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Form 3160-3
(March 2012)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMLC-057210

6. If Indian, Allotee or Tribe Name
N/A

1a. Type of work: ☑ DRILL ☐ REENTER

7. If Unit or CA Agreement, Name and No.
N/A

1b. Type of Well: ☐ Oil Well ☐ Gas Well ☑ Other SWD ☑ Single Zone ☐ Multiple Zone

8. Lease Name and Well No.
Maljamar 28 SWD #1 (317174)

2. Name of Operator COG Operating LLC (229137)

9. API Well No. ~~FEDERAL~~
30-025- 43502

3a. Address One Concho Center, 600 W. Illinois Ave
Midland, TX 79701

3b. Phone No. *(include area code)*
432-685-4385

10. Field and Pool, or Exploratory
SWD; Wolfcamp (96135)

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface SHL: 1600' FSL & 505' FEL, Unit I
At proposed prod. zone

11. Sec., T. R. M. or Blk. and Survey or Area
Sec 28, T17S, R32E

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

12. County or Parish
~~EDDY~~ Lea

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)
505'

16. No. of acres in lease
1200

17. Spacing Unit dedicated to this well
40

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
371.8'

19. Proposed Depth
10250'

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

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3964' GL

22. Approximate date work will start*
11/30/2015

23. Estimated duration
15 Days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must 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 must 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 BLM.

25. Signature

Name *(Printed Typed)*
Robyn M. Odom

Date
06/05/2015

Title
Regulatory Analyst

Approved by *(Signature)* James A. Amos

Name *(Printed Typed)*

Date
JUN 30 2016

Title
FIELD MANAGER

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)

KZ
12/16/16

Roswell Controlled Water Basin

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

Approval Subject to General Requirements
& Special Stipulations Attached

COG Operating LLC
Maljamar 28 SWD #1

1. Geologic Formations

TD of target **	9600'	Pilot hole depth	NA
TD: **	10250'	Deepest expected fresh water:	132'

** Note this is a vertical well with openhole

Back Reef

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Fresh Water	
Rustler	890'	Brackish Water	
Top of Salt	1070'	Salt	
Tansill	2110'	Barren	
Yates	2220'	Oil/Gas	
Seven Rivers	2590'	Oil/Gas	
Queen	3180'	Oil/Gas	
Grayburg	3550'	Oil/Gas	
Glorieta	3690'	Oil/Gas	
San Andres	3930'	Oil/Gas	
Paddock	5750'	Oil/Gas	
Blinebry	6270'	Oil/Gas	
Tubb	7230'	Oil/Gas	
Abo	7820'	Oil/Gas	
Wolfcamp	9300'	Oil/Gas	
Wolfcamp Reef***	9600'	Target	
Cisco***	10200'	Target	

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

*** Because the reef porosity is so discontinuous we won't know for sure where the porosity stops until we drill the openhole and therefore TD might penetrate part of Cisco.

2. Casing Program

Hole Size	Casing Interval From	Casing Interval To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17.5"	0	~~915'~~ 950'	13.375"	48	H40	STC	1.77	3.28	7.33
12.25"	0	2130'	9.625"	40	J55	LTC	2.32	0.82	6.10
8.75"	0	9600'	7.0"	26	L80	LTC	2.50	1.33	2.05
6.125" OH	9600'	10250'	NA	NA	NA	NA	NA	NA	NA
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

See COA

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
Maljamar 28 SWD #1

Assumed 9.0 ppg MW equivalent pore pressure from 9 5/8" shoe to Deepest TD in wellbore. This is justified by offset field data in the area that shows upper Wolfcamp section drilled with 8.8-9.0 ppg mud weights. (Maljamar SWD "29" #1 Sec 1 T17S R32E and Maljamar SWD 30 #2 Sec 30 T17S R32E)

Explanation for SFs below BLM'S minimum standards:
9 5/8'Burst SF @0.81 –used BLM's frac gradiant scenario to qualify.
9 5/8" 40# J55 burst 3950 psi hence 3950 psi/2285'=1.73>0.7

