Form 3160- 5
(August, 2007)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Artesia

FORM APPROVED
OMB No. 1004- 0137
Expires: July 31, 2010

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE *- Other Instructions on page 2.*

5. Lease Serial No.: NMNM12559
6. If Indian, Allottee, or Tribe Name:
7. If Unit or CA. Agreement Name and/or No.:
8. Well Name and No.: Cottonmouth 24 Federal Com #1H
9. API Well No.: 30-015-38507
10. Field and Pool, or Exploratory Area: Tecolote Peak; Delaware
11. County or Parish, State: Eddy County NM

1. Type of Well: [X] Oil Well [ ] Gas Well [ ] Other
2. Name of Operator: COG Production LLC
3a. Address: 2208 W. Main Street, Artesia, NM 88210
3b. Phone No. *(include area code)*: 575-748-6940
4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*: 105' FSL & 745' FWL Unit Letter M (SWSW) Sec 24-26S-28E
Lat.
Long.

12. CHECK APPROPRIATE BOX(S) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
[X] Notice of Intent	[ ] Acidize	[ ] Deepen	[ ] Production (Start/ Resume)	[ ] Water Shut-off
	[ ] Altering Casing	[ ] Fracture Treat	[ ] Reclamation	[ ] Well Integrity
[ ] Subsequent Report	[ ] Casing Repair	[ ] New Construction	[ ] Recomplete	[X] Other
	[ ] Change Plans	[ ] Plug and abandon	[ ] Temporarily Abandon	BHL & Drilling Changes
[ ] Final Abandonment Notice	[ ] Convert to Injection	[ ] Plug back	[ ] Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths or pertinent markers and sands. Attach the Bond under which the work will performed or provide the Bond No. on file with the BLM/ BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notice shall be filed only after all requirements, including reclamantion, have been completed, and the operator has determined that the site is ready for final inspection.)

COG Production LLC respectfully requests approval for the following BHL and drilling program changes to the original APD.

BHL
From: 990' FSL & 330' FWL
To: 330' FNL & 660' FWL

Drilling Program
See attached.

14. I hereby certify that the foregoing is true and correct.
Name *(Printed/ Typed)*: Mayte Reyes
Title: Regulatory Analyst
Signature: Mayte Reyes
Date: 4/17/13

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by:
Title:
Date:
Conditions of approval, if any are attached. Approval of this notice 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.
Office: CARLSBAD FIELD OFFICE

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 any department or agency of the United States any false, fictitiousor fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
DISTRICT II
1301 W. Grand Avenue, Artesia, NM 88210
DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410
DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

Form C-102
Revised October 15, 2009

Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-015-38507	59170	Tecolote Peak; Delaware

Property Code	Property Name	Well Number
	COTTONMOUTH "24" FEDERAL COM	1H

OGRID No.	Operator Name	Elevation
217955	COG PRODUCTION LLC	2961'

Surface Location

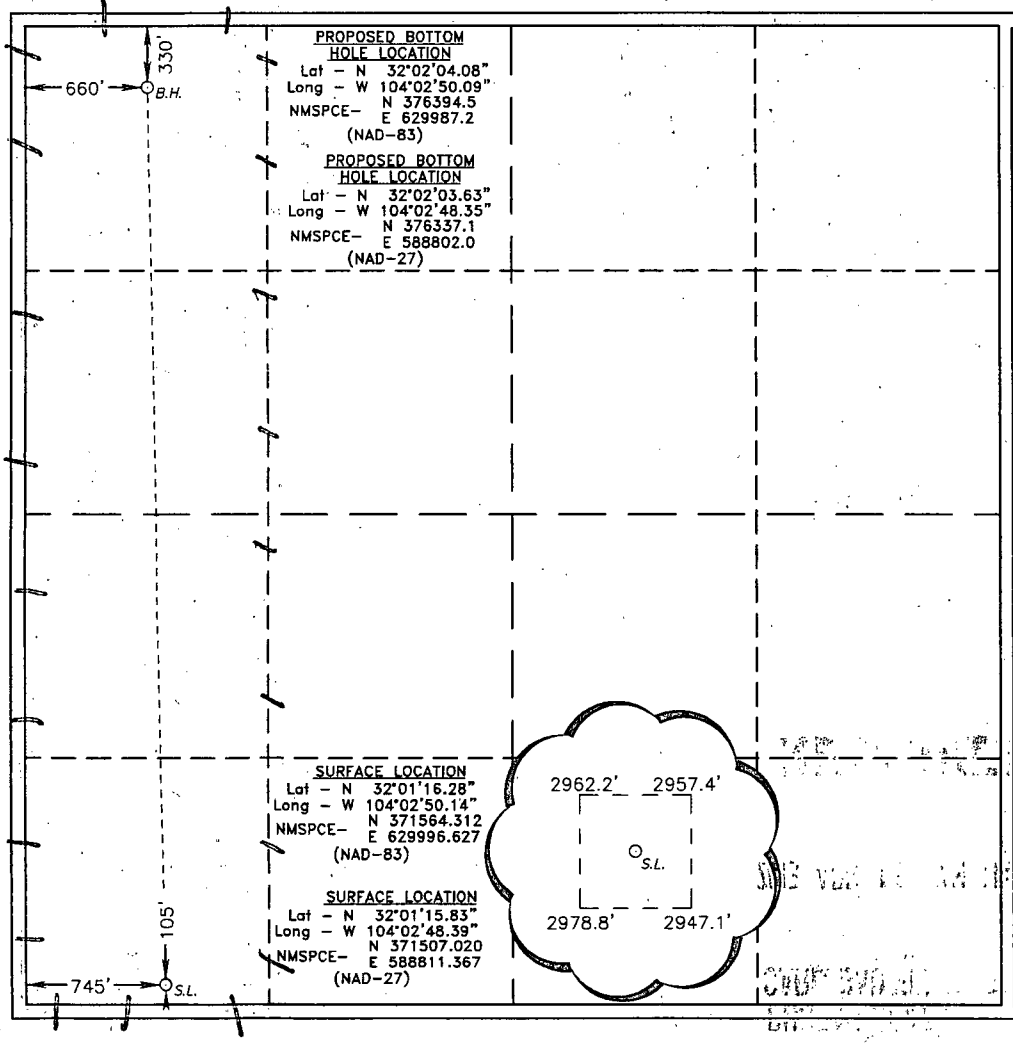
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	24	26 S	28 E		105	SOUTH	745	WEST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	24	26 S	28 E		330	NORTH	660	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Melanie Parker 4/17/13
Signature Date

Melanie J. Parker
Printed Name

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervison, and that the same is true and correct to the best of my belief.

