

OCD-ARTESIA

12-113
FORM APPROVED
OMB No. 1004-013
Expires July 31, 2010

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Split Estate

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM115411
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator COG Operating LLC. <229137>		7. If Unit or CA Agreement, Name and No.
3a. Address 2208 West Main Street Artesia, NM 88210	3b. Phone No. (include area code) 575-748-6940	8. Lease Name and Well No. <39200> Buckwheat 33 Federal #2H
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 380' FSL & 990' FEL Unit Letter P (SESE) SHL At proposed prod. Zone 330' FNL & 990' FEL Unit Letter A (NENE) BHL		9. API Well No. 30-015-40241
14. Distance in miles and direction from nearest town or post office* About 3 miles from Malaga		10. Field and Pool, or Exploratory <64450> WILLOW LAKE, B.S.
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 990'		11. Sec., T.R.M. or Blk and Survey of Area Sec. 33 - T24S - R28E
16. No. of acres in lease 600		12. County or Parish Eddy County
17. Spacing Unit dedicated to this well 160'		13. State NM
18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. 360'		19. Proposed Depth TVD: 6815' MD: 11235'
20. BLM/BIA Bond No. on file NMB000740 + 215		21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3002
22. Approximate date work will start*		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 <i>Mayte Reyes</i>	Name (Printed/Typed) Mayte Reyes	Date 11/9/2011
Title Regulatory Analyst		
Approved by (Signature) <i>/s/ Don Peterson</i>	Name (Printed/Typed)	Date MAY 01 2012
Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

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

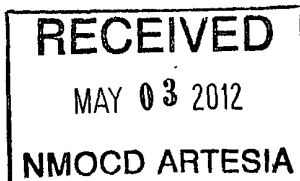
Conditions of approval, if any, are attached.

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)

SEE ATTACHED FOR
CONDITIONS OF APPROVAL



Carlsbad Controlled Water Basin (page 2)

Approval Subject to General Requirements
& Special Stipulations Attached

CERTIFICATION:

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drillsite and access route, that I am familiar with the conditions which presently exist; that the statements made in this plan are to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by COG Operating LLC and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved. This statement is subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.

11-14-11
Date

COG OPERATING LLC


Rand French
Regulatory Supervisor

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 & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised October 15, 2009
Submit one copy to appropriate
District Office
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-015-40241	² Pool Code 64450	³ Pool Name WILLOW LAKE; B. S.
⁴ Property Code 39200	⁵ Property Name BUCKWHEAT "33" FEDERAL	
⁷ OGRID No. 229137	⁸ Operator Name COG OPERATING, LLC.	⁶ Well Number 2H
		⁹ Elevation 3002.0

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	33	24 S	28 E		380	SOUTH	990	EAST	EDDY

¹¹ 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
A	33	24 S	28 E		330	NORTH	990	EAST	EDDY

¹² Dedicated Acres 160	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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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.

NW CORNER SEC. 33 LAT. = 32°10'52.68"N LONG. = 104°06'03.43"W NMSP EAST (FT) N = 429769.37 E = 613230.57	BOTTOM OF HOLE LAT. = 32°10'49.62"N LONG. = 104°05'12.91"W NMSP EAST (FT) N = 429469.70 E = 617573.03	NE CORNER SEC. 33 LAT. = 32°10'52.93"N LONG. = 104°05'01.40"W NMSP EAST (FT) N = 429806.71 E = 618561.59	<p>¹⁷ OPERATOR CERTIFICATION</p> <p>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 undivided 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</p> <p><i>Rand French</i> 6/13/11 Signature Date</p> <p>Printed Name RAND FRENCH</p>
SW CORNER SEC. 33 LAT. = 32°09'59.82"N LONG. = 104°06'03.26"W NMSP EAST (FT) N = 424427.93 E = 613257.09	BUCKWHEAT "33" FEDERAL #2H ELEV. = 3002.0' LAT. = 32°10'03.543"N (NAD83) LONG. = 104°05'12.848"W NMSP EAST (FT) N = 424813.62 E = 617589.00	SE CORNER SEC. 33 LAT. = 32°09'59.77"N LONG. = 104°05'01.33"W NMSP EAST (FT) N = 424435.15 E = 618580.09	

¹⁸ 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 supervision, and that the same is true and correct to the best of my belief.

JUNE 9, 2011
Date of Survey

Filimon F. Jaramillo
Signature and Seal of Professional Surveyor

Certificate Number: **FILIMON F. JARAMILLO, PLS 12797**
SURVEY NO. 444

COG Operating LLC
DRILLING AND OPERATIONS PROGRAM
Buckwheat 33 Federal #2H
SHL: 380' FSL & 990' FEL
BHL: 330' FNL & 990' FEL
Section 33 T24S 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	~140'	
Rusiter	Not Present	
Top of Salt	1051'	
Base of Salt	2388'	
Delaware	2581'	Oil
Bone Spring	6204'	
Avalon Shale	6511'	Oil/Gas
1 st BSS	7193'	Oil
TD TVD	6815'	
TMD	11,235'	

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 400' and circulating cement back to surface. All intervals will be isolated by setting 5 1/2" casing to total depth and circulating cement to surface.

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' - 400'	Surface	13 3/8"	New	48#	STC	J-55	1.125	1.125	1.6
12 1/4"	0' - 2500'	Intrmd	9 5/8"	New	36#	STC	J-55	1.125	1.125	1.6
7 7/8"	0' - 11,235'	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 Cmt: 350 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: 500 sx Class C + 4% Gel + 1% CaCl₂
(13.5 ppg / 1.75 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 Lead: 750 sx 35:65:6 H + Salt+Gilsonite+CFR-3+ HR601
(12.7 ppg / 1.89 cuft/sx)
Tail: 1150 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 from the open hole logs.
- The 9-5/8" intermediate string is designed to circulate cmt to surface.
- The 5-1/2" production string is designed to circulate cmt to surface.

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:

Lateral TD = 2960 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' – 400'	Fresh Water	8.4	29	N.C.
400' – 2500'	Brine	10	29	N.C.
2500' – 11,235' (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: See CoA

- 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, NM

Sec 33, T24S, R28E

Buckwheat 33 Federal #2H

Wellbore #1

Plan: Design #1

DDC Well Planning Report

02 August, 2011

DDC

Well Planning Report

Database: EDM 5000 1 Single User Db	Local Co-ordinate Reference: Well Buckwheat 33 Federal #2H
Company: COG Operating, LLC	TVD Reference: WELL @ 3019 0usft
Project: Eddy County, NM	MD Reference: WELL @ 3019 0usft
Site: Sec 33, T24S, R28E	North Reference: Grid
Well: Buckwheat 33 Federal #2H	Survey Calculation Method: Minimum Curvature
Wellbore: Wellbore #1	
Design: Design #1	

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

Site	Sec 33, T24S, R28E				
Site Position:	Northing:	424,813 62 usft	Latitude:	32° 10' 3.543 N	
From: Map	Easting:	617,589 00 usft	Longitude:	104° 5' 12 848 W	
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0 13 °

Well	Buckwheat 33 Federal #2H					
Well Position	+N/-S	0 0 usft	Northing:	424,813 62 usft	Latitude:	32° 10' 3 543 N
	+E/-W	0 0 usft	Easting:	617,589 00 usft	Longitude:	104° 5' 12 848 W
Position Uncertainty	0 0 usft	Wellhead Elevation:		Ground Level:	3,002 0 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/28/2011	7 80	60 04	48,516

