

HOBBS OCD

APR 11 2013

RECEIVED

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

HOBBS OCD

APR 11 2013

RECEIVED

FORM APPROVED  
OMB No. 1004-013  
Expires July 31, 2010

|                                                                                                                                                                                                                                                                    |                                                           |                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------|
| 1a. Type of Work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER                                                                                                                                                                       |                                                           | 5. Lease Serial No.<br>SHL: Fee, BHL: NMLC063798                    |
| 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                                             |                                                           | 6. If Indian, Allottee or Tribe Name                                |
| 2. Name of Operator<br>COG Operating LLC. (229137)                                                                                                                                                                                                                 |                                                           | 7. If Unit or CA Agreement, Name and No.                            |
| 3a. Address<br>2208 West Main Street<br>Artesia, NM 88210                                                                                                                                                                                                          |                                                           | 8. Lease Name and Well No. (39818)<br>Roy Batty Federal Com #1H     |
| 3b. Phone No. (include area code)<br>575-748-6940                                                                                                                                                                                                                  |                                                           | 9. API Well No.<br>30-025-41099                                     |
| 4. Location of Well (Report location clearly and in accordance with any State requirements. *)<br>At surface 330' FSL & 660' FWL Unit Letter M (SWSW) SHL Sec 11-T24S-R33E<br>At proposed prod. Zone 330' FNL & 380' FWL Unit Letter D (NWNW) BHL Sec 11-T24S-R33E |                                                           | 10. Field and Pool, or Exploratory<br>Bell Lake; Bone Spring (5130) |
| 14. Distance in miles and direction from nearest town or post office*<br>About 19 miles to Jal                                                                                                                                                                     |                                                           | 11. Sec., T.R.M. or Blk and Survey or Area<br>Sec. 11- T24S - R33E  |
| 15. Distance from proposed* location to nearest property or lease line, ft.<br>(Also to nearest drig. Unit line, if any) 330'                                                                                                                                      | 16. No. of acres in lease<br>SHL: Fee<br>BHL: 2480        | 12. County or Parish<br>Lea County                                  |
| 18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft.<br>SHL: 2113' BHL: 2327'                                                                                                                                         | 19. Proposed Depth<br>PH: 12450' TVD: 11105'<br>MD: 15518 | 13. State<br>NM                                                     |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.)<br>3603.3' GL                                                                                                                                                                                                  | 22. Approximate date work will start*<br>3/15/2013        | 17. Spacing Unit dedicated to this well<br>160                      |
|                                                                                                                                                                                                                                                                    |                                                           | 20. BLM/BIA Bond No. on file<br>NMB000740 & NMB00215                |
|                                                                                                                                                                                                                                                                    |                                                           | 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><i>Mayte Reyes</i> | Name (Printed/Typed)<br>Mayte Reyes | Date<br>2/6/2013 |
|-------------------------------------|-------------------------------------|------------------|

|                                                     |                                                         |
|-----------------------------------------------------|---------------------------------------------------------|
| Title<br>Regulatory Analyst                         |                                                         |
| Approved by (Signature)<br><i>/s/ James A. Amos</i> | Name (Printed/Typed)<br>Office<br>CARLSBAD FIELD OFFICE |
| Date<br>APR - 5 2013                                |                                                         |

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)

Carlsbad Controlled Water Basin

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

APR 15 2013

Approval Subject to General Requirements  
& Special Stipulations Attached

*Surface Use Plan*  
*COG Operating, LLC*  
*Roy Batty Federal Com #1H*  
*SL: 330' FSL & 660' FWL           UL M*  
*Section 11, T-24-S, R-33-E*  
*BHL: 330' FNL 380' FWL           UL D*  
*Section 11, T-24-S, R-33-E*  
*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:           February 06, 2013

Lease #:        SHL: Fee  
                  BHL: NMLC063798  
                  Roy Batty Federal Com #1H

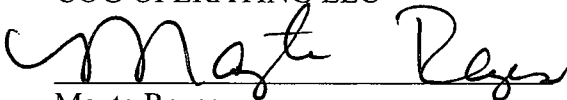
Legal Description:   Sec. 6 – T24S – R33E  
                          Lea County, New Mexico

Formation(s): Bone Spring

Bond Coverage: Statewide

BLM Bond File #: NMB000740 & NMB00215

COG OPERATING LLC



Mayte Reyes  
Regulatory Analyst

**COG Production LLC**  
**DRILLING AND OPERATIONS PROGRAM**  
**Roy Batty Federal Com 1H**  
**SHL: 330' FSL & 660' FWL**  
**BHL: 330' FNL & 380' FWL**  
**Section 11 T24S R33E**  
**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  | ~ 371'  |     |
| Rustler      | 1248'   |     |
| Top of Salt  | 1414'   |     |
| Base of Salt | 4949'   |     |
| Delaware     | 5204'   | Oil |
| Bone Spring  | 9061'   | Oil |
| Wolfcamp     | 12,218' |     |
| PHTD         | 12,450' |     |
| TD TVD       | 11,105' |     |
| TD MD        | 15,518' |     |

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 1275' 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 500' into 9-5/8" csg shoe.

**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' - <del>1275'</del> 1385' | Surface                    | 13 3/8"   | New      | 54.5# | STC    | J-55  | 1.125                  | 1.125               | 1.6                   |
| 12 1/4"   | 0' - <del>5100'</del> 5200' | Intrmd                     | 9 5/8"    | New      | 40#   | BTC    | J-55  | 1.125                  | 1.125               | 1.6                   |
| 7 7/8"    | 0' - 15,518'                | 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.

#### 4. Proposed Cement Program

- a. 13-3/8" Surface      Lead: 600 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 / 1.35 cuft/sx)  
                                      \*\*Calculated w/50% excess on OH volumes
- b. 9 5/8" Intermediate:      Lead: 950 sx 35:65:6 C + Salt+Gilsonite+CFR-3+ HR601  
                                      (12.7 ppg / 1.89 cuft/sx)  
                                      Tail: 250 sx Class C  
                                      (14.8 ppg / 1.35 cuft/sx)  
                                      \*\*Calculated w/35% excess on OH volumes
- d. 5 1/2" Production      Lead: 1000 sx 50:50:10 H Blend  
                                      (11.9 ppg / 2.5 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 measurements.
  - The 9-5/8" intermediate string is designed to circulate to surface.
  - The production string will tie back a minimum 500' into previous shoe
  - Pilot will be plugged back with the following:
    - 925' PHTD Plug: 11,525'-12,450' w/320 sx Class H 17.2 ppg / 0.98 ft<sup>3</sup>/sx
    - 925' KO Plug: 10,600' – 11,525' w/320 sx Class H 17.2 ppg / 0.98 ft<sup>3</sup>/sx

### 5. Minimum Specifications for 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 5M system tested to 5000 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 5000 psi WP rating.

## 6. Estimated BHP & BHT:

PHTD = 5956 psi

PHTD = 171°F

Lateral TD = 4855 psi

Lateral TD = 160°F

Note: In January 1998 the Stevens 11 #1 (11-T24S-R33E) was successfully drilled vertically to 12,600' with 8.6 ppq MW and 9-5/8" csq set @ 5246'. See attached bit record.

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

| Depth                         | Type System | Mud Weight | Viscosity (sec) | Waterloss (cc) |
|-------------------------------|-------------|------------|-----------------|----------------|
| 0' – 1275' 1385               | Fresh Water | 8.4        | 29              | N.C.           |
| <del>1275' – 5100'</del> 5200 | Brine       | 10         | 29              | N.C.           |
| 5100' – 12,450' (PH)          | Cut Brine   | 9.2 – 9.6  | 29              | N.C.           |
| 5100' – 15,518' (Lateral)     | Cut Brine   | 8.9 – 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 totalizer, 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.

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

- 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.

**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.

# HUGHES CHRISTENSEN

## BIT RECORD

|                    |                |             |
|--------------------|----------------|-------------|
| LATITUDE/LONGITUDE | API WELL NO.   | FILE NUMBER |
| +32.2321/-103.5436 | 30-025-34246-- | 611021      |

|                                                                     |                                               |                                     |                                     |                                                                       |                               |
|---------------------------------------------------------------------|-----------------------------------------------|-------------------------------------|-------------------------------------|-----------------------------------------------------------------------|-------------------------------|
| COUNTY/PARISH/OFFSHORE/STATE<br>LEA, NEW MEXICO                     | FIELD / AREA                                  | DIRECTIONS                          | SPUD DATE<br>01/02/1998             | TD DATE<br>04/02/1998                                                 | STATUS<br>COMPLETE            |
| WELL NAME / NUMBER<br>STEVENS 11-1 /                                | OPERATOR<br>MURCHISON OIL & GAS COMPANY, INC. | OPERATOR REPRESENTATIVE<br>/        |                                     |                                                                       |                               |
| CONTRACTOR<br>NABORS DRILLING USA, LP                               | RIG<br>311                                    | CONTRACTOR REPRESENTATIVE<br>/      | DRAWWORKS                           |                                                                       |                               |
| SALESMAN<br>SLATER, SCOTT                                           | TURNKEY / OTHER<br>/                          | PUMP 1 / LINER<br>EMSCOFB1300 / 6.5 | PUMP 2 / LINER<br>EMSCOFB1300 / 6.5 | SOLIDS CONTROL SYSTEM TYPE / DRILLING FLUIDS PROVIDER<br>OPEN / OTHER |                               |
| DRILLING TYPE / DIRECTIONAL DRILLING SERVICE PROVIDER<br>VERTICAL / | WORK TYPE<br>DAYWORK                          | SURVEY                              | ABSTRACT                            | SECT. COORD.                                                          | S-T-R<br>11 - 24S - 33E BLOCK |

