx 35:65:6 H + Salt+Gilsonite+CFR-3+ HR601  
(12.7 ppg / 1.89 cuft/sx)
- Tail: 950 sx 50:50:2 H +Salt+GasStop +HR601 +CFR-3  
(14.4 ppg / 1.25 cuft/sx)
- \*\*Calculated w/35% excess on OH volumes

- The above cement volumes could be revised pending the caliper measurement.
- The 9-5/8" intermediate string is designed to circulate to surface.
- The production string will tie back a minimum of 50' above Capitan Reef.

### 5. Control:

Nipple up on 13 3/8 with annular preventer tested to 50% of rated working pressure by independent tester and the rest of the 2M system tested to 2000 psi.

Nipple up on 9 5/8 with 3M system tested to 3000 psi by independent tester.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. A 2" kill line and a minimum 3" choke line will be included in the drilling spool located below the ram-type BOP. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold with 3000 psi WP rating. A remotely operated choke will be installed before drilling out intermediate shoe.

## 6. Estimated BHP & BHT:

Lateral TD = 4230 psi

Lateral TD= 148°F

See  
CWA

**7. Mud Program:** The applicable depths and properties of this system are as follows:

See COA

| Depth                      | Type System | Mud Weight | Viscosity (sec) | Waterloss (cc) |
|----------------------------|-------------|------------|-----------------|----------------|
| 0' – 937'                  | Fresh Water | 8.4        | 29              | N.C.           |
| 937' – 4,550'              | Brine       | 10         | 29              | N.C.           |
| 4,550' – 13,861' (Lateral) | Cut Brine   | 8.8 – 9.2  | 29              | N.C.           |

- The necessary mud products for weight addition and fluid loss control will be on location at all times.
- A visual and electronic mud monitoring system will be rigged up prior to spud to detect changes in the volume of mud system. The electronic system consists of a pit volume total, stroke counter and flow sensor at flow line.
- If weight and/or viscosity are introduced to the mud system a daily mud check will be performed by mud contractor, along with hourly check by rig personnel.
- After setting intermediate casing, a third party gas unit detection system will be installed at the flow line.

**8. Auxiliary Well Control and Monitoring Equipment:**

- See COA
- a. A Kelly cock will be in the drill string at all times.
  - b. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
  - c. Hydrogen Sulfide detection equipment will be in operation after drilling out the 13 3/8" casing shoe until the 5 1/2" casing is cemented. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached.

**9. Testing, Logging and Coring Program:**

- a. Drill stem tests will be based on geological sample shows.
- b. If open hole electrical logging is performed, the program will be:
  - i. Total Depth to Intermediate Casing: Dual Laterolog-Micro Laterolog and Gamma Ray. Compensated Neutron – Z Density log with Gamma Ray and Caliper.
  - ii. Total Depth to Surface: Compensated Neutron with Gamma Ray
  - iii. No coring program is planned
  - iv. Additional testing will be initiated subsequent to setting the 5 1/2" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.

**10. Potential Hazards:**

- See COA
- a. No abnormal pressures or temperatures are expected. There is no known presence of H2S in this area. If H2S is encountered the operator will comply with the provisions of Onshore Oil and Gas Order No. 6. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. No H2S is anticipated to be encountered.

**11. Anticipated starting date and Duration of Operations:**

- a. Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 30 days.



