ATS-13-929

Form 3160-3
(March 2012)

NORTHODOX LOCATION

OCD Hobbs
HOBBS OCD
OCT 06 2014
RECEIVED

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.
SHL: NMNM114982
BHL: NMNM0536344

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. <313765>
Resolver Federal Com #1H

2. Name of Operator
COG Operating LLC. <229137>

9. API Well No.
30-025-42168

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

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

10. Field and Pool, or Exploratory <17644>
Diamondtail; Bone Spring

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface 190' FNL & 380' FWL Unit Letter D (NWNW) SHL Sec 12-T23S-R32E
At proposed prod. Zone 330' FSL & 380' FWL Unit Letter M (SWSW) BHL Sec 12-T23S-R32E

11. Sec., T.R.M. or Blk and Survey or Area
Section 12 - T23S - R32E

14. Distance in miles and direction from nearest town or post office*
Approximately 24 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
SHL: 160
BHL: 600

17. Spacing Unit dedicated to this well
160

18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 1938' BHL: 1003'

19. Proposed Depth
TVD: 11,000' MD: 15,507'
PH: 12,500'

20. BLM/BIA Bond No. on file
NMB000740 &NMB000215

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3737.7' GL

22. Approximate date work will start*
1/1/2014

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: 9/30/2013

Title: Regulatory Analyst

Approved by *(Signature)*: Steve Caffey
Name *(Printed/Typed)*:
Date: OCT 3 - 2014

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 States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

E-PERMITTING - - New Well P.M.
Comp_____ P&A_____ TA_____
CSNG_____ Loc Chng_____
ReComp_____ Add New Well_____
Cancl Well_____ Create Pool_____

(Continued on page 2)

10/08/14

Carlsbad Controlled Water Basin

Approval Subject to General Requirements & Special Stipulations Attached

SEE ATTACHED FOR CONDITIONS OF APPROVAL

OCT 09 2014

COG Operating LLC
DRILLING AND OPERATIONS PROGRAM
Resolver Federal Com #1H
SHL: 190' FNL & 380' FWL
BHL: 330' FSL & 380' FWL
Section 12 T23S 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	400'	
Rustler	1260'	
Top of Salt	1337'	
Base of Salt	4840'	
Delaware	4995'	Oil
Bone Spring	8830'	Oil
Wolfcamp	12,186'	Oil
PH TD	12,500'	
TD TVD	11,000'	
TD MD	15,507'	

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 1350' ~~1285'~~ 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 the 9-5/8" casing.

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 ½"	0' – ~~1285'~~ 1350'	Surface	13 3/8"	New	54.5#	STC	J-55	1.125	1.125	1.6
12 ¼"	0' – 4500'	Intrmd	9 5/8"	New	40#	LTC	J-55	1.125	1.125	1.6
12 ¼"	4500' – 4950'	Intrmd	9 5/8"	New	40#	LTC	N-80	1.125	1.125	1.6
7 7/8"	4950' – 12,500'	Pilot Hole								
7 7/8"	0' – 15,507'	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: 600 sx Class C + 4% Gel + 2% $CaCl_2$
(13.5 ppg / 1.75 cuft/sx / 9.2 gal/sx)
Tail: 250 sx Class C + 2% $CaCl_2$
(14.8 ppg / 1.34 cuft/sx / 6.3 gal/sx)
**Calculated w/50% excess on OH volumes

b. 9 5/8" Intermediate:

See COA

Lead: 850 sx 35:65:6 C Blend
(12.7 ppg /1.89 cuft/sx / 10.6 gal/sx)
Tail: 250 sx Class C
(14.8 ppg / 1.34 cuft/sx / 6.3 gal/sx)
**Calculated w/35% excess on OH volumes

c. 5 ½" Production

1st Stage:
Lead: 425 sx 35:65:6 H + Salt+KolSeal+CFR-3+ HR601
(12.7 ppg / 1.89 cuft/sx / 10.5 gal/sx)
Tail: 950 sx 50:50:2 H +Salt+GasStop +HR601 +CFR-3
(14.4 ppg /1.25 cuft/sx / 5.66 gal/sx)

See COA

2nd Stage: DVT set @ 7220'

Lead: 225 sx 50:50:10 Interfill C Blend
(11.9 ppg / 2.51 cuft/sx / 14.11 gal/sx)
Tail: 100 sx Class C Neat
(14.8 ppg / 1.34 cuft/sx / 6.3 gal/sx)
**Calculated w/35% excess on OH volumes

- The above cement volumes could be revised pending the caliper measurement.
- The 9-5/8" intermediate string is designed to circulate cement to surface.
- The production string will tie back a minimum of 500' into the 9-5/8" casing.
- The pilot hole will be plugged back with the below plugs:
  1. Plug #1
     - 600' PHTD Plug: 11,900' – PHTD w/ 250 sx Class H [15.6 ppg / 1.18 ft^3/ft / 5.2 gal/sx]

See COA

  2. Plug #2
     - 500' KO Plug: 10,300' – 10,800' w/ 250 sx Class H [17.2 ppg / 0.98 ft^3/ft / 3.74 gal/sx]

5. Pressure Control:

See COA

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. While drilling the intermediate section, if a reading of H_2S is greater than 100 ppm then we will shut-in and rig up a remote operated choke.

