

HOBBS OCD

SEP 06 2013

OCD Hobbs

ATS-13-765

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

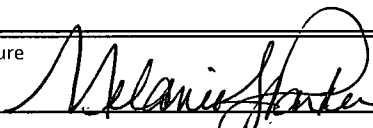
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**APPLICATION FOR PERMIT TO DRILL OR REENTER**

|                                                                                                                                                                                                                                                                          |                                                    |                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------------------|
| 1a. Type of Work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER                                                                                                                                                                             |                                                    | 7. If Unit or CA Agreement, Name and No.                                       |
| 1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone                                                   |                                                    | 8. Lease Name and Well No. <b>&lt;40119&gt;</b><br>Crazy Horse Federal #1H     |
| 2. Name of Operator<br>COG Operating LLC. <b>&lt;229137&gt;</b>                                                                                                                                                                                                          |                                                    | 9. API Well No.<br><b>30-025-41389</b>                                         |
| 3a. Address<br>2208 West Main Street<br>Artesia, NM 88210                                                                                                                                                                                                                | 3b. Phone No. (include area code)<br>575-748-6940  | 10. Field and Pool, or Exploratory<br><b>&lt;4144&gt;</b><br>Lusk; Bone Spring |
| 4. Location of Well (Report location clearly and in accordance with any State requirements.)*<br>At surface 330' FNL & 190' FWL Unit Lot 1 (NWNW) SHL Sec. 18 - T19S - R32E<br>At proposed prod. Zone 380' FNL & 330' FEL Unit Letter A (NENE) BHL Sec. 18 - T19S - R32E |                                                    | 11. Sec., T.R.M. or Blk and Survey or Area<br>Sec. 18 - T19S - R32E            |
| 14. Distance in miles and direction from nearest town or post office*<br>Approximately 12 miles from Maljamar                                                                                                                                                            |                                                    | 12. County or Parish<br>Lea County                                             |
| 15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 190'                                                                                                                                               |                                                    | 13. State<br>NM                                                                |
| 16. No. of acres in lease<br>440.36                                                                                                                                                                                                                                      | 17. Spacing Unit dedicated to this well<br>160.8   |                                                                                |
| 18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 570' BHL: 1349' Closest to the wellbore: ~306'                                                                                                                    | 19. Proposed Depth<br>TVD: 9,220' MD: 13,805'      | 20. BLM/BIA Bond No. on file<br>NMB000740 & NMB000215                          |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.)<br>3604.1' GL                                                                                                                                                                                                        | 22. Approximate date work will start*<br>11/1/2013 | 23. Estimated duration<br>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.                                                                                                | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).    |
| 2. A Drilling Plan                                                                                                                              | 5. Operator certification                                                                          |
| 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). | 6. Such other site specific information and/or plans as may be required by the authorized officer. |

|                                                                                                      |                                           |                  |
|------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|
| 25. Signature<br> | Name (Printed/Typed)<br>Melanie J. Parker | Date<br>8/1/2013 |
|------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|

|                                                       |                                                         |
|-------------------------------------------------------|---------------------------------------------------------|
| Title<br>Regulatory Analyst                           |                                                         |
| Approved by (Signature)<br><b>/s/George MacDonell</b> | Name (Printed/Typed)<br>Office<br>CARLSBAD FIELD OFFICE |
| Date<br><b>SEP 3 - 2013</b>                           |                                                         |

Application approval does not warrant or certify that the applicant holds legan 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 1212, 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

SEP 16 2013

**COG Operating LLC**  
**DRILLING AND OPERATIONS PROGRAM**  
**Crazy Horse Federal 1H**  
**SHL: 330' FNL & 190' FWL**  
**BHL: 380' FNL & 330' FEL**  
**Section 18 T19S R32E**  
**Lea County, New Mexico**

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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  | 223'    |     |
| Rustler      | 789'    |     |
| Top of Salt  | 867'    |     |
| Base of Salt | 2,428'  |     |
| Yates        | 2,638'  |     |
| Seven Rivers | 2,881'  |     |
| Capitan Reef | 2,963'  |     |
| Base of Reef | 3,648'  |     |
| Delaware     | 4,777'  | Oil |
| Bone Spring  | 6,918'  | Oil |
| TD TVD       | 9,220'  |     |
| TD MD        | 13,805' |     |

875' 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 820' 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**

See COA

| Hole Size | Depths        | Section                    | OD Casing | New/Used | Wt    | Collar | Grade | Collapse Design Factor | Burst Design Factor | Tension Design Factor |
|-----------|---------------|----------------------------|-----------|----------|-------|--------|-------|------------------------|---------------------|-----------------------|
| 17 1/2"   | 0' - 820'     | 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' - 4700' | Intrmd                     | 9 5/8"    | New      | 40#   | BTC    | J-55  | 1.125                  | 1.125               | 1.6                   |
| 7 7/8"    | 0' - 13,805'  | Production Curve & Lateral | 5 1/2"    | New      | 17#   | LTC    | P-110 | 1.125                  | 1.125               | 1.6                   |

See COA 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.

#### 4. Proposed Cement Program

- a. 13-3/8" Surface
- Lead: 325 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: 275 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: 850 sx 35:65:6 H + Salt+Gilsonite+CFR-3+ HR601  
(12.7 ppg / 1.89 cuft/sx)  
Tail: 975 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. Pressure 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 = 4315 psi

Lateral TD= 148°F

**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' - 820'                  | Fresh Water | 8.4        | 29              | N.C.           |
| 820' - 4,700'              | Brine       | 10         | 29              | N.C.           |
| 4,700' - 13,805' (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 tourly 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:**

- A Kelly cock will be in the drill string at all times.
- A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
- 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.

See COA

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

- Drill stem tests will be based on geological sample shows.
- If open hole electrical logging is performed, the program will be:
  - Total Depth to Intermediate Casing: Dual Laterolog-Micro Laterolog and Gamma Ray. Compensated Neutron - Z Density log with Gamma Ray and Caliper.
  - Total Depth to Surface: Compensated Neutron with Gamma Ray
  - No coring program is planned
  - 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:**

- 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.

See COA

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

- 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.