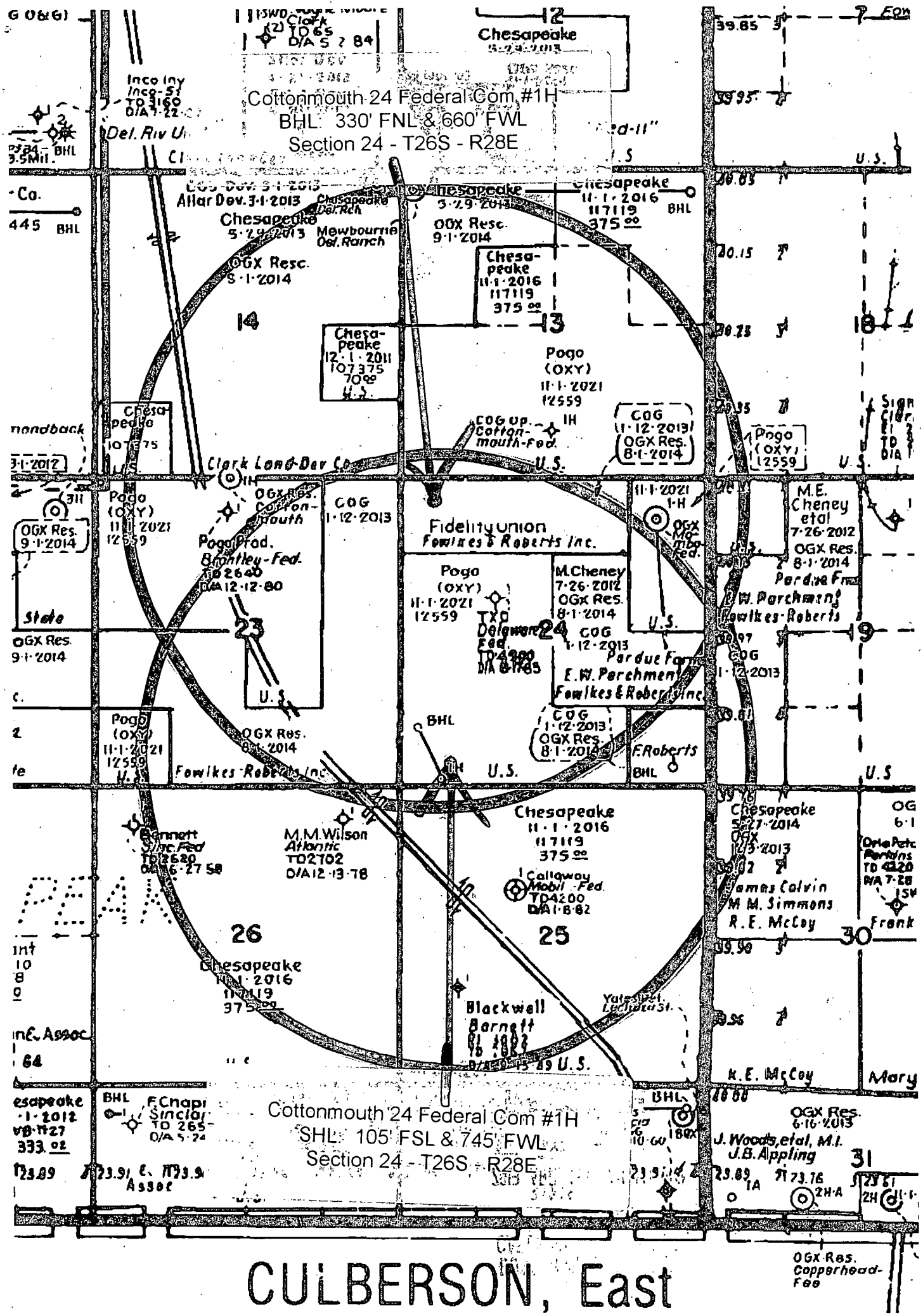
NOVEMBER 4, 2010
Date Surveyed

Signature & Seal of Professional Surveyor

GARY L. JONES
NEW MEXICO
7977
REGISTERED PROFESSIONAL SURVEYOR

Certificate No. Gary L. Jones 7977

BASIN SURVEYS


Cottonmouth 24 Federal Com #1H
BHL: 330' FNL & 660' FWL
Section 24 - T26S - R28E
Cottonmouth 24 Federal Com #1H
SHL: 105' FSL & 745' FWL
Section 24 - T26S - R28E
CULBERSON, East

COG Production LLC
DRILLING AND OPERATIONS PROGRAM
Cottonmouth 24 Federal Com 1H
SHL: 105' FSL & 745' FWL
BHL: 330' FNL & 660' FWL
Section 24 T26S R28E
Eddy 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	118'	
Rustler	337'	
Top of Salt	730'	
Base of Salt	2,337'	
Delaware	2,530'	Oil
Brushy Canyon	4,739'	Oil
Bone Spring	6,319'	Oil
Wolfcamp	9,500'	Oil
TD TVD	6,260'	
TD MD	10,905'	
PH TD	9,500'	