6. **Estimated BHP & BHT:**
   PHTD = 5980 psi
   PHTD = 177°F
   Lateral TD = 5262 psi
   Lateral TD= 164°F

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

See COA

Depth 1350'	Type System	Mud Weight	Viscosity (sec)	Waterloss (cc)
0' – 1285'	Fresh Water	8.4	29	N.C.
1285' – 4950'	Brine	10	29	N.C.
4950' – 12,500'	Cut Brine	9.2 – 9.6	29	N.C.
4950' – 15,507' (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 total, stroke counter and flow sensor at flow line.
- If weight and/or viscosity are introduced to the mud system a daily mud check will be performed by mud contractor, along with tourly check by rig personnel.
- After setting intermediate casing, a third party gas unit detection system will be installed at the flow line.

8. **Auxiliary Well Control and Monitoring Equipment:**
   a. 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.

See COA

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.

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 30th day of September, 2013.

Signed: Melanie Parker

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

CONCHO

COG Operating LLC

Lea County, NM (NAD27 NME)
Resolver Fed Com
1H

OH

Plan: Design #1

Standard Planning Report

16 September, 2013

NEXUS
DIRECTIONAL SOLUTIONS, L.P.

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 1H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3755.7usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	**MD Reference:**	WELL @ 3755.7usft (Original Well Elev)
Site:	Resolver Fed Com	**North Reference:**	Grid
Well:	1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
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 Resolver Fed Com

Site Position:		**Northing:**	0.00 usft	**Latitude:**	30° 59' 24.512 N
From:	Map	**Easting:**	0.00 usft	**Longitude:**	105° 55' 44.137 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	-0.82 °

Well 1H

Well Position	**+N/-S**	482,973.1 usft	**Northing:**	482,973.10 usft	**Latitude:**	32° 19' 33.160 N
	+E/-W	715,652.4 usft	**Easting:**	715,652.40 usft	**Longitude:**	103° 38' 6.704 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	3,737.7 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	09/16/13	7.35	60.21	48,443

Design Design #1

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	179.62

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	
10,473.2	0.00	0.00	10,473.2	0.0	0.0	0.00	0.00	0.00	0.00	
11,217.7	89.34	179.62	10,950.6	-472.0	3.1	12.00	12.00	0.00	179.62	
15,507.0	89.34	179.62	11,000.0	-4,760.9	31.3	0.00	0.00	0.00	0.00	PBHL Resolver #1H

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Site:	Resolver Fed Com	**North Reference:**	Grid
Well:	1H	**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

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 1H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3755.7usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	**MD Reference:**	WELL @ 3755.7usft (Original Well Elev)
Site:	Resolver Fed Com	**North Reference:**	Grid
Well:	1H	**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
10,473.2	0.00	0.00	10,473.2	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 12.00									

