

HOBBS OCD

OCD Hobbs

APR 10 2014

13-911

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM120907
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator COG Production LLC.		7. If Unit or CA Agreement, Name and No.
3a. Address 2208 West Main Street Artesia, NM 88210		8. Lease Name and Well No. (4-0502) Treasure Island Federal #2H
3b. Phone No. (include area code) 575-748-6940		9. API Well No. 30-025-41777
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 190' FSL & 1840' FEL Unit Letter O (SWESE) SHL Sec 23-T24S-R32E At proposed prod. Zone 330' FNL & 1840' FEL Unit Letter B (NWNE) BHL Sec 23-T24S-R32E		10. Field and Pool or Exploratory WC-025 6-07 S24-3225C; LOWER Wildcat; Bone Spring (97964)
14. Distance in miles and direction from nearest town or post office* Approximately 24 miles from Malaga		11. Sec., T.R.M. or Blk and Survey or Area Sec. 23 - T24S - R32E
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 190'		12. County or Parish Lea County
16. No. of acres in lease 1840		13. State NM
17. Spacing Unit dedicated to this well 160		
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 1460' Treasure Island #1H BHL: 1790'		20. BLM/BIA Bond No. on file NMB000860 & NMB000845
19. Proposed Depth TVD: 10,850' MD: 15,440' PH: 13,500'		
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3579.3' GL		22. Approximate date work will start* 2/1/2014
		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 Mayte Reyes	Name (Printed/Typed) Mayte Reyes	Date 11/21/2013
Title		
Regulatory Analyst STEPHEN J. CAFFEY		
Approved by (Signature)	Name (Printed/Typed)	Date
		APR 9 2014
Title		
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.

APPROVAL FOR TWO YEARS

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)

Carlsbad Controlled Water Basin

Approval Subject to General Requirements
& Special Stipulations Attached

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

K2
04/11/14

K2

APR 14 2014

30-025-41777

COG Production LLC
DRILLING AND OPERATIONS PROGRAM
Treasure Island Federal 2H
SHL: 190' FSL & 1840' FEL
BHL: 330' FNL & 1840' FEL
Section 23 T24S R32E
Lea County, New Mexico

In conjunction with Form 3160-3, Application for Permit to Drill subject well, COG Operating LLC submits the following eleven items of pertinent information in accordance with BLM requirements.

1. Geological surface formation: Permian
2. The estimated tops of geologic markers & estimated depths at which anticipated water, oil or gas formations are expected to be encountered are as follows:

Fresh Water	205'	
Rustler	1,030'	
Top of Salt	1,364'	
Fletcher	4,663'	
Delaware	4,896'	Oil
Bone Springs	8,861'	Oil
Wolfcamp	12,151'	Oil
Strawn	14,152'	Oil
TD TVD	10,850'	
TD MD	15,440'	
PHTD	13,500'	

No other formations are expected to give up oil, gas or fresh water in measurable quantities. The surface fresh water sands will be protected by setting 13-3/8" casing at ~~1,055'~~ and circulating cement back to surface. All intervals will be isolated by setting 5 1/2" casing to total depth and tying back cement to a minimum of 500' into 9-5/8" csg.

3. Proposed Casing Program: All casing is new and API approved

Hole Size	Depths	Section	OD Casing	New/Used	Wt	Collar	Grade	Collapse Design Factor	Burst Design Factor	Tension Design Factor
	1175									
17 1/2"	0' - 1,055'	Surface	13 3/8"	New	54.5#	STC	J-55	1.125	1.125	1.6
12 1/4"	0' - 3,500' 4,900'	Intrmd	9 5/8"	New	36#	LTC	J-55	1.125	1.125	1.6
12 1/4"	3500' - 4,800'	Intrmd	9 5/8"	New	40#	LTC	J-55	1.125	1.125	1.6
7 7/8"	0' - 15,440'	Production Curve & Lateral	5 1/2"	New	17#	LTC	P-110	1.125	1.125	1.6

- While running all casing strings, the pipe will be kept a minimum of 1/3 full at all times to avoid approaching the collapse pressure of casing.

4. Proposed Cement Program

- a. 13-3/8" Surface
- Lead: 450 sx Class C + 4% Gel + 2% CaCl₂
(13.5 ppg / 1.75 cuft/sx / 9.2 gal/sk)
Tail: 250 sx Class C + 2% CaCl₂
(14.8 ppg / 1.34 cuft/sx / 6.3 gal/sk)
**Calculated w/50% excess on OH volumes
- b. 9 5/8" Intermediate:
- Lead: 850 sx 35:65:6 C Blend
(12.7 ppg / 2 cuft/sx / 10.6 gal/sk)
Tail: 250 sx Class C
(14.8 ppg / 1.34 cuft/sx / 6.3 gal/sk)
**Calculated w/35% excess on OH volumes
- c. 5 1/2" Production:
- Stage #1: Lead: 425 sx 35:65:6 H Blend
(12.7 ppg / 2 cuft/sx / 10.6 gal/sk)
Tail: 975 sx 50:50:2 H +Salt+GasStop +CFR-3
(14.4 ppg / 1.24 cuft/sx / 6.4 gal/sk)
**Calculated w/35% excess on OH volumes
DVT @ 6,800'
- Stage #2: Lead: 200 sx 50:50:10 Interfill C Blend
(11.9 ppg / 2.51 cuft/sx / 14.11 gal/sk)
Tail: 100 sx Class C Neat
(14.8 ppg / 1.34 cuft/sx / 6.3 gal/sk)
**Calculated w/35% excess on OH volumes
- The above cement volumes could be revised pending the caliper measurement.
 - The 9-5/8" intermediate string is designed to circulate cement to surface.
 - The production string will tie back a minimum of 500' into 9-5/8" shoe
 - The pilot hole will be plugged back with the below plugs:
 1. Plug #1
 - 300' from 13,200' – 13,500'
 - 100 sx Class H
 - 15.6 ppg 1.18 cuft/sk
 2. Plug #2
 - 500' from 11,750' – 12,250'
 - 145 sx Class H
 - 15.6 ppg 1.18 cuft/sk
 3. Plug #3
 - 700' from 10,100' – 10,800'
 - 250 sx Class H
 - 17.2 ppg .98 cuft/sk

5. Pressure Control:

Nipple up on 13 3/8 with annular preventer tested to 2000 psi by independent tester and the rest of the 2M system tested to 2000 psi.

Nipple up on 9 5/8 with 5M system tested to 5000 psi by independent tester.

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. A 2" kill line and a minimum 3" choke line will be included in the drilling spool located below the ram-type BOP. Other accessories to the BOP equipment will include a Kelly cock and

floor safety valve (inside BOP) and choke lines and choke manifold with 5000 psi WP rating. A remotely operated choke will be installed before drilling out intermediate shoe. If H₂S is monitored with 100 ppm in the gas stream while drilling intermediate, we will shut in and install a remote operated choke.

Cog Operating LLC requests a variance if Basic 46 is used to drill this well to use a co-flex line between the BOP and choke manifold.

Manufacturer: N.R.P. Jones

Serial Number MA31113Repair

Length: 23 Size: 3 ½ Ends – flanges/clamps WP rating: 5000 psi

Anchors are not required by the manufacturer

6. Estimated BHP & BHT:

Lateral TD = 5,078 psi

Lateral TD= 163° F

PH TD= 6,318 psi

PH TD= 187° F

7. Mud Program: The applicable depths and properties of this system are as follows:

Depth	Type System	Mud Weight	Viscosity (sec)	Waterloss (cc)
0' – 1,055' 1175	Fresh Water	8.4	29	N.C.
1,055' – 4,800' 4400	Brine	10	29	N.C.
4,800' – 15,440'	Cut Brine	8.8 – 9	29	N.C.
4800' – 13,500' (PH)	Cut Brine	8.8 – 9	29	N.C.

- The necessary mud products for weight addition and fluid loss control will be on location at all times.
- A visual and electronic mud monitoring system will be rigged up prior to spud to detect changes in the volume of mud system. The electronic system consists of a pit volume total, stroke counter and flow sensor at flow line.
- If weight and/or viscosity are introduced to the mud system a daily mud check will be performed by mud contractor, along with tourly check by rig personnel.
- After setting intermediate casing, a third party gas unit detection system will be installed at the flow line.

8. Auxiliary Well Control and Monitoring Equipment:

- a. A Kelly cock will be in the drill string at all times.
- b. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor at all times.
- c. Hydrogen Sulfide detection equipment will be in operation after drilling out the 13 3/8" casing shoe until the 5 ½" casing is cemented. Breathing equipment will be on location upon drilling the 13 3/8" shoe until total depth is reached.

