

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM067979
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name Jameson 26 Federal #4H
2. Name of Operator COG Operating 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. 30-015-39366
3b. Phone No. (include area code) 575-748-6940		9. API Well No. 30-015-39366
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 330' FNL & 2260' FWL Unit Letter C (NENW) SPL At proposed prod Zone 330' FSL & 2260' FWL Unit Letter N (SESW) BHL		10. Field and Pool, or Exploratory Culebra Bluff; Bone Spring S.
14. Distance in miles and direction from nearest town or post office* About 10 miles from Carlsbad		11. Sec., T.R.M. or Blk and Survey or Area Sec. 26 - T22S - R28E
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 330'	16. No. of acres in lease 640	12. County or Parish Eddy County
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. 280'	17. Spacing Unit dedicated to this well 160	13. State NM
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3137.63	19. Proposed Depth TD: 9950' TVD. 8350' MD: 12740'	20. BLM/BIA Bond No. on file NMB000740
	22. Approximate date work will start* 6/15/2011	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:

- Well plat certified by a registered surveyor.
- A Drilling Plan
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification
- Such other site specific information and/or plans as may be required by the authorized officer.

25. Signature <i>Mayte Reyes</i>	Name (Printed/Typed) Mayte Reyes	Date 4/18/2011
Title Regulatory Analyst		
Approved by (Signature) <i>[Signature]</i>	Name (Printed/Typed)	Date 8/29/11
Title FIELD MANAGER		
Office CARLSBAD FIELD OFFICE		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

Carlsbad Controlled Water Basin

*(Instructions on page 2)
Approval Subject to General Requirements
& Special Stipulations Attached

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

COG Operating LLC
DRILLING AND OPERATIONS PROGRAM

Jameson 26 Federal #4H
SHL: 330' FNL & 2260' FWL
BHL: 330' FSL & 2260' FWL
Section 26 T22S 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	~ 50'	
Top of Salt	431'	
Base of Salt	2641'	
Delaware	2731'	Oil
Bone Spring	6266'	
1 st BSS	7322'	
2 nd BSS	8046'	
3 rd BSS	9276'	
Pilot Hole TD	9950'	
TD TVD	8350'	
TMD	12740'	

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 350' 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 200' inside 9-5/8" shoe.

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 1/2"	0' - 350'	Surface	13 3/8"	New	48#	STC	J-55	1.125	1.125	1.6
12 1/4"	0' - 2700'	Intrmd	9 5/8"	New	36#	STC	J-55	1.125	1.125	1.6
8 3/4"	2700' - 9950'	Pilot Hole								
7 7/8"	0' - 12,740'	Production Curve & Lateral	5 1/2"	New	17#	LTC	P-110	1.125	1.125	1.6

4. Proposed Cement Program

- a. 13-3/8" Surface
Cmt: 300 sx Class C + 2% CaCl₂
(14.8 ppg / 1.35 cuft/sx)
**Calculated w/50% excess on OH volumes
- b. 9 5/8" Intermediate
Lead: 450 sx Class C + Gilsonite + HR-800
(12.7 ppg / 1.88 cuft/sx)
Tail: 250 sx Class C + 1% CaCl₂
(14.8 ppg / 1.35 cuft/sx)
**Calculated w/35% excess on OH volumes
- d. 5 1/2" Production
1st Stage:
Lead: 450 sx Class H + Acid soluble
(15.0 ppg / 2.6 cuft/sx)
2nd Stage:
Lead: 900 sx Class H + Bentonite + HALAD-322
(12.7 ppg / 1.89 cuft/sx)
Tail: 100 sx Class H
(15.6 ppg / 1.19 cuft/sx)
DVT @ 7800' (approx depth)
**Calculated w/35% excess on OH volumes

- The above cement volumes could be revised pending the caliper measurement from the open hole logs.
- The 9-5/8" intermediate is designed to circulate cement to surface.
- The production string TOC is designed to reach 200' inside 9-5/8" csg shoe.
- After logging the PH, will plug back to kick off point by setting the following plugs:

PH TD Plug f/PH TD – 9800'

75 sx Class H @ 15.6 ppq/1.18 ft3/sx + HR-800

Kick Off Plug f/7800' – 8300'

225 sx Class H @ 17.2 ppq /0.98 ft³/sx + CFR3 + HR-800

5. Minimum Specifications for Pressure Control:

Nipple up on 13 3/8 with 2M system (Hydril) tested to 2000# by independent tester,
Nipple up on 9 5/8 with 3m system tested to 3000# 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 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:

- PH TD = 4315 psi
- Lateral TD = 3620 psi

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

Depth	Type System	Mud Weight	Viscosity (sec)	Waterloss (cc)
0' – 350'	Fresh Water	8.4	29	N.C.
350' – 2700'	Brine	10	29	N.C.
2700' – 9950' (PH)	Cut Brine	8.9 – 9.2	29	N.C.
2700' – 12740' (Lateral)	Cut Brine	8.9 – 9.2	29	N.C.

The necessary mud products for weight addition and fluid loss control will be on location at all times.

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 1/2" 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. The open hole electrical logging 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. No lost circulation is expected to occur. 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 Operating LLC

Eddy County(NAD83)

Jameson "26"

#4H

OH

Plan: Design #1

Pathfinder X & Y Planning Report

12 April, 2011

PATHFINDER

A Schlumberger Company



Pathfinder
Pathfinder X & Y Planning Report



Company: COG Operating LLC
Project: Eddy County(NAD83)
Site: Jameson "26"
Well: #4H
Wellbore: OH
Design: Design #1

Local Co-ordinate Reference: Well #4H
TVD Reference: WELL @ 3155.63usft (18' KB Correction)
MD Reference: WELL @ 3155.63usft (18' KB Correction)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project	Eddy County(NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Jameson "26"		
Site Position:		Northing:	498,477.930 usft
From: Map		Easting:	625,874.190 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 22' 12.318 N
		Longitude:	104° 3' 34.267 W
		Grid Convergence:	0.15 °

