13-297

Form 3160-3
(August 2007)

HOBBS OCD
RECEIVED
MAY 16 2013

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

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. SHL: NMNM124664
	6. If Indian, Allotee or Tribe Name
	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. <388665> Gunner 8 Federal #6H
2. Name of Operator COG Operating LLC. <229137>	9. API Well No. 30-025-41181
3a. Address 2208 West Main Street Artesia, NM 88210	3b. Phone No. *(include area code)* 575-748-6940
	10. Field and Pool, or Exploratory <97897> Wildcat G-06 S263407P; Bone Spring
4. Location of Well *(Report location clearly and in accordance with any State requirements.*)* At surface 190' FSL & 2625' FWL Unit Letter N (SESW) Sec. 8 - T26S - R34E SHL; At proposed prod. Zone 1650' FNL & 2625' FWL Unit Letter F (SENW) Sec. 5-T26S-R34E BHL	11. Sec., T.R.M. or Blk and Survey or Area Sec. 8 - T26S - R34E
14. Distance in miles and direction from nearest town or post office* About 17 miles from Jal	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 1120; 17. Spacing Unit dedicated to this well 280
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 1135' BHL: 3676'	19. Proposed Depth TVD: 9755' MD: 18329'; 20. BLM/BIA Bond No. on file NMB000740 & NMB00215
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3351'	22. Approximate date work will start* 5/1/2013; 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 1/7/2013
Title Regulatory Analyst		
Approved by *(Signature)* /s/George MacDonell	Name *(Printed/Typed)*	Date MAY 13 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)

Carlsbad Controlled Water Basin

05/17/13

Approval Subject to General Requirements & Special Stipulations Attached

SEE ATTACHED FOR CONDITIONS OF APPROVAL

MAY 20 2013

COG Operating LLC
DRILLING AND OPERATIONS PROGRAM
Gunner 8 Federal 6H
SHL: 190' FSL & 2625' FEL of Section 8
BHL: 1650' FNL & 2625' FEL of Section 5
T26S R34E
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	~ 150'	
Rustler	691'	
Top of Salt	1050'	
Base of Salt	5046'	
Delaware	5297'	Oil
Bone Spring	9543'	Oil
TD TVD	9755'	
TD MD	18,329'	

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 725' 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.

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' - 725' 710'	Surface	13 3/8"	New	54.5#	STC	J-55	1.125	1.125	1.6
12 ¼"	0' – 5200'	Intrmd	9 5/8"	New	40#	BTC	J-55	1.125	1.125	1.6
7 7/8"	0' – 18,329'	Production Curve & Lateral	5 ½"	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: 250 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: 850 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 ½" Production
Lead: 950 sx 50:50:10 H +Salt+Gilsonite+CFR-3+ HR601
(11.8 ppg / 2.5 cuft/sx)
Tail: 1700 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 of 500' into 9-5/8" shoe

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

6. Estimated BHP & BHT:

Lateral TD = 4230 psi
Lateral TD = 148 °F

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

Depth	Type System	Mud Weight	Viscosity (sec)	Waterloss (cc)
0' – 725' 740'	Fresh Water	8.4	29	N.C.
725' – 5200'	Brine	10	29	N.C.
5200' – 18,329' (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.

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 possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 30 days.

CRESCENT DIRECTIONAL DRILLING

COG Operating LLC

Lea County, NM
Gunner 8 Federal
#6H

OH

Plan: Plan #1

Standard Planning Report

05 November, 2012

CONCHO

Database:	Houston R5000 Database	**Local Co-ordinate Reference:**	Well #6H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3381.0usft (Precision #77 - 30' KB)
Project:	Lea County, NM	**MD Reference:**	WELL @ 3381.0usft (Precision #77 - 30' KB)
Site:	Gunner 8 Federal	**North Reference:**	Grid
Well:	#6H	**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	Gunner 8 Federal				
Site Position:		**Northing:**	383,338.69 usft	**Latitude:**	32° 3' 3.935 N
From:	Map	**Easting:**	761,964.80 usft	**Longitude:**	103° 29' 16.135 W
Position Uncertainty:	2.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.45 °

Well	#6H					
Well Position	**+N/-S**	-8.8 usft	**Northing:**	383,329.85 usft	**Latitude:**	32° 3' 3.936 N
	+E/-W	-1,144.2 usft	**Easting:**	760,820.65 usft	**Longitude:**	103° 29' 29.429 W
Position Uncertainty		2.0 usft	**Wellhead Elevation:**		**Ground Level:**	3,351.0 usft

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	11/2/2012	7.37	60.01	48,383

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	359.51	

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	
9,332.5	0.00	0.00	9,332.5	0.0	0.0	0.00	0.00	0.00	0.00	
10,085.7	90.38	355.25	9,810.0	479.0	-39.8	12.00	12.00	0.00	355.25	
10,314.6	90.38	359.83	9,808.5	707.6	-49.6	2.00	0.00	2.00	89.96	
18,329.4	90.38	359.83	9,755.0	8,722.2	-73.9	0.00	0.00	0.00	0.00	PBHL (G#6H)

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Site:	Gunner 8 Federal	**North Reference:**	Grid
Well:	#6H	**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

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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
9,332.5	0.00	0.00	9,332.5	0.0	0.0	0.0	0.00	0.00	0.00
KOP - 9332.5' MD, 9332.5' TVD, 0.00° INC, 0.00° AZI, 0.0' VS									
9,350.0	2.10	355.25	9,350.0	0.3	0.0	0.3	12.00	12.00	0.00
9,375.0	5.10	355.25	9,374.9	1.9	-0.2	1.9	12.00	12.00	0.00
9,400.0	8.10	355.25	9,399.8	4.7	-0.4	4.7	12.00	12.00	0.00
9,425.0	11.10	355.25	9,424.4	8.9	-0.7	8.9	12.00	12.00	0.00
9,450.0	14.10	355.25	9,448.8	14.3	-1.2	14.3	12.00	12.00	0.00
9,475.0	17.10	355.25	9,472.9	21.0	-1.7	21.0	12.00	12.00	0.00
9,500.0	20.10	355.25	9,496.6	29.0	-2.4	29.0	12.00	12.00	0.00
9,525.0	23.10	355.25	9,519.8	38.1	-3.2	38.2	12.00	12.00	0.00
9,550.0	26.10	355.25	9,542.6	48.5	-4.0	48.5	12.00	12.00	0.00
9,575.0	29.10	355.25	9,564.7	60.1	-5.0	60.1	12.00	12.00	0.00
9,600.0	32.10	355.25	9,586.2	72.7	-6.0	72.8	12.00	12.00	0.00