9. Testing, Logging and Coring Program:

- a. Drill stem tests will be based on geological sample shows.
- b. If open hole electrical logging is performed, the program will be:
 - i. Total Depth to Intermediate Casing: Dual Laterolog-Micro Laterolog and Gamma Ray. Compensated Neutron – Z Density log with Gamma Ray and Caliper.

- ii. Total Depth to Surface: Compensated Neutron with Gamma Ray
- iii. No coring program is planned
- iv. Additional testing will be initiated subsequent to setting the 5 1/2" production casing. Specific intervals will be targeted based on log evaluation, geological sample shows and drill stem tests.

10. Potential Hazards:

- a. No abnormal pressures or temperatures are expected. There is no known presence of H₂S in this area. If H₂S is encountered the operator will comply with the provisions of Onshore Oil and Gas Order No. 6. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. No H₂S is anticipated to be encountered.

11. Anticipated starting date and Duration of Operations:

- a. Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 35 days.



25 October, 2013





Wellplanning Survey Report

Company:	COG Production LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3601.3usft (Original Well Elev)
Site:	Treasure Island Federal	MD Reference:	WELL @ 3601.3usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	EDM 5000.1 Single User Db

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		Treasure Island Federal			
Site Position:		Northing:	435,807.90 usft	Latitude:	32° 11' 46.554 N
From:	Map	Easting:	713,748.60 usft	Longitude:	103° 38' 32.429 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.37 °

Well	#2H					
Well Position	+N/-S	0.0 usft	Northing:	435,807.90 usft	Latitude:	32° 11' 46.554 N
	+E/-W	0.0 usft	Easting:	713,748.60 usft	Longitude:	103° 38' 32.429 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,579.3 usft

Wellbore:	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010	10/25/2013	(°)	(°)	(nT)
			7.33	60.09	48,355

Design	Design #1				
Audit Notes:					
Version:		Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	359.70	

Survey Tool Program	Date	10/25/2013			
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
0.0	15,439.9	Design #1 (OH)	MWD	MWD - Standard	

Planned Survey										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate	
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	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	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	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	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	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	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	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	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	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	



Wellplanning Survey Report

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Site:	Treasure Island Federal	MD Reference:	WELL @ 3601.3usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	EDM 5000.1 Single User Db

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)	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	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	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	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	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	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	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	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	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	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	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	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	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	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	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	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	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	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	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	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	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	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	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	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	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	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	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	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	
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	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	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	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	
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	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	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	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	
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	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	
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	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	
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	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	
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	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	



Wellplanning Survey Report

Company:	COG Production LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3601.3usft (Original Well Elev)
Site:	Treasure Island Federal	MD Reference:	WELL @ 3601.3usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	EDM 5000.1 Single User Db

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	
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	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	
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	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	
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	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	
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	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	
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	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	
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	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	
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	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	
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	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	
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	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	
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	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	
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	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	
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	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	
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	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	
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	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	
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	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	
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	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	
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	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	
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	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	
9,100.0	0.00	0.00	9,100.0	0.0	0.0	0.0	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	
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	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	
9,500.0	0.00	0.00	9,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,600.0	0.00	0.00	9,600.0	0.0	0.0	0.0	0.00	0.00	0.00	



Wellplanning Survey Report

Company:	COG Production LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3601.3usft (Original Well Elev)
Site:	Treasure Island Federal	MD Reference:	WELL @ 3601.3usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	EDM 5000.1 Single User Db

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)	
9,700.0	0.00	0.00	9,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,800.0	0.00	0.00	9,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,900.0	0.00	0.00	9,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,300.0	0.00	0.00	10,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,402.5	0.00	0.00	10,402.5	0.0	0.0	0.0	0.00	0.00	0.00	
KOP - 10402.5 'MD, 0.00° INC, 0.00° AZI										
10,425.0	2.70	359.70	10,425.0	0.5	0.0	0.5	12.00	12.00	0.00	
10,450.0	5.70	359.70	10,449.9	2.4	0.0	2.4	12.00	12.00	0.00	
10,475.0	8.70	359.70	10,474.7	5.5	0.0	5.5	12.00	12.00	0.00	
10,500.0	11.70	359.70	10,499.3	9.9	-0.1	9.9	12.00	12.00	0.00	
10,525.0	14.70	359.70	10,523.7	15.6	-0.1	15.6	12.00	12.00	0.00	
10,550.0	17.70	359.70	10,547.7	22.6	-0.1	22.6	12.00	12.00	0.00	
10,575.0	20.70	359.70	10,571.3	30.8	-0.2	30.8	12.00	12.00	0.00	
10,600.0	23.70	359.70	10,594.4	40.3	-0.2	40.3	12.00	12.00	0.00	
10,625.0	26.70	359.70	10,617.0	50.9	-0.3	50.9	12.00	12.00	0.00	
10,650.0	29.70	359.70	10,639.1	62.7	-0.3	62.7	12.00	12.00	0.00	
10,675.0	32.70	359.70	10,660.4	75.7	-0.4	75.7	12.00	12.00	0.00	
10,700.0	35.70	359.70	10,681.1	89.7	-0.5	89.7	12.00	12.00	0.00	
10,725.0	38.70	359.70	10,701.0	104.8	-0.5	104.8	12.00	12.00	0.00	
10,750.0	41.70	359.70	10,720.1	121.0	-0.6	121.0	12.00	12.00	0.00	
10,775.0	44.70	359.70	10,738.4	138.1	-0.7	138.1	12.00	12.00	0.00	
10,800.0	47.70	359.70	10,755.7	156.1	-0.8	156.1	12.00	12.00	0.00	
10,825.0	50.70	359.70	10,772.0	175.0	-0.9	175.0	12.00	12.00	0.00	
10,850.0	53.69	359.70	10,787.3	194.8	-1.0	194.8	12.00	12.00	0.00	
10,875.0	56.69	359.70	10,801.6	215.3	-1.1	215.3	12.00	12.00	0.00	
10,900.0	59.69	359.70	10,814.8	236.5	-1.2	236.6	12.00	12.00	0.00	
10,925.0	62.69	359.70	10,826.8	258.5	-1.4	258.5	12.00	12.00	0.00	
10,950.0	65.69	359.70	10,837.7	281.0	-1.5	281.0	12.00	12.00	0.00	
10,975.0	68.69	359.70	10,847.4	304.0	-1.6	304.0	12.00	12.00	0.00	
11,000.0	71.69	359.70	10,855.8	327.5	-1.7	327.5	12.00	12.00	0.00	
11,025.0	74.69	359.70	10,863.1	351.4	-1.8	351.5	12.00	12.00	0.00	
11,050.0	77.69	359.70	10,869.0	375.7	-2.0	375.7	12.00	12.00	0.00	
11,075.0	80.69	359.70	10,873.7	400.3	-2.1	400.3	12.00	12.00	0.00	
11,100.0	83.69	359.70	10,877.1	425.0	-2.2	425.0	12.00	12.00	0.00	
11,125.0	86.69	359.70	10,879.2	449.9	-2.4	450.0	12.00	12.00	0.00	
11,150.0	89.69	359.70	10,880.0	474.9	-2.5	474.9	12.00	12.00	0.00	
11,155.9	90.40	359.70	10,880.0	480.8	-2.5	480.8	12.00	12.00	0.00	
EOC- 11155.9 'MD, 90.40° INC, 359.70° AZI										
11,200.0	90.40	359.70	10,879.7	524.9	-2.7	524.9	0.00	0.00	0.00	
11,300.0	90.40	359.70	10,879.0	624.9	-3.3	624.9	0.00	0.00	0.00	
11,400.0	90.40	359.70	10,878.3	724.9	-3.8	724.9	0.00	0.00	0.00	



Wellplanning Survey Report

Company:	COG Production LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3601.3usft (Original Well Elev)
Site:	Treasure Island Federal	MD Reference:	WELL @ 3601.3usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	EDM 5000.1 Single User Db

