COG Operating, LLC - Baseball Cap Federal Com 26H

1. Geologic Formations

TVD of target	12,840' EOL	Pilot hole depth	NA
MD at TD:	22,770'	Deepest expected fresh water:	355'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	856	Water	
Top of Salt	1353	Salt	
Base of Salt	5151	Salt	
Lamar	5449	Salt Water	
Bell Canyon	5484	Salt Water	
Cherry Canyon	6481	Oil/Gas	
Brushy Canyon	8067	Oil/Gas	
Bone Spring Lime	9369	Oil/Gas	
U. Avalon Shale	9408	Oil/Gas	
L. Avalon Shale	9611	Oil/Gas	
1st Bone Spring Sand	10551	Oil/Gas	
2nd Bone Spring Sand	11129	Oil/Gas	
3rd Bone Spring Sand	12172	Oil/Gas	
Wolfcamp	12690	Target Oil/Gas	

2. Casing Program — SEE COA

Hole Size	Casing Interval From	Casing Interval To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Body
17.5"	0	~~885~~ 1411	13.375"	68	J55	STC	4.82	0.77	11.22
12.25"	0	12200	9.625"	47	L80	BTC	1.24	1.20	1.89
8.5"	0	22,770	5.5"	23	P110	BTC	2.07	2.21	2.47
				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. Surface burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface and
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Body
	From	To							
17.5"	0	885	13.375"	68	J55	STC	4.82	0.77	11.22
12.25"	0	12200	9.625"	47	L80	BTC	1.24	1.20	1.89
8.5"	0	22,770	5.5"	23	P110	BTC	2.07	2.21	2.47
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COG Operating, LLC - Baseball Cap Federal Com 26H

1. Geologic Formations

TVD of target	12,840' EOL	Pilot hole depth	NA
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Top of Salt	1353	Salt	
Base of Salt	5151	Salt	
Lamar	5449	Salt Water	
Bell Canyon	5484	Salt Water	
Cherry Canyon	6481	Oil/Gas	
Brushy Canyon	8067	Oil/Gas	
Bone Spring Lime	9369	Oil/Gas	
U. Avalon Shale	9408	Oil/Gas	
L. Avalon Shale	9611	Oil/Gas	
1st Bone Spring Sand	10551	Oil/Gas	
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All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

COG Operating, LLC - Baseball Cap Federal Com 26H

	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 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_20 gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	340	13.5	1.75	9	12	Lead: Class C + 4% Gel + 1% CaCl2
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl2
Inter.	2660	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	130	11.9	2.5	19	72	Lead: 50:50:10 H Blend
	2760	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%
1st Intermediate	0'	50%
Production	11,700'	30% 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.

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"	5M	Annular	x	50% testing pressure
			Blind Ram	x	5M
			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.

4. Pressure Control Equipment ~~N~~ SEE COA

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?	Min. Required WP	Type	x	Tested to:
12-1/4"	13-5/8"	~~2M~~ 5M	Annular	x	~~2000 psi~~ 2500 psi
			Blind Ram	x	~~2M~~ 5M
			Pipe Ram	X	
			Double Ram		
			Other*		
8-3/4"	13-5/8"	~~5M~~ 10M	Annular	x	50% testing pressure
			Blind Ram	x	~~5M~~ 10M
			Pipe Ram	x	
			Double Ram	X	
			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.

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	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	Brine Diesel Emulsion	8.4 - 9	28-34	N/C
9-5/8" Int shoe	Lateral TD	OBM	9.6 - 10.5	35-45	<20

Up too low to drill into Wolfcamp

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.	
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	

Midwest Hose & Specialty, Inc.

Hose Assembly & Test Report

General Information		Hose Specifications	
Customer	Hobbs	Hose Assembly Type	choke + kill
Date Assembled	6-26-14	Certification	API 7K
Location Assembled	Okc	Hose Grade	D
Sales Order #	216797	Hose Working Pressure	5,000
Customer Purchase Order #	237512	Hose Lot #	83091
Hose Assembly Serial #	260212	Hose Date Code	04/12
Pick Ticket Line Item	0010	Hose I.D. (inches)	3.5 inches
Hose Assembly Length (Feet and Inches)	50 Feet	Hose O.D. (inches)	5.45
Contact Information Phone #		Armor (yes/no)	yes

Fittings

End A		End B	
Stem (Part and Revision #)	R3.5X64 WB	Stem (Part and Revision #)	R3.5X64 WB
Stem (Heat #)	131140502225	Stem (Heat #)	131140502225
Stem (Rockwell Hardness HRB #)	—	Stem (Rockwell Hardness HRB #)	—
Ferrule (Part and Revision #)	RF3.5	Ferrule (Part and Revision #)	RF3.5
Ferrule (Heat #)	126151	Ferrule (Heat #)	372114
Ferrule (Rockwell Hardness HRB #)	—	Ferrule (Rockwell Hardness HRB #)	—
Connection (Part #)	4 1/16 5K	Connection (Part #)	4 1/16 5K
Connection (Heat #)	V3360	Connection (Heat #)	V3360
Connection (Brinell Hardness HB #)	—	Connection (Brinell Hardness HB #)	—
Stress Relief #	17614	Stress Relief #	17614
Welding #	MKR	Welding #	MKR
X-ray #	—	X-ray #	—

Assembly Information

End A		End B	
Skive O.D. (inches)	5.04	Skive O.D. (inches)	4.92
Swager Dies (1st pass)	5.62	Swager Dies (1st pass)	5.53
Swager Dies (2nd pass)	—	Swager Dies (2nd pass)	—
Final Swage O.D. (inches)	5.64	Final Swage O.D. (inches)	5.48
Compression % (See Crimp Calculator)	24%	Compression % (See Crimp Calculator)	22%
Swaged By	Charles		

Hydrostatic Test Requirements

Test Pressure (psi)	10,000	Hold Time (minutes)	13¼
Tested By	Charles	Date Tested	6-26-14

This is to certify that the above Hose Assembly has been satisfactorily tested in accordance with MHSI procedure 8.2.4.2