Design	Design #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	1 03	

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	
6,282 0	0.00	0 00	6,282 0	0 0	0 0	0 00	0 00	0 00	0 00	
6,782 0	60 00	12 80	6,695.5	232 8	52 9	12 00	12 00	0 00	12 80	
6,882 0	60 00	12 80	6,745 5	317.3	72 1	0.00	0 00	0 00	0 00	
7,152.4	90 00	359 80	6,815 0	573 6	98 3	12.00	11 09	-4 81	-24 78	PBHL Buckweat 33 F
11,235 0	90 00	359 80	6,815 0	4,656 1	84 0	0.00	0 00	0.00	0.00	PBHL Buckweat 33 F

DDC

Well Planning Report

Database: EDM 5000.1 Single User Db
Company: COG Operating, LLC
Project: Eddy County, NM
Site: Sec 33, T24S, R28E
Well: Buckwheat 33 Federal #2H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well Buckwheat 33 Federal #2H
TVD Reference: WELL @ 3019 0usft
MD Reference: WELL @ 3019 0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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

DDC

Well Planning Report

Database: EDM 5000 1 Single User Db
Company: COG Operating, LLC
Project: Eddy County, NM
Site: Sec 33, T24S, R28E
Well: Buckwheat 33 Federal #2H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well Buckwheat 33 Federal #2H
TVD Reference: WELL @ 3019 0usft
MD Reference: WELL @ 3019 0usft
North Reference: Gnd
Survey Calculation Method: Minimum Curvature

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
Build 12°/100' @ 6282' MD									
6,282.0	0.00	0.00	6,282.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	2.16	12.80	6,300.0	0.3	0.1	0.3	12.00	12.00	0.00
6,325.0	5.16	12.80	6,324.9	1.9	0.4	1.9	12.00	12.00	0.00
6,350.0	8.16	12.80	6,349.8	4.7	1.1	4.7	12.00	12.00	0.00
6,375.0	11.16	12.80	6,374.4	8.8	2.0	8.8	12.00	12.00	0.00
6,400.0	14.16	12.80	6,398.8	14.2	3.2	14.2	12.00	12.00	0.00
6,425.0	17.16	12.80	6,422.9	20.7	4.7	20.8	12.00	12.00	0.00
6,450.0	20.16	12.80	6,446.6	28.5	6.5	28.6	12.00	12.00	0.00
6,475.0	23.16	12.80	6,469.8	37.5	8.5	37.7	12.00	12.00	0.00
6,500.0	26.16	12.80	6,492.5	47.7	10.8	47.9	12.00	12.00	0.00
6,525.0	29.16	12.80	6,514.6	59.0	13.4	59.3	12.00	12.00	0.00
6,550.0	32.16	12.80	6,536.1	71.4	16.2	71.7	12.00	12.00	0.00
6,575.0	35.16	12.80	6,556.9	85.0	19.3	85.3	12.00	12.00	0.00
6,600.0	38.16	12.80	6,577.0	99.5	22.6	99.9	12.00	12.00	0.00
6,625.0	41.16	12.80	6,596.2	115.1	26.1	115.5	12.00	12.00	0.00
6,650.0	44.16	12.80	6,614.6	131.6	29.9	132.1	12.00	12.00	0.00
6,675.0	47.16	12.80	6,632.1	149.0	33.9	149.6	12.00	12.00	0.00
6,700.0	50.16	12.80	6,648.6	167.3	38.0	168.0	12.00	12.00	0.00
6,725.0	53.16	12.80	6,664.1	186.4	42.4	187.2	12.00	12.00	0.00
6,750.0	56.16	12.80	6,678.6	206.3	46.9	207.1	12.00	12.00	0.00
6,775.0	59.16	12.80	6,691.9	226.9	51.6	227.8	12.00	12.00	0.00
EOB&T @ 6782' MD / 60° Inc / 12.8° Azm									
6,782.0	60.00	12.80	6,695.5	232.8	52.9	233.7	12.00	12.00	0.00
6,800.0	60.00	12.80	6,704.5	248.0	56.3	249.0	0.00	0.00	0.00
EOH/SOB&T @ 6882' MD / 60° Inc / 12.7° Azm									
6,882.0	60.00	12.80	6,745.5	317.3	72.1	318.5	0.00	0.00	0.00
6,900.0	61.97	11.77	6,754.2	332.6	75.4	334.0	12.01	10.93	-5.70
6,925.0	64.71	10.41	6,765.4	354.6	79.7	355.9	12.00	10.96	-5.46
6,950.0	67.46	9.11	6,775.6	377.1	83.6	378.5	12.00	11.01	-5.21
6,975.0	70.22	7.85	6,784.6	400.1	87.0	401.7	12.00	11.05	-5.01
7,000.0	73.00	6.64	6,792.5	423.7	90.0	425.2	12.00	11.09	-4.84
7,025.0	75.78	5.47	6,799.2	447.6	92.6	449.2	12.00	11.11	-4.70
7,050.0	78.56	4.32	6,804.8	471.9	94.6	473.5	12.00	11.14	-4.58
7,075.0	81.35	3.20	6,809.1	496.5	96.2	498.1	12.00	11.15	-4.49
7,100.0	84.14	2.09	6,812.3	521.2	97.4	522.9	12.00	11.17	-4.43
7,125.0	86.93	1.00	6,814.2	546.1	98.1	547.8	12.00	11.18	-4.38
Start 4082.5 hold at 7152.4' MD									
7,152.4	90.00	359.80	6,815.0	573.6	98.3	575.2	12.00	11.18	-4.36
7,200.0	90.00	359.80	6,815.0	621.1	98.1	622.8	0.00	0.00	0.00
7,300.0	90.00	359.80	6,815.0	721.1	97.7	722.8	0.00	0.00	0.00
7,400.0	90.00	359.80	6,815.0	821.1	97.4	822.8	0.00	0.00	0.00
7,500.0	90.00	359.80	6,815.0	921.1	97.0	922.7	0.00	0.00	0.00
7,600.0	90.00	359.80	6,815.0	1,021.1	96.7	1,022.7	0.00	0.00	0.00

DDC

Well Planning Report

Database: EDM 5000.1 Single User Db
Company: COG Operating, LLC
Project: Eddy County, NM
Site: Sec 33, T24S, R28E
Well: Buckwheat 33 Federal #2H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well Buckwheat 33 Federal #2H
TVD Reference: WELL @ 3019 0usft
MD Reference: WELL @ 3019 0usft
North Reference: Gnd
Survey Calculation Method: Minimum Curvature