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 450' and circulating cement back to surface. All intervals will be isolated by setting 5 ½" 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
17 ½"	0' – 450'	Surface	13 3/8"	New	48#	STC	H-40	1.125	1.125	1.6
12 ¼"	0' – 2,555'	Intrmd	9 5/8"	New	36#	LTC	J-55	1.125	1.125	1.6
7 7/8"	0' – 10,905'	Production Curve & Lateral	5 ½"	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 — Cmt: 350 sx Class C + 2% $CaCl_2$ (14.8 ppg / 1.34 cuft/sx) **Calculated w/50% excess on OH volumes

b. 9 5/8" Intermediate: — Lead: 450 sx Class C + 4% Gel + 2% CaCl2 (13.5 ppg /1.75cuft/sx)
Tail: 250 sx Class C + 2% $CaCl_2$ (14.8 ppg / 1.34 cuft/sx)
**Calculated w/35% excess on OH volumes

d. 5 ½" Production — Lead: 375 sx 50:50:10 H + Salt+Gilsonite+CFR-3+ HR601 (11.9 ppg / 2.51 cuft/sx)
Tail: 975 sx 50:50:2 H +Salt+GasStop +HR601 +CFR-3 (14.4 ppg /1.25 cuft/sx)
**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 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
     - 500' from 9,000' – 9,500'
     - 200 sx Class H
     - 17.2 ppg 0.98 cuft/sk
  2. Plug #2
     - 750' from 5600' – 6350'
     - 275 sx Class H
     - 17.2 ppg 0.98 cuft/sk

5. Control:

Nipple up on 13 3/8 with annular preventer tested to 50% of rated working pressure by independent tester and the rest of the 2M system tested to 2000 psi.
Nipple up on 9 5/8 with 3M system tested 3000 psi to 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 3000 psi WP rating.

6. Estimated BHP & BHT:

Lateral TD = 2865 psi
Lateral TD= 121°F
PH TD= 4347 psi
PH TD= 151°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' – 450'	Fresh Water	8.4	29	N.C.
450' – 2,555'	Brine	10	29	N.C.
2,555' – 10,905' (Lateral)	Cut Brine	8.8 – 9.2	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 ½" 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 possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 30 days.

COG PRODUCTION, L.L.C.

EDDY COUNTY(NAD83)
SECTION 24
Cottonmouth "24" Federal Com #1H

Wellbore #1

Plan: Proposal 1

Standard Planning Report

10 April, 2013

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Cottonmouth "24" Federal Com #1H
Company:	COG PRODUCTION, L.L.C.	**TVD Reference:**	WELL @ 18.0usft (Original Well Elev)
Project:	EDDY COUNTY(NAD83)	**MD Reference:**	WELL @ 18.0usft (Original Well Elev)
Site:	SECTION 24	**North Reference:**	Grid
Well:	Cottonmouth "24" Federal Com #1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Proposal 1		

Project EDDY COUNTY(NAD83) NM-East

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 SECTION 24

Site Position:		**Northing:**	371,564.31 usft	**Latitude:**	32° 1' 15.063 N
From:	Map	**Easting:**	629,996.63 usft	**Longitude:**	103° 54' 50.000 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.22 °

Well Cottonmouth "24" Federal Com #1H

Well Position	**+N/-S**	0.0 usft	**Northing:**	371,564.31 usft	**Latitude:**	32° 1' 15.063 N
	+E/-W	0.0 usft	**Easting:**	629,996.63 usft	**Longitude:**	103° 54' 50.000 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	0.0 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/10/2013	7.51	59.89	48,300

Design Proposal 1

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	359.89

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,802.3	0.00	0.00	5,802.3	0.0	0.0	0.00	0.00	0.00	0.00	
6,554.4	90.26	359.89	6,279.7	479.6	-0.9	12.00	12.00	0.00	359.89	
10,905.1	90.26	359.89	6,260.0	4,830.2	-9.4	0.00	0.00	0.00	0.00	PBHL Cottonmouth "2

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Site:	SECTION 24	**North Reference:**	Grid
Well:	Cottonmouth "24" Federal Com #1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Proposal 1		

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)
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
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

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Wellbore:	Wellbore #1		
Design:	Proposal 1		