Database:	Houston R5000 Database	**Local Co-ordinate Reference:**	Well #6H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3381.0usft (Precision #77 - 30' KB)
Project:	Lea County, NM	**MD Reference:**	WELL @ 3381.0usft (Precision #77 - 30' KB)
Site:	Gunner 8 Federal	**North Reference:**	Grid
Well:	#6H	**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)
9,625.0	35.10	355.25	9,607.0	86.5	-7.2	86.6	12.00	12.00	0.00
9,650.0	38.10	355.25	9,627.1	101.4	-8.4	101.4	12.00	12.00	0.00
9,675.0	41.10	355.25	9,646.4	117.3	-9.7	117.3	12.00	12.00	0.00
9,700.0	44.10	355.25	9,664.8	134.1	-11.1	134.2	12.00	12.00	0.00
9,725.0	47.10	355.25	9,682.3	151.9	-12.6	152.0	12.00	12.00	0.00
9,750.0	50.10	355.25	9,698.8	170.6	-14.2	170.7	12.00	12.00	0.00
9,775.0	53.09	355.25	9,714.3	190.1	-15.8	190.2	12.00	12.00	0.00
9,800.0	56.09	355.25	9,728.8	210.4	-17.5	210.6	12.00	12.00	0.00
9,825.0	59.09	355.25	9,742.2	231.5	-19.2	231.6	12.00	12.00	0.00
9,850.0	62.09	355.25	9,754.5	253.2	-21.0	253.3	12.00	12.00	0.00
9,875.0	65.09	355.25	9,765.6	275.5	-22.9	275.6	12.00	12.00	0.00
9,900.0	68.09	355.25	9,775.5	298.3	-24.8	298.5	12.00	12.00	0.00
9,925.0	71.09	355.25	9,784.2	321.7	-26.7	321.9	12.00	12.00	0.00
9,950.0	74.09	355.25	9,791.7	345.4	-28.7	345.7	12.00	12.00	0.00
9,975.0	77.09	355.25	9,797.9	369.6	-30.7	369.8	12.00	12.00	0.00
10,000.0	80.09	355.25	9,802.9	394.0	-32.7	394.3	12.00	12.00	0.00
10,025.0	83.09	355.25	9,806.5	418.6	-34.8	418.9	12.00	12.00	0.00
10,050.0	86.09	355.25	9,808.9	443.4	-36.8	443.7	12.00	12.00	0.00
10,075.0	89.09	355.25	9,810.0	468.3	-38.9	468.6	12.00	12.00	0.00
10,085.7	90.38	355.25	9,810.0	479.0	-39.8	479.3	12.00	12.00	0.00
EOC - 10085.7' MD, 9810.0' TVD, 90.38° INC, 355.25° AZI, 479.3' VS									
10,100.0	90.38	355.54	9,809.9	493.2	-40.9	493.6	1.99	0.03	1.99
10,200.0	90.38	357.54	9,809.2	593.1	-47.0	593.4	2.00	0.00	2.00
10,300.0	90.38	359.54	9,808.6	693.0	-49.5	693.4	2.00	0.00	2.00
10,314.6	90.38	359.83	9,808.5	707.6	-49.6	708.0	2.00	0.00	2.00
10,400.0	90.38	359.83	9,807.9	793.0	-49.9	793.4	0.00	0.00	0.00
10,500.0	90.38	359.83	9,807.2	893.0	-50.2	893.4	0.00	0.00	0.00
10,600.0	90.38	359.83	9,806.6	993.0	-50.5	993.4	0.00	0.00	0.00
10,700.0	90.38	359.83	9,805.9	1,093.0	-50.8	1,093.4	0.00	0.00	0.00
10,800.0	90.38	359.83	9,805.2	1,193.0	-51.1	1,193.4	0.00	0.00	0.00
10,900.0	90.38	359.83	9,804.6	1,293.0	-51.4	1,293.4	0.00	0.00	0.00
11,000.0	90.38	359.83	9,803.9	1,393.0	-51.7	1,393.4	0.00	0.00	0.00
11,100.0	90.38	359.83	9,803.2	1,493.0	-52.0	1,493.4	0.00	0.00	0.00
11,200.0	90.38	359.83	9,802.6	1,593.0	-52.3	1,593.4	0.00	0.00	0.00
11,300.0	90.38	359.83	9,801.9	1,693.0	-52.6	1,693.4	0.00	0.00	0.00
11,400.0	90.38	359.83	9,801.2	1,793.0	-52.9	1,793.4	0.00	0.00	0.00
11,500.0	90.38	359.83	9,800.6	1,893.0	-53.2	1,893.4	0.00	0.00	0.00
11,600.0	90.38	359.83	9,799.9	1,993.0	-53.5	1,993.4	0.00	0.00	0.00
11,700.0	90.38	359.83	9,799.2	2,093.0	-53.8	2,093.4	0.00	0.00	0.00
11,800.0	90.38	359.83	9,798.6	2,193.0	-54.1	2,193.4	0.00	0.00	0.00
11,900.0	90.38	359.83	9,797.9	2,293.0	-54.4	2,293.3	0.00	0.00	0.00
12,000.0	90.38	359.83	9,797.2	2,393.0	-54.7	2,393.3	0.00	0.00	0.00
12,100.0	90.38	359.83	9,796.6	2,493.0	-55.0	2,493.3	0.00	0.00	0.00
12,200.0	90.38	359.83	9,795.9	2,593.0	-55.3	2,593.3	0.00	0.00	0.00
12,300.0	90.38	359.83	9,795.2	2,693.0	-55.6	2,693.3	0.00	0.00	0.00
12,400.0	90.38	359.83	9,794.6	2,793.0	-55.9	2,793.3	0.00	0.00	0.00
12,500.0	90.38	359.83	9,793.9	2,893.0	-56.2	2,893.3	0.00	0.00	0.00
12,600.0	90.38	359.83	9,793.2	2,992.9	-56.6	2,993.3	0.00	0.00	0.00
12,700.0	90.38	359.83	9,792.6	3,092.9	-56.9	3,093.3	0.00	0.00	0.00
12,800.0	90.38	359.83	9,791.9	3,192.9	-57.2	3,193.3	0.00	0.00	0.00
12,900.0	90.38	359.83	9,791.2	3,292.9	-57.5	3,293.3	0.00	0.00	0.00
13,000.0	90.38	359.83	9,790.6	3,392.9	-57.8	3,393.3	0.00	0.00	0.00
13,100.0	90.38	359.83	9,789.9	3,492.9	-58.1	3,493.3	0.00	0.00	0.00
13,200.0	90.38	359.83	9,789.2	3,592.9	-58.4	3,593.3	0.00	0.00	0.00

