HOBBS OCD

ATS-13-440

Form 3160-3
(March 2012)

MAY 03 2013

RECEIVED

OCD Hobbs

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.: NMNM120908

6. If Indian, Allotee or Tribe Name:

1a. Type of Work: [✓] DRILL [ ] REENTER

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

1b. Type of Well: [✓] Oil Well [ ] Gas Well [ ] Other [✓] Single Zone [ ] Multiple Zone

8. Lease Name and Well No. 39881
Azores Federal #3H

2. Name of Operator
COG Production LLC. 217955

9. API Well No.
30-025-41158

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

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

10. Field and Pool, or Exploratory
WC-025 S253206M; Bone Spring 97899
~~Wildcat~~

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface: 190' FSL & 1980' FWL Unit Letter N (SESW) SHL Sec 29-T24S-R32E
At proposed prod. Zone: 330' FNL & 1980' FWL Unit Letter C (NENW) BHL Sec 29-T24S-R32E

11. Sec., T.R.M. or Blk and Survey or Area
Sec. 29 - T24S - R32E

14. Distance in miles and direction from nearest town or post office*
Approximately 22 miles from Malaga

12. County or Parish: Lea County

13. State: NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 190'	16. No. of acres in lease 1891.72	17. Spacing Unit dedicated to this well 160
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 1419' BHL: 2113'	19. Proposed Depth TVD: 10,540' MD: 15,076' PH: 11,600'	20. BLM/BIA Bond No. on file NMB000860 &NMB000845
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3493.8' GL	22. Approximate date work will start* 4/1/2013	23. Estimated duration 30 days

24. Attachments

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

1. Well plat certified by a registered surveyor.
2. A Drilling Plan
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the authorized officer.

25. Signature Mayte Reyes	Name *(Printed/Typed)* Mayte Reyes	Date 2/19/2012

Title: Regulatory Analyst

Approved by *(Signature)* /s/George MacDonell	Name *(Printed/Typed)*	Date MAY 1 - 2013
Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

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 theron.
Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)

Approval Subject to General Requirements & Special Stipulations Attached

Carlsbad Controlled Water Basin

KA 05/01/13

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

MAY 20 2013

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 19, 2013

Lease #: NMNM120908
Azores Federal #3H

Legal Description: Sec. 29 – T24S – R32E
Lea County, New Mexico

Formation(s): Bone Spring

Bond Coverage: Statewide

BLM Bond File #: NMB000860 & NMB000845

COG PRODUCTION LLC

Mayte Reyes
Regulatory Analyst

HOBBS OCD

MAY 0 3 2013

RECEIVED

COG Production LLC
DRILLING AND OPERATIONS PROGRAM
Azores Federal 3H
SHL: 190' FSL & 1980' FWL
BHL: 330' FNL & 1980' FWL
Section 29 T24S R32E
Lea County, New Mexico

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

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

Fresh Water	~ 200'	
Rustler	754'	
Top of Salt	1086'	
Base of Salt	4481'	
Delaware	4601'	Oil
Bone Spring	8492'	Oil
Wolfcamp	11,400'	
PHTD	11,600'	
TD TVD	10,540'	
TD MD	15,076'	

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 780' and circulating cement back to surface. All intervals will be isolated by setting 5 ½" 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 See COA	Section	OD Casing	New/ Used	Wt	Collar	Grade	Collapse Design Factor	Burst Design Factor	Tension Design Factor
17 ½"	0' - ~~780'~~ 810'	Surface	13 3/8"	New	54.5#	STC	J-55	1.125	1.125	1.6
12 ¼"	0' – 3500'	Intrmd	9 5/8"	New	36#	LTC	J-55	1.125	1.125	1.6
12 ¼"	3500' – 4550'	Intrmd	9 5/8"	New	40#	LTC	J-55	1.125	1.125	1.6
7-7/8"	4550' – 11,600'	Pilot Hole								
7 7/8"	0' – 15,076'	Production Curve & Lateral	5 ½"	New	17#	LTC	P-110	1.125	1.125	1.6

See COA

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

4. Proposed Cement Program

a. 13-3/8" Surface
Lead: 300 sx Class C + 4% Gel + 2% $CaCl_2$
(13.5 ppg /1.75 cuft/sx)
Tail: 250 sx Class C + 2% $CaCl_2$
(14.8 ppg / 1.35 cuft/sx)
**Calculated w/50% excess on OH volumes

b. 9 5/8" Intermediate:
Lead: 900 sx Class C + 4% Gel
(13.5 ppg /1.75 cuft/sx)
Tail: 250 sx Class C
(14.8 ppg / 1.35 cuft/sx)
**Calculated w/35% excess on OH volumes

d. 5 ½" Production
Lead: 1050 sx 50:50:10 H +Salt+Gilsonite+CFR-3+ HR601
(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 cement is designed to circulate to surface.
- The production TOC will tie back a minimum 500' into previous shoe
- Pilot will be plugged back with the following:
  - 800' PHTD Plug: 10,800' – PHTD w/275 sx Class H 17.2 ppg / 0.98 ft3/sx
  - 800' KO Plug: 10,000' – 10,800' w/275 sx Class H 17.2 ppg / 0.98 ft3/sx

See COA

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 = 5549 psi
PHTD = 164°F
Lateral TD = 4605 psi
Lateral TD = 155°F

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

Depth See COA	Type System	Mud Weight	Viscosity (sec)	Waterloss (cc)
0' – ~~780'~~ 810'	Fresh Water	8.4	29	N.C.
~~780'~~ – 4550'	Brine	10	29	N.C.
4550' – 11,600' (PH)	Cut Brine	9.2 – 9.6	29	N.C.
4550' – 15,076' (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 hourly check by rig personnel.
- After setting intermediate casing, a third party gas unit detection system will be installed at the flow line.