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)	
11,500.0	90.40	359.70	10,877.6	824.9	-4.3	824.9	0.00	0.00	0.00	
11,600.0	90.40	359.70	10,876.9	924.9	-4.8	924.9	0.00	0.00	0.00	
11,700.0	90.40	359.70	10,876.2	1,024.9	-5.4	1,024.9	0.00	0.00	0.00	
11,800.0	90.40	359.70	10,875.5	1,124.9	-5.9	1,124.9	0.00	0.00	0.00	
11,900.0	90.40	359.70	10,874.8	1,224.9	-6.4	1,224.9	0.00	0.00	0.00	
12,000.0	90.40	359.70	10,874.1	1,324.9	-6.9	1,324.9	0.00	0.00	0.00	
12,100.0	90.40	359.70	10,873.4	1,424.9	-7.5	1,424.9	0.00	0.00	0.00	
12,200.0	90.40	359.70	10,872.7	1,524.9	-8.0	1,524.9	0.00	0.00	0.00	
12,300.0	90.40	359.70	10,872.0	1,624.9	-8.5	1,624.9	0.00	0.00	0.00	
12,400.0	90.40	359.70	10,871.3	1,724.9	-9.0	1,724.9	0.00	0.00	0.00	
12,500.0	90.40	359.70	10,870.6	1,824.9	-9.6	1,824.9	0.00	0.00	0.00	
12,600.0	90.40	359.70	10,869.9	1,924.9	-10.1	1,924.9	0.00	0.00	0.00	
12,700.0	90.40	359.70	10,869.2	2,024.9	-10.6	2,024.9	0.00	0.00	0.00	
12,800.0	90.40	359.70	10,868.5	2,124.9	-11.1	2,124.9	0.00	0.00	0.00	
12,900.0	90.40	359.70	10,867.8	2,224.9	-11.6	2,224.9	0.00	0.00	0.00	
13,000.0	90.40	359.70	10,867.1	2,324.9	-12.2	2,324.9	0.00	0.00	0.00	
13,100.0	90.40	359.70	10,866.4	2,424.9	-12.7	2,424.9	0.00	0.00	0.00	
13,200.0	90.40	359.70	10,865.7	2,524.9	-13.2	2,524.9	0.00	0.00	0.00	
13,300.0	90.40	359.70	10,865.0	2,624.8	-13.7	2,624.9	0.00	0.00	0.00	
13,400.0	90.40	359.70	10,864.3	2,724.8	-14.3	2,724.9	0.00	0.00	0.00	
13,500.0	90.40	359.70	10,863.6	2,824.8	-14.8	2,824.9	0.00	0.00	0.00	
13,600.0	90.40	359.70	10,862.9	2,924.8	-15.3	2,924.9	0.00	0.00	0.00	
13,700.0	90.40	359.70	10,862.2	3,024.8	-15.8	3,024.9	0.00	0.00	0.00	
13,800.0	90.40	359.70	10,861.5	3,124.8	-16.4	3,124.9	0.00	0.00	0.00	
13,900.0	90.40	359.70	10,860.8	3,224.8	-16.9	3,224.9	0.00	0.00	0.00	
14,000.0	90.40	359.70	10,860.1	3,324.8	-17.4	3,324.9	0.00	0.00	0.00	
14,100.0	90.40	359.70	10,859.4	3,424.8	-17.9	3,424.9	0.00	0.00	0.00	
14,200.0	90.40	359.70	10,858.7	3,524.8	-18.5	3,524.9	0.00	0.00	0.00	
14,300.0	90.40	359.70	10,858.1	3,624.8	-19.0	3,624.9	0.00	0.00	0.00	
14,400.0	90.40	359.70	10,857.4	3,724.8	-19.5	3,724.9	0.00	0.00	0.00	
14,500.0	90.40	359.70	10,856.7	3,824.8	-20.0	3,824.9	0.00	0.00	0.00	
14,600.0	90.40	359.70	10,856.0	3,924.8	-20.6	3,924.9	0.00	0.00	0.00	
14,700.0	90.40	359.70	10,855.3	4,024.8	-21.1	4,024.9	0.00	0.00	0.00	
14,800.0	90.40	359.70	10,854.6	4,124.8	-21.6	4,124.8	0.00	0.00	0.00	
14,900.0	90.40	359.70	10,853.9	4,224.8	-22.1	4,224.8	0.00	0.00	0.00	
15,000.0	90.40	359.70	10,853.2	4,324.8	-22.6	4,324.8	0.00	0.00	0.00	
15,100.0	90.40	359.70	10,852.5	4,424.8	-23.2	4,424.8	0.00	0.00	0.00	
15,200.0	90.40	359.70	10,851.8	4,524.8	-23.7	4,524.8	0.00	0.00	0.00	
15,300.0	90.40	359.70	10,851.1	4,624.8	-24.2	4,624.8	0.00	0.00	0.00	
15,400.0	90.40	359.70	10,850.4	4,724.8	-24.7	4,724.8	0.00	0.00	0.00	
15,439.9	90.40	359.70	10,850.1	4,764.7	-24.9	4,764.7	0.00	0.00	0.00	
TD at 15439.9 - PBHL(TI#2H)										



Wellplanning Survey Report

Company:	COG Production LLC	Local Co-ordinate Reference:	Well #2H
Project:	Lea County, NM	TVD Reference:	WELL @ 3601.3usft (Original Well Elev)
Site:	Treasure Island Federal	MD Reference:	WELL @ 3601.3usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	EDM 5000.1 Single User Db

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
PBHL(TI#2H)	0.00	0.00	10,850.0	4,764.7	-21.6	440,572.60	713,727.00	32° 12' 33.705 N	103° 38' 32.324 W
- plan misses target center by 3.3usft at 15439.9usft MD (10850.1 TVD, 4764.7 N, -24.9 E)									
- Point									

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
10,403	10,403	0	0	KOP - 10402.5 'MD, 0.00° INC, 0.00° AZI
11,156	10,880	481	-3	EOC- 11155.9 'MD, 90.40° INC, 359.70° AZI
15,440	10,850	4765	-25	TD at 15439.9

Checked By: _____	Approved By: _____	Date: _____
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COG Production LLC
Project: Lea County, NM
Site: Treasure Island Federal
Well: #2H
Wellbore: OH
Plan: Design #1 (#2H/OH)

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0
2	10402.5	0.00	0.00	10402.5	0.0	0.0	0.00	0.00	0.0
3	11155.9	90.40	359.70	10880.0	480.8	-2.5	12.00	359.70	480.8
4	15439.9	90.40	359.70	10850.1	4764.7	-24.9	0.00	0.00	4764.7

PBHL(TI#2H)

WELL DETAILS: #2H

Ground Elevation:: 3579.3
RKB Elevation: WELL @ 3601.3usft (Original Well Elev)
Rig Name: Original Well Elev

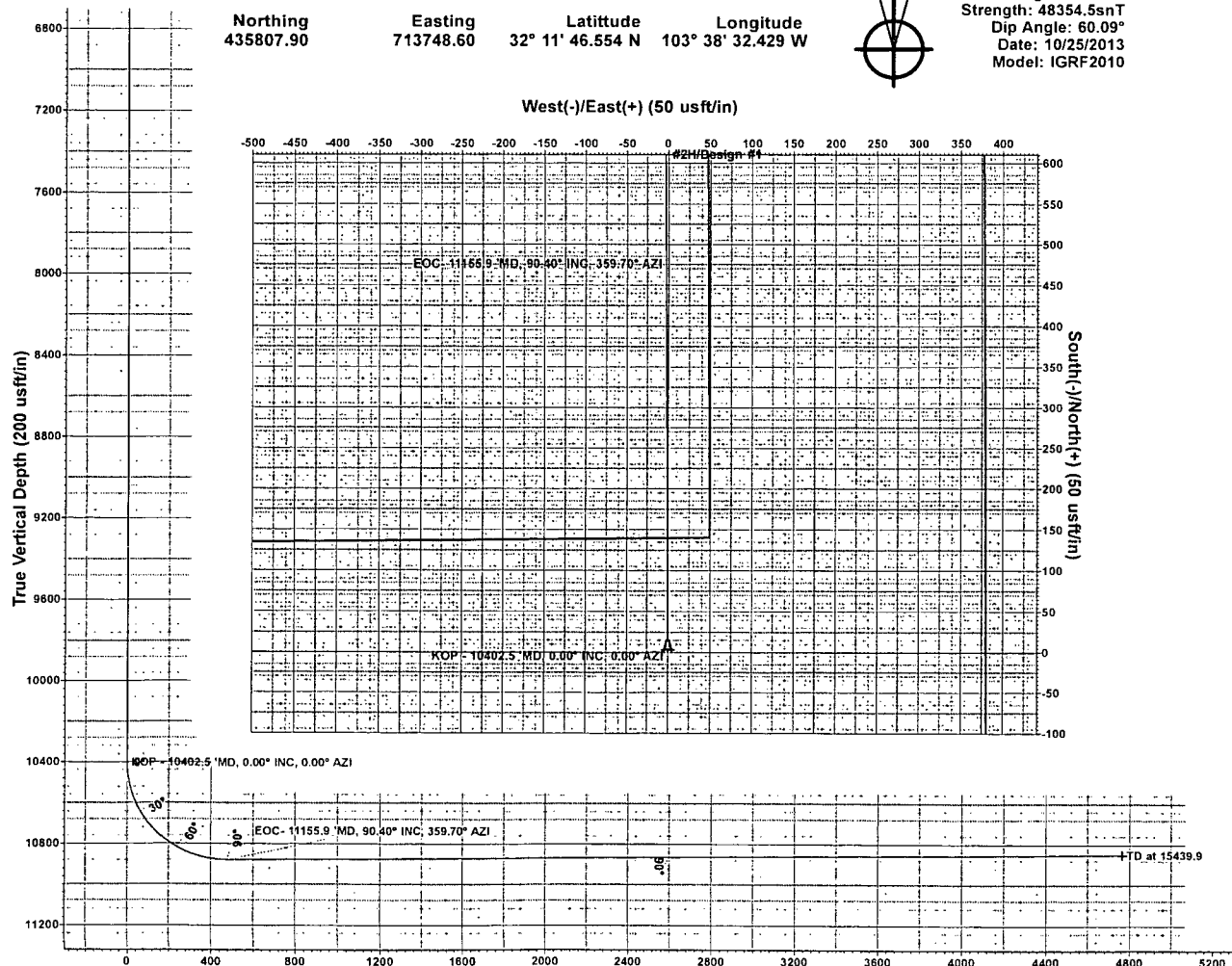
Northing 435807.90 Easting 713748.60 Latitude 32° 11' 46.554 N Longitude 103° 38' 32.429 W



