

HOBBS OCD

APR 26 2017

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

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

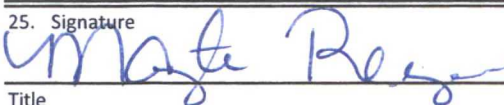
APPLICATION FOR PERMIT TO DRILL OR REENTER

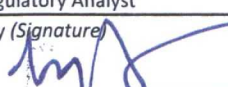
1a. Type of Work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		7. If Unit or CA Agreement, Name and No.	
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		8. Lease Name and Well No. (317670) Azores Federal Com #5H	
2. Name of Operator COG Production LLC. (21794)		9. API Well No. 30-025-43760	
3a. Address 2208 West Main Street Artesia, NM 88210	3b. Phone No. (include area code) 575-748-6940	10. Field and Pool, or Exploratory (97899) WC-025 G-06 S253206M; Bone Spring	
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 210' FSL & 370' FEL Unit Letter P (SESE) Sec 29-T24S-R32E At proposed prod. Zone 200' FNL & 330' FEL Unit Letter A (NENE) Sec 29-T24S-R32E		11. Sec., T.R.M. or Blk and Survey or Area Sec. 29 - T24S - R32E	
14. Distance in miles and direction from nearest town or post office* Approximately 21 miles East of Malaga		12. County or Parish Lea	13. State NM
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 200'	16. No. of acres in lease NMNM108968: 80 NMNM120908: 1891.72	17. Spacing Unit dedicated to this well 160	
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 50' (Prop. Azores #10H)	19. Proposed Depth TVD: 9,260' MD: 13,958'	20. BLM/BIA Bond No. on file NMB000860 & NMB000845	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3508.6' GL	22. Approximate date work will start* 11/1/2016	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.  | 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 	Name (Printed/Typed) Mayte Reyes	Date 9/15/2016
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Regulatory Analyst		
Approved by (Signature) 	Name (Printed/Typed) Cody Layton	Date 07 Apr 2017
Title FOR FIELD MANAGER	Office BLM-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.

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)

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

KZ  
04/26/17

# COG Production, LLC - Azores Federal Com #5H

## 1. Geologic Formations

TVD of target	9,290' EOL	Pilot hole depth	NA
MD at TD:	13,958'	Deepest expected fresh water:	541'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	881	Water	
Top of Salt	1098	Salt	
Base of Salt	4416	Salt	
Lamar	4644	Salt Water	
Bell Canyon	4666	Salt Water	
Cherry Canyon	5576	Oil/Gas	
Brushy Canyon	6966	Oil/Gas	
Bone Spring Lime	8590	Oil/Gas	
U. Avalon Shale	8830	Oil/Gas	
L. Avalon Shale	9070	Oil/Gas	
1st Bone Spring Sand	9649	Oil/Gas	
2nd Bone Spring Sand	X	Oil/Gas	
3rd Bone Spring Sand	X	Oil/Gas	
Wolfcamp	X	Oil/Gas	

## 2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	910	13.375"	54.5	J55	STC	2.71	1.36	10.36
12.25"	0	4670	9.625"	40	J55	LTC	1.04	1.09	2.78
8.75"	0	13,958	5.5"	17	P110	LTC	1.65	2.95	2.82
BLM Minimum Safety Factor							1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing to mitigate collapse. Intermediate burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface.

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h



**COG Production, LLC - Azores Federal Com #5H**

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? 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 (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	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 <sup>rd</sup> 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 <sup>nd</sup> 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

Casing	# Sks	Wt. lb/ gal	Yld ft <sup>3</sup> / sack	H <sub>2</sub> O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	360	13.5	1.75	9	12	Lead: Class C + 4% Gel + 1% CaCl <sub>2</sub>
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl <sub>2</sub>
Inter.	890	12.7	2.0	9.6	16	Lead: 35:65:6 C Blend
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl
5.5 Prod	640	11.9	2.5	19	72	Lead: 50:50:10 H Blend
	1320	14.4	1.24	5.7	19	Tail: 50:50:2 Class H Blend

Volumes Subject to Observed Hole Conditions and/or Fluid Caliper Results

Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
Surface	0'	50%
1 <sup>st</sup> Intermediate	0'	50%
Production	4,170'	25% OH in Lateral (KOP to EOL) – 40% OH in Vertical



## 4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
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BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	x	Tested to:
12-1/4"	13-5/8"	2M	Annular	x	2000 psi
			Blind Ram		2M
			Pipe Ram		
			Double Ram		
			Other*		
8-3/4"	13-5/8"	3M	Annular	x	50% testing pressure
			Blind Ram	x	3M
			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.

X	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.
Y	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.
N	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.