Planned Survey

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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
5,802.3	0.00	0.00	5,802.3	0.0	0.0	0.0	0.00	0.00	0.00
KOP @ 5802.3 MD									
5,900.0	11.73	359.89	5,899.3	10.0	0.0	10.0	12.00	12.00	0.00
6,000.0	23.73	359.89	5,994.4	40.4	-0.1	40.4	12.00	12.00	0.00
6,100.0	35.73	359.89	6,081.1	89.9	-0.2	89.9	12.00	12.00	0.00
6,200.0	47.73	359.89	6,155.6	156.3	-0.3	156.3	12.00	12.00	0.00
6,300.0	59.73	359.89	6,214.6	236.8	-0.5	236.8	12.00	12.00	0.00
6,400.0	71.73	359.89	6,255.7	327.8	-0.6	327.8	12.00	12.00	0.00
6,500.0	83.73	359.89	6,276.9	425.3	-0.8	425.3	12.00	12.00	0.00
6,544.8	89.11	359.89	6,279.7	470.0	-0.9	470.0	12.00	12.00	0.00
LP Cottonmouth "24" Federal Com #1H									
6,554.4	90.26	359.89	6,279.7	479.6	-0.9	479.6	12.00	12.00	0.00
LP @ 6554.4 MD									
6,600.0	90.26	359.89	6,279.5	525.2	-1.0	525.2	0.00	0.00	0.00
6,700.0	90.26	359.89	6,279.1	625.2	-1.2	625.2	0.00	0.00	0.00
6,800.0	90.26	359.89	6,278.6	725.2	-1.4	725.2	0.00	0.00	0.00
6,900.0	90.26	359.89	6,278.2	825.2	-1.6	825.2	0.00	0.00	0.00
7,000.0	90.26	359.89	6,277.7	925.2	-1.8	925.2	0.00	0.00	0.00
7,100.0	90.26	359.89	6,277.3	1,025.2	-2.0	1,025.2	0.00	0.00	0.00
7,200.0	90.26	359.89	6,276.8	1,125.2	-2.2	1,125.2	0.00	0.00	0.00
7,300.0	90.26	359.89	6,276.4	1,225.2	-2.4	1,225.2	0.00	0.00	0.00
7,400.0	90.26	359.89	6,275.9	1,325.2	-2.6	1,325.2	0.00	0.00	0.00
7,500.0	90.26	359.89	6,275.5	1,425.2	-2.8	1,425.2	0.00	0.00	0.00
7,600.0	90.26	359.89	6,275.0	1,525.2	-3.0	1,525.2	0.00	0.00	0.00
7,700.0	90.26	359.89	6,274.5	1,625.2	-3.2	1,625.2	0.00	0.00	0.00
7,800.0	90.26	359.89	6,274.1	1,725.2	-3.4	1,725.2	0.00	0.00	0.00
7,900.0	90.26	359.89	6,273.6	1,825.2	-3.6	1,825.2	0.00	0.00	0.00
8,000.0	90.26	359.89	6,273.2	1,925.2	-3.8	1,925.2	0.00	0.00	0.00
8,100.0	90.26	359.89	6,272.7	2,025.2	-4.0	2,025.2	0.00	0.00	0.00
8,200.0	90.26	359.89	6,272.3	2,125.2	-4.1	2,125.2	0.00	0.00	0.00
8,300.0	90.26	359.89	6,271.8	2,225.2	-4.3	2,225.2	0.00	0.00	0.00
8,400.0	90.26	359.89	6,271.4	2,325.2	-4.5	2,325.2	0.00	0.00	0.00
8,500.0	90.26	359.89	6,270.9	2,425.2	-4.7	2,425.2	0.00	0.00	0.00
8,600.0	90.26	359.89	6,270.5	2,525.2	-4.9	2,525.2	0.00	0.00	0.00
8,700.0	90.26	359.89	6,270.0	2,625.2	-5.1	2,625.2	0.00	0.00	0.00
8,800.0	90.26	359.89	6,269.6	2,725.2	-5.3	2,725.2	0.00	0.00	0.00
8,900.0	90.26	359.89	6,269.1	2,825.2	-5.5	2,825.2	0.00	0.00	0.00
9,000.0	90.26	359.89	6,268.6	2,925.2	-5.7	2,925.2	0.00	0.00	0.00
9,100.0	90.26	359.89	6,268.2	3,025.2	-5.9	3,025.2	0.00	0.00	0.00
9,200.0	90.26	359.89	6,267.7	3,125.1	-6.1	3,125.2	0.00	0.00	0.00
9,300.0	90.26	359.89	6,267.3	3,225.1	-6.3	3,225.2	0.00	0.00	0.00
9,400.0	90.26	359.89	6,266.8	3,325.1	-6.5	3,325.2	0.00	0.00	0.00
9,500.0	90.26	359.89	6,266.4	3,425.1	-6.7	3,425.2	0.00	0.00	0.00
9,600.0	90.26	359.89	6,265.9	3,525.1	-6.9	3,525.2	0.00	0.00	0.00
9,700.0	90.26	359.89	6,265.5	3,625.1	-7.1	3,625.1	0.00	0.00	0.00
9,800.0	90.26	359.89	6,265.0	3,725.1	-7.3	3,725.1	0.00	0.00	0.00
9,900.0	90.26	359.89	6,264.6	3,825.1	-7.5	3,825.1	0.00	0.00	0.00
10,000.0	90.26	359.89	6,264.1	3,925.1	-7.7	3,925.1	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Cottonmouth "24" Federal Com #1H
Company:	COG PRODUCTION, L.L.C.	**TVD Reference:**	WELL @ 18.0usft (Original Well Elev)
Project:	EDDY COUNTY(NAD83)	**MD Reference:**	WELL @ 18.0usft (Original Well Elev)
Site:	SECTION 24	**North Reference:**	Grid
Well:	Cottonmouth "24" Federal Com #1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Proposal 1		

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)
10,100.0	90.26	359.89	6,263.7	4,025.1	-7.9	4,025.1	0.00	0.00	0.00
10,200.0	90.26	359.89	6,263.2	4,125.1	-8.1	4,125.1	0.00	0.00	0.00
10,300.0	90.26	359.89	6,262.7	4,225.1	-8.2	4,225.1	0.00	0.00	0.00
10,400.0	90.26	359.89	6,262.3	4,325.1	-8.4	4,325.1	0.00	0.00	0.00
10,500.0	90.26	359.89	6,261.8	4,425.1	-8.6	4,425.1	0.00	0.00	0.00
10,600.0	90.26	359.89	6,261.4	4,525.1	-8.8	4,525.1	0.00	0.00	0.00
10,700.0	90.26	359.89	6,260.9	4,625.1	-9.0	4,625.1	0.00	0.00	0.00
10,800.0	90.26	359.89	6,260.5	4,725.1	-9.2	4,725.1	0.00	0.00	0.00
10,900.0	90.26	359.89	6,260.0	4,825.1	-9.4	4,825.1	0.00	0.00	0.00
10,905.1	90.26	359.89	6,260.0	4,830.2	-9.4	4,830.2	0.00	0.00	0.00
TD at 10905.1 MD - PBHL Cottonmouth "24" Federal Com #1H									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL Cottonmouth "24" - plan hits target center - Point	0.00	0.00	6,260.0	4,830.2	-9.4	376,394.50	629,987.20	32° 2' 2.865 N	103° 54' 49.892 W
LP Cottonmouth "24" Fe - plan misses target center by 0.3usft at 6544.8usft MD (6279.7 TVD, 470.0 N, -0.9 E) - Point	0.00	0.00	6,280.0	470.0	-0.9	372,034.31	629,995.73	32° 1' 19.714 N	103° 54' 49.989 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
5,802.3	5,802.3	0.0	0.0	KOP @ 5802.3 MD
6,554.4	6,279.7	479.6	-0.9	LP @ 6554.4 MD
10,905.1	6,260.0	4,830.2	-9.4	TD at 10905.1 MD