Final Verification

[illegible]	Yes No	Hammer Unions	Yes No
[illegible]	Yes No	Safety Clamps	Yes No
[illegible] Third Party Witness	Customer or Third Party Witnessed By:		
No			

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	Brine Diesel Emulsion	8.4 - 9	28-34	N/C
9-5/8" Int shoe	Lateral TD	OBM	9.6 - 10.5	35-45	<20

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.	
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	7015 psi at 12840' TVD
Abnormal Temperature	NO 185 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 (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.	
N	H2S is present
Y	H2S Plan attached

8. Other Facets of Operation

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

x	H2S Plan.
x	BOP & Choke Schematics.
x	Directional Plan

CONCHO

WELL DETAILS: ***BASEBALL CAP FED COM #26H***

3406.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	431084.20	780910.50	32° 10' 54.870 N	103° 25' 31.348 W	

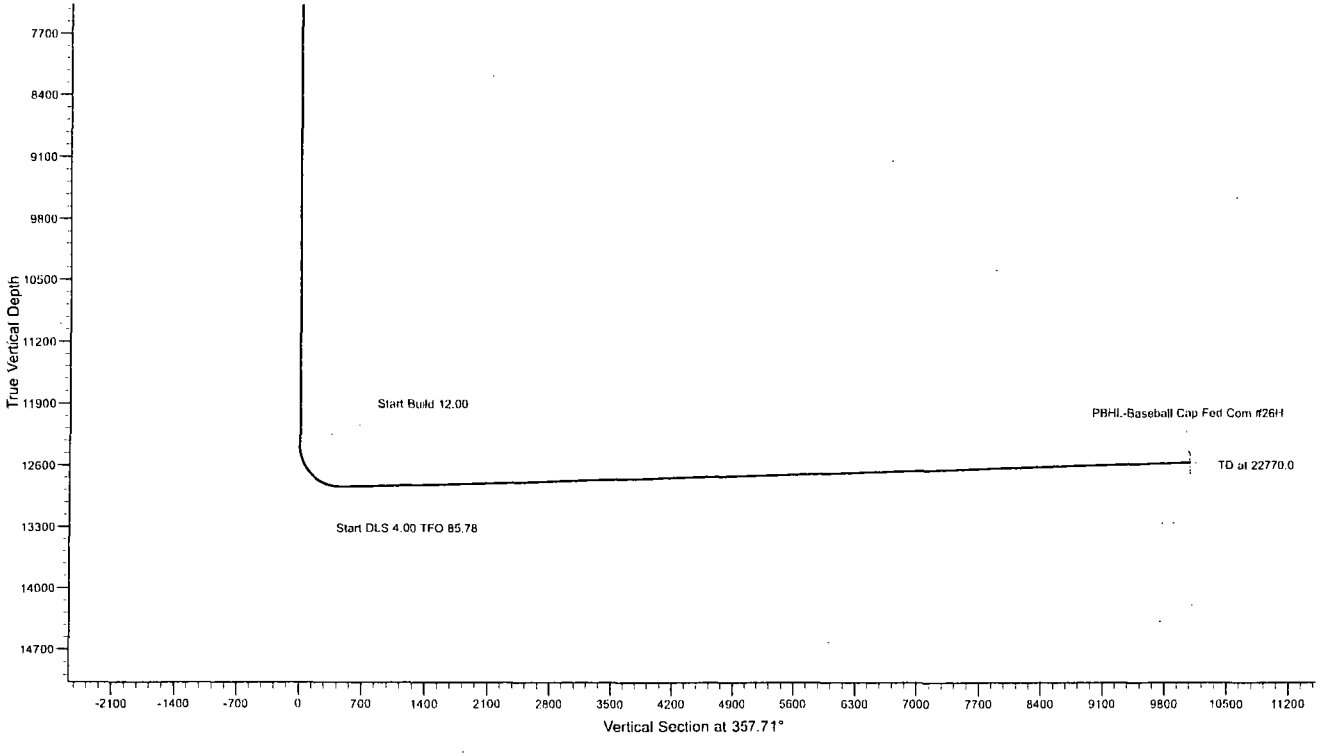
SECTION DETAILS

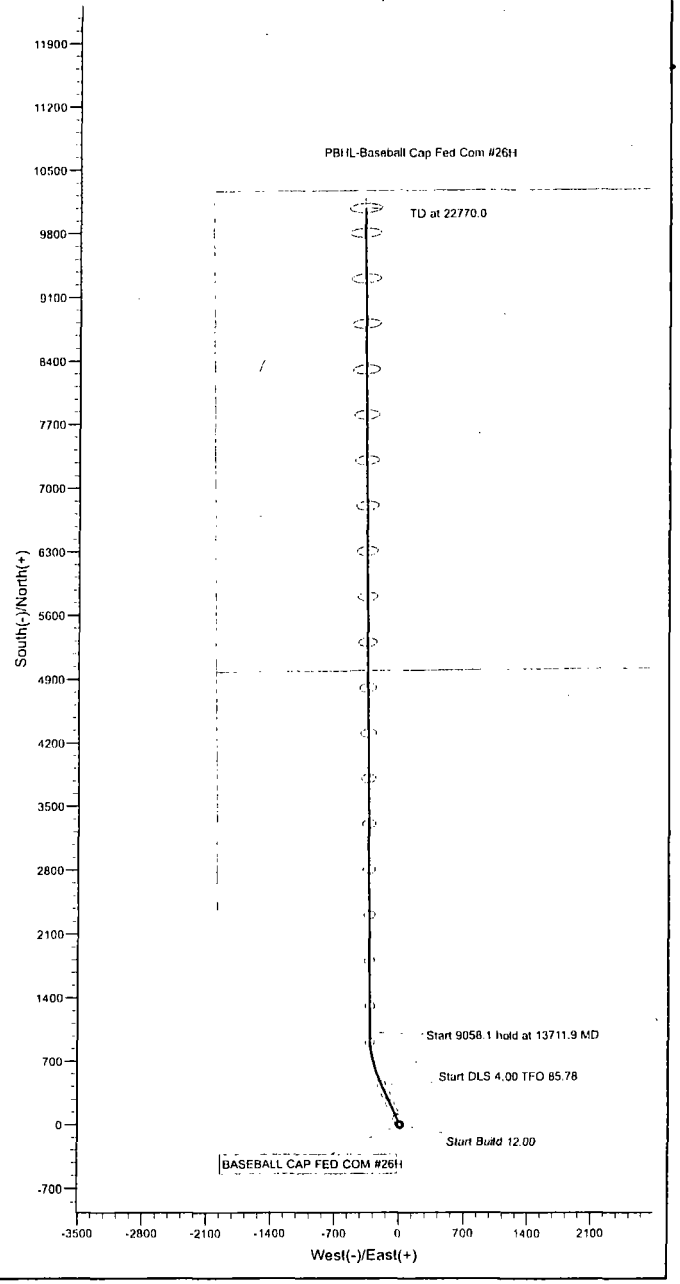
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	12362.5	0.00	0.00	12362.5	0.0	0.0	0.00	0.00	0.0	
3	13112.6	90.00	335.60	12840.0	434.9	-197.3	12.00	335.60	442.4	
4	13711.9	91.71	359.52	12830.9	1015.8	-325.5	4.00	85.78	1028.0	
5	22770.0	91.71	359.52	12560.0	10069.5	-401.9	0.00	0.00	10077.5	