Well	#4H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 22' 12.318 N
		Longitude:	104° 3' 34.267 W
		Ground Level:	3,137.63 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF200510	04/12/11	7.83
			Dip Angle
			60.26
			Field Strength
			48,706

Design	Design #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			180.00

Survey Tool Program	Date 04/12/11		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
0.00	12,741.11	Design #1 (OH)	MWD
			Description
			MWD - Standard



Pathfinder
Pathfinder X & Y Planning Report



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Planned Survey											
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
0.00	0.00	0.00	0.00	3,155.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
100.00	0.00	0.00	100.00	3,055.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
200.00	0.00	0.00	200.00	2,955.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
300.00	0.00	0.00	300.00	2,855.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
400.00	0.00	0.00	400.00	2,755.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
500.00	0.00	0.00	500.00	2,655.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
600.00	0.00	0.00	600.00	2,555.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
700.00	0.00	0.00	700.00	2,455.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
800.00	0.00	0.00	800.00	2,355.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
900.00	0.00	0.00	900.00	2,255.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
1,000.00	0.00	0.00	1,000.00	2,155.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
1,100.00	0.00	0.00	1,100.00	2,055.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
1,200.00	0.00	0.00	1,200.00	1,955.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
1,300.00	0.00	0.00	1,300.00	1,855.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
1,400.00	0.00	0.00	1,400.00	1,755.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
1,500.00	0.00	0.00	1,500.00	1,655.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
1,600.00	0.00	0.00	1,600.00	1,555.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
1,700.00	0.00	0.00	1,700.00	1,455.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
1,800.00	0.00	0.00	1,800.00	1,355.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
1,900.00	0.00	0.00	1,900.00	1,255.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
2,000.00	0.00	0.00	2,000.00	1,155.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
2,100.00	0.00	0.00	2,100.00	1,055.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
2,200.00	0.00	0.00	2,200.00	955.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
2,300.00	0.00	0.00	2,300.00	855.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
2,400.00	0.00	0.00	2,400.00	755.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
2,500.00	0.00	0.00	2,500.00	655.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	
2,600.00	0.00	0.00	2,600.00	555.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19	



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Wellbore: OH
Design: Design #1

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MD Reference: WELL @ 3155.63usft (18' KB Correction)
North Reference: Grd
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
2,700.00	0.00	0.00	2,700.00	455.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19
2,800.00	0.00	0.00	2,800.00	355.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19
2,900.00	0.00	0.00	2,900.00	255.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19
3,000.00	0.00	0.00	3,000.00	155.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19
3,100.00	0.00	0.00	3,100.00	55.63	0.00	0.00	0.00	0.00	498,477.93	625,874.19
3,200.00	0.00	0.00	3,200.00	-44.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
3,300.00	0.00	0.00	3,300.00	-144.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
3,400.00	0.00	0.00	3,400.00	-244.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
3,500.00	0.00	0.00	3,500.00	-344.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
3,600.00	0.00	0.00	3,600.00	-444.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
3,700.00	0.00	0.00	3,700.00	-544.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
3,800.00	0.00	0.00	3,800.00	-644.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
3,900.00	0.00	0.00	3,900.00	-744.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
4,000.00	0.00	0.00	4,000.00	-844.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
4,100.00	0.00	0.00	4,100.00	-944.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
4,200.00	0.00	0.00	4,200.00	-1,044.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
4,300.00	0.00	0.00	4,300.00	-1,144.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
4,400.00	0.00	0.00	4,400.00	-1,244.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
4,500.00	0.00	0.00	4,500.00	-1,344.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
4,600.00	0.00	0.00	4,600.00	-1,444.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
4,700.00	0.00	0.00	4,700.00	-1,544.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
4,800.00	0.00	0.00	4,800.00	-1,644.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
4,900.00	0.00	0.00	4,900.00	-1,744.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
5,000.00	0.00	0.00	5,000.00	-1,844.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
5,100.00	0.00	0.00	5,100.00	-1,944.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
5,200.00	0.00	0.00	5,200.00	-2,044.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
5,300.00	0.00	0.00	5,300.00	-2,144.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19



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Pathfinder X & Y Planning Report

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A Schlumberger Company

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5,400.00	0.00	0.00	5,400.00	-2,244.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
5,500.00	0.00	0.00	5,500.00	-2,344.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
5,600.00	0.00	0.00	5,600.00	-2,444.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
5,700.00	0.00	0.00	5,700.00	-2,544.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
5,800.00	0.00	0.00	5,800.00	-2,644.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
5,900.00	0.00	0.00	5,900.00	-2,744.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
6,000.00	0.00	0.00	6,000.00	-2,844.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
6,100.00	0.00	0.00	6,100.00	-2,944.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
6,200.00	0.00	0.00	6,200.00	-3,044.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
6,300.00	0.00	0.00	6,300.00	-3,144.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
6,400.00	0.00	0.00	6,400.00	-3,244.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
6,500.00	0.00	0.00	6,500.00	-3,344.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
6,600.00	0.00	0.00	6,600.00	-3,444.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
6,700.00	0.00	0.00	6,700.00	-3,544.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
6,800.00	0.00	0.00	6,800.00	-3,644.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
6,900.00	0.00	0.00	6,900.00	-3,744.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
7,000.00	0.00	0.00	7,000.00	-3,844.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
7,100.00	0.00	0.00	7,100.00	-3,944.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
7,200.00	0.00	0.00	7,200.00	-4,044.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
7,300.00	0.00	0.00	7,300.00	-4,144.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
7,400.00	0.00	0.00	7,400.00	-4,244.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
7,500.00	0.00	0.00	7,500.00	-4,344.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
7,600.00	0.00	0.00	7,600.00	-4,444.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
7,700.00	0.00	0.00	7,700.00	-4,544.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
7,800.00	0.00	0.00	7,800.00	-4,644.37	0.00	0.00	0.00	0.00	498,477.93	625,874.19
7,852.50	0.00	0.00	7,852.50	-4,696.87	0.00	0.00	0.00	0.00	498,477.93	625,874.19
7,875.00	2.70	-180.00	7,874.99	-4,719.36	-0.53	0.00	0.53	12.00	498,477.40	625,874.19