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)
7,700.0	90.00	359.80	6,815.0	1,121.1	96.3	1,122.7	0.00	0.00	0.00
7,800.0	90.00	359.80	6,815.0	1,221.1	96.0	1,222.7	0.00	0.00	0.00
7,900.0	90.00	359.80	6,815.0	1,321.1	95.6	1,322.6	0.00	0.00	0.00
8,000.0	90.00	359.80	6,815.0	1,421.1	95.3	1,422.6	0.00	0.00	0.00
8,100.0	90.00	359.80	6,815.0	1,521.1	95.0	1,522.6	0.00	0.00	0.00
8,200.0	90.00	359.80	6,815.0	1,621.1	94.6	1,622.6	0.00	0.00	0.00
8,300.0	90.00	359.80	6,815.0	1,721.1	94.3	1,722.5	0.00	0.00	0.00
8,400.0	90.00	359.80	6,815.0	1,821.1	93.9	1,822.5	0.00	0.00	0.00
8,500.0	90.00	359.80	6,815.0	1,921.1	93.6	1,922.5	0.00	0.00	0.00
8,600.0	90.00	359.80	6,815.0	2,021.1	93.2	2,022.5	0.00	0.00	0.00
8,700.0	90.00	359.80	6,815.0	2,121.1	92.9	2,122.5	0.00	0.00	0.00
8,800.0	90.00	359.80	6,815.0	2,221.1	92.5	2,222.4	0.00	0.00	0.00
8,900.0	90.00	359.80	6,815.0	2,321.1	92.2	2,322.4	0.00	0.00	0.00
9,000.0	90.00	359.80	6,815.0	2,421.1	91.8	2,422.4	0.00	0.00	0.00
9,100.0	90.00	359.80	6,815.0	2,521.1	91.5	2,522.4	0.00	0.00	0.00
9,200.0	90.00	359.80	6,815.0	2,621.1	91.1	2,622.3	0.00	0.00	0.00
9,300.0	90.00	359.80	6,815.0	2,721.1	90.8	2,722.3	0.00	0.00	0.00
9,400.0	90.00	359.80	6,815.0	2,821.1	90.4	2,822.3	0.00	0.00	0.00
9,500.0	90.00	359.80	6,815.0	2,921.1	90.1	2,922.3	0.00	0.00	0.00
9,600.0	90.00	359.80	6,815.0	3,021.1	89.7	3,022.2	0.00	0.00	0.00
9,700.0	90.00	359.80	6,815.0	3,121.1	89.4	3,122.2	0.00	0.00	0.00
9,800.0	90.00	359.80	6,815.0	3,221.1	89.0	3,222.2	0.00	0.00	0.00
9,900.0	90.00	359.80	6,815.0	3,321.1	88.7	3,322.2	0.00	0.00	0.00
10,000.0	90.00	359.80	6,815.0	3,421.1	88.3	3,422.2	0.00	0.00	0.00
10,100.0	90.00	359.80	6,815.0	3,521.1	88.0	3,522.1	0.00	0.00	0.00
10,200.0	90.00	359.80	6,815.0	3,621.1	87.6	3,622.1	0.00	0.00	0.00
10,300.0	90.00	359.80	6,815.0	3,721.1	87.3	3,722.1	0.00	0.00	0.00
10,400.0	90.00	359.80	6,815.0	3,821.1	86.9	3,822.1	0.00	0.00	0.00
10,500.0	90.00	359.80	6,815.0	3,921.1	86.6	3,922.0	0.00	0.00	0.00
10,600.0	90.00	359.80	6,815.0	4,021.1	86.2	4,022.0	0.00	0.00	0.00
10,700.0	90.00	359.80	6,815.0	4,121.1	85.9	4,122.0	0.00	0.00	0.00
10,800.0	90.00	359.80	6,815.0	4,221.1	85.5	4,222.0	0.00	0.00	0.00
10,900.0	90.00	359.80	6,815.0	4,321.1	85.2	4,321.9	0.00	0.00	0.00
11,000.0	90.00	359.80	6,815.0	4,421.1	84.8	4,421.9	0.00	0.00	0.00
11,100.0	90.00	359.80	6,815.0	4,521.1	84.5	4,521.9	0.00	0.00	0.00
11,200.0	90.00	359.80	6,815.0	4,621.1	84.2	4,621.9	0.00	0.00	0.00
TD @ 11235' MD									
11,235.0	90.00	359.80	6,815.0	4,656.1	84.0	4,656.8	0.00	0.00	0.00

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL Buckwheat 33 Fed	0.00	0.00	6,815.0	4,656.1	84.0	429,469.70	617,673.03	32° 10' 49.617 N	104° 5' 11.746 W
- plan hits target center									
- Point									

DDC

Well Planning Report

Database: EDM 5000.1 Single User Db
Company: COG Operating, LLC
Project: Eddy County, NM
Site: Sec 33, T24S, R28E
Well: Buckwheat 33 Federal #2H
Wellbore: Wellbore #1
Design: Design #1

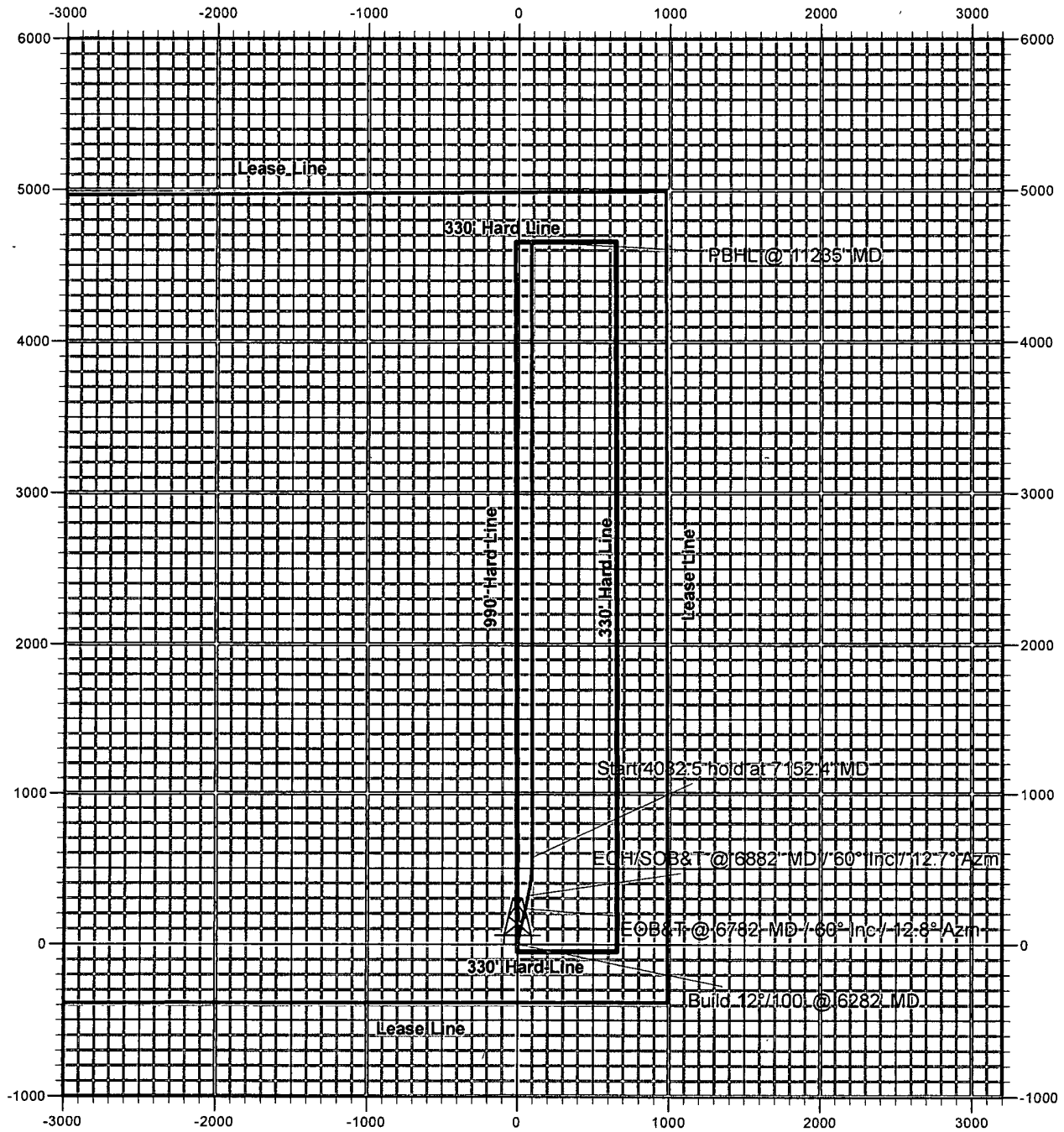
Local Co-ordinate Reference: Well Buckwheat 33 Federal #2H
TVD Reference: WELL @ 3019 0usft
MD Reference: WELL @ 3019 0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Plan Annotations