Project: LEA COUNTY, NM
Site: BULLDOG
Well: BASEBALL CAP FED COM #26H
Wellbore: OWB
Design: ***PWP0***

LEGEND

PWP0





Midwest Hose
& Specialty, Inc.

Certificate of Conformity

Customer: **Hobbs**	*Customer P.O.#* **302337**
Sales Order # **271739**	*Date Assembled:* **11/19/2015**

Specifications

Hose Assembly Type:	**Rotary/Vibrator**		
Assembly Serial #	**326000**	*Hose Lot # and Date Code*	**11834 11/14**
Hose Working Pressure (psi)	**5000**	*Test Pressure (psi)*	**10000**

We hereby certify that the above material supplied for the referenced purchase order to be true according to the requirements of the purchase order and current industry standards.

Supplier:
Midwest Hose & Specialty, Inc.
3312 S I-35 Service Rd
Oklahoma City, OK 73129

Comments:

Approved By	*Date*
Kim Thomas	**11/19/2015**

Midwest Hose & Specialty, Inc.

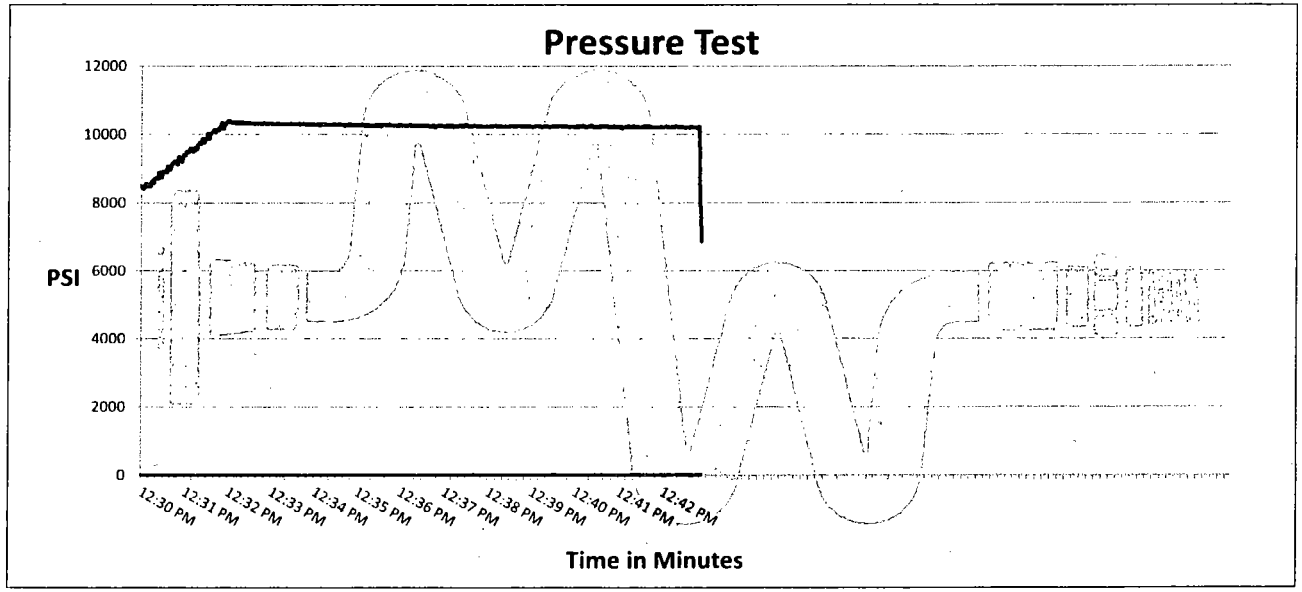
Internal Hydrostatic Test Graph

November 19, 2015

Customer: Hobbs

Pick Ticket #: 326000

Hose Specifications		Verification	
Hose Type	**Length**	**Type of Fitting**	**Coupling Method**
D	25'	4 1/16 5K	Swage
I.D.	**O.D.**	**Die Size**	**Final O.D.**
3.5"	4.89"	5.49"	5.50"
Working Pressure	**Burst Pressure**	**Hose Serial #**	**Hose Assembly Serial #**
5000 PSI	Standard Safety Multiplier Applies	11834	326000



Test Pressure	Time Held at Test Pressure	Actual Burst Pressure	Peak Pressure
10000 PSI	11 2/4 Minutes		10473 PSI

Comments: Hose assembly pressure tested with water at ambient temperature.

Tested By: *James Hawkins*

Approved By: *Kim Thomas*

x _____

x _____

Midwest Hose
& Specialty, Inc.