Pathfinder
Pathfinder X & Y Planning Report



Company: COG Operating LLC
Project: Eddy County(NAD83)
Site: Jameson "26"
Well: #4H
Wellbore: OH
Design: Design #1

Local Co-ordinate Reference: Well #4H
TVD Reference: WELL @ 3155.63usft (18' KB Correction)
MD Reference: WELL @ 3155.63usft (18' KB Correction)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
7,900.00	5.70	180.00	7,899.92	-4,744.29	-2.36	0.00	2.36	12.00	498,475.57	625,874.19
7,925.00	8.70	180.00	7,924.72	-4,769.09	-5.49	0.00	5.49	12.00	498,472.44	625,874.19
7,950.00	11.70	180.00	7,949.32	-4,793.69	-9.92	0.00	9.92	12.00	498,468.01	625,874.19
7,975.00	14.70	180.00	7,973.66	-4,818.03	-15.63	0.00	15.63	12.00	498,462.30	625,874.19
8,000.00	17.70	180.00	7,997.67	-4,842.04	-22.60	0.00	22.60	12.00	498,455.33	625,874.19
8,025.00	20.70	180.00	8,021.27	-4,865.64	-30.82	0.00	30.82	12.00	498,447.11	625,874.19
8,050.00	23.70	180.00	8,044.42	-4,888.79	-40.27	0.00	40.27	12.00	498,437.66	625,874.19
8,075.00	26.70	180.00	8,067.04	-4,911.41	-50.91	0.00	50.91	12.00	498,427.02	625,874.19
8,100.00	29.70	180.00	8,089.07	-4,933.44	-62.72	0.00	62.72	12.00	498,415.21	625,874.19
8,125.00	32.70	180.00	8,110.45	-4,954.82	-75.67	0.00	75.67	12.00	498,402.26	625,874.19
8,150.00	35.70	180.00	8,131.12	-4,975.49	-89.72	0.00	89.72	12.00	498,388.21	625,874.19
8,175.00	38.70	180.00	8,151.03	-4,995.40	-104.83	0.00	104.83	12.00	498,373.10	625,874.19
8,200.00	41.70	180.00	8,170.13	-5,014.50	-120.96	0.00	120.96	12.00	498,356.97	625,874.19
8,225.00	44.70	180.00	8,188.35	-5,032.72	-138.07	0.00	138.07	12.00	498,339.86	625,874.19
8,250.00	47.70	180.00	8,205.65	-5,050.02	-156.11	0.00	156.11	12.00	498,321.82	625,874.19
8,275.00	50.70	180.00	8,221.99	-5,066.36	-175.04	0.00	175.04	12.00	498,302.89	625,874.19
8,300.00	53.70	180.00	8,237.31	-5,081.68	-194.79	0.00	194.79	12.00	498,283.14	625,874.19
8,325.00	56.70	180.00	8,251.58	-5,095.95	-215.31	0.00	215.31	12.00	498,262.62	625,874.19
8,350.00	59.70	180.00	8,264.75	-5,109.12	-236.56	0.00	236.56	12.00	498,241.37	625,874.19
8,375.00	62.70	180.00	8,276.80	-5,121.17	-258.46	0.00	258.46	12.00	498,219.47	625,874.19
8,400.00	65.70	180.00	8,287.68	-5,132.05	-280.97	0.00	280.97	12.00	498,196.96	625,874.19
8,425.00	68.69	180.00	8,297.37	-5,141.74	-304.01	0.00	304.01	12.00	498,173.92	625,874.19
8,450.00	71.69	180.00	8,305.84	-5,150.21	-327.53	0.00	327.53	12.00	498,150.40	625,874.19
8,475.00	74.69	180.00	8,313.06	-5,157.43	-351.46	0.00	351.46	12.00	498,126.47	625,874.19
8,500.00	77.69	180.00	8,319.03	-5,163.40	-375.73	0.00	375.73	12.00	498,102.20	625,874.19
8,525.00	80.69	180.00	8,323.72	-5,168.09	-400.29	0.00	400.29	12.00	498,077.64	625,874.19
8,550.00	83.69	180.00	8,327.11	-5,171.48	-425.05	0.00	425.05	12.00	498,052.88	625,874.19