8. Auxiliary Well Control and Monitoring Equipment:

a. A Kelly cock will be in the drill string at all times.
b. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
c. Hydrogen Sulfide detection equipment will be in operation after drilling out the 13 3/8" casing shoe until the 5 ½" casing is cemented. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached.

See COA

9. Testing, Logging and Coring Program:

a. Drill stem tests will be based on geological sample shows.
b. If open hole electrical logging is performed, the program will be:
   i. Total Depth to Intermediate Casing: Dual Laterolog-Micro Laterolog and Gamma Ray. Compensated Neutron – Z Density log with Gamma Ray and Caliper.
   ii. Total Depth to Surface: Compensated Neutron with Gamma Ray
   iii. No coring program is planned
   iv. Additional testing will be initiated subsequent to setting the 5 ½" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.

10. Potential Hazards:

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

11. Anticipated starting date and Duration of Operations:

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

COG Production LLC

Lea County, NM
Azores Federal
#3H

OH

Plan: Plan #1

Standard Planning Report

13 February, 2013

Database:	Houston R5000 Database	**Local Co-ordinate Reference:**	Well #3H
Company:	COG Production LLC	**TVD Reference:**	WELL @ 3511.8usft (Silver Oak #12 - 18' KB)
Project:	Lea County, NM	**MD Reference:**	WELL @ 3511.8usft (Silver Oak #12 - 18' KB)
Site:	Azores Federal	**North Reference:**	Grid
Well:	#3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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	Azores Federal				
Site Position:		**Northing:**	430,351.90 usft	**Latitude:**	32° 10' 53.618 N
From:	Map	**Easting:**	696,455.20 usft	**Longitude:**	103° 41' 54.050 W
Position Uncertainty:	2.0 usft	**Slot Radius:**	7-7/8 "	**Grid Convergence:**	0.34 °

Well	#3H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	430,351.90 usft	**Latitude:**	32° 10' 53.618 N
	+E/-W	0.0 usft	**Easting:**	696,455.20 usft	**Longitude:**	103° 41' 54.050 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	3,493.8 usft

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	2/13/2013	7.44	60.08	48,410

Design	Plan #1				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.0	0.0	0.0	359.63	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
10,042.5	0.00	0.00	10,042.5	0.0	0.0	0.00	0.00	0.00	0.00	
10,790.3	89.73	359.63	10,520.0	475.2	-3.1	12.00	12.00	0.00	359.63	
15,076.1	89.73	359.63	10,540.2	4,760.9	-30.7	0.00	0.00	0.00	0.00	PBHL (A#3H)

Database:	Houston R5000 Database	**Local Co-ordinate Reference:**	Well #3H
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Project:	Lea County, NM	**MD Reference:**	WELL @ 3511.8usft (Silver Oak #12 - 18' KB)
Site:	Azores Federal	**North Reference:**	Grid
Well:	#3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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

Database:	Houston R5000 Database	**Local Co-ordinate Reference:**	Well #3H
Company:	COG Production LLC	**TVD Reference:**	WELL @ 3511.8usft (Silver Oak #12 - 18' KB)
Project:	Lea County, NM	**MD Reference:**	WELL @ 3511.8usft (Silver Oak #12 - 18' KB)
Site:	Azores Federal	**North Reference:**	Grid
Well:	#3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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)
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
10,042.5	0.00	0.00	10,042.5	0.0	0.0	0.0	0.00	0.00	0.00
KOP - 10042.5' MD, 10042.5' TVD									
10,050.0	0.90	359.63	10,050.0	0.1	0.0	0.1	12.00	12.00	0.00
10,075.0	3.90	359.63	10,075.0	1.1	0.0	1.1	12.00	12.00	0.00
10,100.0	6.90	359.63	10,099.9	3.5	0.0	3.5	12.00	12.00	0.00
10,125.0	9.90	359.63	10,124.6	7.1	0.0	7.1	12.00	12.00	0.00

