

OCD Hobbs

HOBBSOCD

OCT 30 2015

RECEIVED

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

15-455

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

H

1a. Type of Work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		7. If Unit or CA Agreement, Name and No.
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		8. Lease Name and Well No. <u>38865</u> Gunner 8 Federal Com #9H
2. Name of Operator COG Operating LLC. <u>(229137)</u>		9. API Well No. <u>30-025-42905</u>
3a. Address 2208 West Main Street Artesia, NM 88210	3b. Phone No. (include area code) 575-748-6940	10. Field and Pool, or Exploratory <u>97892</u> WC-025 G-06 S263407P; UPR Bone Spring
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 200' FSL & 890' FWL Unit Letter M (SWSW) Sec. 8 - T26S - R34E SHL At proposed prod. Zone 330' FNL & 990' FWL Unit Letter D (NWNW) 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
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 220'		13. State NM
16. No. of acres in lease NMNM124664: 1120		17. Spacing Unit dedicated to this well 320
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 1735' BHL: None on Fee		20. BLM/BIA Bond No. on file NMB000740 & NMB000215
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3361.3' GL		22. Approximate date work will start* 6/1/2015
		23. Estimated duration 30 days

UNORTHODOX
LOCATION

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. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan | 5. Operator certification |
| 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). | 6. Such other site specific information and/or plans as may be required by the authorized officer. |

25. Signature <u>Mayte Reyes</u>	Name (Printed/Typed) Mayte Reyes	Date 3-5-15
Title Regulatory Analyst		
Approved by (Signature) <u>/s/ Chris Walls</u>	Name (Printed/Typed) CARLSBAD FIELD OFFICE	Date OCT 30 2015
Title <u>FIELD MANAGER</u>	Office CARLSBAD FIELD OFFICE	

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

K2
10/30/15

Approval Subject to General Requirements
& Special Stipulations Attached

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

1. Geologic Formations

RECEIVED

TVD of target	9830'	Pilot hole depth	N/A
MD at TD:	19,728'	Deepest expected fresh water:	160'

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	723	Water	
Top of Salt	1082	Salt	
Lamar	5329		
Delaware Group	5371	Oil/Gas	
Bone Spring	9577	Oil/Gas	
1 st BSS Sand	10,527	Oil/Gas	
Avalon Shale	9830	Target Zone	

*H2S, water flows, loss of circulation, abnormal pressures, etc.

See COA

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	750 800	13.375"	54.5	J55	STC	3.18	1.08	12.57
12.25"	0	5350	9.625"	40	J55	BTC	1.22	1.24	4.28
8.75"	0	19,728	5.5"	17	HCP110	LTC	1.60	2.29	3.40
BLM Minimum Safety Factor							1.125	1.0	1.6 Dry 1.8 Wet

- All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h
- BLM standard formulas where used on all SF calculations

COG Operating LLC, Gunner 8 Federal 9H

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Is casing API approved? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification. <i>See COA</i>	Y <i>N</i>
<u>Will the pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?</u>	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program

Csg	# sx	Density ppg	Yield ft ³ /sx	H ₂ O gal/sx	500# Comp. Strength (hours)	Slurry Description
Sfc	300	13.5	1.75	9.2	13	Lead: Class C + 4% Gel + 2% CaCl ₂
	250	14.8	1.34	6.4	6	Tail: Class C + 2% CaCl ₂
Intrmd	1000	12.7	1.9	10.6	14	Lead: 35:65:6 C Blend (FR, Retarder, FL adds as needed)
	250	14.8	1.34	6.4	6	Tail: Class C neat
Prod	600	10.3	3.5	21.2	72	Lead: Tuned Light H Blend (FR, Retarder, FL adds as needed)
	2500	14.4	1.25	5.7	17	Tail: 50:50:2 H Blend (FR, Retarder, FL adds as needed)

Casing String	TOC	% Excess
Surface	0'	50% on OH volumes
Intermediate	0'	30% on OH volumes
Production	4850' (500' tie back)	25% on OH volumes EOC-EOL 40% on OH volumes EOC to 9-5/8" shoe

COG Operating LLC, Gunner 8 Federal 9H

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
---	--

BOP installed and tested before drilling which hole?	Size?	System Rated WP	Type	✓	Tested to:
12-1/4"	13-5/8"	2M	Annular	X	50% of working pressure
			Blind Ram		WP
			Pipe Ram		
			Double Ram		
			Other*		
8-3/4"	11"	5M	Annular	X	50% working pressure
			Blind Ram	X	WP
			Pipe Ram	X	
			Double Ram		
			Other*		

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

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. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

Y	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
N	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
	Are anchors required by manufacturer?
N	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. See attached schematic & Description.

COG Operating LLC, Gunner 8 Federal 9H

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	Surf. shoe	FW Gel	8.6-8.8	28-34	N/C
Surf csg	Int shoe	Saturated Brine	10.0-10.2	28-34	N/C
Int shoe	TD	Cut Brine	8.5-9.3	28-34	N/C

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

What will be used to monitor the loss or gain of fluid?	Pason PVT
---	-----------

6. Logging and Testing Procedures

Logging, Coring and Testing.	
X	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No Logs are planned based on well control or offset log information.
	Drill stem test? If yes, explain
	Coring? If yes, explain

Additional logs planned	Interval
Resistivity	
Density	
CBL	
Mud log	
PEX	

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4651 psi
Abnormal Temperature	No

Mitigation measure for abnormal conditions. Describe:
 No abnormal drilling conditions are expected to occur.