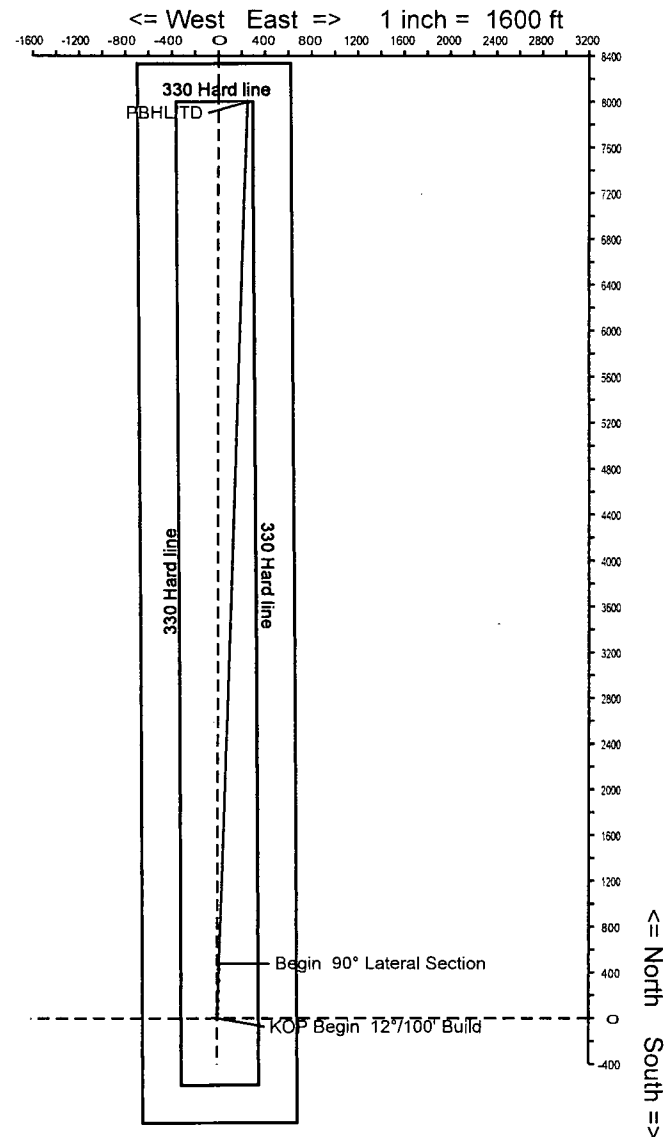
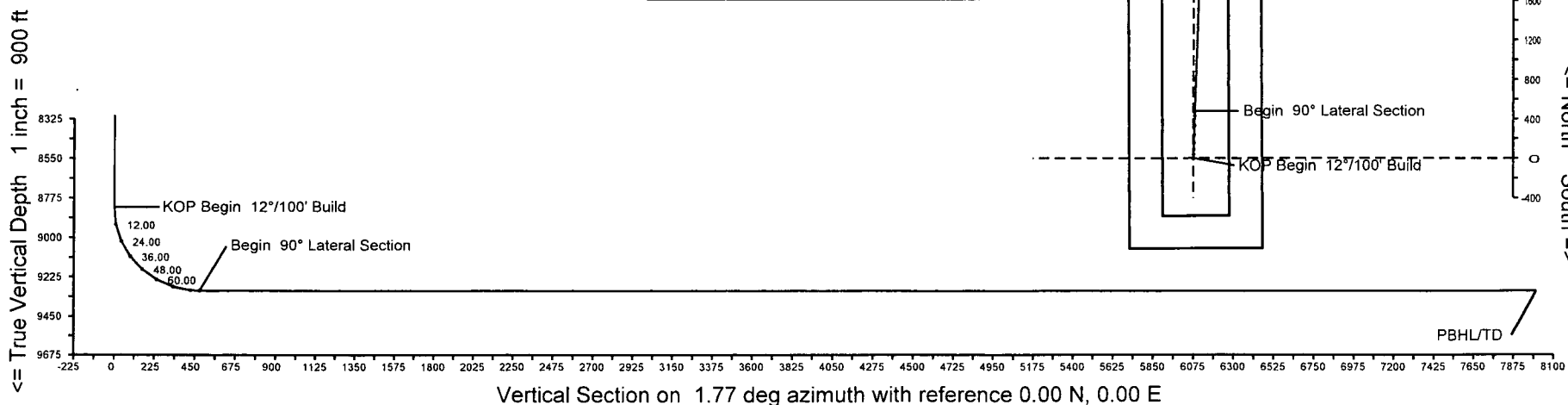
King Air 8 Federal Com 3H

Lea County, New Mexico

| WELL PROFILE DATA rev0 |       |      |      |      |     |       |                           |            |  |
|------------------------|-------|------|------|------|-----|-------|---------------------------|------------|--|
| MD                     | Inc.  | Azi. | TVD  | N-S  | E-W | DLS   | Comment                   | 06-12-2013 |  |
| 8828                   | 0.00  | 1.78 | 8828 | 0    | 0   | 0.00  | KOP Begin 12°/100' Build  |            |  |
| 9578                   | 90.00 | 1.78 | 9305 | 477  | 15  | 12.00 | Begin 90° Lateral Section |            |  |
| 17102                  | 90.00 | 1.78 | 9305 | 7999 | 249 | 0.00  | PBHL/TD                   |            |  |

|                                    |                     |
|------------------------------------|---------------------|
| Surface Location                   | NAD27 NM East       |
| Lat: N 32.688465°                  | Long: W 103.789196° |
| x: 667408.2                        | y: 614603.9         |
| Model IGRF2011 Date: 12-Jun-2013   |                     |
| Declination (MN to TN): 7.48° East |                     |
| Dip: 60.53                         |                     |
| Field Strength: 42375.6            |                     |
| Total Corr. (MN to GN): 7.19° East |                     |

rolfson oil



# Rolfson Oilfield Services, Inc.

Company: COG Operating LLC  
Well: King Air 8 Federal Com 3H  
Location: Lea County, New Mexico