Internal Hydrostatic Test Certificate

General Information		Hose Specifications	
Customer	**Hobbs**	*Hose Assembly Type*	**Rotary/Vibrator**
MWH Sales Representative	**Ryan Rynolds**	*Certification*	**API 7K/FSL Level 2**
Date Assembled	**11/19/2015**	*Hose Grade*	**D**
Location Assembled	**OKC**	*Hose Working Pressure*	**5000**
Sales Order #	**271739**	*Hose Lot # and Date Code*	**11834 11/14**
Customer Purchase Order #	**302337**	*Hose I.D. (Inches)*	**3.5"**
Assembly Serial # (Pick Ticket #)	**326000**	*Hose O.D. (Inches)*	**4.89"**
Hose Assembly Length	**25'**	*Armor (yes/no)*	No

Fittings

End A		End B	
Stem (Part and Revision #)	**R3.5X64WB**	*Stem (Part and Revision #)*	**R3.5X64WB**
Stem (Heat #)	**A144783**	*Stem (Heat #)*	**A144783**
Ferrule (Part and Revision #)	**RF3.5**	*Ferrule (Part and Revision #)*	**RF3.5**
Ferrule (Heat #)	**J1628**	*Ferrule (Heat #)*	**J1628**
Connection . Flange Hammer Union Part	**4-1/16 5000**	*Connection (Part #)*	**4-1/16 5000**
Connection (Heat #)	**14032501**	*Connection (Heat #)*	**1404H321**
Nut (Part #)	**N/A**	*Nut (Part #)*	**N/A**
Nut (Heat #)	**N/A**	*Nut (Heat #)*	**N/A**
Dies Used	**5.49"**	*Dies Used*	**5.49"**

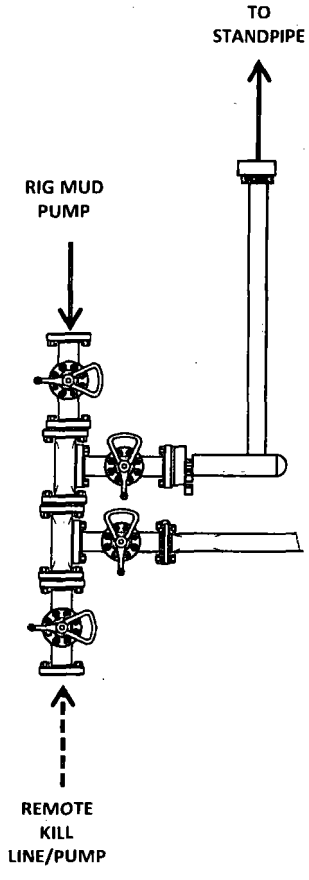
Hydrostatic Test Requirements

Test Pressure (psi)	**10,000**	***Hose assembly was tested with ambient water temperature.***
Test Pressure Hold Time (minutes)	**11 1/2**	

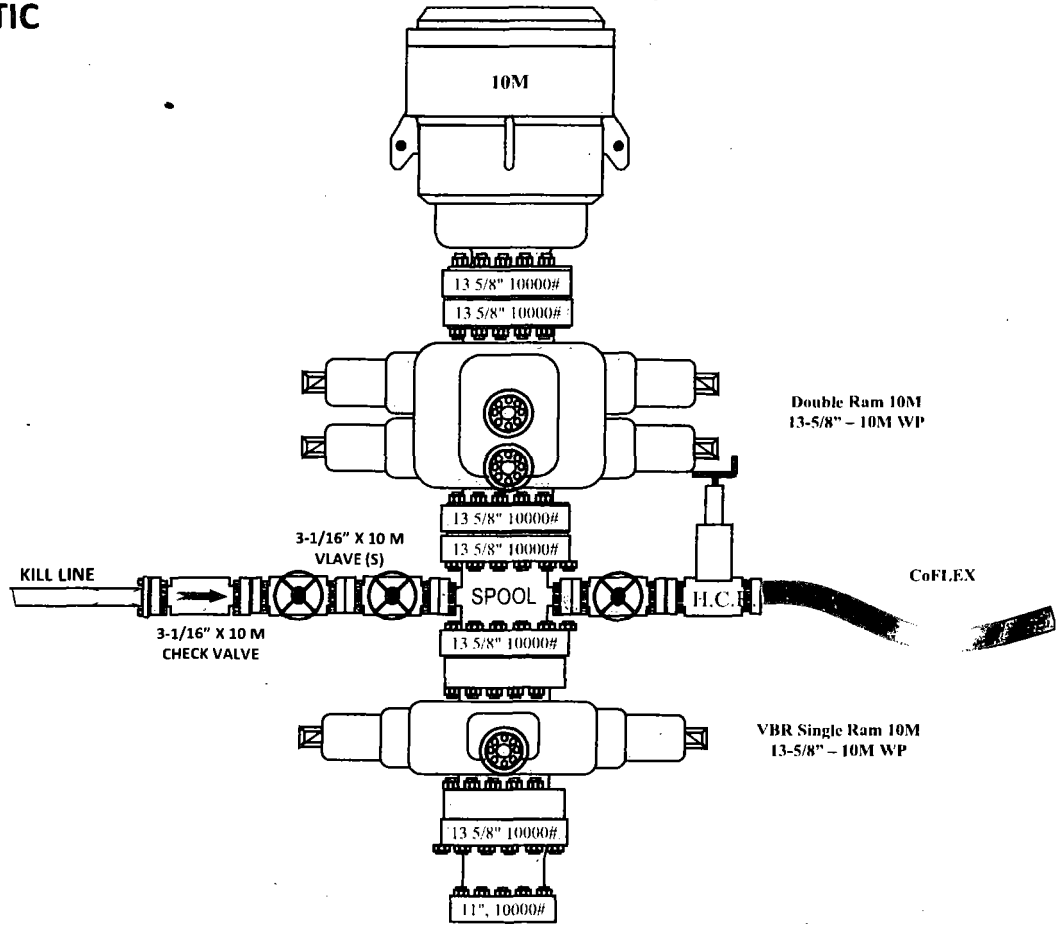
Date Tested	*Tested By*	*Approved By*
11/19/2015		

