

Split Estate HOBBS OCD
OCD Hobbs
APR 16 2014
RECEIVED

ATS-14-381

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM02386A
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator COG Operating LLC. 229137		7. If Unit or CA Agreement, Name and No. Brinninstool Unit; NMNM070796X
3a. Address 2208 West Main Street Artesia, NM 88210		8. Lease Name and Well No. 310143 Brinninstool Unit #4H
3b. Phone No. (include area code) 575-748-6940		9. API Well No. 30025-41803
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 330' FSL & 752' FEL Unit Letter P (SESE) SHL At proposed prod. Zone 330' FNL & 752' FEL Unit Letter A (NENE) BHL		10. Field and Pool, or Exploratory Cruz; Bone Spring 1486
14. Distance in miles and direction from nearest town or post office* Approximately 25 miles from Eunice		11. Sec., T.R.M. or Blk and Survey or Area Sec. 20 - T23S - R33E
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 330'	16. No. of acres in lease 560	12. County or Parish Lea County
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 342' BHL: 1344'	19. Proposed Depth TVD: 11,089' MD: 15,537' PH: 12,500'	13. State NM
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3687.2' GL	22. Approximate date work will start* 4/1/2014	17. Spacing Unit dedicated to this well 160
		20. BLM/BIA Bond No. on file NMB000740 & NMB000215
		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:

- Well plat certified by a registered surveyor.
- A Drilling Plan
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification
- 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 1/16/2014
Title Regulatory Analyst		
Approved by (Signature) /s/ STEPHEN J. CAFFEY	Name (Printed/Typed)	Date APR 2 2014
Title FIELD MANAGER		
Office CARLSBAD FIELD OFFICE		

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

APPROVAL FOR TWO YEARS

Conditions of approval, if any, are attached.

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)

Approval Subject to General Requirements
& Special Stipulations Attached

Carlsbad Controlled Water Basin
SEE ATTACHED FOR
CONDITIONS OF APPROVAL

APR 23 2014

Surface Use Plan
COG Operating, LLC
Brinninstool Unit #4H
SL: 330' FSL & 752' FEL ULP
Section 20, T23S, R33E
BHL: 330' FNL & 752' FEL ULA
Section 20, T23S, R33E
Lea County, New Mexico

OPERATOR CERTIFICATION

I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access road proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or COG Operating LLC, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements. Executed this 16th day of January, 2014.

Signed: 

Printed Name: Melanie J. Parker

Position: Regulatory Coordinator

Address: 2208 W. Main Street, Artesia, NM 88210

Telephone: (575) 748-6940

Field Representative (if not above signatory): Rand French

E-mail: mparker@concho.com

COG Operating LLC
DRILLING AND OPERATIONS PROGRAM
Brinninstool Unit 4H
SHL: 330' FSL & 752' FEL
BHL: 330' FNL & 752' FEL
Section 20 T23S 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	~ 350'
Rustler	1352'
Top of Salt	1456'
Fletcher Anhydrite	4945'
Delaware	5196' Oil
Bone Spring	9005' Oil
Wolfcamp	12,291'
PHTD	12,500'
TD TVD	11,089'
TD MD	15,537'

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 1400' 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.

See COA **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' - 1400'	Surface	13 3/8"	New	54.5#	STC	J-55	1.85	1.95	7.73
12 1/4"	0' - 4300' <i>5100'</i>	Intrmd	9 5/8"	New	40#	LTC	J-55	1.149	1.91	3.57
12 1/4"	4300' - 5225'	Intrmd	9 5/8"	New	40#	LTC	N-80	1.13	2.79	4.07
8 3/4"	0' - 15,537'	Production Curve & Lateral	5 1/2"	New	17#	LTC	P-110	1.67	1.33	3.25

- 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: 650 sx Class C + 4% Gel + 2% CaCl ₂
(13.5 ppg, 1.75 cuft/sx, 9.2 gal/sx)
Cmt: 250 sx Class C + 2% CaCl ₂
(14.8 ppg, 1.35 cuft/sx, 6.3 gal/sx)
**Calculated w/50% excess on OH volumes |
| b. 9 5/8" Intermediate: | Lead: 1050 sx 35:65:6 C +Salt+Gilsonite+CFR-3+ HR601
(12.8 ppg, 1.89 cuft/sx, 10.6 gal/sx)
Tail: 250 sx Class C
(14.8 ppg, 1.35 cuft/sx, 6.3 gal/sx)
**Calculated w/35% excess on OH volumes |
| d. 5 1/2" Production | Lead: 1100 sx 50:50:10 C +Salt+Gilsonite+CFR-3+ HR601
(11.9 ppg, 2.5 cuft/sx, 14.2 gal/sx)
Tail: 950 sx 50:50:2 H +Salt+GasStop +HR601 +CFR-3
(14.4 ppg, 1.25 cuft/sx, 5.7 gal/sx)
**Calculated w/35% excess on OH volumes |

- The above cement volumes could be revised pending the caliper measurements.
- The 13-3/8" surface cement is designed to circulate to surface.
- 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 hole will be plugged back with the following cmt plugs:

- PHTD – 11,500' with 350 sx Class H @ 17.2 ppg/0.98 yeild
- 11,500' – 10,500' with 350 sx Class H @ 17.2 ppg/0.98 yeild

5. Minimum Specifications for Pressure Control:

A 13 5/8" 2000 psi Hydril type annular preventer with mud cross, choke manifold, chokes, kill line, Kelly cock, safety valve and subs to fit all drill strings in use as provided for in Onshore Order #2 will be nipped up on the 13 3/8" x 2000 psi SOW X 13 5/8" x 2000 psi casing head (see attached BOPE drawings). This unit will be hydraulically operated and will be tested by independent tester using test plug to 250 psig/300 psig low and 1000 psig high. Choke line valve, chokes, upper Kelly cock valve, safety valve shall also be tested to 250 psig/300 psig low and 1000 psig high by independent tester.