COMPANY: COG PRODUCTION, L.L.C.
WELL: Cottonmouth "24" Federal Com #1H
COUNTY: EDDY COUNTY(NAD83)
DATUM: NAD 1927 (NADCON CONUS)
RIG: Silver Oak #7
GRID CORRECTION: 7.28° E

OFFICE: 936.582.7296 PLANNING: 214.784.3778

Azimuths to Grid North
True North: -0.22°
Magnetic North: 7.28°

Magnetic Field
Strength: 48299.6snT
Dip Angle: 59.89°
Date: 4/10/2013
Model: IGRF2010

CREATED BY: BRANDON ESTES

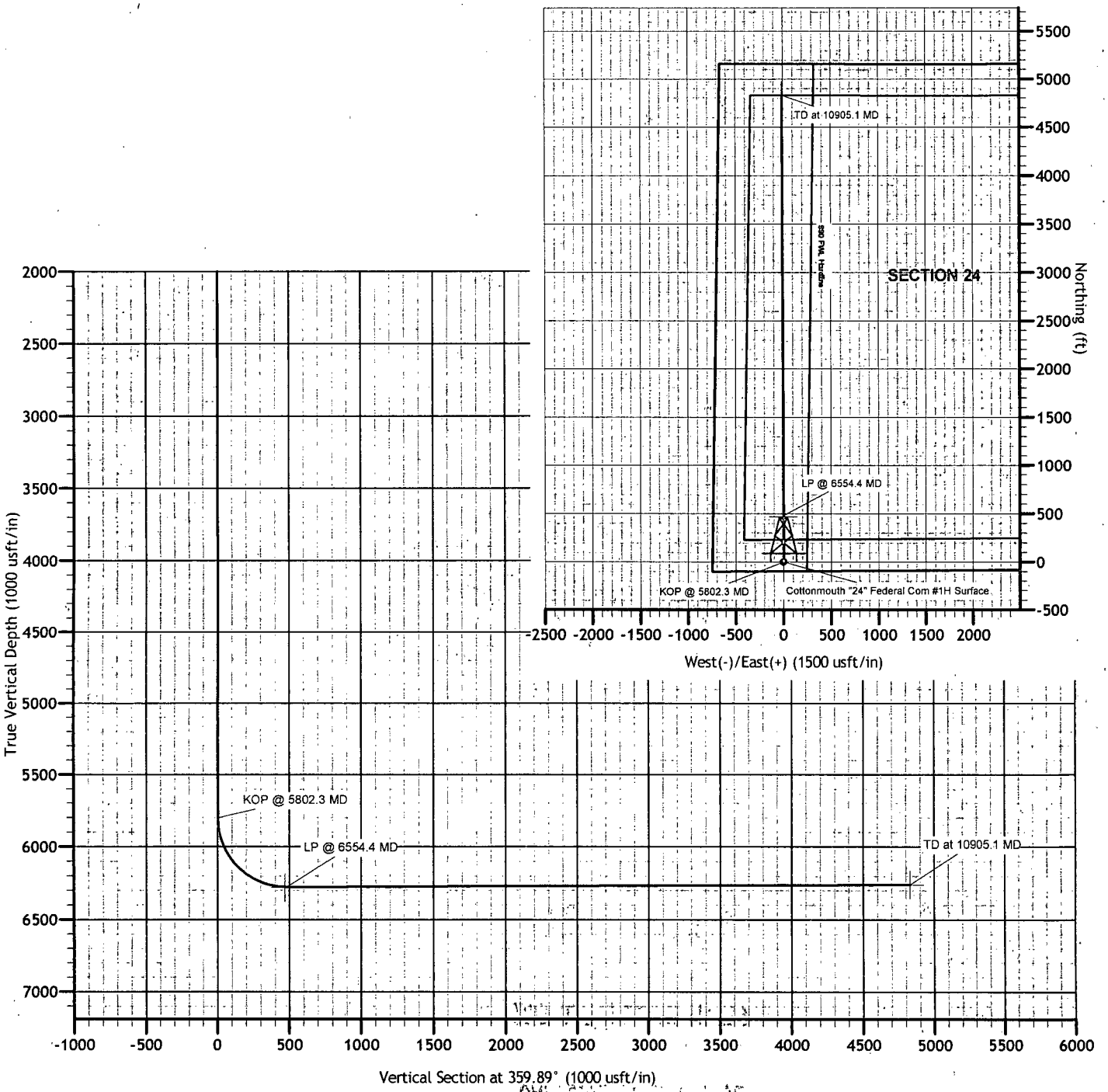
DATE: 13:59, April 10 2013
PLAN: Proposal 1

GEODETIC ZONE: New Mexico East 3001
WELL @ 18.0usft (Original Well Elev)
GROUND ELEVATION: 0.0