Azimuths to Grid North
True North: -0.37°
Magnetic North: 6.96°

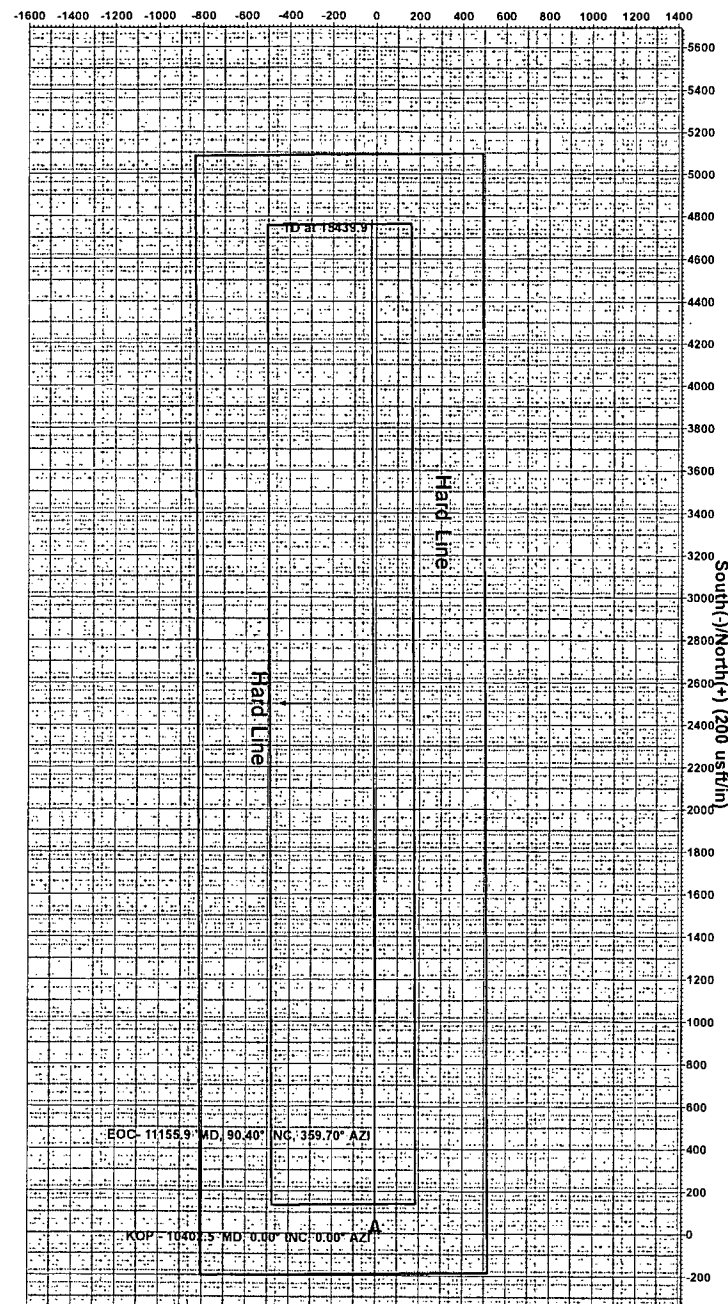
Magnetic Field
Strength: 48354.5snT
Dip Angle: 60.09°
Date: 10/25/2013
Model: IGRF2010

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



Vertical Section at 359.70° (200 usft/in)

West(-)/East(+) (200 usft/in)



PROJECT DETAILS: 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



Plan: Design #1 (#2H/OH)
created By: Well Planner Date: 17:00, October 25 2013

Terra Directional Services
322 Spring Hill Drive, Suite A100, Spring, Texas 77386
432.425.7532

COG Production LLC
H₂S Equipment Schematic
Terrain: Shinnery sand hills.

7

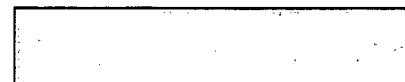


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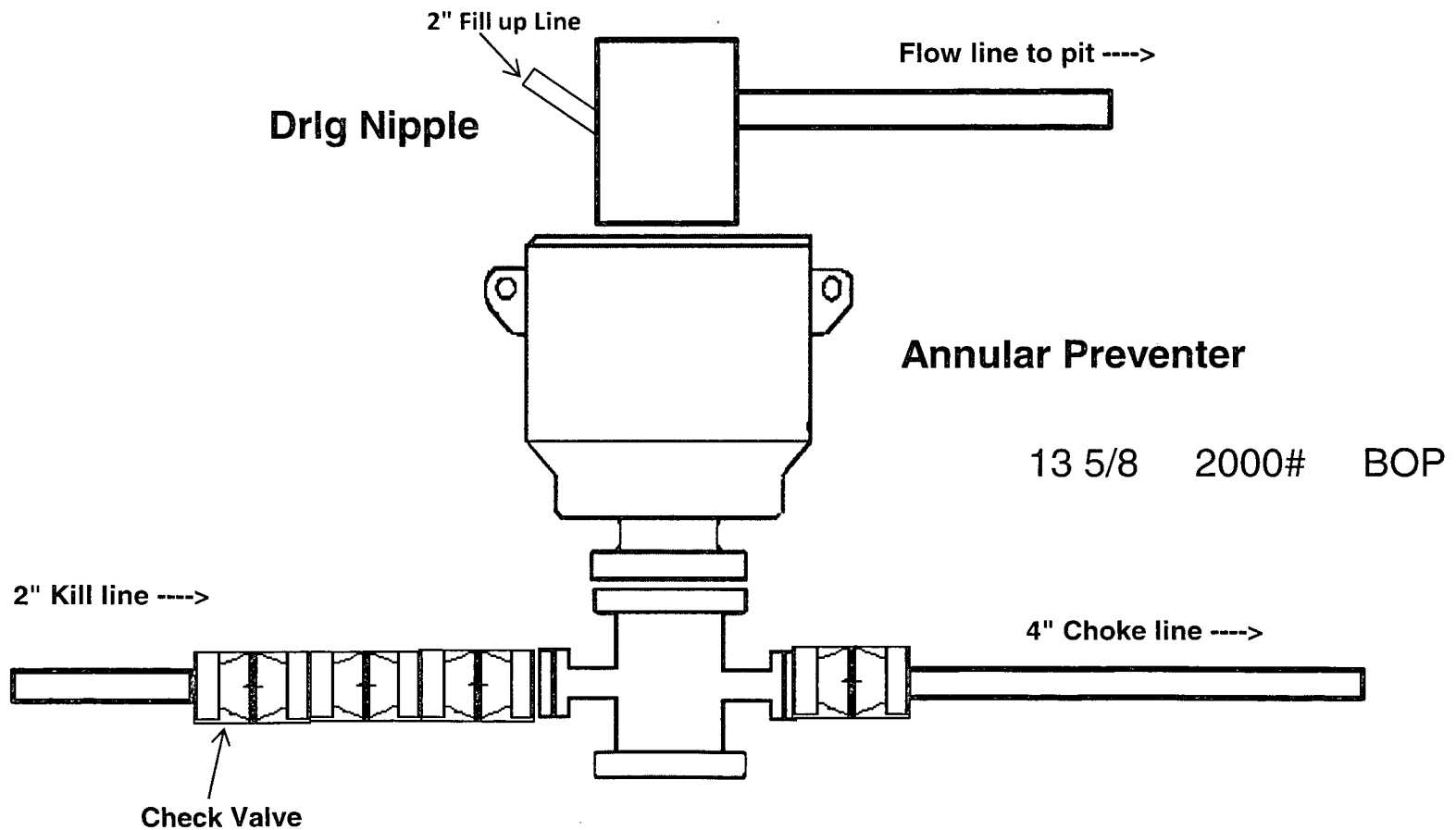
Secondary egress.