Hydrogen Sulfide (H ₂ S) monitors will be installed prior to drilling out the surface shoe. If H ₂ S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H ₂ S is present
X	H ₂ S Contingency Plan Attached

8. Other Facets of Operation

Is this a walking operation? No

Will be pre-setting casing? No

Attachments:

- Directional Plan
- BOP & Choke Schematics
- C102 and supporting maps
- Rig plat
- H2S schematic
- H2S contingency plan
- Interim reclamation plat



COG Operating LLC

Lea County, NM

Gunner 8 Federal Com

#9H

OH

Plan: Design #1

Standard Planning Report

04 March, 2015



Wellplanning
Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #9H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3387.3usft (Original Well Elev)
Project:	Lea County, NM	MD Reference:	WELL @ 3387.3usft (Original Well Elev)
Site:	Gunner 8 Federal Com	North Reference:	Grid
Well:	#9H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #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 Com				
Site Position:		Northing:	383,347.50 usft	Latitude:	32° 3' 3.934 N
From:	Map	Easting:	763,104.70 usft	Longitude:	103° 29' 2.891 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.45 °

Well	#9H					
Well Position	+N/-S	-20.2 usft	Northing:	383,327.30 usft	Latitude:	32° 3' 4.044 N
	+E/-W	-4,019.1 usft	Easting:	759,085.60 usft	Longitude:	103° 29' 49.588 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	3,361.3 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/4/2015	7.08	59.95	48,149

Design	Design #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	0.09

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	
9,422.5	0.00	0.00	9,422.5	0.0	0.0	0.00	0.00	0.00	0.00	
10,176.1	90.42	0.09	9,900.0	481.0	0.8	12.00	12.00	0.00	0.09	
19,727.8	90.42	0.09	9,830.0	10,032.5	15.8	0.00	0.00	0.00	0.00	PBHL(G8#9)



Wellplanning
Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #9H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3387.3usft (Original Well Elev)
Project:	Lea County, NM	MD Reference:	WELL @ 3387.3usft (Original Well Elev)
Site:	Gunner 8 Federal Com	North Reference:	Grid
Well:	#9H	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	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	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	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	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	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	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	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	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	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	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	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	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	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	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	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	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	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	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	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	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	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	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	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	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	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	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	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	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	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	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	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	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	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	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	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	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	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	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	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	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	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	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	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	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	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	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	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	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	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	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	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	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	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00



Wellplanning
Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #9H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3387.3usft (Original Well Elev)
Project:	Lea County, NM	MD Reference:	WELL @ 3387.3usft (Original Well Elev)
Site:	Gunner 8 Federal Com	North Reference:	Grid
Well:	#9H	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	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	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	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	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	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	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	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	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	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	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	0.00
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	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	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	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	0.00
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	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	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	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	0.00
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	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	0.00
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	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	0.00
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	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	0.00
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	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	0.00
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	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	0.00
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	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	0.00
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	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	0.00
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	0.00	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	0.00
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	0.00	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	0.00
9,100.0	0.00	0.00	9,100.0	0.0	0.0	0.0	0.00	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	0.00
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	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	0.00
9,422.5	0.00	0.00	9,422.5	0.0	0.0	0.0	0.00	0.00	0.00	0.00
KOP - 9422.5 MD, 0.00° INC, 0.00° AZI										
9,425.0	0.30	0.09	9,425.0	0.0	0.0	0.0	12.00	12.00	0.00	0.00
9,450.0	3.30	0.09	9,450.0	0.8	0.0	0.8	12.00	12.00	0.00	0.00
9,475.0	6.30	0.09	9,474.9	2.9	0.0	2.9	12.00	12.00	0.00	0.00
9,500.0	9.30	0.09	9,499.7	6.3	0.0	6.3	12.00	12.00	0.00	0.00
9,525.0	12.30	0.09	9,524.2	11.0	0.0	11.0	12.00	12.00	0.00	0.00
9,550.0	15.30	0.09	9,548.5	16.9	0.0	16.9	12.00	12.00	0.00	0.00
9,575.0	18.30	0.09	9,572.4	24.1	0.0	24.1	12.00	12.00	0.00	0.00
9,600.0	21.30	0.09	9,595.9	32.6	0.1	32.6	12.00	12.00	0.00	0.00
9,625.0	24.30	0.09	9,619.0	42.3	0.1	42.3	12.00	12.00	0.00	0.00
9,650.0	27.30	0.09	9,641.5	53.2	0.1	53.2	12.00	12.00	0.00	0.00