Database:	Houston R5000 Database	**Local Co-ordinate Reference:**	Well #6H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3381.0usft (Precision #77 - 30' KB)
Project:	Lea County, NM	**MD Reference:**	WELL @ 3381.0usft (Precision #77 - 30' KB)
Site:	Gunner 8 Federal	**North Reference:**	Grid
Well:	#6H	**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)
13,300.0	90.38	359.83	9,788.6	3,692.9	-58.7	3,693.3	0.00	0.00	0.00
13,400.0	90.38	359.83	9,787.9	3,792.9	-59.0	3,793.3	0.00	0.00	0.00
13,500.0	90.38	359.83	9,787.2	3,892.9	-59.3	3,893.3	0.00	0.00	0.00
13,600.0	90.38	359.83	9,786.6	3,992.9	-59.6	3,993.3	0.00	0.00	0.00
13,700.0	90.38	359.83	9,785.9	4,092.9	-59.9	4,093.3	0.00	0.00	0.00
13,800.0	90.38	359.83	9,785.2	4,192.9	-60.2	4,193.3	0.00	0.00	0.00
13,900.0	90.38	359.83	9,784.6	4,292.9	-60.5	4,293.3	0.00	0.00	0.00
14,000.0	90.38	359.83	9,783.9	4,392.9	-60.8	4,393.3	0.00	0.00	0.00
14,100.0	90.38	359.83	9,783.2	4,492.9	-61.1	4,493.3	0.00	0.00	0.00
14,200.0	90.38	359.83	9,782.6	4,592.9	-61.4	4,593.3	0.00	0.00	0.00
14,300.0	90.38	359.83	9,781.9	4,692.9	-61.7	4,693.3	0.00	0.00	0.00
14,400.0	90.38	359.83	9,781.2	4,792.9	-62.0	4,793.3	0.00	0.00	0.00
14,500.0	90.38	359.83	9,780.6	4,892.9	-62.3	4,893.3	0.00	0.00	0.00
14,600.0	90.38	359.83	9,779.9	4,992.9	-62.6	4,993.2	0.00	0.00	0.00
14,700.0	90.38	359.83	9,779.2	5,092.9	-62.9	5,093.2	0.00	0.00	0.00
14,800.0	90.38	359.83	9,778.5	5,192.9	-63.2	5,193.2	0.00	0.00	0.00
14,900.0	90.38	359.83	9,777.9	5,292.9	-63.5	5,293.2	0.00	0.00	0.00
15,000.0	90.38	359.83	9,777.2	5,392.9	-63.8	5,393.2	0.00	0.00	0.00
15,100.0	90.38	359.83	9,776.5	5,492.9	-64.1	5,493.2	0.00	0.00	0.00
15,200.0	90.38	359.83	9,775.9	5,592.9	-64.4	5,593.2	0.00	0.00	0.00
15,300.0	90.38	359.83	9,775.2	5,692.9	-64.7	5,693.2	0.00	0.00	0.00
15,400.0	90.38	359.83	9,774.5	5,792.9	-65.0	5,793.2	0.00	0.00	0.00
15,500.0	90.38	359.83	9,773.9	5,892.9	-65.3	5,893.2	0.00	0.00	0.00
15,600.0	90.38	359.83	9,773.2	5,992.9	-65.6	5,993.2	0.00	0.00	0.00
15,700.0	90.38	359.83	9,772.5	6,092.9	-65.9	6,093.2	0.00	0.00	0.00
15,800.0	90.38	359.83	9,771.9	6,192.9	-66.2	6,193.2	0.00	0.00	0.00
15,900.0	90.38	359.83	9,771.2	6,292.9	-66.5	6,293.2	0.00	0.00	0.00
16,000.0	90.38	359.83	9,770.5	6,392.9	-66.8	6,393.2	0.00	0.00	0.00
16,100.0	90.38	359.83	9,769.9	6,492.9	-67.1	6,493.2	0.00	0.00	0.00
16,200.0	90.38	359.83	9,769.2	6,592.9	-67.5	6,593.2	0.00	0.00	0.00
16,300.0	90.38	359.83	9,768.5	6,692.9	-67.8	6,693.2	0.00	0.00	0.00
16,400.0	90.38	359.83	9,767.9	6,792.8	-68.1	6,793.2	0.00	0.00	0.00
16,500.0	90.38	359.83	9,767.2	6,892.8	-68.4	6,893.2	0.00	0.00	0.00
16,600.0	90.38	359.83	9,766.5	6,992.8	-68.7	6,993.2	0.00	0.00	0.00
16,700.0	90.38	359.83	9,765.9	7,092.8	-69.0	7,093.2	0.00	0.00	0.00
16,800.0	90.38	359.83	9,765.2	7,192.8	-69.3	7,193.2	0.00	0.00	0.00
16,900.0	90.38	359.83	9,764.5	7,292.8	-69.6	7,293.2	0.00	0.00	0.00
17,000.0	90.38	359.83	9,763.9	7,392.8	-69.9	7,393.2	0.00	0.00	0.00
17,100.0	90.38	359.83	9,763.2	7,492.8	-70.2	7,493.2	0.00	0.00	0.00
17,200.0	90.38	359.83	9,762.5	7,592.8	-70.5	7,593.2	0.00	0.00	0.00
17,300.0	90.38	359.83	9,761.9	7,692.8	-70.8	7,693.1	0.00	0.00	0.00
17,400.0	90.38	359.83	9,761.2	7,792.8	-71.1	7,793.1	0.00	0.00	0.00
17,500.0	90.38	359.83	9,760.5	7,892.8	-71.4	7,893.1	0.00	0.00	0.00
17,600.0	90.38	359.83	9,759.9	7,992.8	-71.7	7,993.1	0.00	0.00	0.00
17,700.0	90.38	359.83	9,759.2	8,092.8	-72.0	8,093.1	0.00	0.00	0.00
17,800.0	90.38	359.83	9,758.5	8,192.8	-72.3	8,193.1	0.00	0.00	0.00
17,900.0	90.38	359.83	9,757.9	8,292.8	-72.6	8,293.1	0.00	0.00	0.00
18,000.0	90.38	359.83	9,757.2	8,392.8	-72.9	8,393.1	0.00	0.00	0.00
18,100.0	90.38	359.83	9,756.5	8,492.8	-73.2	8,493.1	0.00	0.00	0.00
18,200.0	90.38	359.83	9,755.9	8,592.8	-73.5	8,593.1	0.00	0.00	0.00
18,300.0	90.38	359.83	9,755.2	8,692.8	-73.8	8,693.1	0.00	0.00	0.00
18,329.4	90.38	359.83	9,755.0	8,722.2	-73.9	8,722.5	0.00	0.00	0.00