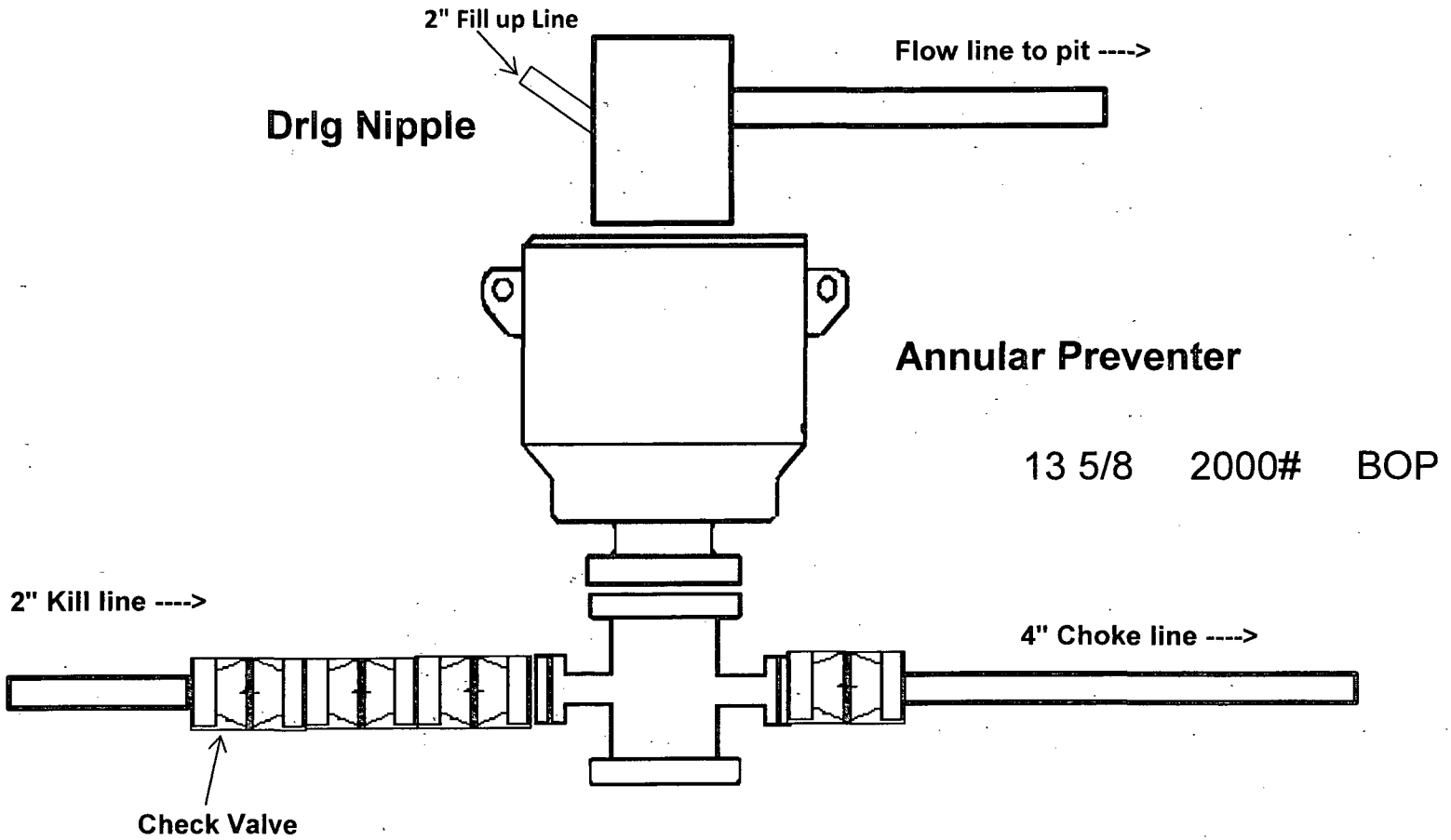
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	371564.31	629996.63	32° 1' 15.063 N	103° 54' 50.000 W

CRITICAL POINTS

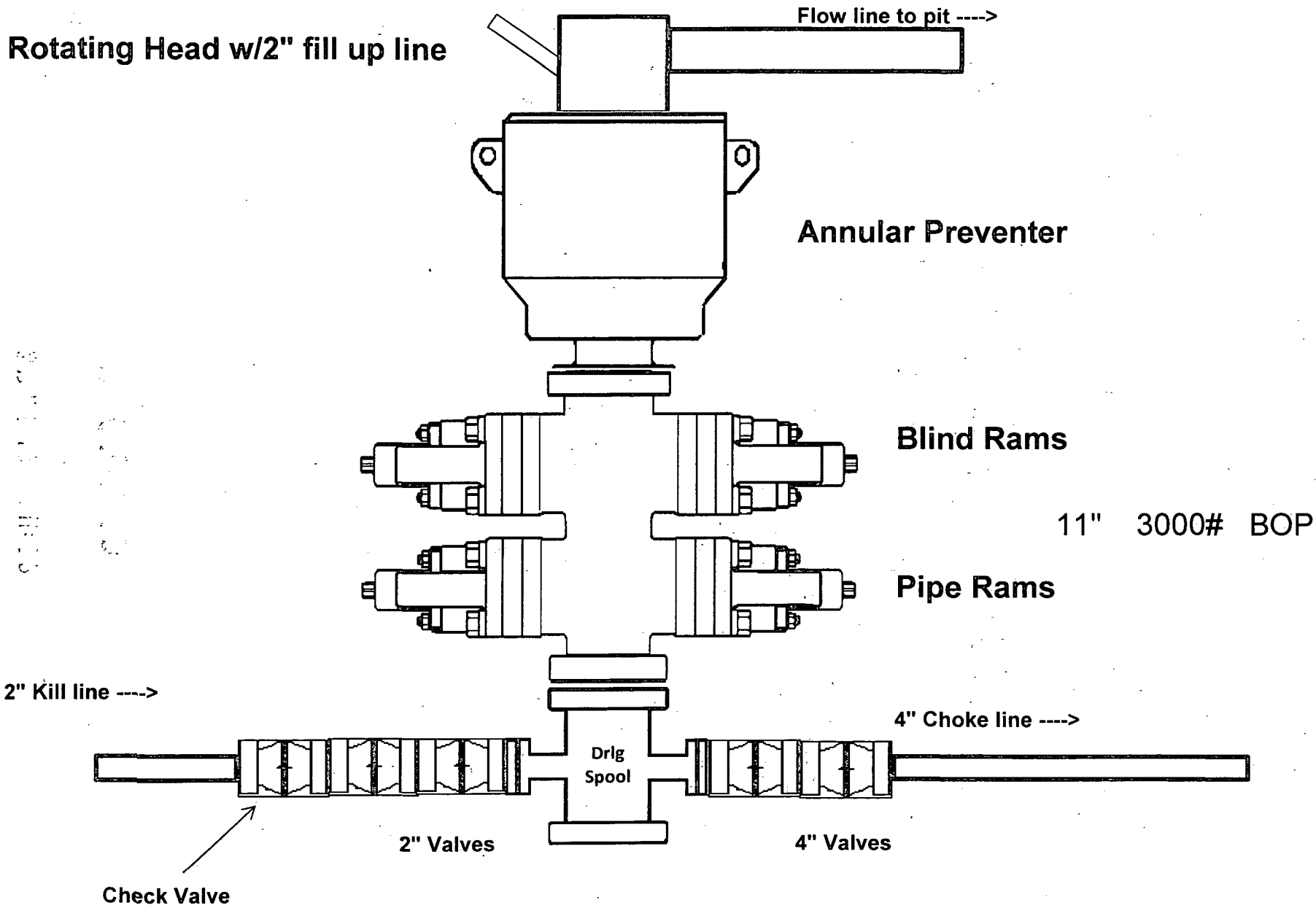
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
5802.3	5802.3	0.00	0.00	0.0	0.0	0.0	0.0	KOP @ 5802.3 MD
6279.7	6554.4	90.26	359.89	479.6	-0.9	479.6	479.6	LP @ 6554.4 MD
6260.0	10905.1	90.26	359.89	4830.2	-9.4	4830.2	4830.2	TD at 10905.1 MD