Company Representative's Trailer

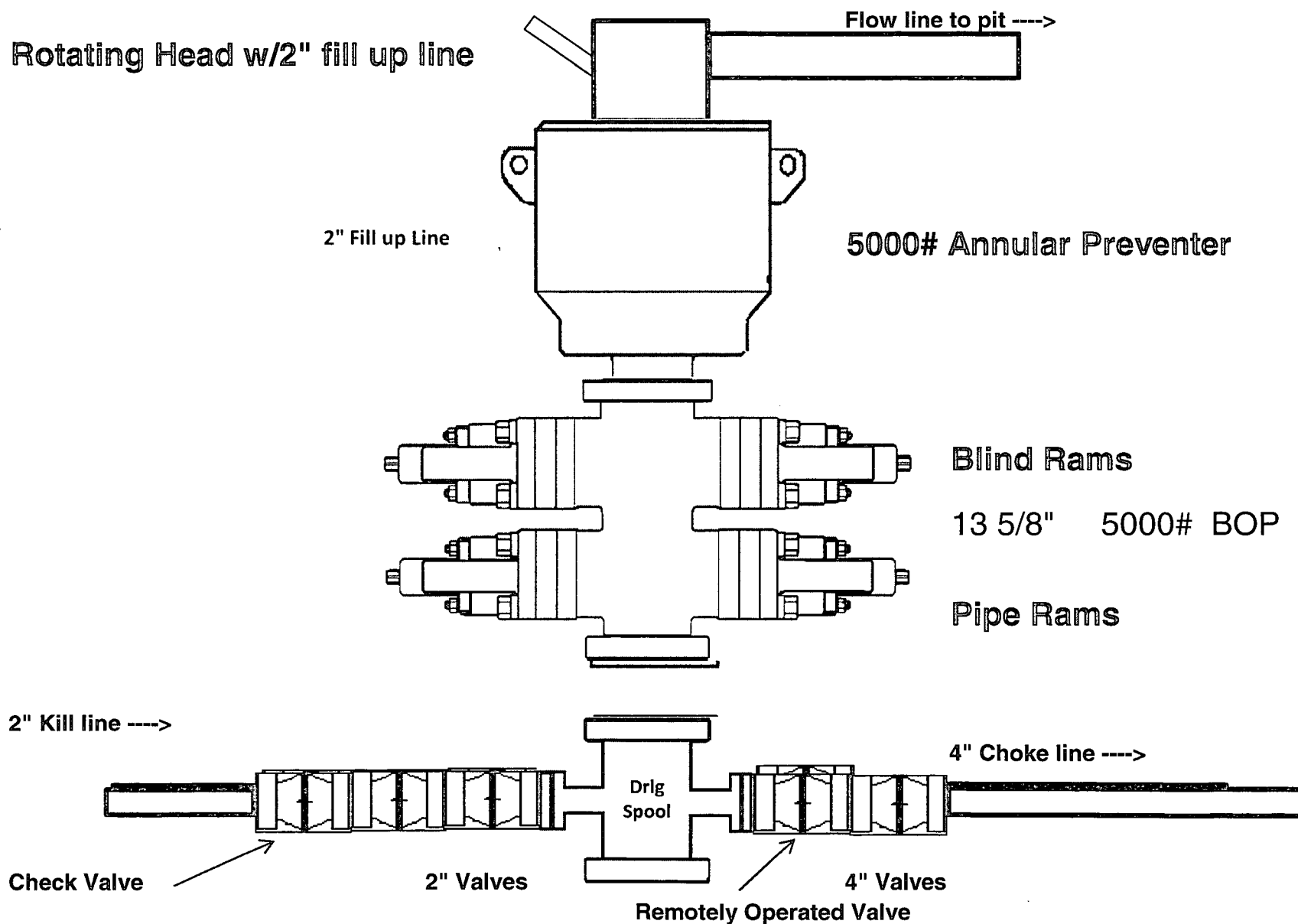
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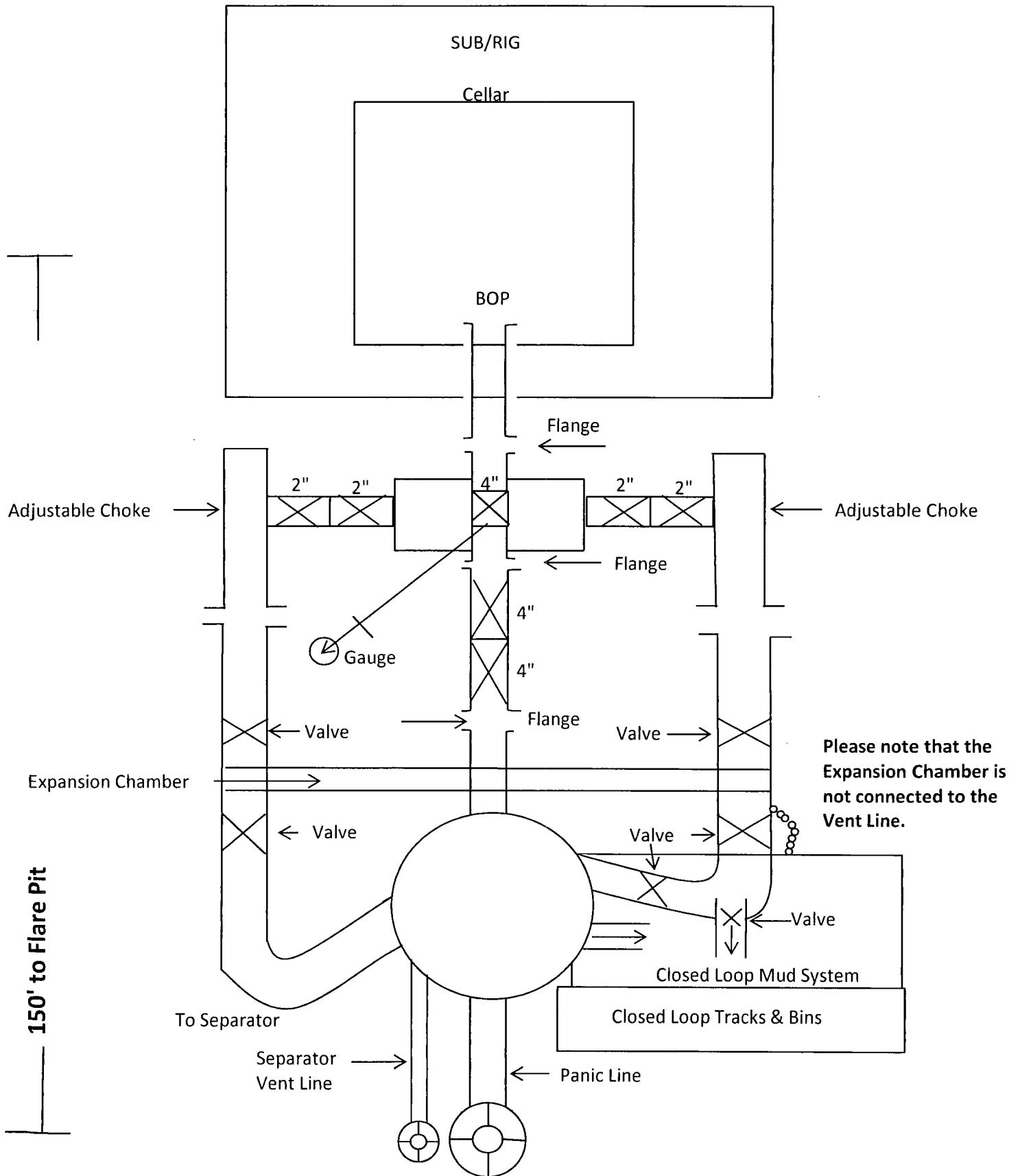
2,000 psi BOP Schematic