## 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	9-5/8" Int shoe	Saturated Brine	10 - 10.2	28-34	N/C
9-5/8" Int shoe	Lateral TD	Cut Brine	8.6 - 9.4	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?	PVT/Pason/Visual Monitoring
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## 6. Logging and Testing Procedures

Logging, Coring and Testing.	
Y	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.
Y	No Logs are planned based on well control or offset log information.
N	Drill stem test? If yes, explain.
N	Coring? If yes, explain.

Additional logs planned		Interval
N	Resistivity	Pilot Hole TD to ICP
N	Density	Pilot Hole TD to ICP
Y	CBL	Production casing (If cement not circulated to surface)
Y	Mud log	Intermediate shoe to TD
N	PEX	



**7. Drilling Conditions**

Condition	Specify what type and where?
BH Pressure at deepest TVD	4545 psi at 9290' TVD
Abnormal Temperature	NO 150 Deg. F.

No abnormal pressure or temperature conditions are anticipated. Sufficient mud materials to maintain mud properties and weight increase requirements will be kept on location at all times.

Sufficient supplies of Paper/LCM for periodic sweeps to control seepage and losses will be maintained on location.

Hydrogen Sulfide (H<sub>2</sub>S) monitors will be installed prior to drilling out the surface shoe. If H<sub>2</sub>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.

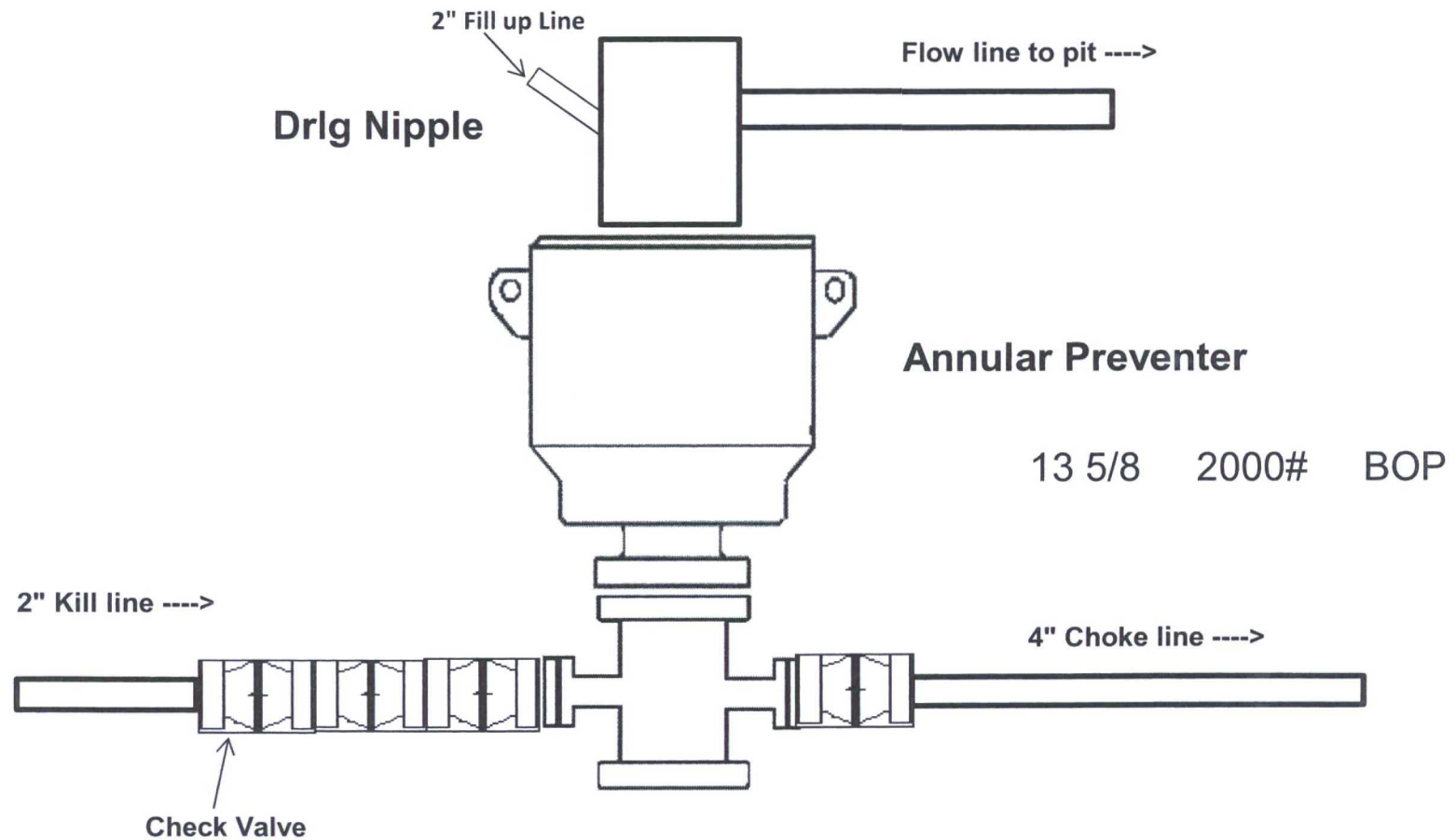
N	H <sub>2</sub> S is present
Y	H <sub>2</sub> S Plan attached

