14-111

Form 3160-3
(March 2012)

SECRETARY'S POTASH

OCD Hobbs

HOBBS OCD

SEP 22 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: NMNM058935, BHL: NMNM107392

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. (40118)
Nightcap 6 Federal #1H

2. Name of Operator
COG Operating LLC. (229137)

9. API Well No.
30-025-42133

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

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

10. Field and Pool, or Exploratory (41460)
Lusk; Bone Spring, South

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface 1800' FSL & 560' FEL Unit Letter I (NESE) SHL Sec. 31-T19S - R32E
At proposed prod. Zone 330' FSL & 380' FEL Unit Letter P (SESE) BHL Sec. 6 - T20S - R32E

11. Sec., T.R.M. or Blk and Survey or Area
Sec. 31- T19S - R32E

14. Distance in miles and direction from nearest town or post office*
About 14 miles from Loco Hills

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) 330'

16. No. of acres in lease
SHL: 281.03
BHL: 636.47

17. Spacing Unit dedicated to this well
159.91

18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 156' (Nightcap #2H) BHL: 4244'

19. Proposed Depth
TVD: 9450' MD: 15,624'

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

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3523.6 GL

22. Approximate date work will start*
7/1/2014

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 4/24/2014

Title
Regulatory Analyst

Approved by *(Signature)* Steve Caffey — Name *(Printed/Typed)* — Date SEP 16 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 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)

KZ 09/22/14

*(Instructions on page 2)

Capitan Controlled Water Basin

Approval Subject to General Requirements & Special Stipulations Attached

SEE ATTACHED FOR CONDITIONS OF APPROVAL

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 24th day of April, 2014.

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

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
NIGHTCAP 6 FEDERAL #1H
SHL: 1800' FSL & 560' FEL, UNIT I
Sec 31 T19S R32E
BHL: 330' FSL & 380' FEL, Unit P
Sec 6, T20S, R32E
Lea County, NM

1. Proration Unit Spacing: 159.91 Acres

2. Ground Elevation: 3523.6'

3. Proposed Depths: Horizontal:
KOP (Kick off Point) TVD=8564' MD=8564'
EOC (end of curve) TVD=9386' MD=11610'
Toe (end of lateral) TVD=9450' MD= 15624'

4. Estimated tops of geological markers:

Fresh Water	223'
Rustler	845'
Top of Salt	936'
BOS/Top of Tansil	2477'
Yates	2587'
Seven Rivers	2754'
Capitan Reef	2867'
BOR/ CYCN	4347'
Brushy Canyon	5623'
Bone Spring	7303'
1st.Bone Spring Sd.	8482'
2nd Bone Spring Sd.	9183'
3rd Bone Spring Sd.	10031'
Wolfcamp	10440'

5. Possible mineral bearing formations:

Yates	2587'	Oil/Gas
Seven Rivers	2754'	Oil/Gas
Capitan Reef	2867'	Brackish Water
BOR/ CYCN	4347'	Oil/Gas
Brushy Canyon	5623'	Oil/Gas
Bone Spring	7303'	Oil/Gas
1st.Bone Spring Sd.	8482'	Oil/Gas
2nd Bone Spring Sd.	9183'	Oil/Gas
3rd Bone Spring Sd.	10031'	Oil/Gas
Wolfcamp	10440'	Oil/Gas

925' 2750'

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 20" casing at ~~870'~~ (25' into Rustler) and circulating cement back to the surface will protect the surface fresh water sand. The Salt Section will be isolated and protected by setting 13 3/8" casing at ~~2497'~~ (20' ~~into Tansill~~) and circulating cement back to surface in a single stage job. The Capitan Reef will be isolated and protected by setting 9 5/8" casing at 4350' (13' into Cherry Canyon) and circulating cement back to surface in a single stage job.. Any shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them as described in the following paragraph.

A 8 ¾" open hole will be drilled from 9 5/8" casing shoe to TD. 5 ½" production casing will be installed. This casing string will be cemented from the TD to surface in single stage job. If wellbore conditions arise that require immediate action and/or a change to this program, COG Operating LLC personnel will always react to protect the wellbore and/or environment.

6. Proposed Mud System

The well will be drilled to TD with a combination of fresh water, brine, cut brine mud systems. The applicable depths and properties of these systems are as follows:

See COA

DEPTH (MD)	TYPE	WEIGHT	VISCOSITY	WATERLOSS
0-870' 925' 2750'	Fresh Water	8.3-8.8	28-40	N.C.
870'-2497'	Brine	9.8-10.1	28-32	N.C.
2497'-4350'	Fresh Water	8.3-8.7	28-32	N.C.
4350'-8564'	FW/CutBrine mud	8.3-9.2	28-32	N.C.
8564'-15624'	Cut Brine mud	8.5-9.2	30-35	N.C.

Sufficient mud materials will be kept at the well site to maintain mud properties and meet minimum lost circulation and weight increase requirements at all times.

Visual or electronic mud monitoring equipment shall be in place to detect volume changes indicating loss or gain of circulating fluid volume.

The mud program has been designed to minimize the volume of H_2S circulated to surface. Proper mud weights, safe drilling practices and the use of H_2S scavengers will minimize hazards when penetrating H_2S bearing zones.

6. Proposed Casing Program

See COA

Hole Size	Interval MD	OD Casing	Weight	Grade	Condition	Jt.	brst/clps/ten
26"	0-870' 925'	20" 0-870'	94#	J55	New	ST&C	2.43/1.35/11.00
17 ½"	870-2497' 2750'	13 3/8" 0-2497'	61#	J55	New	ST&C	1.24/1.19/4.61
12 ¼"	2497'-4350'	9 5/8" 0-4350'	40#	J55	New	LT&C	2.14/1.29/3.45
8 ¾"	4350'-15624'	5 1/2" 0-15624'	17#	P110	New	LT&C	1.33/1.65/3.22

7. Proposed Cement Program

20" SURFACE: (Circulate to Surface)

See COA

		Description	Yield	Density	Water Requirements
	Lead 1150 sx	Class C	1.75 cf/sk		
Tail: 0'-~~870'~~ Excess 104%	375 sks	Class "C" w/2% CaCl2	1.32 cf/sk	14.8 ppg	6.3 gal/sk.

13 3/8" INTERMEDIATE: (Circulate to Surface)

Lead: 0'-2000' Excess 31%	1250 sks	Class "C"+ 4% Gel+ 2% $CaCl_2$+ 0.25 ppsCF	1.75 cf/sk	13.5 ppg	9.2 gal/sk.
See COA Tail: 2000'-~~2497'~~ Excess 24%	350 sks	Class C w/2% $CaCl_2$	1.32 cf/sk	14.8 ppg	6.3 gal/sk.

Combined Excess 30%

See COA

9 5/8" INTERMEDIATE: (DV Tool @ ~~2767'~~—100' above T/Capitan Reef)

Multi-Stage: (Cement circulated to surface)

		Description	Yield	Density	Water Requirement
1st Stage:					
Lead: ~~2767~~-3750' Excess 100%	350 sks	Class "C" w/ 4% Gel + 2% $CaCL_2$	1.75 cf/sk	13.5 ppg	9.2 gal/sk.
Tail: 3750'-4350' Excess 65%	250 sks	Class "C" w/1% $CaCl_2$	1.35 cf/sk	14.8 ppg	6.3 gal/sk.

DV Tool @ ~~2767'~~ 2800 See COA

2nd Stage:					
Lead: 0'-~~2497'~~ Excess 12%	600 sks	Class "C" w/ 4% Gel + 2% $CaCl_2$	1.75 cf/sk	13.5 ppg	9.2 gal/sk.

Tail: 2497'-2767' Excess 139%	150 sks	Class C w/2% CaCl2	1.35 cf/sk	14.8 ppg	6.3 gal/sk.