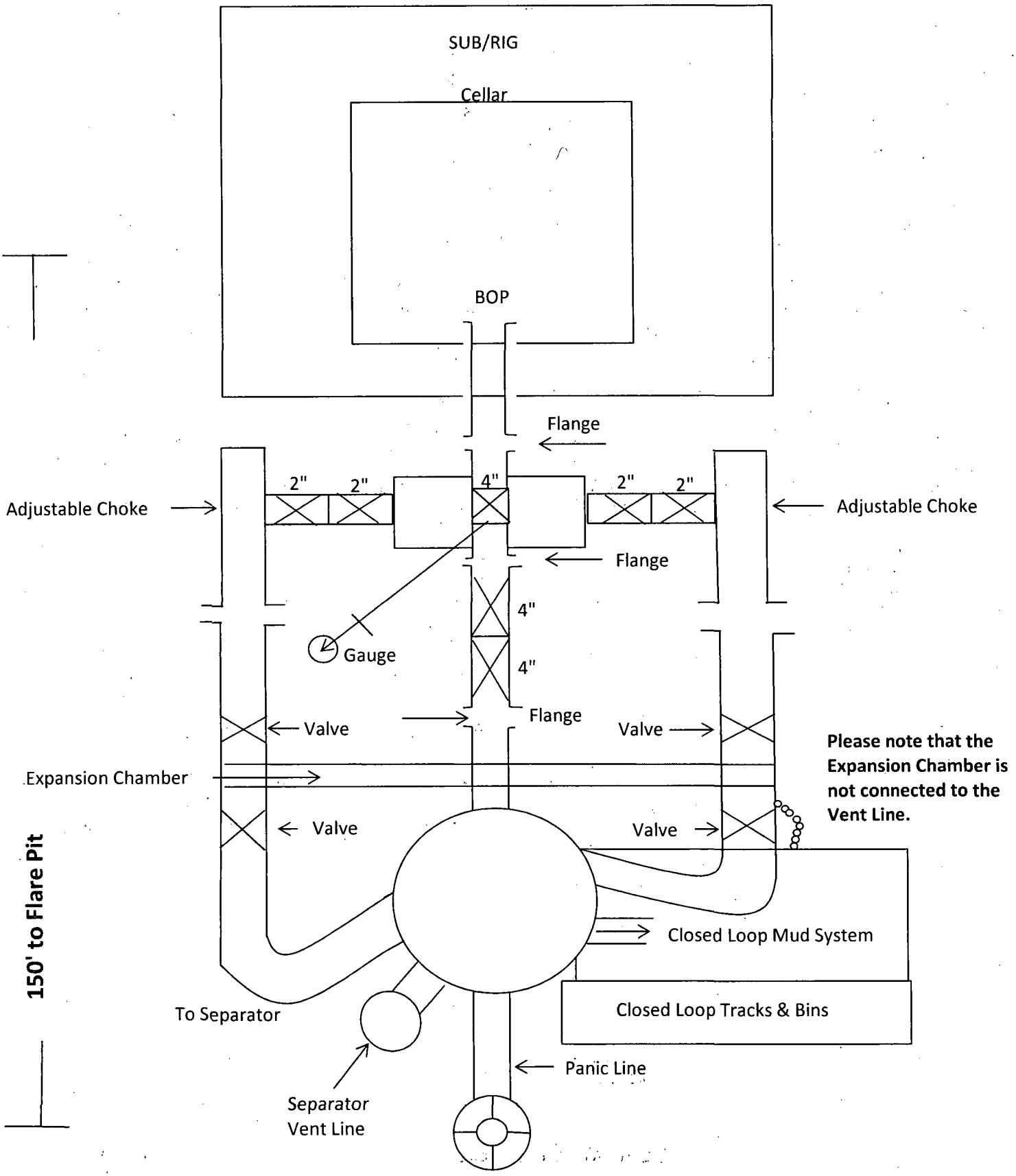
2,000 psi BOP Schematic



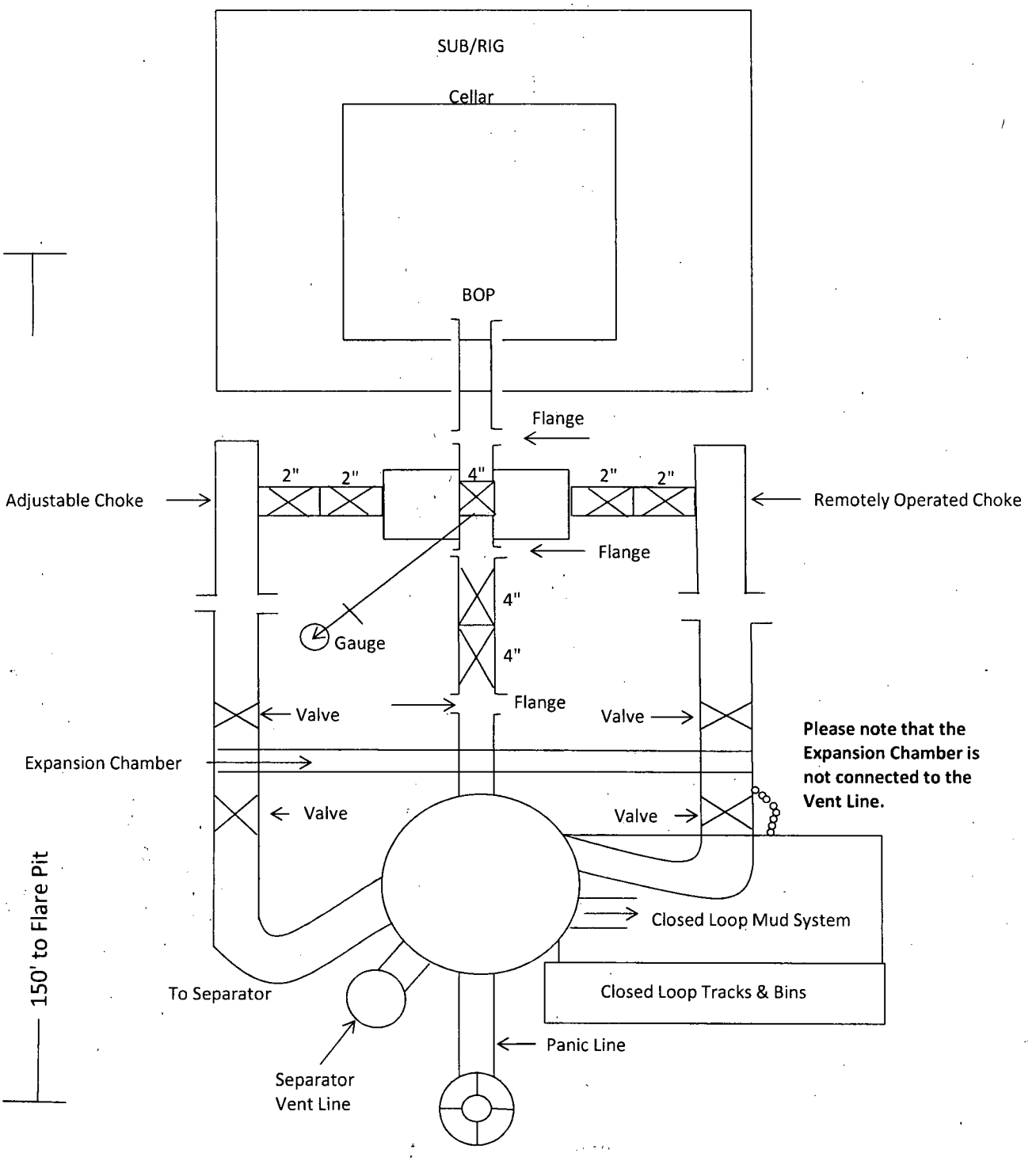
3,000 psi BOP Schematic



2M Choke Manifold Equipment



3M Choke Manifold Equipment



PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Production LLC
LEASE NO.:	NM12559
WELL NAME & NO.:	1H Cottonmouth 24 Fed Com
SURFACE HOLE FOOTAGE:	0105' FSL & 0745' FWL
BOTTOM HOLE FOOTAGE	0330' FNL & 0660' FWL
LOCATION:	Section 24, T. 26 S., R. 28 E., NMPM
COUNTY:	Eddy County, New Mexico

The Standard Conditions of Approval (COA) that were approved with the APD on 02/18/2011 apply to this well extension. If any deviations to the standards exist or special COAs are additionally required, the section with the deviation or requirement will be checked below.

☒ **Special Requirements**
Communitization Agreement

☒ **Drilling**
Logging Requirements
Medium Cave/Karst
Waste Material and Fluids

I. SPECIAL REQUIREMENT(S)

Communitization Agreement

A Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the BLM. The effective date of the agreement shall be prior to any sales. In addition, the well sign shall include the surface and bottom hole lease numbers. If the Communitization Agreement number is known, it shall also be on the sign. If not, it shall be placed on the sign when the sign is replaced.

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ **Eddy County**
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

1. **Although Hydrogen Sulfide has not been reported in this section, it is always a potential hazard. If Hydrogen Sulfide is encountered, please report measured amounts and formations to the BLM.**

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Medium Cave/Karst
Possible lost circulation in the Delaware and Bone Spring.

1. The **13-3/8** inch surface casing shall be set at **approximately 450 feet (a minimum of 25 feet above the salt)** and cemented to the surface. **Onshore Order II requires casing to be set across a competent bed. If salt is encountered, set casing shoe 25 feet above the top of salt.**

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

    b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.

    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

    d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **8-5/8** inch intermediate casing, which shall be set at approximately **2555** feet, is:

    ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**

If 75% or greater lost circulation occurs while drilling the intermediate casing hole,

the cement on the production casing must come to surface.

Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:

   ☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification.

The pilot hole plugging procedure is approved as written. Note plug top on drilling report.

4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.

   a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **3000 (3M)** psi.

4. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

   a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips or where the float does not hold,

the minimum wait time before cut-off is eight hours after bumping the plug or when the cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. BOP/BOPE testing can begin after the above conditions are satisfied.

b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock.

d. The results of the test shall be reported to the appropriate BLM office.

e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**

f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

E. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

JAM 051313