Pathfinder
Pathfinder X & Y Planning Report



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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
8,575.00	86.69	180.00	8,329.21	-5,173.58	-449.96	0.00	449.96	12.00	498,027.97	625,874.19
8,600.00	89.69	180.00	8,329.99	-5,174.36	-474.94	0.00	474.94	12.00	498,002.99	625,874.19
8,602.56	90.00	180.00	8,330.00	-5,174.37	-477.50	0.00	477.50	12.00	498,000.43	625,874.19
8,700.00	90.00	180.00	8,330.00	-5,174.37	-574.94	0.00	574.94	0.00	497,902.99	625,874.19
8,800.00	90.00	180.00	8,330.00	-5,174.37	-674.94	0.00	674.94	0.00	497,802.99	625,874.19
8,900.00	90.00	180.00	8,330.00	-5,174.37	-774.94	0.00	774.94	0.00	497,702.99	625,874.19
9,000.00	90.00	180.00	8,330.00	-5,174.37	-874.94	0.00	874.94	0.00	497,602.99	625,874.19
9,100.00	90.00	180.00	8,330.00	-5,174.37	-974.94	0.00	974.94	0.00	497,502.99	625,874.19
9,200.00	90.00	180.00	8,330.00	-5,174.37	-1,074.94	0.00	1,074.94	0.00	497,402.99	625,874.19
9,300.00	90.00	180.00	8,330.00	-5,174.37	-1,174.94	0.00	1,174.94	0.00	497,302.99	625,874.19
9,400.00	90.00	180.00	8,330.00	-5,174.37	-1,274.94	0.00	1,274.94	0.00	497,202.99	625,874.19
9,500.00	90.00	180.00	8,330.00	-5,174.37	-1,374.94	0.00	1,374.94	0.00	497,102.99	625,874.19
9,600.00	90.00	180.00	8,330.00	-5,174.37	-1,474.94	0.00	1,474.94	0.00	497,002.99	625,874.19
9,700.00	90.00	180.00	8,330.00	-5,174.37	-1,574.94	0.00	1,574.94	0.00	496,902.99	625,874.19
9,800.00	90.00	180.00	8,330.00	-5,174.37	-1,674.94	0.00	1,674.94	0.00	496,802.99	625,874.19
9,900.00	90.00	180.00	8,330.00	-5,174.37	-1,774.94	0.00	1,774.94	0.00	496,702.99	625,874.19
10,000.00	90.00	180.00	8,330.00	-5,174.37	-1,874.94	0.00	1,874.94	0.00	496,602.99	625,874.19
10,100.00	90.00	180.00	8,330.00	-5,174.37	-1,974.94	0.00	1,974.94	0.00	496,502.99	625,874.19
10,200.00	90.00	180.00	8,330.00	-5,174.37	-2,074.94	0.00	2,074.94	0.00	496,402.99	625,874.19
10,300.00	90.00	180.00	8,330.00	-5,174.37	-2,174.94	0.00	2,174.94	0.00	496,302.99	625,874.19
10,400.00	90.00	180.00	8,330.00	-5,174.37	-2,274.94	0.00	2,274.94	0.00	496,202.99	625,874.19
10,500.00	90.00	180.00	8,330.00	-5,174.37	-2,374.94	0.00	2,374.94	0.00	496,102.99	625,874.19
10,600.00	90.00	180.00	8,330.00	-5,174.37	-2,474.94	0.00	2,474.94	0.00	496,002.99	625,874.19
10,700.00	90.00	180.00	8,330.00	-5,174.37	-2,574.94	0.00	2,574.94	0.00	495,902.99	625,874.19
10,800.00	90.00	180.00	8,330.00	-5,174.37	-2,674.94	0.00	2,674.94	0.00	495,802.99	625,874.19
10,900.00	90.00	180.00	8,330.00	-5,174.37	-2,774.94	0.00	2,774.94	0.00	495,702.99	625,874.19
11,000.00	90.00	180.00	8,330.00	-5,174.37	-2,874.94	0.00	2,874.94	0.00	495,602.99	625,874.19



Pathfinder
Pathfinder X & Y Planning Report

PATHFINDER
A Schlumberger Company

Company: COG Operating LLC
Project: Eddy County(NAD83)
Site: Jameson "26"
Well: #4H
Wellbore: OH
Design: Design #1

Local Co-ordinate Reference: Well #4H
TVD Reference: WELL @ 3155.63usft (18' KB Correction)
MD Reference: WELL @ 3155.63usft (18' KB Correction)
North Reference: Gnd
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
11,100.00	90.00	180.00	8,330.00	-5,174.37	-2,974.94	0.00	2,974.94	0.00	495,502.99	625,874.19
11,200.00	90.00	180.00	8,330.00	-5,174.37	-3,074.94	0.00	3,074.94	0.00	495,402.99	625,874.19
11,300.00	90.00	180.00	8,330.00	-5,174.37	-3,174.94	0.00	3,174.94	0.00	495,302.99	625,874.19
11,400.00	90.00	180.00	8,330.00	-5,174.37	-3,274.94	0.00	3,274.94	0.00	495,202.99	625,874.19
11,500.00	90.00	180.00	8,330.00	-5,174.37	-3,374.94	0.00	3,374.94	0.00	495,102.99	625,874.19
11,600.00	90.00	180.00	8,330.00	-5,174.37	-3,474.94	0.00	3,474.94	0.00	495,002.99	625,874.19
11,700.00	90.00	180.00	8,330.00	-5,174.37	-3,574.94	0.00	3,574.94	0.00	494,902.99	625,874.19
11,800.00	90.00	180.00	8,330.00	-5,174.37	-3,674.94	0.00	3,674.94	0.00	494,802.99	625,874.19
11,900.00	90.00	180.00	8,330.00	-5,174.37	-3,774.94	0.00	3,774.94	0.00	494,702.99	625,874.19
12,000.00	90.00	180.00	8,330.00	-5,174.37	-3,874.94	0.00	3,874.94	0.00	494,602.99	625,874.19
12,100.00	90.00	180.00	8,330.00	-5,174.37	-3,974.94	0.00	3,974.94	0.00	494,502.99	625,874.19
12,200.00	90.00	180.00	8,330.00	-5,174.37	-4,074.94	0.00	4,074.94	0.00	494,402.99	625,874.19
12,300.00	90.00	180.00	8,330.00	-5,174.37	-4,174.94	0.00	4,174.94	0.00	494,302.99	625,874.19
12,400.00	90.00	180.00	8,330.00	-5,174.37	-4,274.94	0.00	4,274.94	0.00	494,202.99	625,874.19
12,500.00	90.00	180.00	8,330.00	-5,174.37	-4,374.94	0.00	4,374.94	0.00	494,102.99	625,874.19
12,600.00	90.00	180.00	8,330.00	-5,174.37	-4,474.94	0.00	4,474.94	0.00	494,002.99	625,874.19
12,700.00	90.00	180.00	8,330.00	-5,174.37	-4,574.94	0.00	4,574.94	0.00	493,902.99	625,874.19
12,740.94	90.00	180.00	8,330.00	-5,174.37	-4,615.88	0.00	4,615.88	0.00	493,862.05	625,874.19
PBHL(Jameson#4H)										
12,741.16	90.00	180.00	8,330.00	-5,174.37	-4,616.10	0.00	4,616.10	0.00	493,861.83	625,874.19

Checked By: _____ Approved By: _____ Date: _____



Project: Eddy County(NAD83)
 Site: Jameson "26"
 Well: #4H
 Wellbore: OH
 Plan: Design #1 (#4H/OH)



Azimuths to Grid North
 True North: -0.15°
 Magnetic North: 7.68°

Magnetic Field
 Strength: 48705.9snT
 Dip Angle: 60.26°
 Date: 04/12/2011
 Model: IGRF200510