Combined Excess 1st & 2nd stage 56%

5 ½" PRODUCTION CASING: 500' in Secretary Potash ★ 50' above Capitan Reef ≈ 2850' ★

Single Stage: (Cement cal to surface) (~~Minimum tie-back 200' above 9 5/8" casing shoe~~)

1st Lead: 0'-8564' Excess 37%	1200 sks	EconoCem-H+ 0.5% Halad-322+ 5 pps Kol-Seal+ 0.25 pps D-Air 5000+ 0.2% HR-601	2.51 cf/sk	11.9 ppg	14.2 gal/sk.
Tail: 8564'-15624' Excess 22%	1750 sks	VersaCem+0.4% GasStop +0.3% CFR-3+1% Salt+ 0.1% HR-601	1.24 cf/sk	14.4 ppg	5.7 gal/sk.

Combined Lead & Tail Excess: 30%

8. Pressure Control Equipment:

A 20" X 2000 psi annular BOP will be installed on the 20" casing with mud cross, choke manifold, chokes, kill line, Kelly cock, safety valve and subs to fit all drill strings in use. (see attached BOPE drawings). This equipment will be nippled up on the 20" casing head and used to TD of 17 ½" hole. This unit will be hydraulically operated and will be hydrostatically tested by independent tester using test plug to 250/300 psig low and 1000 psig. high. Choke line valve, chokes, upper Kelly cock valve, safety valve shall be tested to 2000 psig.by independent tester..

After setting the 13 3/8" casing, the 20" X 2000 psi Hydril type annular preventer with mud cross, choke manifold, chokes will be rigged up again. Kill line, Kelly cock, safety valve and subs to fit all drill strings in use will be on location. (see attached BOPE drawings). Hydril and associated equipment will be tested using test plug to 250/300 psig low and 1000 psig high independent tester using test plug. Choke line valve, chokes, upper Kelly cock valve, safety valve shall be tested to 2000 psig.by independent tester..

After setting 9 5/8" casing a 13 3/8" X 5000 psi annular and 13/5/8" X 5000 psi double ram BOPs will be rigged up and used to TD. This double ram BOP will be hydraulically operated and will be tested by independent tester using test plug to 250 psig/300 psig low and 3000 psig high. .Annular preventer will be hydraulically operated and will be tested to 250 psig/300 psig low and 1500 psig. high. Choke line valve, chokes, upper Kelly cock valve, safety valve shall also be tested to 250 psig/300 psig low and 3000 psig high by independent tester.

Note: as per Onshore Order #2 D.1 if an operator chooses to use higher rated equipment than that authorized in the Application for Permit to Drill (APD), testing procedures shall apply to the approved working pressures, not the upgraded higher working pressures" therefore test pressures of 3000 psig for dual rams & 1500 psig.for annular will be followed.

All casing strings below the conductor shall be pressure tested to 0.22 psi per foot of casing string length 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.

9. Production Hole Drilling Summary:

Drill 8¾" hole to 8564'. Kick off at +/- 8564', building curve at 11°/100' to 82.00° inclination,178.32° az at 9309' MD/9080'TVD. Continue this inclination and azmith to 11374' MD/9367' TVD. Resume building angle at 3°/100' to 89.08° inclination at 11610' MD/9386' TVD. Continue this inclination and azmith to 15624' MD/9450' TVD. Run 5-1/2" production casing. 5 ½" to be run from surface thru kickoff point, curve and lateral to TD. 5 ½" casing will be isolated by a single stage cement job. Cement volume will be calculated to surface. Minimum tie-back is 200' above 9 5/8" casing shoe.

10. Auxiliary Well Control and Monitoring Equipment

A. Kelly cock will be kept in the drill string at all times.

B. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

11. Logging, Testing and Coring Program:

A. Cased hole GR/CNL logs will be run in the vertical portion of the hole.

B. The mud logging program will consist of lagged 10' samples from 9 5/8" casing shoe to TD in Horizontal hole.

C. Drill Stem testing is not anticipated.

D. No conventional coring is anticipated.

E. Further testing procedures will be determined after the 5 ½" production casing has been cemented at TD based on drill shows and log evaluation.

12. Abnormal Conditions, Pressures, Temperatures and Potential Hazards:

See COA

No abnormal pressures or temperatures are anticipated. The estimated bottom hole temperature at TD is 112° Fahrenheit and estimated maximum bottom hole pressure is 4063 psi. Wells in this area will penetrate formations that are known or could reasonably be expected to contain Hydrogen Sulfide. Therefore, a H_2S drilling operations plan is included with this APD. Hydrogen sulfide detection equipment will be operational and breathing equipment will be on location after drilling out the 20" casing shoe and until the 5 ½" casing is cemented. If while drilling the 17 ½" or 12 ¼" intermediate hole sections H_2S concentrations exceed 100 ppm the well will be shut-in and a remote operated choke installed. A remote operated choke will be installed as part of the 5000 psi BOP equipment rigged up after setting 9 5/8" casing and before drilling the 9 5/8" casing shoe. COG will comply with Onshore Order #6. All BOPE testing companies used by COG have H2S certified employees and will work on H2S locations. No major loss circulation zones have been reported in offsetting wells.

13. Anticipated Starting Date

Drilling operations will commence approximately on **July 31, 2014** with drilling and completion operations lasting approximately **90** days.

GEG 5.28.14

NIGHTCAP 6 FEDERAL #1H, 2H & 4H

Melanie Parker <MParker@concho.com> Tue, Sep 16, 2014 at 7:50 AM
To: "Mason, Jennifer" <jamason@blm.gov>
Cc: Mayte Reyes <mreyes1@concho.com>

Jennifer,

The revised 20" Surface Casing Cement Program for the Nightcap 6 Federal #1H, 2H and 4H is:

Lead: 1100 sx Class "C" w/2% CC + 4% Gel, 1.75 cf/sx, 13.5 ppg, 9.2 gal/sx

Tail: 500 sx Class "C" w/2% CaCl2, 1.32 cf/sx, 14.8 ppg, 6.3 gal/sx

If you need anything more, please let me know.

Thank you!!

Melanie

575-748-6952 (direct)

From: Mason, Jennifer [mailto:jamason@blm.gov]
Sent: Tuesday, September 16, 2014 7:10 AM
To: Melanie Parker
Subject:

Did you ever find out the cement on the 20" casing for the nightcaps 1H, 2H, and 4H?

–

Thank you,

Jennifer Mason

Bureau of Land Management

Project: Lea County, NM (NAD27 NME)
Site: Nightcap 6 Federal
Well: #1H
Wellbore: WB1
Design: Plan #3 05-23-14

CONCHO

PHOENIX TECHNOLOGY SERVICES

Azimuths to Grid North
True North: -0.29°
Magnetic North: 7.07°

Magnetic Field
Strength: 48532.1snT
Dip Angle: 60.44°
Date: 2014/05/22
Model: IGRF2010_14

WELL DETAILS

Ground Level: 3523.60

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	587656.00	664734.50	32° 36' 51.95144 N	103° 47' 53.97918 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	8564.00	0.00	0.00	8564.00	0.00	0.00	0.00	0.00	0.00		KOP, Start 11°/100 Build
3	9309.45	82.00	178.32	9079.80	-448.19	13.15	11.00	178.32	448.38		EOB, 82° Inc, 178.32° Azm - Start hold
4	11374.45	82.00	178.32	9367.19	-2492.21	73.10	0.00	0.00	2493.28		Start 3°/100' Build
5	11610.45	89.08	178.32	9385.53	-2727.24	79.99	3.00	-0.01	2728.41		LP, 89.08° Inc, Start Hold
6	15624.35	89.08	178.32	9450.00	-6738.90	197.70	0.00	0.00	6741.80	PBHL-Nightcap 6 Fed #1H	TD at 15624.35' MD

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PP-Nightcap 6 Fed #1H	9316.27 - plan hits target center	-2130.00	62.47	585526.00	664796.97	32° 36' 30.87126 N	103° 47' 53.37415 W	Point
PBHL-Nightcap 6 Fed #1H	9450.00 - plan hits target center	-6738.90	197.70	580917.10	664932.20	32° 35' 45.25785 N	103° 47' 52.06464 W	Point

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° 36' 51.95144 N
Longitude: 103° 47' 53.97918 W

Grid East: 664734.50
Grid North: 587656.00
Scale Factor: 1.000

Geomagnetic Model: IGRF2010_14
Sample Date: 22-May-14
Magnetic Declination: 7.36°
Dip Angle from Horizontal: 60.44°
Magnetic Field Strength: 48532