Database:	Houston R5000 Database	**Local Co-ordinate Reference:**	Well #3H
Company:	COG Production LLC	**TVD Reference:**	WELL @ 3511.8usft (Silver Oak #12 - 18' KB)
Project:	Lea County, NM	**MD Reference:**	WELL @ 3511.8usft (Silver Oak #12 - 18' KB)
Site:	Azores Federal	**North Reference:**	Grid
Well:	#3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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)
10,150.0	12.90	359.63	10,149.1	12.0	-0.1	12.0	12.00	12.00	0.00
10,175.0	15.90	359.63	10,173.3	18.3	-0.1	18.3	12.00	12.00	0.00
10,200.0	18.90	359.63	10,197.2	25.7	-0.2	25.7	12.00	12.00	0.00
10,225.0	21.90	359.63	10,220.6	34.5	-0.2	34.5	12.00	12.00	0.00
10,250.0	24.90	359.63	10,243.5	44.4	-0.3	44.4	12.00	12.00	0.00
10,275.0	27.90	359.63	10,265.9	55.5	-0.4	55.5	12.00	12.00	0.00
10,300.0	30.90	359.63	10,287.7	67.8	-0.4	67.8	12.00	12.00	0.00
10,325.0	33.90	359.63	10,308.8	81.2	-0.5	81.2	12.00	12.00	0.00
10,350.0	36.90	359.63	10,329.2	95.6	-0.6	95.6	12.00	12.00	0.00
10,375.0	39.90	359.63	10,348.8	111.2	-0.7	111.2	12.00	12.00	0.00
10,400.0	42.90	359.63	10,367.5	127.7	-0.8	127.7	12.00	12.00	0.00
10,425.0	45.90	359.63	10,385.4	145.2	-0.9	145.2	12.00	12.00	0.00
10,450.0	48.90	359.63	10,402.3	163.6	-1.1	163.6	12.00	12.00	0.00
10,475.0	51.90	359.63	10,418.2	182.8	-1.2	182.8	12.00	12.00	0.00
10,500.0	54.90	359.63	10,433.1	202.9	-1.3	202.9	12.00	12.00	0.00
10,525.0	57.90	359.63	10,447.0	223.7	-1.4	223.7	12.00	12.00	0.00
10,550.0	60.89	359.63	10,459.7	245.2	-1.6	245.2	12.00	12.00	0.00
10,575.0	63.89	359.63	10,471.3	267.4	-1.7	267.4	12.00	12.00	0.00
10,600.0	66.89	359.63	10,481.7	290.1	-1.9	290.1	12.00	12.00	0.00
10,625.0	69.89	359.63	10,490.9	313.4	-2.0	313.4	12.00	12.00	0.00
10,650.0	72.89	359.63	10,498.9	337.0	-2.2	337.1	12.00	12.00	0.00
10,675.0	75.89	359.63	10,505.6	361.1	-2.3	361.1	12.00	12.00	0.00
10,700.0	78.89	359.63	10,511.1	385.5	-2.5	385.5	12.00	12.00	0.00
10,725.0	81.89	359.63	10,515.2	410.2	-2.6	410.2	12.00	12.00	0.00
10,750.0	84.89	359.63	10,518.1	435.0	-2.8	435.0	12.00	12.00	0.00
10,775.0	87.89	359.63	10,519.7	459.9	-3.0	459.9	12.00	12.00	0.00
10,790.3	89.73	359.63	10,520.0	475.2	-3.1	475.2	12.00	12.00	0.00
EOC - 10790.3' MD, 10520.0' TVD, 89.73° INC, 475.2' VS									
10,800.0	89.73	359.63	10,520.0	484.9	-3.1	484.9	0.02	0.02	0.00
10,900.0	89.73	359.63	10,520.5	584.9	-3.8	584.9	0.00	0.00	0.00
11,000.0	89.73	359.63	10,521.0	684.9	-4.4	684.9	0.00	0.00	0.00
11,100.0	89.73	359.63	10,521.5	784.9	-5.1	784.9	0.00	0.00	0.00
11,200.0	89.73	359.63	10,521.9	884.9	-5.7	884.9	0.00	0.00	0.00
11,300.0	89.73	359.63	10,522.4	984.9	-6.4	984.9	0.00	0.00	0.00
11,400.0	89.73	359.63	10,522.9	1,084.9	-7.0	1,084.9	0.00	0.00	0.00
11,500.0	89.73	359.63	10,523.3	1,184.9	-7.7	1,184.9	0.00	0.00	0.00
11,600.0	89.73	359.63	10,523.8	1,284.9	-8.3	1,284.9	0.00	0.00	0.00
11,700.0	89.73	359.63	10,524.3	1,384.9	-8.9	1,384.9	0.00	0.00	0.00
11,800.0	89.73	359.63	10,524.8	1,484.9	-9.6	1,484.9	0.00	0.00	0.00
11,900.0	89.73	359.63	10,525.2	1,584.9	-10.2	1,584.9	0.00	0.00	0.00
12,000.0	89.73	359.63	10,525.7	1,684.9	-10.9	1,684.9	0.00	0.00	0.00
12,100.0	89.73	359.63	10,526.2	1,784.9	-11.5	1,784.9	0.00	0.00	0.00
12,200.0	89.73	359.63	10,526.6	1,884.9	-12.2	1,884.9	0.00	0.00	0.00
12,300.0	89.73	359.63	10,527.1	1,984.9	-12.8	1,984.9	0.00	0.00	0.00
12,400.0	89.73	359.63	10,527.6	2,084.9	-13.5	2,084.9	0.00	0.00	0.00
12,500.0	89.73	359.63	10,528.1	2,184.9	-14.1	2,184.9	0.00	0.00	0.00
12,600.0	89.73	359.63	10,528.5	2,284.9	-14.8	2,284.9	0.00	0.00	0.00
12,700.0	89.73	359.63	10,529.0	2,384.9	-15.4	2,384.9	0.00	0.00	0.00
12,800.0	89.73	359.63	10,529.5	2,484.9	-16.0	2,484.9	0.00	0.00	0.00
12,900.0	89.73	359.63	10,529.9	2,584.9	-16.7	2,584.9	0.00	0.00	0.00
13,000.0	89.73	359.63	10,530.4	2,684.9	-17.3	2,684.9	0.00	0.00	0.00
13,100.0	89.73	359.63	10,530.9	2,784.9	-18.0	2,784.9	0.00	0.00	0.00
13,200.0	89.73	359.63	10,531.4	2,884.9	-18.6	2,884.9	0.00	0.00	0.00
13,300.0	89.73	359.63	10,531.8	2,984.9	-19.3	2,984.9	0.00	0.00	0.00