	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 (loading assumptions, casing design criteria).	Y
Will the 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.	N
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd 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 2nd 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 ft3/ sack	H_2O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	325	13.5	1.75	9.2	13	Lead: Class "C" + 4% Gel + 2% CaCl2 + 0.25 pps CF
	350	14.8	1.32	6.3	6	Tail: Class C + 2% CaCl2 + 0.25 pps CelloFlake

Inter	325	11.8	2.45	14.4	24	Lead: 50:50:10 C PozGel w/5% Salt+ 5 pps LCM+ 0.25 pps CelloFlake
	250	14.8	1.32	6.3	6	Tail: Class C + 2% Ca Cl2
	Multi-stage DV Tool +/-7000'					
Prod.	300	14.0	1.37	6.4	18	1st stage Tail: 50:50:2 H Pox Gel w/5% salt+3 pps LCM + 0.2% SMS + 0.5% FL-25+0.5% BFL-52 +2% gel
	600	12.5	2.01	12.5	22	2nd Stage Lead: 35:65;6 C:Poz Gel w/5% salt+5 pps LCM+0.2% SMS + 1% FL-25+1% BA-58+0.3% FL-52A+ 0.125 pps CF
	350	14.2	1.19	6.6	8	2nd Stage Tail: Class "H" w/ 3 pps Gilsonite + 3 pps Poli-E-Flake + 0.3% Halad 9

Casing String	TOC	% Excess
Surface	0'	50%
Intermediate	0'	50%
Production	0'	35%

4. Pressure Control Equipment

No	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?	Min Required WP	Type	✓	Tested to:
12-1/4"	13-5/8"	2M	Annular	X	2000 psi
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other*		
8-3/4"	13-5/8"	3M	Annular	X	1500 psi
			Blind Ram		3000 psi
			Pipe Ram		
			Double Ram	X	
			Other*		
6 -1/8"	13 5/8"	3M	Annular	X	1500 psi
			Blind Ram		3000 psi
			Pipe Ram		
			Double Ram	X	
			Other*		

*Specify if additional ram is utilized.

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.

NA	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.
NA	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.
NA	Are anchors required by manufacturer?
NA	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. • Provide description here See attached schematic.

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 shoe	Int shoe	Saturated Brine	10.0-10.2	28-34	N/C
Int shoe	TD	FW-Cut Brine	8.5-9.0	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

6. Logging and Testing Procedures

Logging, Coring and Testing.	
X	Will run Cased hole GR/CNL from TD to surface. Stated logs run will be in the Completion Report and submitted to the BLM.
X	Open hole logs are planned from TD to Intermediate casing shoe.
No	Drill stem test? If yes, explain
No	Coring? If yes, explain

Additional logs planned		Interval
	Resistivity	Int. shoe to KOP
	Density	Int. shoe to KOP
	CBL	Production casing
X	Mud log	Intermediate shoe to TD
X	PEX/HRLA/HNGS	Intermediate shoe to TD

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4510 psi
Abnormal Temperature	No

Mitigation measure for abnormal conditions.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S 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.	
Yes	H2S is present
Yes	H2S Plan attached