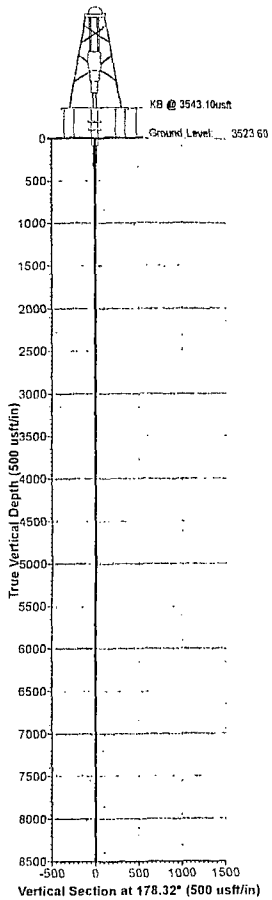
To convert a Magnetic Direction to a Grid Direction, Add 7.07°
To convert a Magnetic Direction to a True Direction, Add 7.36° East
To convert a True Direction to a Grid Direction, Subtract 0.29°

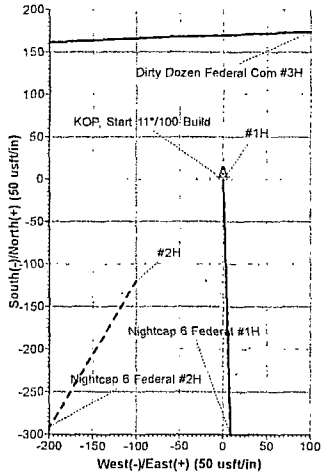
FORMATION TOP DETAILS

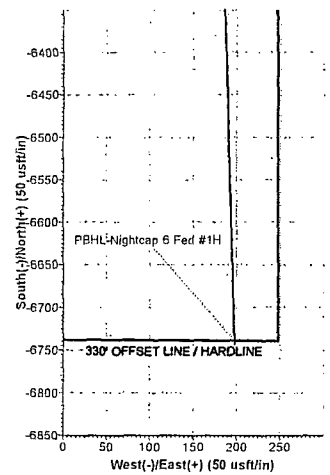
No formation data is available

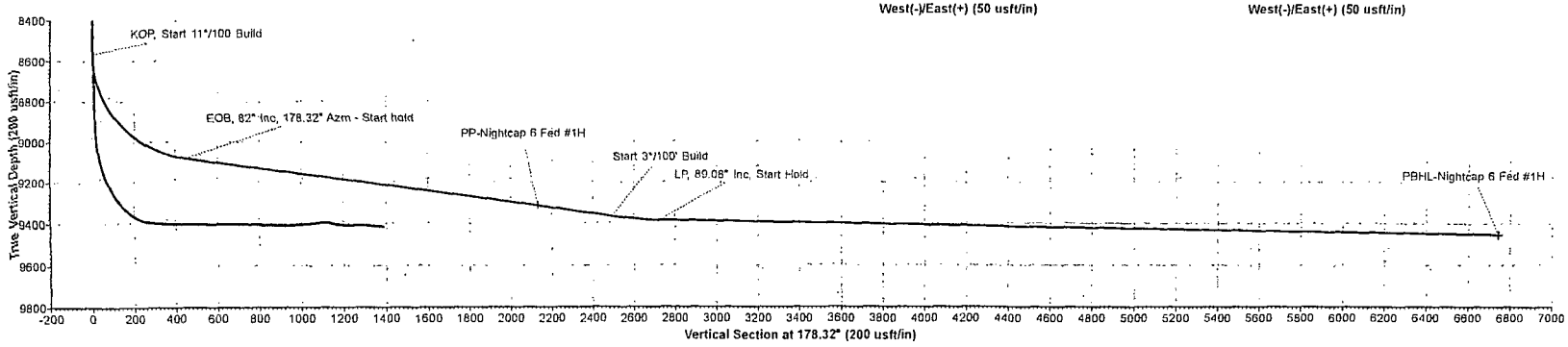
LEGEND

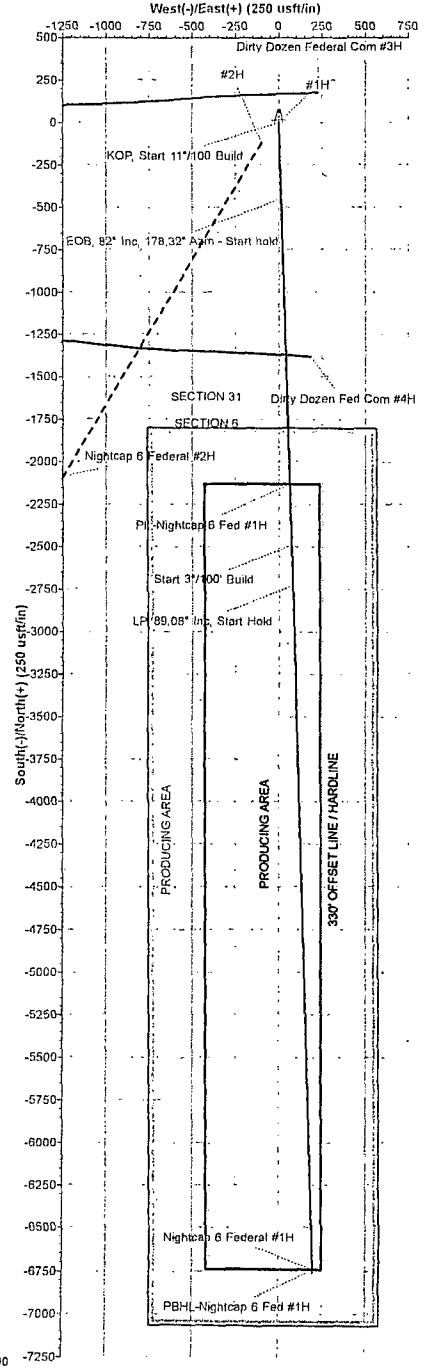
- #4H, WB1, Plan #1 03-03-14 V0
- #4H, WB1, Surveys (Basic 46) V0
- #3H, WB1, Surveys V0
- #2H, WB1, Plan #3 02-23-14 V0
- Plan #3 05-23-14











Created By: Jobo Pina Date: 19:12, May 23 2014

PHOENIX
TECHNOLOGY SERVICES

COG Operating LLC

Lea County, NM (NAD27 NME)
Nightcap 6 Federal
#1H
WB1

Plan: Plan #3 05-23-14

Planning Report

23 May, 2014

CONCHO

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3543.10usft
Site:	Nightcap 6 Federal	**MD Reference:**	KB @ 3543.10usft
Well:	#1H	**North Reference:**	Grid
Wellbore:	WB1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #3 05-23-14	**Database:**	Compass 5000 GCR DB

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 Nightcap 6 Federal

Site Position:		**Northing:**	587,656.00 usft	**Latitude:**	32° 36' 51.95144 N
From:	Map	**Easting:**	664,734.50 usft	**Longitude:**	103° 47' 53.97918 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.29 °

Well #1H

Well Position	**+N/-S**	0.00 usft	**Northing:**	587,656.00 usft	**Latitude:**	32° 36' 51.95144 N
	+E/-W	0.00 usft	**Easting:**	664,734.50 usft	**Longitude:**	103° 47' 53.97918 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,523.60 usft

Wellbore WB1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	2014/05/22	7.36	60.44	48,532

Design Plan #3 05-23-14

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	178.32

Survey Tool Program Date 2014/05/23

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	15,623.87	Plan #3 05-23-14 (WB1)	MWD	MWD - Standard

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3543.10usft
Site:	Nightcap 6 Federal	**MD Reference:**	KB @ 3543.10usft
Well:	#1H	**North Reference:**	Grid
Wellbore:	WB1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #3 05-23-14	**Database:**	Compass 5000 GCR DB