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 1H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3755.7usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	**MD Reference:**	WELL @ 3755.7usft (Original Well Elev)
Site:	Resolver Fed Com	**North Reference:**	Grid
Well:	1H	**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)
10,500.0	3.22	179.62	10,500.0	-0.8	0.0	0.8	12.00	12.00	0.00
10,600.0	15.22	179.62	10,598.5	-16.7	0.1	16.7	12.00	12.00	0.00
10,700.0	27.22	179.62	10,691.6	-52.9	0.3	52.9	12.00	12.00	0.00
10,800.0	39.22	179.62	10,775.1	-107.6	0.7	107.6	12.00	12.00	0.00
10,900.0	51.22	179.62	10,845.4	-178.4	1.2	178.4	12.00	12.00	0.00
11,000.0	63.22	179.62	10,899.4	-262.3	1.7	262.3	12.00	12.00	0.00
11,100.0	75.22	179.62	10,934.8	-355.7	2.3	355.7	12.00	12.00	0.00
11,200.0	87.22	179.62	10,950.1	-454.3	3.0	454.3	12.00	12.00	0.00
11,217.7	89.34	179.62	10,950.6	-472.0	3.1	472.0	12.00	12.00	0.00
Start 4289.3 hold at 11217.7 MD									
11,300.0	89.34	179.62	10,951.5	-554.3	3.6	554.3	0.00	0.00	0.00
11,400.0	89.34	179.62	10,952.7	-654.3	4.3	654.3	0.00	0.00	0.00
11,500.0	89.34	179.62	10,953.8	-754.3	5.0	754.3	0.00	0.00	0.00
11,600.0	89.34	179.62	10,955.0	-854.3	5.6	854.3	0.00	0.00	0.00
11,700.0	89.34	179.62	10,956.1	-954.3	6.3	954.3	0.00	0.00	0.00
11,800.0	89.34	179.62	10,957.3	-1,054.2	6.9	1,054.3	0.00	0.00	0.00
11,900.0	89.34	179.62	10,958.5	-1,154.2	7.6	1,154.3	0.00	0.00	0.00
12,000.0	89.34	179.62	10,959.6	-1,254.2	8.2	1,254.3	0.00	0.00	0.00
12,100.0	89.34	179.62	10,960.8	-1,354.2	8.9	1,354.2	0.00	0.00	0.00
12,200.0	89.34	179.62	10,961.9	-1,454.2	9.6	1,454.2	0.00	0.00	0.00
12,300.0	89.34	179.62	10,963.1	-1,554.2	10.2	1,554.2	0.00	0.00	0.00
12,400.0	89.34	179.62	10,964.2	-1,654.2	10.9	1,654.2	0.00	0.00	0.00
12,500.0	89.34	179.62	10,965.4	-1,754.2	11.5	1,754.2	0.00	0.00	0.00
12,600.0	89.34	179.62	10,966.5	-1,854.2	12.2	1,854.2	0.00	0.00	0.00
12,700.0	89.34	179.62	10,967.7	-1,954.2	12.8	1,954.2	0.00	0.00	0.00
12,800.0	89.34	179.62	10,968.8	-2,054.2	13.5	2,054.2	0.00	0.00	0.00
12,900.0	89.34	179.62	10,970.0	-2,154.1	14.2	2,154.2	0.00	0.00	0.00
13,000.0	89.34	179.62	10,971.1	-2,254.1	14.8	2,254.2	0.00	0.00	0.00
13,100.0	89.34	179.62	10,972.3	-2,354.1	15.5	2,354.2	0.00	0.00	0.00
13,200.0	89.34	179.62	10,973.4	-2,454.1	16.1	2,454.2	0.00	0.00	0.00
13,300.0	89.34	179.62	10,974.6	-2,554.1	16.8	2,554.2	0.00	0.00	0.00
13,400.0	89.34	179.62	10,975.7	-2,654.1	17.4	2,654.2	0.00	0.00	0.00
13,500.0	89.34	179.62	10,976.9	-2,754.1	18.1	2,754.2	0.00	0.00	0.00
13,600.0	89.34	179.62	10,978.0	-2,854.1	18.8	2,854.1	0.00	0.00	0.00
13,700.0	89.34	179.62	10,979.2	-2,954.1	19.4	2,954.1	0.00	0.00	0.00
13,800.0	89.34	179.62	10,980.3	-3,054.1	20.1	3,054.1	0.00	0.00	0.00
13,900.0	89.34	179.62	10,981.5	-3,154.1	20.7	3,154.1	0.00	0.00	0.00
14,000.0	89.34	179.62	10,982.6	-3,254.1	21.4	3,254.1	0.00	0.00	0.00
14,100.0	89.34	179.62	10,983.8	-3,354.0	22.1	3,354.1	0.00	0.00	0.00
14,200.0	89.34	179.62	10,984.9	-3,454.0	22.7	3,454.1	0.00	0.00	0.00
14,300.0	89.34	179.62	10,986.1	-3,554.0	23.4	3,554.1	0.00	0.00	0.00
14,400.0	89.34	179.62	10,987.2	-3,654.0	24.0	3,654.1	0.00	0.00	0.00
14,500.0	89.34	179.62	10,988.4	-3,754.0	24.7	3,754.1	0.00	0.00	0.00
14,600.0	89.34	179.62	10,989.6	-3,854.0	25.3	3,854.1	0.00	0.00	0.00
14,700.0	89.34	179.62	10,990.7	-3,954.0	26.0	3,954.1	0.00	0.00	0.00
14,800.0	89.34	179.62	10,991.9	-4,054.0	26.7	4,054.1	0.00	0.00	0.00
14,900.0	89.34	179.62	10,993.0	-4,154.0	27.3	4,154.1	0.00	0.00	0.00
15,000.0	89.34	179.62	10,994.2	-4,254.0	28.0	4,254.1	0.00	0.00	0.00
15,100.0	89.34	179.62	10,995.3	-4,354.0	28.6	4,354.0	0.00	0.00	0.00
15,200.0	89.34	179.62	10,996.5	-4,453.9	29.3	4,454.0	0.00	0.00	0.00
15,300.0	89.34	179.62	10,997.6	-4,553.9	29.9	4,554.0	0.00	0.00	0.00
15,400.0	89.34	179.62	10,998.8	-4,653.9	30.6	4,654.0	0.00	0.00	0.00
15,500.0	89.34	179.62	10,999.9	-4,753.9	31.3	4,754.0	0.00	0.00	0.00
15,507.0	89.34	179.62	11,000.0	-4,760.9	31.3	4,761.0	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 1H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3755.7usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	**MD Reference:**	WELL @ 3755.7usft (Original Well Elev)
Site:	Resolver Fed Com	**North Reference:**	Grid
Well:	1H	**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)
TD at 15507.0									

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 Resolver #1H - plan hits target center - Point	0.00	0.00	11,000.0	-4,760.9	31.3	478,212.20	715,683.70	32° 18' 46.046 N	103° 38' 6.701 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,473.2	10,473.2	0.0	0.0	Start Build 12.00
11,217.7	10,950.6	-472.0	3.1	Start 4289.3 hold at 11217.7 MD
15,507.0	11,000.0	-4,760.9	31.3	TD at 15507.0

CONCHO

NEXUS DIRECTIONAL SOLUTIONS, L.P.

Resolver Fed Com 1H
Lea County, NM (NAD27 NME)
Northing: (Y) 482973.10
Easting: (X) 715652.40
Design #1

Azimuths to Grid North
True North: -0.37°
Magnetic North: 6.97°

Magnetic Field
Strength: 48442.9snT
Dip Angle: 60.21°
Date: 09/16/2013
Model: IGRF2010

To convert a Magnetic Direction to a Grid Direction, Add 6.97°
To convert a True Direction to a Grid Direction, Subtract 0.37°

WELL DETAILS:

WELL @ 3755.7usft (Original Well Elev)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	482973.10	715652.40	32° 19' 33.160 N	103° 38' 6.704 W

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
10473.2	0.00	0.00	10473.2	0.0	0.0	0.00	0.00	0.0	
11217.7	89.34	179.62	10950.6	-472.0	3.1	12.00	179.62	472.0	
15507.0	89.34	179.62	11000.0	-4760.9	31.3	0.00	0.00	4761.0	PBHL Resolver #1H