# COG Crazy Horse Federal #1H Rev0 MDT 10Jul13 Proposal Geodetic Report

(Def Plan)



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Report Date: July 10, 2013 - 03:50 PM  
Client: COG  
Field: NM Lea County (NAD 27)  
Structure / Slot: COG Crazy Horse Federal #1H / COG Crazy Horse Federal #1H  
Well: Crazy Horse Federal #1H  
Borehole: Original Borehole  
UWI / API#: Unknown / Unknown  
Survey Name: COG Crazy Horse Federal #1H Rev0 MDT 10Jul13  
Survey Date: July 10, 2013  
Tort / AHD / DDI / ERD Ratio: 91.712 ° / 4789.369 ft / 5.818 / 0.519  
Coordinate Reference System: NAD27 New Mexico State Plane, Eastern Zone, US Feet  
Location Lat / Long: N 32° 40' 0.29373", W 103° 48' 47.29129"  
Location Grid N/E Y/X: N 606666.400 ftUS, E 660081.400 ftUS  
CRS Grid Convergence Angle: 0.2808 °  
Grid Scale Factor: 0.99993844

Survey / DLS Computation: Minimum Curvature / Lubinski  
Vertical Section Azimuth: 90.474 ° (Grid North)  
Vertical Section Origin: 0.000 ft, 0.000 ft  
TVD Reference Datum: RKB  
TVD Reference Elevation: 3622.100 ft above  
Seabed / Ground Elevation: 3604.100 ft above  
Magnetic Declination: 7.588 °  
Total Gravity Field Strength: 998.5045mgn (9.80665 Based)  
Total Magnetic Field Strength: 48637.540 nT  
Magnetic Dip Angle: 60.495 °  
Declination Date: July 10, 2013  
Magnetic Declination Model: BGGM 2013  
North Reference: Grid North  
Grid Convergence Used: 0.2808 °  
Total Corr Mag North->Grid North: 7.3070 °  
Local Coord Referenced To: Structure Reference Point

| Comments | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLS<br>("/100ft) | Northing<br>(ftUS) | Easting<br>(ftUS) | Latitude<br>(N/S ° ' ") | Longitude<br>(E/W ° ' ") |
|----------|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|--------------------|-------------------|-------------------------|--------------------------|
| SHL      | 0.00       | 0.00        | 92.00            | 0.00        | 0.00         | 0.00       | 0.00       | N/A              | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 100.00     | 0.00        | 92.00            | 100.00      | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 200.00     | 0.00        | 92.00            | 200.00      | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 300.00     | 0.00        | 92.00            | 300.00      | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 400.00     | 0.00        | 92.00            | 400.00      | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 500.00     | 0.00        | 92.00            | 500.00      | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 600.00     | 0.00        | 92.00            | 600.00      | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 700.00     | 0.00        | 92.00            | 700.00      | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 800.00     | 0.00        | 92.00            | 800.00      | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 900.00     | 0.00        | 92.00            | 900.00      | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 1000.00    | 0.00        | 92.00            | 1000.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 1100.00    | 0.00        | 92.00            | 1100.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 1200.00    | 0.00        | 92.00            | 1200.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 1300.00    | 0.00        | 92.00            | 1300.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 1400.00    | 0.00        | 92.00            | 1400.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 1500.00    | 0.00        | 92.00            | 1500.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 1600.00    | 0.00        | 92.00            | 1600.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 1700.00    | 0.00        | 92.00            | 1700.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 1800.00    | 0.00        | 92.00            | 1800.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 1900.00    | 0.00        | 92.00            | 1900.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 2000.00    | 0.00        | 92.00            | 2000.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 2100.00    | 0.00        | 92.00            | 2100.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 2200.00    | 0.00        | 92.00            | 2200.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 2300.00    | 0.00        | 92.00            | 2300.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 2400.00    | 0.00        | 92.00            | 2400.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 2500.00    | 0.00        | 92.00            | 2500.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 2600.00    | 0.00        | 92.00            | 2600.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 2700.00    | 0.00        | 92.00            | 2700.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 2800.00    | 0.00        | 92.00            | 2800.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 2900.00    | 0.00        | 92.00            | 2900.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 3000.00    | 0.00        | 92.00            | 3000.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 3100.00    | 0.00        | 92.00            | 3100.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 3200.00    | 0.00        | 92.00            | 3200.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 3300.00    | 0.00        | 92.00            | 3300.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 3400.00    | 0.00        | 92.00            | 3400.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 3500.00    | 0.00        | 92.00            | 3500.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 3600.00    | 0.00        | 92.00            | 3600.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 3700.00    | 0.00        | 92.00            | 3700.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 3800.00    | 0.00        | 92.00            | 3800.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 3900.00    | 0.00        | 92.00            | 3900.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 4000.00    | 0.00        | 92.00            | 4000.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 4100.00    | 0.00        | 92.00            | 4100.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 4200.00    | 0.00        | 92.00            | 4200.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 4300.00    | 0.00        | 92.00            | 4300.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 4400.00    | 0.00        | 92.00            | 4400.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 4500.00    | 0.00        | 92.00            | 4500.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 4600.00    | 0.00        | 92.00            | 4600.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 4700.00    | 0.00        | 92.00            | 4700.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 4800.00    | 0.00        | 92.00            | 4800.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 4900.00    | 0.00        | 92.00            | 4900.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 5000.00    | 0.00        | 92.00            | 5000.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 5100.00    | 0.00        | 92.00            | 5100.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 5200.00    | 0.00        | 92.00            | 5200.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 5300.00    | 0.00        | 92.00            | 5300.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 5400.00    | 0.00        | 92.00            | 5400.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 5500.00    | 0.00        | 92.00            | 5500.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 5600.00    | 0.00        | 92.00            | 5600.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 5700.00    | 0.00        | 92.00            | 5700.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 5800.00    | 0.00        | 92.00            | 5800.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 5900.00    | 0.00        | 92.00            | 5900.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 6000.00    | 0.00        | 92.00            | 6000.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 6100.00    | 0.00        | 92.00            | 6100.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 6200.00    | 0.00        | 92.00            | 6200.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 6300.00    | 0.00        | 92.00            | 6300.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |
|          | 6400.00    | 0.00        | 92.00            | 6400.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40          | 660081.40         | N 32 40 0.29            | W 103 48 47.29           |

