COG Production, LLC - Windward Federal #11H

1. Geologic Formations

TVD of target	9,195' EOL	Pilot hole depth	NA
MD at TD:	19,254'	Deepest expected fresh water:	550'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	830	Water	
Top of Salt	1172	Salt	
Base of Salt	4372	Salt	
Lamar	4613	Salt Water	
Bell Canyon	4650	Salt Water	
Cherry Canyon	5543	Oil/Gas	
Brushy Canyon	6949	Oil/Gas	
Bone Spring Lime	8484	Oil/Gas	
U. Avalon Shale	8771	Oil/Gas	
L. Avalon Shale	9029	Oil/Gas	
1st Bone Spring Sand	9627	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	855	13.375"	54.5	J55	STC	2.89	1.37	11.03
12.25"	0	4640	9.625"	40	J55	LTC	1.04	1.10	2.80
8.75"	0	19,254	5.5"	17	P110	LTC	1.66	2.98	2.85
			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 - Windward Federal #11H

	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.	320	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.	880	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	630	11.9	2.5	19	72	Lead: 50:50:10 H Blend
	2690	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	4,140'	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.

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

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	4495 psi at 9195' 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 (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

WINDWARD FEDERAL COM #11H 1 MILE DATA (16-1087)

FID	OPERATOR	WELL_NAME	LATITUDE	LONGITUDE	API	SECTION	TOWNSHIP	RANGE	FTG_NS	NS_CD	FTG_EW	EW_CD	COMPL_STAT
0	LEGACY RESERVES OPERATING, LP	BTBN 25 FEDERAL 002	32.189235	-103.724073	3001529551	25	24.0S	31E	2300	N	330	E	Active
1	DEVON ENERGY PRODUCTION COMPANY, LP	COTTON DRAW UNIT 116H	32.167397	-103.724254	3001537926	36	24.0S	31E	330	S	430	E	New (Not drilled or compl)
2	STANOLIND OIL & GAS CO	PAYNE 001	32.190181	-103.703114	3002512715	29	24.0S	32E	1980	N	660	W	Plugged
3	FORTE ENERGY CORP	PADUCA FEDERAL 001	32.190153	-103.711689	3002526234	30	24.0S	32E	1980	N	1980	E	Plugged
4	YATES PETROLEUM CORPORATION	HARACZ AMO FEDERAL 007	32.205569	-103.715482	3002533345	19	24.0S	32E	1650	N	2310	W	Active
5	COG PRODUCTION, LLC	TURQUOISE 30 FEDERAL SWD 001	32.190274	-103.716568	3002533455	30	24.0S	32E	1930	N	1980	W	Plugged
6	SAHARA OPERATING CO	SPENCER 5 FEDERAL 001	32.153352	-103.703611	3002535390	5	25.0S	32E	478	S	680	W	Plugged
7	COG PRODUCTION, LLC	REDHEAD 31 FEDERAL 001H	32.180106	-103.719683	3002540390	31	24.0S	32E	330	N	990	W	New (Not drilled or compl)
8	YATES PETROLEUM CORPORATION	CALCUTTA BRZ STATE 001	32.180179	-103.703088	3002540453	32	24.0S	32E	330	N	660	W	Plugged
9	COG PRODUCTION, LLC	AZORES FEDERAL 003H	32.181662	-103.698801	3002541158	29	24.0S	32E	190	S	1980	W	New (Not drilled or compl)
10	DEVON ENERGY PRODUCTION COMPANY, LP	COTTON DRAW 32 STATE FEDERAL COM 002H	32.172901	-103.698585	3002541170	32	24.0S	32E	2310	S	2030	W	New (Not drilled or compl)
11	DEVON ENERGY PRODUCTION COMPANY, LP	COTTON DRAW 32 STATE FEDERAL COM 003H	32.172901	-103.698748	3002541171	32	24.0S	32E	2310	S	1980	W	New (Not drilled or compl)
12	DEVON ENERGY PRODUCTION COMPANY, LP	COTTON DRAW 32 STATE FEDERAL COM 004H	32.172894	-103.700859	3002541172	32	24.0S	32E	2310	S	1330	W	New (Not drilled or compl)
13	COG PRODUCTION, LLC	WINDWARD FEDERAL 002H	32.195078	-103.717262	3002541408	30	24.0S	32E	190	N	1750	W	New (Not drilled or compl)