| NO | SIZE (in) | MFG                            | BIT TYPE | NOZZLES        | SERIAL NO. | MEASURED DEPTH OUT | DISTANCE (ft) | HRS    | ROP (ft/hr) | ACCUM DRLG HRS | WT (klbf) | TOTAL (rpm) | VERT DEV OUT (deg) | P.P. (psi) | FLOW (USgal/min) | MUD (ppg) / DULL GRADING |      |       |      |        |        |          |         |    |  |
|----|-----------|--------------------------------|----------|----------------|------------|--------------------|---------------|--------|-------------|----------------|-----------|-------------|--------------------|------------|------------------|--------------------------|------|-------|------|--------|--------|----------|---------|----|--|
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  | WT I                     | FV O | PV DC | YP L | FL B/S | TYPE G | SLDS ODC | DATE RP |    |  |
| 1  | 17.5      | SMITH                          | MSDS     |                | RR         | 798                | 798           | 20     | 39.9        | 20             | 10-55     | 100-0       | 1                  | 1100       | 320              | 8.4                      | 28   | 0     | 0    | 0      | W      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          |      |       |      |        | U      |          |         |    |  |
| 2  | 12.25     | Varel                          | ETD29    | 3X14           | 127990     | 4231               | 3433          | 108.25 | 31.7        | 128.25         | 50-0      | 70-0        | 0                  | 1700       | 300              | 10                       | 29   | 0     | 0    | 0      | B      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          |      |       |      |        | U      |          |         |    |  |
| 3  | 11        | Varel                          | ETD29    | 1X14,2X15      | 127842     | 5248               | 1017          | 62.25  | 16.3        | 190.5          | 50-65     | 0-0         | 0.5                | 1800       | 291              | 10                       | 29   | 0     | 0    | 0      | B      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          |      |       |      |        | U      |          |         |    |  |
| 4  | 8.5       | SMITH                          | F47      | 1X12,1X13,1X0  | LP6073     | 7891               | 2643          | 72.75  | 36.3        | 263.25         | 63-0      | 60-0        | 0.75               | 1900       | 355              | 8.6                      | 28   | 0     | 0    | 0      | W      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          | 2    | 7     | WT   | A      | E      | 0        | NO      | PR |  |
| 5  | 8.5       | HCC                            | ATJ-44C  | 2X11,1X10      | V74CL      | 9661               | 1770          | 77.25  | 22.9        | 340.5          | 55-0      | 65-0        | 1                  | 1850       | 341              | 8.5                      | 28   | 0     | 0    | 0      | W      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          | 2    | 3     | WT   | A      | E      | 0        | BT      | PR |  |
| 6  | 8.5       | HCC                            | ATJ-44C  | 2X11,1X10      | G43YS      | 11423              | 1762          | 89     | 19.8        | 429.5          | 55-0      | 65-0        | 1.5                | 1900       | 341              | 8.4                      | 28   | 0     | 0    | 0      | W      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          | 2    | 3     | BT   | N      | E      | 0        | WT      | PR |  |
| 7  | 8.5       | SMITH                          | F47      | 3X11           | LP6072     | 12600              | 1177          | 65.25  | 18          | 494.75         | 50-0      | 65-0        | 0                  | 2025       | 311              | 8.6                      | 28   | 0     | 0    | 0      | W      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          | 3    | 3     | WT   | A      | E      | 0        | NO      | TD |  |
| 8  | 6.125     | ReedHycalog                    | EHP53    | 3X10           | SM2944     | 13115              | 515           | 33.25  | 15.5        | 528            | 15-20     | 60-0        | 3.25               | 1850       | 280              | 8.6                      | 28   | 0     | 0    | 0      | W      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          | 3    | 3     | WT   | A      | E      | 0        | NO      |    |  |
| 9  | 6.125     | HCC                            | STR-30C  | 3X10           | P85YM      | 13660              | 545           | 61.3   | 8.9         | 589.3          | 13-0      | 60-0        | 3.25               | 1900       | 280              | 8.6                      | 28   | 0     | 0    | 0      | W      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          | 7    | 6     | BT   | A      | F      | 0        | ER      | TD |  |
| 10 | 6.125     | HCC                            | STR-30C  | 3X10           | R39YL      | 13726              | 66            | 13.3   | 5           | 602.6          | 12-18     | 60-0        | 0                  | 2150       | 280              | 9.8                      | 30   | 0     | 0    | 0      | B      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          | 7    | 7     | BT   | A      | F      | 2        | WT      | PR |  |
| 11 | 6.125     | Ultrerra Drilling Technologies | C47LRG   | 3X10           | BL460      | 13821              | 95            | 15.3   | 6.2         | 617.9          | 16-0      | 60-0        | 0                  | 2025       | 280              | 9.8                      | 29   | 0     | 0    | 0      | B      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          |      |       |      |        | U      |          |         |    |  |
| 12 | 6.125     | HCC                            | STR-44C  | 3X10           | F76YM      | 13967              | 146           | 23.3   | 6.3         | 641.2          | 18-18     | 60-0        | 3.5                | 1950       | 280              | 9.4                      | 29   | 0     | 0    | 0      | B      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          | 2    | 2     | WT   | A      | E      | 0        | NO      |    |  |
| 13 | 6.125     | HCC                            | STR-44C  | 1X11,1X12,1X13 | R00YV      | 14102              | 135           | 37     | 3.6         | 678.2          | 20-0      | 60-0        | 0                  | 2000       | 280              | 12.3                     | 41   | 0     | 0    | 0      | B      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          | 1    | 1     | WT   | A      | E      | 0        | NO      | PR |  |
| 14 | 6.125     | Ultrerra Drilling Technologies | C47LRG   | 3X12           | BP548B     | 14226              | 124           | 26.75  | 4.6         | 704.95         | 25-30     | 60-0        | 0                  | 2000       | 280              | 12.5                     | 50   | 0     | 0    | 0      | B      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          | 4    | 4     | BT   | A      | E      | 2        | NO      | PR |  |
| 15 | 6.125     | Ultrerra Drilling Technologies | C47LRG   | 3X12           | BL461      | 14298              | 72            | 27.25  | 2.6         | 732.2          | 20-0      | 60-0        | 3.75               | 2100       | 280              | 12.4                     | 46   | 0     | 0    | 0      | B      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          | 2    | 3     | BT   | M      | E      | 0        | NO      | PR |  |
| 16 | 6.125     | ReedHycalog                    | EHP62    | 3X13           | UW4098     | 14397              | 99            | 33     | 3           | 765.2          | 20-22     | 60-0        | 0                  | 1950       | 260              | 12.4                     | 48   | 0     | 0    | 0      | B      |          |         |    |  |
|    |           |                                |          |                |            |                    |               |        |             |                |           |             |                    |            |                  |                          | 2    | 2     | WT   | A      | E      | 0        | NO      | PR |  |
| 17 | 6.125     | ReedHycalog                    | EHP62    | 3X12           | RB0717     | 14506              | 109           | 45.75  | 2.4         | 810.95         | 22-25     | 62-0        | 0                  | 2000       | 260              | 12.3                     | 45   | 0     | 0    | 0      | B      |          |         |    |  |

[illegible]



| GEOGRAPHIC LOCATION |              |                                | FIELD/AREA  | WELL NAME/WELL NUMBER |               | HCC FILE NUMBER            |                  | OPERATOR                          |                |                   |              |                | TURNKEY CO.           |               | CONTRACTOR / RIG        |                    |    |    |    |    |      |      |      |    |
|---------------------|--------------|--------------------------------|-------------|-----------------------|---------------|----------------------------|------------------|-----------------------------------|----------------|-------------------|--------------|----------------|-----------------------|---------------|-------------------------|--------------------|----|----|----|----|------|------|------|----|
| UNITED STATES       |              |                                |             | STEVENS 11-1          |               | 611021                     |                  | MURCHISON OIL & GAS COMPANY, INC. |                |                   |              |                |                       |               | NABORS DRILLING USA, LP |                    |    |    |    |    |      |      |      |    |
| No.                 | SIZE<br>(in) | MFG                            | BIT<br>TYPE | Nozzles (tfa)         | SERIAL<br>NO. | MEASURED DEPTH<br>OUT (ft) | DISTANCE<br>(ft) | HRS                               | ROP<br>(ft/hr) | ACCUM<br>DRLG HRS | WT<br>(klbf) | TOTAL<br>(rpm) | VERT DEV<br>OUT (deg) | P.P.<br>(psi) | FLOW<br>(USgal/min)     | MUD / DULL GRADING |    |    |    |    |      |      |      |    |
|                     |              |                                |             |                       |               |                            |                  |                                   |                |                   |              |                |                       |               |                         | WT                 | FV | PV | YP | FL | TYPE | SLDS | DATE |    |
|                     |              |                                |             |                       |               |                            |                  |                                   |                |                   |              |                |                       |               |                         |                    | I  | O  | DC | L  | B/S  | G    | ODC  | RP |
| 19                  | 6.125        | SMITH                          | F37H        | 3X13                  | LP1462        | 14641                      | 51               | 25.75                             | 2              | 859.7             | 25-0         | 58-0           | 0                     | 2100          | 260                     | 12.3               | 48 | 0  | 0  | 0  |      | B    |      |    |
|                     |              |                                |             |                       |               |                            |                  |                                   |                |                   |              |                |                       |               |                         |                    | 1  | 1  | WT | A  | E    | 0    | NO   | PR |
| 20                  | 6.125        | Ultrerra Drilling Technologies | L37LR       | 3X13                  | BP465B        | 14693                      | 52               | 8                                 | 6.5            | 867.7             | 28-0         | 58-0           | 0                     | 2100          | 260                     | 12.3               | 43 | 0  | 0  | 0  |      | B    |      |    |
|                     |              |                                |             |                       |               |                            |                  |                                   |                |                   |              |                |                       |               |                         |                    | 1  | 1  | CT | G  | E    | 0    | WT   | PR |
| 21                  | 6.125        | SMITH                          | F37H        | 3X13                  | LP8104        | 14833                      | 140              | 45.25                             | 3.1            | 912.95            | 30-0         | 52-0           | 0                     | 2100          | 285                     | 12.2               | 42 | 0  | 0  | 0  |      | B    |      |    |
|                     |              |                                |             |                       |               |                            |                  |                                   |                |                   |              |                |                       |               |                         |                    | 4  | 4  | BT | A  | E    | 0    | WT   | PR |
| 22                  | 6.125        | SMITH                          | F37H        | 3X13                  | LP7553        | 14958                      | 125              | 42.25                             | 3              | 955.2             | 32-33        | 52-0           | 0                     | 2200          | 285                     | 12.2               | 42 | 0  | 0  | 0  |      | B    |      |    |
|                     |              |                                |             |                       |               |                            |                  |                                   |                |                   |              |                |                       |               |                         |                    | 2  | 2  | WT | A  | E    | 0    | NO   | PR |
| 23                  | 6.125        | HCC                            | STR-30      | 3X13                  | R86YU         | 15046                      | 88               | 24.75                             | 3.6            | 979.95            | 30-0         | 50-0           | 0                     | 2050          | 300                     | 12.2               | 46 | 0  | 0  | 0  |      | B    |      |    |
|                     |              |                                |             |                       |               |                            |                  |                                   |                |                   |              |                |                       |               |                         |                    | 2  | 2  | WT | A  | E    | 0    | NO   | PR |
| 24                  | 6.125        | SMITH                          | F37         | 3X13                  | LP2930        | 15207                      | 161              | 46.75                             | 3.4            | 1026.7            | 35-0         | 50-0           | 0                     | 2100          | 300                     | 12.2               | 43 | 0  | 0  | 0  |      | B    |      |    |
|                     |              |                                |             |                       |               |                            |                  |                                   |                |                   |              |                |                       |               |                         |                    | 2  | 2  | WT | A  | E    | 0    | NO   | PR |
| 25                  | 6.125        | HCC                            | STR-30      | 3X13                  | L35YK         | 15250                      | 43               | 13                                | 3.3            | 1039.7            | 26-32        | 50-0           | 4.5                   | 2050          | 300                     | 12.1               | 45 | 0  | 0  | 0  |      | B    |      |    |
|                     |              |                                |             |                       |               |                            |                  |                                   |                |                   |              |                |                       |               |                         |                    |    |    |    |    | U    |      |      |    |