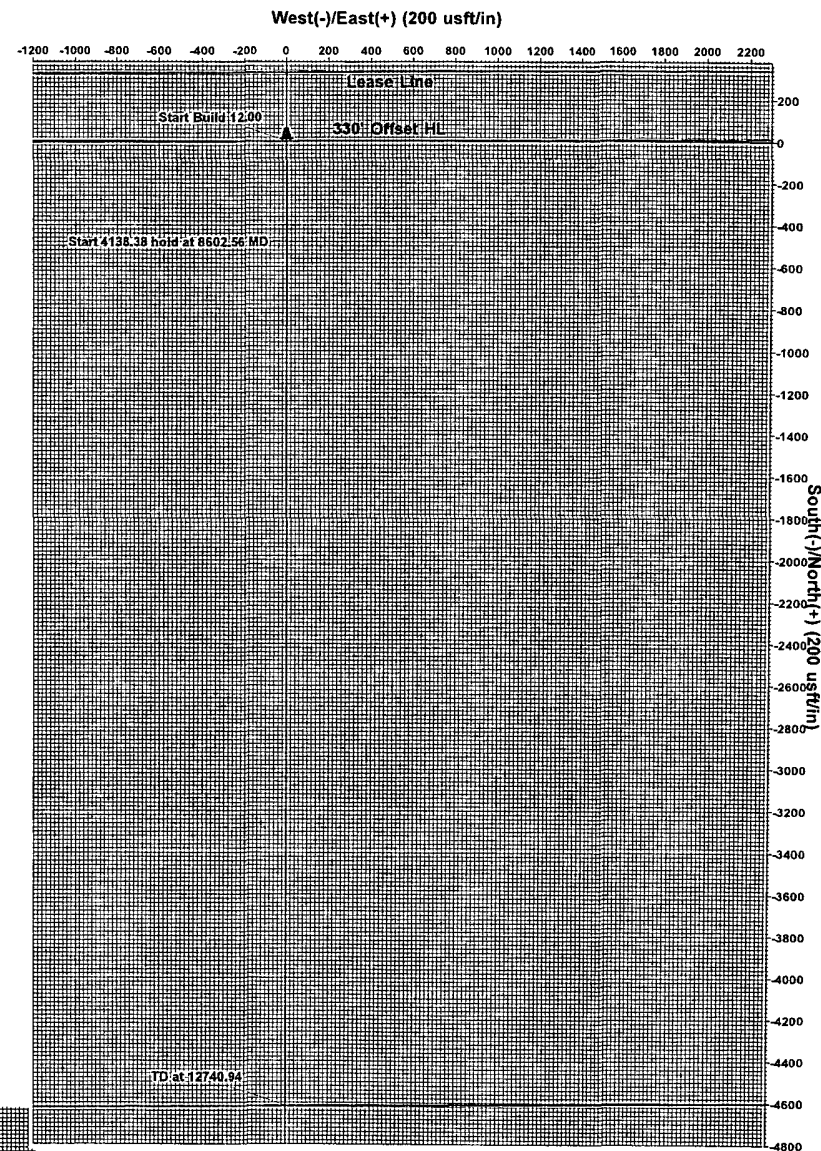
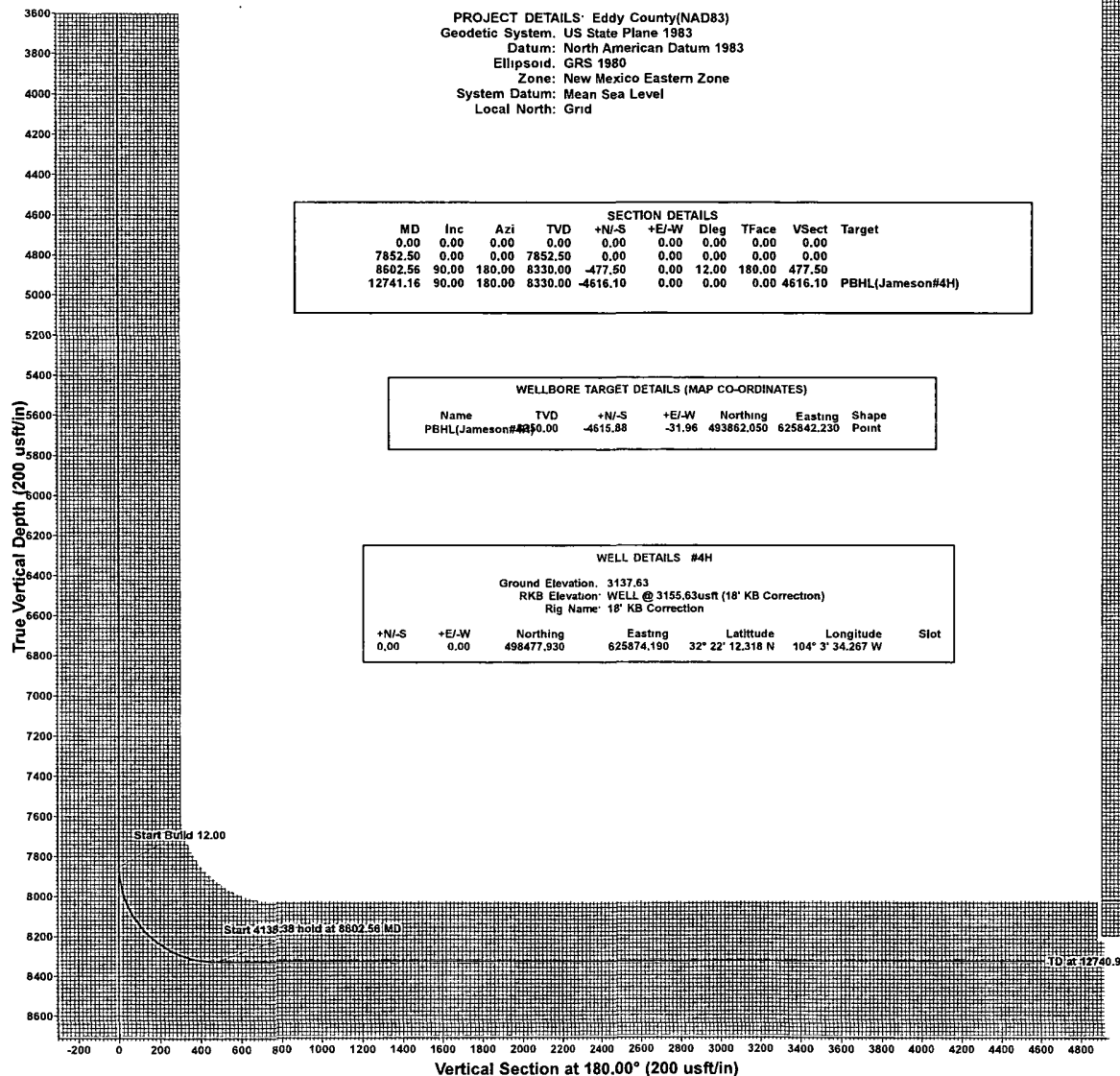
PATHFINDER
 A Schlumberger Company