| Comments                         | MD<br>(ft) | Incl<br>(°) | Azim Grid<br>(°) | TVD<br>(ft) | VSEC<br>(ft) | NS<br>(ft) | EW<br>(ft) | DLS<br>(°/100ft) | Northing<br>(RUS) | Easting<br>(RUS) | Latitude<br>(N/S ° ' ") | Longitude<br>(E/W ° ' ") |
|----------------------------------|------------|-------------|------------------|-------------|--------------|------------|------------|------------------|-------------------|------------------|-------------------------|--------------------------|
|                                  | 6500.00    | 0.00        | 92.00            | 6500.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 6600.00    | 0.00        | 92.00            | 6600.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 6700.00    | 0.00        | 92.00            | 6700.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 6800.00    | 0.00        | 92.00            | 6800.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 6900.00    | 0.00        | 92.00            | 6900.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 7000.00    | 0.00        | 92.00            | 7000.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 7100.00    | 0.00        | 92.00            | 7100.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 7200.00    | 0.00        | 92.00            | 7200.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 7300.00    | 0.00        | 92.00            | 7300.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 7400.00    | 0.00        | 92.00            | 7400.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 7500.00    | 0.00        | 92.00            | 7500.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 7600.00    | 0.00        | 92.00            | 7600.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 7700.00    | 0.00        | 92.00            | 7700.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 7800.00    | 0.00        | 92.00            | 7800.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 7900.00    | 0.00        | 92.00            | 7900.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 8000.00    | 0.00        | 92.00            | 8000.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 8100.00    | 0.00        | 92.00            | 8100.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 8200.00    | 0.00        | 92.00            | 8200.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 8300.00    | 0.00        | 92.00            | 8300.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 8400.00    | 0.00        | 92.00            | 8400.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 8500.00    | 0.00        | 92.00            | 8500.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 8600.00    | 0.00        | 92.00            | 8600.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 8700.00    | 0.00        | 92.00            | 8700.00     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
| KOP Build @ 12° DLS              | 8742.54    | 0.00        | 92.00            | 8742.54     | 0.00         | 0.00       | 0.00       | 0.00             | 606666.40         | 660081.40        | N 32 40 0.29            | W 103 48 47.29           |
|                                  | 8800.00    | 6.90        | 92.00            | 8799.86     | 3.45         | -0.12      | 3.45       | 12.00            | 606666.28         | 660084.85        | N 32 40 0.29            | W 103 48 47.25           |
|                                  | 8900.00    | 18.90       | 92.00            | 8897.16     | 25.72        | -0.90      | 25.71      | 12.00            | 606665.50         | 660107.11        | N 32 40 0.28            | W 103 48 46.99           |
|                                  | 9000.00    | 30.90       | 92.00            | 8897.70     | 67.73        | -2.36      | 67.71      | 12.00            | 606664.04         | 660149.10        | N 32 40 0.27            | W 103 48 46.50           |
|                                  | 9100.00    | 42.90       | 92.00            | 9067.53     | 127.63       | -4.46      | 127.60     | 12.00            | 606661.94         | 660208.99        | N 32 40 0.24            | W 103 48 45.80           |
|                                  | 9200.00    | 54.90       | 92.00            | 9133.15     | 202.82       | -7.08      | 202.77     | 12.00            | 606659.32         | 660284.15        | N 32 40 0.21            | W 103 48 44.92           |
|                                  | 9300.00    | 66.90       | 92.00            | 9181.70     | 290.00       | -10.12     | 289.93     | 12.00            | 606656.28         | 660371.31        | N 32 40 0.18            | W 103 48 43.90           |
|                                  | 9400.00    | 78.90       | 92.00            | 9211.06     | 385.37       | -13.45     | 385.27     | 12.00            | 606652.95         | 660466.65        | N 32 40 0.14            | W 103 48 42.79           |
| Land then Turn @ 2° DLS          | 9492.53    | 90.00       | 92.00            | 9220.00     | 477.29       | -16.66     | 477.17     | 12.00            | 606649.74         | 660558.54        | N 32 40 0.11            | W 103 48 41.71           |
|                                  | 9500.00    | 90.00       | 91.85            | 9220.00     | 484.76       | -16.91     | 484.63     | 2.00             | 606649.49         | 660566.00        | N 32 40 0.10            | W 103 48 41.62           |
| Hold                             | 9578.14    | 90.00       | 90.29            | 9220.00     | 562.89       | -18.37     | 562.76     | 2.00             | 606648.03         | 660644.12        | N 32 40 0.08            | W 103 48 40.71           |
|                                  | 9600.00    | 90.00       | 90.29            | 9220.00     | 584.75       | -18.48     | 584.62     | 0.00             | 606647.92         | 660665.98        | N 32 40 0.08            | W 103 48 40.45           |
|                                  | 9700.00    | 90.00       | 90.29            | 9220.00     | 684.75       | -18.98     | 684.61     | 0.00             | 606647.42         | 660765.97        | N 32 40 0.07            | W 103 48 39.28           |
|                                  | 9800.00    | 90.00       | 90.29            | 9220.00     | 784.75       | -19.49     | 784.61     | 0.00             | 606646.91         | 660865.96        | N 32 40 0.06            | W 103 48 38.11           |
|                                  | 9900.00    | 90.00       | 90.29            | 9220.00     | 884.75       | -19.99     | 884.61     | 0.00             | 606646.41         | 660965.96        | N 32 40 0.05            | W 103 48 36.94           |
|                                  | 10000.00   | 90.00       | 90.29            | 9220.00     | 984.75       | -20.49     | 984.61     | 0.00             | 606645.91         | 661065.95        | N 32 40 0.04            | W 103 48 35.78           |
|                                  | 10100.00   | 90.00       | 90.29            | 9220.00     | 1084.75      | -20.99     | 1084.61    | 0.00             | 606645.41         | 661165.94        | N 32 40 0.03            | W 103 48 34.61           |
|                                  | 10200.00   | 90.00       | 90.29            | 9220.00     | 1184.75      | -21.50     | 1184.61    | 0.00             | 606644.91         | 661265.93        | N 32 40 0.02            | W 103 48 33.44           |
|                                  | 10300.00   | 90.00       | 90.29            | 9220.00     | 1284.75      | -22.00     | 1284.61    | 0.00             | 606644.40         | 661365.93        | N 32 40 0.01            | W 103 48 32.27           |
|                                  | 10400.00   | 90.00       | 90.29            | 9220.00     | 1384.74      | -22.50     | 1384.61    | 0.00             | 606643.90         | 661465.92        | N 32 40 0.00            | W 103 48 31.10           |
|                                  | 10500.00   | 90.00       | 90.29            | 9220.00     | 1484.74      | -23.00     | 1484.60    | 0.00             | 606643.40         | 661565.91        | N 32 39 59.99           | W 103 48 29.93           |
|                                  | 10600.00   | 90.00       | 90.29            | 9220.00     | 1584.74      | -23.51     | 1584.60    | 0.00             | 606642.90         | 661665.90        | N 32 39 59.98           | W 103 48 28.76           |