10M BOP Stack

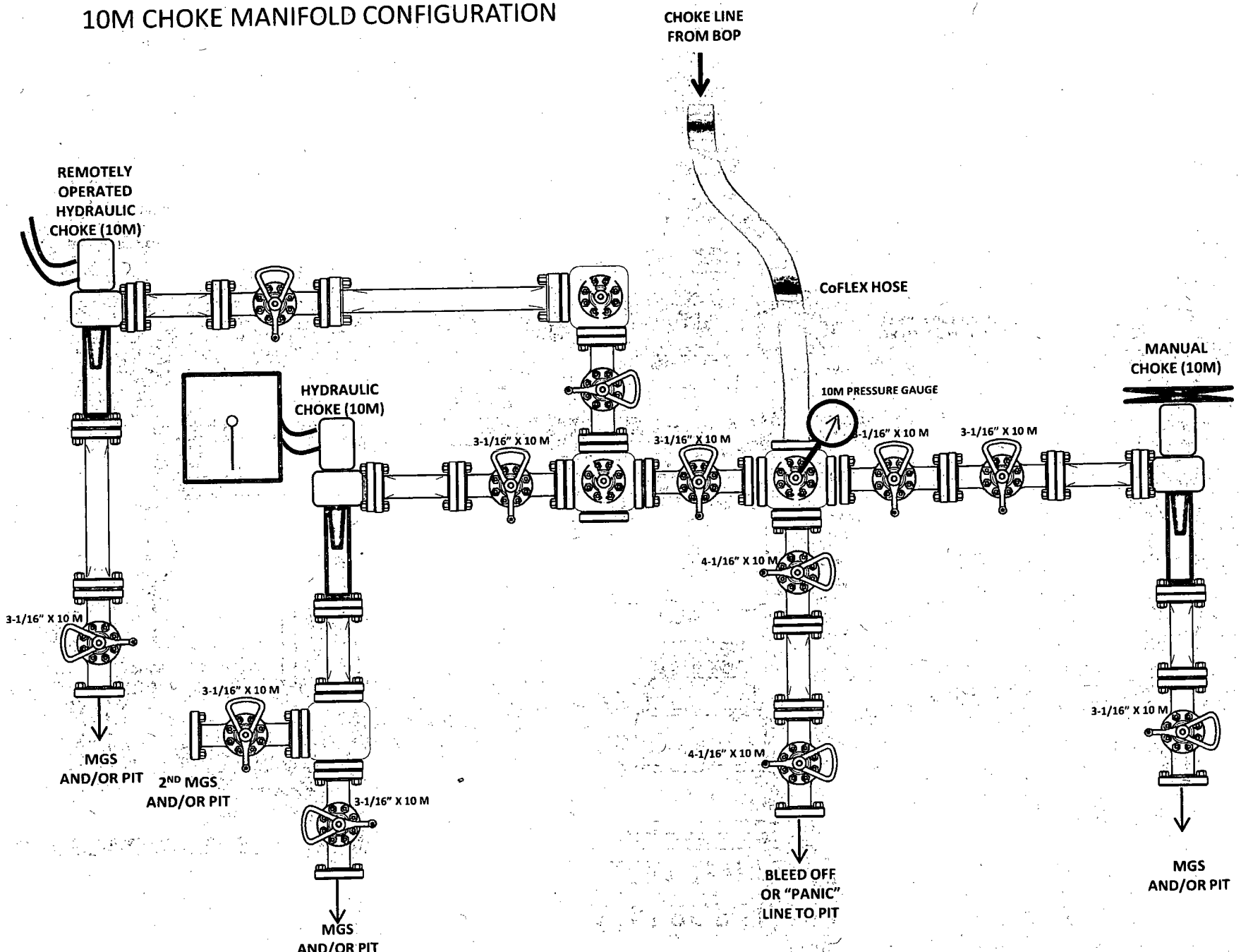
10M REMOTE KILL SCHEMATIC



10M BOP Stack
(10M Annular)