TD @ 18329.4' MD, 9755.0' TVD

Database:	Houston R5000 Database	**Local Co-ordinate Reference:**	Well #6H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3381.0usft (Precision #77 - 30' KB)
Project:	Lea County, NM	**MD Reference:**	WELL @ 3381.0usft (Precision #77 - 30' KB)
Site:	Gunner 8 Federal	**North Reference:**	Grid
Well:	#6H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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 (G#6H) - plan hits target center - Point	0.00	0.00	9,755.0	8,722.2	-73.9	392,052.05	760,746.75	32° 4' 30.253 N	103° 29' 29.497 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
9,332.5	9,332.5	0.0	0.0	KOP - 9332.5' MD, 9332.5' TVD, 0.00° INC, 0.00° AZI, 0.0' VS
10,085.7	9,810.0	479.0	-39.8	EOC - 10085.7' MD, 9810.0' TVD, 90.38° INC, 355.25° AZI, 479.3' VS
18,329.4	9,755.0	8,722.2	-73.9	TD @ 18329.4' MD, 9755.0' TVD

CONCHO

COG Operating LLC
Project: Lea County, NM
Site: Gunner 8 Federal
Well: #6H
Wellbore: OH
Plan: Plan #1 (#6H/OH)

WELL DETAILS: #6H

Ground Elevation:: 3351.0
RKB Elevation: WELL @ 3381.0usft (Precision #77 - 30' KB)
Rig Name: Precision #77 - 30' KB

Surface Hole Location

Northing	Easting	Latittude	Longitude
383329.85	760820.65	32° 3' 3.936 N	103° 29' 29.429 W

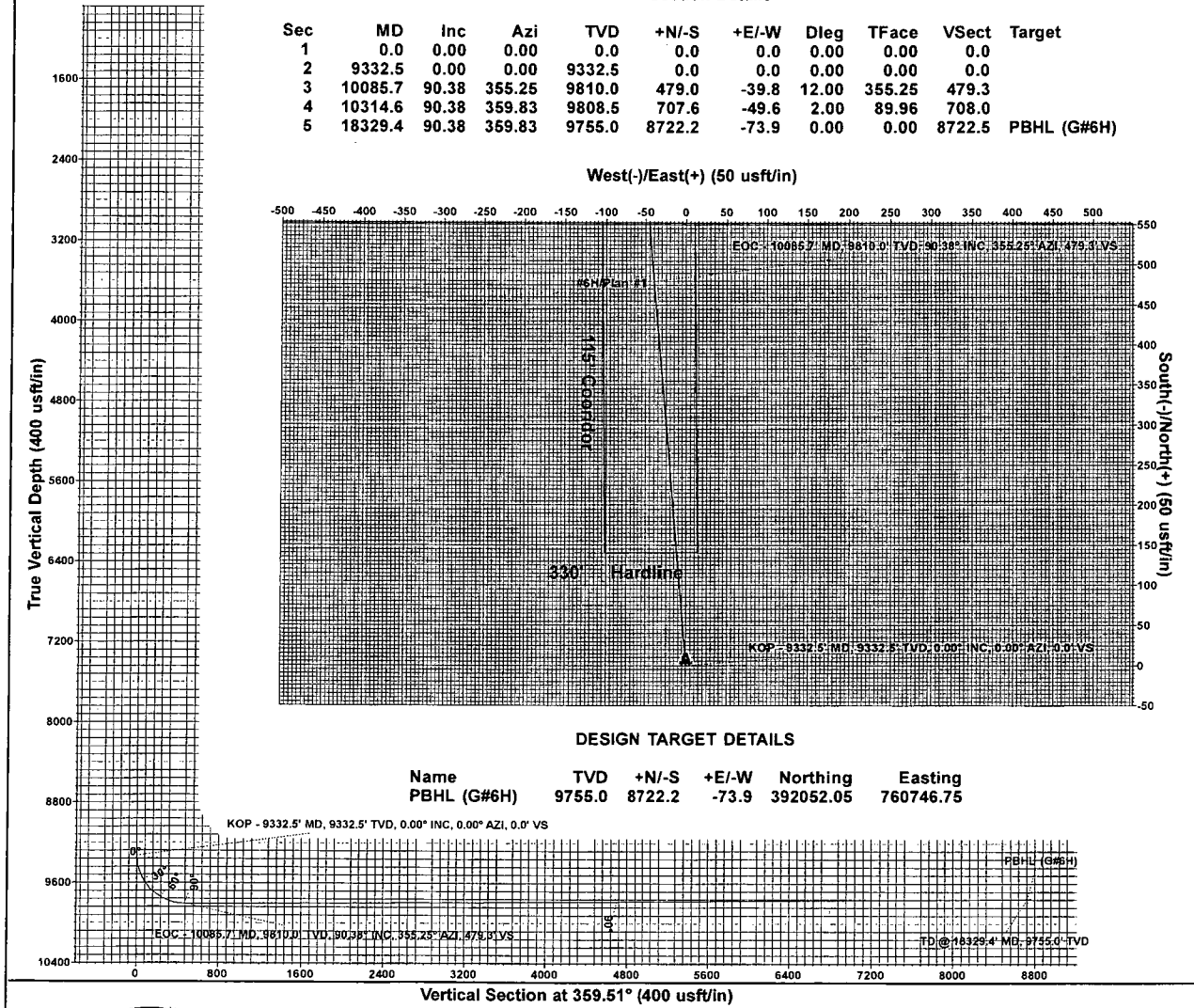
G
T M

Azimuths to Grid North
True North: -0.45°
Magnetic North: 6.92°

Magnetic Field
Strength: 48382.6snT
Dip Angle: 60.01°
Date: 11/2/2012
Model: IGRF2010