See Unsub Order 2 - 2004, raising the following BOPE as provided for in

After setting the 9 5/8" intermediate casing the following BOPE as provided for in Onshore Order #2 will be rigged up on the 9 5/8" intermediate casing spool (13 5/8" 2000 psi x 13 5/8" 5000 psi): 13 5/8" X 5000 psi annular, 13 5/8" X 5000 psi double ram type preventer with blind rams on top and 4 1/2" drill pipe rams on the bottom, choke, mud cross, choke manifold, 4" diameter choke line, 2" kill line, kelly cock, safety valve with proper subs for all drill string connections in use (see attached BOPE drawings). The BOPE including auxiliary equipment (chokes, choke manifold etc.) will be tested by independent tester.

Test plug will be used and all BOPE tested to 250 psig/ 300 psig low pressure and 5000 psig high pressure for 10 minutes. Annular preventer will be tested to 2500 psig. BOP stack will be used continuously until total depth is reached. 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. Any time a component of the BOP stack or choke manifold is changed or installed BOPE will be re-tested as required.

All casing strings below the conductor shall be pressure tested to 0.22 psi per foot of casing string depth or 1500 psig, whichever is greater, but not to exceed 70 percent of casing's minimum internal yield. If pressure declines more than 10 percent in 30 minutes, corrective action will be taken. If H₂S is monitored with 100 ppm in the gas stream while drilling intermediate, we will shut in and install a remote operated choke.

6. Estimated BHP & BHT:

Lateral TD = 4822 psi

Lateral TD = 159°F

PHTD = 5850 psi

PHTD = 171°F

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

Self
COA

Depth	Type System	Mud Weight	Viscosity (sec)	Waterloss (cc)
0' - 1400'	Fresh Water	8.4	29	N.C.
1400' - 5225' 500'	Brine	10	29	N.C.
5225' - 12,500' (PHTD)	Cut Brine	8.9 - 9.2	29	N.C.
5225' - 15,537' (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:

- Self
COA
- 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:

- 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

- iv. Additional testing will be initiated subsequent to setting the 5 1/2" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.

10. Potential Hazards:

- 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.

See
COA

11. Anticipated starting date and Duration of Operations:

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



COG Operating LLC

Lea County, NM (NAD27 NME)

Brinninstool Unit

#4H

OH

Plan: Design #1

Standard Planning Report

22 October, 2013



Wellplanning Planning Report

Database Company:	EDM 5000.1 Single User Db COG Operating LLC	Local Co-ordinate Reference	Well #4H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	WELL @ 3705.2usft (Original Well Elev)
Site:	Brinninstool Unit	MD Reference:	WELL @ 3705.2usft (Original Well Elev)
Well:	#4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1		

Project:	Lea County, NM (NAD27 NME)		
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:	Brinninstool Unit		
Site Position:	From: Map	Northing:	467,743.10 usft
		Easting:	730,412.80 usft
Position Uncertainty:	3.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 17' 1.468 N
		Longitude:	103° 35' 15.927 W
		Grid Convergence:	0.40 °

Well:	#4H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	Ground Level:
			3,687.2 usft

Wellbore:	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	10/22/2013	7.31
			60.18
			48,413

Design:	Design #1		
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
			359.50

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	
10,642.5	0.00	0.00	10,642.5	0.0	0.0	0.00	0.00	0.00	0.00	
11,396.1	90.42	359.50	11,120.0	481.0	-4.2	12.00	12.00	0.00	359.50	
15,537.6	90.42	359.50	11,089.6	4,622.3	-40.3	0.00	0.00	0.00	0.00	PBHL(Brinninstool #4



Wellplanning Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #4H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3705.2usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	WELL @ 3705.2usft (Original Well Elev)
Site:	Brinninstool Unit	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #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	



Wellplanning Planning Report

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Company	COG Operating LLC	TVD Reference:	WELL @ 3705.2usft (Original Well Elev)
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Site	Brinninstool Unit	North Reference:	Grid
Well	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore	OH		
Design	Design #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
10,100.0	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
10,642.5	0.00	0.00	10,642.5	0.0	0.0	0.0	0.00	0.00	0.00