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
PBHL Resolver #1H	11000.0	-4760.9	31.3	478212.20	715683.70

LEGEND

○ Design #1

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

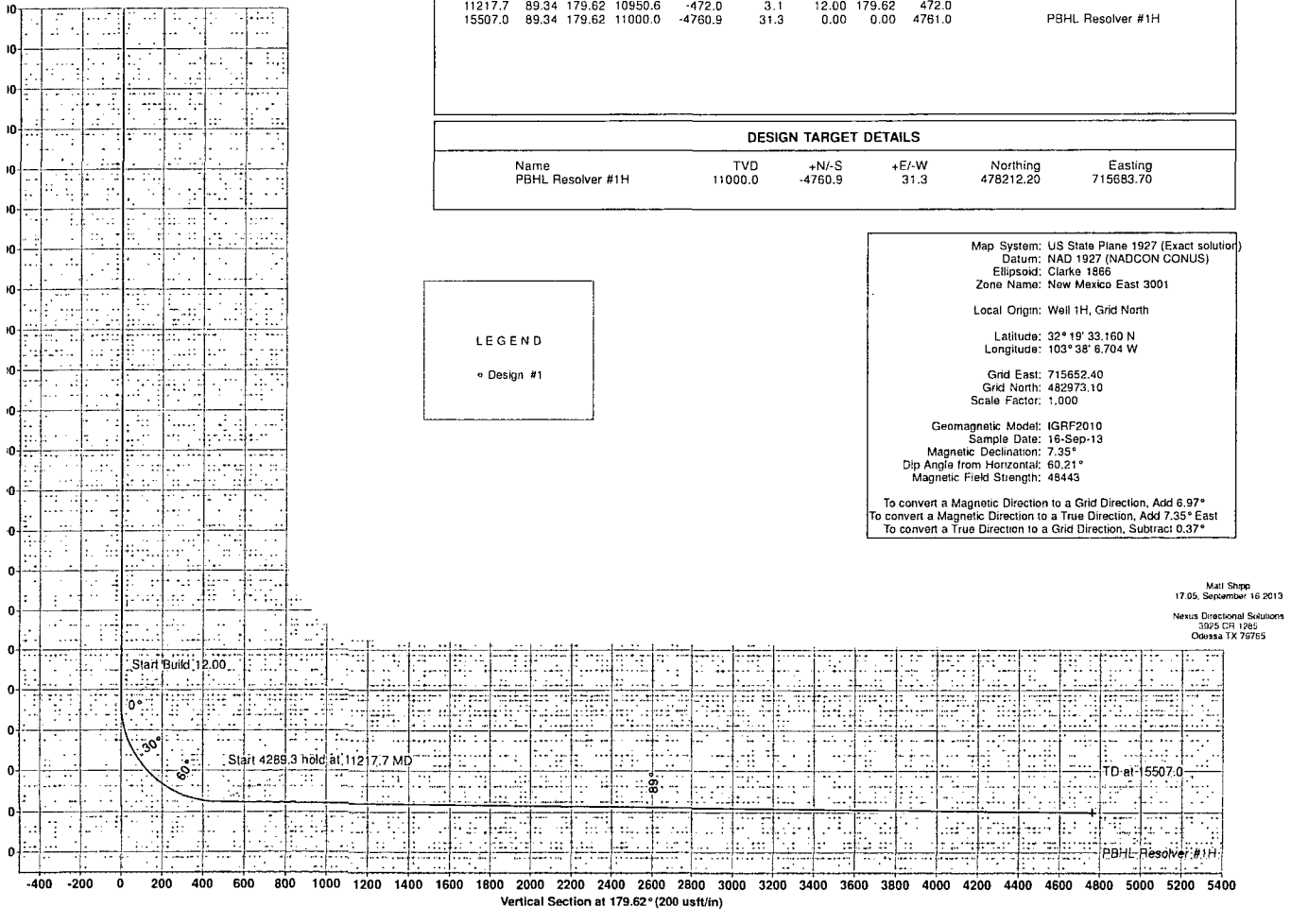
Local Origin: Well 1H, Grid North

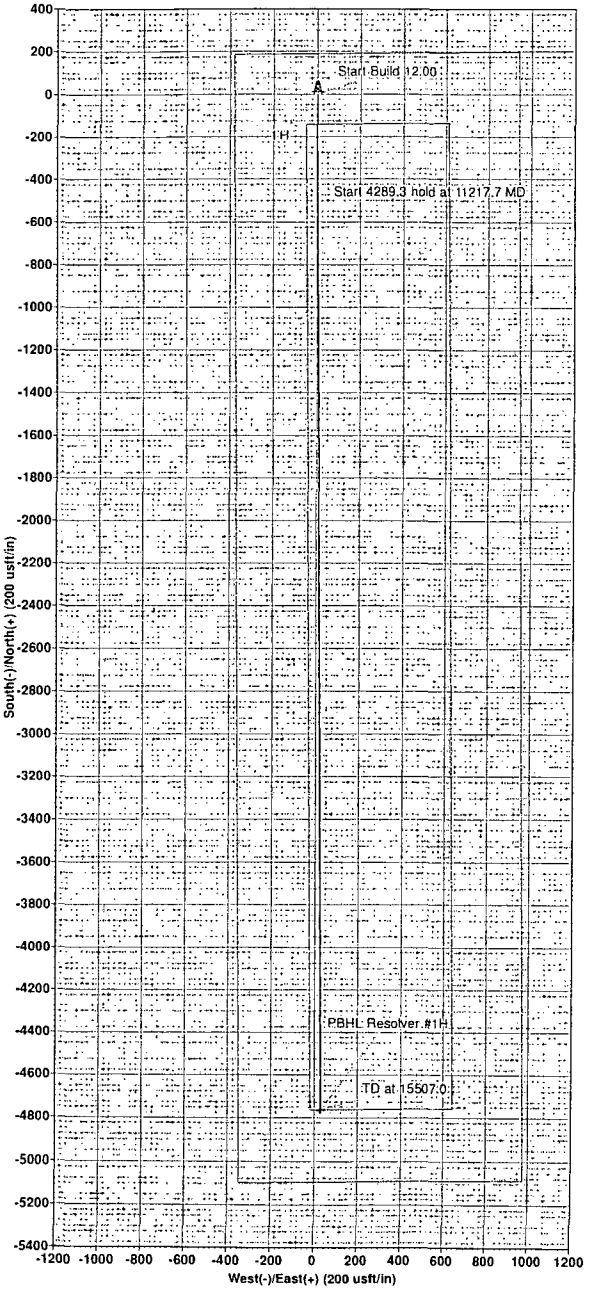
Latitude: 32° 19' 33.160 N
Longitude: 103° 38' 6.704 W