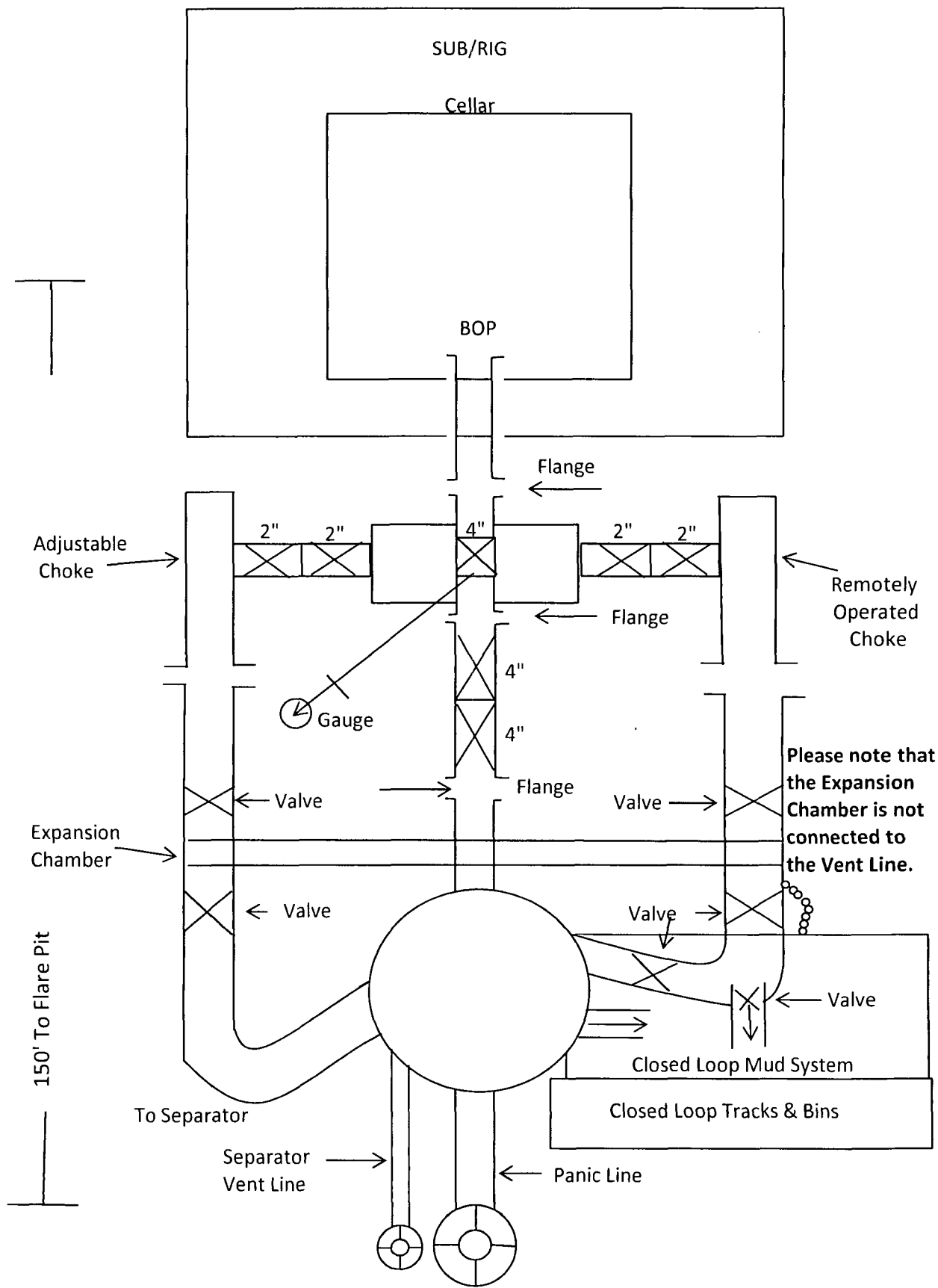
5,000 psi BOP Schematic

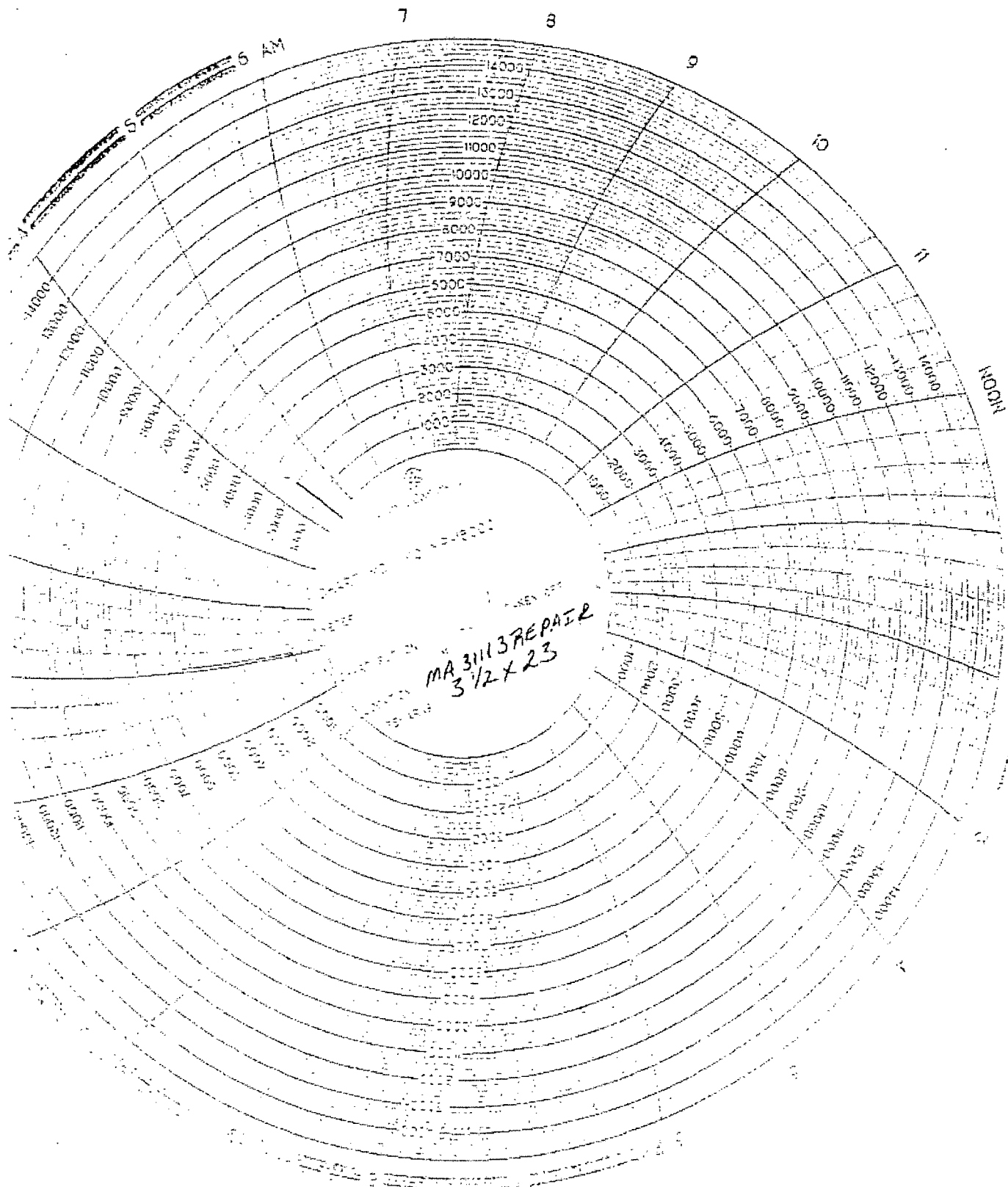


2M Choke Manifold Equipment

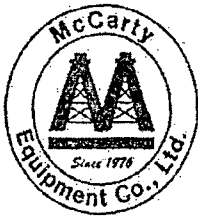


5M Choke Manifold Equipment





MA 3113 REPAIR
3 1/2 x 23



Product Specification 3 1/2" CHOKE AND KILL LINE

Catalog Item? Yes **Design Factor** 2:1

Scope Hydraulic control line between BOP control system and Manifold Equipment.

Tube High grade abrasion resistant synthetic HNBR for H₂S service

Cover High grade Neoprene with high ozone, abrasion and heat resistance

Fluids Oil based drilling fluids, glycols and polyglycols, and hydraulic oil

Reinforcement Multiple plies of Nylon Cord, with 2 high tensile spiraled wound cables

Pressure 5000 PSI Working Pressure 10,000 PSI Burst Test Pressure

Thermal Barrier Layer of thermal insulation material rated from -250° F to +1500° F
1/16" Chemical Resistant, Non-Flammable Industrial grade braided yarn

Outer Armor Interlocking stainless steel armor heat resistant +1500° F

Fittings Hose fitting is an Integral Swage Coupling with 4 1/6" RX-39 Flanges
Coupling combines locking features of the insulation and armor.

Lengths Lengths vary by request.

Testing Hydrostatically tested at 2 times working pressure for 5 minutes.

Conformity Manufactured to meet or exceed API 16C Specifications.
A prototype of each control line manufactured is then fire tested per API 16C.
Each control line is hydrostatically tested per API 16C Specifications.
Each control line is issued a serial number which is etched on the completed assembly and documented with a Certificate of Proof Test.

ID	OD	WEIGHT FT/LBS	BEND RADIUS	W.P PSI	BURST PSI
3 1/2"	5.75"	18.6	54"	5,000 PSI	10,000PSI

Construction

Tube: Black, oil and abrasion resistant HNBR for H₂S service.

Reinforcement: Multiple plies of bias laid textile cord for extra strength and flexibility. Spirally wound, high tensile, multiple strand cables to provide unsurpassed ruggedness and reliability to withstand sudden high pressure.