Wellplanning Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #4H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3705.2usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	WELL @ 3705.2usft (Original Well Elev)
Site:	Brinninstool Unit	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #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)
KOP - 10642.5 'MD, 0.00° INC, 0.00° AZI									
10,650.0	0.90	359.50	10,650.0	0.1	0.0	0.1	12.00	12.00	0.00
10,675.0	3.90	359.50	10,675.0	1.1	0.0	1.1	12.00	12.00	0.00
10,700.0	6.90	359.50	10,699.9	3.5	0.0	3.5	12.00	12.00	0.00
10,725.0	9.90	359.50	10,724.6	7.1	-0.1	7.1	12.00	12.00	0.00
10,750.0	12.90	359.50	10,749.1	12.0	-0.1	12.0	12.00	12.00	0.00
10,775.0	15.90	359.50	10,773.3	18.3	-0.2	18.3	12.00	12.00	0.00
10,800.0	18.90	359.50	10,797.2	25.7	-0.2	25.7	12.00	12.00	0.00
10,825.0	21.90	359.50	10,820.6	34.5	-0.3	34.5	12.00	12.00	0.00
10,850.0	24.90	359.50	10,843.5	44.4	-0.4	44.4	12.00	12.00	0.00
10,875.0	27.90	359.50	10,865.9	55.5	-0.5	55.5	12.00	12.00	0.00
10,900.0	30.90	359.50	10,887.7	67.8	-0.6	67.8	12.00	12.00	0.00
10,925.0	33.90	359.50	10,908.8	81.2	-0.7	81.2	12.00	12.00	0.00
10,950.0	36.90	359.50	10,929.2	95.6	-0.8	95.6	12.00	12.00	0.00
10,975.0	39.90	359.50	10,948.8	111.2	-1.0	111.2	12.00	12.00	0.00
11,000.0	42.90	359.50	10,967.5	127.7	-1.1	127.7	12.00	12.00	0.00
11,025.0	45.90	359.50	10,985.4	145.2	-1.3	145.2	12.00	12.00	0.00
11,050.0	48.90	359.50	11,002.3	163.6	-1.4	163.6	12.00	12.00	0.00
11,075.0	51.89	359.50	11,018.2	182.8	-1.6	182.8	12.00	12.00	0.00
11,100.0	54.89	359.50	11,033.2	202.9	-1.8	202.9	12.00	12.00	0.00
11,125.0	57.89	359.50	11,047.0	223.7	-2.0	223.7	12.00	12.00	0.00
11,150.0	60.89	359.50	11,059.7	245.2	-2.1	245.2	12.00	12.00	0.00
11,175.0	63.89	359.50	11,071.3	267.4	-2.3	267.4	12.00	12.00	0.00
11,200.0	66.89	359.50	11,081.7	290.1	-2.5	290.1	12.00	12.00	0.00
11,225.0	69.89	359.50	11,090.9	313.3	-2.7	313.4	12.00	12.00	0.00
11,250.0	72.89	359.50	11,098.9	337.0	-2.9	337.0	12.00	12.00	0.00
11,275.0	75.89	359.50	11,105.6	361.1	-3.2	361.1	12.00	12.00	0.00
11,300.0	78.89	359.50	11,111.1	385.5	-3.4	385.5	12.00	12.00	0.00
11,325.0	81.89	359.50	11,115.2	410.1	-3.6	410.2	12.00	12.00	0.00
11,350.0	84.89	359.50	11,118.1	435.0	-3.8	435.0	12.00	12.00	0.00
11,375.0	87.89	359.50	11,119.7	459.9	-4.0	459.9	12.00	12.00	0.00
11,396.1	90.42	359.50	11,120.0	481.0	-4.2	481.0	12.00	12.00	0.00
EOC - 11396.1 'MD, 90.42° INC, 359.50° AZI									
11,400.0	90.42	359.50	11,120.0	484.9	-4.2	484.9	0.00	0.00	0.00
11,500.0	90.42	359.50	11,119.2	584.9	-5.1	584.9	0.00	0.00	0.00
11,600.0	90.42	359.50	11,118.5	684.9	-6.0	684.9	0.00	0.00	0.00
11,700.0	90.42	359.50	11,117.8	784.9	-6.8	784.9	0.00	0.00	0.00
11,800.0	90.42	359.50	11,117.0	884.9	-7.7	884.9	0.00	0.00	0.00
11,900.0	90.42	359.50	11,116.3	984.9	-8.6	984.9	0.00	0.00	0.00
12,000.0	90.42	359.50	11,115.6	1,084.9	-9.5	1,084.9	0.00	0.00	0.00
12,100.0	90.42	359.50	11,114.8	1,184.9	-10.3	1,184.9	0.00	0.00	0.00
12,200.0	90.42	359.50	11,114.1	1,284.9	-11.2	1,284.9	0.00	0.00	0.00
12,300.0	90.42	359.50	11,113.4	1,384.9	-12.1	1,384.9	0.00	0.00	0.00
12,400.0	90.42	359.50	11,112.6	1,484.9	-13.0	1,484.9	0.00	0.00	0.00
12,500.0	90.42	359.50	11,111.9	1,584.8	-13.8	1,584.9	0.00	0.00	0.00
12,600.0	90.42	359.50	11,111.2	1,684.8	-14.7	1,684.9	0.00	0.00	0.00
12,700.0	90.42	359.50	11,110.4	1,784.8	-15.6	1,784.9	0.00	0.00	0.00
12,800.0	90.42	359.50	11,109.7	1,884.8	-16.4	1,884.9	0.00	0.00	0.00
12,900.0	90.42	359.50	11,109.0	1,984.8	-17.3	1,984.9	0.00	0.00	0.00
13,000.0	90.42	359.50	11,108.2	2,084.8	-18.2	2,084.9	0.00	0.00	0.00
13,100.0	90.42	359.50	11,107.5	2,184.8	-19.1	2,184.9	0.00	0.00	0.00
13,200.0	90.42	359.50	11,106.8	2,284.8	-19.9	2,284.9	0.00	0.00	0.00
13,300.0	90.42	359.50	11,106.0	2,384.8	-20.8	2,384.9	0.00	0.00	0.00
13,400.0	90.42	359.50	11,105.3	2,484.8	-21.7	2,484.9	0.00	0.00	0.00



Wellplanning Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #4H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3705.2usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	WELL @ 3705.2usft (Original Well Elev)
Site:	Brinninstool Unit	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #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)
13,500.0	90.42	359.50	11,104.6	2,584.8	-22.6	2,584.9	0.00	0.00	0.00
13,600.0	90.42	359.50	11,103.8	2,684.8	-23.4	2,684.9	0.00	0.00	0.00
13,700.0	90.42	359.50	11,103.1	2,784.8	-24.3	2,784.9	0.00	0.00	0.00
13,800.0	90.42	359.50	11,102.4	2,884.8	-25.2	2,884.9	0.00	0.00	0.00
13,900.0	90.42	359.50	11,101.6	2,984.8	-26.0	2,984.9	0.00	0.00	0.00
14,000.0	90.42	359.50	11,100.9	3,084.7	-26.9	3,084.9	0.00	0.00	0.00
14,100.0	90.42	359.50	11,100.2	3,184.7	-27.8	3,184.9	0.00	0.00	0.00
14,200.0	90.42	359.50	11,099.4	3,284.7	-28.7	3,284.9	0.00	0.00	0.00
14,300.0	90.42	359.50	11,098.7	3,384.7	-29.5	3,384.9	0.00	0.00	0.00
14,400.0	90.42	359.50	11,098.0	3,484.7	-30.4	3,484.9	0.00	0.00	0.00
14,500.0	90.42	359.50	11,097.2	3,584.7	-31.3	3,584.9	0.00	0.00	0.00
14,600.0	90.42	359.50	11,096.5	3,684.7	-32.2	3,684.9	0.00	0.00	0.00
14,700.0	90.42	359.50	11,095.8	3,784.7	-33.0	3,784.8	0.00	0.00	0.00
14,800.0	90.42	359.50	11,095.0	3,884.7	-33.9	3,884.8	0.00	0.00	0.00
14,900.0	90.42	359.50	11,094.3	3,984.7	-34.8	3,984.8	0.00	0.00	0.00
15,000.0	90.42	359.50	11,093.6	4,084.7	-35.6	4,084.8	0.00	0.00	0.00
15,100.0	90.42	359.50	11,092.8	4,184.7	-36.5	4,184.8	0.00	0.00	0.00
15,200.0	90.42	359.50	11,092.1	4,284.7	-37.4	4,284.8	0.00	0.00	0.00
15,300.0	90.42	359.50	11,091.4	4,384.7	-38.3	4,384.8	0.00	0.00	0.00
15,400.0	90.42	359.50	11,090.6	4,484.7	-39.1	4,484.8	0.00	0.00	0.00
15,500.0	90.42	359.50	11,089.9	4,584.7	-40.0	4,584.8	0.00	0.00	0.00
15,537.6	90.42	359.50	11,089.6	4,622.3	-40.3	4,622.4	0.00	0.00	0.00
TD at 15537.6 - PBHL(Brinninstool #4H)									