Date: 12-Jun-2013  
Rev0  
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| MD<br>(feet)     | Inclination<br>(degrees) | Azimuth<br>(degrees) | TVD RKB<br>(feet) | N/-S<br>(feet) | E/-W<br>(feet) | DLS<br>(deg/100') | VS @ 1.78° Az<br>(feet) | Grid Y    | Grid X    | Comments                  |
|------------------|--------------------------|----------------------|-------------------|----------------|----------------|-------------------|-------------------------|-----------|-----------|---------------------------|
| Surface Location |                          |                      |                   |                |                |                   |                         | 606605.40 | 667159.70 |                           |
| 8827.54          | 0.00                     | 1.78                 | 8827.54           | 0.00           | 0.00           | 0.00              | 0.00                    | 606605.40 | 667159.70 | KOP Begin 12°/100' Build  |
| 8927.54          | 12.00                    | 1.78                 | 8926.81           | 10.43          | 0.32           | 12.00             | 10.43                   | 606615.83 | 667160.02 |                           |
| 9027.54          | 24.00                    | 1.78                 | 9021.74           | 41.26          | 1.28           | 12.00             | 41.28                   | 606646.66 | 667160.98 |                           |
| 9127.54          | 36.00                    | 1.78                 | 9108.18           | 91.14          | 2.83           | 12.00             | 91.19                   | 606696.54 | 667162.53 |                           |
| 9227.54          | 48.00                    | 1.78                 | 9182.36           | 157.90         | 4.91           | 12.00             | 157.98                  | 606763.30 | 667164.61 |                           |
| 9327.54          | 60.00                    | 1.78                 | 9241.03           | 238.62         | 7.41           | 12.00             | 238.73                  | 606844.02 | 667167.11 |                           |
| 9427.54          | 72.00                    | 1.78                 | 9281.63           | 329.76         | 10.25          | 12.00             | 329.92                  | 606935.16 | 667169.95 |                           |
| 9527.54          | 84.00                    | 1.78                 | 9302.39           | 427.35         | 13.28          | 12.00             | 427.56                  | 607032.75 | 667172.98 |                           |
| 9577.54          | 90.00                    | 1.78                 | 9305.00           | 477.23         | 14.83          | 12.00             | 477.46                  | 607082.63 | 667174.53 | Begin 90° Lateral Section |
| 9677.54          | 90.00                    | 1.78                 | 9305.00           | 577.19         | 17.93          | 0.00              | 577.46                  | 607182.59 | 667177.63 |                           |
| 9777.54          | 90.00                    | 1.78                 | 9305.00           | 677.14         | 21.04          | 0.00              | 677.46                  | 607282.54 | 667180.74 |                           |
| 9877.54          | 90.00                    | 1.78                 | 9305.00           | 777.09         | 24.14          | 0.00              | 777.46                  | 607382.49 | 667183.84 |                           |
| 9977.54          | 90.00                    | 1.78                 | 9305.00           | 877.04         | 27.25          | 0.00              | 877.46                  | 607482.44 | 667186.95 |                           |
| 10077.54         | 90.00                    | 1.78                 | 9305.00           | 976.99         | 30.35          | 0.00              | 977.46                  | 607582.39 | 667190.05 |                           |
| 10177.54         | 90.00                    | 1.78                 | 9305.00           | 1076.95        | 33.46          | 0.00              | 1077.47                 | 607682.35 | 667193.16 |                           |
| 10277.54         | 90.00                    | 1.78                 | 9305.00           | 1176.90        | 36.56          | 0.00              | 1177.47                 | 607782.30 | 667196.26 |                           |
| 10377.54         | 90.00                    | 1.78                 | 9305.00           | 1276.85        | 39.67          | 0.00              | 1277.47                 | 607882.25 | 667199.37 |                           |
| 10477.54         | 90.00                    | 1.78                 | 9305.00           | 1376.80        | 42.77          | 0.00              | 1377.47                 | 607982.20 | 667202.47 |                           |
| 10577.54         | 90.00                    | 1.78                 | 9305.00           | 1476.75        | 45.88          | 0.00              | 1477.47                 | 608082.15 | 667205.58 |                           |
| 10677.54         | 90.00                    | 1.78                 | 9305.00           | 1576.70        | 48.99          | 0.00              | 1577.47                 | 608182.10 | 667208.69 |                           |
| 10777.54         | 90.00                    | 1.78                 | 9305.00           | 1676.66        | 52.09          | 0.00              | 1677.47                 | 608282.06 | 667211.79 |                           |
| 10877.54         | 90.00                    | 1.78                 | 9305.00           | 1776.61        | 55.20          | 0.00              | 1777.47                 | 608382.01 | 667214.90 |                           |
| 10977.54         | 90.00                    | 1.78                 | 9305.00           | 1876.56        | 58.30          | 0.00              | 1877.47                 | 608481.96 | 667218.00 |                           |
| 11077.54         | 90.00                    | 1.78                 | 9305.00           | 1976.51        | 61.41          | 0.00              | 1977.47                 | 608581.91 | 667221.11 |                           |
| 11177.54         | 90.00                    | 1.78                 | 9305.00           | 2076.46        | 64.51          | 0.00              | 2077.47                 | 608681.86 | 667224.21 |                           |
| 11277.54         | 90.00                    | 1.78                 | 9305.00           | 2176.42        | 67.62          | 0.00              | 2177.47                 | 608781.82 | 667227.32 |                           |
| 11377.54         | 90.00                    | 1.78                 | 9305.00           | 2276.37        | 70.72          | 0.00              | 2277.47                 | 608881.77 | 667230.42 |                           |
| 11477.54         | 90.00                    | 1.78                 | 9305.00           | 2376.32        | 73.83          | 0.00              | 2377.47                 | 608981.72 | 667233.53 |                           |
| 11577.54         | 90.00                    | 1.78                 | 9305.00           | 2476.27        | 76.93          | 0.00              | 2477.47                 | 609081.67 | 667236.63 |                           |
| 11677.54         | 90.00                    | 1.78                 | 9305.00           | 2576.22        | 80.04          | 0.00              | 2577.47                 | 609181.62 | 667239.74 |                           |