Wellplanning
Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #9H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3387.3usft (Original Well Elev)
Project:	Lea County, NM	MD Reference:	WELL @ 3387.3usft (Original Well Elev)
Site:	Gunner 8 Federal Com	North Reference:	Grid
Well:	#9H	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)	
9,675.0	30.30	0.09	9,663.4	65.2	0.1	65.2	12.00	12.00	0.00	
9,700.0	33.30	0.09	9,684.6	78.4	0.1	78.4	12.00	12.00	0.00	
9,725.0	36.30	0.09	9,705.2	92.7	0.1	92.7	12.00	12.00	0.00	
9,750.0	39.30	0.09	9,724.9	108.0	0.2	108.0	12.00	12.00	0.00	
9,775.0	42.30	0.09	9,743.8	124.3	0.2	124.3	12.00	12.00	0.00	
9,800.0	45.30	0.09	9,761.9	141.6	0.2	141.6	12.00	12.00	0.00	
9,825.0	48.30	0.09	9,779.0	159.8	0.3	159.8	12.00	12.00	0.00	
9,850.0	51.29	0.09	9,795.1	178.9	0.3	178.9	12.00	12.00	0.00	
9,875.0	54.29	0.09	9,810.3	198.8	0.3	198.8	12.00	12.00	0.00	
9,900.0	57.29	0.09	9,824.3	219.5	0.3	219.5	12.00	12.00	0.00	
9,925.0	60.29	0.09	9,837.3	240.9	0.4	240.9	12.00	12.00	0.00	
9,950.0	63.29	0.09	9,849.1	262.9	0.4	262.9	12.00	12.00	0.00	
9,975.0	66.29	0.09	9,859.7	285.5	0.4	285.5	12.00	12.00	0.00	
10,000.0	69.29	0.09	9,869.2	308.7	0.5	308.7	12.00	12.00	0.00	
10,025.0	72.29	0.09	9,877.4	332.3	0.5	332.3	12.00	12.00	0.00	
10,050.0	75.29	0.09	9,884.4	356.3	0.6	356.3	12.00	12.00	0.00	
10,075.0	78.29	0.09	9,890.1	380.6	0.6	380.6	12.00	12.00	0.00	
10,100.0	81.29	0.09	9,894.5	405.2	0.6	405.2	12.00	12.00	0.00	
10,125.0	84.29	0.09	9,897.6	430.0	0.7	430.0	12.00	12.00	0.00	
10,150.0	87.29	0.09	9,899.5	454.9	0.7	454.9	12.00	12.00	0.00	
10,176.1	90.42	0.09	9,900.0	481.0	0.8	481.0	12.00	12.00	0.00	
EOC- 10176.1 'MD, 90.42° INC, 0.09° AZI										
10,200.0	90.42	0.09	9,899.8	504.9	0.8	504.9	0.00	0.00	0.00	
10,300.0	90.42	0.09	9,899.1	604.9	1.0	604.9	0.00	0.00	0.00	
10,400.0	90.42	0.09	9,898.4	704.9	1.1	704.9	0.00	0.00	0.00	
10,500.0	90.42	0.09	9,897.6	804.9	1.3	804.9	0.00	0.00	0.00	
10,600.0	90.42	0.09	9,896.9	904.9	1.4	904.9	0.00	0.00	0.00	
10,700.0	90.42	0.09	9,896.2	1,004.9	1.6	1,004.9	0.00	0.00	0.00	
10,800.0	90.42	0.09	9,895.4	1,104.9	1.7	1,104.9	0.00	0.00	0.00	
10,900.0	90.42	0.09	9,894.7	1,204.9	1.9	1,204.9	0.00	0.00	0.00	
11,000.0	90.42	0.09	9,894.0	1,304.9	2.0	1,304.9	0.00	0.00	0.00	
11,100.0	90.42	0.09	9,893.2	1,404.9	2.2	1,404.9	0.00	0.00	0.00	
11,200.0	90.42	0.09	9,892.5	1,504.9	2.4	1,504.9	0.00	0.00	0.00	
11,300.0	90.42	0.09	9,891.8	1,604.9	2.5	1,604.9	0.00	0.00	0.00	
11,400.0	90.42	0.09	9,891.0	1,704.9	2.7	1,704.9	0.00	0.00	0.00	
11,500.0	90.42	0.09	9,890.3	1,804.9	2.8	1,804.9	0.00	0.00	0.00	
11,600.0	90.42	0.09	9,889.6	1,904.9	3.0	1,904.9	0.00	0.00	0.00	
11,700.0	90.42	0.09	9,888.8	2,004.9	3.1	2,004.9	0.00	0.00	0.00	
11,800.0	90.42	0.09	9,888.1	2,104.9	3.3	2,104.9	0.00	0.00	0.00	
11,900.0	90.42	0.09	9,887.4	2,204.9	3.5	2,204.9	0.00	0.00	0.00	
12,000.0	90.42	0.09	9,886.6	2,304.9	3.6	2,304.9	0.00	0.00	0.00	
12,100.0	90.42	0.09	9,885.9	2,404.9	3.8	2,404.9	0.00	0.00	0.00	
12,200.0	90.42	0.09	9,885.2	2,504.9	3.9	2,504.9	0.00	0.00	0.00	
12,300.0	90.42	0.09	9,884.4	2,604.9	4.1	2,604.9	0.00	0.00	0.00	
12,400.0	90.42	0.09	9,883.7	2,704.9	4.2	2,704.9	0.00	0.00	0.00	
12,500.0	90.42	0.09	9,883.0	2,804.9	4.4	2,804.9	0.00	0.00	0.00	
12,600.0	90.42	0.09	9,882.2	2,904.9	4.6	2,904.9	0.00	0.00	0.00	
12,700.0	90.42	0.09	9,881.5	3,004.9	4.7	3,004.9	0.00	0.00	0.00	
12,800.0	90.42	0.09	9,880.8	3,104.9	4.9	3,104.9	0.00	0.00	0.00	
12,900.0	90.42	0.09	9,880.0	3,204.9	5.0	3,204.9	0.00	0.00	0.00	
13,000.0	90.42	0.09	9,879.3	3,304.9	5.2	3,304.9	0.00	0.00	0.00	
13,100.0	90.42	0.09	9,878.6	3,404.9	5.3	3,404.9	0.00	0.00	0.00	
13,200.0	90.42	0.09	9,877.8	3,504.9	5.5	3,504.9	0.00	0.00	0.00	
13,300.0	90.42	0.09	9,877.1	3,604.8	5.7	3,604.9	0.00	0.00	0.00	