Database:	Houston R5000 Database	**Local Co-ordinate Reference:**	Well #3H
Company:	COG Production LLC	**TVD Reference:**	WELL @ 3511.8usft (Silver Oak #12 - 18' KB)
Project:	Lea County, NM	**MD Reference:**	WELL @ 3511.8usft (Silver Oak #12 - 18' KB)
Site:	Azores Federal	**North Reference:**	Grid
Well:	#3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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)
13,400.0	89.73	359.63	10,532.3	3,084.8	-19.9	3,084.9	0.00	0.00	0.00
13,500.0	89.73	359.63	10,532.8	3,184.8	-20.6	3,184.9	0.00	0.00	0.00
13,600.0	89.73	359.63	10,533.2	3,284.8	-21.2	3,284.9	0.00	0.00	0.00
13,700.0	89.73	359.63	10,533.7	3,384.8	-21.9	3,384.9	0.00	0.00	0.00
13,800.0	89.73	359.63	10,534.2	3,484.8	-22.5	3,484.9	0.00	0.00	0.00
13,900.0	89.73	359.63	10,534.7	3,584.8	-23.2	3,584.9	0.00	0.00	0.00
14,000.0	89.73	359.63	10,535.1	3,684.8	-23.8	3,684.9	0.00	0.00	0.00
14,100.0	89.73	359.63	10,535.6	3,784.8	-24.4	3,784.9	0.00	0.00	0.00
14,200.0	89.73	359.63	10,536.1	3,884.8	-25.1	3,884.9	0.00	0.00	0.00
14,300.0	89.73	359.63	10,536.5	3,984.8	-25.7	3,984.9	0.00	0.00	0.00
14,400.0	89.73	359.63	10,537.0	4,084.8	-26.4	4,084.9	0.00	0.00	0.00
14,500.0	89.73	359.63	10,537.5	4,184.8	-27.0	4,184.9	0.00	0.00	0.00
14,600.0	89.73	359.63	10,538.0	4,284.8	-27.7	4,284.9	0.00	0.00	0.00
14,700.0	89.73	359.63	10,538.4	4,384.8	-28.3	4,384.9	0.00	0.00	0.00
14,800.0	89.73	359.63	10,538.9	4,484.8	-29.0	4,484.9	0.00	0.00	0.00
14,900.0	89.73	359.63	10,539.4	4,584.8	-29.6	4,584.9	0.00	0.00	0.00
15,000.0	89.73	359.63	10,539.8	4,684.8	-30.3	4,684.9	0.00	0.00	0.00
15,076.1	89.73	359.63	10,540.2	4,760.9	-30.7	4,761.0	0.00	0.00	0.00

TD @ 15076.1' MD, 10540.2' TVD

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL (A#3H)	0.00	0.00	10,540.0	4,760.9	-30.8	435,112.80	696,424.40	32° 11' 40.733 N	103° 41' 54.081 W
- plan misses target center by 0.2usft at 15076.1usft MD (10540.2 TVD, 4760.9 N, -30.7 E)									
- Point									

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,042.5	10,042.5	0.0	0.0	KOP - 10042.5' MD, 10042.5' TVD
10,790.3	10,520.0	475.2	-3.1	EOC - 10790.3' MD, 10520.0' TVD, 89.73° INC, 475.2' VS
15,076.1	10,540.2	4,760.9	-30.7	TD @ 15076.1' MD, 10540.2' TVD

COG Production LLC
Project: Lea County, NM
Site: Azores Federal
Well: #3H
Wellbore: OH
Plan: Plan #1 (#3H/OH)

CONCHO

Azimuths to Grid North
True North: -0.34°
Magnetic North: 7.10°

Magnetic Field
Strength: 48409.8snT
Dip Angle: 60.08°
Date: 2/13/2013
Model: IGRF2010

WELL DETAILS: #3H

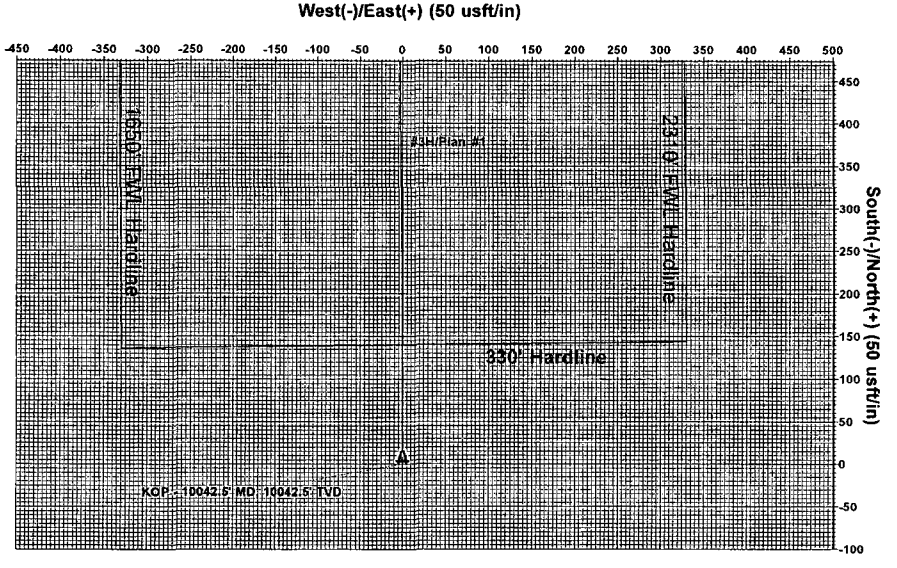
Ground Elevation:: 3493.8
RKB Elevation: WELL @ 3511.8usft (Silver Oak #12 - 18' KB)
Rig Name: Silver Oak #12 - 18' KB

Surface Hole Location

Northing	Easting	Latitude	Longitude
430351.90	696455.20	32° 10' 53.618 N	103° 41' 54.050 W