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	Northing (usft)	Easting (usft)	V. Sec (usft)	DLeg (°/100usft)
0.00	0.00	0.00	-3,543.10	0.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
100.00	0.00	0.00	-3,443.10	100.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
200.00	0.00	0.00	-3,343.10	200.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
300.00	0.00	0.00	-3,243.10	300.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
400.00	0.00	0.00	-3,143.10	400.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
500.00	0.00	0.00	-3,043.10	500.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
600.00	0.00	0.00	-2,943.10	600.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
700.00	0.00	0.00	-2,843.10	700.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
800.00	0.00	0.00	-2,743.10	800.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
900.00	0.00	0.00	-2,643.10	900.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
1,000.00	0.00	0.00	-2,543.10	1,000.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
1,100.00	0.00	0.00	-2,443.10	1,100.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
1,200.00	0.00	0.00	-2,343.10	1,200.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
1,300.00	0.00	0.00	-2,243.10	1,300.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
1,400.00	0.00	0.00	-2,143.10	1,400.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
1,500.00	0.00	0.00	-2,043.10	1,500.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
1,600.00	0.00	0.00	-1,943.10	1,600.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
1,700.00	0.00	0.00	-1,843.10	1,700.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
1,800.00	0.00	0.00	-1,743.10	1,800.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
1,900.00	0.00	0.00	-1,643.10	1,900.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
2,000.00	0.00	0.00	-1,543.10	2,000.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
2,100.00	0.00	0.00	-1,443.10	2,100.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
2,200.00	0.00	0.00	-1,343.10	2,200.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
2,300.00	0.00	0.00	-1,243.10	2,300.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
2,400.00	0.00	0.00	-1,143.10	2,400.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
2,500.00	0.00	0.00	-1,043.10	2,500.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
2,600.00	0.00	0.00	-943.10	2,600.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3543.10usft
Site:	Nightcap 6 Federal	**MD Reference:**	KB @ 3543.10usft
Well:	#1H	**North Reference:**	Grid
Wellbore:	WB1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #3 05-23-14	**Database:**	Compass 5000 GCR DB

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	Northing (usft)	Easting (usft)	V. Sec (usft)	DLeg (°/100usft)
2,700.00	0.00	0.00	-843.10	2,700.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
2,800.00	0.00	0.00	-743.10	2,800.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
2,900.00	0.00	0.00	-643.10	2,900.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
3,000.00	0.00	0.00	-543.10	3,000.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
3,100.00	0.00	0.00	-443.10	3,100.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
3,200.00	0.00	0.00	-343.10	3,200.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
3,300.00	0.00	0.00	-243.10	3,300.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
3,400.00	0.00	0.00	-143.10	3,400.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
3,500.00	0.00	0.00	-43.10	3,500.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
3,600.00	0.00	0.00	56.90	3,600.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
3,700.00	0.00	0.00	156.90	3,700.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
3,800.00	0.00	0.00	256.90	3,800.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
3,900.00	0.00	0.00	356.90	3,900.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
4,000.00	0.00	0.00	456.90	4,000.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
4,100.00	0.00	0.00	556.90	4,100.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
4,200.00	0.00	0.00	656.90	4,200.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
4,300.00	0.00	0.00	756.90	4,300.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
4,400.00	0.00	0.00	856.90	4,400.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
4,500.00	0.00	0.00	956.90	4,500.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
4,600.00	0.00	0.00	1,056.90	4,600.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
4,700.00	0.00	0.00	1,156.90	4,700.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
4,800.00	0.00	0.00	1,256.90	4,800.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
4,900.00	0.00	0.00	1,356.90	4,900.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
5,000.00	0.00	0.00	1,456.90	5,000.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
5,100.00	0.00	0.00	1,556.90	5,100.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
5,200.00	0.00	0.00	1,656.90	5,200.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
5,300.00	0.00	0.00	1,756.90	5,300.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3543.10usft
Site:	Nightcap 6 Federal	**MD Reference:**	KB @ 3543.10usft
Well:	#1H	**North Reference:**	Grid
Wellbore:	WB1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #3 05-23-14	**Database:**	Compass 5000 GCR DB

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	Northing (usft)	Easting (usft)	V. Sec (usft)	DLeg (°/100usft)
5,400.00	0.00	0.00	1,856.90	5,400.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
5,500.00	0.00	0.00	1,956.90	5,500.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
5,600.00	0.00	0.00	2,056.90	5,600.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
5,700.00	0.00	0.00	2,156.90	5,700.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
5,800.00	0.00	0.00	2,256.90	5,800.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
5,900.00	0.00	0.00	2,356.90	5,900.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
6,000.00	0.00	0.00	2,456.90	6,000.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
6,100.00	0.00	0.00	2,556.90	6,100.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
6,200.00	0.00	0.00	2,656.90	6,200.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
6,300.00	0.00	0.00	2,756.90	6,300.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
6,400.00	0.00	0.00	2,856.90	6,400.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
6,500.00	0.00	0.00	2,956.90	6,500.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
6,600.00	0.00	0.00	3,056.90	6,600.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
6,700.00	0.00	0.00	3,156.90	6,700.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
6,800.00	0.00	0.00	3,256.90	6,800.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
6,900.00	0.00	0.00	3,356.90	6,900.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
7,000.00	0.00	0.00	3,456.90	7,000.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
7,100.00	0.00	0.00	3,556.90	7,100.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
7,200.00	0.00	0.00	3,656.90	7,200.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
7,300.00	0.00	0.00	3,756.90	7,300.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
7,400.00	0.00	0.00	3,856.90	7,400.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
7,500.00	0.00	0.00	3,956.90	7,500.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
7,600.00	0.00	0.00	4,056.90	7,600.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
7,700.00	0.00	0.00	4,156.90	7,700.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
7,800.00	0.00	0.00	4,256.90	7,800.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
7,900.00	0.00	0.00	4,356.90	7,900.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
8,000.00	0.00	0.00	4,456.90	8,000.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3543.10usft
Site:	Nightcap 6 Federal	**MD Reference:**	KB @ 3543.10usft
Well:	#1H	**North Reference:**	Grid
Wellbore:	WB1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #3 05-23-14	**Database:**	Compass 5000 GCR DB

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	Northing (usft)	Easting (usft)	V. Sec (usft)	DLeg (°/100usft)
8,100.00	0.00	0.00	4,556.90	8,100.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
8,200.00	0.00	0.00	4,656.90	8,200.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
8,300.00	0.00	0.00	4,756.90	8,300.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
8,400.00	0.00	0.00	4,856.90	8,400.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
8,500.00	0.00	0.00	4,956.90	8,500.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
8,564.00	0.00	0.00	5,020.90	8,564.00	0.00	0.00	587,656.00	664,734.50	0.00	0.00
KOP, Start 11°/100 Build										
8,600.00	3.96	178.32	5,056.87	8,599.97	-1.24	0.04	587,654.76	664,734.54	1.24	11.00
8,650.00	9.46	178.32	5,106.51	8,649.61	-7.08	0.21	587,648.92	664,734.71	7.08	11.00
8,700.00	14.96	178.32	5,155.36	8,698.46	-17.65	0.52	587,638.35	664,735.02	17.65	11.00
8,750.00	20.46	178.32	5,202.97	8,746.07	-32.84	0.96	587,623.16	664,735.46	32.86	11.00
8,800.00	25.96	178.32	5,248.91	8,792.01	-52.53	1.54	587,603.47	664,736.04	52.56	11.00
8,850.00	31.46	178.32	5,292.74	8,835.84	-76.53	2.24	587,579.47	664,736.74	76.57	11.00
8,900.00	36.96	178.32	5,334.08	8,877.18	-104.62	3.07	587,551.38	664,737.57	104.67	11.00
8,950.00	42.46	178.32	5,372.53	8,915.63	-136.54	4.00	587,519.46	664,738.50	136.60	11.00
9,000.00	47.96	178.32	5,407.74	8,950.84	-172.00	5.04	587,484.00	664,739.54	172.07	11.00
9,050.00	53.46	178.32	5,439.39	8,982.49	-210.66	6.18	587,445.34	664,740.68	210.75	11.00
9,100.00	58.96	178.32	5,467.19	9,010.29	-252.18	7.40	587,403.82	664,741.90	252.29	11.00
9,150.00	64.46	178.32	5,490.87	9,033.97	-296.17	8.69	587,359.83	664,743.19	296.30	11.00
9,200.00	69.96	178.32	5,510.23	9,053.33	-342.23	10.04	587,313.77	664,744.54	342.38	11.00
9,250.00	75.46	178.32	5,525.09	9,068.19	-389.94	11.44	587,266.06	664,745.94	390.10	11.00
9,300.00	80.96	178.32	5,535.30	9,078.40	-438.84	12.87	587,217.16	664,747.37	439.03	11.00
9,309.45	82.00	178.32	5,536.70	9,079.80	-448.19	13.15	587,207.81	664,747.65	448.38	11.00
EOB, 82° Inc, 178.32° Azm - Start hold										
9,400.00	82.00	178.32	5,549.30	9,092.40	-537.81	15.77	587,118.19	664,750.27	538.04	0.00
9,500.00	82.00	178.32	5,563.22	9,106.32	-636.60	18.68	587,019.20	664,753.18	637.07	0.00
9,600.00	82.00	178.32	5,577.14	9,120.24	-735.78	21.58	586,920.22	664,756.08	736.10	0.00