# Rolfson Oilfield Services, Inc.

Company: COG Operating LLC  
Well: King Air 8 Federal Com 3H  
Location: Lea County, New Mexico

Date: 12-Jun-2013  
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| MD<br>(feet) | Inclination<br>(degrees) | Azimuth<br>(degrees) | TVD RKB<br>(feet) | N/-S<br>(feet) | E/-W<br>(feet) | DLS<br>(deg/100') | VS @ 1.78° Az<br>(feet) | Grid Y    | NAD27 NM East gr elev=3609.4 RKB=3631.4<br>Grid X | Comments |
|--------------|--------------------------|----------------------|-------------------|----------------|----------------|-------------------|-------------------------|-----------|---------------------------------------------------|----------|
| 11777.54     | 90.00                    | 1.78                 | 9305.00           | 2676.17        | 83.14          | 0.00              | 2677.47                 | 609281.57 | 667242.84                                         |          |
| 11877.54     | 90.00                    | 1.78                 | 9305.00           | 2776.13        | 86.25          | 0.00              | 2777.47                 | 609381.53 | 667245.95                                         |          |
| 11977.54     | 90.00                    | 1.78                 | 9305.00           | 2876.08        | 89.35          | 0.00              | 2877.47                 | 609481.48 | 667249.05                                         |          |
| 12077.54     | 90.00                    | 1.78                 | 9305.00           | 2976.03        | 92.46          | 0.00              | 2977.47                 | 609581.43 | 667252.16                                         |          |
| 12177.54     | 90.00                    | 1.78                 | 9305.00           | 3075.98        | 95.57          | 0.00              | 3077.47                 | 609681.38 | 667255.27                                         |          |
| 12277.54     | 90.00                    | 1.78                 | 9305.00           | 3175.93        | 98.67          | 0.00              | 3177.47                 | 609781.33 | 667258.37                                         |          |
| 12377.54     | 90.00                    | 1.78                 | 9305.00           | 3275.88        | 101.78         | 0.00              | 3277.47                 | 609881.28 | 667261.48                                         |          |
| 12477.54     | 90.00                    | 1.78                 | 9305.00           | 3375.84        | 104.88         | 0.00              | 3377.47                 | 609981.24 | 667264.58                                         |          |
| 12577.54     | 90.00                    | 1.78                 | 9305.00           | 3475.79        | 107.99         | 0.00              | 3477.47                 | 610081.19 | 667267.69                                         |          |
| 12677.54     | 90.00                    | 1.78                 | 9305.00           | 3575.74        | 111.09         | 0.00              | 3577.47                 | 610181.14 | 667270.79                                         |          |
| 12777.54     | 90.00                    | 1.78                 | 9305.00           | 3675.69        | 114.20         | 0.00              | 3677.47                 | 610281.09 | 667273.90                                         |          |
| 12877.54     | 90.00                    | 1.78                 | 9305.00           | 3775.64        | 117.30         | 0.00              | 3777.47                 | 610381.04 | 667277.00                                         |          |
| 12977.54     | 90.00                    | 1.78                 | 9305.00           | 3875.60        | 120.41         | 0.00              | 3877.47                 | 610481.00 | 667280.11                                         |          |
| 13077.54     | 90.00                    | 1.78                 | 9305.00           | 3975.55        | 123.51         | 0.00              | 3977.47                 | 610580.95 | 667283.21                                         |          |
| 13177.54     | 90.00                    | 1.78                 | 9305.00           | 4075.50        | 126.62         | 0.00              | 4077.47                 | 610680.90 | 667286.32                                         |          |
| 13277.54     | 90.00                    | 1.78                 | 9305.00           | 4175.45        | 129.72         | 0.00              | 4177.47                 | 610780.85 | 667289.42                                         |          |
| 13377.54     | 90.00                    | 1.78                 | 9305.00           | 4275.40        | 132.83         | 0.00              | 4277.47                 | 610880.80 | 667292.53                                         |          |
| 13477.54     | 90.00                    | 1.78                 | 9305.00           | 4375.35        | 135.93         | 0.00              | 4377.47                 | 610980.75 | 667295.63                                         |          |
| 13577.54     | 90.00                    | 1.78                 | 9305.00           | 4475.31        | 139.04         | 0.00              | 4477.47                 | 611080.71 | 667298.74                                         |          |
| 13677.54     | 90.00                    | 1.78                 | 9305.00           | 4575.26        | 142.15         | 0.00              | 4577.47                 | 611180.66 | 667301.85                                         |          |
| 13777.54     | 90.00                    | 1.78                 | 9305.00           | 4675.21        | 145.25         | 0.00              | 4677.47                 | 611280.61 | 667304.95                                         |          |
| 13877.54     | 90.00                    | 1.78                 | 9305.00           | 4775.16        | 148.36         | 0.00              | 4777.47                 | 611380.56 | 667308.06                                         |          |
| 13977.54     | 90.00                    | 1.78                 | 9305.00           | 4875.11        | 151.46         | 0.00              | 4877.47                 | 611480.51 | 667311.16                                         |          |
| 14077.54     | 90.00                    | 1.78                 | 9305.00           | 4975.06        | 154.57         | 0.00              | 4977.47                 | 611580.46 | 667314.27                                         |          |
| 14177.54     | 90.00                    | 1.78                 | 9305.00           | 5075.02        | 157.67         | 0.00              | 5077.47                 | 611680.42 | 667317.37                                         |          |
| 14277.54     | 90.00                    | 1.78                 | 9305.00           | 5174.97        | 160.78         | 0.00              | 5177.47                 | 611780.37 | 667320.48                                         |          |
| 14377.54     | 90.00                    | 1.78                 | 9305.00           | 5274.92        | 163.88         | 0.00              | 5277.47                 | 611880.32 | 667323.58                                         |          |
| 14477.54     | 90.00                    | 1.78                 | 9305.00           | 5374.87        | 166.99         | 0.00              | 5377.47                 | 611980.27 | 667326.69                                         |          |
| 14577.54     | 90.00                    | 1.78                 | 9305.00           | 5474.82        | 170.09         | 0.00              | 5477.47                 | 612080.22 | 667329.79                                         |          |
| 14677.54     | 90.00                    | 1.78                 | 9305.00           | 5574.78        | 173.20         | 0.00              | 5577.47                 | 612180.18 | 667332.90                                         |          |