14	COG PRODUCTION, LLC	WINDWARD FEDERAL 004H	32.19511	-103.706489	3002541412	30	24.0S	32E	190	N	430	E	New (Not drilled or compl)
15	COG PRODUCTION, LLC	WINDWARD FEDERAL 003H	32.195094	-103.711914	3002541413	30	24.0S	32E	190	N	2100	E	New (Not drilled or compl)
16	COG PRODUCTION, LLC	WINDWARD FEDERAL 001H	32.195065	-103.721549	3002541414	30	24.0S	32E	190	N	430	W	New (Not drilled or compl)
17	COG PRODUCTION, LLC	AZORES FEDERAL 002H	32.181728	-103.693402	3002541534	29	24.0S	32E	190	S	1650	E	New (Not drilled or compl)
18	COG PRODUCTION, LLC	AZORES FEDERAL 004H	32.181609	-103.703089	3002541535	29	24.0S	32E	190	S	660	W	New (Not drilled or compl)
19	COG PRODUCTION, LLC	KING TUT FEDERAL 001H	32.195064	-103.721874	3002541542	30	24.0S	32E	190	N	330	W	New (Not drilled or compl)
20	COG PRODUCTION, LLC	KING TUT FEDERAL 002H	32.195077	-103.717587	3002541558	30	24.0S	32E	190	N	1650	W	New (Not drilled or compl)
21	COG PRODUCTION, LLC	KING TUT FEDERAL 003H	32.195093	-103.712239	3002541559	30	24.0S	32E	190	N	2200	E	New (Not drilled or compl)
22	COG PRODUCTION, LLC	KING TUT FEDERAL 004H	32.195111	-103.706164	3002541560	30	24.0S	32E	190	N	330	E	New (Not drilled or compl)
23	COG PRODUCTION, LLC	CORVO FEDERAL 002H	32.180654	-103.695739	3002541910	32	24.0S	32E	190	N	2370	E	New (Not drilled or compl)
24	COG PRODUCTION, LLC	CORVO FEDERAL 003H	32.181658	-103.699125	3002541911	29	24.0S	32E	190	S	1880	W	New (Not drilled or compl)
25	COG PRODUCTION, LLC	CORVO FEDERAL 004H	32.181605	-103.703414	3002541912	29	24.0S	32E	190	S	560	W	New (Not drilled or compl)
26	DEVON ENERGY PRODUCTION COMPANY, LP	CHINCOTEAGUE 32 STATE COM 001H	32.167089	-103.702439	3002542215	32	24.0S	32E	200	S	830	W	New (Not drilled or compl)
27	DEVON ENERGY PRODUCTION COMPANY, LP	CHINCOTEAGUE 32 STATE COM 003H	32.167108	-103.696594	3002542216	32	24.0S	32E	200	S	2630	W	New (Not drilled or compl)
28	DEVON ENERGY PRODUCTION COMPANY, LP	CHINCOTEAGUE 32 STATE COM 004H	32.167108	-103.696499	3002542217	32	24.0S	32E	200	S	2600	E	New (Not drilled or compl)
29	DEVON ENERGY PRODUCTION COMPANY, LP	CHINCOTEAGUE 32 STATE COM 002H	32.167089	-103.702277	3002542263	32	24.0S	32E	200	S	880	W	New (Not drilled or compl)
30	DEVON ENERGY PRODUCTION COMPANY, LP	REBEL 20 FEDERAL 001H	32.20926	-103.703684	3002542515	20	24.0S	32E	330	N	520	W	New (Not drilled or compl)
31	DEVON ENERGY PRODUCTION COMPANY, LP	REBEL 20 FEDERAL 005H	32.209303	-103.703841	3002542769	20	24.0S	32E	314	N	472	W	New (Not drilled or compl)
32	COG PRODUCTION, LLC	AZORES FEDERAL 007H	32.180592	-103.696323	3002543170	32	24.0S	32E	210	N	2550	E	New (Not drilled or compl)
33	COG PRODUCTION, LLC	AZORES FEDERAL 011H	32.180595	-103.696064	3002543171	32	24.0S	32E	210	N	2470	E	New (Not drilled or compl)
34	COG PRODUCTION, LLC	WINDWARD FEDERAL 005H	32.195011	-103.721224	3002543174	30	24.0S	32E	210	N	530	W	New (Not drilled or compl)
35	COG PRODUCTION, LLC	AZORES FEDERAL 012H	32.181705	-103.699775	3002543178	29	24.0S	32E	210	S	1680	W	New (Not drilled or compl)
36	COG PRODUCTION, LLC	AZORES FEDERAL 008H	32.181709	-103.69945	3002543212	29	24.0S	32E	210	S	1780	W	New (Not drilled or compl)
37	DEVON ENERGY PRODUCTION COMPANY, LP	COTTON DRAW 32 STATE FEDERAL COM 005H	32.173162	-103.69448	3002543274	32	24.0S	32E	2400	S	1980	E	New (Not drilled or compl)