**8. Other Facets of Operation**

N	Is it a walking operation?
N	Is casing pre-set?

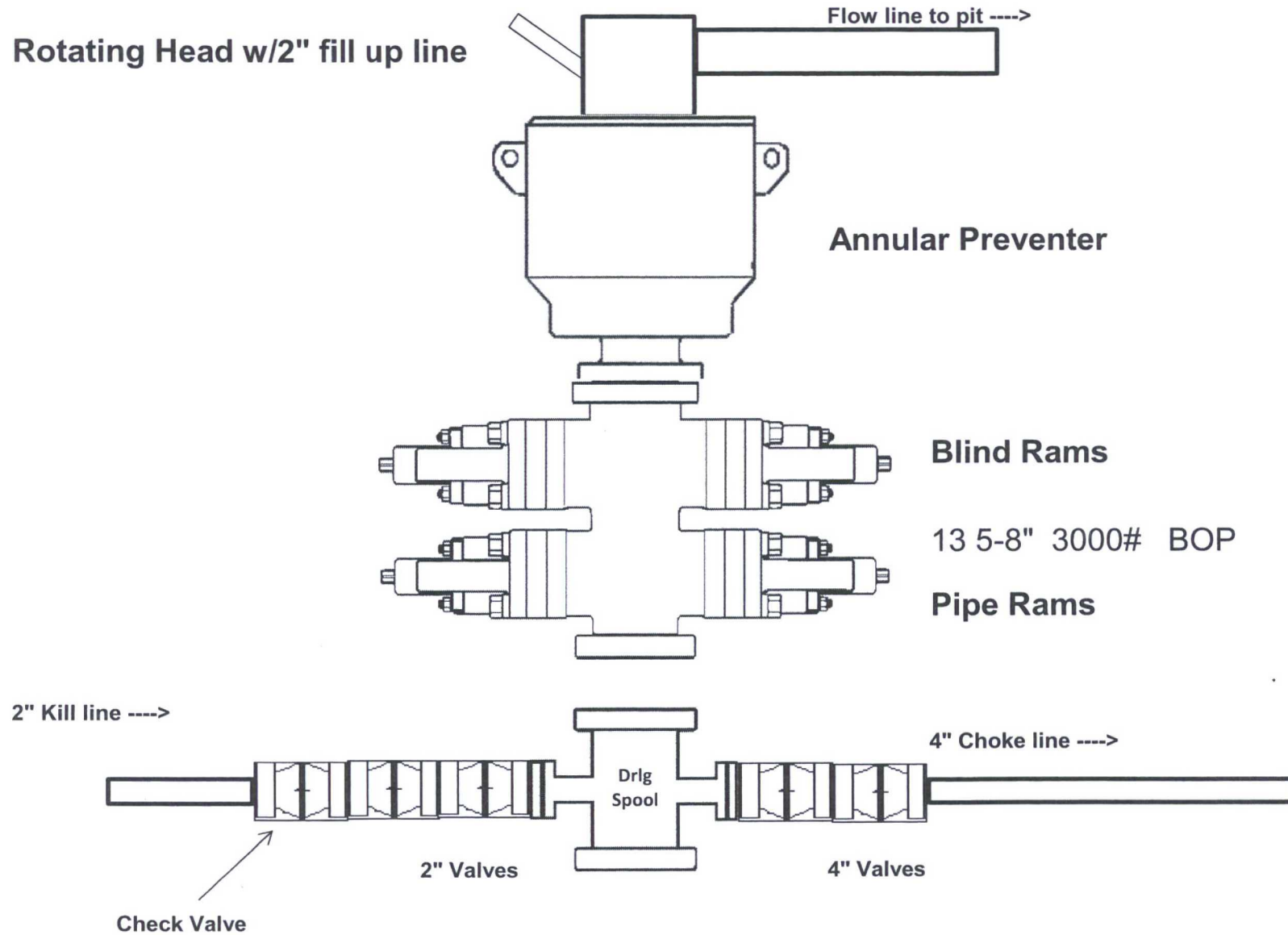
x	H <sub>2</sub> S Plan.
x	BOP & Choke Schematics.
x	Directional Plan