# Rolfson Oilfield Services, Inc.

Company: COG Operating LLC  
Well: King Air 8 Federal Com 3H  
Location: Lea County, New Mexico

Date: 12-Jun-2013

Rev0

Page 3

Job#: 7390

NAD27 NM East gr elev=3609.4 RKB=3631.4

| MD<br>(feet) | Inclination<br>(degrees) | Azimuth<br>(degrees) | TVD RKB<br>(feet) | N-S<br>(feet) | E-W<br>(feet) | DLS<br>(deg/100') | VS @ 1.78° Az<br>(feet) | Grid Y    | Grid X    | Comments |
|--------------|--------------------------|----------------------|-------------------|---------------|---------------|-------------------|-------------------------|-----------|-----------|----------|
| 14777.54     | 90.00                    | 1.78                 | 9305.00           | 5674.73       | 176.30        | 0.00              | 5677.47                 | 612280.13 | 667336.00 |          |
| 14877.54     | 90.00                    | 1.78                 | 9305.00           | 5774.68       | 179.41        | 0.00              | 5777.47                 | 612380.08 | 667339.11 |          |
| 14977.54     | 90.00                    | 1.78                 | 9305.00           | 5874.63       | 182.51        | 0.00              | 5877.47                 | 612480.03 | 667342.21 |          |
| 15077.54     | 90.00                    | 1.78                 | 9305.00           | 5974.58       | 185.62        | 0.00              | 5977.47                 | 612579.98 | 667345.32 |          |
| 15177.54     | 90.00                    | 1.78                 | 9305.00           | 6074.53       | 188.73        | 0.00              | 6077.47                 | 612679.93 | 667348.43 |          |
| 15277.54     | 90.00                    | 1.78                 | 9305.00           | 6174.49       | 191.83        | 0.00              | 6177.47                 | 612779.89 | 667351.53 |          |
| 15377.54     | 90.00                    | 1.78                 | 9305.00           | 6274.44       | 194.94        | 0.00              | 6277.47                 | 612879.84 | 667354.64 |          |
| 15477.54     | 90.00                    | 1.78                 | 9305.00           | 6374.39       | 198.04        | 0.00              | 6377.47                 | 612979.79 | 667357.74 |          |
| 15577.54     | 90.00                    | 1.78                 | 9305.00           | 6474.34       | 201.15        | 0.00              | 6477.47                 | 613079.74 | 667360.85 |          |
| 15677.54     | 90.00                    | 1.78                 | 9305.00           | 6574.29       | 204.25        | 0.00              | 6577.47                 | 613179.69 | 667363.95 |          |
| 15777.54     | 90.00                    | 1.78                 | 9305.00           | 6674.25       | 207.36        | 0.00              | 6677.47                 | 613279.65 | 667367.06 |          |
| 15877.54     | 90.00                    | 1.78                 | 9305.00           | 6774.20       | 210.46        | 0.00              | 6777.47                 | 613379.60 | 667370.16 |          |
| 15977.54     | 90.00                    | 1.78                 | 9305.00           | 6874.15       | 213.57        | 0.00              | 6877.47                 | 613479.55 | 667373.27 |          |
| 16077.54     | 90.00                    | 1.78                 | 9305.00           | 6974.10       | 216.67        | 0.00              | 6977.47                 | 613579.50 | 667376.37 |          |
| 16177.54     | 90.00                    | 1.78                 | 9305.00           | 7074.05       | 219.78        | 0.00              | 7077.47                 | 613679.45 | 667379.48 |          |
| 16277.54     | 90.00                    | 1.78                 | 9305.00           | 7174.00       | 222.88        | 0.00              | 7177.47                 | 613779.40 | 667382.58 |          |
| 16377.54     | 90.00                    | 1.78                 | 9305.00           | 7273.96       | 225.99        | 0.00              | 7277.47                 | 613879.36 | 667385.69 |          |
| 16477.54     | 90.00                    | 1.78                 | 9305.00           | 7373.91       | 229.09        | 0.00              | 7377.47                 | 613979.31 | 667388.79 |          |
| 16577.54     | 90.00                    | 1.78                 | 9305.00           | 7473.86       | 232.20        | 0.00              | 7477.47                 | 614079.26 | 667391.90 |          |
| 16677.54     | 90.00                    | 1.78                 | 9305.00           | 7573.81       | 235.31        | 0.00              | 7577.47                 | 614179.21 | 667395.01 |          |
| 16777.54     | 90.00                    | 1.78                 | 9305.00           | 7673.76       | 238.41        | 0.00              | 7677.47                 | 614279.16 | 667398.11 |          |
| 16877.54     | 90.00                    | 1.78                 | 9305.00           | 7773.71       | 241.52        | 0.00              | 7777.47                 | 614379.11 | 667401.22 |          |
| 16977.54     | 90.00                    | 1.78                 | 9305.00           | 7873.67       | 244.62        | 0.00              | 7877.47                 | 614479.07 | 667404.32 |          |
| 17077.54     | 90.00                    | 1.78                 | 9305.00           | 7973.62       | 247.73        | 0.00              | 7977.47                 | 614579.02 | 667407.43 |          |
| 17102.43     | 90.00                    | 1.78                 | 9305.00           | 7998.50       | 248.50        | 0.00              | 8002.36                 | 614603.90 | 667408.20 | PBHL/TD  |