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		

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

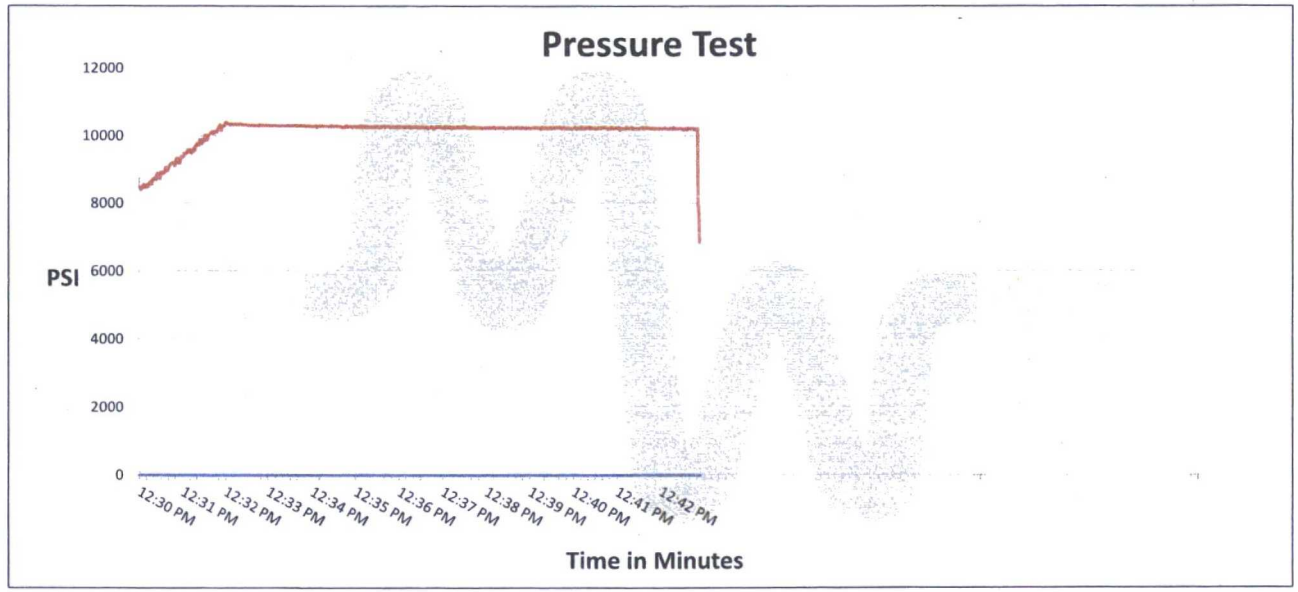
Pick Ticket #: 326000

Hose Specifications

Hose Type	Length
D	25'
I.D.	**O.D.**
3.5"	4.89"
Working Pressure	**Burst Pressure**
5000 PSI	Standard Safety Multiplier Applies

Verification

Type of Fitting	Coupling Method
4 1/16 5K	Swage
Die Size	**Final O.D.**
5.49"	5.50"
Hose Serial #	**Hose Assembly Serial #**
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.

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	Dec	Hose Grade	D
Sales Order #	216297	Hose Working Pressure	5,000
Customer Purchase Order #	237512	Hose Lot #	8309
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 #)	V33LD	Connection (Heat #)	V336D
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)	22%	Compression % (See Crimp Calculator)	22%
Swaged By	Charles		