|                                  | 10700.00   | 90.00       | 90.29            | 9220.00     | 1684.74      | -24.01     | 1684.60    | 0.00             | 606642.39         | 661765.90        | N 32 39 59.97           | W 103 48 27.59           |
|                                  | 10800.00   | 90.00       | 90.29            | 9220.00     | 1784.74      | -24.51     | 1784.60    | 0.00             | 606641.89         | 661865.89        | N 32 39 59.96           | W 103 48 26.42           |
|                                  | 10900.00   | 90.00       | 90.29            | 9220.00     | 1884.74      | -25.01     | 1884.60    | 0.00             | 606641.39         | 661965.88        | N 32 39 59.95           | W 103 48 25.25           |
|                                  | 11000.00   | 90.00       | 90.29            | 9220.00     | 1984.74      | -25.51     | 1984.60    | 0.00             | 606640.89         | 662065.87        | N 32 39 59.94           | W 103 48 24.08           |
|                                  | 11100.00   | 90.00       | 90.29            | 9220.00     | 2084.74      | -26.02     | 2084.60    | 0.00             | 606640.38         | 662165.86        | N 32 39 59.93           | W 103 48 22.91           |
|                                  | 11200.00   | 90.00       | 90.29            | 9220.00     | 2184.74      | -26.52     | 2184.60    | 0.00             | 606639.88         | 662265.86        | N 32 39 59.92           | W 103 48 21.74           |
|                                  | 11300.00   | 90.00       | 90.29            | 9220.00     | 2284.74      | -27.02     | 2284.59    | 0.00             | 606639.38         | 662365.85        | N 32 39 59.91           | W 103 48 20.57           |
|                                  | 11400.00   | 90.00       | 90.29            | 9220.00     | 2384.74      | -27.52     | 2384.59    | 0.00             | 606638.88         | 662465.84        | N 32 39 59.90           | W 103 48 19.40           |
|                                  | 11500.00   | 90.00       | 90.29            | 9220.00     | 2484.74      | -28.03     | 2484.59    | 0.00             | 606638.38         | 662565.83        | N 32 39 59.89           | W 103 48 18.23           |
|                                  | 11600.00   | 90.00       | 90.29            | 9220.00     | 2584.74      | -28.53     | 2584.59    | 0.00             | 606637.87         | 662665.83        | N 32 39 59.88           | W 103 48 17.06           |
|                                  | 11700.00   | 90.00       | 90.29            | 9220.00     | 2684.74      | -29.03     | 2684.59    | 0.00             | 606637.37         | 662765.82        | N 32 39 59.88           | W 103 48 15.89           |
|                                  | 11800.00   | 90.00       | 90.29            | 9220.00     | 2784.74      | -29.53     | 2784.59    | 0.00             | 606636.87         | 662865.81        | N 32 39 59.87           | W 103 48 14.72           |
|                                  | 11900.00   | 90.00       | 90.29            | 9220.00     | 2884.74      | -30.04     | 2884.59    | 0.00             | 606636.37         | 662965.80        | N 32 39 59.86           | W 103 48 13.55           |
|                                  | 12000.00   | 90.00       | 90.29            | 9220.00     | 2984.74      | -30.54     | 2984.59    | 0.00             | 606635.86         | 663065.80        | N 32 39 59.85           | W 103 48 12.38           |
|                                  | 12100.00   | 90.00       | 90.29            | 9220.00     | 3084.74      | -31.04     | 3084.58    | 0.00             | 606635.36         | 663165.79        | N 32 39 59.84           | W 103 48 11.21           |
|                                  | 12200.00   | 90.00       | 90.29            | 9220.00     | 3184.74      | -31.54     | 3184.58    | 0.00             | 606634.86         | 663265.78        | N 32 39 59.83           | W 103 48 10.04           |
|                                  | 12300.00   | 90.00       | 90.29            | 9220.00     | 3284.73      | -32.05     | 3284.58    | 0.00             | 606634.36         | 663365.77        | N 32 39 59.82           | W 103 48 8.87            |
|                                  | 12400.00   | 90.00       | 90.29            | 9220.00     | 3384.73      | -32.55     | 3384.58    | 0.00             | 606633.85         | 663465.77        | N 32 39 59.81           | W 103 48 7.70            |
|                                  | 12500.00   | 90.00       | 90.29            | 9220.00     | 3484.73      | -33.05     | 3484.58    | 0.00             | 606633.35         | 663565.76        | N 32 39 59.80           | W 103 48 6.53            |
|                                  | 12600.00   | 90.00       | 90.29            | 9220.00     | 3584.73      | -33.55     | 3584.58    | 0.00             | 606632.85         | 663665.75        | N 32 39 59.79           | W 103 48 5.36            |
|                                  | 12700.00   | 90.00       | 90.29            | 9220.00     | 3684.73      | -34.05     | 3684.58    | 0.00             | 606632.35         | 663765.74        | N 32 39 59.78           | W 103 48 4.19            |
|                                  | 12800.00   | 90.00       | 90.29            | 9220.00     | 3784.73      | -34.56     | 3784.58    | 0.00             | 606631.85         | 663865.74        | N 32 39 59.77           | W 103 48 3.02            |
|                                  | 12900.00   | 90.00       | 90.29            | 9220.00     | 3884.73      | -35.06     | 3884.57    | 0.00             | 606631.34         | 663965.73        | N 32 39 59.76           | W 103 48 1.85            |
|                                  | 13000.00   | 90.00       | 90.29            | 9220.00     | 3984.73      | -35.56     | 3984.57    | 0.00             | 606630.84         | 664065.72        | N 32 39 59.75           | W 103 48 0.68            |
|                                  | 13100.00   | 90.00       | 90.29            | 9220.00     | 4084.73      | -36.06     | 4084.57    | 0.00             | 606630.34         | 664165.71        | N 32 39 59.74           | W 103 47 58.51           |
|                                  | 13200.00   | 90.00       | 90.29            | 9220.00     | 4184.73      | -36.57     | 4184.57    | 0.00             | 606629.84         | 664265.70        | N 32 39 59.73           | W 103 47 58.35           |
|                                  | 13300.00   | 90.00       | 90.29            | 9220.00     | 4284.73      | -37.07     | 4284.57    | 0.00             | 606629.33         | 664365.70        | N 32 39 59.72           | W 103 47 57.18           |
|                                  | 13400.00   | 90.00       | 90.29            | 9220.00     | 4384.73      | -37.57     | 4384.57    | 0.00             | 606628.83         | 664465.69        | N 32 39 59.71           | W 103 47 56.01           |
|                                  | 13500.00   | 90.00       | 90.29            | 9220.00     | 4484.73      | -38.07     | 4484.57    | 0.00             | 606628.33         | 664565.68        | N 32 39 59.70           | W 103 47 54.84           |
|                                  | 13600.00   | 90.00       | 90.29            | 9220.00     | 4584.73      | -38.58     | 4584.57    | 0.00             | 606627.83         | 664665.67        | N 32 39 59.69           | W 103 47 53.67           |
|                                  | 13700.00   | 90.00       | 90.29            | 9220.00     | 4684.73      | -39.08     | 4684.56    | 0.00             | 606627.32         | 664765.67        | N 32 39 59.68           | W 103 47 52.50           |
|                                  | 13800.00   | 90.00       | 90.29            | 9220.00     | 4784.73      | -39.58     | 4784.56    | 0.00             | 606626.82         | 664865.66        | N 32 39 59.67           | W 103 47 51.33           |
| COG Crazy Horse Federal #1H PBHL | 13804.44   | 90.00       | 90.29            | 9220.00     | 4789.17      | -39.60     | 4789.00    | 0.00             |                   |                  |                         |                          |