# **COG Operating LLC**

**Lea County, NM**

**Roy Batty Federal Com**

**#1H**

**OH**

**Plan: Plan #2**

## **Standard Planning Report**

**01 February, 2013**





## Planning Report



Database: Houston R5000 Database  
Company: COG Operating LLC  
Project: Lea County, NM  
Site: Roy Batty Federal Com  
Well: #1H  
Wellbore: OH  
Design: Plan #2

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:

Well #1H  
RKB @ 3620.6usft (Silver Oak #12 - 18' KB)  
RKB @ 3620.6usft (Silver Oak #12 - 18' KB)  
Grid  
Minimum Curvature

|             |                                      |               |                |
|-------------|--------------------------------------|---------------|----------------|
| Project:    | Lea County, NM                       |               |                |
| Map System: | US State Plane 1927 (Exact solution) | System Datum: | Mean Sea Level |
| Geo Datum:  | NAD 1927 (NADCON CONUS)              |               |                |
| Map Zone:   | New Mexico East 3001                 |               |                |

|                       |                       |                   |                   |
|-----------------------|-----------------------|-------------------|-------------------|
| Site:                 | Roy Batty Federal Com |                   |                   |
| Site Position:        | Map                   | Northings:        | 446,694.70 usft   |
| From:                 |                       | Easting:          | 742,531.00 usft   |
| Position Uncertainty: | 2.0 usft              | Slot Radius:      | 13-3/16 "         |
|                       |                       | Latitude:         | 32° 13' 32.331 N  |
|                       |                       | Longitude:        | 103° 32' 56.565 W |
|                       |                       | Grid Convergence: | 0.42 °            |

|                      |          |                     |               |
|----------------------|----------|---------------------|---------------|
| Well:                | #1H      |                     |               |
| Well Position        | +N/-S    | 0.0 usft            | Northings:    |
|                      | +E/-W    | 0.0 usft            | Easting:      |
| Position Uncertainty | 0.0 usft | Wellhead Elevation: | Ground Level: |
|                      |          |                     | 3,602.6 usft  |

|           |            |             |                |
|-----------|------------|-------------|----------------|
| Wellbore: | OH         |             |                |
| Magnetics | Model Name | Sample Date | Declination    |
|           |            |             | (°)            |
|           | IGRF2010   | 1/9/2013    | 7.38           |
|           |            |             | Dip Angle      |
|           |            |             | (°)            |
|           |            |             | 60.15          |
|           |            |             | Field Strength |
|           |            |             | (nT)           |
|           |            |             | 48,461         |

|                   |                  |        |               |
|-------------------|------------------|--------|---------------|
| Design:           | Plan #2          |        |               |
| Audit Notes:      |                  |        |               |
| Version:          | Phase:           | PLAN   | Tie On Depth: |
|                   |                  |        | 0.0           |
| Vertical Section: | Depth From (TVD) | +N/-S  | +E/-W         |
|                   | (usft)           | (usft) | (usft)        |
|                   | 0.0              | 0.0    | 0.0           |
|                   |                  |        | Direction     |
|                   |                  |        | (°)           |
|                   |                  |        | 356.15        |

|                |             |         |                |         |        |             |             |             |        |              |
|----------------|-------------|---------|----------------|---------|--------|-------------|-------------|-------------|--------|--------------|
| Plan Sections  |             |         |                |         |        |             |             |             |        |              |
| Measured Depth | Inclination | Azimuth | Vertical Depth | +N/-S   | +E/-W  | Dogleg Rate | Build Rate  | Turn Rate   | TFO    | Target       |
| (usft)         | (°)         | (°)     | (usft)         | (usft)  | (usft) | (°/100usft) | (°/100usft) | (°/100usft) | (°)    |              |
| 0.0            | 0.00        | 0.00    | 0.0            | 0.0     | 0.0    | 0.00        | 0.00        | 0.00        | 0.00   |              |
| 10,637.5       | 0.00        | 0.00    | 10,637.5       | 0.0     | 0.0    | 0.00        | 0.00        | 0.00        | 0.00   |              |
| 11,388.7       | 90.14       | 356.15  | 11,115.0       | 477.6   | -32.1  | 12.00       | 12.00       | 0.00        | 356.15 |              |
| 15,517.7       | 90.14       | 356.15  | 11,104.9       | 4,597.2 | -309.4 | 0.00        | 0.00        | 0.00        | 0.00   | PBHL (RB#1H) |



## Planning Report



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Company: COG Operating LLC  
Project: Lea County, NM  
Site: Roy Batty Federal Com  
Well: #1H  
Wellbore: OH  
Design: Plan #2

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:

Well #1H  
RKB @ 3620.6usft (Silver Oak #12 - 18' KB)  
RKB @ 3620.6usft (Silver Oak #12 - 18' KB)  
Grid  
Minimum Curvature

| Planned Survey        |                 |             |                       |              |              |                         |                         |                        |                       |  |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|--|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |  |
| 0.0                   | 0.00            | 0.00        | 0.0                   | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 100.0                 | 0.00            | 0.00        | 100.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 200.0                 | 0.00            | 0.00        | 200.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 300.0                 | 0.00            | 0.00        | 300.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 400.0                 | 0.00            | 0.00        | 400.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 500.0                 | 0.00            | 0.00        | 500.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 600.0                 | 0.00            | 0.00        | 600.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 700.0                 | 0.00            | 0.00        | 700.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 800.0                 | 0.00            | 0.00        | 800.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 900.0                 | 0.00            | 0.00        | 900.0                 | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 1,000.0               | 0.00            | 0.00        | 1,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 1,100.0               | 0.00            | 0.00        | 1,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 1,200.0               | 0.00            | 0.00        | 1,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 1,300.0               | 0.00            | 0.00        | 1,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 1,400.0               | 0.00            | 0.00        | 1,400.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 1,500.0               | 0.00            | 0.00        | 1,500.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 1,600.0               | 0.00            | 0.00        | 1,600.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 1,700.0               | 0.00            | 0.00        | 1,700.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 1,800.0               | 0.00            | 0.00        | 1,800.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 1,900.0               | 0.00            | 0.00        | 1,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 2,000.0               | 0.00            | 0.00        | 2,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 2,100.0               | 0.00            | 0.00        | 2,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 2,200.0               | 0.00            | 0.00        | 2,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 2,300.0               | 0.00            | 0.00        | 2,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 2,400.0               | 0.00            | 0.00        | 2,400.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 2,500.0               | 0.00            | 0.00        | 2,500.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 2,600.0               | 0.00            | 0.00        | 2,600.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 2,700.0               | 0.00            | 0.00        | 2,700.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 2,800.0               | 0.00            | 0.00        | 2,800.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 2,900.0               | 0.00            | 0.00        | 2,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 3,000.0               | 0.00            | 0.00        | 3,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 3,100.0               | 0.00            | 0.00        | 3,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 3,200.0               | 0.00            | 0.00        | 3,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 3,300.0               | 0.00            | 0.00        | 3,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 3,400.0               | 0.00            | 0.00        | 3,400.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 3,500.0               | 0.00            | 0.00        | 3,500.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 3,600.0               | 0.00            | 0.00        | 3,600.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 3,700.0               | 0.00            | 0.00        | 3,700.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 3,800.0               | 0.00            | 0.00        | 3,800.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 3,900.0               | 0.00            | 0.00        | 3,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 4,000.0               | 0.00            | 0.00        | 4,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 4,100.0               | 0.00            | 0.00        | 4,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 4,200.0               | 0.00            | 0.00        | 4,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 4,300.0               | 0.00            | 0.00        | 4,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 4,400.0               | 0.00            | 0.00        | 4,400.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 4,500.0               | 0.00            | 0.00        | 4,500.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 4,600.0               | 0.00            | 0.00        | 4,600.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 4,700.0               | 0.00            | 0.00        | 4,700.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 4,800.0               | 0.00            | 0.00        | 4,800.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 4,900.0               | 0.00            | 0.00        | 4,900.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 5,000.0               | 0.00            | 0.00        | 5,000.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 5,100.0               | 0.00            | 0.00        | 5,100.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 5,200.0               | 0.00            | 0.00        | 5,200.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |
| 5,300.0               | 0.00            | 0.00        | 5,300.0               | 0.0          | 0.0          | 0.0                     | 0.00                    | 0.00                   | 0.00                  |  |