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(Brinninstool #4H)	0.00	0.00	11,090.0	4,622.3	-35.3	472,365.40	730,377.50	32° 17' 47.211 N	103° 35' 15.964 W
- plan misses target center by 5.1usft at 15537.6usft MD (11089.6 TVD, 4622.3 N, -40.3 E)									
- Point									

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,642.5	10,642.5	0.0	0.0	KOP - 10642.5 'MD, 0.00° INC, 0.00° AZI
11,396.1	11,120.0	481.0	-4.2	EOC- 11396.1 'MD, 90.42° INC, 359.50° AZI
15,537.6	11,089.6	4,622.3	-40.3	TD at 15537.6



COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Brinninstool Unit
Well: #4H
Wellbore: OH
Plan: Design #1 (#4H/OH)

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0
2	10642.5	0.00	0.00	10642.5	0.0	0.0	0.00	0.00	0.0
3	11396.1	90.42	359.50	11120.0	481.0	-4.2	12.00	359.50	481.0
4	15537.6	90.42	359.50	11089.6	4622.3	-40.3	0.00	0.00	4622.4

WELL DETAILS: #4H

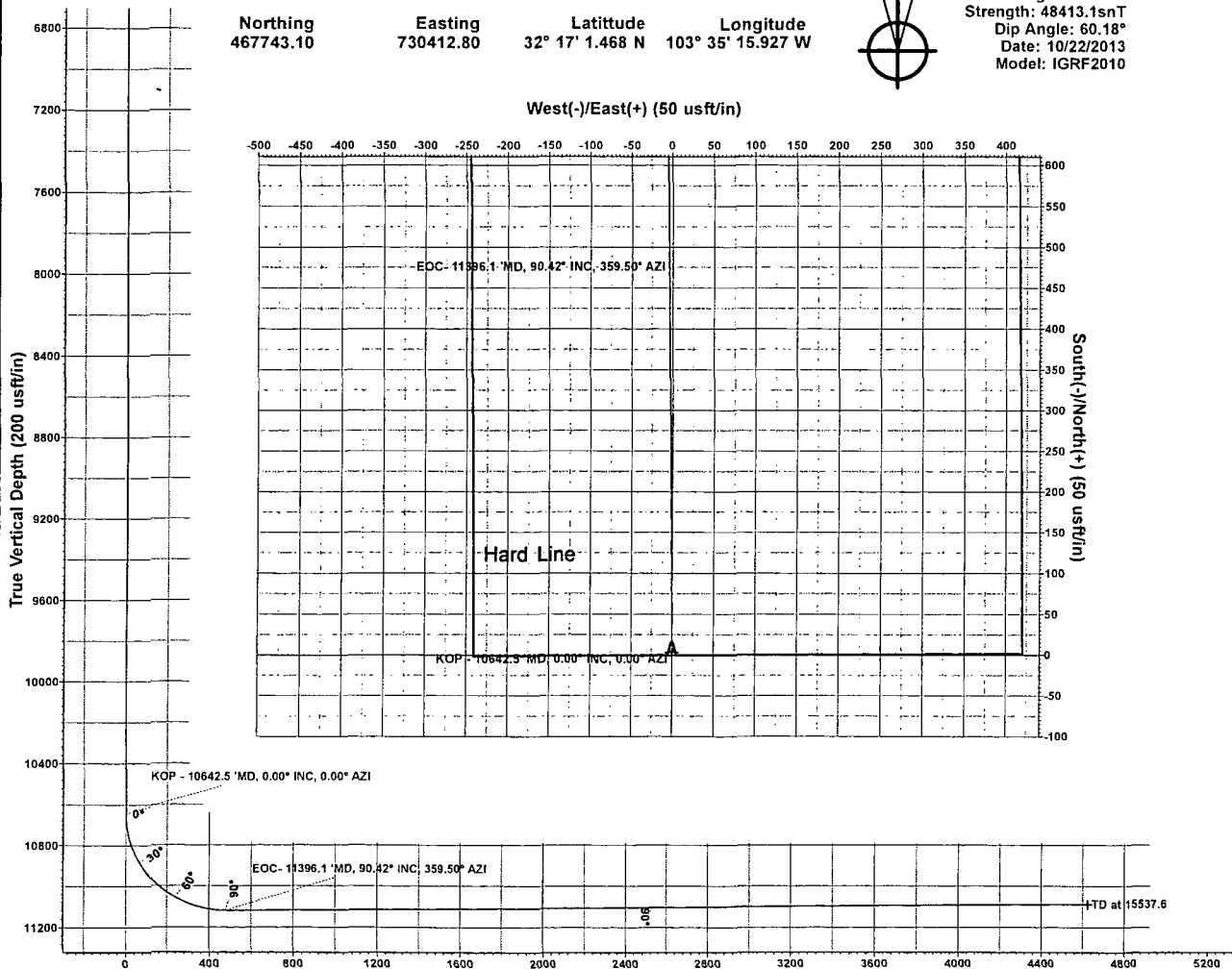
Ground Elevation:: 3687.2
RKB Elevation: WELL @ 3705.2usft (Original Well Elev)
Rig Name: Original Well Elev