| Comments    | MD<br>(ft)      | Incl<br>(°)   | Azim Grid<br>(°) | TVD<br>(ft)       | VSEC<br>(ft)            | NS<br>(ft)       | EW<br>(ft)             | DLS<br>(°/100ft)  | Northing<br>(ftUS)                                       | Easting<br>(ftUS) | Latitude<br>(N/S ° ' ") | Longitude<br>(E/W ° ' ") |
|-------------|-----------------|---------------|------------------|-------------------|-------------------------|------------------|------------------------|-------------------|----------------------------------------------------------|-------------------|-------------------------|--------------------------|
| Description | MD From<br>(ft) | MD To<br>(ft) | EOU Freq<br>(ft) | Hole Size<br>(in) | Casing Diameter<br>(in) | Survey Tool Type |                        | Borehole / Survey |                                                          |                   |                         |                          |
|             | 0.000           | 18.000        |                  | 1/100,000         | 30.000                  | 30.000           | SLB_MWD-STD-Depth Only |                   | Original Borehole / COG Crazy Horse Federal #1H Rev0 MDT |                   |                         |                          |
|             | 18.000          | 13804.441     |                  | 1/100,000         | 30.000                  | 30.000           | SLB_MWD-STD            |                   | Original Borehole / COG Crazy Horse Federal #1H Rev0 MDT |                   |                         |                          |