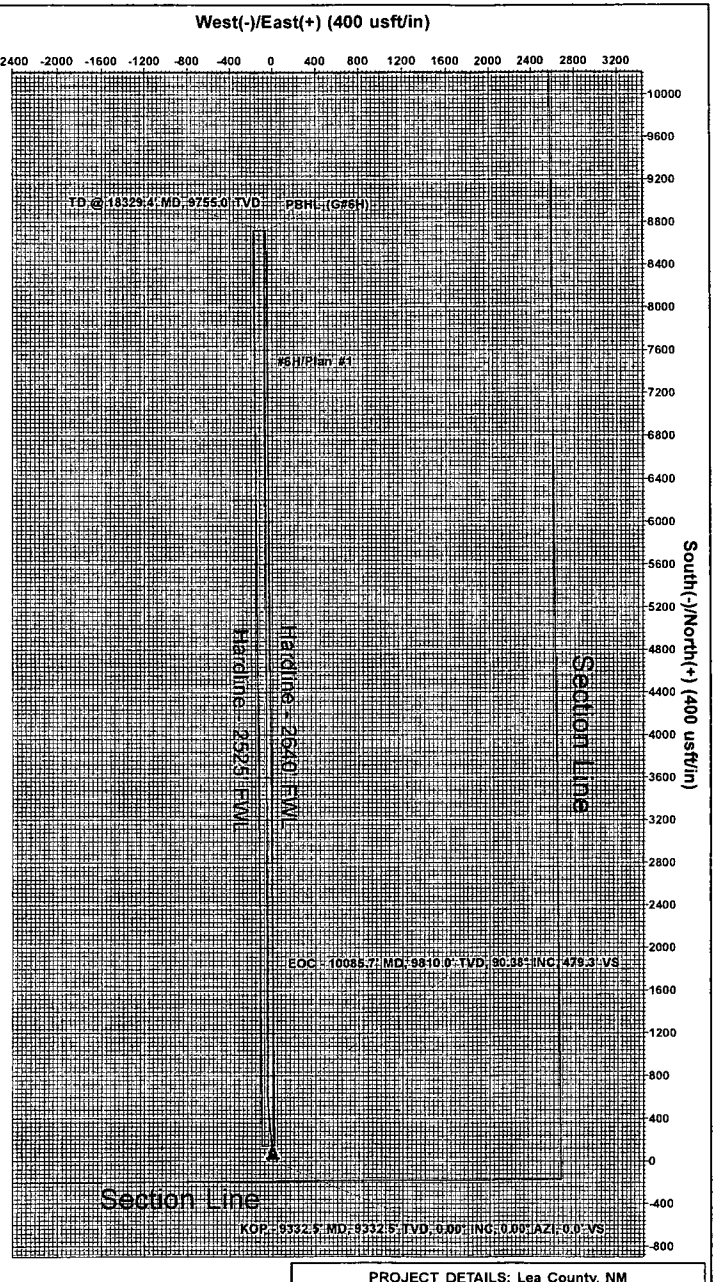
Section Details

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	9332.5	0.00	0.00	9332.5	0.0	0.0	0.00	0.00	0.0	
3	10085.7	90.38	355.25	9810.0	479.0	-39.8	12.00	355.25	479.3	
4	10314.6	90.38	359.83	9808.5	707.6	-49.6	2.00	89.96	708.0	
5	18329.4	90.38	359.83	9755.0	8722.2	-73.9	0.00	0.00	8722.5	PBHL (G#6H)



DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
PBHL (G#6H)	9755.0	8722.2	-73.9	392052.05	760746.75