## Planning Report



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Well: #1H  
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Local Co-ordinate Reference: Well #1H  
TVD Reference: RKB @ 3620.6usft (Silver Oak #12 - 18' KB)  
MD Reference: RKB @ 3620.6usft (Silver Oak #12 - 18' KB)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

| Planned Survey              |                    |                |                             |                 |                 |                               |                               |                              |                             |  |
|-----------------------------|--------------------|----------------|-----------------------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|--|
| Measured<br>Depth<br>(usft) | Inclination<br>(°) | Azimuth<br>(°) | Vertical<br>Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Vertical<br>Section<br>(usft) | Dogleg<br>Rate<br>(°/100usft) | Build<br>Rate<br>(°/100usft) | Turn<br>Rate<br>(°/100usft) |  |
| 5,400.0                     | 0.00               | 0.00           | 5,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 5,500.0                     | 0.00               | 0.00           | 5,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 5,600.0                     | 0.00               | 0.00           | 5,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 5,700.0                     | 0.00               | 0.00           | 5,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 5,800.0                     | 0.00               | 0.00           | 5,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 5,900.0                     | 0.00               | 0.00           | 5,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 6,000.0                     | 0.00               | 0.00           | 6,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 6,100.0                     | 0.00               | 0.00           | 6,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 6,200.0                     | 0.00               | 0.00           | 6,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 6,300.0                     | 0.00               | 0.00           | 6,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 6,400.0                     | 0.00               | 0.00           | 6,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 6,500.0                     | 0.00               | 0.00           | 6,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 6,600.0                     | 0.00               | 0.00           | 6,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 6,700.0                     | 0.00               | 0.00           | 6,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 6,800.0                     | 0.00               | 0.00           | 6,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 6,900.0                     | 0.00               | 0.00           | 6,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 7,000.0                     | 0.00               | 0.00           | 7,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 7,100.0                     | 0.00               | 0.00           | 7,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 7,200.0                     | 0.00               | 0.00           | 7,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 7,300.0                     | 0.00               | 0.00           | 7,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 7,400.0                     | 0.00               | 0.00           | 7,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 7,500.0                     | 0.00               | 0.00           | 7,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 7,600.0                     | 0.00               | 0.00           | 7,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 7,700.0                     | 0.00               | 0.00           | 7,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 7,800.0                     | 0.00               | 0.00           | 7,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 7,900.0                     | 0.00               | 0.00           | 7,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 8,000.0                     | 0.00               | 0.00           | 8,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 8,100.0                     | 0.00               | 0.00           | 8,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 8,200.0                     | 0.00               | 0.00           | 8,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 8,300.0                     | 0.00               | 0.00           | 8,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 8,400.0                     | 0.00               | 0.00           | 8,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 8,500.0                     | 0.00               | 0.00           | 8,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 8,600.0                     | 0.00               | 0.00           | 8,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 8,700.0                     | 0.00               | 0.00           | 8,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 8,800.0                     | 0.00               | 0.00           | 8,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 8,900.0                     | 0.00               | 0.00           | 8,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 9,000.0                     | 0.00               | 0.00           | 9,000.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 9,100.0                     | 0.00               | 0.00           | 9,100.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 9,200.0                     | 0.00               | 0.00           | 9,200.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 9,300.0                     | 0.00               | 0.00           | 9,300.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 9,400.0                     | 0.00               | 0.00           | 9,400.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 9,500.0                     | 0.00               | 0.00           | 9,500.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 9,600.0                     | 0.00               | 0.00           | 9,600.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 9,700.0                     | 0.00               | 0.00           | 9,700.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 9,800.0                     | 0.00               | 0.00           | 9,800.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 9,900.0                     | 0.00               | 0.00           | 9,900.0                     | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 10,000.0                    | 0.00               | 0.00           | 10,000.0                    | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 10,100.0                    | 0.00               | 0.00           | 10,100.0                    | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 10,200.0                    | 0.00               | 0.00           | 10,200.0                    | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 10,300.0                    | 0.00               | 0.00           | 10,300.0                    | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 10,400.0                    | 0.00               | 0.00           | 10,400.0                    | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 10,500.0                    | 0.00               | 0.00           | 10,500.0                    | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 10,600.0                    | 0.00               | 0.00           | 10,600.0                    | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |
| 10,637.5                    | 0.00               | 0.00           | 10,637.5                    | 0.0             | 0.0             | 0.0                           | 0.00                          | 0.00                         | 0.00                        |  |



## Planning Report



Database: Houston R5000 Database  
Company: COG Operating LLC  
Project: Lea County, NM  
Site: Roy Batty Federal Com  
Well: #1H  
Wellbore: OH  
Design: Plan #2

Local Co-ordinate Reference: Well #1H  
TVD Reference: RKB @ 3620.6usft (Silver Oak #12 - 18' KB)  
MD Reference: RKB @ 3620.6usft (Silver Oak #12 - 18' KB)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