8. Other facets of operation

Is this a walking operation? No.
Will be pre-setting casing? No

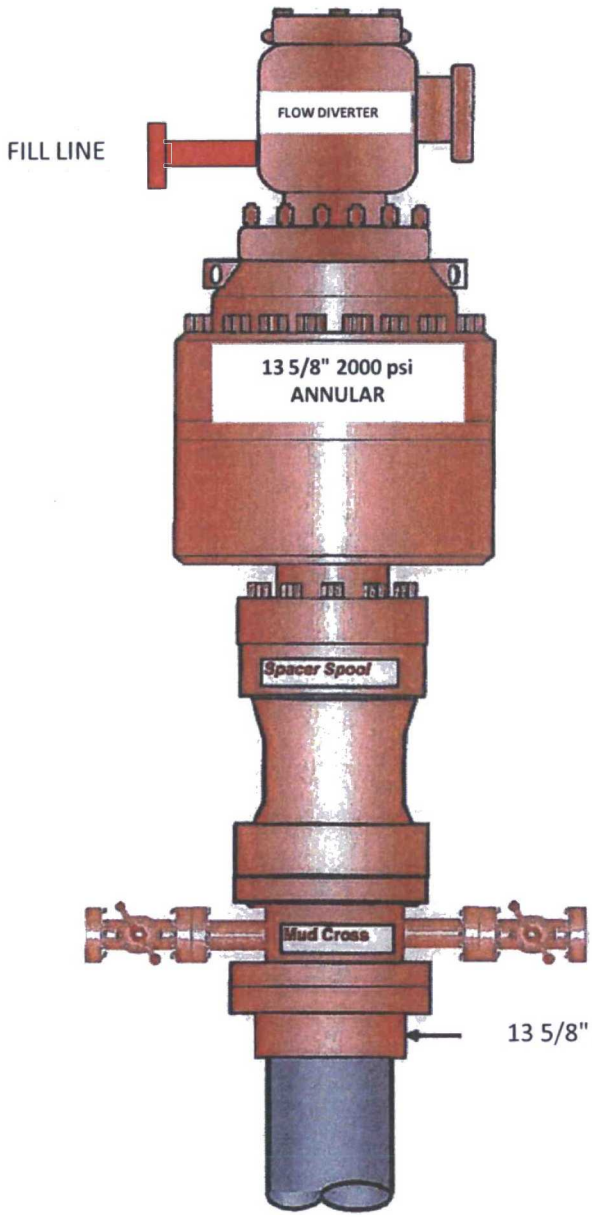
Attachments:
BOPs drawings

GEG 5/26/15

Exhibit #10

(Choke Manifold Schematic same as Exhibit #9)