Northing 467743.10 Easting 730412.80 Latitude 32° 17' 1.468 N Longitude 103° 35' 15.927 W

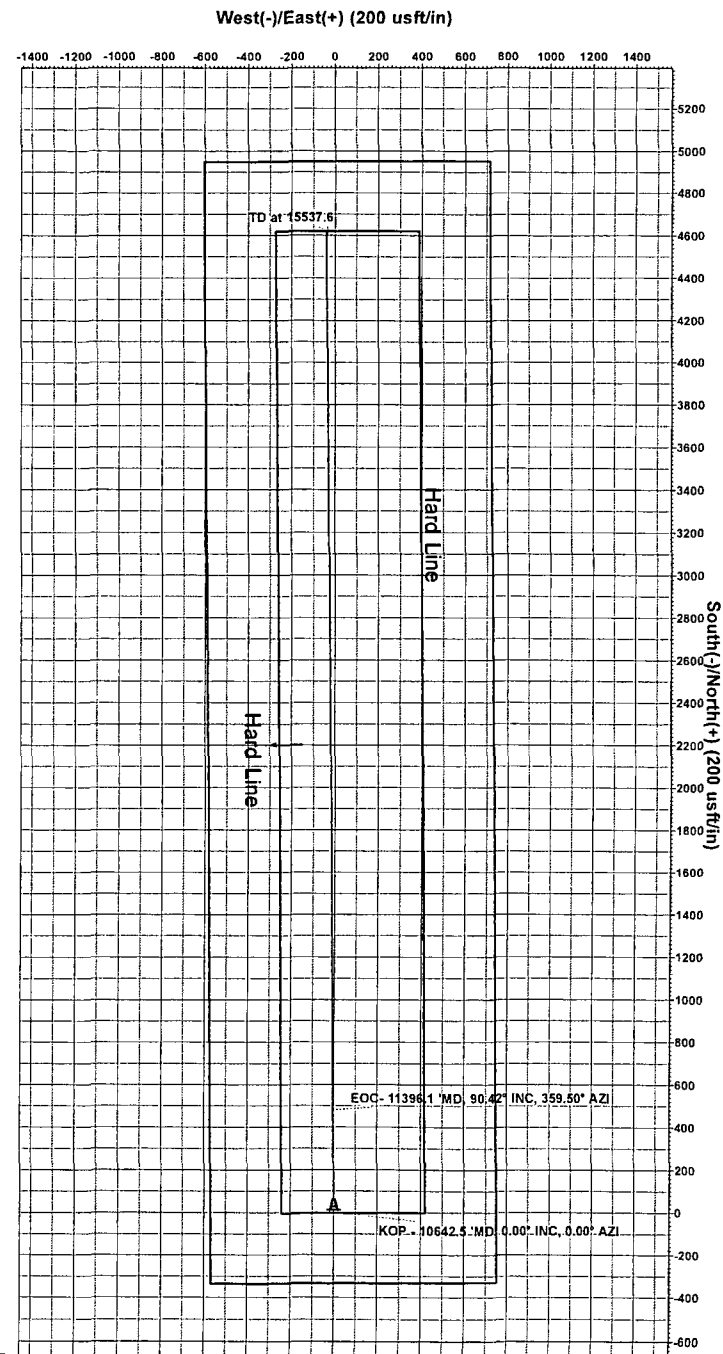


Azimuths to Grid North
True North: -0.40°
Magnetic North: 6.91°

Magnetic Field
Strength: 48413.1snT
Dip Angle: 60.18°
Date: 10/22/2013
Model: IGRF2010



Vertical Section at 359.50° (200 usft/in)