Grid East: 715652.40
Grid North: 482973.10
Scale Factor: 1.000

Geomagnetic Model: IGRF2010
Sample Date: 16-Sep-13
Magnetic Declination: 7.35°
Dip Angle from Horizontal: 60.21°
Magnetic Field Strength: 48443

To convert a Magnetic Direction to a Grid Direction, Add 6.97°
To convert a Magnetic Direction to a True Direction, Add 7.35° East
To convert a True Direction to a Grid Direction, Subtract 0.37°





Matt Shipp
17.05, September 16 2013

Nexus Directional Solutions
3925 CR 1285
Odessa TX 79765

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

No records found.

PLSS Search:

Section(s): 12 **Township:** 23S **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 Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 02216	CUB	LE	2	2	4	21	23S	32E	625035	3573261*	585	400	185
C 02349		ED		2	3	03	23S	32E	625678	3578004*	525		
C 03529 POD1	C	LE	2	4	3	29	23S	32E	622651	3571212	550		

Average Depth to Water: **400 feet**

Minimum Depth: **400 feet**

Maximum Depth: **400 feet**

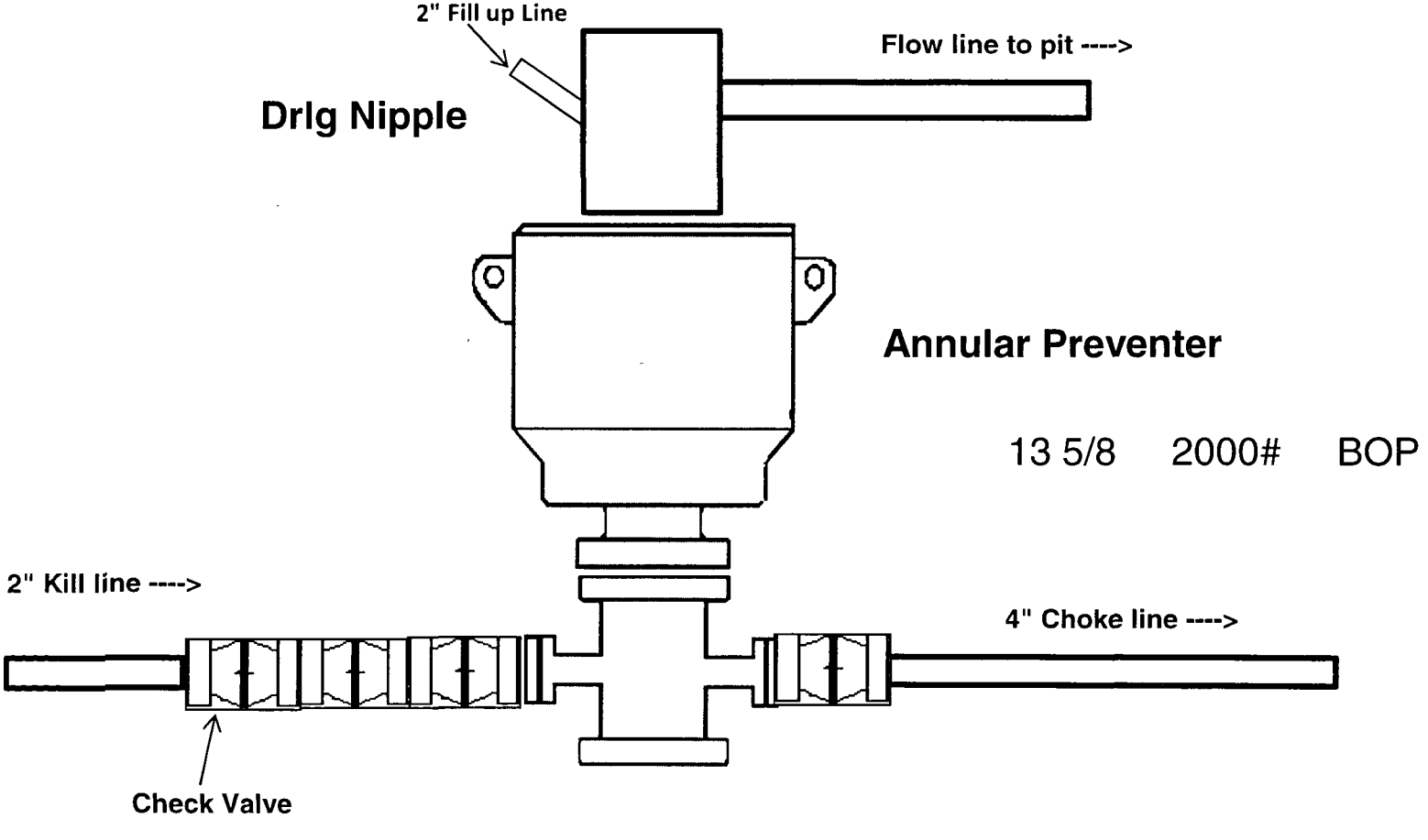
Record Count: 3

PLSS Search:

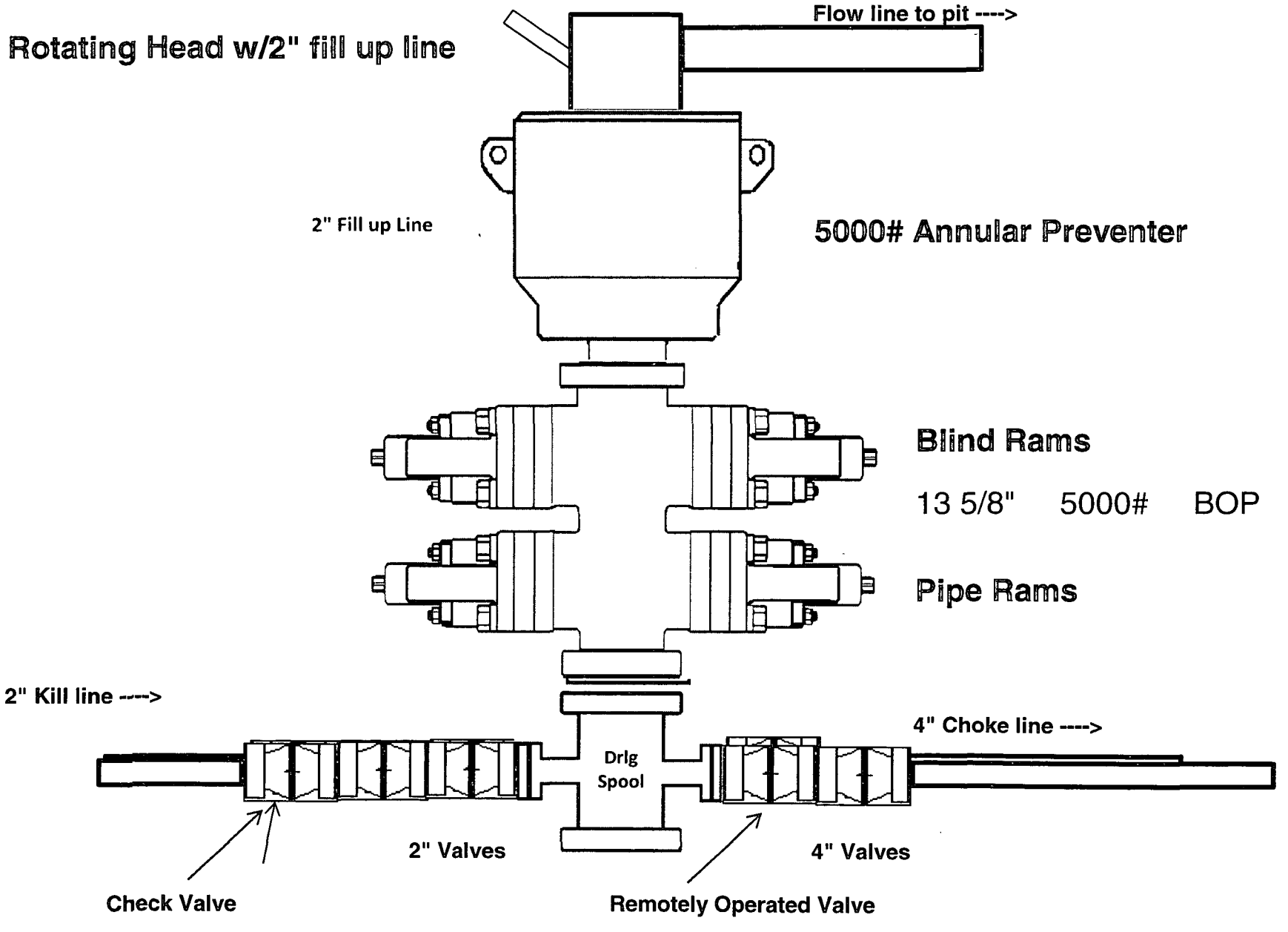
Township: 23S **Range:** 32E

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