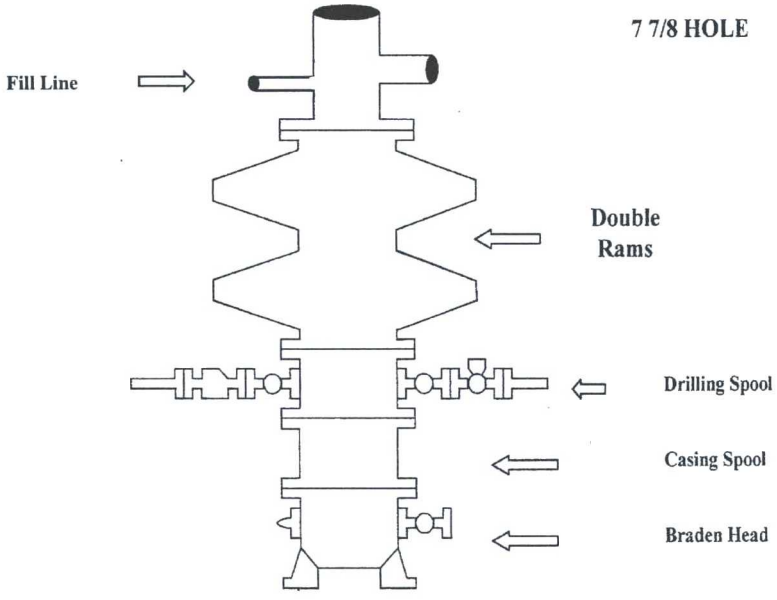
13 5/8" 2K ANNULAR



COG Operating LLC

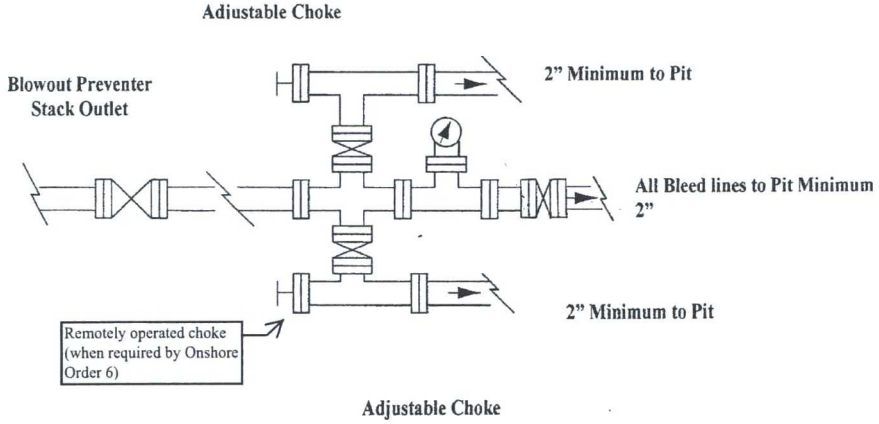
Exhibit #9

BOPE and Choke Schematic



Minimum 4" Nominal choke and kill lines

Choke Manifold Requirement (2000 psi WP)
No Annular Required



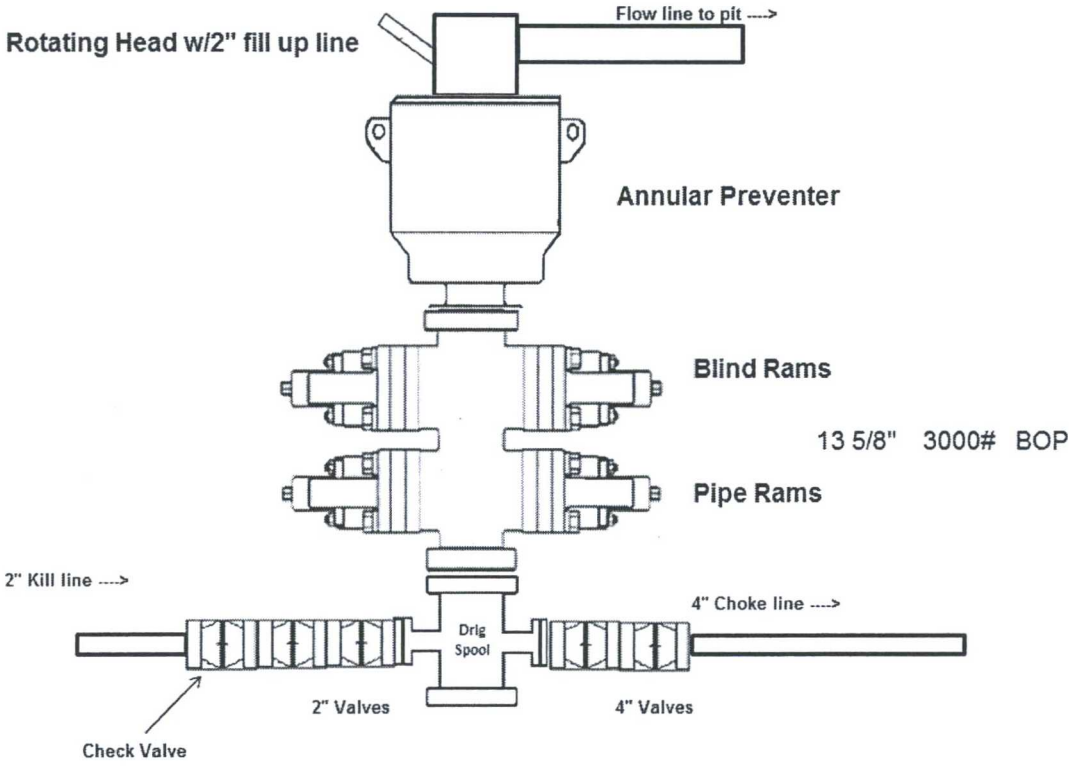
Adjustable Choke

NOTES REGARDING THE BLOWOUT PREVENTERS
Master Drilling Plan
Eddy County, New Mexico