10M CHOKE MANIFOLD CONFIGURATION



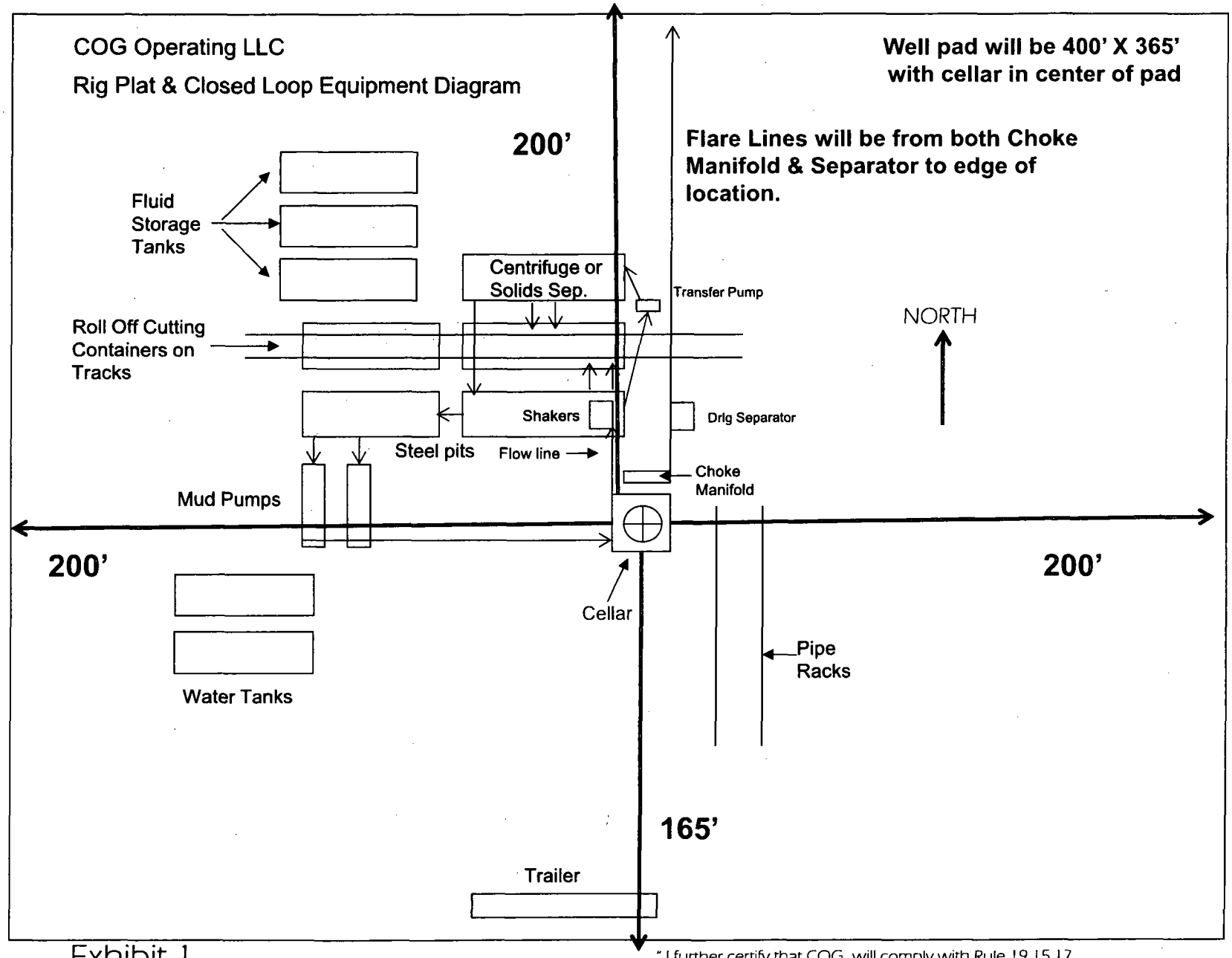


Exhibit 1

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

APD ID: 10400010088 **Submission Date:** 01/17/2017

Operator Name: COG OPERATING LLC

Well Name: BASEBALL CAP FEDERAL COM **Well Number:** 26H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	UNKNOWN	0	0	0		NONE	No
2	RUSTLER	-856	856	856		NONE	No
3	TOP OF SALT	-1353	1353	1353		NONE	No
4	BASE OF SALT	-5151	5151	5151		NONE	No
5	LAMAR LS	-5449	5449	5449		NATURAL GAS,OIL	No
6	BELL CANYON	-5484	5484	5484		NATURAL GAS,OIL	No
7	CHERRY CANYON	-6481	6481	6481		NATURAL GAS,OIL	No
8	BRUSHY CANYON	-8067	8067	8067		NATURAL GAS,OIL	No
9	BONE SPRING LIME	-9369	9369	9369		NATURAL GAS,OIL	No
10	BONE SPRINGS UPPER SHAL	-9408	9408	9408		NATURAL GAS,OIL	No
11	BONE SPRING LOWER	-9611	9611	9611		NATURAL GAS,OIL	No
12	BONE SPRING 1ST	-10551	10551	10551		NATURAL GAS,OIL	No
13	BONE SPRING 2ND	-11129	11129	11129		NATURAL GAS,OIL	No
14	BONE SPRING 3RD	-12172	12172	12172		NATURAL GAS,OIL	No
15	WOLFCAMP	-12690	12690	12690		NATURAL GAS,OIL	Yes

Section 2 - Blowout Prevention

Operator Name: COG OPERATING LLC

Well Name: BASEBALL CAP FEDERAL COM **Well Number:** 26H

Pressure Rating (PSI): 2M **Rating Depth:** 12000

Equipment: Annular. The BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold.
Requesting Variance? YES

Variance request: 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.
Testing Procedure: 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 of the components installed will be functional and tested.

Choke Diagram Attachment:

COG Baseball Cap 26H_2M Choke_01-17-2017.pdf

BOP Diagram Attachment:

COG Baseball Cap 26H_2M BOP_01-17-2017.pdf

Pressure Rating (PSI): 5M **Rating Depth:** 23000

Equipment: Annular. The BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold.
Requesting Variance? NO

Variance request: 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.
Testing Procedure: 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 of the components installed will be functional and tested.

Choke Diagram Attachment:

COG Baseball Cap 26H_5M Choke_01-17-2017.pdf

BOP Diagram Attachment:

COG Baseball Cap 26H_5M BOP_01-17-2017.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	885	0	885	-9434	-10319	885	J-55	68	STC	4.82	0.77	DRY	11.22	DRY	11.22

Operator Name: COG OPERATING LLC

Well Name: BASEBALL CAP FEDERAL COM **Well Number:** 26H

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	12200	0	12200	-9434	-21634	12200	L-80	47	OTHER - BTC	1.24	1.2	DRY	1.89	DRY	1.89
3	PRODUCTION	8.5	5.5	NEW	API	N	0	22770	0	22770	-9434	-32204	22770	P-110	23	OTHER - BTC	2.07	2.21	DRY	2.47	DRY	2.47

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG Baseball Cap 26H_Casing Program_01-17-2017.pdf

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG Baseball Cap 26H_Casing Program_01-17-2017.pdf

Operator Name: COG OPERATING LLC

Well Name: BASEBALL CAP FEDERAL COM **Well Number:** 26H

Casing Attachments

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG Baseball Cap 26H_Casing Program_01-17-2017.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	885	340	1.75	13.5	595	50	Class C	4% Gel + 1% CaCl2
SURFACE	Tail		0	885	250	1.34	14.8	335	50	C	2% CaCl2
INTERMEDIATE	Lead		0	12200	2660	2	12.7	5320	50	C Blend 35:65:6	No Additives
INTERMEDIATE	Tail		0	12200	250	1.34	14.8	335	50	Class C	2% CaCl
PRODUCTION	Lead		0	22770	130	2.5	11.9	325	30	Lead: 50:50:10 H Blend	No additives
PRODUCTION	Tail		0	22770	2760	1.24	14.4	3422	30	Tail: 50:50:2 Class H Blend	No additives

Operator Name: COG OPERATING LLC

Well Name: BASEBALL CAP FEDERAL COM **Well Number:** 26H

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
885	12200	OTHER : Brine Diesel Emulsion	8.4	9							
12200	22770	OIL-BASED MUD	9.6	10.5							
0	885	OTHER : Fresh water gel	8.6	8.8							

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

None planned

List of open and cased hole logs run in the well:

CNL,GR

Coring operation description for the well:

None planned

Operator Name: COG OPERATING LLC

Well Name: BASEBALL CAP FEDERAL COM **Well Number:** 26H

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 7015 **Anticipated Surface Pressure:** 4190.2