## Planned Survey

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| <b>Build 12°/100'</b> |                 |             |                       |              |              |                         |                         |                        |                       |
| 10,650.0              | 1.50            | 356.15      | 10,650.0              | 0.2          | 0.0          | 0.2                     | 12.00                   | 12.00                  | 0.00                  |
| 10,675.0              | 4.50            | 356.15      | 10,675.0              | 1.5          | -0.1         | 1.5                     | 12.00                   | 12.00                  | 0.00                  |
| 10,700.0              | 7.50            | 356.15      | 10,699.8              | 4.1          | -0.3         | 4.1                     | 12.00                   | 12.00                  | 0.00                  |
| 10,725.0              | 10.50           | 356.15      | 10,724.5              | 8.0          | -0.5         | 8.0                     | 12.00                   | 12.00                  | 0.00                  |
| 10,750.0              | 13.50           | 356.15      | 10,749.0              | 13.2         | -0.9         | 13.2                    | 12.00                   | 12.00                  | 0.00                  |
| 10,775.0              | 16.50           | 356.15      | 10,773.1              | 19.6         | -1.3         | 19.7                    | 12.00                   | 12.00                  | 0.00                  |
| 10,800.0              | 19.50           | 356.15      | 10,796.9              | 27.3         | -1.8         | 27.4                    | 12.00                   | 12.00                  | 0.00                  |
| 10,825.0              | 22.50           | 356.15      | 10,820.2              | 36.3         | -2.4         | 36.3                    | 12.00                   | 12.00                  | 0.00                  |
| 10,850.0              | 25.50           | 356.15      | 10,843.1              | 46.4         | -3.1         | 46.5                    | 12.00                   | 12.00                  | 0.00                  |
| 10,875.0              | 28.50           | 356.15      | 10,865.3              | 57.7         | -3.9         | 57.9                    | 12.00                   | 12.00                  | 0.00                  |
| 10,900.0              | 31.50           | 356.15      | 10,887.0              | 70.2         | -4.7         | 70.4                    | 12.00                   | 12.00                  | 0.00                  |
| 10,925.0              | 34.50           | 356.15      | 10,907.9              | 83.8         | -5.6         | 84.0                    | 12.00                   | 12.00                  | 0.00                  |
| 10,950.0              | 37.50           | 356.15      | 10,928.2              | 98.4         | -6.6         | 98.7                    | 12.00                   | 12.00                  | 0.00                  |
| 10,975.0              | 40.50           | 356.15      | 10,947.6              | 114.1        | -7.7         | 114.4                   | 12.00                   | 12.00                  | 0.00                  |
| 11,000.0              | 43.50           | 356.15      | 10,966.2              | 130.8        | -8.8         | 131.1                   | 12.00                   | 12.00                  | 0.00                  |
| 11,025.0              | 46.50           | 356.15      | 10,983.8              | 148.5        | -10.0        | 148.8                   | 12.00                   | 12.00                  | 0.00                  |
| 11,050.0              | 49.50           | 356.15      | 11,000.6              | 167.0        | -11.2        | 167.4                   | 12.00                   | 12.00                  | 0.00                  |
| 11,075.0              | 52.50           | 356.15      | 11,016.3              | 186.4        | -12.5        | 186.8                   | 12.00                   | 12.00                  | 0.00                  |
| 11,100.0              | 55.50           | 356.15      | 11,031.0              | 206.5        | -13.9        | 207.0                   | 12.00                   | 12.00                  | 0.00                  |
| 11,125.0              | 58.50           | 356.15      | 11,044.6              | 227.5        | -15.3        | 228.0                   | 12.00                   | 12.00                  | 0.00                  |
| 11,150.0              | 61.50           | 356.15      | 11,057.1              | 249.1        | -16.8        | 249.6                   | 12.00                   | 12.00                  | 0.00                  |
| 11,175.0              | 64.50           | 356.15      | 11,068.5              | 271.3        | -18.3        | 271.9                   | 12.00                   | 12.00                  | 0.00                  |
| 11,200.0              | 67.49           | 356.15      | 11,078.6              | 294.1        | -19.8        | 294.7                   | 12.00                   | 12.00                  | 0.00                  |
| 11,225.0              | 70.49           | 356.15      | 11,087.6              | 317.3        | -21.4        | 318.1                   | 12.00                   | 12.00                  | 0.00                  |
| 11,250.0              | 73.49           | 356.15      | 11,095.3              | 341.1        | -23.0        | 341.8                   | 12.00                   | 12.00                  | 0.00                  |
| 11,275.0              | 76.49           | 356.15      | 11,101.8              | 365.2        | -24.6        | 366.0                   | 12.00                   | 12.00                  | 0.00                  |
| 11,300.0              | 79.49           | 356.15      | 11,107.0              | 389.6        | -26.2        | 390.4                   | 12.00                   | 12.00                  | 0.00                  |
| 11,325.0              | 82.49           | 356.15      | 11,110.9              | 414.2        | -27.9        | 415.1                   | 12.00                   | 12.00                  | 0.00                  |
| 11,350.0              | 85.49           | 356.15      | 11,113.5              | 439.0        | -29.5        | 440.0                   | 12.00                   | 12.00                  | 0.00                  |
| 11,375.0              | 88.49           | 356.15      | 11,114.8              | 463.9        | -31.2        | 464.9                   | 12.00                   | 12.00                  | 0.00                  |
| 11,388.7              | 90.14           | 356.15      | 11,115.0              | 477.6        | -32.1        | 478.6                   | 12.00                   | 12.00                  | 0.00                  |
| <b>Hold 90.14°</b>    |                 |             |                       |              |              |                         |                         |                        |                       |
| 11,400.0              | 90.14           | 356.15      | 11,115.0              | 488.8        | -32.9        | 489.9                   | 0.02                    | 0.02                   | 0.00                  |
| 11,500.0              | 90.14           | 356.15      | 11,114.7              | 588.6        | -39.6        | 589.9                   | 0.00                    | 0.00                   | 0.00                  |
| 11,600.0              | 90.14           | 356.15      | 11,114.5              | 688.4        | -46.3        | 689.9                   | 0.00                    | 0.00                   | 0.00                  |
| 11,700.0              | 90.14           | 356.15      | 11,114.2              | 788.2        | -53.0        | 789.9                   | 0.00                    | 0.00                   | 0.00                  |
| 11,800.0              | 90.14           | 356.15      | 11,114.0              | 887.9        | -59.8        | 889.9                   | 0.00                    | 0.00                   | 0.00                  |
| 11,900.0              | 90.14           | 356.15      | 11,113.8              | 987.7        | -66.5        | 989.9                   | 0.00                    | 0.00                   | 0.00                  |
| 12,000.0              | 90.14           | 356.15      | 11,113.5              | 1,087.5      | -73.2        | 1,089.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,100.0              | 90.14           | 356.15      | 11,113.3              | 1,187.3      | -79.9        | 1,189.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,200.0              | 90.14           | 356.15      | 11,113.0              | 1,287.0      | -86.6        | 1,289.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,300.0              | 90.14           | 356.15      | 11,112.8              | 1,386.8      | -93.3        | 1,389.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,400.0              | 90.14           | 356.15      | 11,112.5              | 1,486.6      | -100.0       | 1,489.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,500.0              | 90.14           | 356.15      | 11,112.3              | 1,586.4      | -106.8       | 1,589.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,600.0              | 90.14           | 356.15      | 11,112.0              | 1,686.1      | -113.5       | 1,689.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,700.0              | 90.14           | 356.15      | 11,111.8              | 1,785.9      | -120.2       | 1,789.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,800.0              | 90.14           | 356.15      | 11,111.6              | 1,885.7      | -126.9       | 1,889.9                 | 0.00                    | 0.00                   | 0.00                  |
| 12,900.0              | 90.14           | 356.15      | 11,111.3              | 1,985.4      | -133.6       | 1,989.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,000.0              | 90.14           | 356.15      | 11,111.1              | 2,085.2      | -140.3       | 2,089.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,100.0              | 90.14           | 356.15      | 11,110.8              | 2,185.0      | -147.0       | 2,189.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,200.0              | 90.14           | 356.15      | 11,110.6              | 2,284.8      | -153.8       | 2,289.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,300.0              | 90.14           | 356.15      | 11,110.3              | 2,384.5      | -160.5       | 2,389.9                 | 0.00                    | 0.00                   | 0.00                  |
| 13,400.0              | 90.14           | 356.15      | 11,110.1              | 2,484.3      | -167.2       | 2,489.9                 | 0.00                    | 0.00                   | 0.00                  |



## Planning Report



Database: Houston R5000 Database  
Company: COG Operating LLC  
Project: Lea County, NM  
Site: Roy Batty Federal Com  
Well: #1H  
Wellbore: OH  
Design: Plan #2

Local Co-ordinate Reference: Well #1H  
TVD Reference: RKB @ 3620.6usft (Silver Oak #12 - 18' KB)  
MD Reference: RKB @ 3620.6usft (Silver Oak #12 - 18' KB)  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature

| Planned Survey                 |                    |                |                             |                 |                 |                               |                               |                              |                             |  |
|--------------------------------|--------------------|----------------|-----------------------------|-----------------|-----------------|-------------------------------|-------------------------------|------------------------------|-----------------------------|--|
| Measured<br>Depth<br>(usft)    | Inclination<br>(°) | Azimuth<br>(°) | Vertical<br>Depth<br>(usft) | +N/-S<br>(usft) | +E/-W<br>(usft) | Vertical<br>Section<br>(usft) | Dogleg<br>Rate<br>(°/100usft) | Build<br>Rate<br>(°/100usft) | Turn<br>Rate<br>(°/100usft) |  |
| 13,500.0                       | 90.14              | 356.15         | 11,109.8                    | 2,584.1         | -173.9          | 2,589.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 13,600.0                       | 90.14              | 356.15         | 11,109.6                    | 2,683.9         | -180.6          | 2,689.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 13,700.0                       | 90.14              | 356.15         | 11,109.4                    | 2,783.6         | -187.3          | 2,789.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 13,800.0                       | 90.14              | 356.15         | 11,109.1                    | 2,883.4         | -194.0          | 2,889.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 13,900.0                       | 90.14              | 356.15         | 11,108.9                    | 2,983.2         | -200.8          | 2,989.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 14,000.0                       | 90.14              | 356.15         | 11,108.6                    | 3,083.0         | -207.5          | 3,089.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 14,100.0                       | 90.14              | 356.15         | 11,108.4                    | 3,182.7         | -214.2          | 3,189.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 14,200.0                       | 90.14              | 356.15         | 11,108.1                    | 3,282.5         | -220.9          | 3,289.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 14,300.0                       | 90.14              | 356.15         | 11,107.9                    | 3,382.3         | -227.6          | 3,389.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 14,400.0                       | 90.14              | 356.15         | 11,107.6                    | 3,482.1         | -234.3          | 3,489.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 14,500.0                       | 90.14              | 356.15         | 11,107.4                    | 3,581.8         | -241.0          | 3,589.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 14,600.0                       | 90.14              | 356.15         | 11,107.2                    | 3,681.6         | -247.8          | 3,689.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 14,700.0                       | 90.14              | 356.15         | 11,106.9                    | 3,781.4         | -254.5          | 3,789.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 14,800.0                       | 90.14              | 356.15         | 11,106.7                    | 3,881.2         | -261.2          | 3,889.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 14,900.0                       | 90.14              | 356.15         | 11,106.4                    | 3,980.9         | -267.9          | 3,989.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 15,000.0                       | 90.14              | 356.15         | 11,106.2                    | 4,080.7         | -274.6          | 4,089.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 15,100.0                       | 90.14              | 356.15         | 11,105.9                    | 4,180.5         | -281.3          | 4,189.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 15,200.0                       | 90.14              | 356.15         | 11,105.7                    | 4,280.3         | -288.0          | 4,289.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 15,300.0                       | 90.14              | 356.15         | 11,105.4                    | 4,380.0         | -294.8          | 4,389.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 15,400.0                       | 90.14              | 356.15         | 11,105.2                    | 4,479.8         | -301.5          | 4,489.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 15,500.0                       | 90.14              | 356.15         | 11,105.0                    | 4,579.6         | -308.2          | 4,589.9                       | 0.00                          | 0.00                         | 0.00                        |  |
| 15,517.7                       | 90.14              | 356.15         | 11,104.9                    | 4,597.2         | -309.4          | 4,607.6                       | 0.00                          | 0.00                         | 0.00                        |  |
| TD @ 15517.7' MD, 11104.9' TVD |                    |                |                             |                 |                 |                               |                               |                              |                             |  |

| Design Targets                                                                             |               |             |            |              |              |                 |                |                  |                   |
|--------------------------------------------------------------------------------------------|---------------|-------------|------------|--------------|--------------|-----------------|----------------|------------------|-------------------|
| Target Name                                                                                | Dip Angle (°) | Dip Dir (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude         | Longitude         |
| - hit/miss target                                                                          |               |             |            |              |              |                 |                |                  |                   |
| - Shape                                                                                    |               |             |            |              |              |                 |                |                  |                   |
| PBHL (RB#1H)                                                                               | 0.00          | 0.00        | 11,105.0   | 4,597.2      | -309.4       | 451,291.90      | 742,221.60     | 32° 14' 17.844 N | 103° 32' 59.776 W |
| - plan misses target center by 0.1usft at 15517.7usft MD (11104.9 TVD, 4597.2 N, -309.4 E) |               |             |            |              |              |                 |                |                  |                   |
| - Point                                                                                    |               |             |            |              |              |                 |                |                  |                   |

| Plan Annotations      |                       |              |              |                                |
|-----------------------|-----------------------|--------------|--------------|--------------------------------|
| Measured Depth (usft) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Comment                        |
| 10,637.5              | 10,637.5              | 0.0          | 0.0          | Build 12°/100'                 |
| 11,388.7              | 11,115.0              | 477.6        | -32.1        | Hold 90.14°                    |
| 15,517.7              | 11,104.9              | 4,597.2      | -309.4       | TD @ 15517.7' MD, 11104.9' TVD |