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3543.10usft
Site:	Nightcap 6 Federal	**MD Reference:**	KB @ 3543.10usft
Well:	#1H	**North Reference:**	Grid
Wellbore:	WB1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #3 05-23-14	**Database:**	Compass 5000 GCR DB

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	Northing (usft)	Easting (usft)	V. Sec (usft)	DLeg (°/100usft)
9,700.00	82.00	178.32	5,591.06	9,134.16	-834.77	24.48	586,821.23	664,758.98	835.12	0.00
9,800.00	82.00	178.32	5,604.97	9,148.07	-933.75	27.39	586,722.25	664,761.89	934.15	0.00
9,900.00	82.00	178.32	5,618.89	9,161.99	-1,032.73	30.29	586,623.27	664,764.79	1,033.18	0.00
10,000.00	82.00	178.32	5,632.81	9,175.91	-1,131.72	33.19	586,524.28	664,767.69	1,132.20	0.00
10,100.00	82.00	178.32	5,646.72	9,189.82	-1,230.70	36.10	586,425.30	664,770.60	1,231.23	0.00
10,200.00	82.00	178.32	5,660.64	9,203.74	-1,329.69	39.00	586,326.31	664,773.50	1,330.26	0.00
10,300.00	82.00	178.32	5,674.56	9,217.66	-1,428.67	41.90	586,227.33	664,776.40	1,429.29	0.00
10,400.00	82.00	178.32	5,688.48	9,231.58	-1,527.65	44.81	586,128.35	664,779.31	1,528.31	0.00
10,500.00	82.00	178.32	5,702.39	9,245.49	-1,626.64	47.71	586,029.36	664,782.21	1,627.34	0.00
10,600.00	82.00	178.32	5,716.31	9,259.41	-1,725.62	50.61	585,930.38	664,785.11	1,726.37	0.00
10,700.00	82.00	178.32	5,730.23	9,273.33	-1,824.61	53.52	585,831.39	664,788.02	1,825.39	0.00
10,800.00	82.00	178.32	5,744.15	9,287.25	-1,923.59	56.42	585,732.41	664,790.92	1,924.42	0.00
10,900.00	82.00	178.32	5,758.06	9,301.16	-2,022.58	59.32	585,633.42	664,793.82	2,023.45	0.00
11,000.00	82.00	178.32	5,771.98	9,315.08	-2,121.56	62.23	585,534.44	664,796.73	2,122.47	0.00
11,100.00	82.00	178.32	5,785.90	9,329.00	-2,220.54	65.13	585,435.46	664,799.63	2,221.50	0.00
11,200.00	82.00	178.32	5,799.81	9,342.91	-2,319.53	68.03	585,336.47	664,802.53	2,320.53	0.00
11,300.00	82.00	178.32	5,813.73	9,356.83	-2,418.51	70.93	585,237.49	664,805.43	2,419.55	0.00
11,374.45	82.00	178.32	5,824.09	9,367.19	-2,492.21	73.10	585,163.79	664,807.60	2,493.28	0.00
Start 3°/100' Build										
11,400.00	82.77	178.32	5,827.48	9,370.58	-2,517.52	73.84	585,138.48	664,808.34	2,518.60	3.00
11,500.00	85.77	178.32	5,837.47	9,380.57	-2,616.97	76.76	585,039.03	664,811.26	2,618.09	3.00
11,600.00	88.77	178.32	5,842.24	9,385.34	-2,716.80	79.68	584,939.20	664,814.18	2,717.97	3.00
11,610.45	89.08	178.32	5,842.43	9,385.53	-2,727.24	79.99	584,928.76	664,814.49	2,728.41	3.00
LP, 89.08° Inc, Start Hold										
11,700.00	89.08	178.32	5,843.87	9,386.97	-2,816.74	82.62	584,839.26	664,817.12	2,817.95	0.00
11,800.00	89.08	178.32	5,845.48	9,388.58	-2,916.69	85.55	584,739.31	664,820.05	2,917.94	0.00
11,900.00	89.08	178.32	5,847.08	9,390.18	-3,016.63	88.48	584,639.37	664,822.98	3,017.93	0.00

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3543.10usft
Site:	Nightcap 6 Federal	**MD Reference:**	KB @ 3543.10usft
Well:	#1H	**North Reference:**	Grid
Wellbore:	WB1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #3 05-23-14	**Database:**	Compass 5000 GCR DB

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	Northing (usft)	Easting (usft)	V. Sec (usft)	DLeg (°/100usft)
12,000.00	89.08	178.32	5,848.69	9,391.79	-3,116.57	91.41	584,539.43	664,825.91	3,117.91	0.00
12,100.00	89.08	178.32	5,850.30	9,393.40	-3,216.52	94.35	584,439.48	664,828.85	3,217.90	0.00
12,200.00	89.08	178.32	5,851.90	9,395.00	-3,316.46	97.28	584,339.54	664,831.78	3,317.89	0.00
12,300.00	89.08	178.32	5,853.51	9,396.61	-3,416.41	100.21	584,239.59	664,834.71	3,417.88	0.00
12,400.00	89.08	178.32	5,855.12	9,398.22	-3,516.35	103.14	584,139.65	664,837.64	3,517.86	0.00
12,500.00	89.08	178.32	5,856.72	9,399.82	-3,616.29	106.08	584,039.71	664,840.58	3,617.85	0.00
12,600.00	89.08	178.32	5,858.33	9,401.43	-3,716.24	109.01	583,939.76	664,843.51	3,717.84	0.00
12,700.00	89.08	178.32	5,859.93	9,403.03	-3,816.18	111.94	583,839.82	664,846.44	3,817.82	0.00
12,800.00	89.08	178.32	5,861.54	9,404.64	-3,916.13	114.88	583,739.87	664,849.38	3,917.81	0.00
12,900.00	89.08	178.32	5,863.15	9,406.25	-4,016.07	117.81	583,639.93	664,852.31	4,017.80	0.00
13,000.00	89.08	178.32	5,864.75	9,407.85	-4,116.01	120.74	583,539.99	664,855.24	4,117.79	0.00
13,100.00	89.08	178.32	5,866.36	9,409.46	-4,215.96	123.67	583,440.04	664,858.17	4,217.77	0.00
13,200.00	89.08	178.32	5,867.96	9,411.06	-4,315.90	126.61	583,340.10	664,861.11	4,317.76	0.00
13,300.00	89.08	178.32	5,869.57	9,412.67	-4,415.85	129.54	583,240.15	664,864.04	4,417.75	0.00
13,400.00	89.08	178.32	5,871.18	9,414.28	-4,515.79	132.47	583,140.21	664,866.97	4,517.73	0.00
13,500.00	89.08	178.32	5,872.78	9,415.88	-4,615.73	135.40	583,040.27	664,869.90	4,617.72	0.00
13,600.00	89.08	178.32	5,874.39	9,417.49	-4,715.68	138.34	582,940.32	664,872.84	4,717.71	0.00
13,700.00	89.08	178.32	5,875.99	9,419.09	-4,815.62	141.27	582,840.38	664,875.77	4,817.69	0.00
13,800.00	89.08	178.32	5,877.60	9,420.70	-4,915.57	144.20	582,740.43	664,878.70	4,917.68	0.00
13,900.00	89.08	178.32	5,879.21	9,422.31	-5,015.51	147.13	582,640.49	664,881.63	5,017.67	0.00
14,000.00	89.08	178.32	5,880.81	9,423.91	-5,115.46	150.07	582,540.54	664,884.57	5,117.66	0.00
14,100.00	89.08	178.32	5,882.42	9,425.52	-5,215.40	153.00	582,440.60	664,887.50	5,217.64	0.00
14,200.00	89.08	178.32	5,884.02	9,427.12	-5,315.34	155.93	582,340.66	664,890.43	5,317.63	0.00
14,300.00	89.08	178.32	5,885.63	9,428.73	-5,415.29	158.86	582,240.71	664,893.36	5,417.62	0.00
14,400.00	89.08	178.32	5,887.24	9,430.34	-5,515.23	161.80	582,140.77	664,896.30	5,517.60	0.00
14,500.00	89.08	178.32	5,888.84	9,431.94	-5,615.18	164.73	582,040.82	664,899.23	5,617.59	0.00
14,600.00	89.08	178.32	5,890.45	9,433.55	-5,715.12	167.66	581,940.88	664,902.16	5,717.58	0.00