## 2,000 psi BOP Schematic

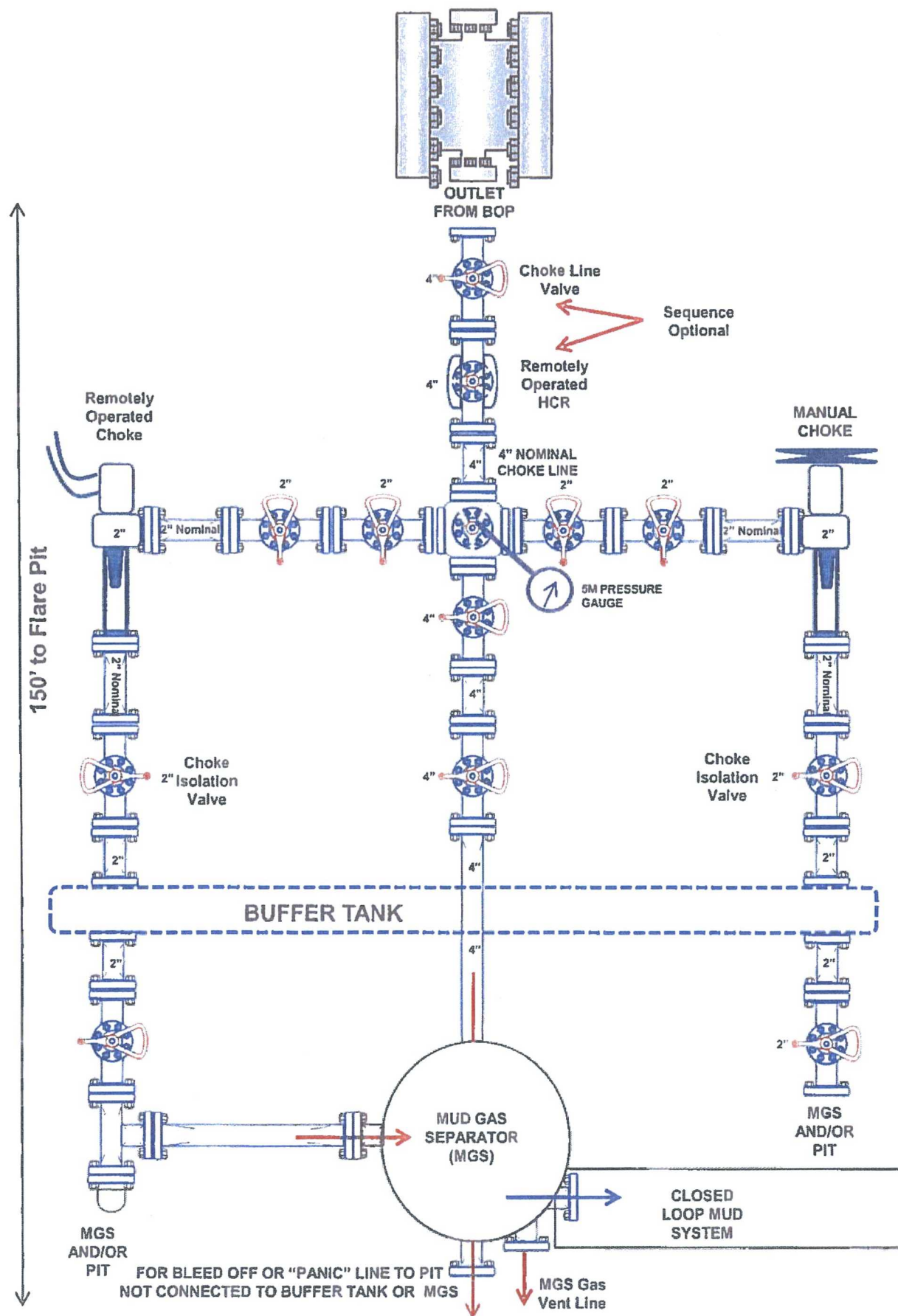




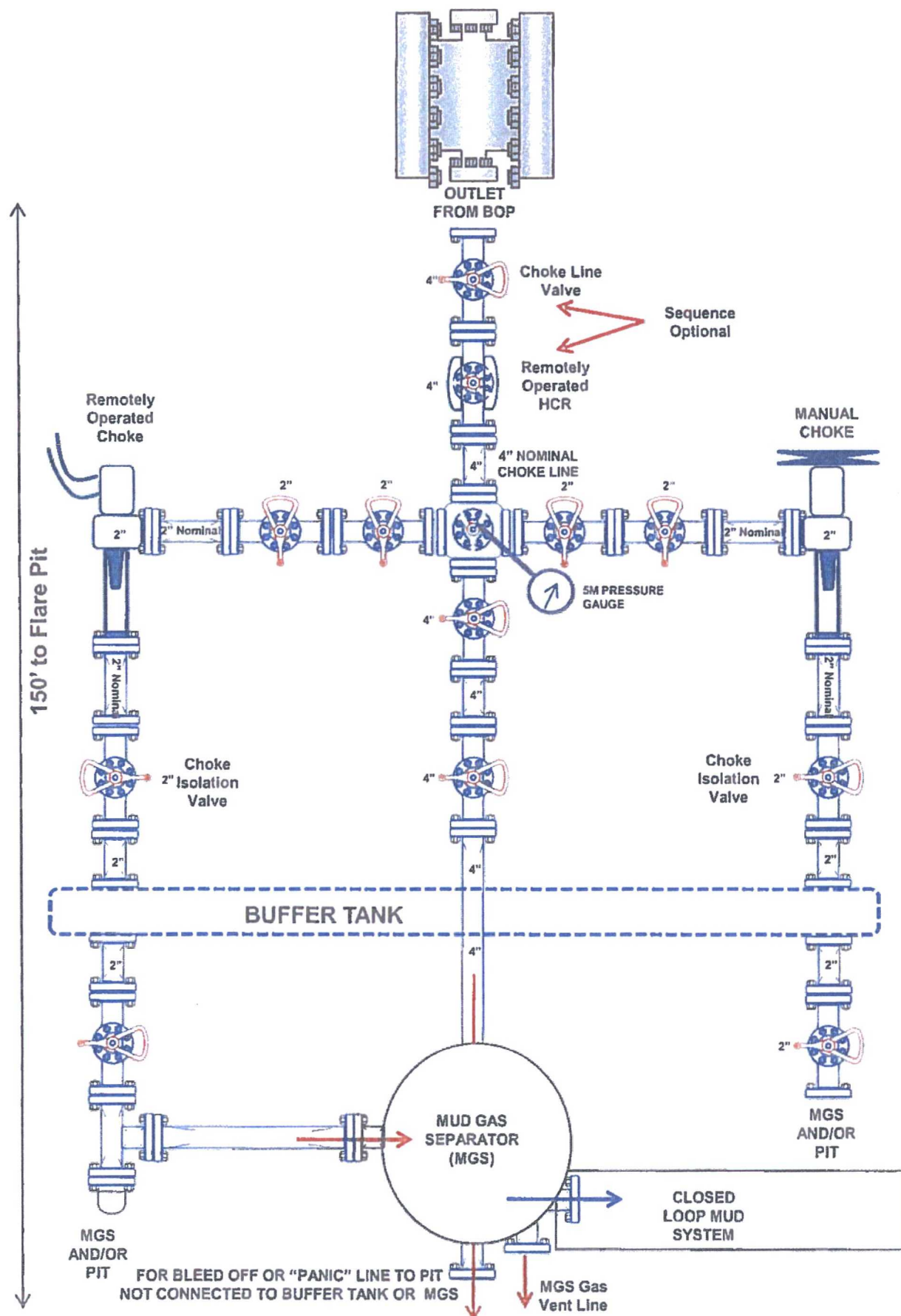
# 3,000 psi BOP Schematic



# 