COG Operating LLC  
Project: Lea County, NM  
Site: Roy Batty Federal Com  
Well: #1H  
Wellbore: OH  
Plan: Plan #2 (#1H/OH)

# WELL DETAILS: #1H

Ground Elevation: 3602.6  
RKB Elevation: RKB @ 3620.6usft (Silver Oak #12 - 18' KB)  
Rig Name: Silver Oak #12 - 18' KB

Surface Hole Location  
Northing Easting Latitude Longitude  
446694.70 742531.00 32° 13' 32.331 N 103° 32' 56.565 W



Azimuths to Grid North  
True North: -0.42°  
Magnetic North: 6.96°

Magnetic Field  
Strength: 48461.4snT  
Dip Angle: 60.15°  
Date: 1/9/2013  
Model: IGRF2010

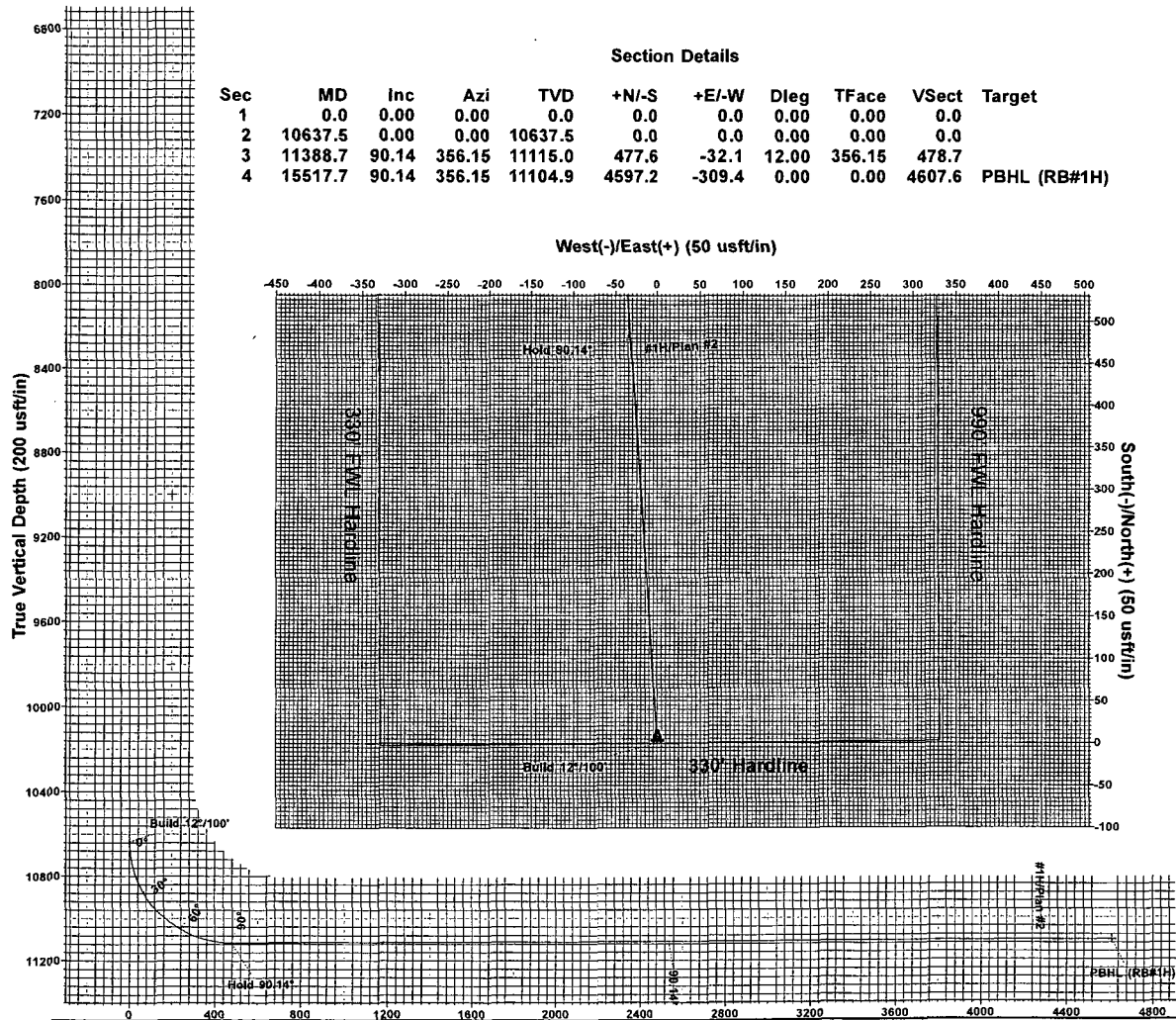
## DESIGN TARGET DETAILS

| Name         | TVD     | +N/-S  | +E/-W  | Northing  | Easting   | Latitude         | Longitude         |
|--------------|---------|--------|--------|-----------|-----------|------------------|-------------------|
| PBHL (RB#1H) | 11105.0 | 4597.2 | -309.4 | 451291.90 | 742221.60 | 32° 14' 17.844 N | 103° 32' 59.776 W |

## Section Details

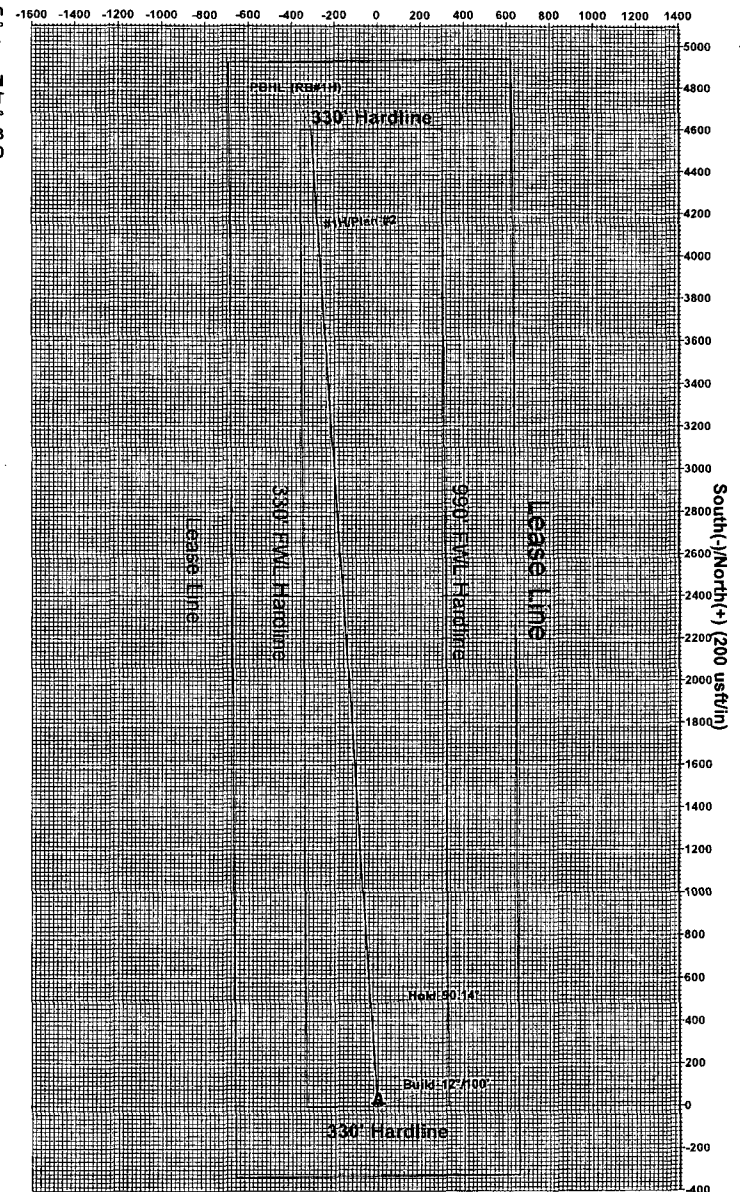
| Sec | MD      | Inc   | Azi    | TVD     | +N/-S  | +E/-W  | Dleg  | TFace  | Vsect  | Target       |
|-----|---------|-------|--------|---------|--------|--------|-------|--------|--------|--------------|
| 1   | 0.0     | 0.00  | 0.00   | 0.0     | 0.0    | 0.0    | 0.00  | 0.00   | 0.0    |              |
| 2   | 10637.5 | 0.00  | 0.00   | 10637.5 | 0.0    | 0.0    | 0.00  | 0.00   | 0.0    |              |
| 3   | 11388.7 | 90.14 | 356.15 | 11115.0 | 477.6  | -32.1  | 12.00 | 356.15 | 478.7  |              |
| 4   | 15517.7 | 90.14 | 356.15 | 11104.9 | 4597.2 | -309.4 | 0.00  | 0.00   | 4607.6 | PBHL (RB#1H) |

## West(-)/East(+) (50 usft/in)



Vertical Section at 356.15° (200 usft/in)

## West(-)/East(+) (200 usft/in)



PROJECT DETAILS: Lea County, NM  
Geodetic System: US State Plane 1927 (Exact solution)  
Datum: NAD 1927 (NADCON CONUS)  
Ellipsoid: Clarke 1866  
Zone: New Mexico East 3001  
System Datum: Mean Sea Level  
Local North: Grid