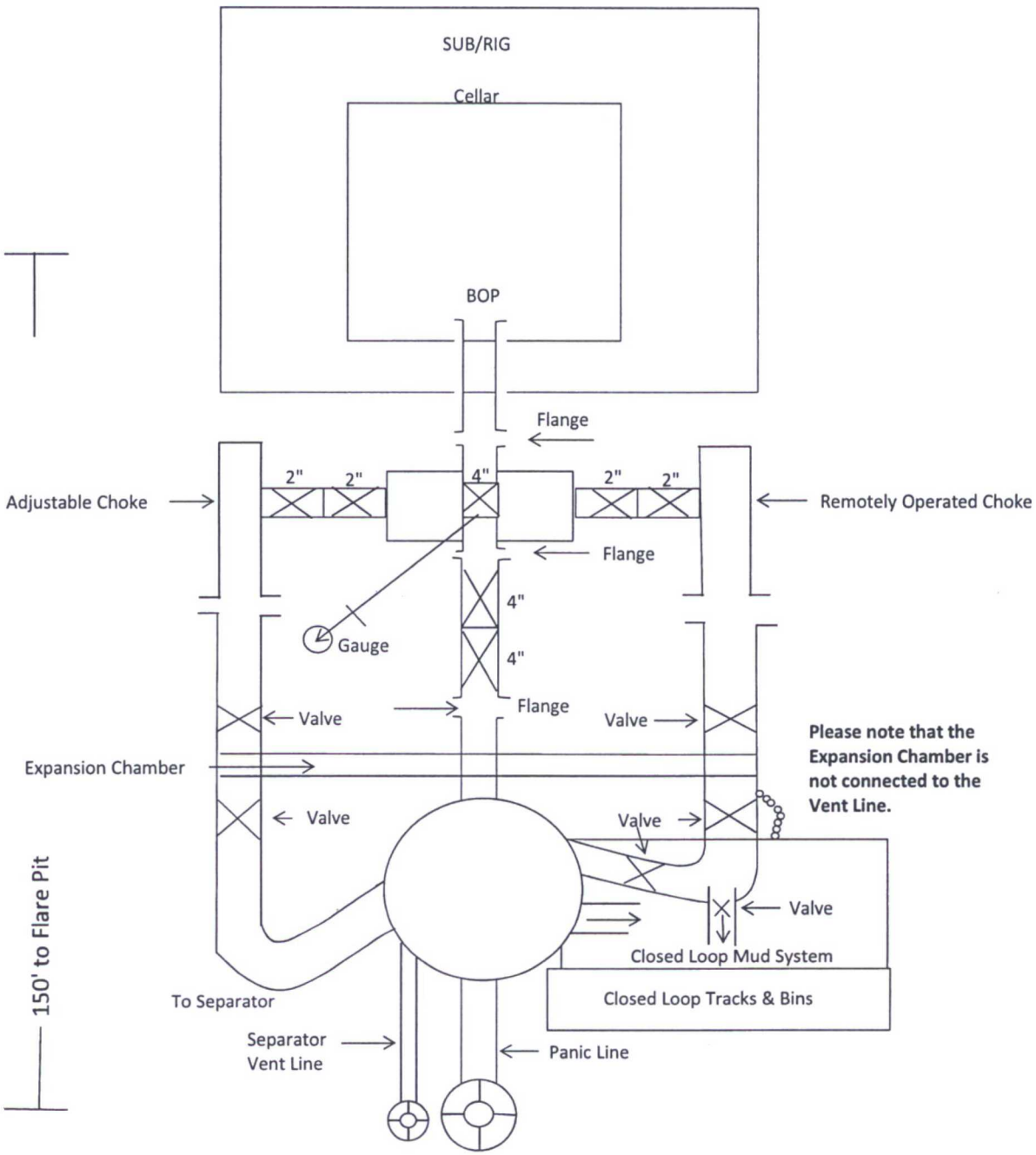
1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I.D. equal to preventer bore.
2. Wear ring to be properly installed in head.
3. Blow out preventer and all fittings must be in good condition, 2000 psi WP minimum.
4. All fittings to be flanged.
5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.
6. All choke and fill lines to be securely anchored especially ends of choke lines.
7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.
8. Kelly cock on Kelly.
9. Extension wrenches and hands wheels to be properly installed.
10. Blow out preventer control to be located as close to driller's position as feasible.
11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

Exhibit #11

3,000 psi BOP Schematic



3M Choke Manifold Equipment



Closed Loop Operation & Maintenance Procedure

All drilling fluid circulated over shaker(s) with cuttings discharged into roll off container.

Fluid and fines below shaker(s) are circulated with transfer pump through centrifuge(s) or solids separator with cuttings and fines discharged into roll off container.

Fluid is continuously re-circulated through equipment with polymer added to aid separation of cutting fines.

Roll off containers are lined and de-watered with fluids re-circulated into system.

Additional tank is used to capture unused drilling fluid or cement returns from casing jobs.

This equipment will be maintained 24 hrs./day by solids control personnel and or rig crews that stay on location.

Cuttings will be hauled to either:

CRI (permit number R9166)
or
GMI (permit number 711-019-001)

dependent upon which rig is available to drill this well.

COG Operating LLC

Closed Loop Equipment Diagram