PROJECT DETAILS: Eddy County(NAD83)
 Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: New Mexico Eastern Zone
 System Datum: Mean Sea Level
 Local North: Grid

SECTION DETAILS									
MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSec	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7852.50	0.00	0.00	7852.50	0.00	0.00	0.00	0.00	0.00	
8602.56	90.00	180.00	8330.00	-477.50	0.00	12.00	180.00	477.50	
12741.16	90.00	180.00	8330.00	-4616.10	0.00	0.00	0.00	4616.10	PBHL(Jameson#4H)

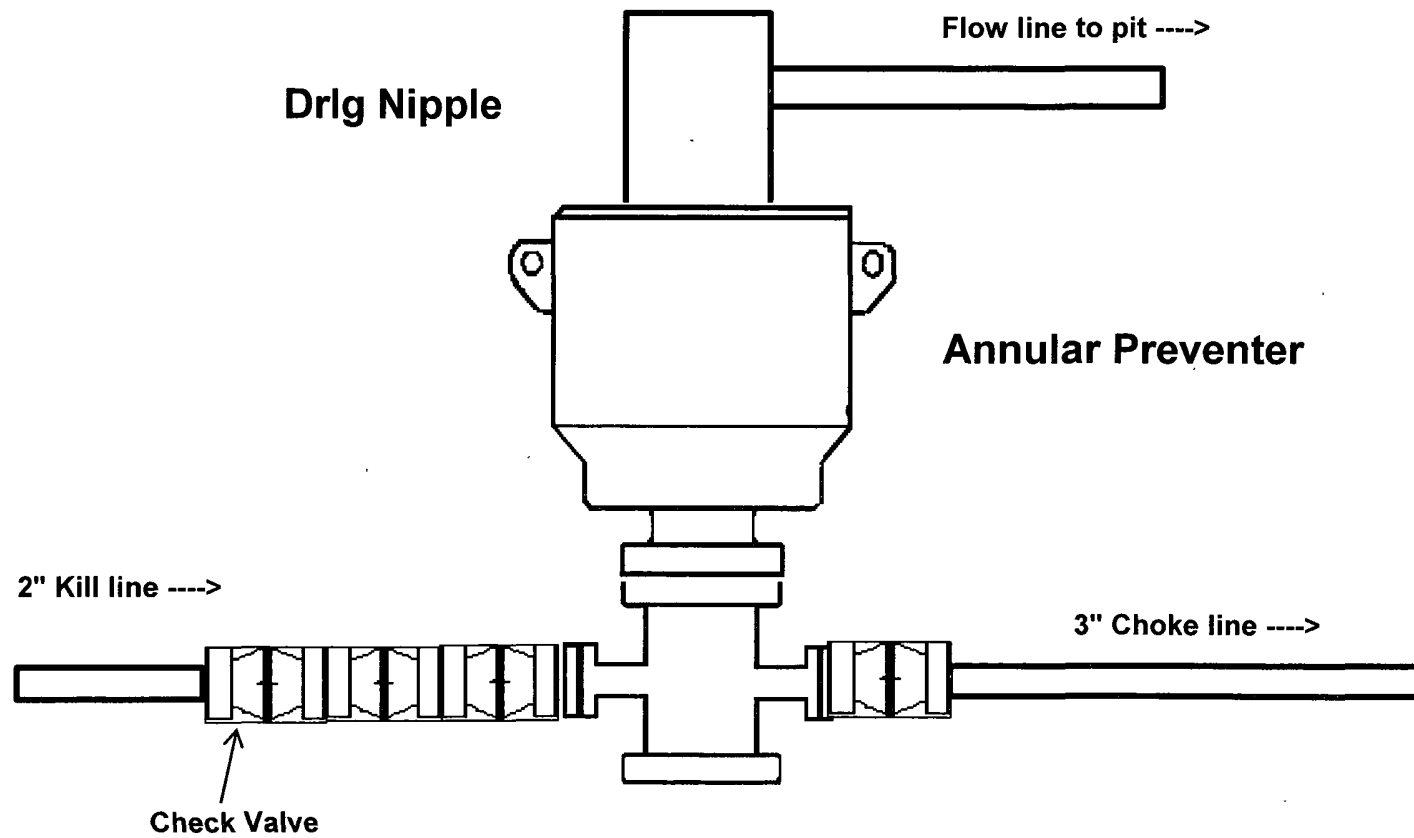
WELLBORE TARGET DETAILS (MAP CO-ORDINATES)						
Name	TVD	+N-S	+E-W	Northing	Easting	Shape
PBHL(Jameson#4H)	8330.00	-4615.88	-31.96	493862.050	625842.230	Point

WELL DETAILS #4H						
Ground Elevation: 3137.53						
RKB Elevation: WELL @ 3155.63usft (18" KB Correction)						
Rig Name: 18" KB Correction						
+N-S	+E-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	498477.930	625874.190	32° 22' 12.318 N	104° 3' 34.267 W	