Hydrostatic Test Requirements

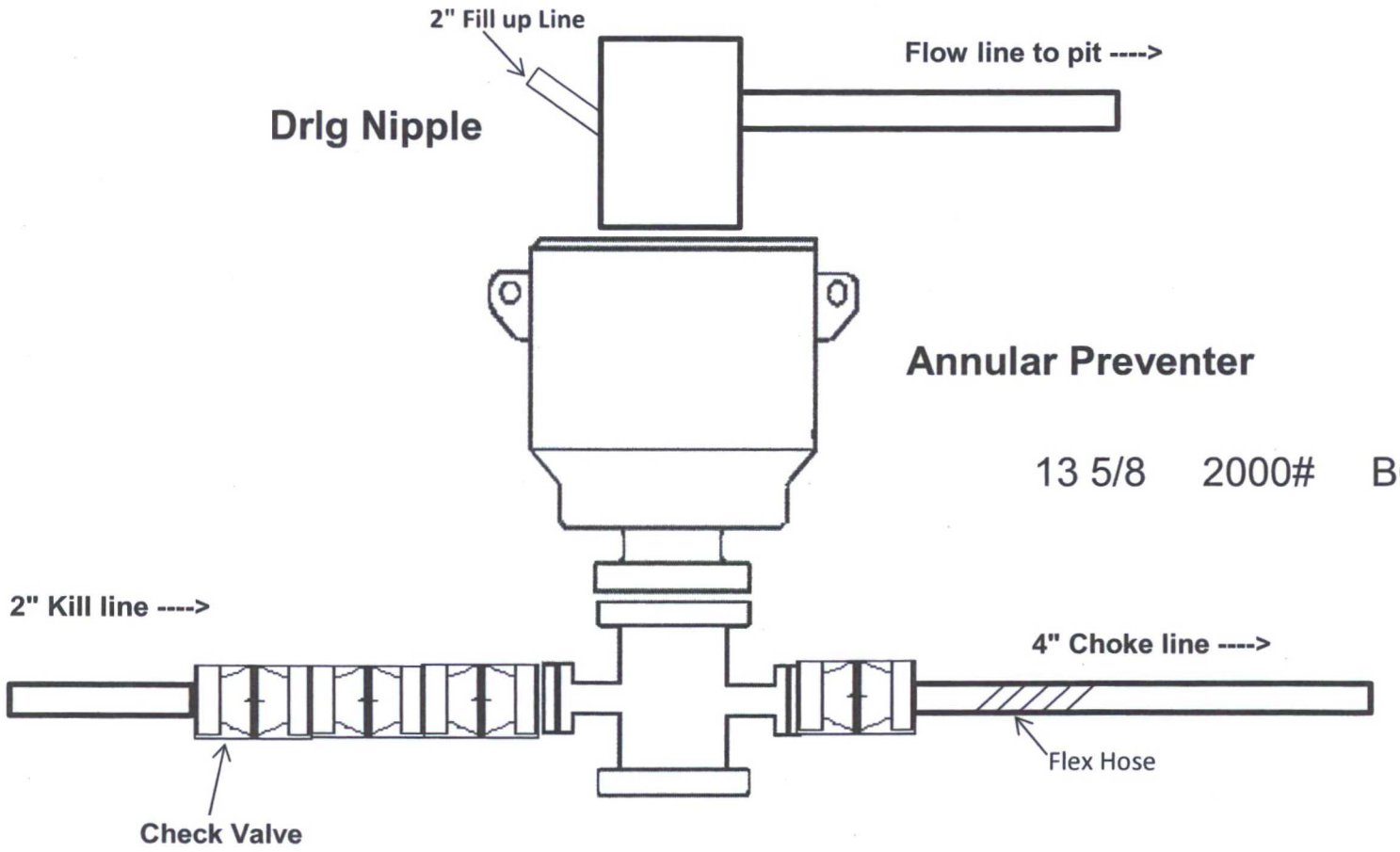
Test Pressure (psi)	10,000	Hold Time (minutes)	13¼
Tested By	Charles	Date Tested	6-26-14