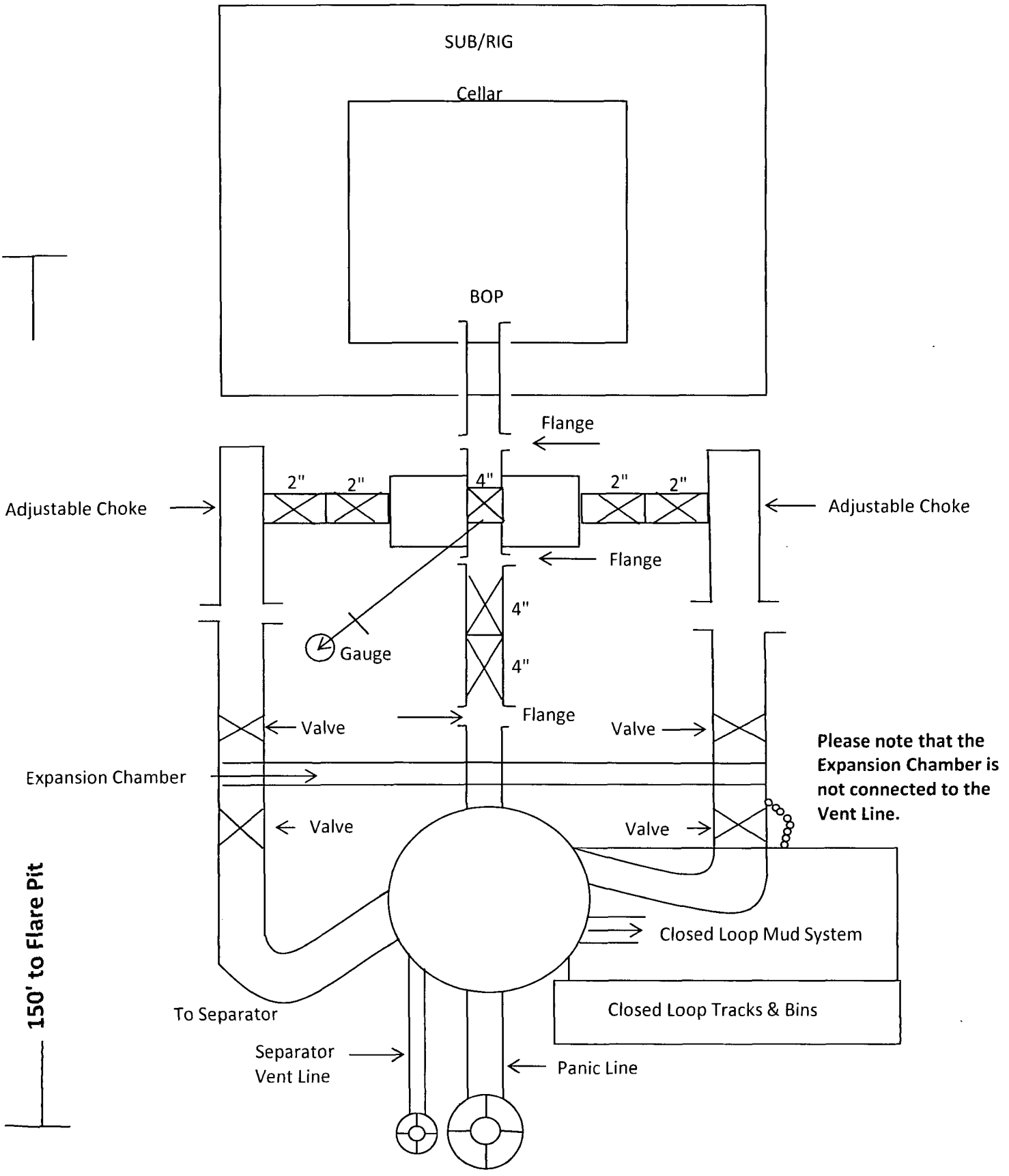
2,000 psi BOP Schematic



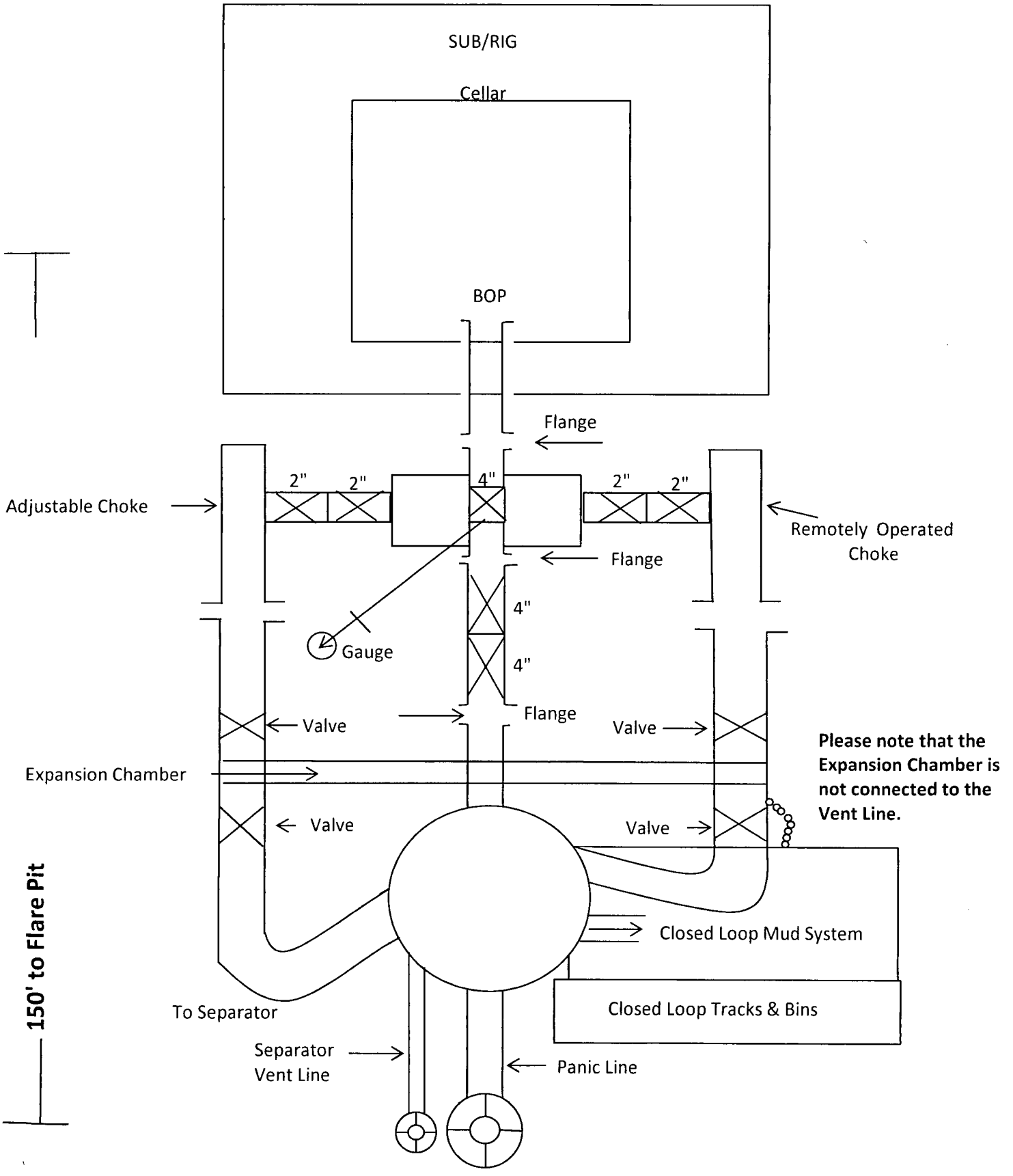
5,000 psi BOP Schematic