2M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



# 3M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)

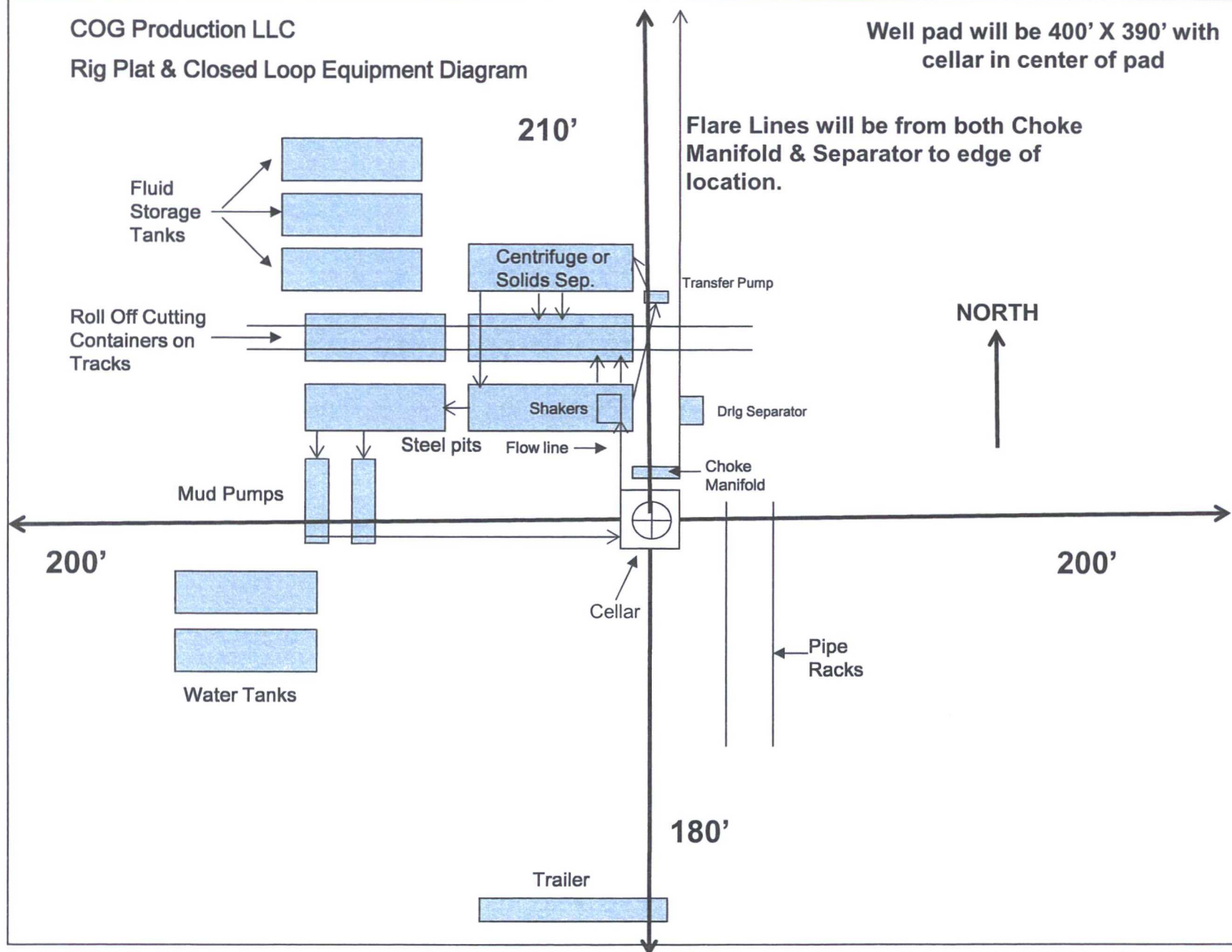