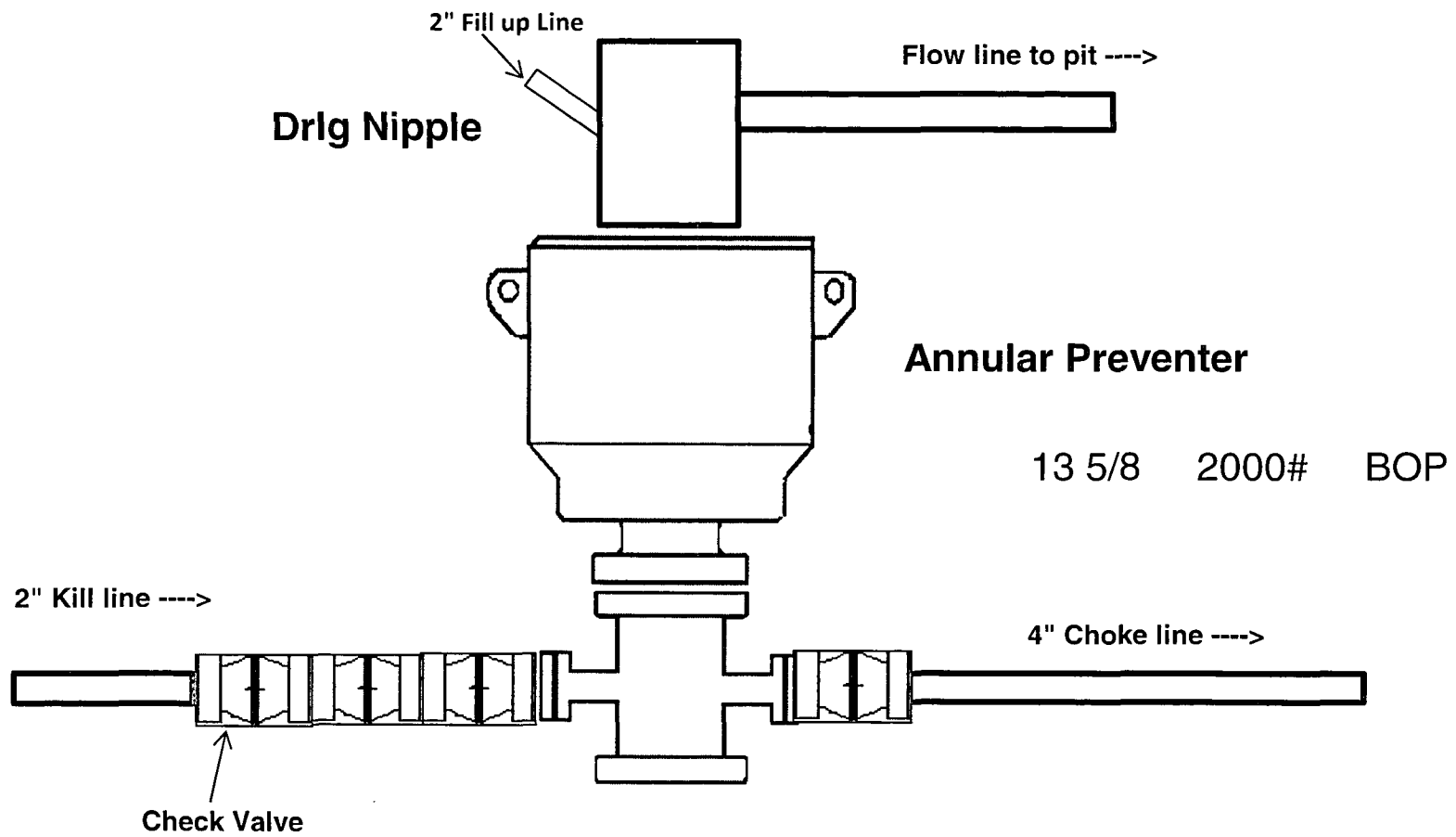
NEXUS
DIRECTIONAL SOLUTIONS, L.P.