# *New Mexico Office of the State Engineer* **Water Column/Average Depth to Water**

No records found.

**PLSS Search:**

**Section(s): 8**

**Township: 19S**

**Range: 32E**

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

3/8/13 1:29 PM

Page 1 of 1

WATER COLUMN/ AVERAGE  
DEPTH TO WATER



# New Mexico Office of the State Engineer

## Water Column/Average Depth to Water

(A CLW##### in the  
POD suffix indicates the  
POD has been replaced  
& no longer serves a  
water right file.)

(R=POD has  
been replaced,  
O=orphaned,  
C=the file is

closed) (quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest) (NAD83 UTM in meters)

(In feet)

| POD Number    | POD Code | Subbasin | County | Q 64 | Q 16 | Q 4 | Sec | Tws | Rng    | X        | Y   | Depth Well | Depth Water | Water Column |
|---------------|----------|----------|--------|------|------|-----|-----|-----|--------|----------|-----|------------|-------------|--------------|
| CP 00073      |          |          | LE     | 2    | 4    | 34  | 19S | 32E | 617502 | 3609301* | 575 |            |             |              |
| CP 00075      |          |          | LE     | 2    | 4    | 34  | 19S | 32E | 617502 | 3609301* | 575 |            |             |              |
| CP 00639 EXPL |          |          | LE     | 3    | 1    | 20  | 19S | 32E | 613029 | 3612880* | 350 | 345        |             | 5            |
| CP 00640 EXPL |          |          | LE     | 2    | 2    | 19  | 19S | 32E | 612621 | 3613280* | 260 | 102        |             | 158          |

Average Depth to Water: **223 feet**

Minimum Depth: **102 feet**

Maximum Depth: **345 feet**

Record Count: 4

PLSS Search:

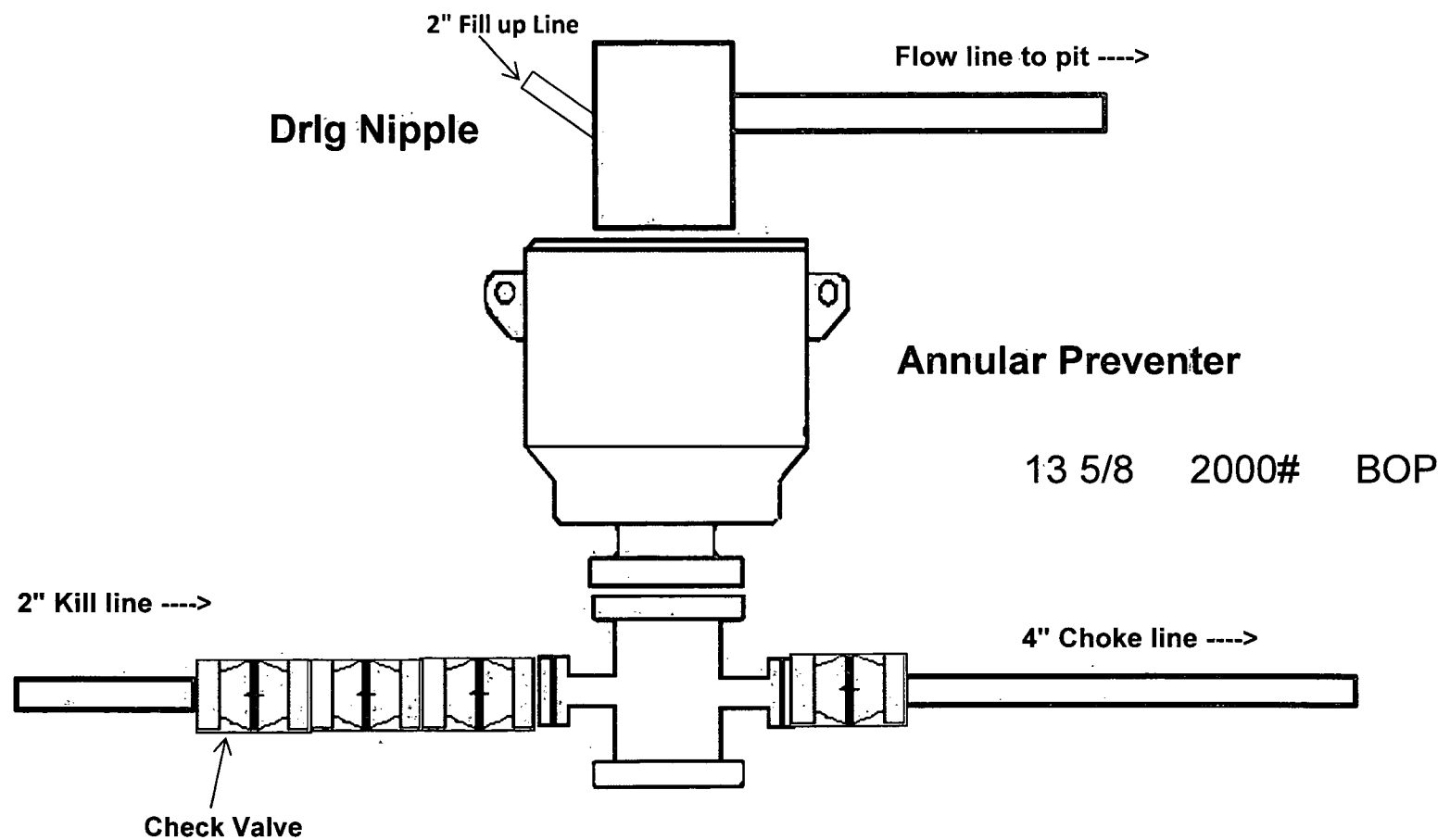
Township: 19S

Range: 32E

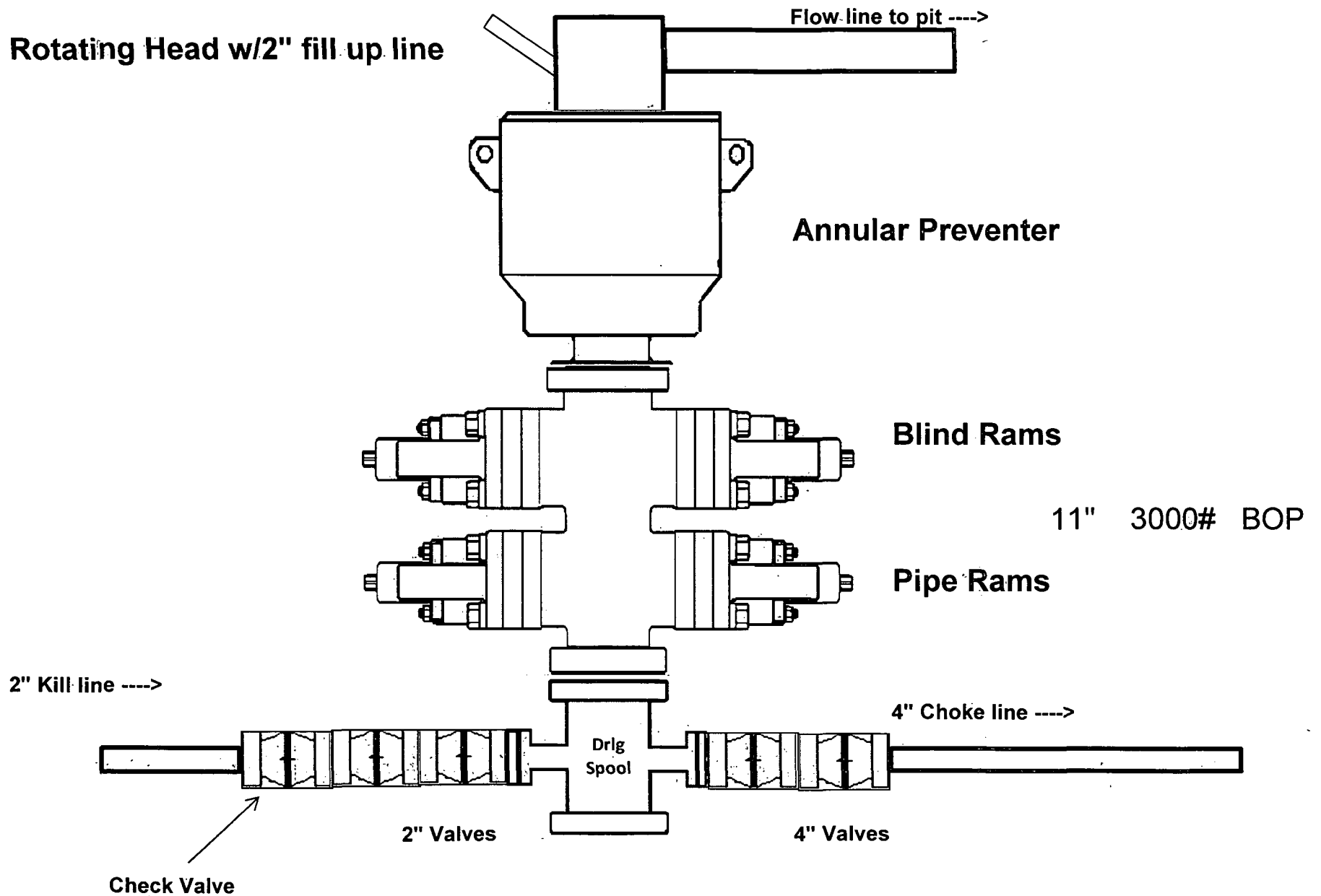
\*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