Wellplanning
Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #9H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3387.3usft (Original Well Elev)
Project:	Lea County, NM	MD Reference:	WELL @ 3387.3usft (Original Well Elev)
Site:	Gunner 8 Federal Com	North Reference:	Grid
Well:	#9H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
13,400.0	90.42	0.09	9,876.4	3,704.8	5.8	3,704.9	0.00	0.00	0.00	
13,500.0	90.42	0.09	9,875.6	3,804.8	6.0	3,804.8	0.00	0.00	0.00	
13,600.0	90.42	0.09	9,874.9	3,904.8	6.1	3,904.8	0.00	0.00	0.00	
13,700.0	90.42	0.09	9,874.2	4,004.8	6.3	4,004.8	0.00	0.00	0.00	
13,800.0	90.42	0.09	9,873.4	4,104.8	6.4	4,104.8	0.00	0.00	0.00	
13,900.0	90.42	0.09	9,872.7	4,204.8	6.6	4,204.8	0.00	0.00	0.00	
14,000.0	90.42	0.09	9,872.0	4,304.8	6.8	4,304.8	0.00	0.00	0.00	
14,100.0	90.42	0.09	9,871.2	4,404.8	6.9	4,404.8	0.00	0.00	0.00	
14,200.0	90.42	0.09	9,870.5	4,504.8	7.1	4,504.8	0.00	0.00	0.00	
14,300.0	90.42	0.09	9,869.8	4,604.8	7.2	4,604.8	0.00	0.00	0.00	
14,400.0	90.42	0.09	9,869.0	4,704.8	7.4	4,704.8	0.00	0.00	0.00	
14,500.0	90.42	0.09	9,868.3	4,804.8	7.5	4,804.8	0.00	0.00	0.00	
14,600.0	90.42	0.09	9,867.6	4,904.8	7.7	4,904.8	0.00	0.00	0.00	
14,700.0	90.42	0.09	9,866.8	5,004.8	7.9	5,004.8	0.00	0.00	0.00	
14,800.0	90.42	0.09	9,866.1	5,104.8	8.0	5,104.8	0.00	0.00	0.00	
14,900.0	90.42	0.09	9,865.4	5,204.8	8.2	5,204.8	0.00	0.00	0.00	
15,000.0	90.42	0.09	9,864.6	5,304.8	8.3	5,304.8	0.00	0.00	0.00	
15,100.0	90.42	0.09	9,863.9	5,404.8	8.5	5,404.8	0.00	0.00	0.00	
15,200.0	90.42	0.09	9,863.2	5,504.8	8.6	5,504.8	0.00	0.00	0.00	
15,300.0	90.42	0.09	9,862.4	5,604.8	8.8	5,604.8	0.00	0.00	0.00	
15,400.0	90.42	0.09	9,861.7	5,704.8	9.0	5,704.8	0.00	0.00	0.00	
15,500.0	90.42	0.09	9,861.0	5,804.8	9.1	5,804.8	0.00	0.00	0.00	
15,600.0	90.42	0.09	9,860.2	5,904.8	9.3	5,904.8	0.00	0.00	0.00	
15,700.0	90.42	0.09	9,859.5	6,004.8	9.4	6,004.8	0.00	0.00	0.00	
15,800.0	90.42	0.09	9,858.8	6,104.8	9.6	6,104.8	0.00	0.00	0.00	
15,900.0	90.42	0.09	9,858.0	6,204.8	9.7	6,204.8	0.00	0.00	0.00	
16,000.0	90.42	0.09	9,857.3	6,304.8	9.9	6,304.8	0.00	0.00	0.00	
16,100.0	90.42	0.09	9,856.6	6,404.8	10.1	6,404.8	0.00	0.00	0.00	
16,200.0	90.42	0.09	9,855.8	6,504.8	10.2	6,504.8	0.00	0.00	0.00	
16,300.0	90.42	0.09	9,855.1	6,604.8	10.4	6,604.8	0.00	0.00	0.00	
16,400.0	90.42	0.09	9,854.4	6,704.8	10.5	6,704.8	0.00	0.00	0.00	
16,500.0	90.42	0.09	9,853.6	6,804.8	10.7	6,804.8	0.00	0.00	0.00	
16,600.0	90.42	0.09	9,852.9	6,904.8	10.8	6,904.8	0.00	0.00	0.00	
16,700.0	90.42	0.09	9,852.2	7,004.8	11.0	7,004.8	0.00	0.00	0.00	
16,800.0	90.42	0.09	9,851.4	7,104.8	11.2	7,104.8	0.00	0.00	0.00	
16,900.0	90.42	0.09	9,850.7	7,204.7	11.3	7,204.8	0.00	0.00	0.00	
17,000.0	90.42	0.09	9,850.0	7,304.7	11.5	7,304.8	0.00	0.00	0.00	
17,100.0	90.42	0.09	9,849.2	7,404.7	11.6	7,404.8	0.00	0.00	0.00	
17,200.0	90.42	0.09	9,848.5	7,504.7	11.8	7,504.7	0.00	0.00	0.00	
17,300.0	90.42	0.09	9,847.8	7,604.7	11.9	7,604.7	0.00	0.00	0.00	
17,400.0	90.42	0.09	9,847.0	7,704.7	12.1	7,704.7	0.00	0.00	0.00	
17,500.0	90.42	0.09	9,846.3	7,804.7	12.3	7,804.7	0.00	0.00	0.00	
17,600.0	90.42	0.09	9,845.6	7,904.7	12.4	7,904.7	0.00	0.00	0.00	
17,700.0	90.42	0.09	9,844.8	8,004.7	12.6	8,004.7	0.00	0.00	0.00	
17,800.0	90.42	0.09	9,844.1	8,104.7	12.7	8,104.7	0.00	0.00	0.00	
17,900.0	90.42	0.09	9,843.4	8,204.7	12.9	8,204.7	0.00	0.00	0.00	
18,000.0	90.42	0.09	9,842.6	8,304.7	13.0	8,304.7	0.00	0.00	0.00	
18,100.0	90.42	0.09	9,841.9	8,404.7	13.2	8,404.7	0.00	0.00	0.00	
18,200.0	90.42	0.09	9,841.2	8,504.7	13.4	8,504.7	0.00	0.00	0.00	
18,300.0	90.42	0.09	9,840.4	8,604.7	13.5	8,604.7	0.00	0.00	0.00	
18,400.0	90.42	0.09	9,839.7	8,704.7	13.7	8,704.7	0.00	0.00	0.00	
18,500.0	90.42	0.09	9,839.0	8,804.7	13.8	8,804.7	0.00	0.00	0.00	
18,600.0	90.42	0.09	9,838.2	8,904.7	14.0	8,904.7	0.00	0.00	0.00	
18,700.0	90.42	0.09	9,837.5	9,004.7	14.1	9,004.7	0.00	0.00	0.00	



Wellplanning
Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #9H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3387.3usft (Original Well Elev)
Project:	Lea County, NM	MD Reference:	WELL @ 3387.3usft (Original Well Elev)
Site:	Gunner 8 Federal Com	North Reference:	Grid
Well:	#9H	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)	
18,800.0	90.42	0.09	9,836.8	9,104.7	14.3	9,104.7	0.00	0.00	0.00	
18,900.0	90.42	0.09	9,836.1	9,204.7	14.5	9,204.7	0.00	0.00	0.00	
19,000.0	90.42	0.09	9,835.3	9,304.7	14.6	9,304.7	0.00	0.00	0.00	
19,100.0	90.42	0.09	9,834.6	9,404.7	14.8	9,404.7	0.00	0.00	0.00	
19,200.0	90.42	0.09	9,833.9	9,504.7	14.9	9,504.7	0.00	0.00	0.00	
19,300.0	90.42	0.09	9,833.1	9,604.7	15.1	9,604.7	0.00	0.00	0.00	
19,400.0	90.42	0.09	9,832.4	9,704.7	15.2	9,704.7	0.00	0.00	0.00	
19,500.0	90.42	0.09	9,831.7	9,804.7	15.4	9,804.7	0.00	0.00	0.00	
19,600.0	90.42	0.09	9,830.9	9,904.7	15.6	9,904.7	0.00	0.00	0.00	
19,700.0	90.42	0.09	9,830.2	10,004.7	15.7	10,004.7	0.00	0.00	0.00	
19,727.8	90.42	0.09	9,830.0	10,032.5	15.8	10,032.5	0.00	0.00	0.00	
TD at 19727.8 - PBHL(G8#9)										