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

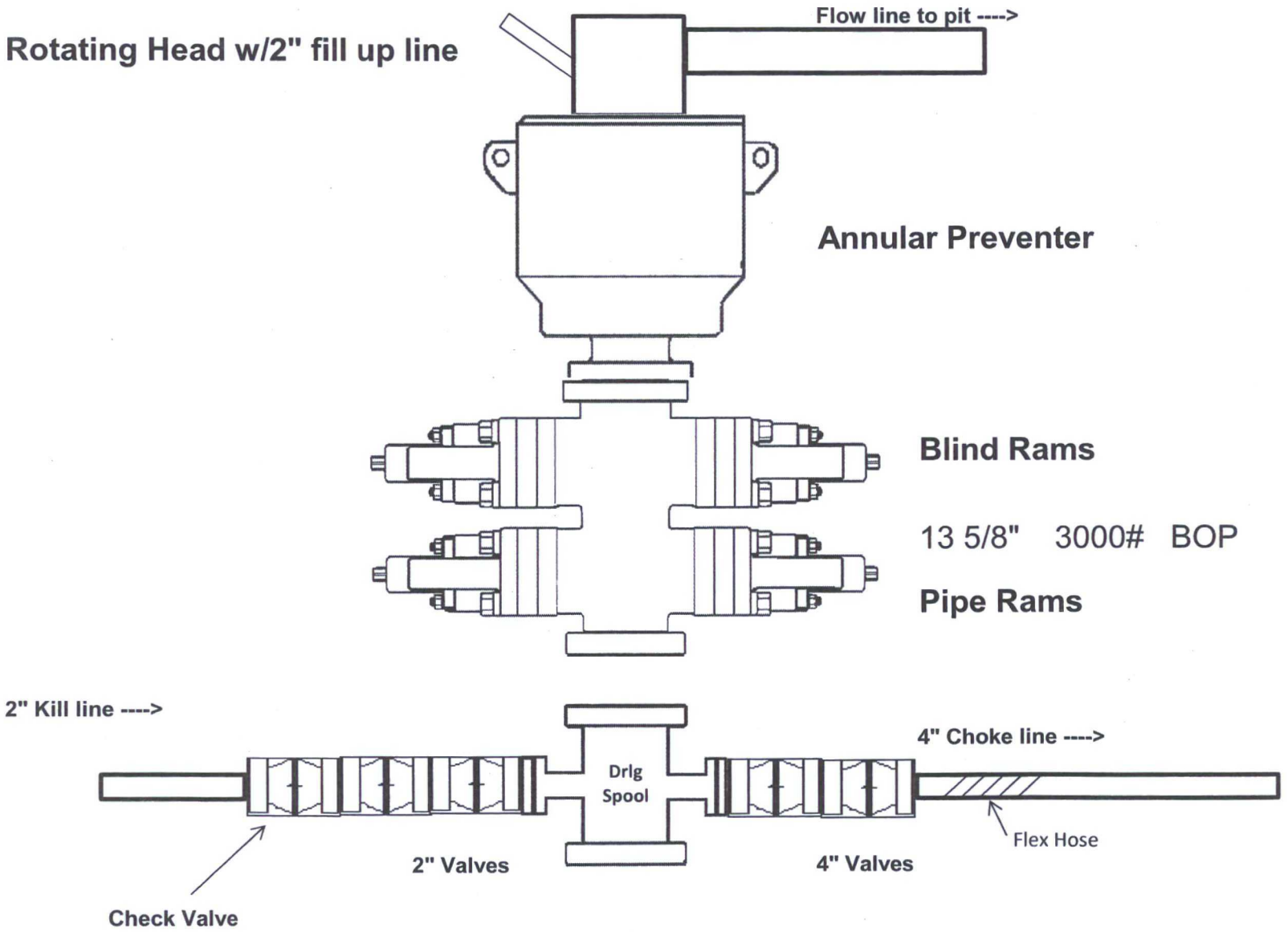
Final Verification

Visual Inspection	Yes No	Hammer Unions	Yes No
Lifting Collar	Yes No	Safety Clamps	Yes No
Customer or Third Party Witness	Customer or Third Party Witnessed By:		