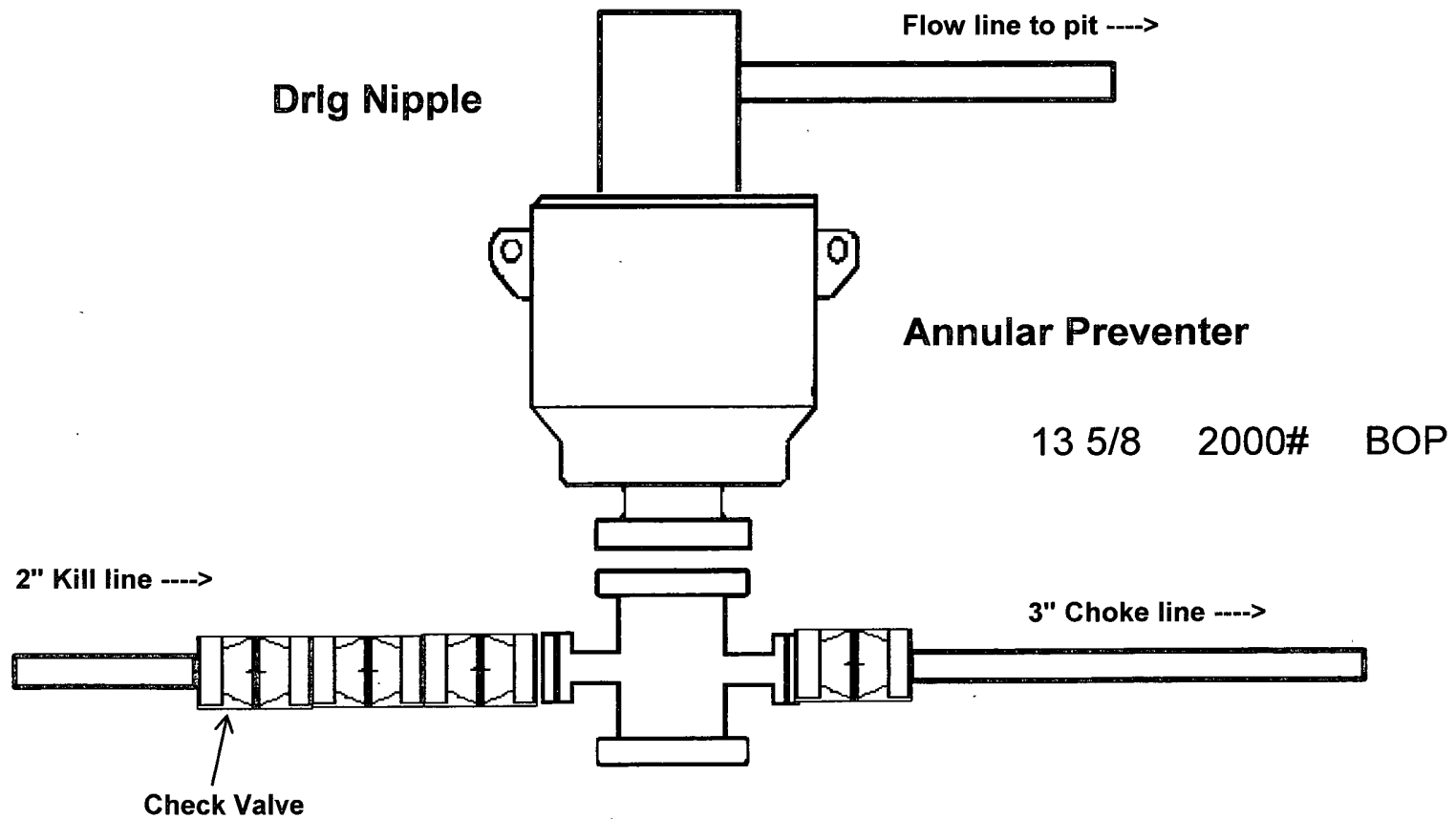
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,282.0	6,282.0	0.0	0.0	Build 12"/100' @ 6282' MD
6,782.0	6,695.5	232.8	52.9	EOB&T @ 6782' MD / 60° Inc / 12.8° Azm
6,882.0	6,745.5	317.3	72.1	EOH/SOB&T @ 6882' MD / 60° Inc / 12.7° Azm
7,152.4	6,815.0	573.6	98.3	Start 4082.5 hold at 7152.4' MD
11,235.0	6,815.0	4,656.1	84.0	TD @ 11235' MD

COG OPERATING, LLC.

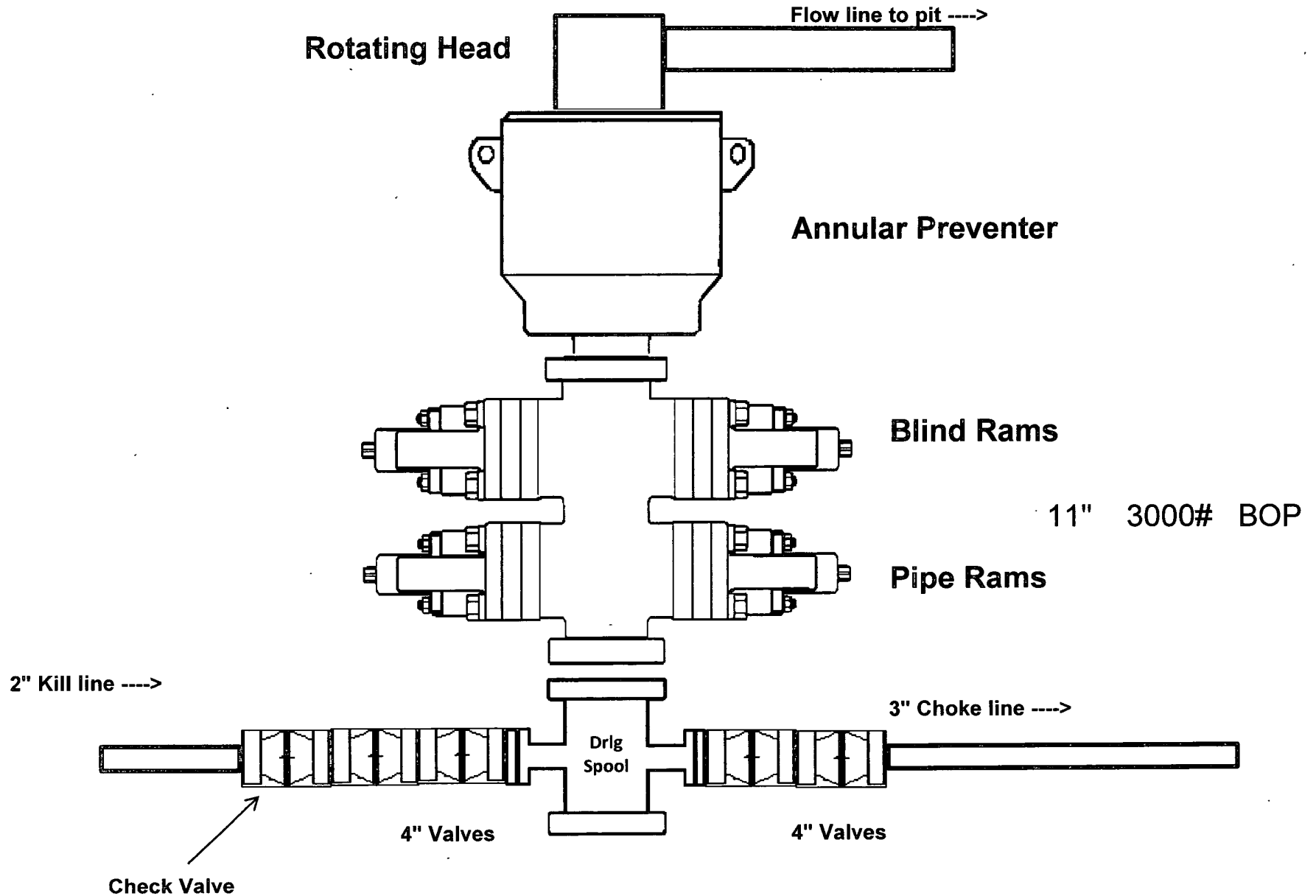
Eddy County, NM
Buckwheat 33 Federal #2H
Quote 110527