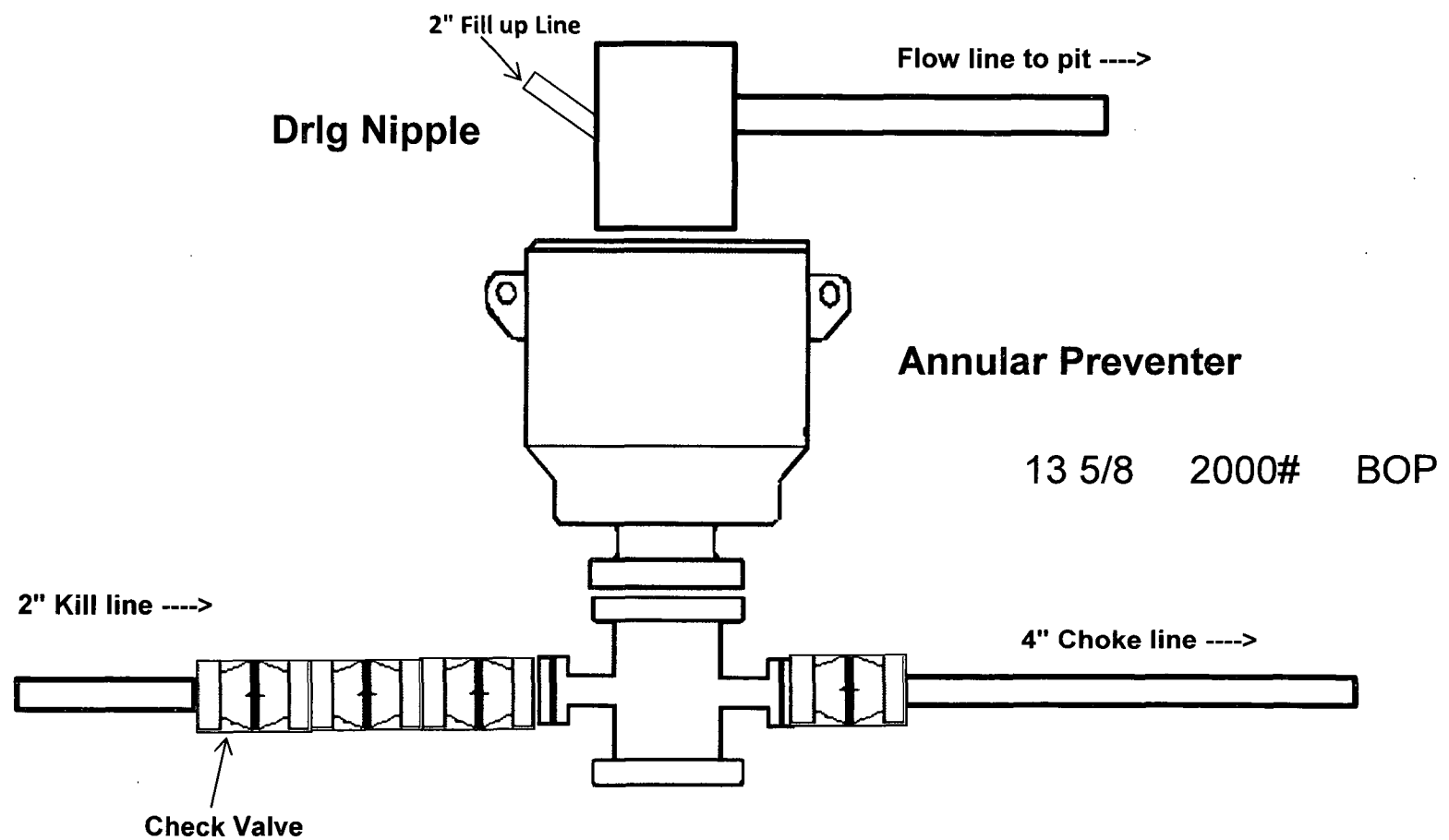


Crescent Directional Drilling  
7715 West Industrial Ave. Midland, Tx 79706  
Phone: 432-618-1135

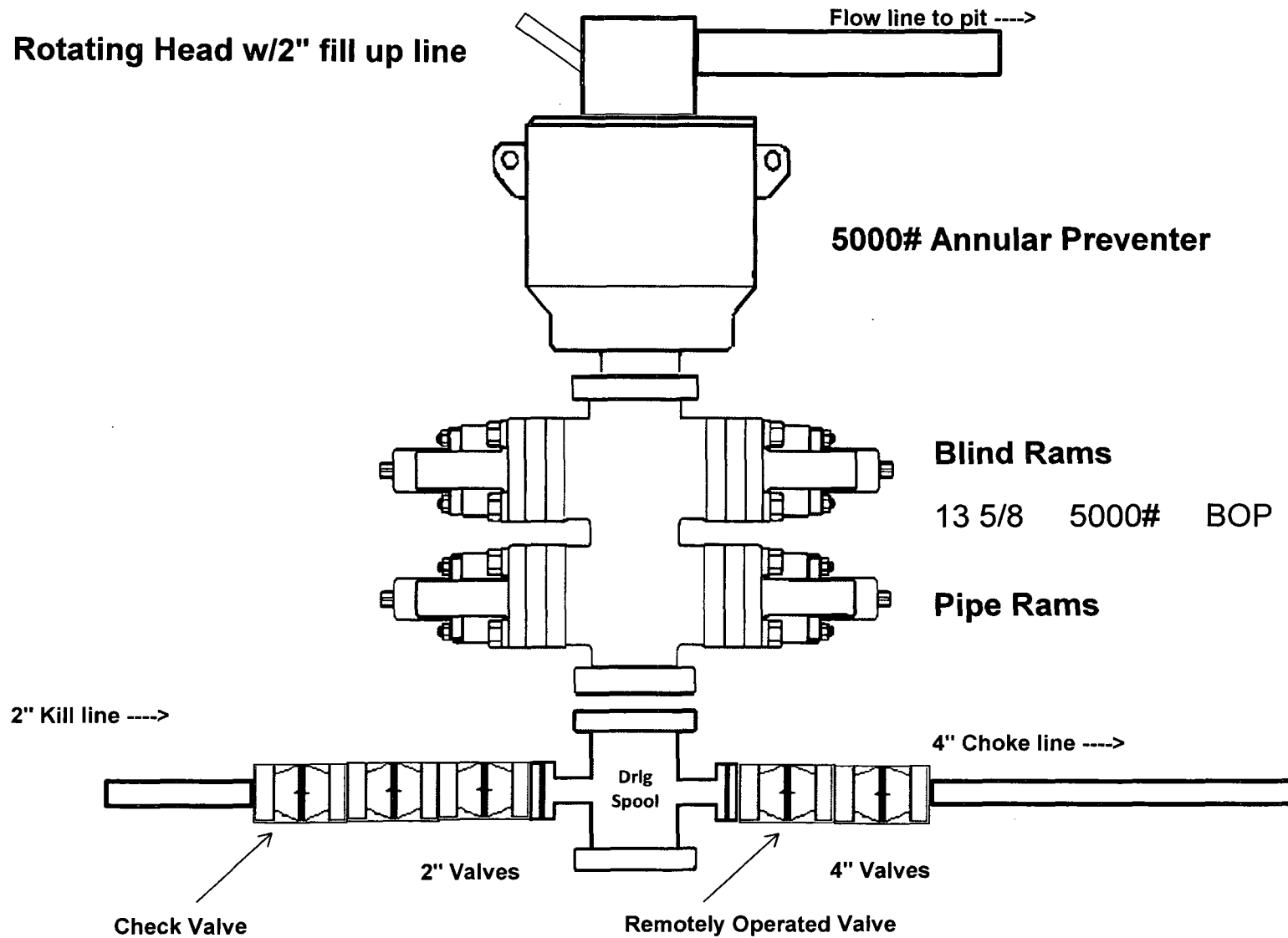
Plan: Plan #2 (#1H/OH)  
Created By: Matt Higgins Date: 15:34, February 01 2013