COG Production LLC

Rig Plat & Closed Loop Equipment Diagram

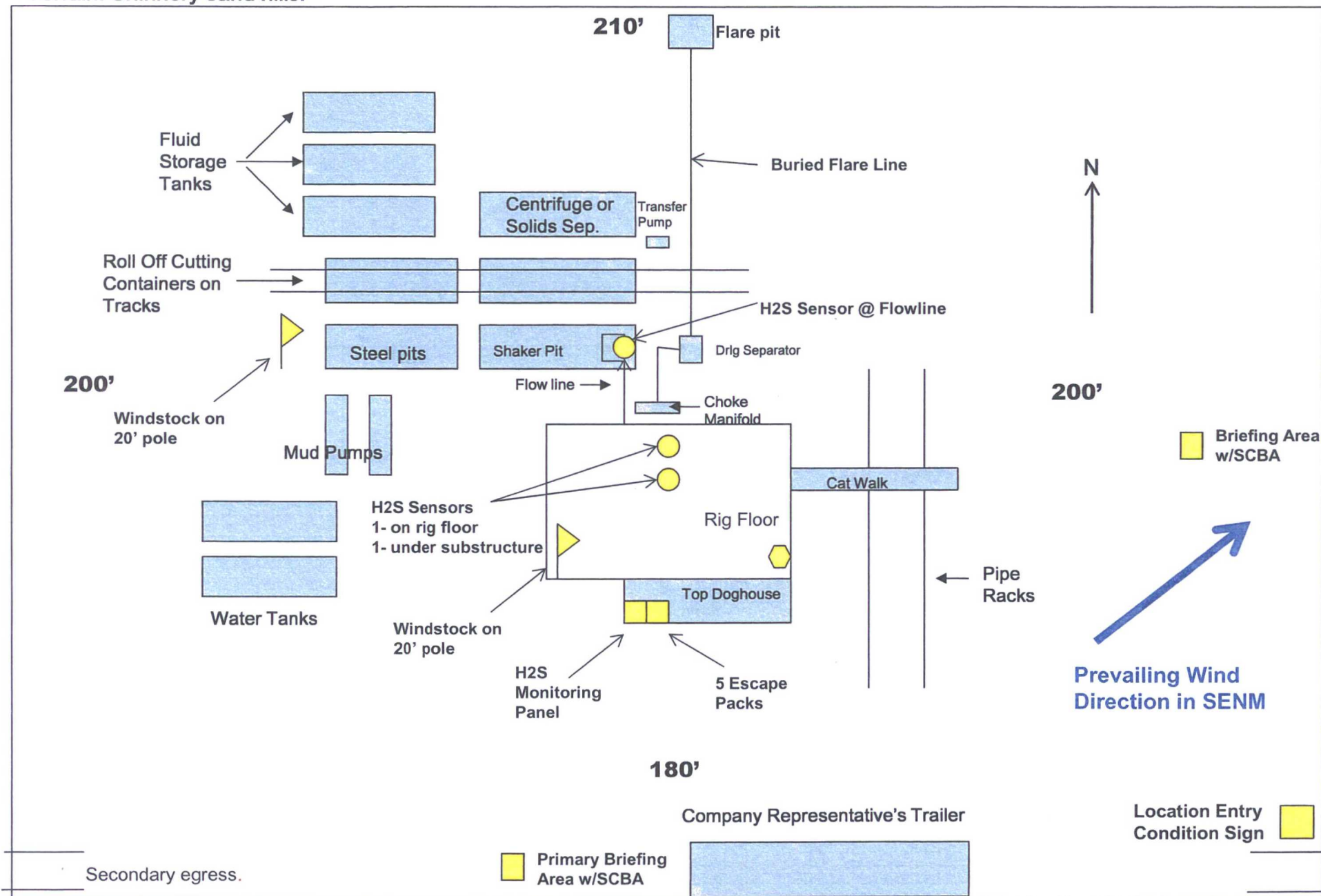
Well pad will be 400' X 390' with  
cellar in center of pad