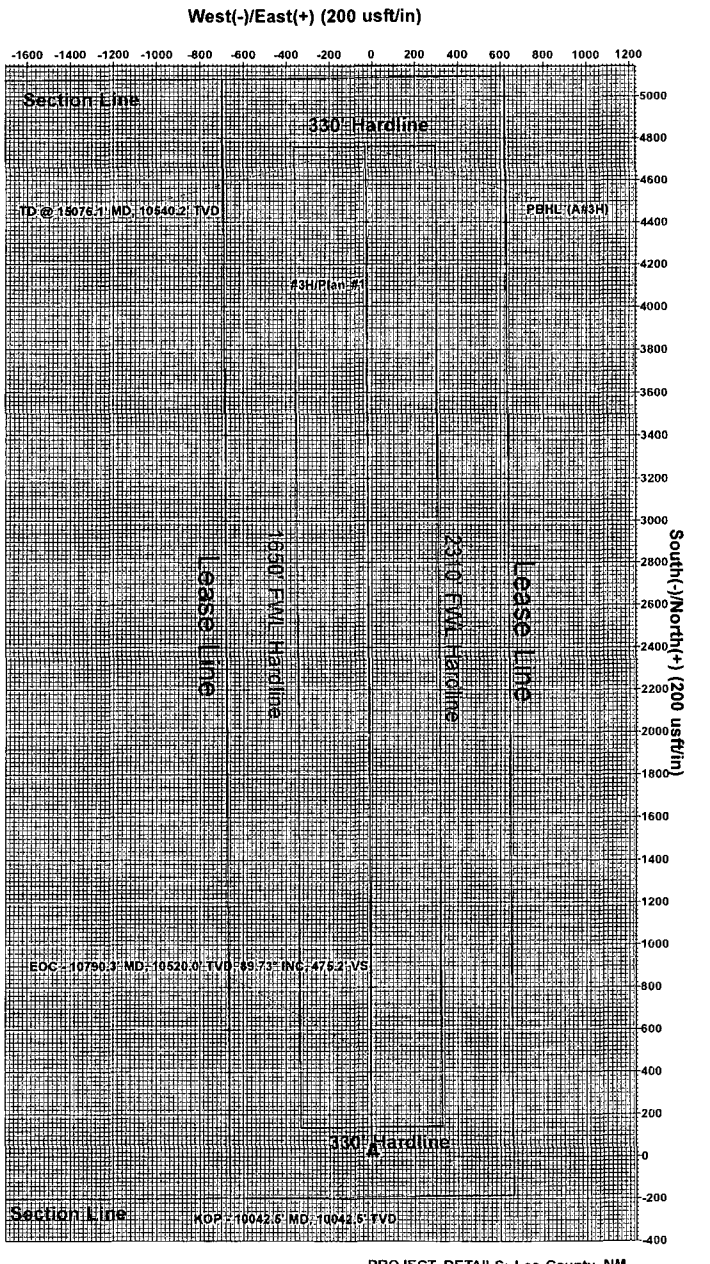
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL (A#3H)	10540.0	4760.9	-30.8	435112.80	696424.40	32° 11' 40.733 N	103° 41' 54.081 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	10042.5	0.00	0.00	10042.5	0.0	0.0	0.00	0.00	0.0	
3	10790.3	89.73	359.63	10520.0	475.2	-3.1	12.00	359.63	475.3	
4	15076.1	89.73	359.63	10540.2	4760.9	-30.7	0.00	0.00	4761.0	PBHL (A#3H)



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 #1 (#3H/OH)
Created By: Matt Higgins Date: 16:11, February 13 2013

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

No records found.

PLSS Search:

Section(s): 29 **Township:** 24S **Range:** 32E

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

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

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

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Code	Subbasin	County	Q 64	Q 16	Q 4	Sec	Twn	Rng	X	Y	Depth Well	Depth Water	Water Column
C 01932		C	ED		3	1	12	24S	32E	628633	3567188*	492		
C 02350			ED		4	3	10	24S	32E	625826	3566333*	60		
C 03527 POD1		C	LE	1	2	3	03	24S	32E	625770	3568487	500		
C 03528 POD1		C	LE	1	1	2	15	24S	32E	626040	3566129	541		
C 03530 POD1		C	LE	3	4	3	07	24S	32E	620886	3566156	550		
C 03555 POD1		C	LE	2	2	1	05	24S	32E	622709	3569231	560		