Anticipated Bottom Hole Temperature(F): 185

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

COG Baseball Cap 26H_H2S SUP_01-17-2017.pdf

COG Baseball Cap 26H_H2S Schematic_01-17-2017.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

COG Baseball Cap 26H_Directional Plan_01-17-2017.pdf

Other proposed operations facets description:

None

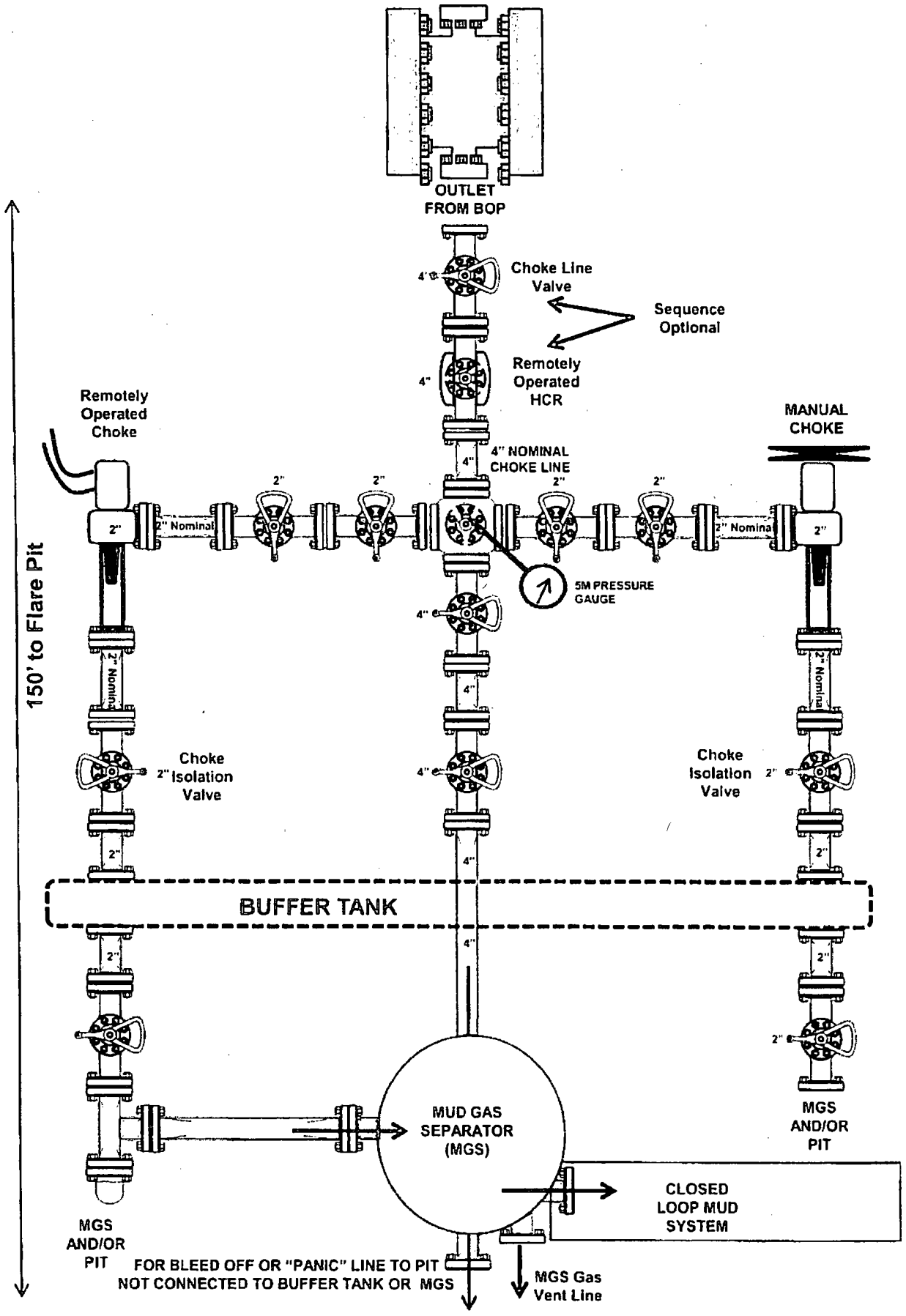
Other proposed operations facets attachment:

COG Baseball Cap 26H_Drilling Program_01-17-2017.pdf

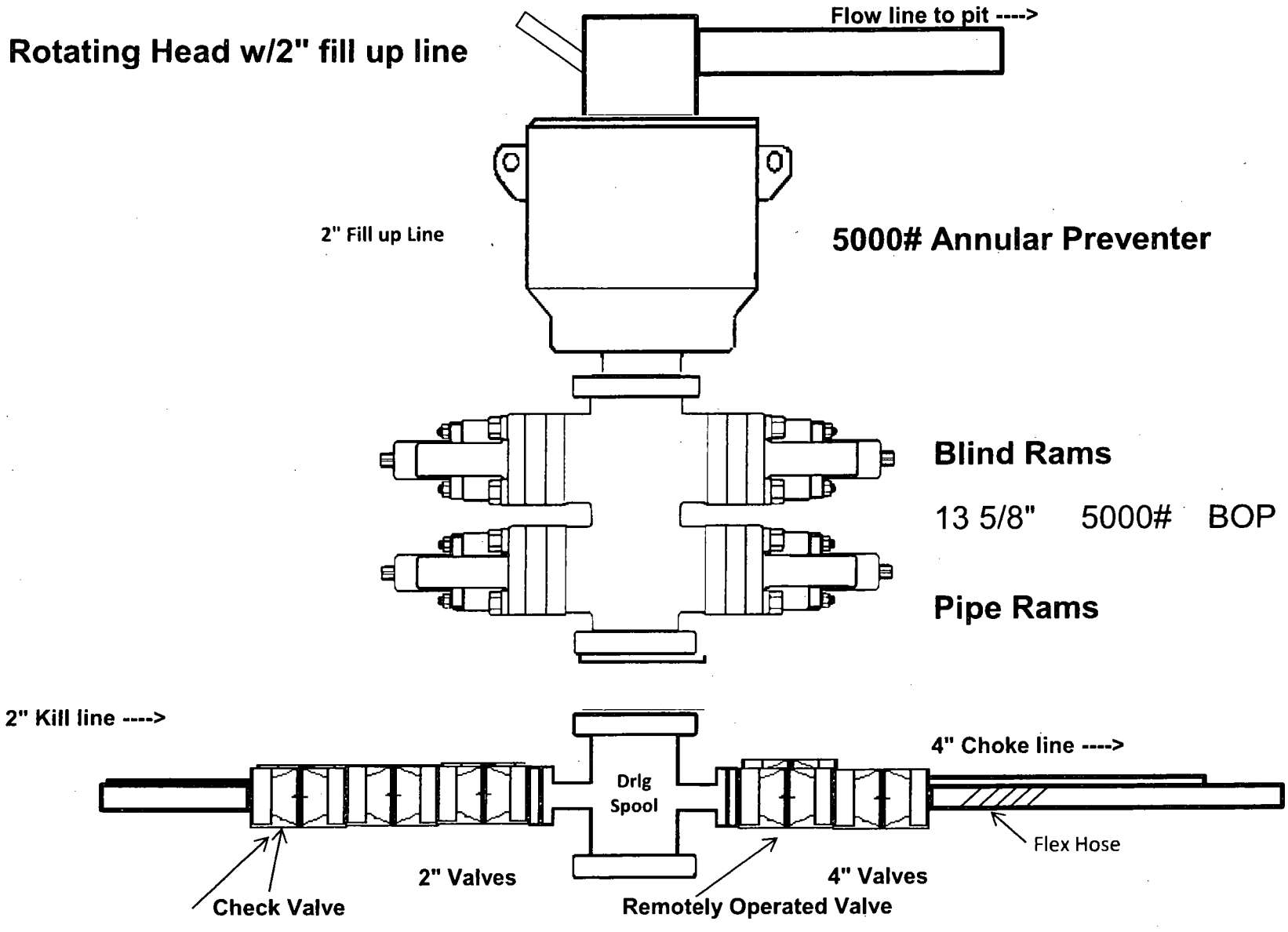
Other Variance attachment:

COG Baseball Cap 26H_Flex Hose Variance_01-17-2017.pdf

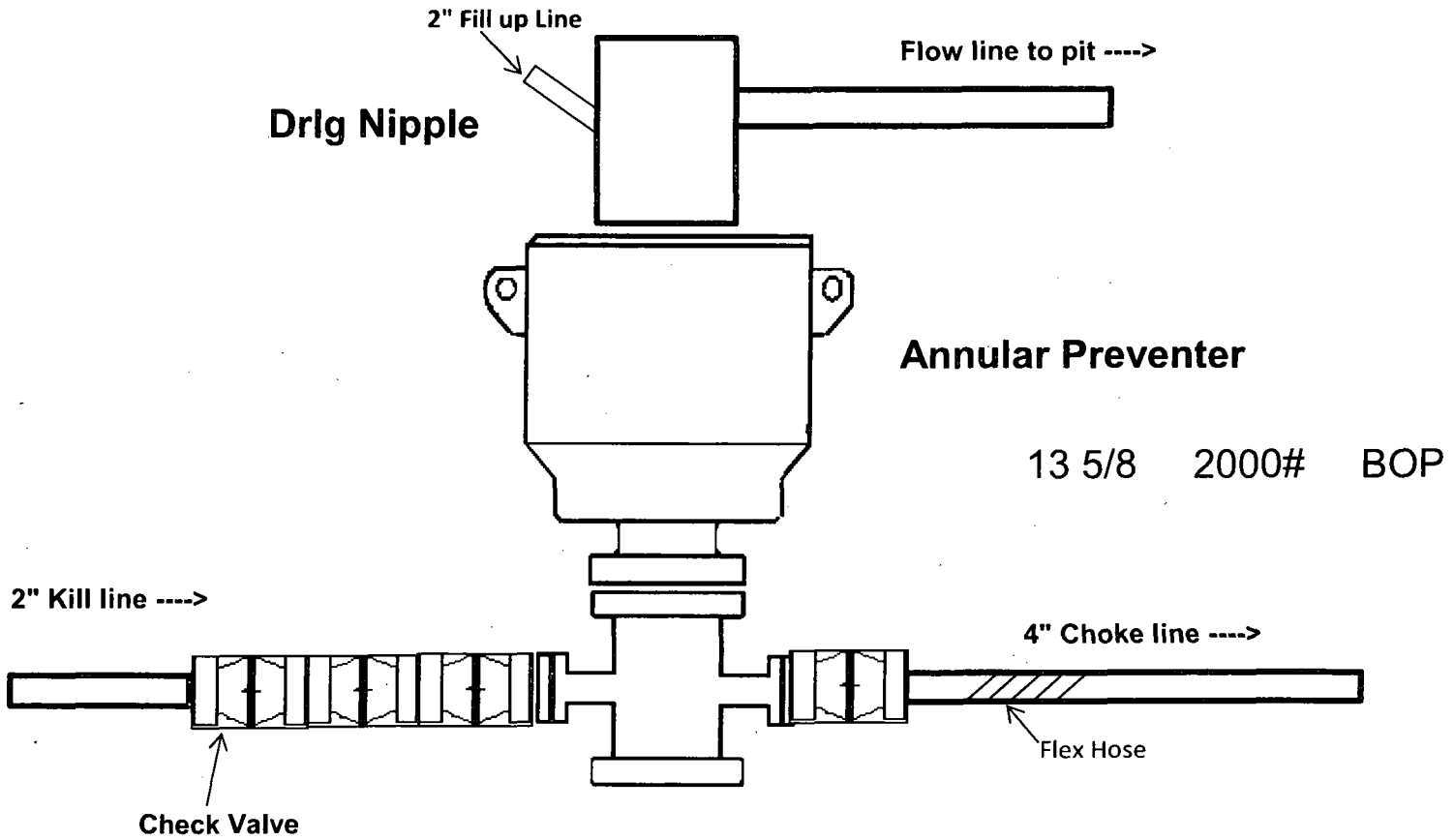
2M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



5,000 psi BOP Schematic



2,000 psi BOP Schematic



5M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)