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL(G8#9)	0.00	0.00	9,830.0	10,032.5	15.6	393,359.80	759,101.20	32° 4' 43.321 N	103° 29' 48.503 W
- plan misses target center by 0.2usft at 19727.8usft MD (9830.0 TVD, 10032.5 N, 15.8 E)									
- Point									

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
9,422.5	9,422.5	0.0	0.0	KOP - 9422.5 'MD, 0.00° INC, 0.00° AZI	
10,176.1	9,900.0	481.0	0.8	EOC- 10176.1 'MD, 90.42° INC, 0.09° AZI	
19,727.8	9,830.0	10,032.5	15.8	TD at 19727.8	



COG Operating LLC
 Project: Lea County, NM
 Site: Gunner 8 Federal Com
 Well: #9H
 Plan: Design #1 (#9H/OH)

WELL DETAILS: #9H

Ground Elevation: 3361.3
 RKB Elevation: WELL @ 3387.3usft (Original Well Elev)
 Rig Name: Original Well Elev

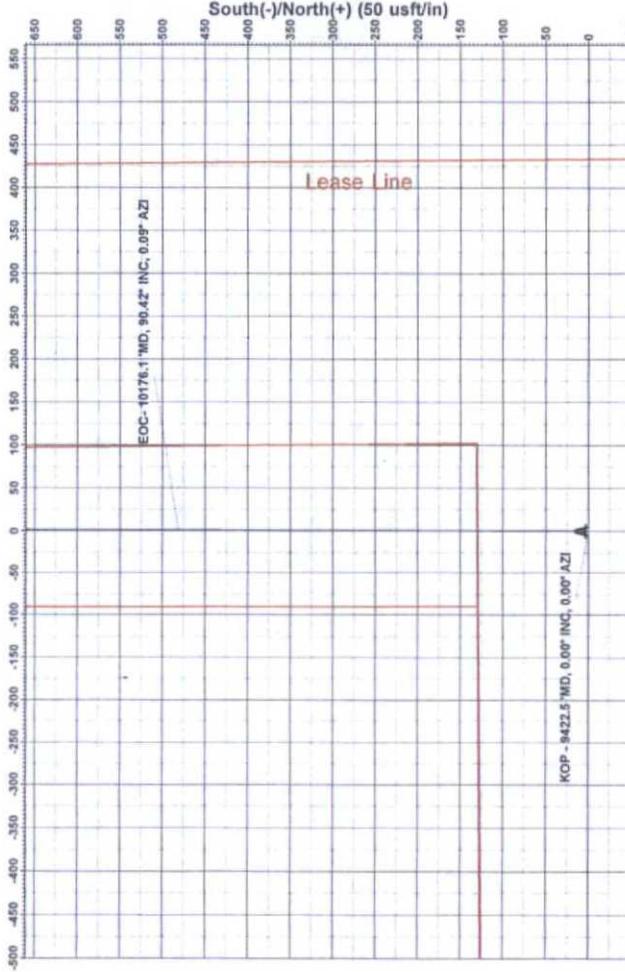
Northing: 383327.30
 Easting: 759085.60
 Latitude: 32° 3' 4.044 N
 Longitude: 103° 29' 49.588 W



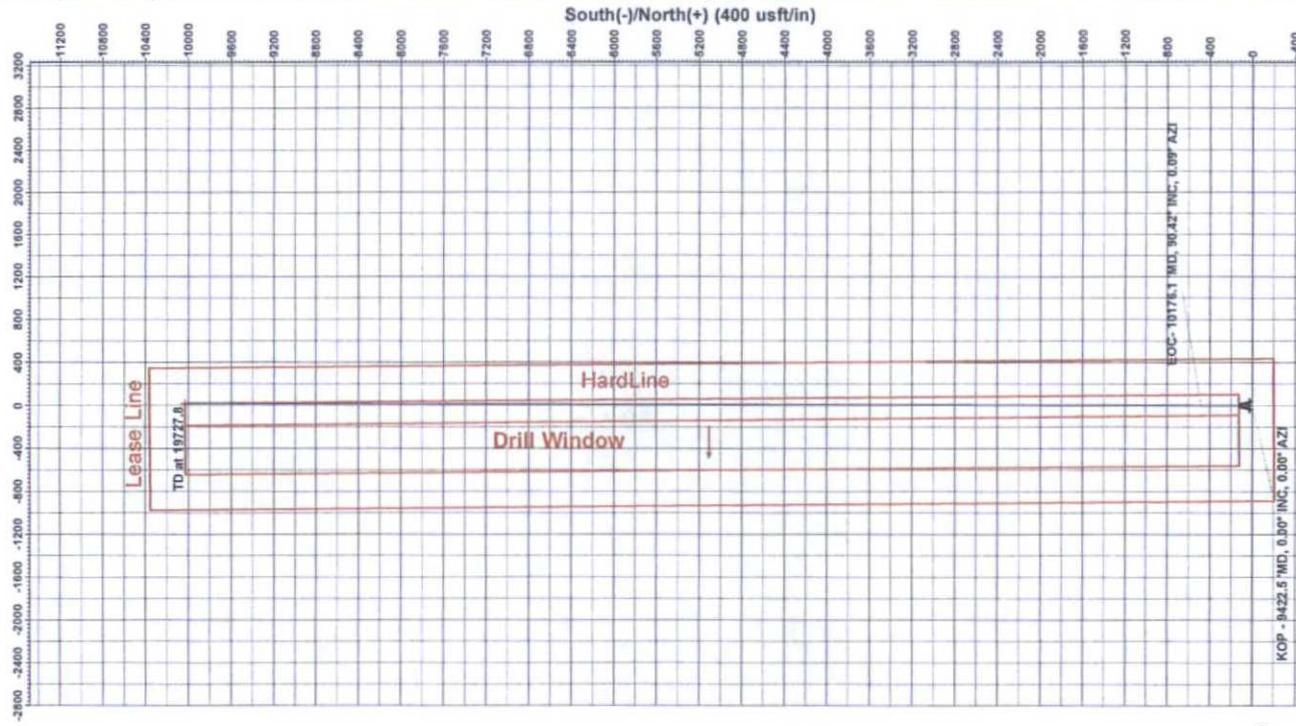
Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSEct	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.0
2	9422.5	0.00	0.00	9422.5	0.0	0.0	0.00	0.00	0.0	0.0
3	10176.1	90.42	0.09	9900.0	481.0	0.8	12.00	0.09	481.0	0.8
4	19727.8	90.42	0.09	9830.0	10032.5	15.8	0.00	0.00	10032.5	PBHL(G8#9)