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #1H
Project:	Lea County, NM (NAD27 NME)	**TVD Reference:**	KB @ 3543.10usft
Site:	Nightcap 6 Federal	**MD Reference:**	KB @ 3543.10usft
Well:	#1H	**North Reference:**	Grid
Wellbore:	WB1	**Survey Calculation Method:**	Minimum Curvature
Design:	Plan #3 05-23-14	**Database:**	Compass 5000 GCR DB

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	Northing (usft)	Easting (usft)	V. Sec (usft)	DLeg (°/100usft)
14,700.00	89.08	178.32	5,892.05	9,435.15	-5,815.06	170.59	581,840.94	664,905.09	5,817.57	0.00
14,800.00	89.08	178.32	5,893.66	9,436.76	-5,915.01	173.53	581,740.99	664,908.03	5,917.55	0.00
14,900.00	89.08	178.32	5,895.27	9,438.37	-6,014.95	176.46	581,641.05	664,910.96	6,017.54	0.00
15,000.00	89.08	178.32	5,896.87	9,439.97	-6,114.90	179.39	581,541.10	664,913.89	6,117.53	0.00
15,100.00	89.08	178.32	5,898.48	9,441.58	-6,214.84	182.32	581,441.16	664,916.82	6,217.51	0.00
15,200.00	89.08	178.32	5,900.08	9,443.18	-6,314.78	185.26	581,341.22	664,919.76	6,317.50	0.00
15,300.00	89.08	178.32	5,901.69	9,444.79	-6,414.73	188.19	581,241.27	664,922.69	6,417.49	0.00
15,400.00	89.08	178.32	5,903.30	9,446.40	-6,514.67	191.12	581,141.33	664,925.62	6,517.48	0.00
15,500.00	89.08	178.32	5,904.90	9,448.00	-6,614.62	194.05	581,041.38	664,928.55	6,617.46	0.00
15,600.00	89.08	178.32	5,906.51	9,449.61	-6,714.56	196.99	580,941.44	664,931.49	6,717.45	0.00
15,624.35	89.08	178.32	5,906.90	9,450.00	-6,738.90	197.70	580,917.10	664,932.20	6,741.80	0.00

TD at 15624.35' MD

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,564.00	8,564.00	0.00	0.00	KOP, Start 11°/100 Build
9,309.45	9,079.80	-448.19	13.15	EOB, 82° Inc, 178.32° Azm - Start hold
11,374.45	9,367.19	-2,492.21	73.10	Start 3°/100' Build
11,610.45	9,385.53	-2,727.24	79.99	LP, 89.08° Inc, Start Hold
15,624.35	9,450.00	-6,738.90	197.70	TD at 15624.35' MD

Checked By: _____ Approved By: _____ Date: _____

LLD ACREAGE REPORT

Admin State: NM

Geo State: NM

MTR: 23 0200S 0320E

Section: 006

Sur Type	Sur No	Lld Suff	NE NW SW SE NNSS NNSS NNSS NNSS EWWE EWWE EWWE EWWE	Sur Note	Dup Flg	Sub Surf	Acreage
A			--XX ---X X--X XXXX				360.000
L	1		X--- ---- ---- ----				39.910
L	2		-X-- ---- ---- ----				39.940
L	3		---- X--- ---- ----				39.960
L	4		---- -X-- ---- ----				39.100
L	5		---- --X- ---- ----				39.150
L	6		---- ---- -X-- ----				39.190
L	7		---- ---- --X- ----				39.220

Section 006 Total: 636.470

MTR Total Exluding Survey Notes C/D/R and Sub Surf = Y 636.470

Grand Total Excluding Survey Notes C/D/R and Sub Surf = Y: 636.470

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

No records found.

PLSS Search:

Township: 20S **Range:** 32E

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

No records found.

PLSS Search:

Section(s): 6 **Township:** 20S **Range:** 32E

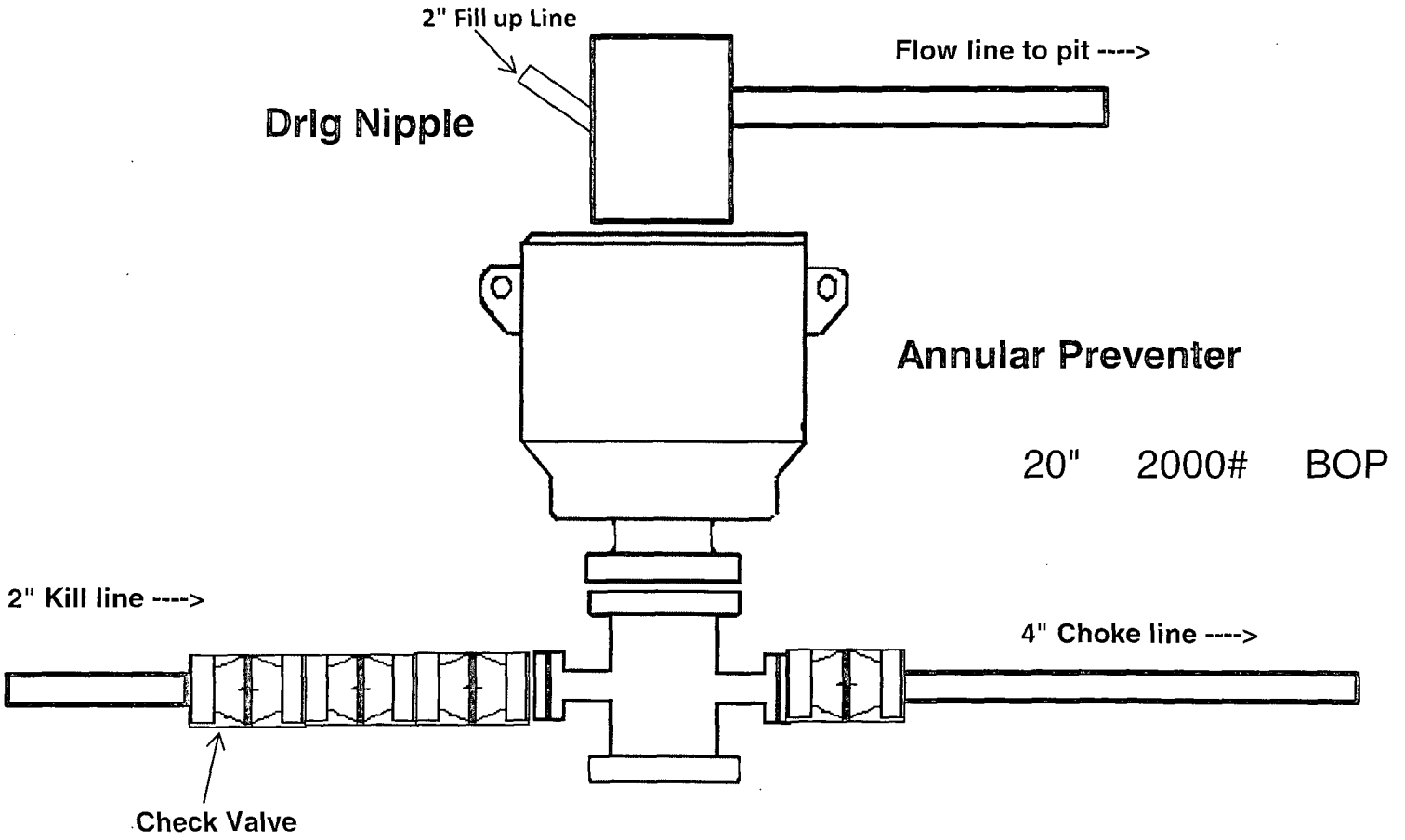
New Mexico Office of the State Engineer
Water Column/Average Depth to Water

No records found.