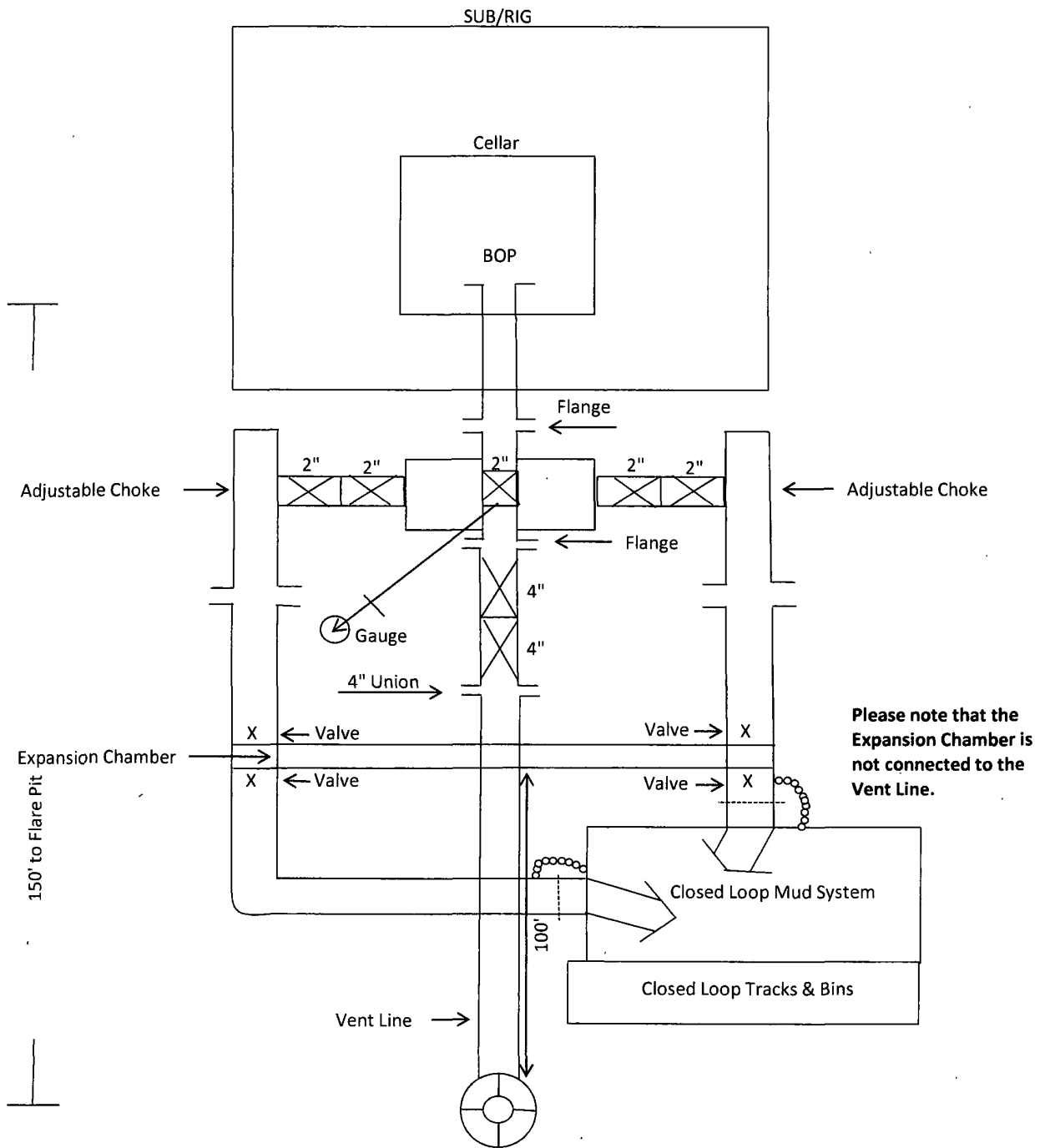
2,000 psi BOP Schematic



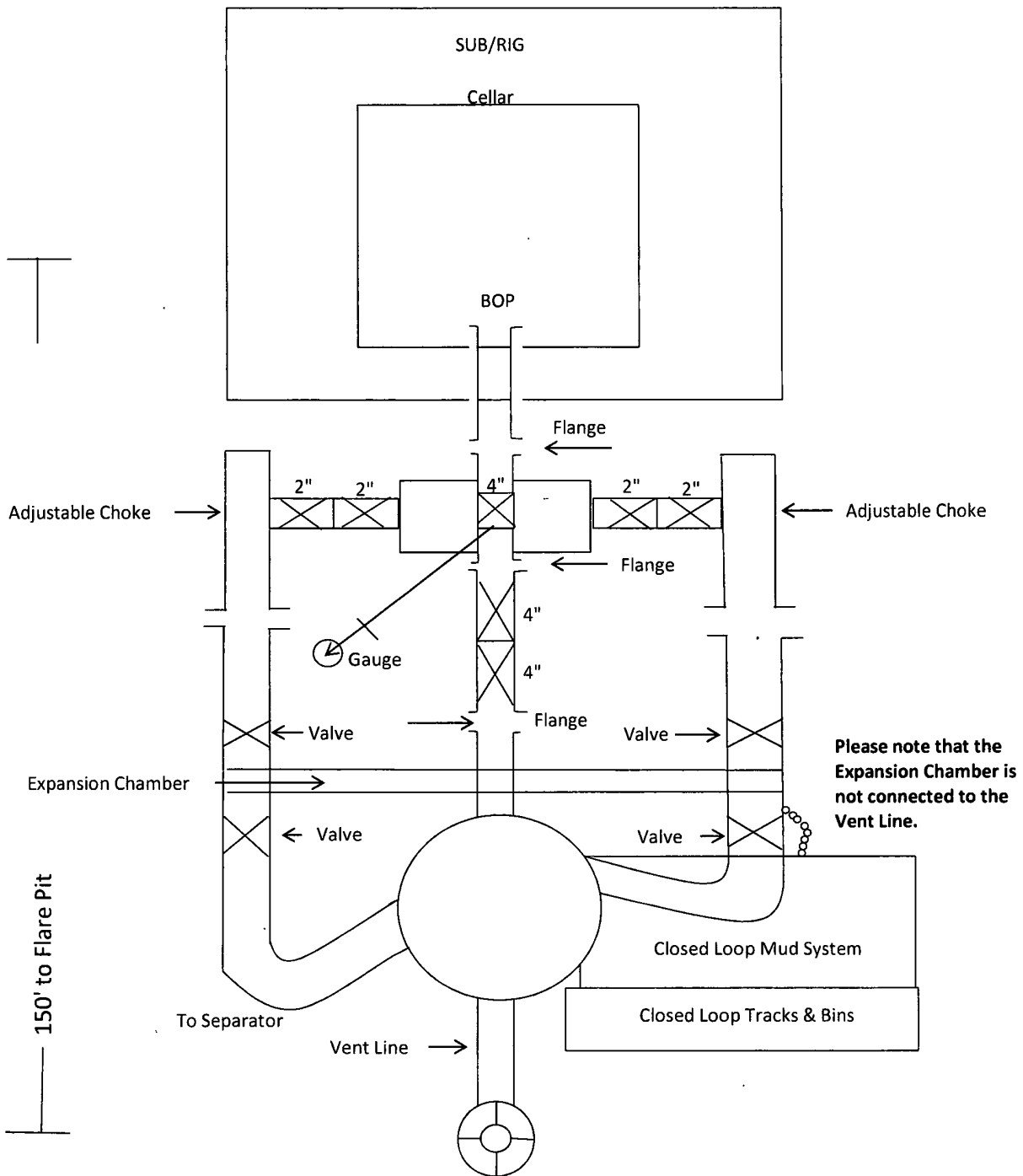
3,000 psi BOP Schematic



2M Choke Manifold Equipment



3M Choke Manifold Equipment



**Design Plan
Operating and Maintenance Plan
Closure Plan**

**Buckwheat 33 Federal #2H
SHL: 380' FSL & 990' FEL
BHL: 330' FNL & 990' FEL
Section 33 T24S R28E**

Eddy County, New Mexico

COG Operating LLC will be using all above ground steel pits for fluid and cuttings while drilling. If any tank develops a leak we will have immediate visual discovery, we would then transfer the fluid to another tank then remove any contaminated soil and dispose of it in the cuttings bins for transportation. All leaks should be kept to less than 5 barrels. Rig crews will monitor the tanks at all times.

Equipment List:

- 2- Mongoose Shale Shakers
- 1- 414 Centrifuge
- 1- 518 Centrifuge
- 2- Roll Off Bins w/ Tracks
- 2- 500 BBL Frac Tanks

During drilling operations all liquids, drilling fluids and cuttings will be hauled off via CRI (Controlled Recovery Inc.) Permit R-9166 or any other approved facility.

COG Operating LLC

Rig Plat & Closed Loop Equipment Diagram

Well pads will be 300' X 300'
with cellar in center of pad

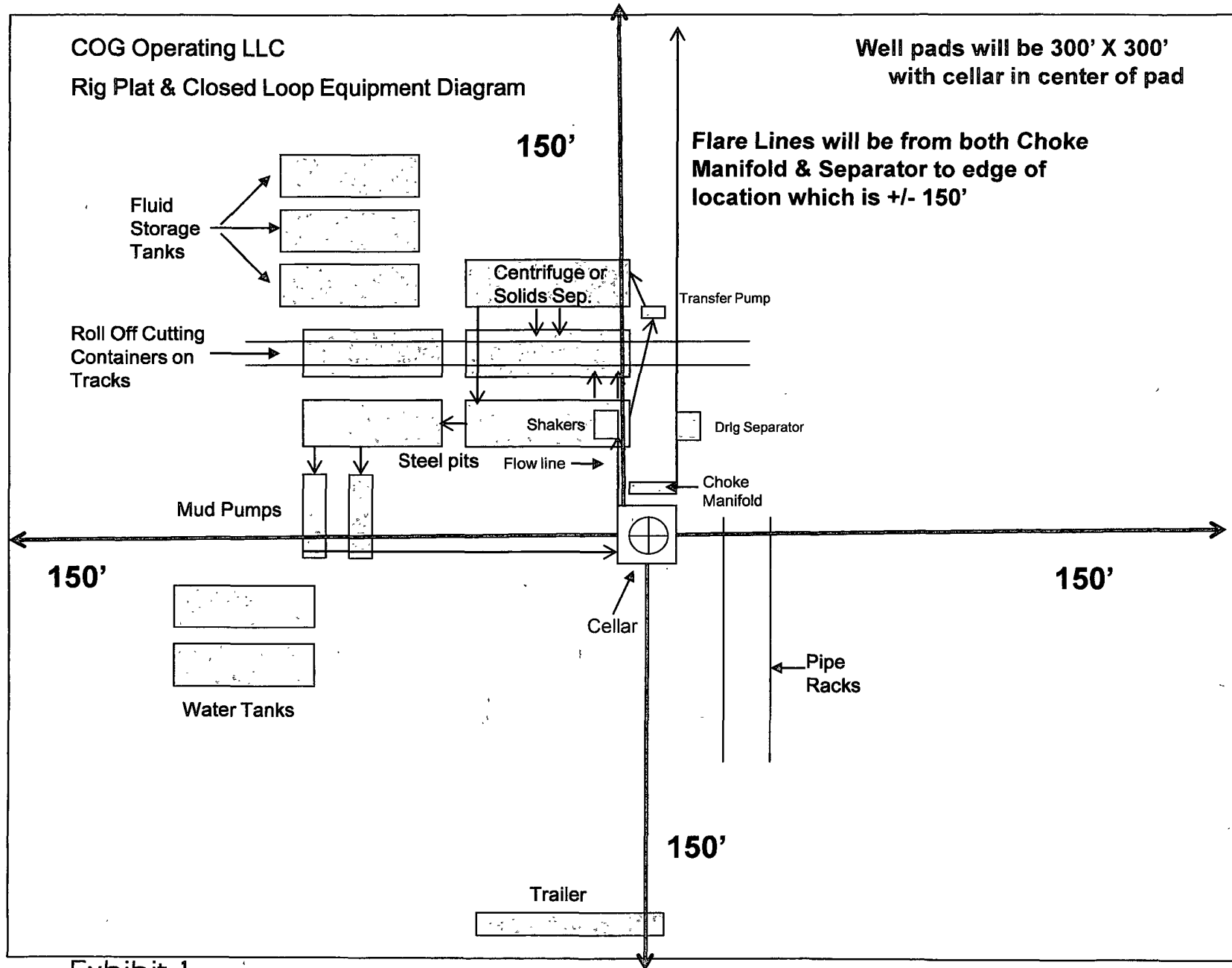


Exhibit 1

COG OPERATING LLC

HYDROGEN SULFIDE DRILLING OPERATIONS PLAN

I. HYDROGEN SULFIDE TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

- A. The hazards and characteristics of hydrogen sulfide (H₂S).
- B. The proper use and maintenance of personal protective equipment and life support systems.
- C. The proper use of H₂S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
- D. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

- A. The effects of H₂S on metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