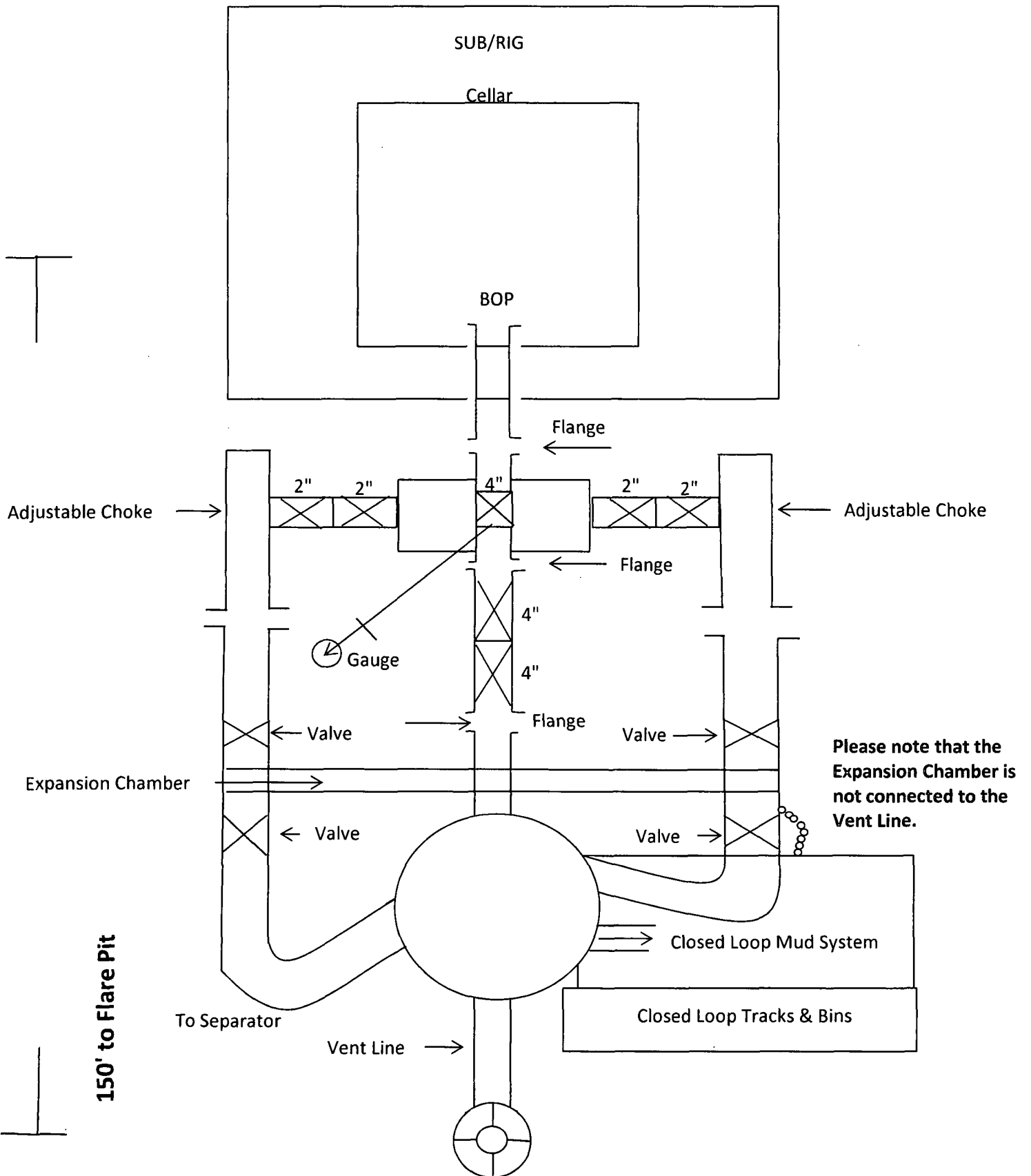
## 2,000 psi BOP Schematic



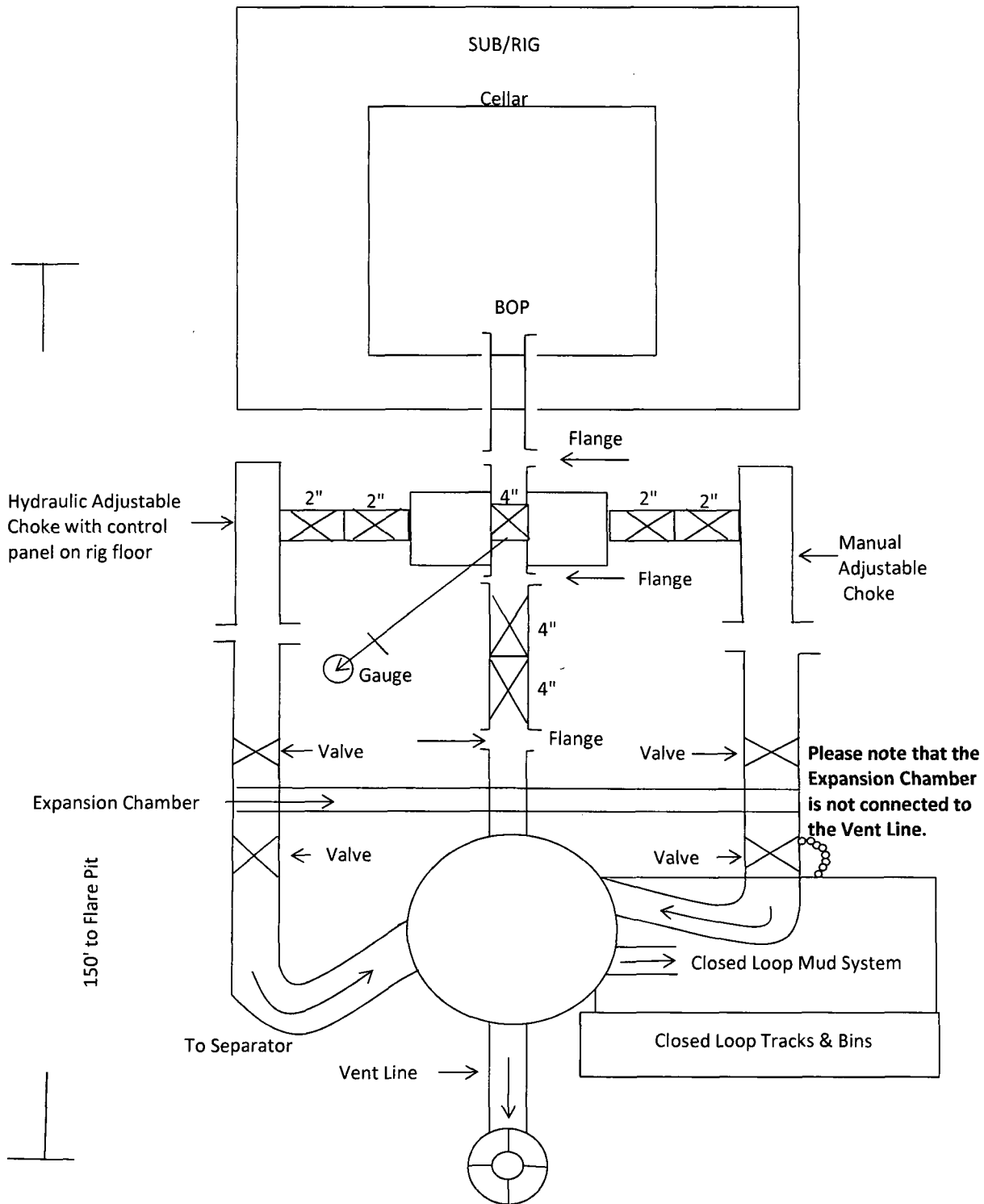
# 5,000 psi BOP Schematic



# 2M Choke Manifold Equipment



## 5M Choke Manifold Equipment



COG Operating LLC

Rig Plat & Closed Loop Equipment Diagram

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

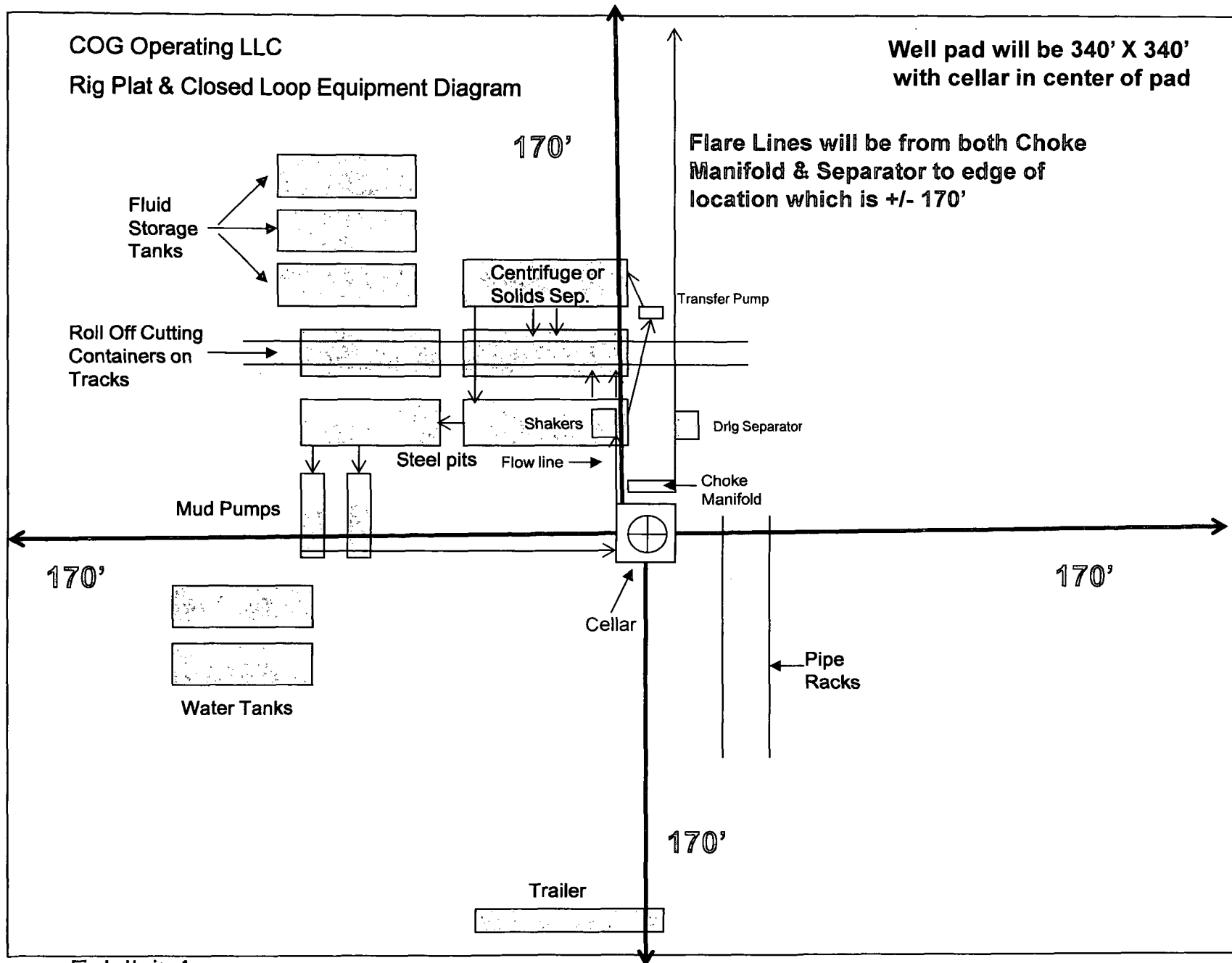


Exhibit 1