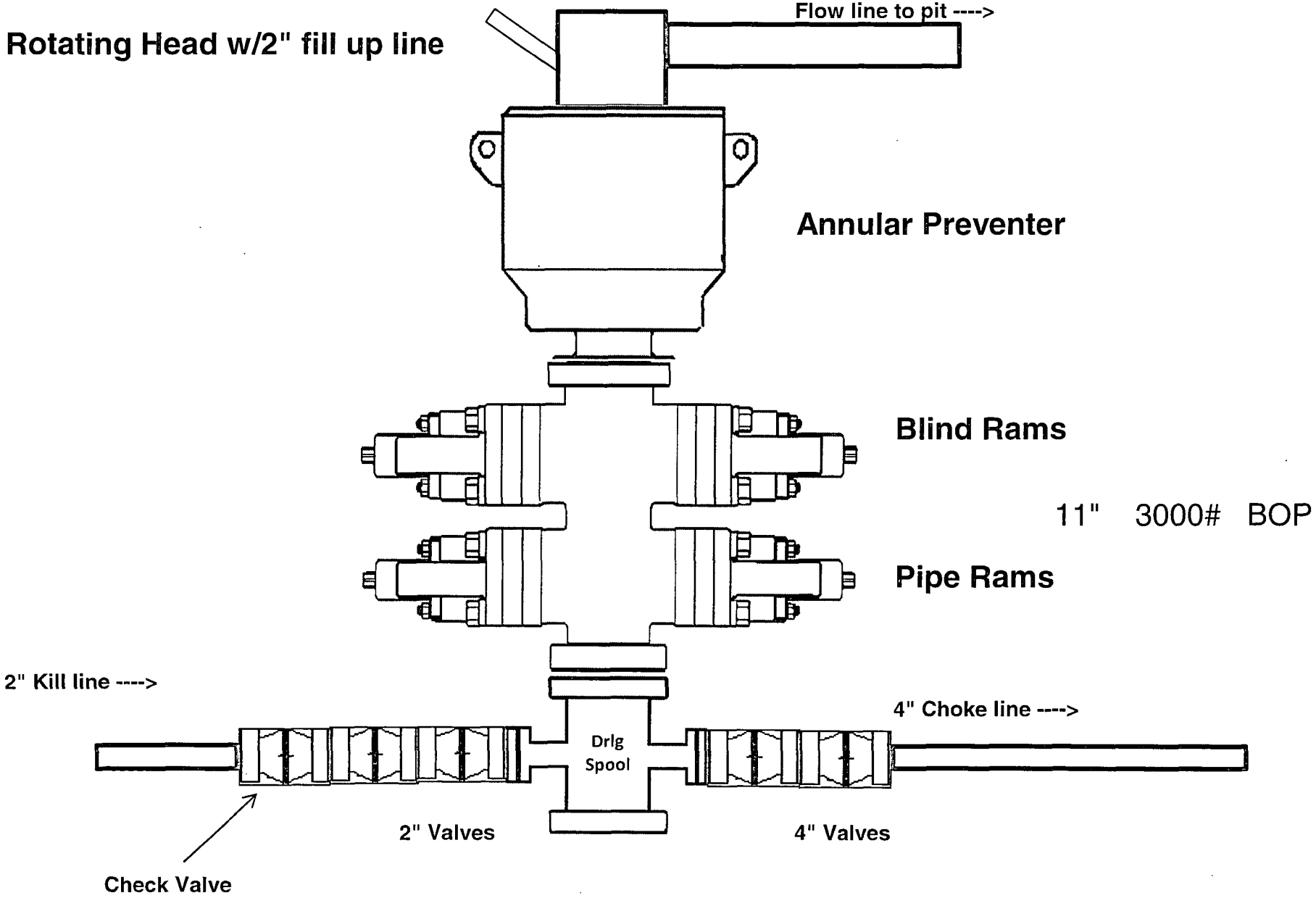
PLSS Search:

Section(s): 31 **Township:** 19S **Range:** 32E

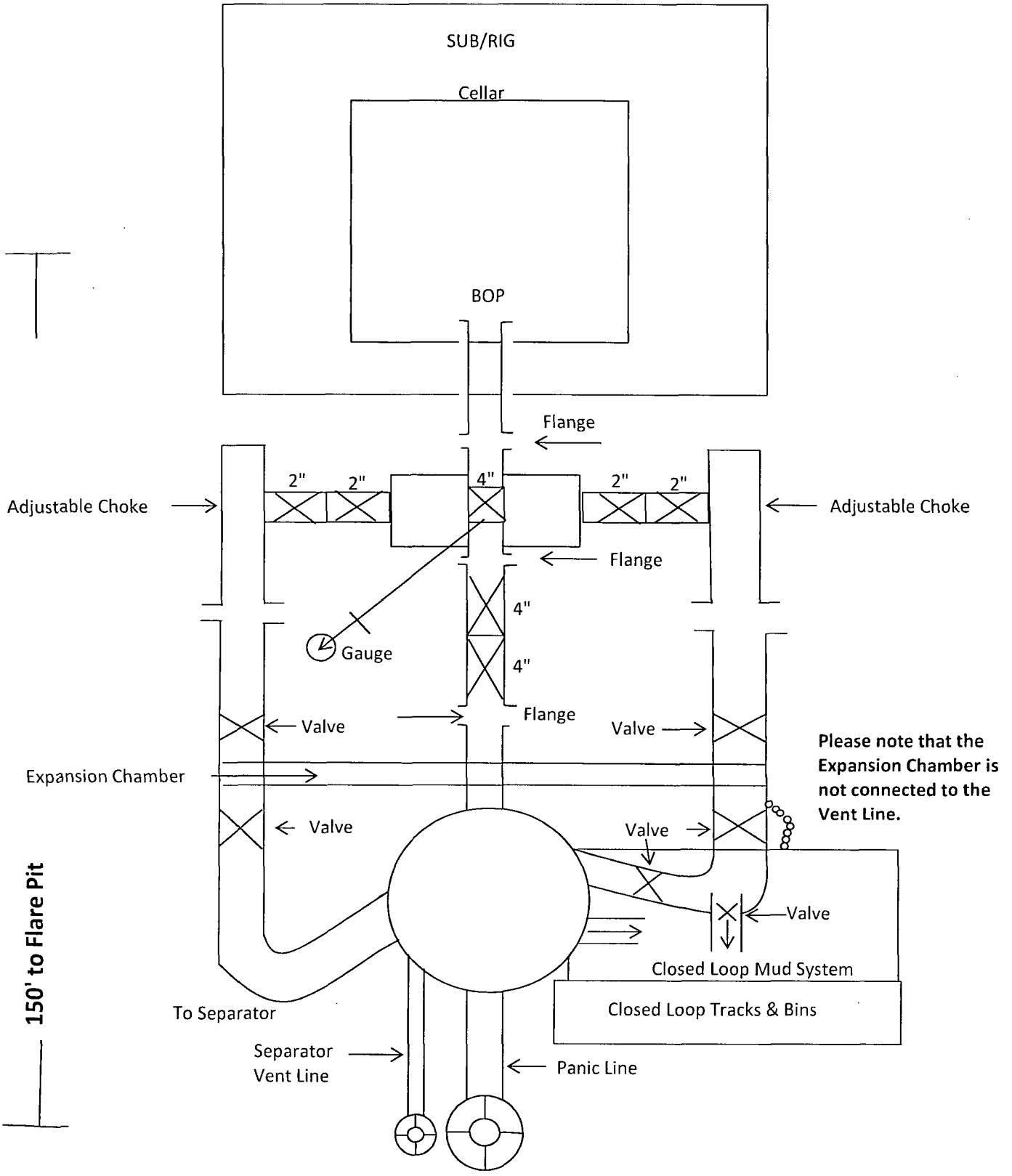
2,000 psi BOP Schematic



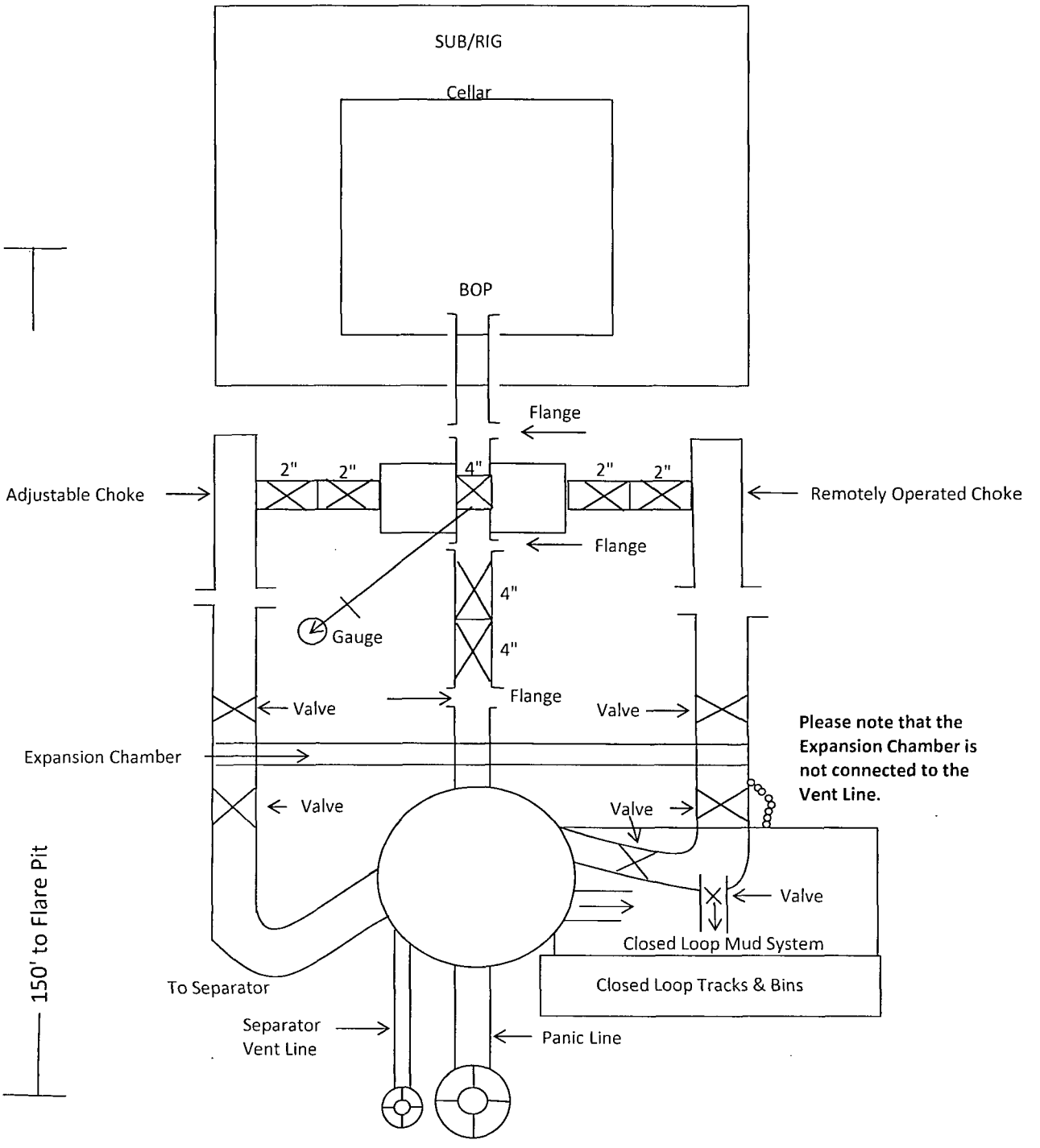
3,000 psi BOP Schematic



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'

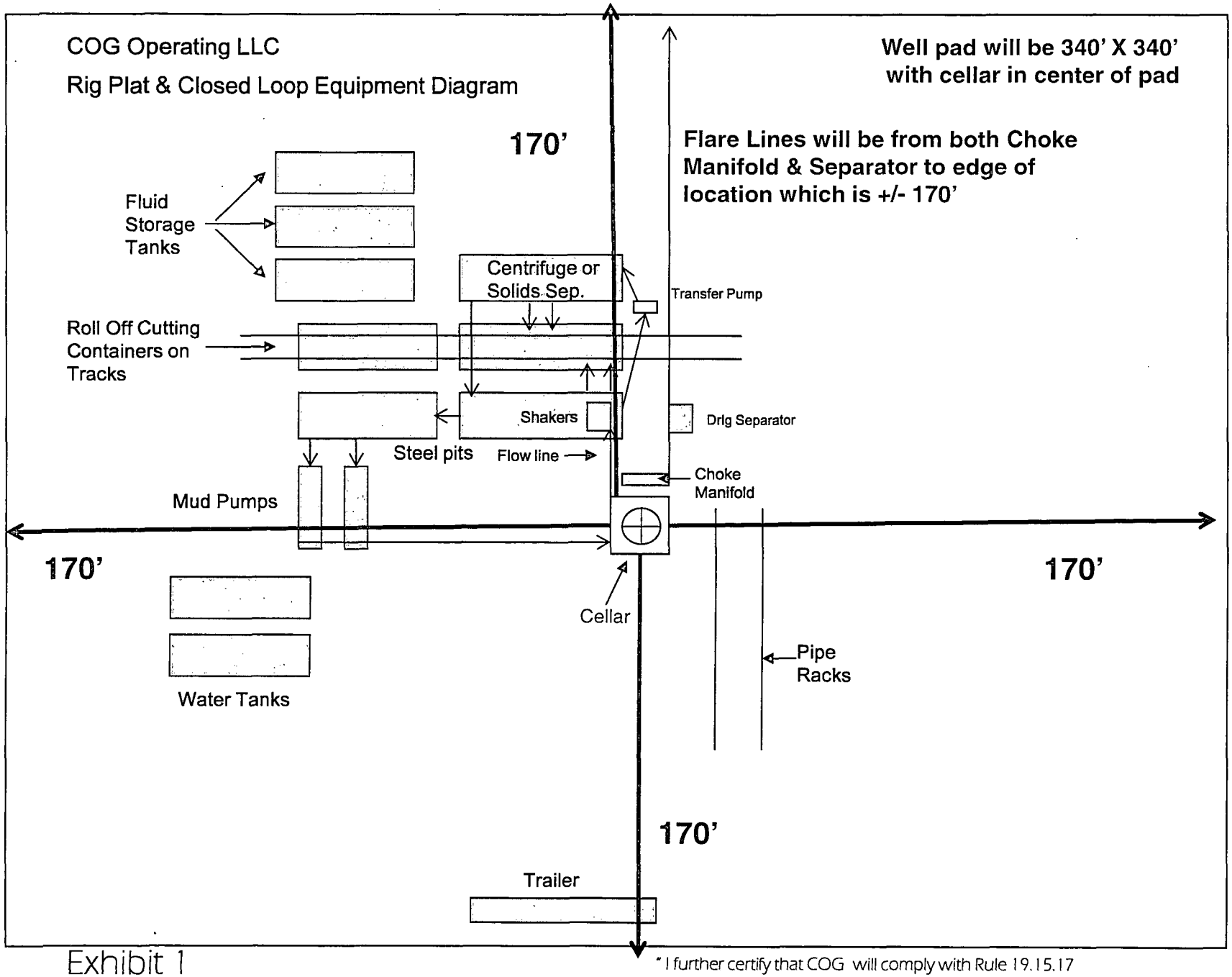


Exhibit 1

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

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

COG Operating LLC
H_2S Equipment Schematic
Terrain: Shinnery sand hills.