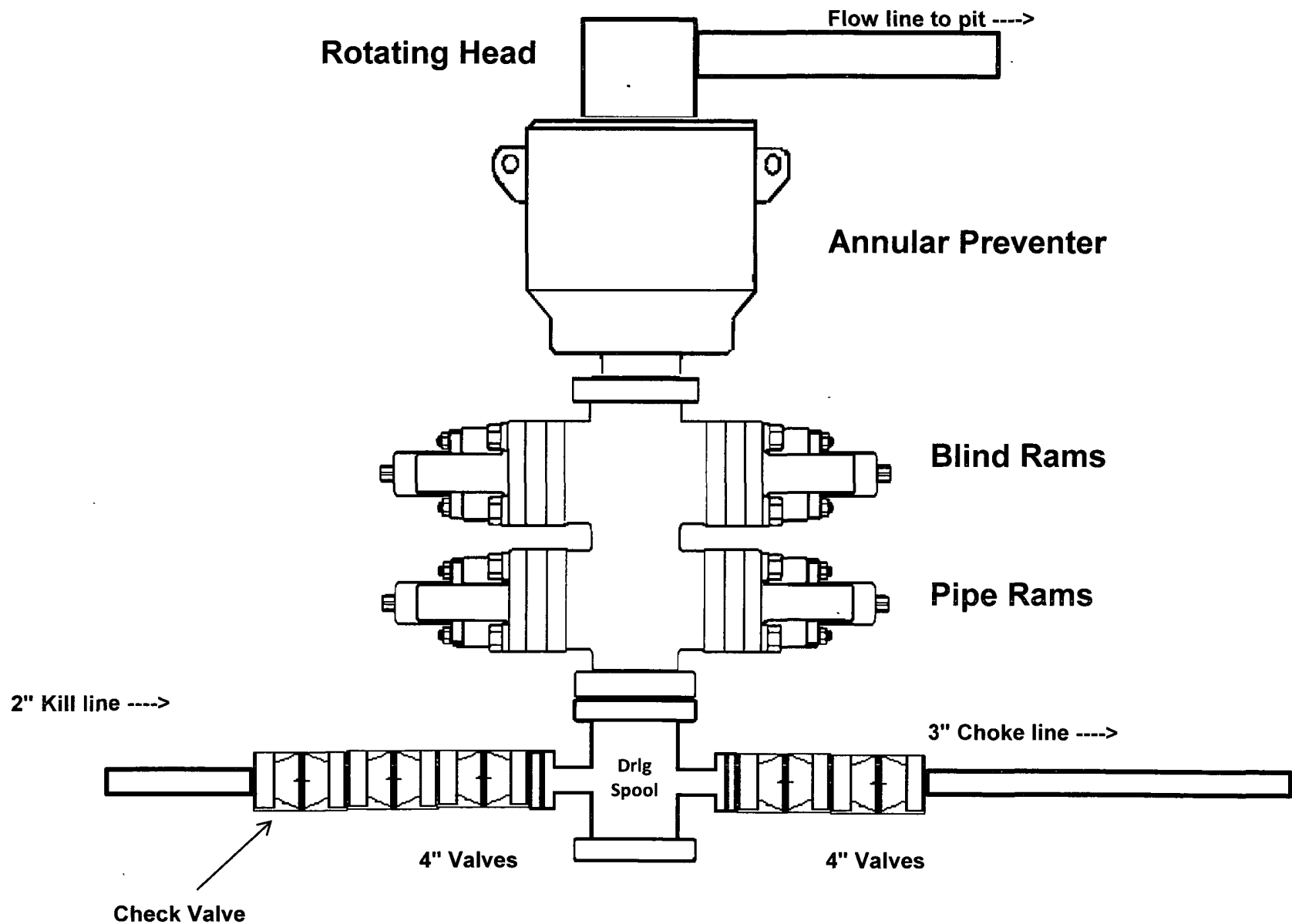


Plan: Design #1 (#4H/OH)
 Created By: Nate Bingham Date: 14:58, April 12 2011
 Checked: _____ Date: _____