Cover: Special flame resistant red Neoprene (CR) with optional stainless steel armor.

Fittings: Integral connection flanged or hubbed.

Temperature: -40 to 212°F (-40 to 100°C)

Branding: NRP Choke & Kill Hose. MADE IN USA.

Choke & Kill Specifications

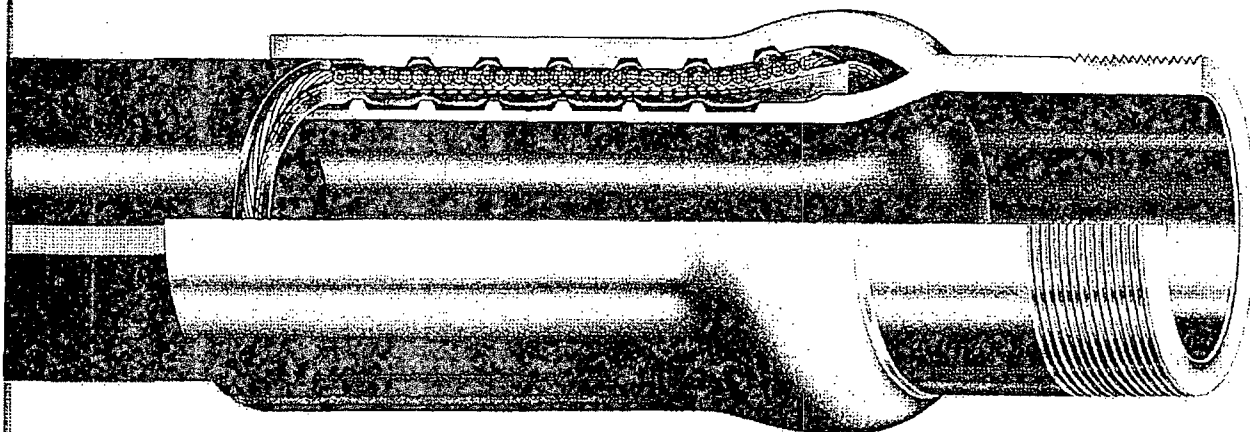
NRP Part Number	Hose ID (in)	Hose OD (in)	Rated WP (psi)	Test Pressure (psi)	Minimum Bend Radius	Weight per Foot (lbs)
5035-32	2.00	4.45	5,000	10,000	44	12.9
5035-40	2.50	4.60	5,000	10,000	48	13.9
5035-48	3.00	5.10	5,000	10,000	52	16.1
5040-32	2.00	4.68	10,000	15,000	48	22.4
5040-40	2.50	5.34	10,000	15,000	52	27.4
5040-48	3.00	5.84	10,000	15,000	56	28.8

Super Choke & Kill Specifications

5085-40	2.50	5.84	15,000	22,500	60	28.2
5085-48	3.00	6.34	15,000	22,500	60	34.1

Specifications

NRP Rotary Number	NRP Vibrator Number	Hose ID (in)	Hose OD (in)	Grade	Rated WP (psi)	Test Pressure (psi)	Minimum Bend Radius	Weight per Foot (lbs)	Weight of 2 Cplgs (lbs)	Cplg Thread API (in)
5501-40	5502-40	2.50	4.45	C	4,000	8,000	36	12.9	54	3
5501-48	5502-48	3.00	4.95	C	4,000	8,000	48	14.9	74	4
5501-56	5502-56	3.50	5.45	C	4,000	8,000	54	16.6	94	4
5603-40	5604-40	2.50	4.60	D	5,000	10,000	36	13.6	54	3
5603-48	5604-48	3.00	5.10	D	5,000	10,000	48	15.5	74	4
5603-56	5604-56	3.50	5.75	D	5,000	10,000	54	18.6	94	4
5603-64	5604-64	4.00	6.25	D	5,000	10,000	54	19.8	105	5



Flex Hose Variance Request

Flex Hose Variance Statement

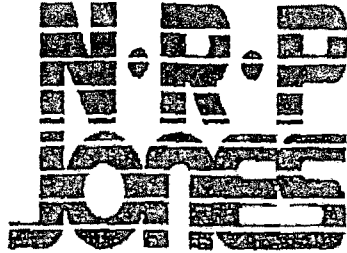
COG (operator) requests a variance if Basic 46 (rig name) is used to drill this well to use a co-flex line between the BOP and choke manifold.

Manufacturer: N. R. P. Jones

Serial Number: MA31113 RePAir

Length: 23 Size: 3 1/2 Ends - flanges/clamps

WP rating: 5000 psi Anchors required by manufacturer - Yes/No



Certificate of Conformance

DATE ~~2/7/13~~ 3/11/13

SERIAL NO. MA31113REPAIR PART NO. _____

SIZE 3 1/2 LENGTH 23

HYDROSTATICALLY TESTED AT 5000

BY Chance Perkins Q.A. Allen Casey

NEPHI RUBBER PRODUCTS CORP.

Corporate Office: P.O. Box 310 • LaPorte, Indiana 46352 • (800)348-8868 • (219)362-9908 • Fax Number (219)324-0815
Manufacturing: 255 West 11th North • Nephi, Utah 84648 • (800)453-1480 • (435)623-1740 • Fax Number (435)623-2638

Well pad will be 340' X 340'
with cellar in center of pad

COG Production LLC
H₂S Equipment Schematic
Terrain: Shinnery sand hills.

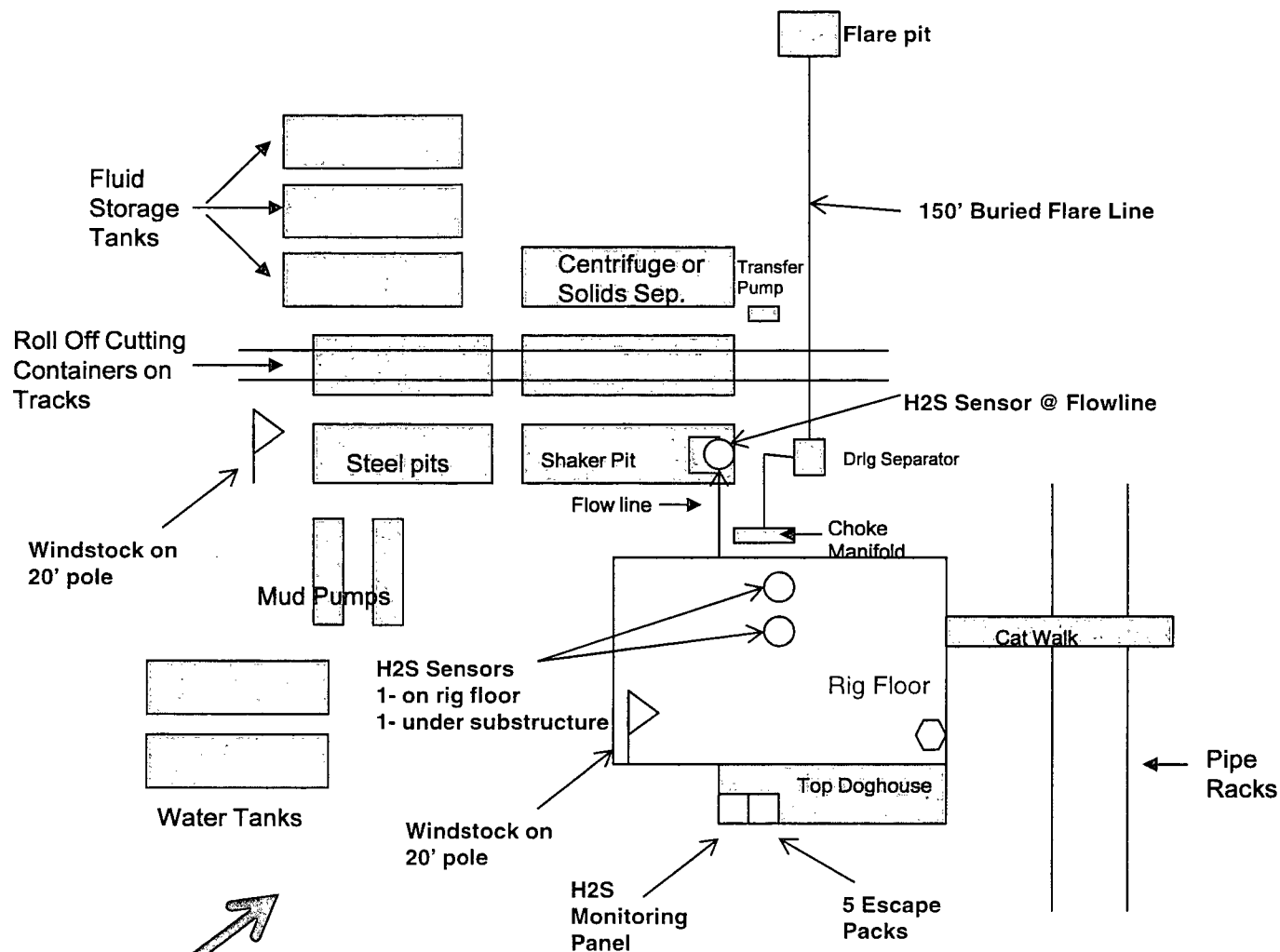
Location
Entry
Condition
Sign



N



Briefing Area
w/SCBA

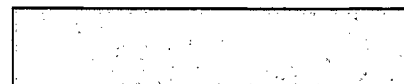


Prevailing Wind
Direction in SENM

Secondary egress.