- B. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
- C. The contents and requirements of the H₂S Drilling Operations Plan and the Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H₂S zone (within 3 days or 500 feet) and weekly H₂S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H₂S Drilling Operations Plan and the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

II. H₂S SAFETY EQUIPMENT AND SYSTEMS

Note: All H₂S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H₂S.

A. Well Control Equipment:

Flare line.

Choke manifold.

Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.

Auxiliary equipment to include: annular preventer, mud-gas separator, rotating head.

B. Protective equipment for essential personnel:

Mark II Surviveair 30-minute units located in the dog house and at briefing areas.

C. H₂S detection and monitoring equipment:

2 - portable H₂S monitor positioned on location for best coverage and response. These units have warning lights and audible sirens when H₂S levels of 20 ppm are reached.

D. Visual warning systems:

Caution/Danger signs shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.

E. Mud Program:

The mud program has been designed to minimize the volume of H₂S circulated to the surface.

F. Metallurgy:

All drill strings, casings, tubing, wellhead, blowout preventers, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H₂S service.

G. Communication:

Company vehicles equipped with cellular telephone.

COG Operating LLC has conducted a review to determine if an H₂S contingency plan is required for the above referenced well. We were able to conclude that any potential hazardous volume would be minimal. H₂S concentrations of wells in this area from surface to TD are low enough; therefore, we do not believe that an H₂S contingency plan is necessary.