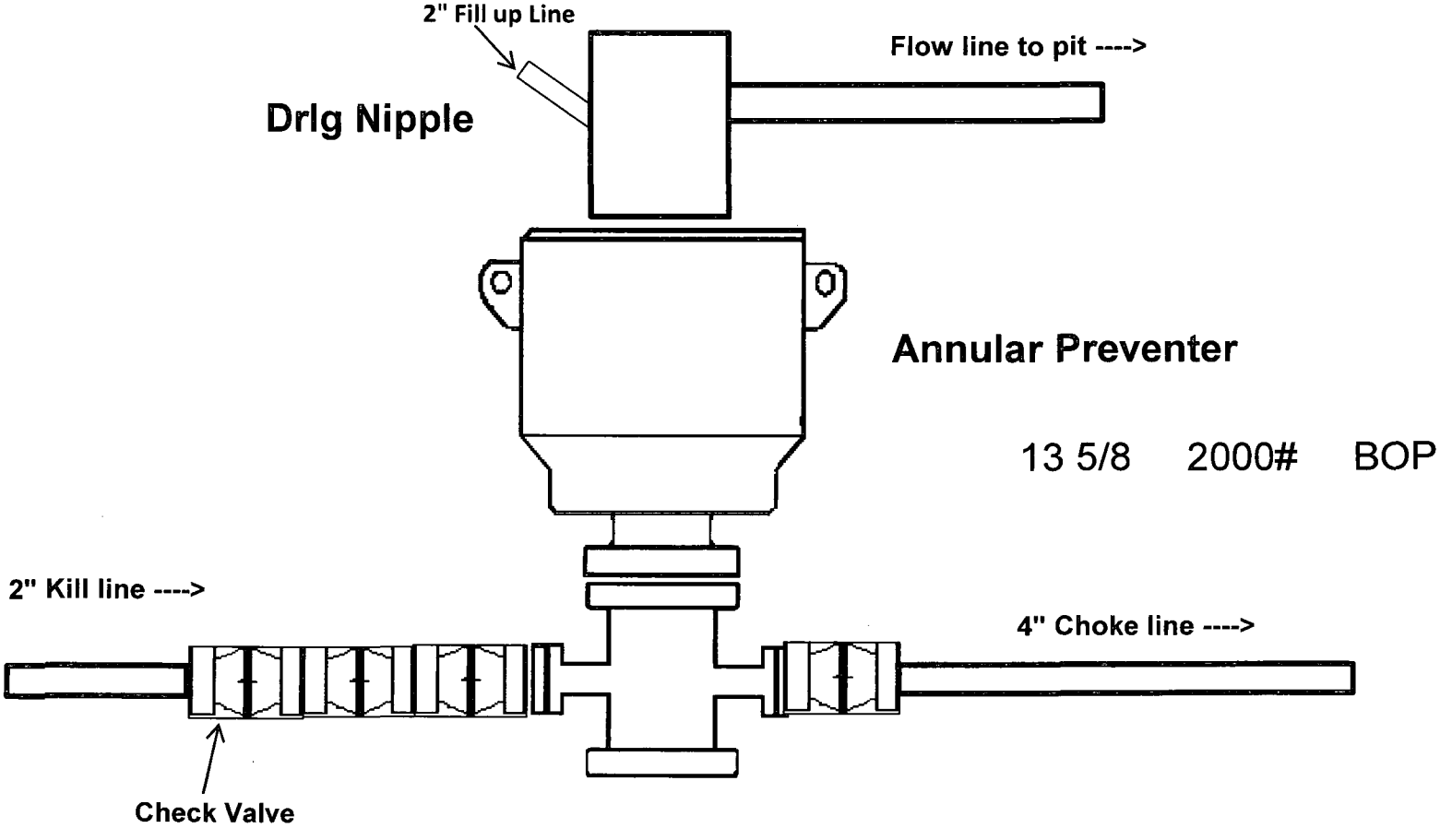


PROJECT DETAILS: Lea County, NM
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid

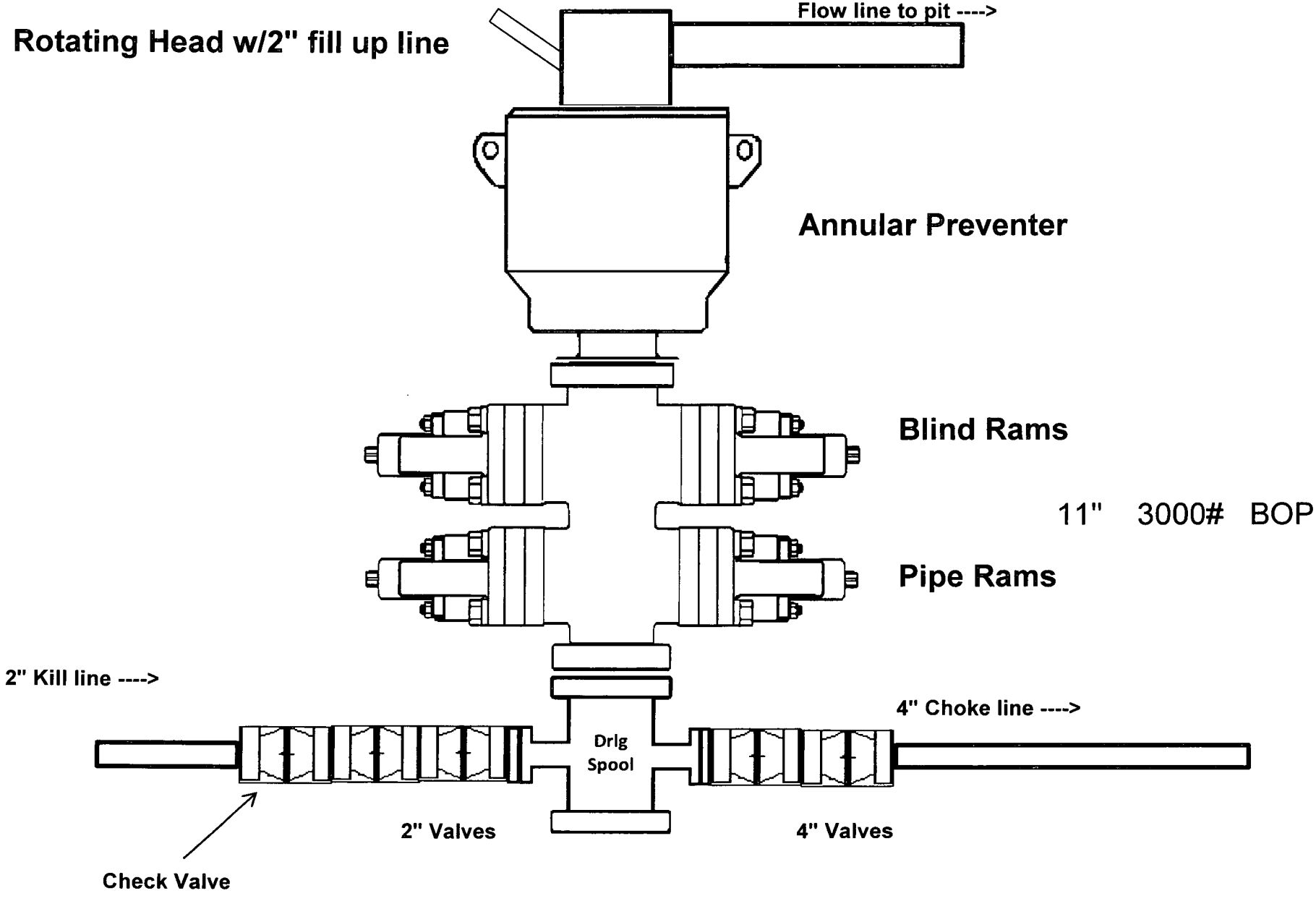
CRESCENT DIRECTIONAL DRILLING
Crescent Directional Drilling
7715 West Industrial Ave. Midland, Tx 79706
Phone: 432-618-1135