Company Representative's Trailer

Primary Briefing
Area w/SCBA



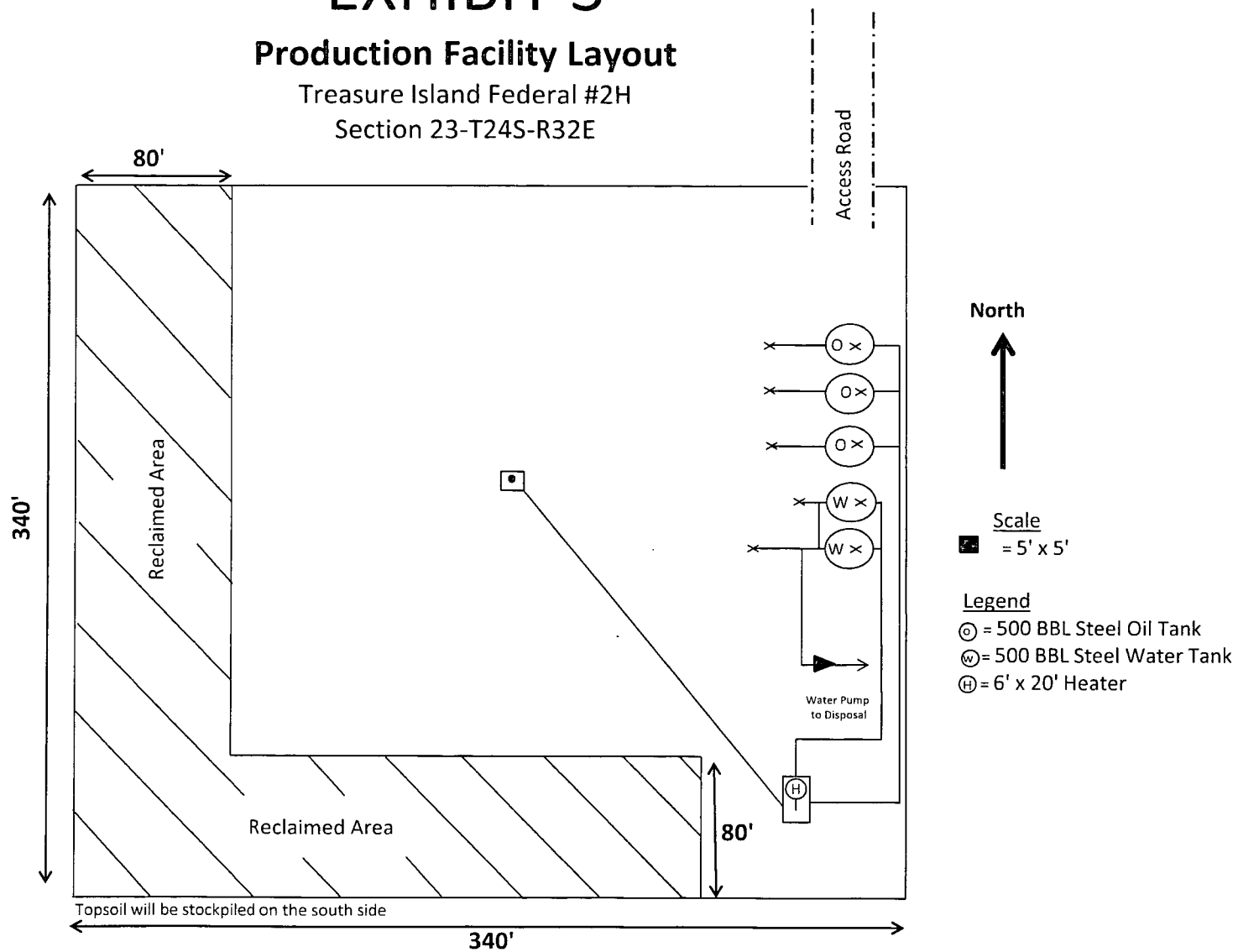


COG Production LLC
2208 West Main
Artesia, NM 88210

EXHIBIT 3

Production Facility Layout

Treasure Island Federal #2H
Section 23-T24S-R32E



COG Production LLC

Rig Plat & Closed Loop Equipment Diagram

Well pad will be 340' X 340'
with cellar in center of pad

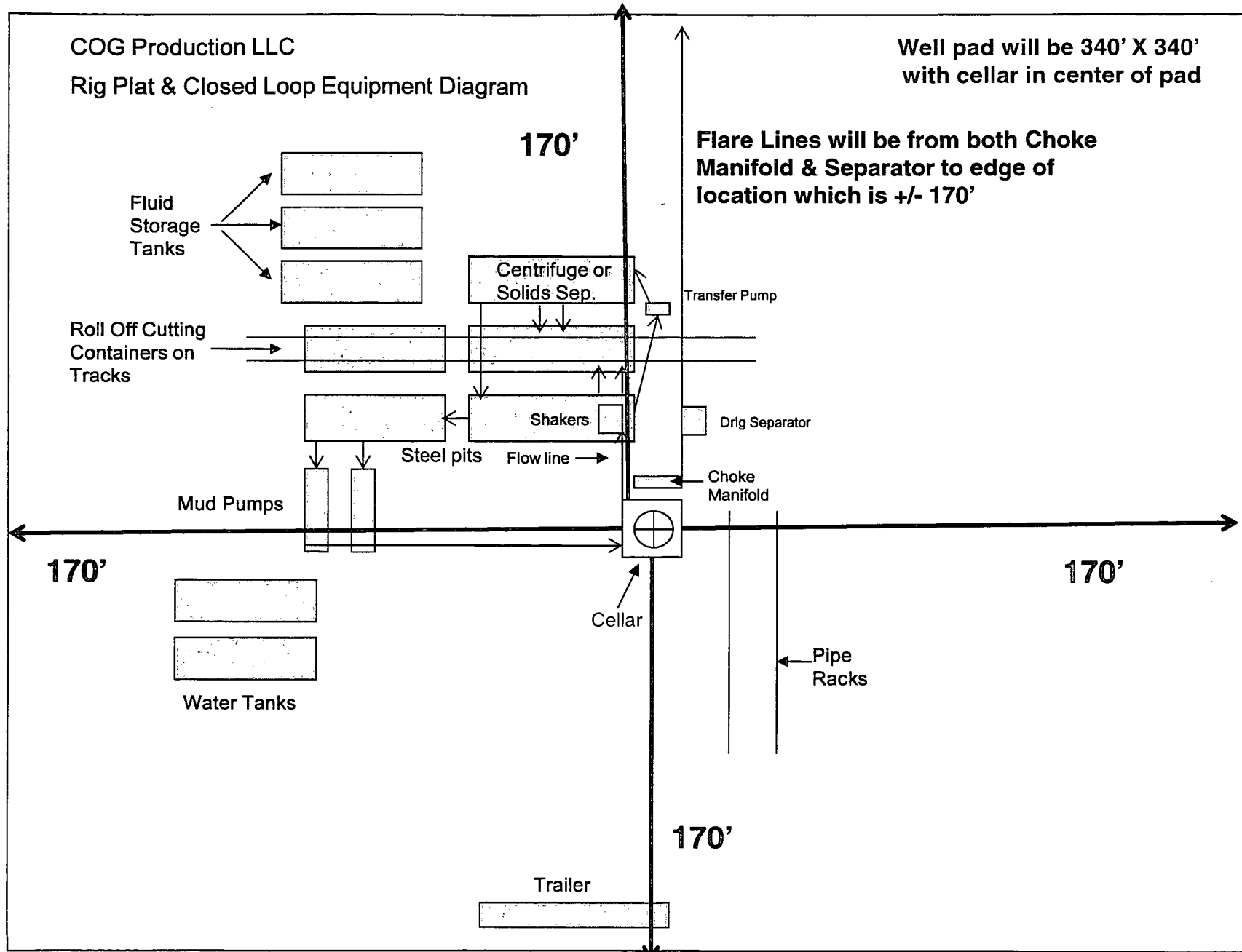


Exhibit 1

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