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'

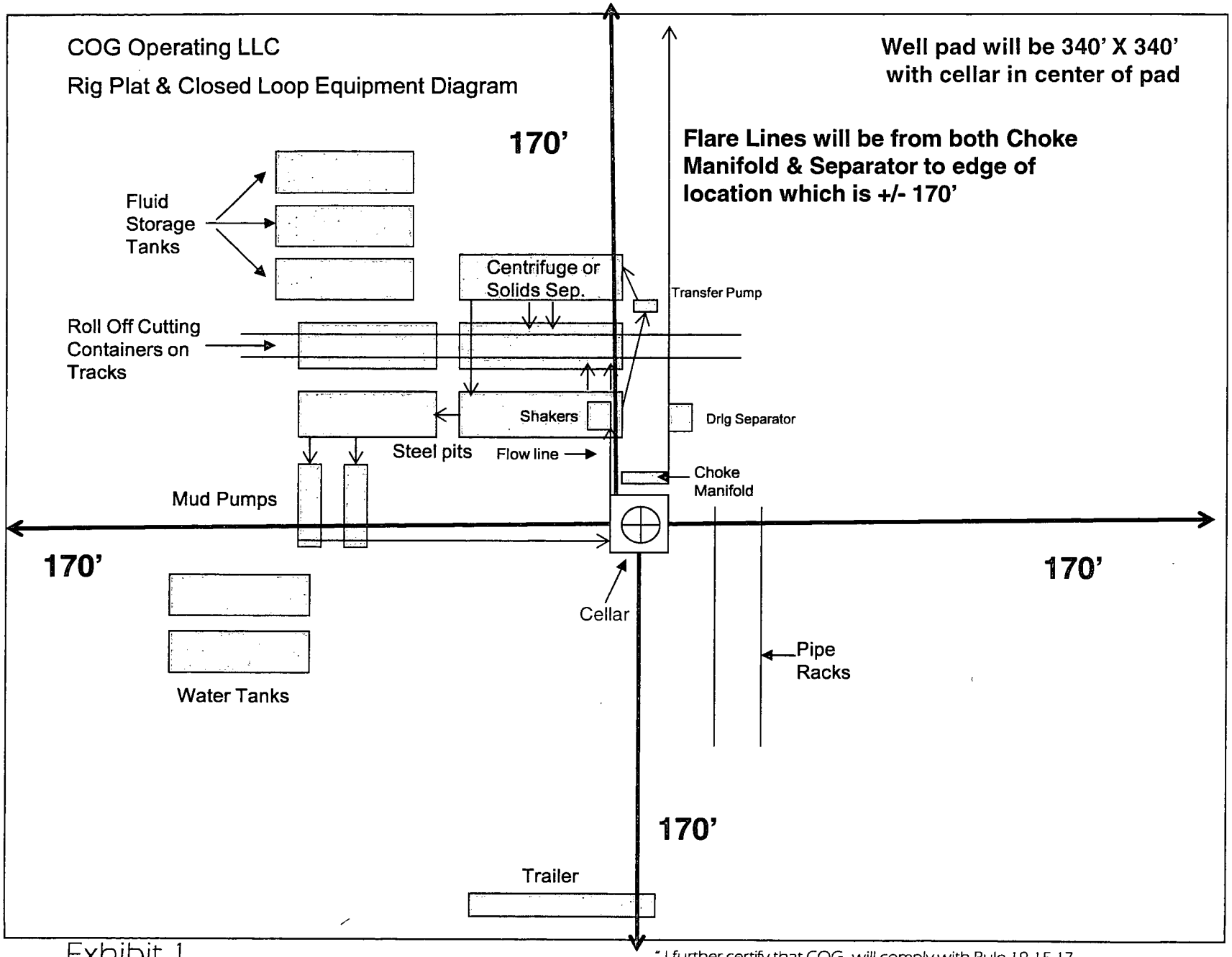


Exhibit 1

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