Plan: Design #1 (#4H/OH)
Created By: Mshipp Date: 15:19, October 22 2013

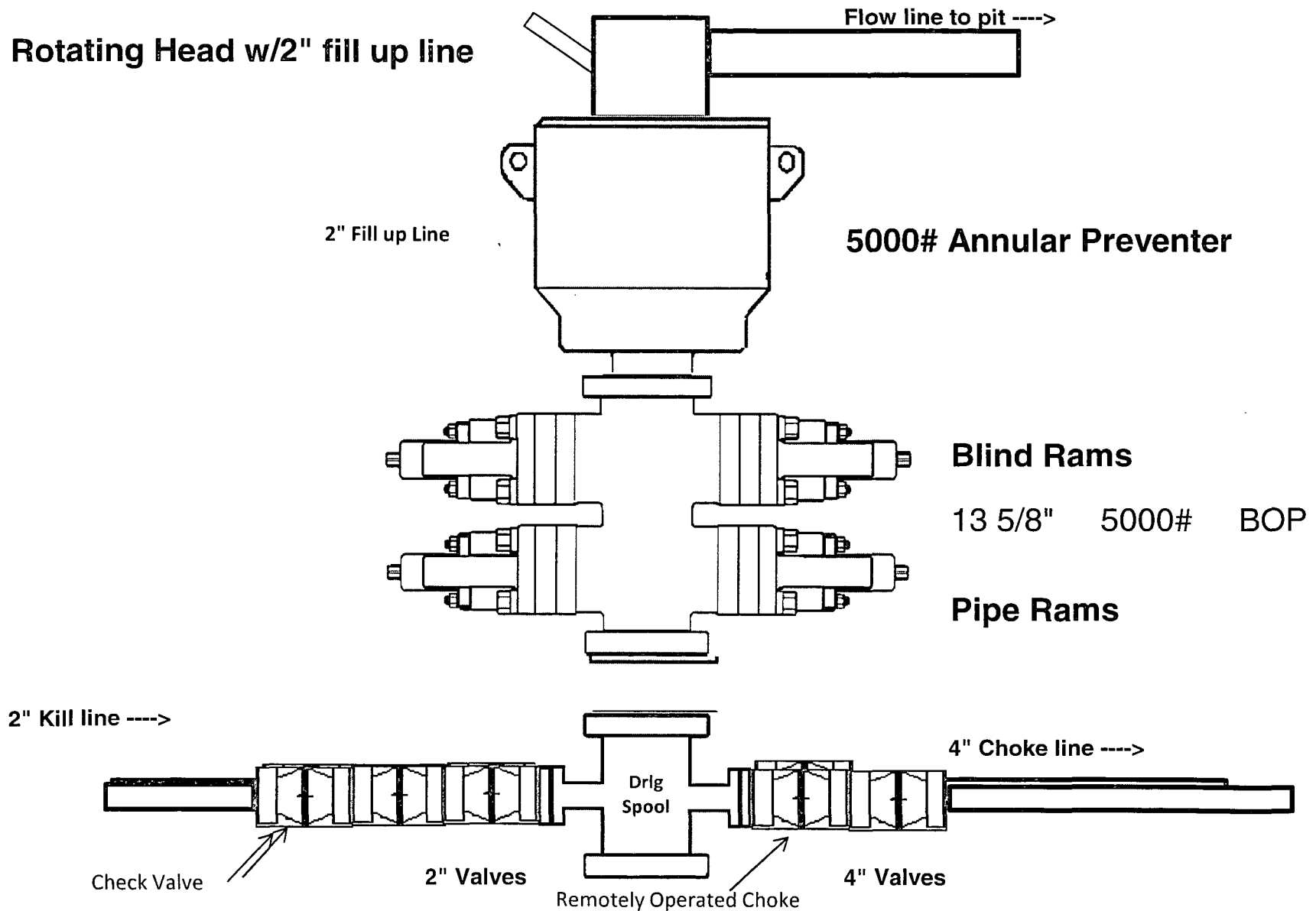
Nexus Directional Solutions

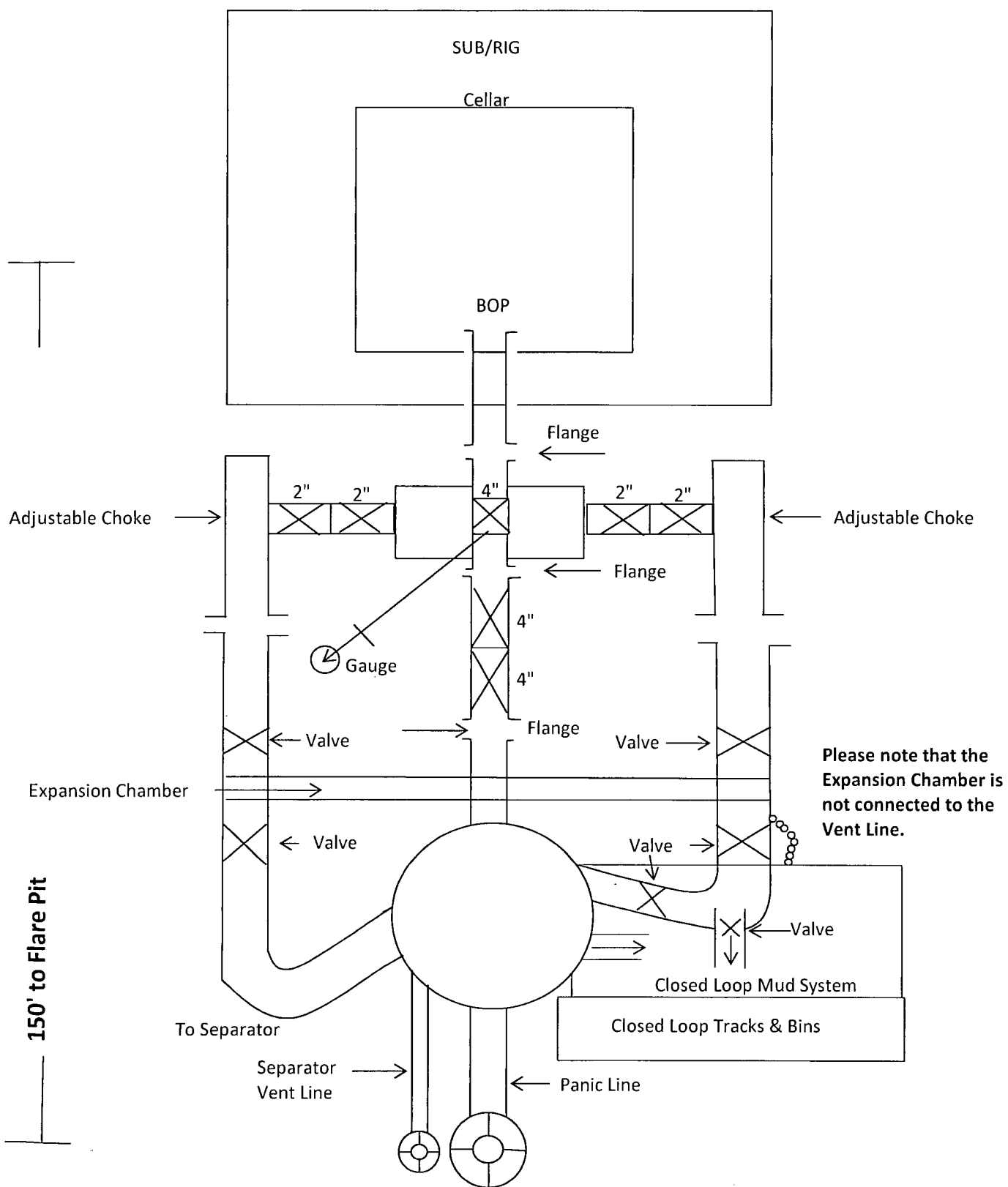
PROJECT DETAILS: Lea County, NM (NAD27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid

2,000 psi BOP Schematic

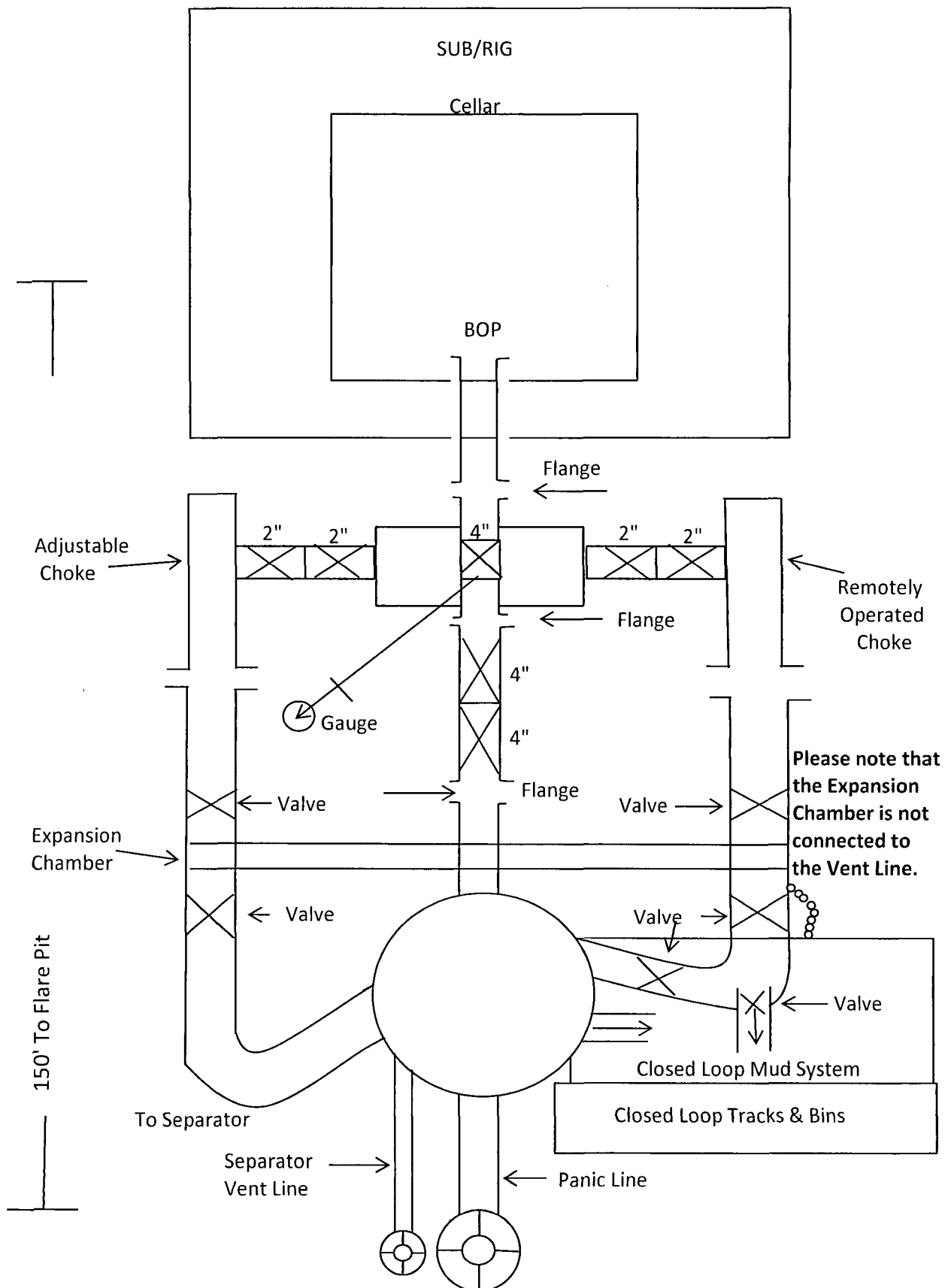


5,000 psi BOP Schematic





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

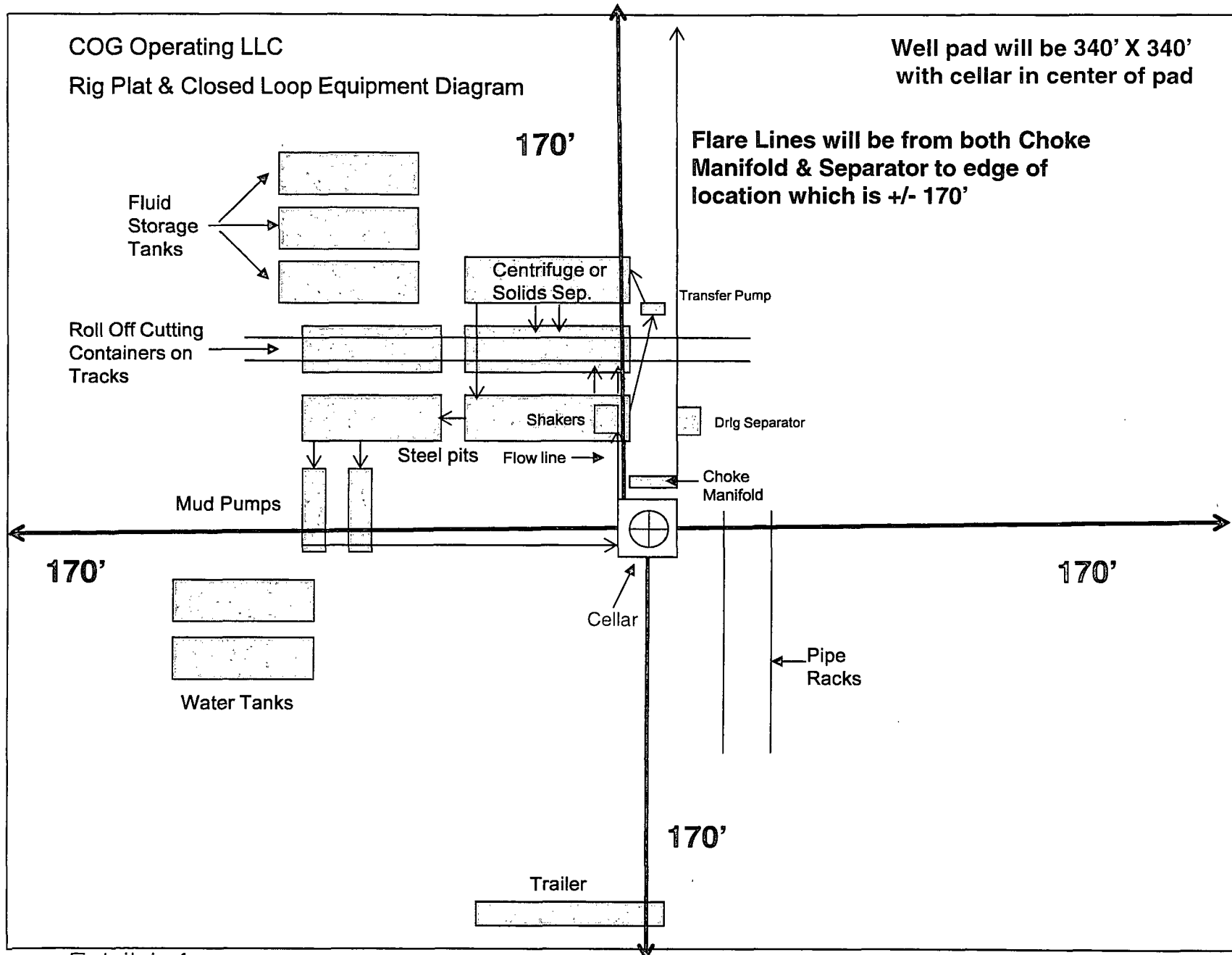


Exhibit 1

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