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

COG Production LLC  
H<sub>2</sub>S Equipment Schematic  
Terrain: Shinnery sand hills.

Well pad will be 400' X 390'  
with cellar in center of pad



AZORES FEDERAL COM #SH 1 MILE WELLS (16-854)										
FID	OPERATOR	WELL_NAME	LATITUDE	LONGITUDE	API	SECTION	TOWNSHIP	RANGE	FTG_NS/NS_CD	FTG_EW/EW_CD/COMPL_STAT
0	STANOLIND OIL & GAS CO	PAYNE 001	32.190181	-103.703114	3002512715	29	24.05	32E	1980 N	660 W Plugged
1	EXXON CORP	ALLEN B FEDERAL 001	32.190276	-103.67753	3002528237	28	24.05	32E	1980 N	1980 E Plugged
2	YATES PETROLEUM CORPORATION	CALCUTTA BRZ STATE 001H	32.180179	-103.703088	3002540453	32	24.05	32E	330 N	660 W Plugged
3	DEVON ENERGY PRODUCTION COMPANY, LI	COTTON DRAW 32 STATE 001I	32.172904	-103.690196	3002540495	32	24.05	32E	2301 S	661 E New (Not drilled or compl)
4	DEVON ENERGY PRODUCTION COMPANY, LI	COTTON DRAW 32 STATE FEDERAL COM 001I	32.172929	-103.690193	3002540583	32	24.05	32E	2310 S	660 E New (Not drilled or compl)
5	YATES PETROLEUM CORPORATION	BOMBAY BSB FEDERAL COM 001H	32.174903	-103.689444	3002540718	32	24.05	32E	2310 N	430 E New (Not drilled or compl)
6	COG PRODUCTION, LLC	AZORES FEDERAL 003H	32.181662	-103.698801	3002541158	29	24.05	32E	190 S	1980 W New (Not drilled or compl)
7	DEVON ENERGY PRODUCTION COMPANY, LI	COTTON DRAW 32 STATE FEDERAL COM 002I	32.172901	-103.698585	3002541170	32	24.05	32E	2310 S	2030 W New (Not drilled or compl)
8	DEVON ENERGY PRODUCTION COMPANY, LI	COTTON DRAW 32 STATE FEDERAL COM 003I	32.172901	-103.698748	3002541171	32	24.05	32E	2310 S	1980 W New (Not drilled or compl)
9	DEVON ENERGY PRODUCTION COMPANY, LI	COTTON DRAW 32 STATE FEDERAL COM 004I	32.172894	-103.700859	3002541172	32	24.05	32E	2310 S	1330 W New (Not drilled or compl)
10	DEVON ENERGY PRODUCTION COMPANY, LI	COTTON DRAW 33 4 FEDERAL COM 001H	32.180374	-103.683837	3002541263	33	24.05	32E	330 N	1295 W New (Not drilled or compl)
11	DEVON ENERGY PRODUCTION COMPANY, LI	COTTON DRAW 33 4 FEDERAL COM 002H	32.180375	-103.683674	3002541264	33	24.05	32E	330 N	1345 W New (Not drilled or compl)
12	DEVON ENERGY PRODUCTION COMPANY, LI	COTTON DRAW 32 STATE SWD 002	32.169819	-103.6913	3002541524	32	24.05	32E	1180 S	1000 E New (Not drilled or compl)
13	COG PRODUCTION, LLC	AZORES FEDERAL 002H	32.181728	-103.693402	3002541534	29	24.05	32E	190 S	1650 E New (Not drilled or compl)
14	COG PRODUCTION, LLC	AZORES FEDERAL 004H	32.181609	-103.703089	3002541535	29	24.05	32E	190 S	660 W New (Not drilled or compl)