Average Depth to Water: --

Minimum Depth: --

Maximum Depth: --

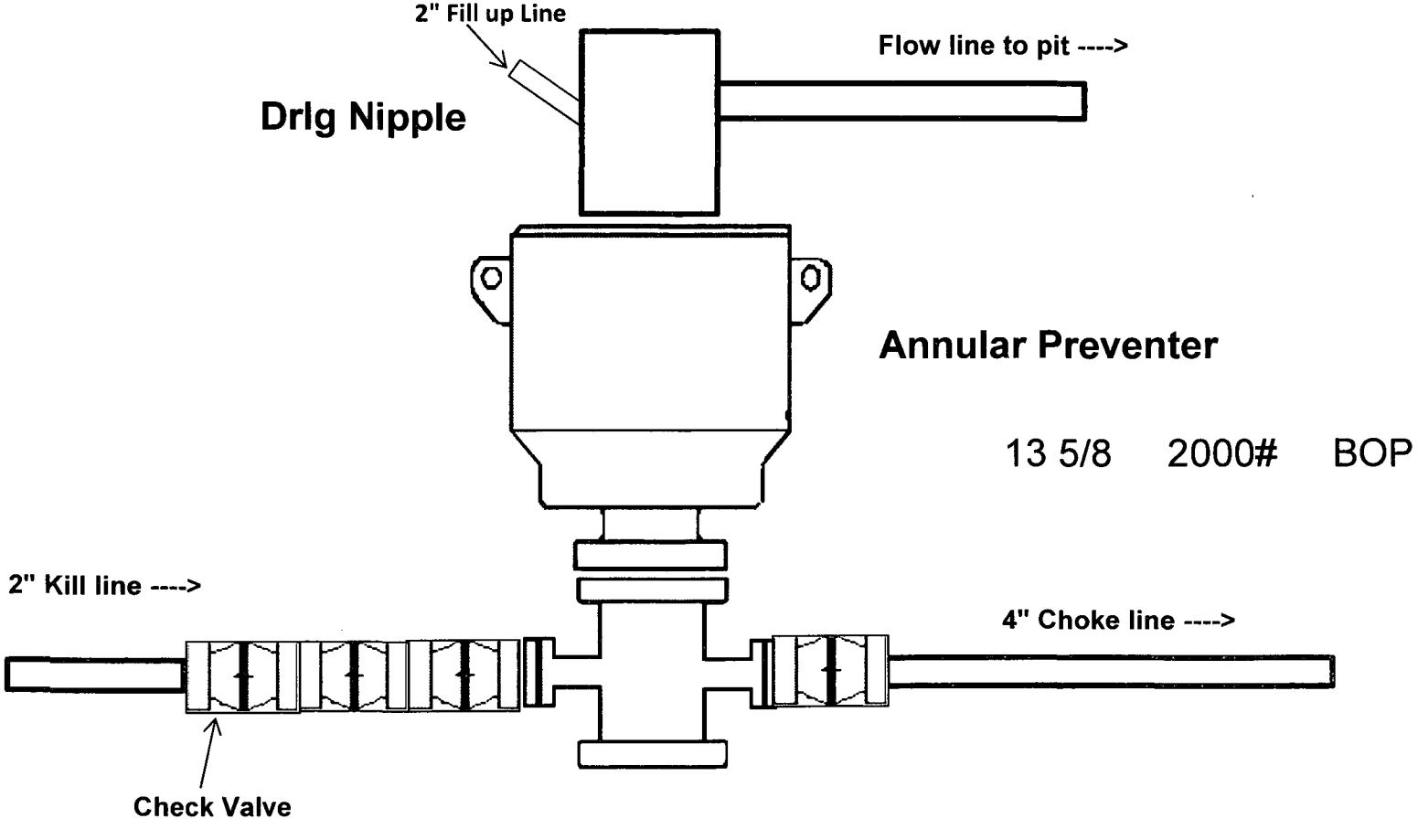
Record Count: 6

PLSS Search:

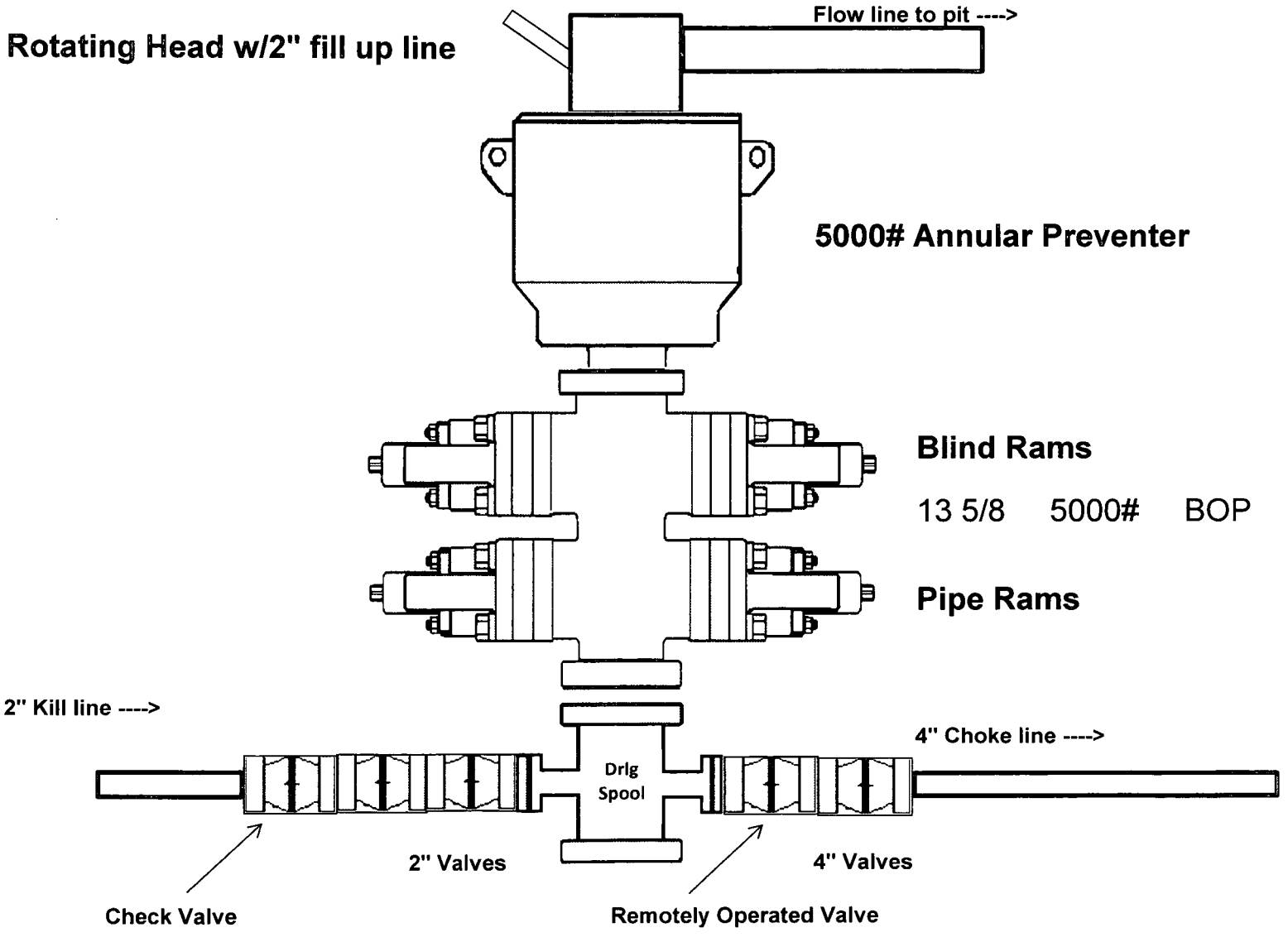
Township: 24S **Range:** 32E

***UTM location was derived from PLSS - see Help**

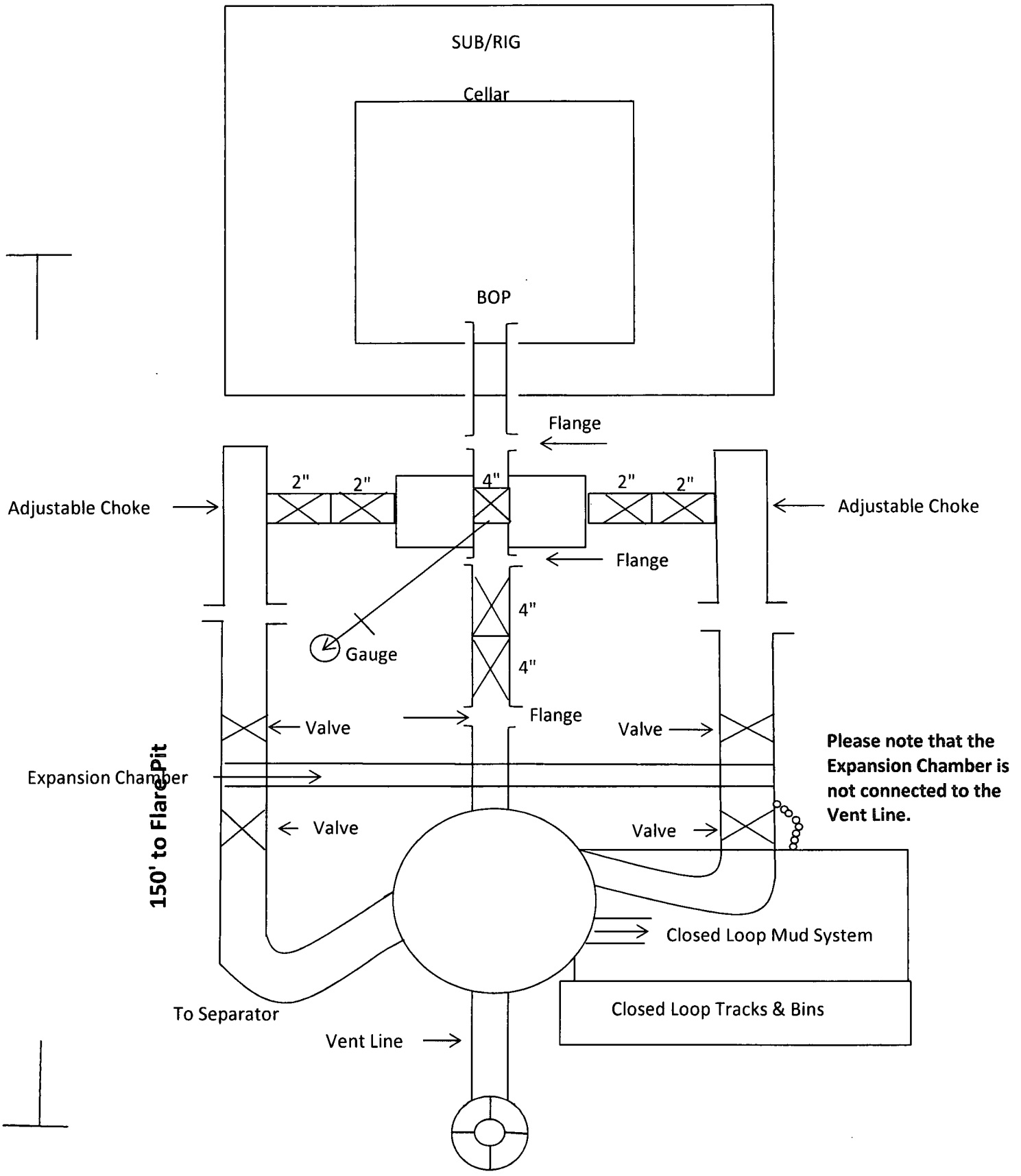
2,000 psi BOP Schematic



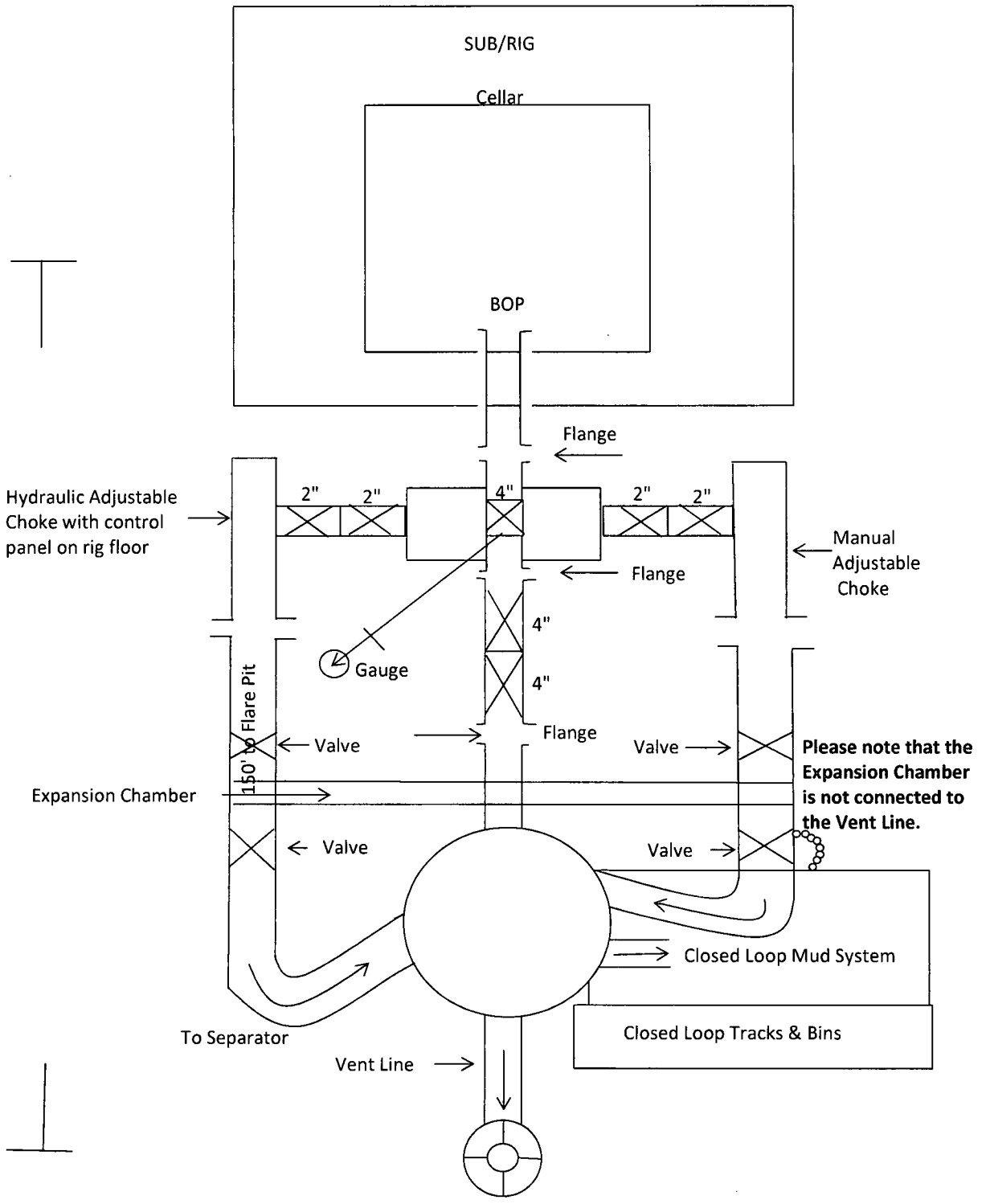
5,000 psi BOP Schematic



2M Choke Manifold Equipment



5M Choke Manifold Equipment



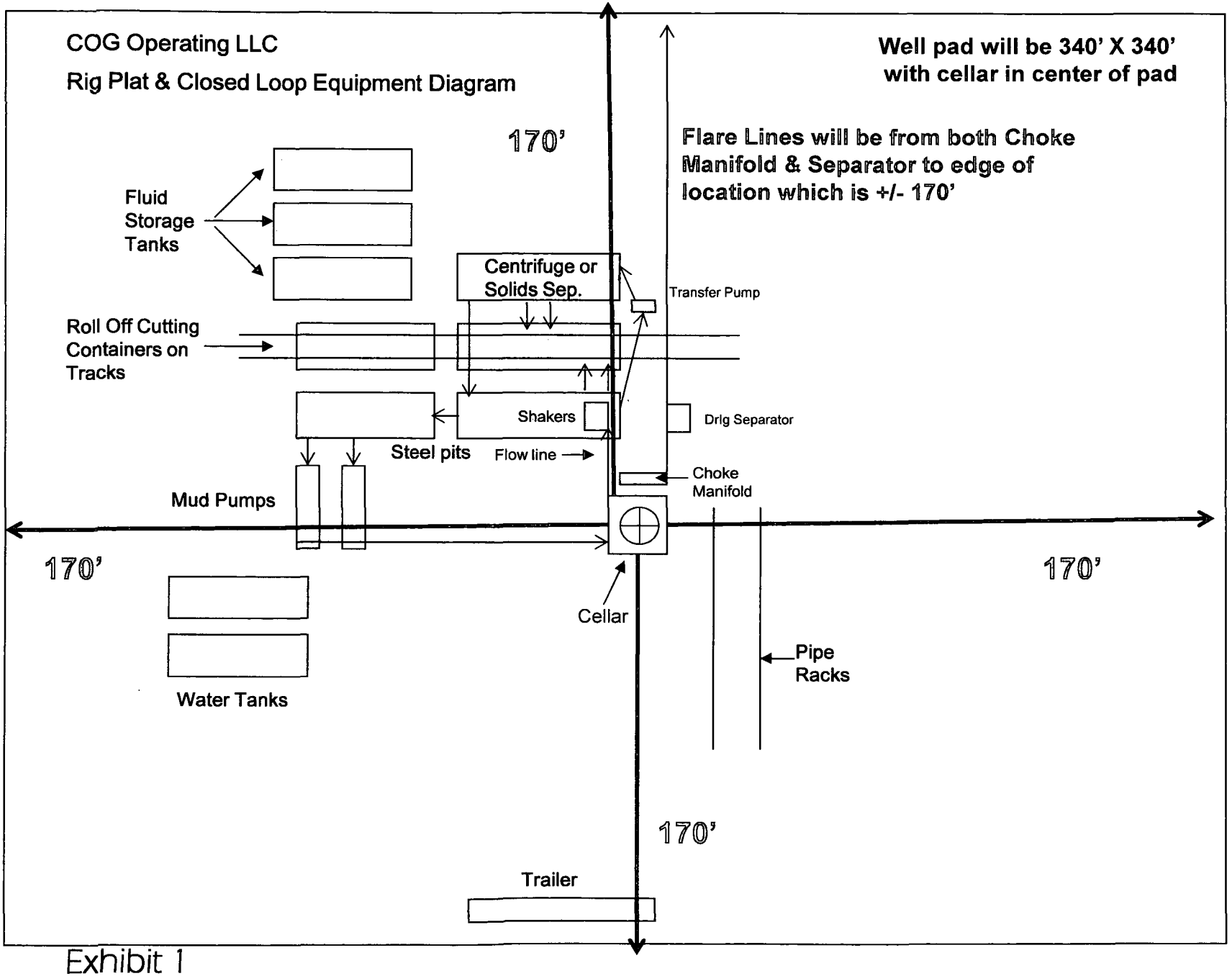

COG Operating LLC
Rig Plat & Closed Loop Equipment Diagram
Well pad will be 340' X 340'
with cellar in center of pad
Flare Lines will be from both Choke Manifold & Separator to edge of location which is +/- 170'
170'
Fluid Storage Tanks
Centrifuge or Solids Sep.
Transfer Pump
Roll Off Cutting Containers on Tracks
Shakers
Drlg Separator
Steel pits
Flow line
Choke Manifold
Mud Pumps
170'
170'
Cellar
Pipe Racks
Water Tanks
170'
Trailer

Exhibit 1