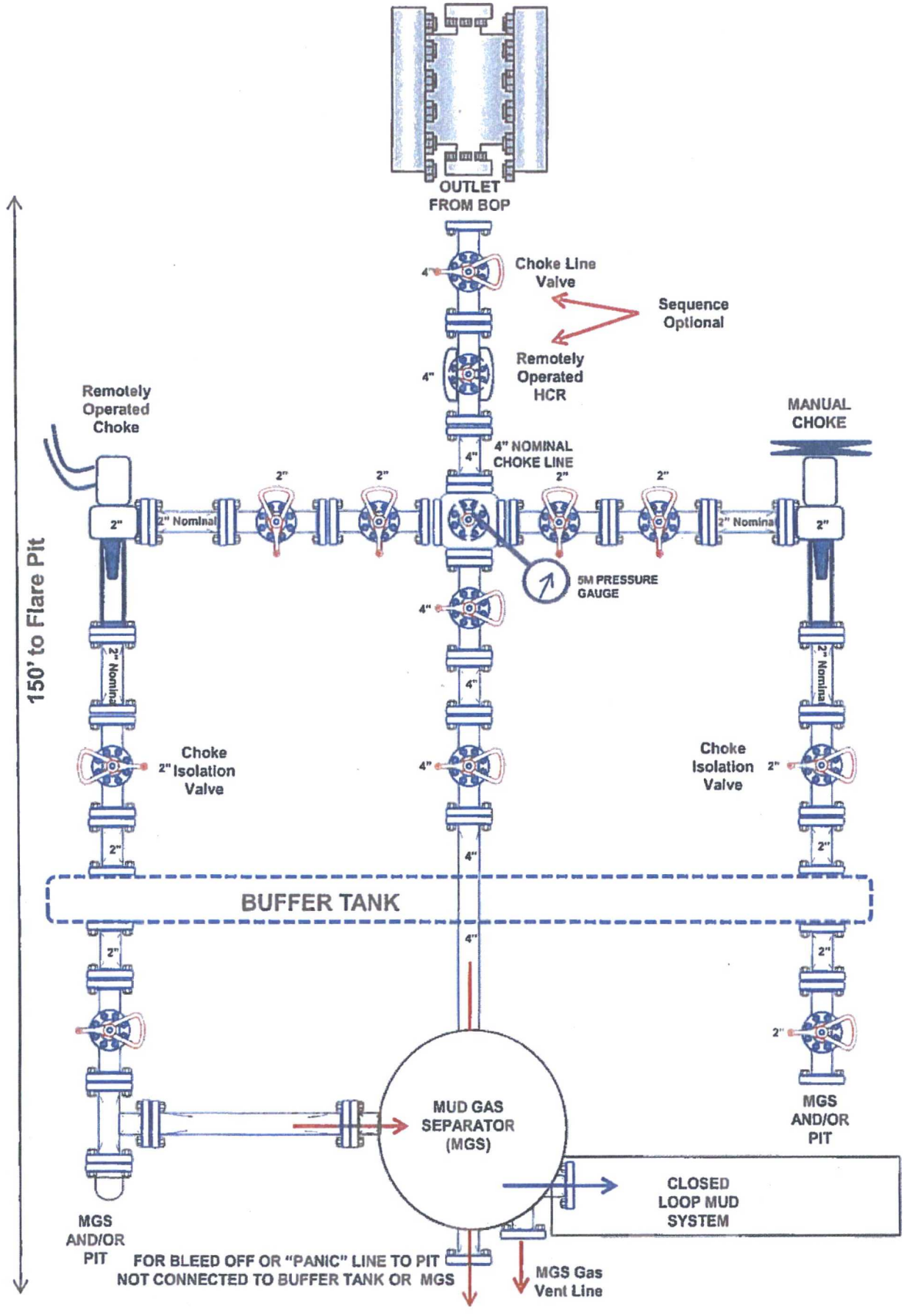
2,000 psi BOP Schematic



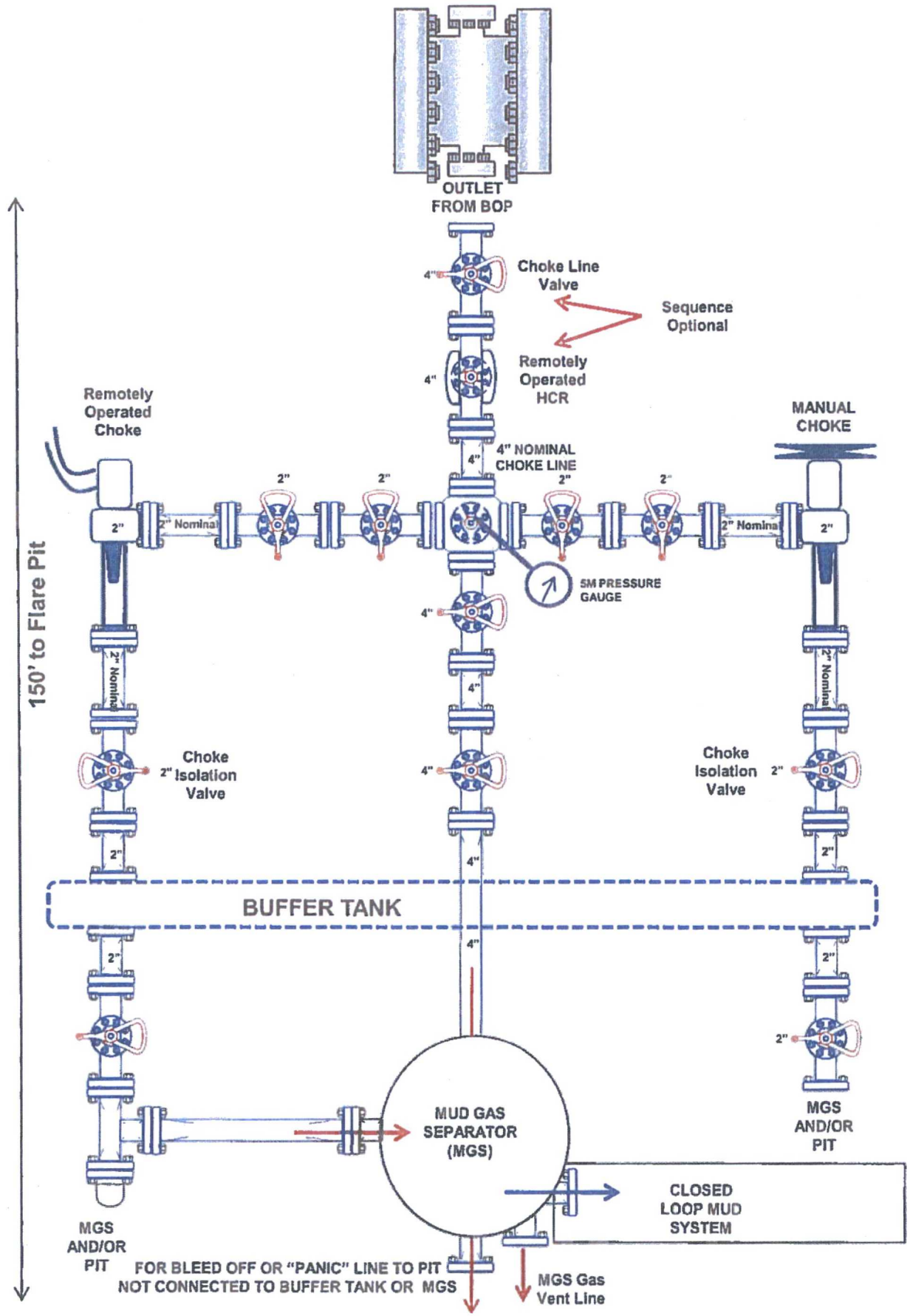
3,000 psi BOP Schematic

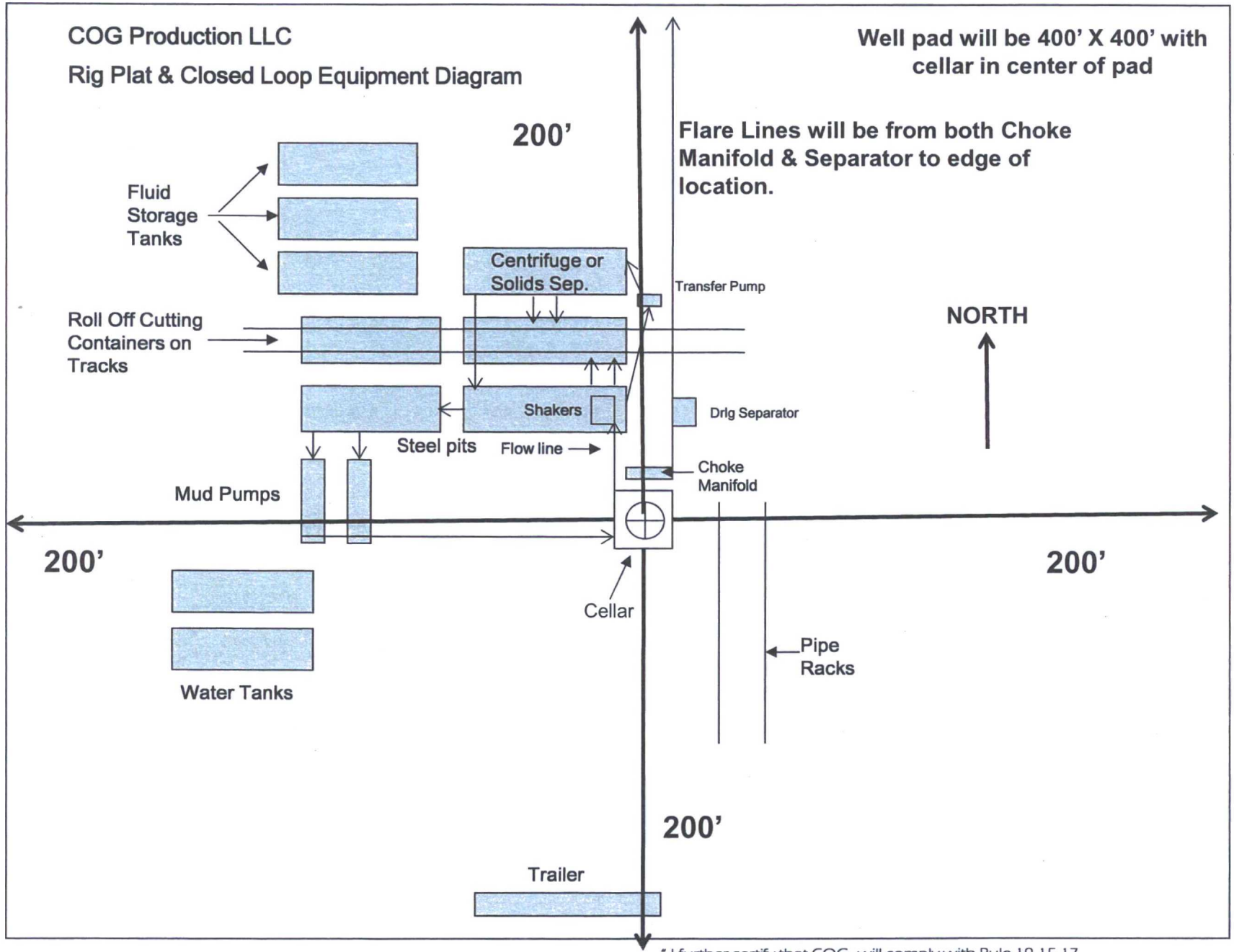


2M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