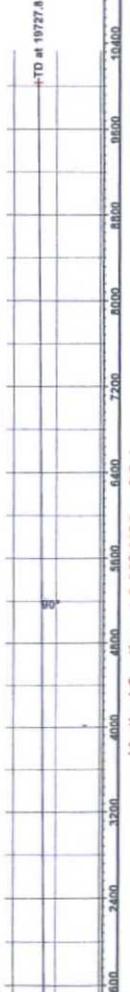
West(-)/East(+) (50 usft/in)



West(-)/East(+) (400 usft/in)



Vertical Section at 0.09° (400 usft/in)



Nexus Directional Solutions

PROJECT DETAIL S: 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



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

No records found.

PLSS Search:

Section(s): 5

Township: 26S

Range: 34E



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

No records found.

PLSS Search:

Section(s): 8

Township: 26S

Range: 34E

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

3/5/15 12:57 PM

Page 1 of 1

WATER COLUMN/ AVERAGE
DEPTH TO WATER



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-Code	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
<u>C 02291</u>	CUB	LE		1	1	2	06	26S	34E	640825	3550140*	220	160	60
<u>C 02292 POD1</u>	C	LE		4	1	2	06	26S	34E	640992	3549987	200	140	60
<u>C 03441 POD1</u>	C	LE		4	1	2	06	26S	34E	640971	3550039	250		
<u>C 03442 POD1</u>	C	LE		4	1	2	06	26S	34E	641056	3550028	251		

Average Depth to Water: **150 feet**
 Minimum Depth: **140 feet**
 Maximum Depth: **160 feet**

Record Count: 4

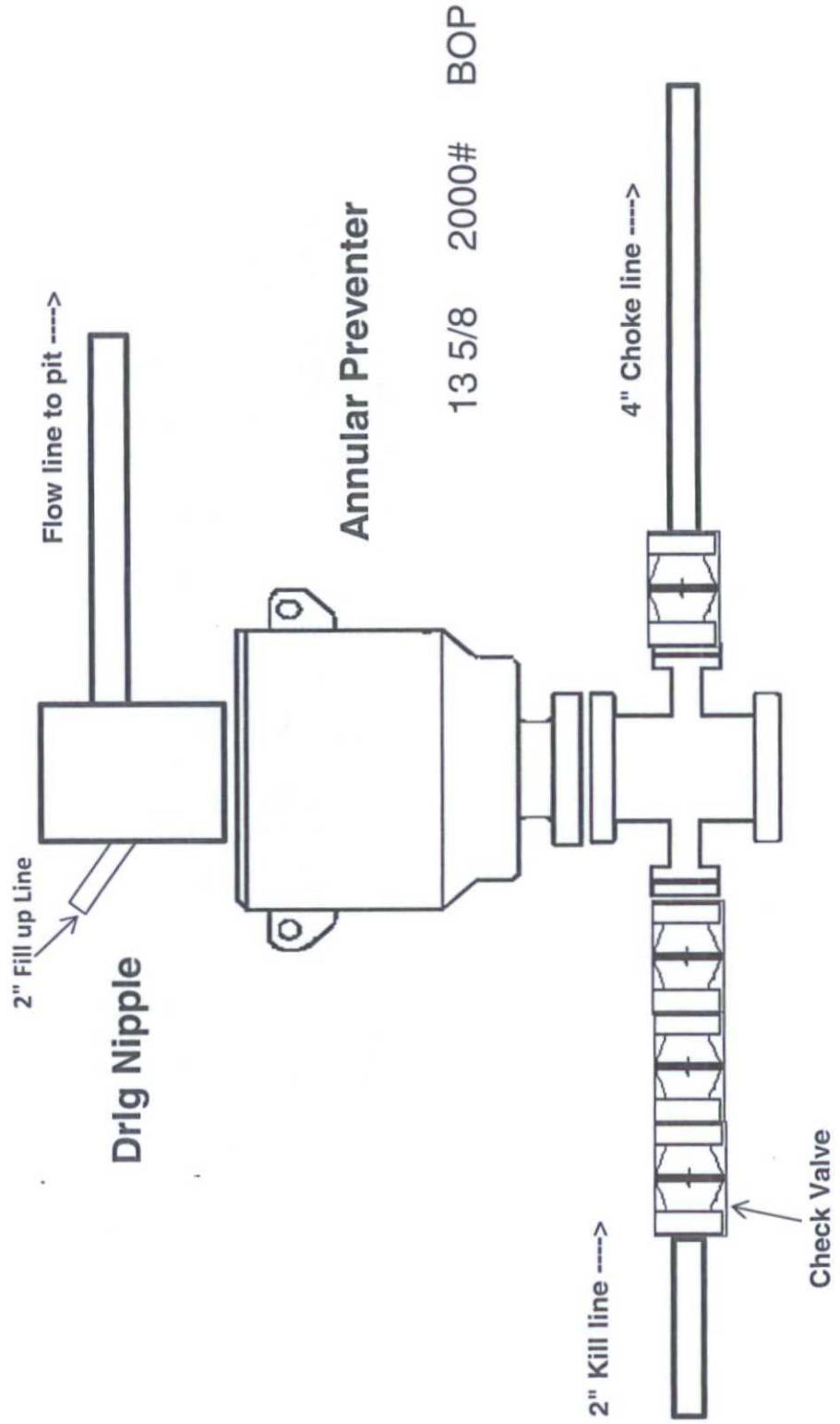
PLSS Search:

Township: 26S Range: 34E

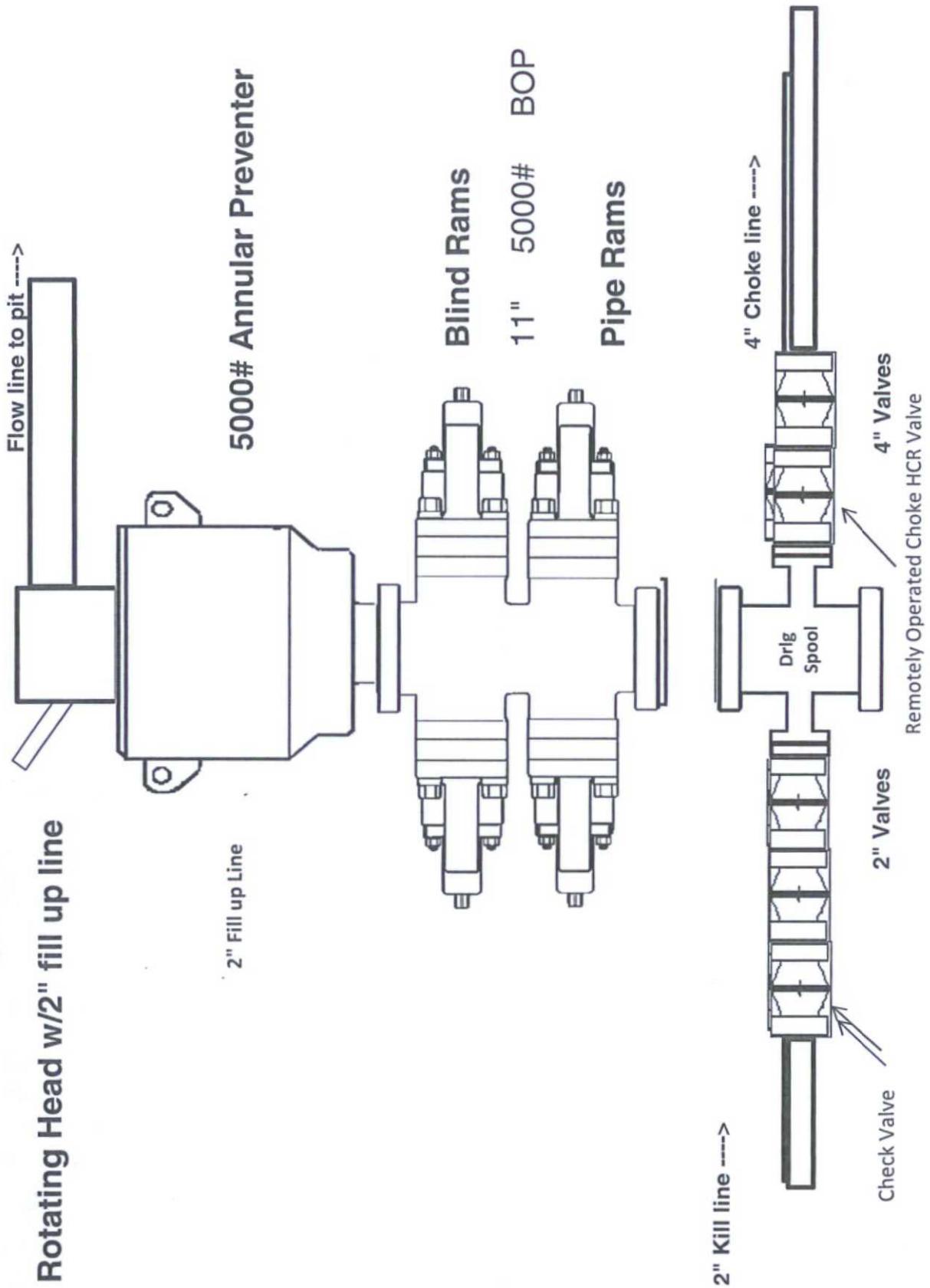
*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