|                     |                               |                            |                        |                         |                                                      |
|---------------------|-------------------------------|----------------------------|------------------------|-------------------------|------------------------------------------------------|
| WELL                | Crazy Horse Federal #1H       | FIELD                      | NM Lea County (NAD 27) | STRUCTURE               | Patriot 6                                            |
| Magnetic Parameters | Model: BGOM 2013              | Dip: 40.491°               | Date: July 10, 2013    | Surface Location        | NAD83 New Mexico State Plane, Eastern Zone, 115 Feet |
|                     | Mag Dec: 7.588°               | FS: 48537.5aT              |                        | Lat: N 32 40 0.294      | North: 606666.40 US                                  |
|                     |                               |                            |                        | Long: W 103 48 47.291   | East: 660081.40 US                                   |
|                     |                               |                            |                        |                         | Grid Conv: 7.317°                                    |
|                     |                               |                            |                        |                         | Scale Fact: 0.99991844                               |
| Miscellaneous       | Site: Crazy Horse Federal #1H | TVD Ref: RRR3632.1ft above |                        | Plan: Rev-0 MDT 10/6/11 | Srvy Date: July 10, 2013                             |

Legend

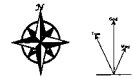
COG Crazy Horse Federal #1H PBHL

COG Crazy Horse Federal #1H LBSH LBS

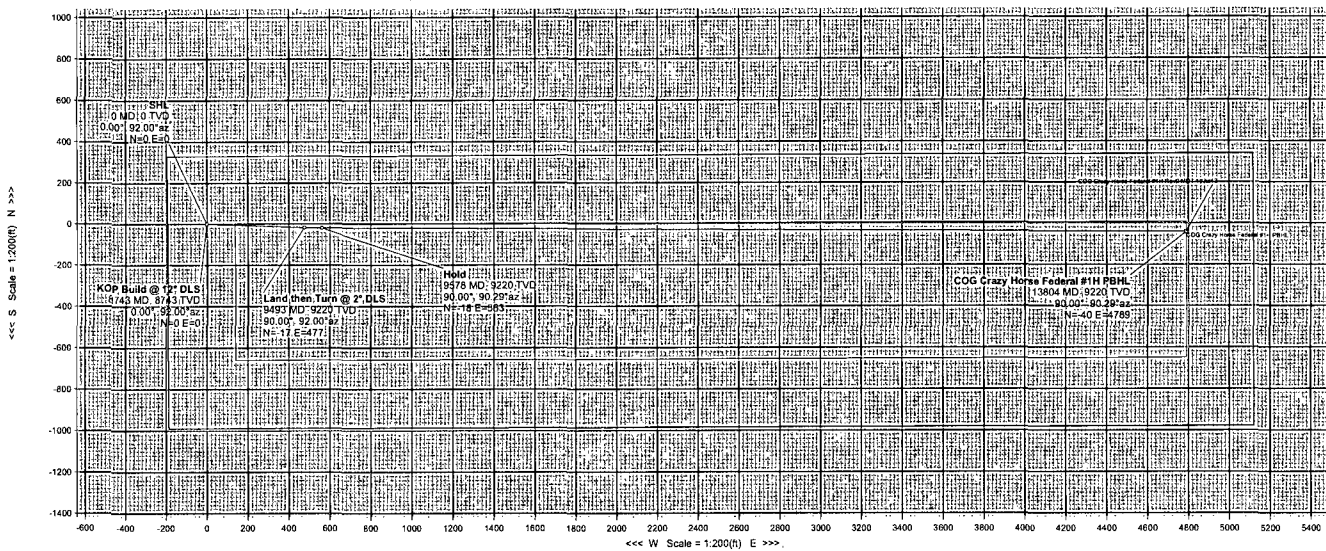
COG Crazy Horse Federal #1H LBSH LBS

COG Crazy Horse Federal #1H LBSH LBS

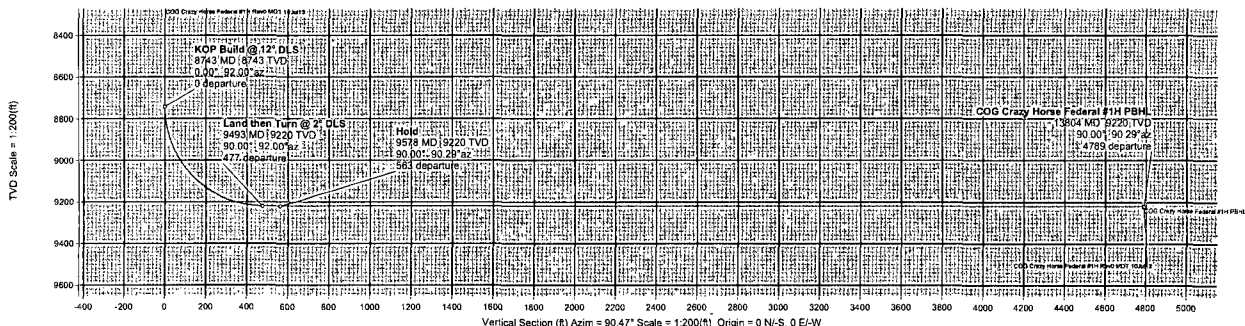
COG Crazy Horse Federal #1H LBSH LBS



Grid North  
Tot Corr (M->G)  
7.3070°  
Mag Dec (7.588°)  
Grid Conv (0.281°)

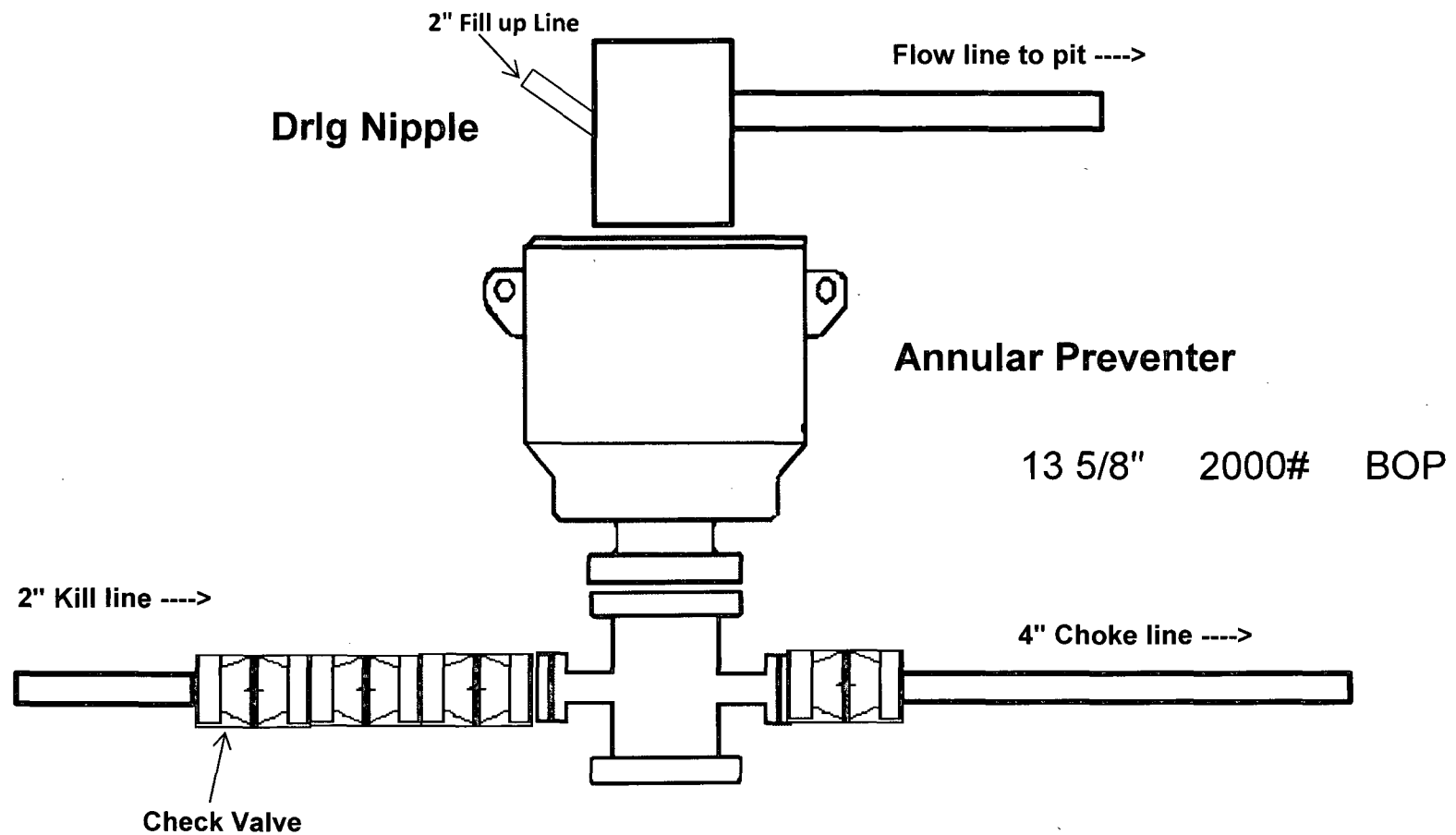


| Comments                         | Survey MD (ft) | Inclination (deg) | Azimuth (deg) | TVD (ft) | Sub-Seq TVD | VS (ft) | NS (ft) | EW (ft) | North (ftUS) | East (ftUS) | Latitude (deg) | Longitude (deg) | DLS (1/100ft) | Tool Face (deg) |
|----------------------------------|----------------|-------------------|---------------|----------|-------------|---------|---------|---------|--------------|-------------|----------------|-----------------|---------------|-----------------|
| SHL                              | 0.00           | 0.00              | 92.00         | 0.00     | -3622.10    | 0.00    | 0.00    | 0.00    | 606666.40    | 660081.40   | N 32 40 0.294  | W 103 48 47.291 | 92.00         |                 |
| KOP Build @ 12° DLS              | 8742.54        | 0.00              | 92.00         | 8742.54  | 5120.44     | 0.00    | 0.00    | 0.00    | 606666.40    | 660081.40   | N 32 40 0.294  | W 103 48 47.291 | 0.00          | 92.00           |
| Land then Turn @ 2° DLS          | 9492.53        | 90.00             | 92.00         | 9220.00  | 5597.90     | 477.29  | -16.66  | 477.17  | 606648.74    | 660558.54   | N 32 40 0.106  | W 103 48 41.711 | 12.00         | -90.00          |
| Hold                             | 9578.14        | 90.00             | 90.29         | 9220.00  | 5597.90     | 562.89  | -18.37  | 562.76  | 606648.03    | 660644.12   | N 32 40 0.085  | W 103 48 40.710 | 2.00          | 0.00            |
| COG Crazy Horse Federal #1H PBHL | 13804.44       | 90.00             | 90.29         | 9220.00  | 5597.90     | 4789.17 | -39.60  | 4789.00 | 606626.80    | 664870.10   | N 32 39 59.666 | W 103 47 51.275 | 0.00          |                 |