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

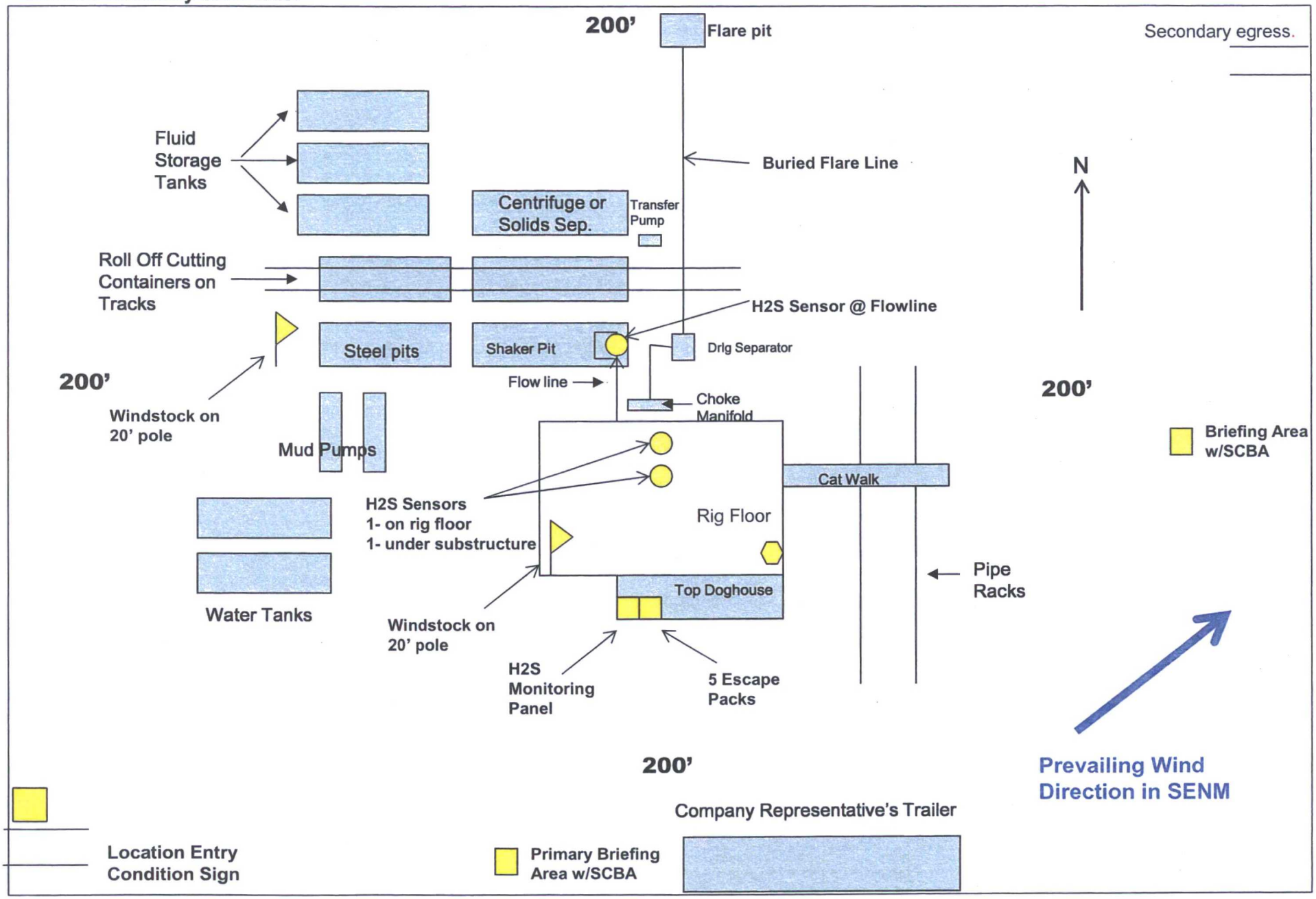




"I further certify that COG will comply with Rule 19.15.17 NMAC by using a Closed Loop System."

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

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



CONCHO

COG Production LLC
2208 West Main Street
Artesia, NM 88210

Well SIte Layout
Production Facility Layout

Windward Federal #11H
Section 30 - T24S - R32E

Exhibit 3