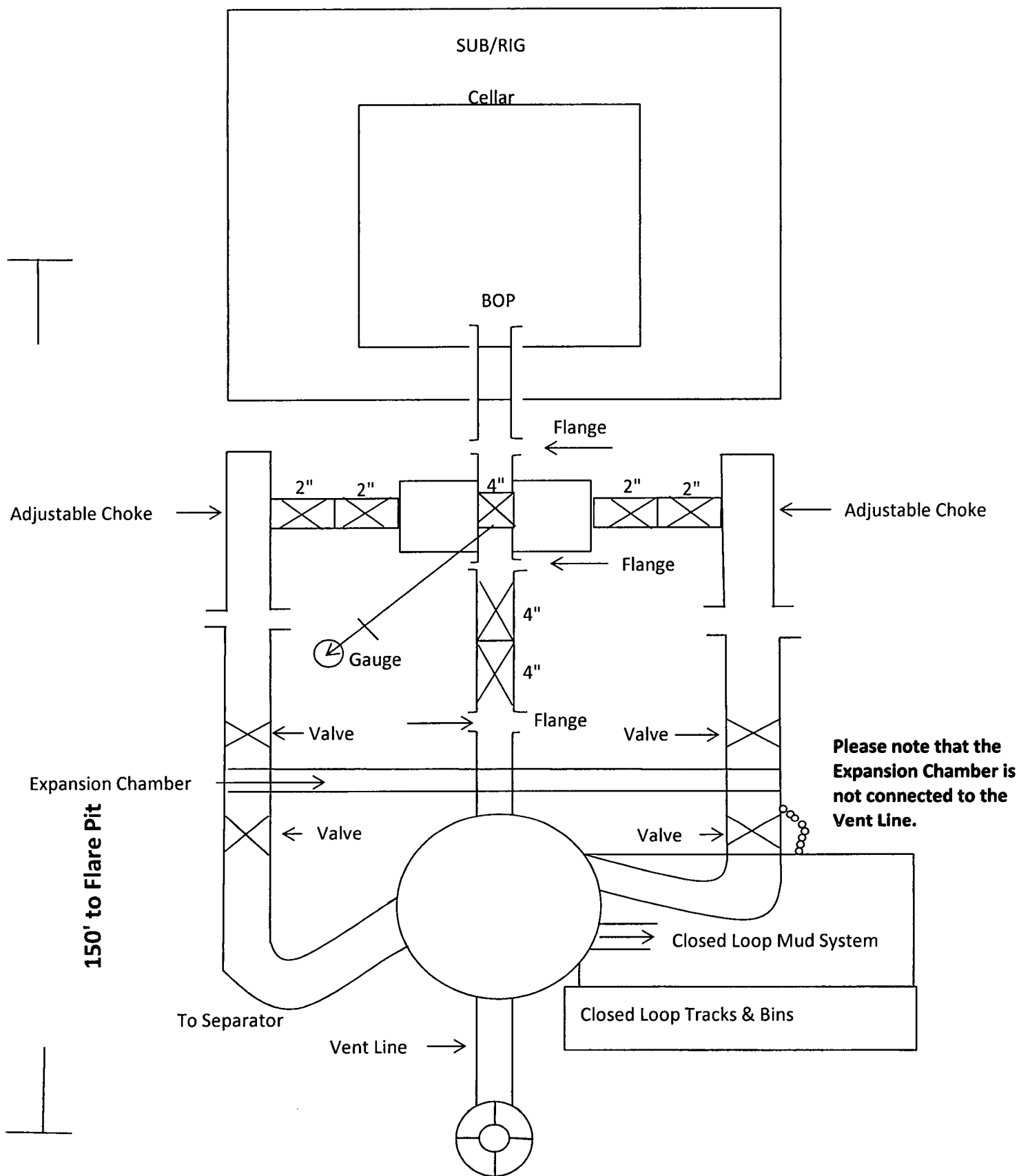
# 2,000 psi BOP Schematic



# 3,000 psi BOP Schematic



# 2M Choke Manifold Equipment



# 3M Choke Manifold Equipment