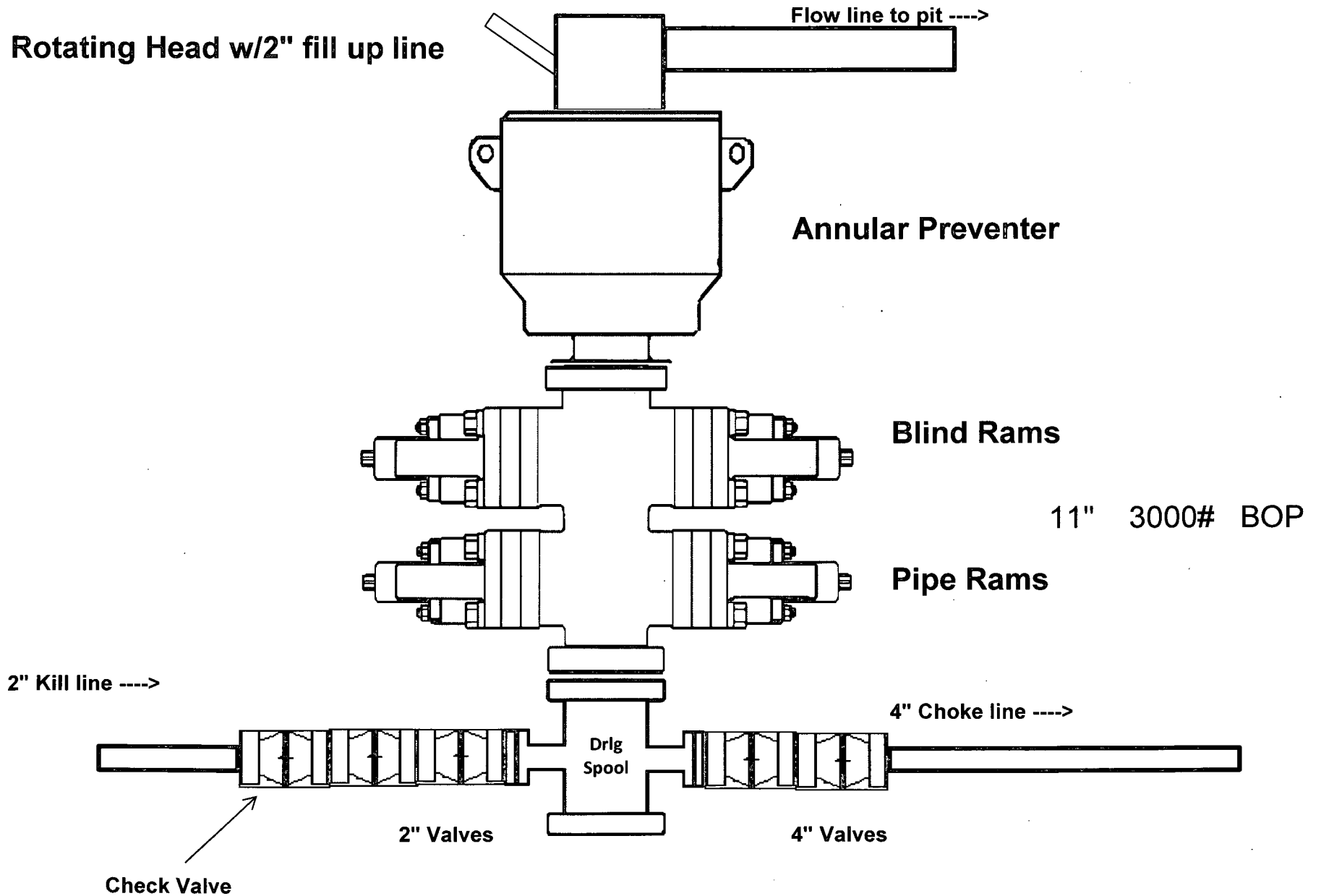


Drawn By: Current User  
Data Created: July 10, 2013 03:22:56 PM  
Checked By:  
Checked Date:  
Approved By:  
Approved Date:

## 2,000 psi BOP Schematic



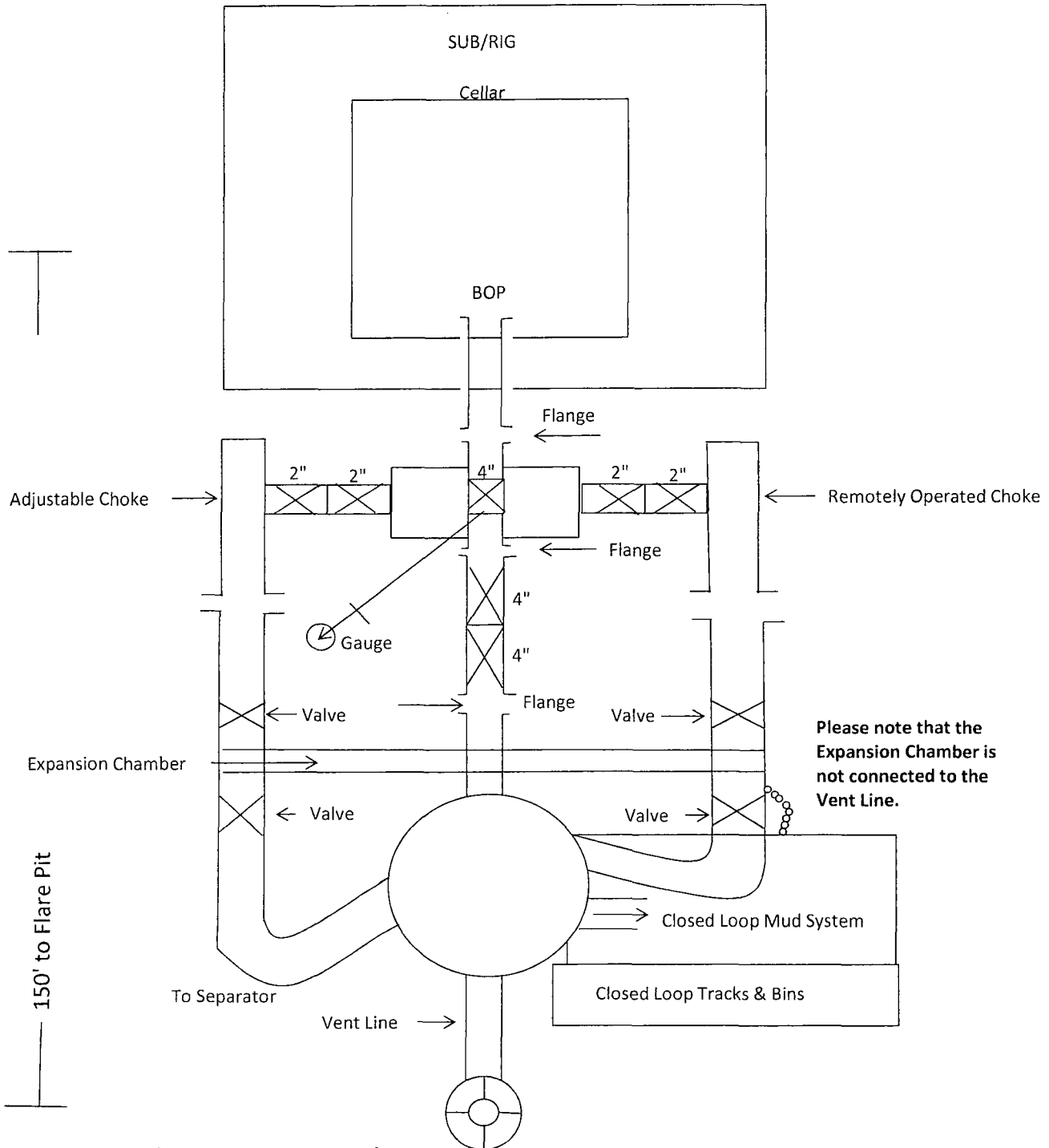
# 3,000 psi BOP Schematic





Operator shall have separate panic and vent lines.

# 3M Choke Manifold Equipment

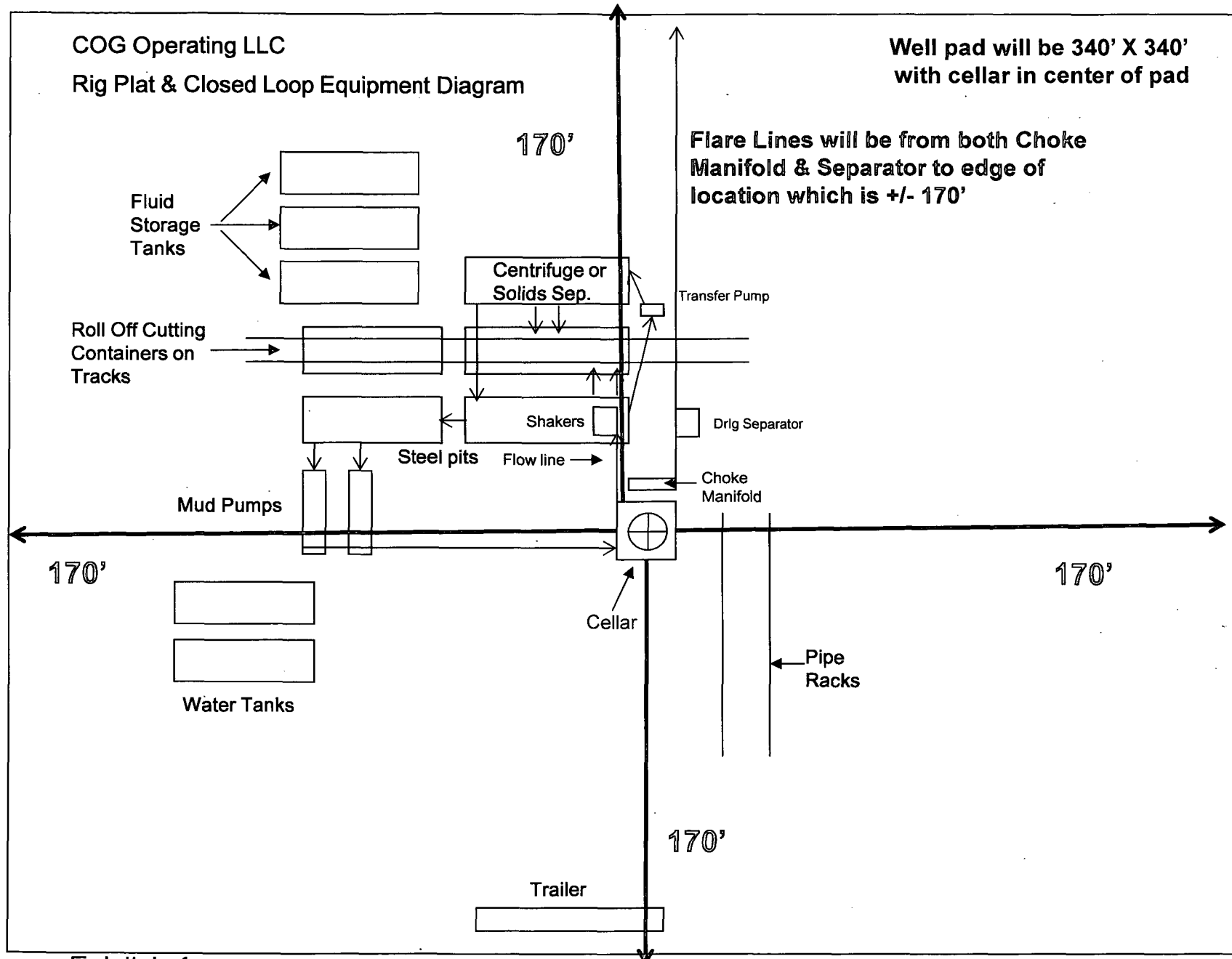


*Operator shall have separate panic and vent lines.*

COG Operating LLC

Rig Plat & Closed Loop Equipment Diagram

Well pad will be 340' X 340'  
with cellar in center of pad



4  
N  
VS  
8-12-2013

Exhibit 1

"I further certify that COG will comply with Rule 19.15.17  
NMAC by using a Closed Loop System."

Secondary egress.

Well pad will be 340' X 340'  
with cellar in center of pad

COG Operating LLC  
H<sub>2</sub>S Equipment Schematic  
Terrain: Shinnery sand hills.