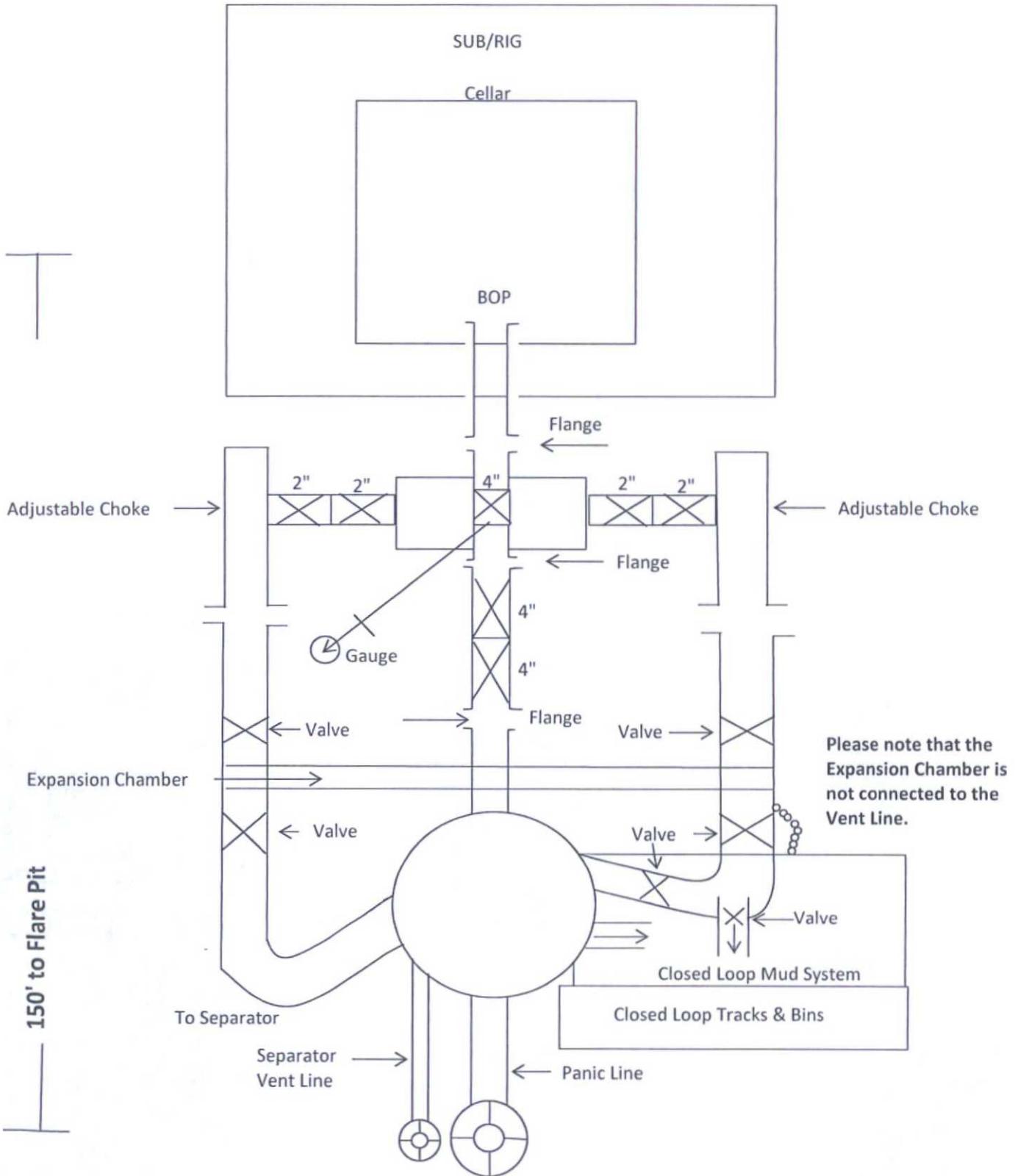
2,000 psi BOP Schematic



5,000 psi BOP Schematic

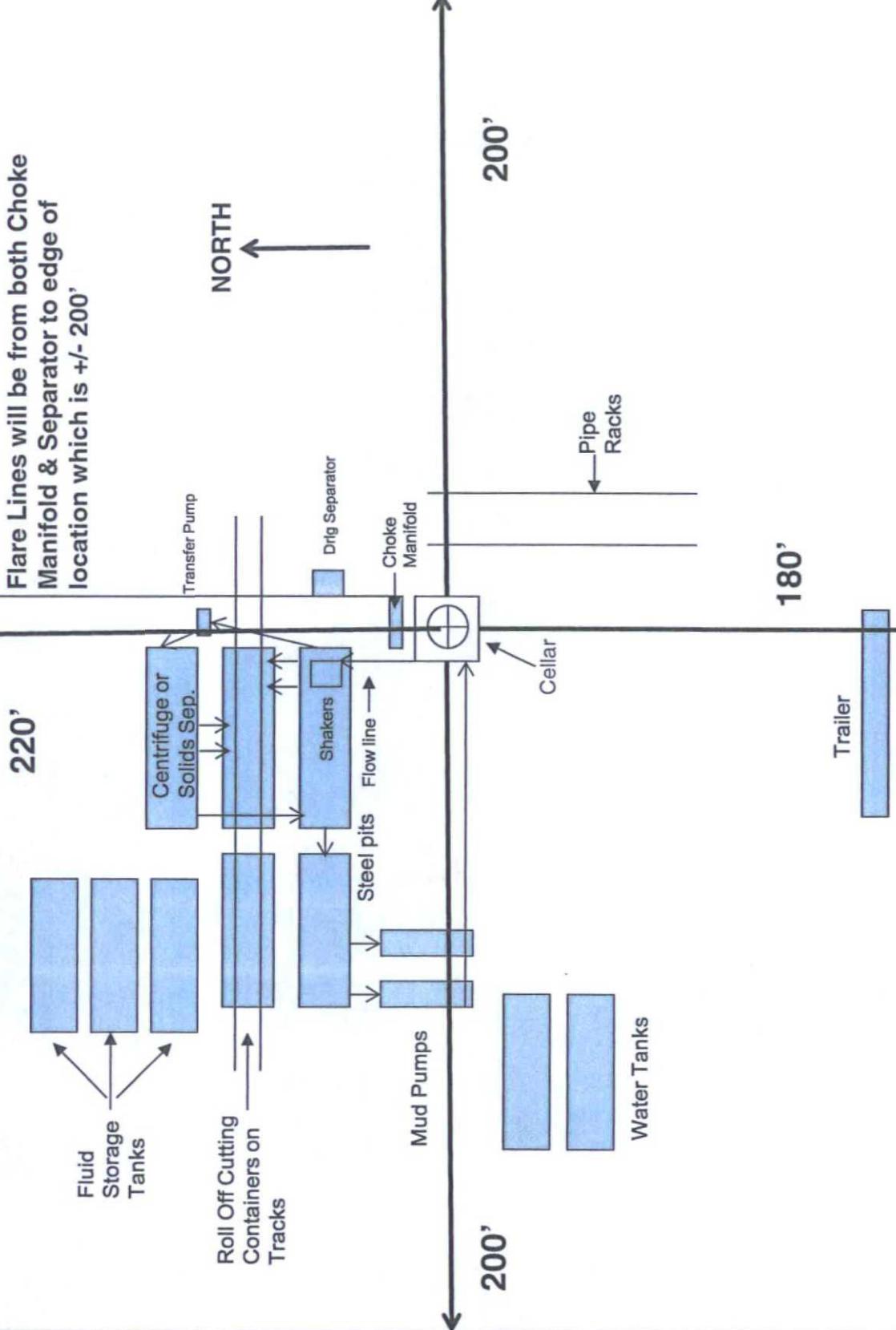


2M Choke Manifold Equipment



COG Operating LLC

Rig Plat & Closed Loop Equipment Diagram



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