W A R N I N G

**YOU ARE ENTERING AN H₂S AREA
AUTHORIZED PERSONNEL ONLY**

- 1. BEARDS OR CONTACT LENSES NOT ALLOWED**
- 2. HARD HATS REQUIRED**
- 3. SMOKING IN DESIGNATED AREAS ONLY**
- 4. BE WIND CONSCIOUS AT ALL TIMES**
- 5. CK WITH COG OPERATING LLC FOREMAN AT MAIN OFFICE**

COG OPERATING LLC

1-575-748-6940

EMERGENCY CALL LIST

	<u>OFFICE</u>	<u>MOBILE</u>	<u>HOME</u>
COG OPERATING LLC OFFICE	575-748-6940		
SHERYL BAKER	575-748-6940	432-934-1873	575-748-2396
RON BEASLEY	575-746-2010	432-254-9883	
SETH WILD	575-748-6940	432-528-3633	
DEAN CHUMBLEY	575-748-3303	575-748-5988	575-748-2426

EMERGENCY RESPONSE NUMBERS

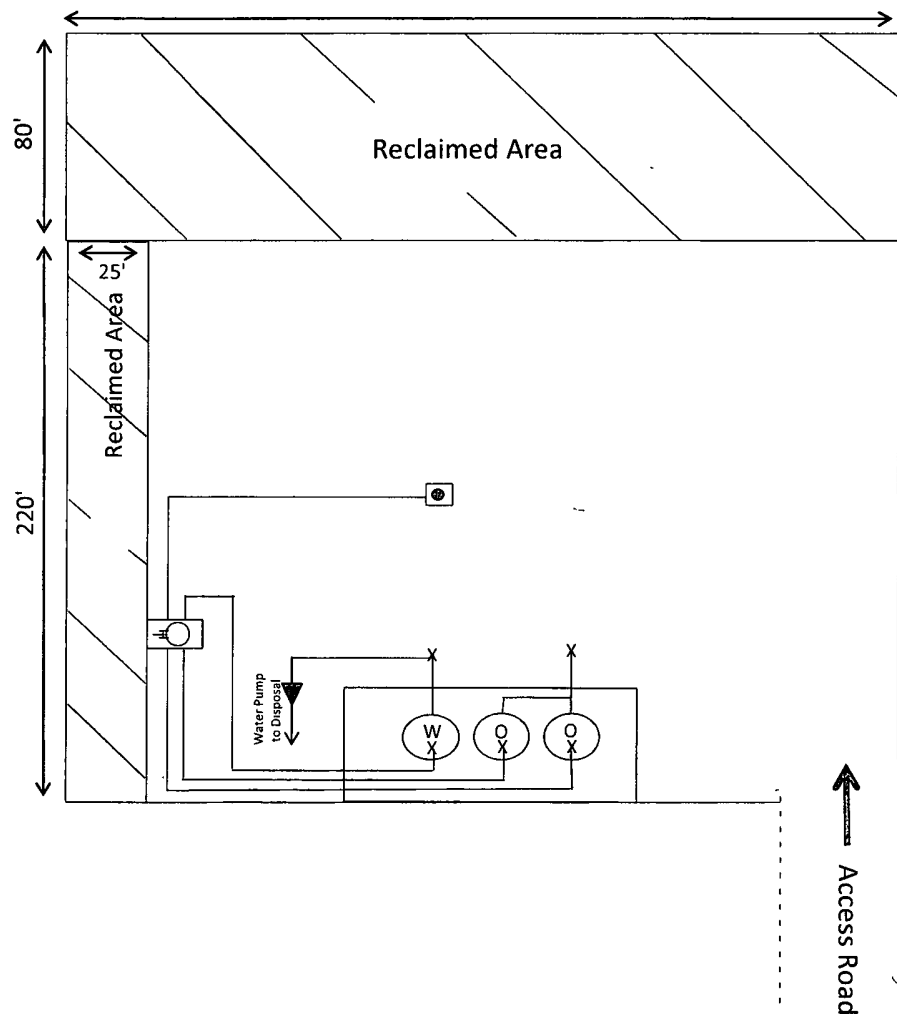
	<u>OFFICE</u>
STATE POLICE	575-748-9718
EDDY COUNTY SHERIFF	575-746-2701
EMERGENCY MEDICAL SERVICES (AMBULANCE)	911 or 575-746-2701
EDDY COUNTY EMERGENCY MANAGEMENT (HARRY BURGESS)	575-887-9511
STATE EMERGENCY RESPONSE CENTER (SERC)	575-476-9620
CARLSBAD POLICE DEPARTMENT	575-885-2111
CARLSBAD FIRE DEPARTMENT	575-885-3125
NEW MEXICO OIL CONSERVATION DIVISION	575-748-1283
INDIAN FIRE & SAFETY	800-530-8693
HALLIBURTON SERVICES	800-844-8451



COG Operating LLC
2208 West Main
Artesia, NM 88210

Production Facility Layout

Buckwheat 33 Federal #2H



North

Scale

1" = 5' x 5'

Legend

- ⊙ = 500 BBL Steel Oil Tank
- ⊕ = 500 BBL Steel Water Tank
- ⊞ = 6' x 20' Heater

COG OPERATING LLC
MULTI-POINT SURFACE USE AND OPERATIONS PLAN

Buckwheat 33 Federal #2H
SHL: 380' FSL & 990' FEL
BHL: 330' FNL & 990' FEL
Section 33 T24S R28E

Eddy County, New Mexico

This plan is submitted with Form 3160-3, Application for Permit to Drill, covering the above described well. The purpose of this plan is to describe the location of the proposed well, the proposed construction activities and operations plan, the magnitude of the surface disturbance involved and the procedures to be followed in rehabilitating the surface after completion of the operations, so that a complete appraisal can be made of the environmental effect associated with the operations.

1. EXISTING ROADS:

- a. The well site and elevation plat for the proposed well are reflected on the well site layout; Form C-102. The well was staked by John West Surveying Company.
- b. Exhibit 2 is a portion of a topo map showing the well and roads in the vicinity of the proposed location. The proposed wellsite and the access route to the location are indicated in red on Exhibit 2. Right of way using this proposed route is being requested if necessary.
- c. Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue on this lease.

DIRECTIONS:

From US. Hwy 285 and CR 721 (Pulley Rd.) Go south on Hwy 285 3.0 miles, turn right on caliche lease road and go west 390', turn right and go northwest 1.3 miles, turn left and follow lease road west, then south, then west a total of 0.2 miles, and follow proposed road survey north 268' to the southeast proposed pad corner for this location.

PLANNED ACCESS ROAD:

COG will be using a proposed access road of 268' coming in from the west side of the pad.

2. LOCATION OF EXISTING AND/OR PROPOSED FACILITIES:

- A. In the event the well is found productive, the Buckwheat 33 Federal #2H tank battery would be utilized and the necessary production equipment will be installed at the well site. See Exhibit #3.
- B. All flowlines will adhere to API standards

- C. If electricity is needed, power will be obtained from Central Valley Electric. Central Valley Electric will apply for ROW for their power lines.
- D. If the well is productive, rehabilitation plans are as follows:
 - i. The original topsoil from the well site will be returned to the location. The drill site will then be contoured as close as possible to the original state.

3. LOCATION AND TYPES OF WATER SUPPLY:

This location will be drilled using a combination of water mud systems (outlined in the Drilling Program). The water will be obtained from commercial water stations in the area and hauled to location by transport truck using the existing and proposed roads shown in Exhibit #2. On occasion, water will be obtained from a pre-existing water well, running a pump directly to the drill rig. In these cases where a poly pipeline is used to transport water for drilling purposes, the existing and proposed road shown in Exhibit "2" will be utilized.