Plan: Plan #1 (#6H/OH)
Created By: Matt Higgins Date: 16:33, November 05 2012

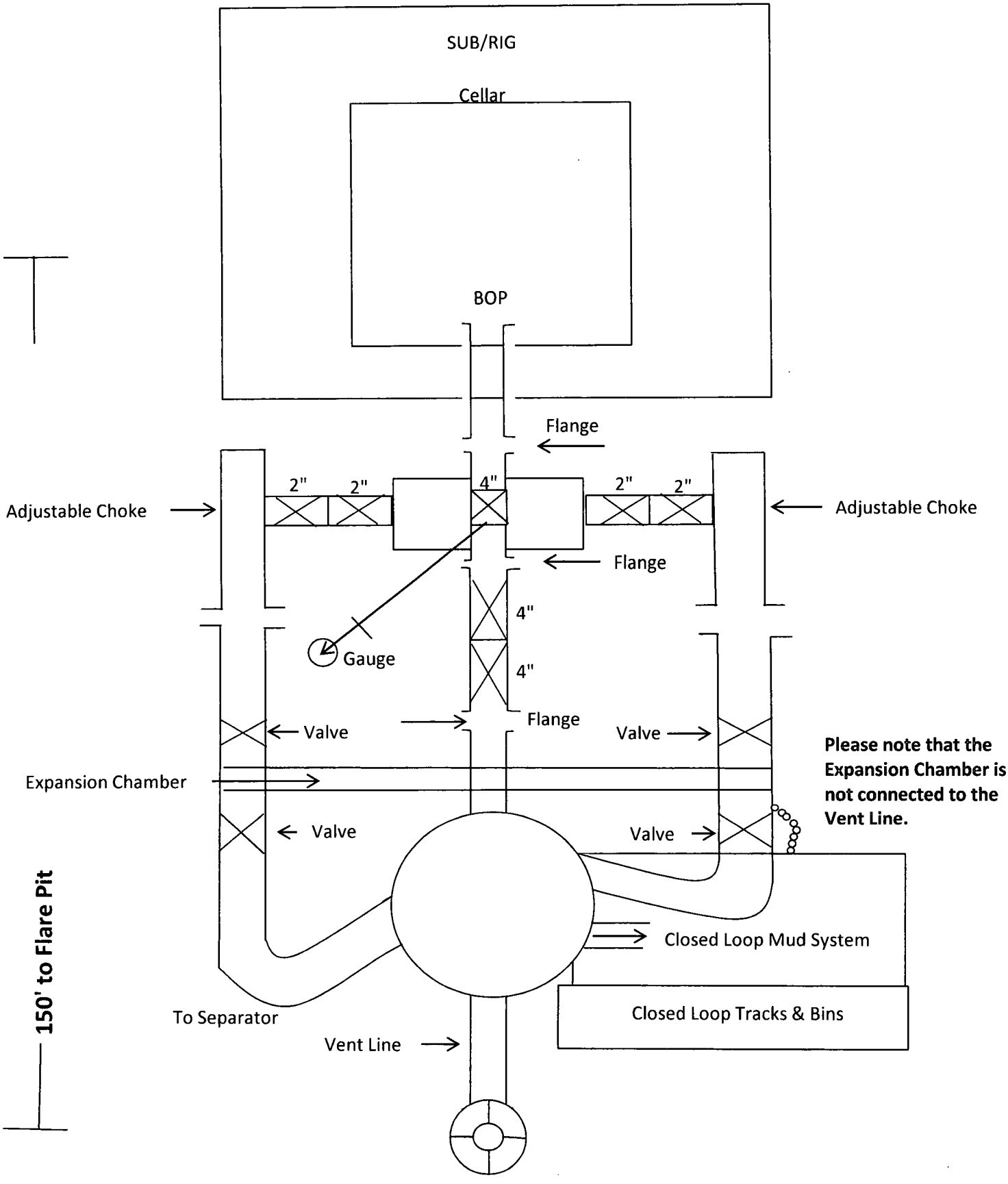
2,000 psi BOP Schematic



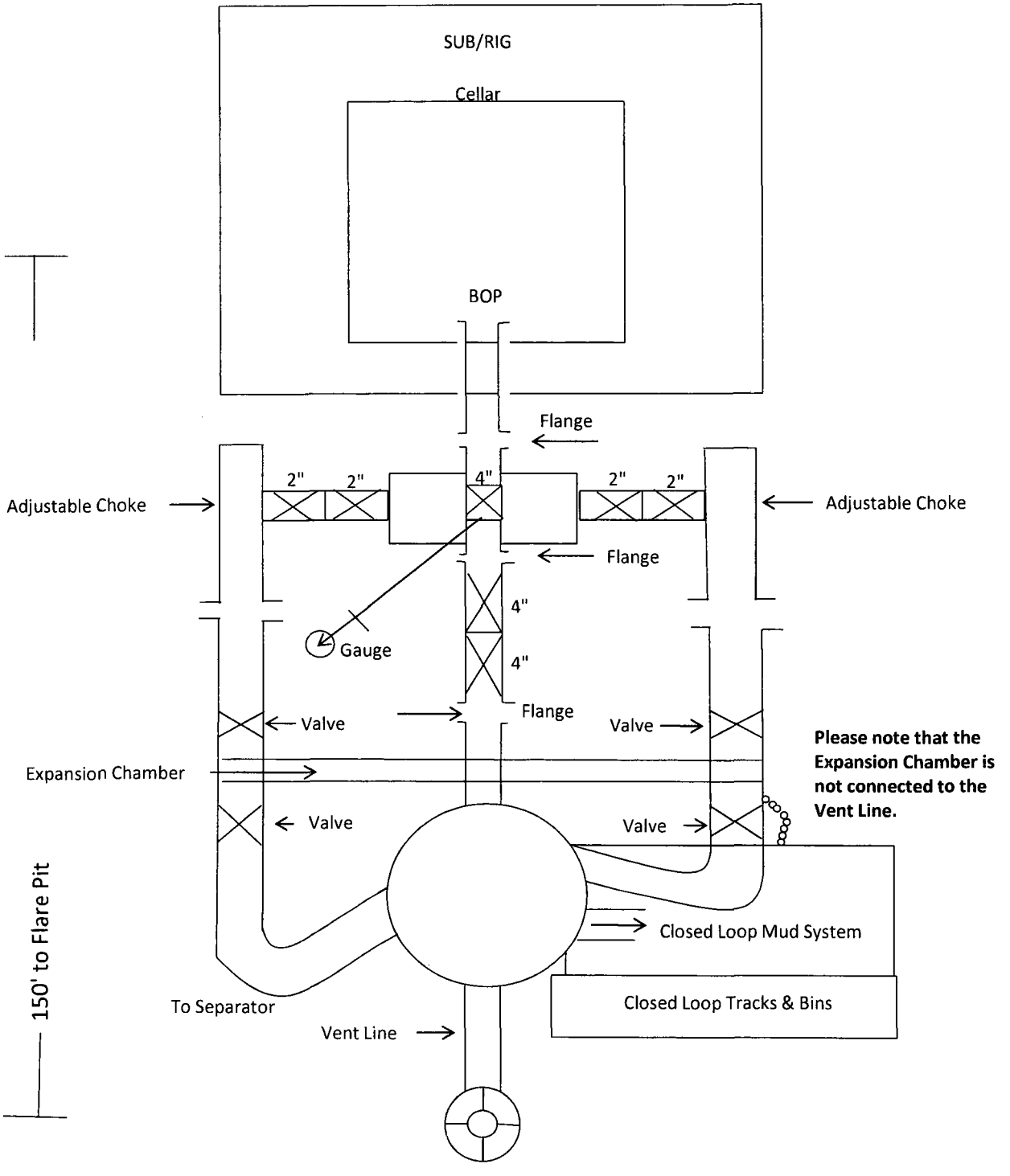
3,000 psi BOP Schematic



2M Choke Manifold Equipment



3M Choke Manifold Equipment



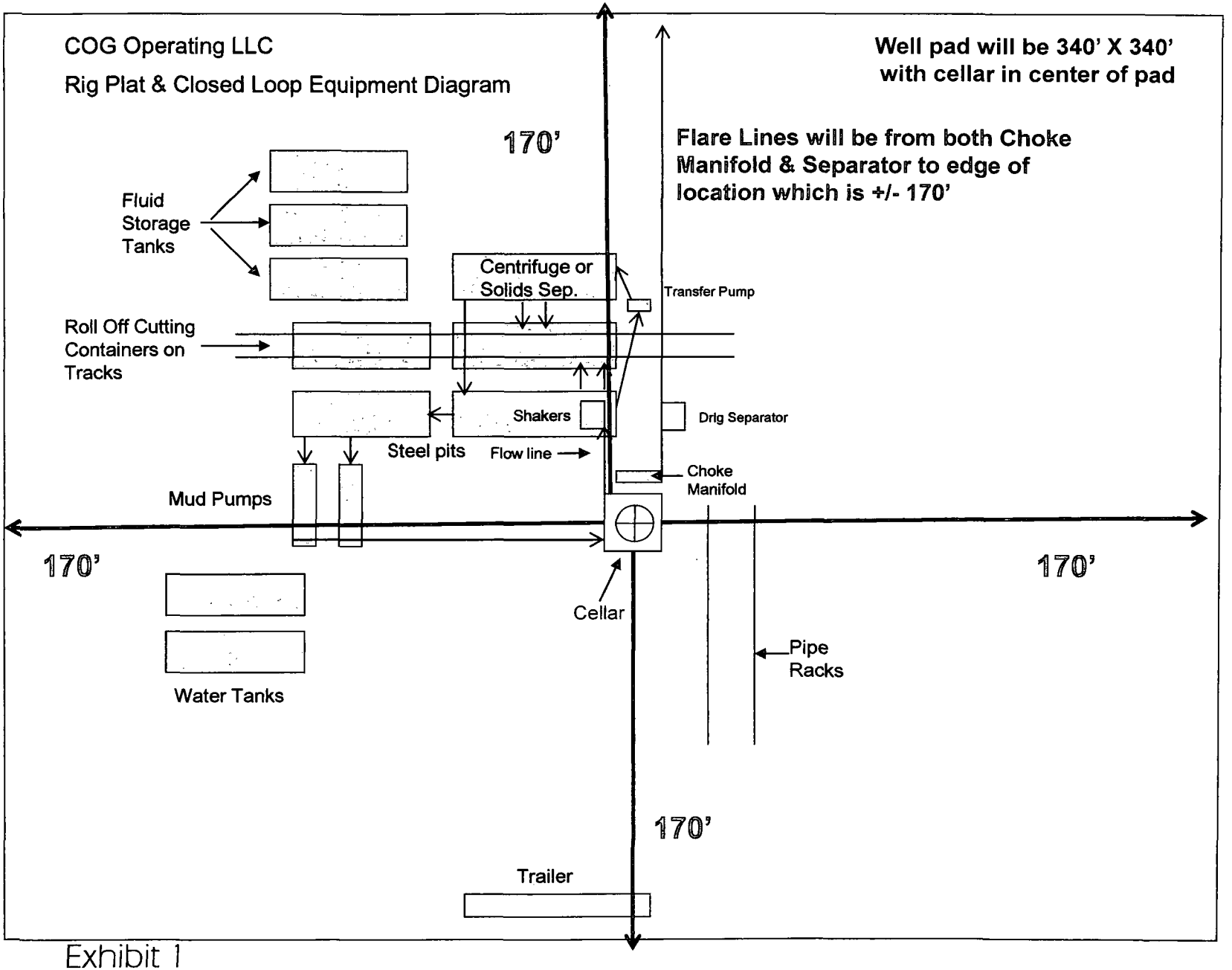

COG Operating LLC
Rig Plat & Closed Loop Equipment Diagram
Well pad will be 340' X 340' with cellar in center of pad
Flare Lines will be from both Choke Manifold & Separator to edge of location which is +/- 170'
170'
Fluid Storage Tanks
Centrifuge or Solids Sep.
Transfer Pump
Roll Off Cutting Containers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

Exhibit 1

Design Plan
Operating and Maintenance Plan
Closure Plan

Gunner 8 Federal 6H
SHL: 190' FSL & 2625' FEL of Section 8
BHL: 1650' FNL & 2625' FEL of Section 5
T26S R34E
Lea County, New Mexico

COG Operating LLC will be using all above ground steel pits for fluid and cuttings while drilling. If any tank develops a leak we will have immediate visual discovery, we would then transfer the fluid to another tank then remove any contaminated soil and dispose of it in the cuttings bins for transportation. All leaks should be kept to less than 5 barrels. Rig crews will monitor the tanks at all times.

Equipment List:
2- Mongoose Shale Shakers
1- 414 Centrifuge
1- 518 Centrifuge
2- Roll Off Bins w/ Tracks
2- 500 BBL Frac Tanks

During drilling operations all liquids, drilling fluids and cuttings will be hauled off via CRI (Controlled Recovery Inc.) Permit R-9166 or any other approved facility.