15	COG PRODUCTION, LLC	KING TUT FEDERAL 004H	32.195111	-103.706164	3002541560	30	24.05	32E	190 N	330 E New (Not drilled or compl)
16	COG PRODUCTION, LLC	CORVO FEDERAL 002H	32.180654	-103.695739	3002541910	32	24.05	32E	190 N	2370 E New (Not drilled or compl)
17	COG PRODUCTION, LLC	CORVO FEDERAL 003H	32.181658	-103.699125	3002541911	29	24.05	32E	190 S	1880 W New (Not drilled or compl)
18	COG PRODUCTION, LLC	CORVO FEDERAL 004H	32.181605	-103.703414	3002541912	29	24.05	32E	190 S	560 W New (Not drilled or compl)
19	XTO ENERGY, INC	OUTRIDER FEDERAL 003H	32.196083	-103.677437	3002542867	21	24.05	32E	100 S	2005 E New (Not drilled or compl)
20	XTO ENERGY, INC	OUTRIDER FEDERAL 004H	32.196068	-103.673149	3002542868	21	24.05	32E	100 S	685 E New (Not drilled or compl)
21	XTO ENERGY, INC	CAZADOR FEDERAL 001H	32.195567	-103.686863	3002542869	28	24.05	32E	100 N	370 W New (Not drilled or compl)
22	XTO ENERGY, INC	CAZADOR FEDERAL 002H	32.195548	-103.681552	3002542870	28	24.05	32E	100 N	2005 W New (Not drilled or compl)
23	XTO ENERGY, INC	CAZADOR FEDERAL 003H	32.195533	-103.677271	3002542871	28	24.05	32E	100 N	1955 E New (Not drilled or compl)
24	XTO ENERGY, INC	CAZADOR FEDERAL 004H	32.195517	-103.672983	3002542872	28	24.05	32E	100 N	635 E New (Not drilled or compl)
25	XTO ENERGY, INC	OUTRIDER FEDERAL 001H	32.196117	-103.687028	3002542883	21	24.05	32E	100 S	320 W New (Not drilled or compl)
26	XTO ENERGY, INC	OUTRIDER FEDERAL 002H	32.196098	-103.681716	3002542884	21	24.05	32E	100 S	1955 W New (Not drilled or compl)
27	DEVON ENERGY PRODUCTION COMPANY, LI	REBEL 20 FEDERAL 004H	32.209603	-103.690882	3002543158	20	24.05	32E	250 N	820 E New (Not drilled or compl)
28	DEVON ENERGY PRODUCTION COMPANY, LI	REBEL 20 FEDERAL 008H	32.209602	-103.691045	3002543159	20	24.05	32E	250 N	870 E New (Not drilled or compl)
29	COG PRODUCTION, LLC	AZORES FEDERAL 007H	32.180592	-103.696323	3002543170	32	24.05	32E	210 N	2550 E New (Not drilled or compl)
30	COG PRODUCTION, LLC	AZORES FEDERAL 011H	32.180595	-103.696064	3002543171	32	24.05	32E	210 N	2470 E New (Not drilled or compl)
31	COG PRODUCTION, LLC	AZORES FEDERAL 012H	32.181705	-103.699775	3002543178	29	24.05	32E	210 S	1680 W New (Not drilled or compl)
32	COG PRODUCTION, LLC	AZORES FEDERAL 008H	32.181709	-103.69945	3002543212	29	24.05	32E	210 S	1780 W New (Not drilled or compl)
33	DEVON ENERGY PRODUCTION COMPANY, LI	COTTON DRAW 32 STATE FEDERAL COM 005I	32.173162	-103.69448	3002543274	32	24.05	32E	2400 S	1980 E New (Not drilled or compl)