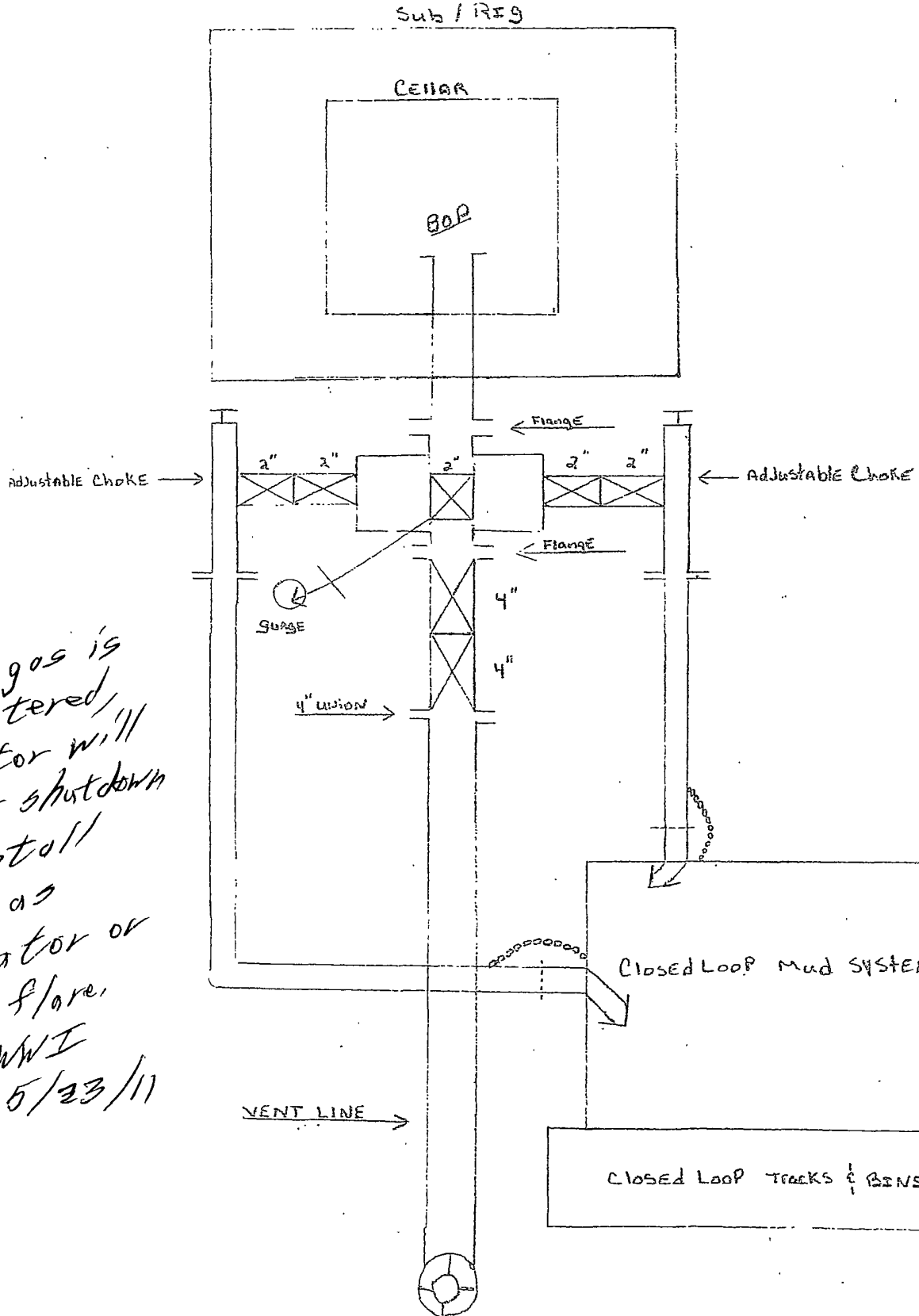
2,000 psi BOP Schematic



3,000 psi BOP Schematic

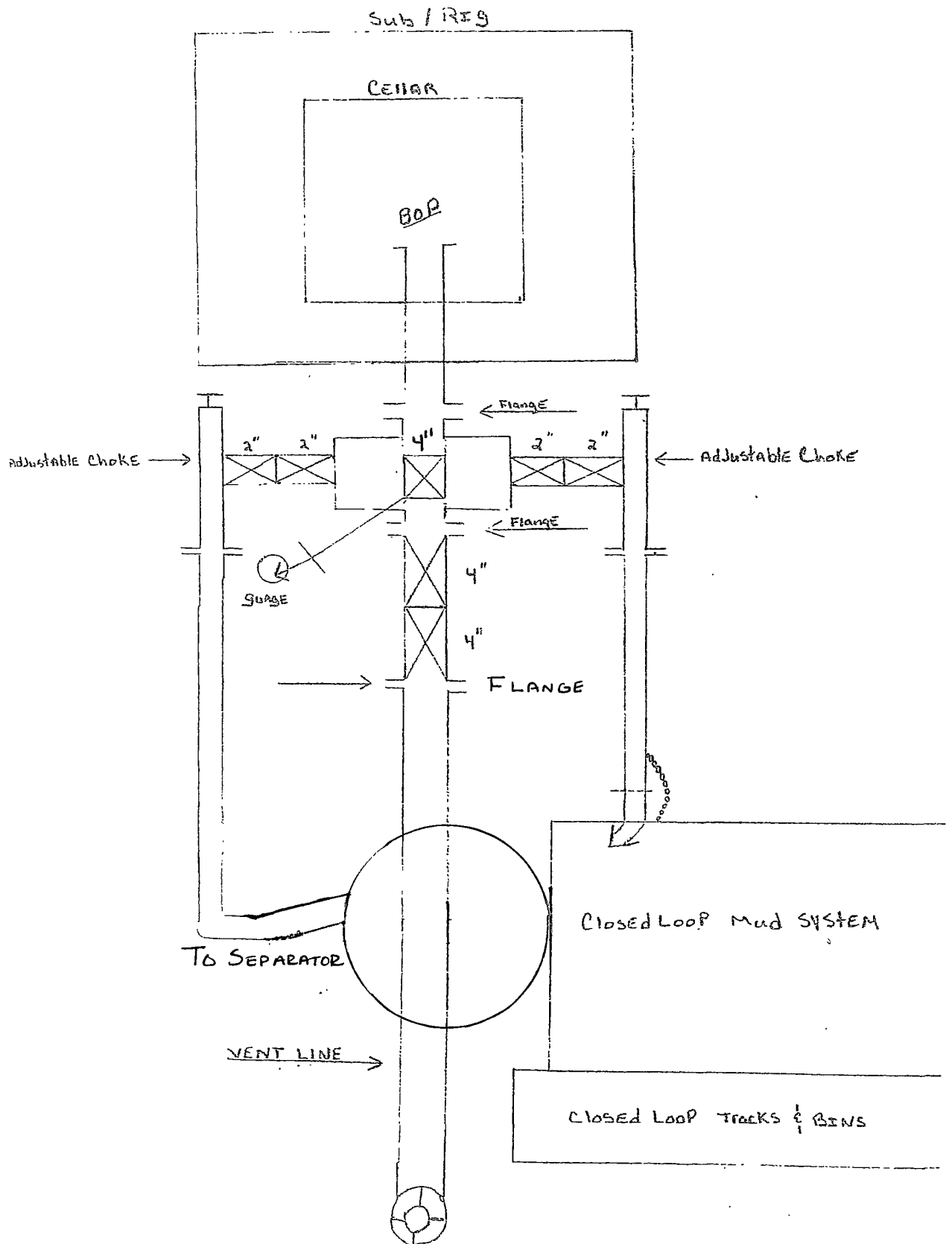


2M Choke Manifold Equipment



If any gas is encountered, operator will either shutdown to install mud/gas separator or will flare.
 WWI
 5/23/11

3M Choke Manifold Equipment



150' TO FLARE PIT