5. CONSTRUCTION MATERIALS:

All Caliche utilized for the drilling pad and proposed access road will be obtained from an existing BLM approved pit or from prevailing deposits found under the location. All roads will be constructed of 6" rolled and compacted caliche. Will use BLM recommended use of extra caliche from other locations close by for roads, if available.

6. METHODS OF HANDLING WASTE MATERIAL:

- a. All trash, junk and other waste material will be removed from the wellsite within 30 days after finishing drilling and/or completion operations. All waste material will be contained in trash cages or trash bins to prevent scattering. When the job is completed, all contents will be removed and disposed of in an approved sanitary landfill.
- b. The supplier, including broken sacks, will pick up slats remaining after completion of well.
- c. A porto-john will be provided for the rig crews. This equipment will be properly maintained during the drilling and completion operations and will be removed when all operations are complete.
- d. Disposal of fluids to be transported by an approved disposal company.

6. ANCILLARY FACILITIES:

No campsite or other facilities will be constructed as a result of this well.

7. WELLSITE LAYOUT:

- a. Exhibit 1 shows the proposed well site layout with dimensions of the pad layout.
- b. This exhibit indicates proposed location of reserve and sump pits if utilized and living facilities.
- c. Mud pits in the active circulating system will be steel pits and a closed loop system will be utilized.

8. PLANS FOR SURFACE RECLAMATION:

- a. After finishing drilling and/or completion operations, if the well is found non-commercial, the caliche will be removed from the pad and transported to the original caliche pit or used for other drilling locations. The road will be reclaimed as directed by the BLM. The original top soil will again be returned to the pad and contoured, as close as possible, to the original state.
- b. The location and road will be rehabilitated as recommended by the BLM.
- c. Caliche from areas of the pad site not required for operations will be reclaimed. The original top soil will be returned to the area of the drill pad not necessary to operate the well. These unused areas of the drill pad will be contoured, as close as possible, to match the original topography.

9. SURFACE OWNERSHIP:

The surface is private owned and a Surface use Agreement was previously signed by Bruce D. Pardue on July 18th, 2007

10. OTHER INFORMATION:

- a. The area surrounding the well site is grassland. The vegetation is moderately sparse with native prairie grass and mesquite bushes. No wildlife was observed but it is likely that deer, rabbits, coyotes, and rodents traverse the area.
- b. There is no permanent or live water in the general proximity of the location.
- c. If the well is deemed commercially productive, caliche from areas of the pad site not required for operations will be reclaimed. The original top soil will be returned to the area of the drill pad not necessary to operate the well. These unused areas of the drill pad will be contoured, as close as possible, to match the original topography. Reserve pit will not be used on this location therefore no reclamation is needed.
- d. Topsoil will be stockpiled on the WEST SIDE of the location until it is needed for interim reclamation described in paragraph above.

11. OPERATOR'S REPRESENTATIVE:

A. Through A.P.D. Approval:
Rand French, Regulatory Supervisor
COG Operating LLC
Artesia, NM 88210
Phone (575)748-6940
Cell (432) 254-5556

B. Through Drilling Operations
Sheryl Baker, Drilling Supervisor
COG Operating LLC
Artesia, NM 88210
Phone (575)748-6940
Cell (432)934-7873

STATEMENT ACCEPTING RESPONSIBILITY FOR OPERATIONS

The undersigned accepts all applicable terms, conditions, stipulations, and restrictions concerning operations conducted on the leased land or portion thereof, as described below:

Date: November 9, 2011
Lease #: NMNM115411
Buckwheat 33 Federal #2H

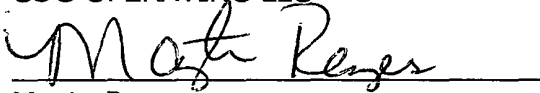
Legal Description: Sec. 33– T24S – R28E
Eddy County, New Mexico

Formation(s): Bone Springs

Bond Coverage: Statewide

BLM Bond File #: NMB000740

COG OPERATING LLC

A handwritten signature in black ink, appearing to read "Mayte Reyes", is written over a horizontal line.

Mayte Reyes
Regulatory Analyst

PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating LLC
LEASE NO.:	NMNM115411
WELL NAME & NO.:	Buckwheat 33 Federal 2H
SURFACE HOLE FOOTAGE:	380' FSL & 990' FEL
BOTTOM HOLE FOOTAGE:	330' FNL & 990' FEL
LOCATION:	Section 33, T. 24 S., R. 28 E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
 - Cave/karst
- ☐ **Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- ☐ **Road Section Diagram**
- ☒ **Drilling**
 - Critical Cave/Karst
 - Logging requirement
 - Waste Material and Fluids
- ☐ **Production (Post Drilling)**
 - Well Structures & Facilities
 - Pipelines
 - Electric Lines
- ☒ **Interim Reclamation**
- ☒ **Final Abandonment & Reclamation**

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Cave and Karst

** Depending on location, additional Drilling, Casing, and Cementing procedures may be required by engineering to protect critical karst groundwater recharge areas.

Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production.

Construction:

In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

No Blasting:

No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

Tank Battery Liners and Berms:

Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

Leak Detection System:

A method of detecting leaks is required. The method could incorporate gauges to measure loss, siting valves and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

Automatic Shut-off Systems:

Automatic shut off, check valves, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and ground water concerns:

Rotary Drilling with Fresh Water:

Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

Directional Drilling:

Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

Lost Circulation:

ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

Abandonment Cementing:

Upon well abandonment in high cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

Pressure Testing:

Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5972 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall stockpile the topsoil in a low profile manner in order to prevent wind/water erosion of the topsoil. The topsoil to be stripped is approximately 4 inches in depth. The topsoil will be used for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.

The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. ON LEASE ACCESS ROADS

Road Width

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty (20) feet.

Surfacing

Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

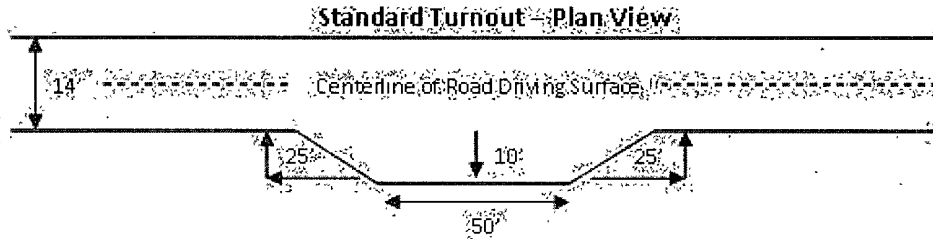
The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning

Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Turnouts

Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:

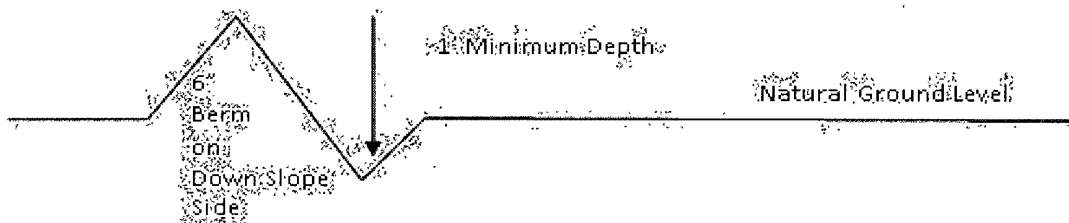


Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$400 \text{ foot road with } 4\% \text{ road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

Culvert Installations

Appropriately sized culvert(s) shall be installed at the deep waterway channel flow crossing.

Cattleguards

An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations.

A gate shall be constructed and fastened securely to H-braces.

Fence Requirement

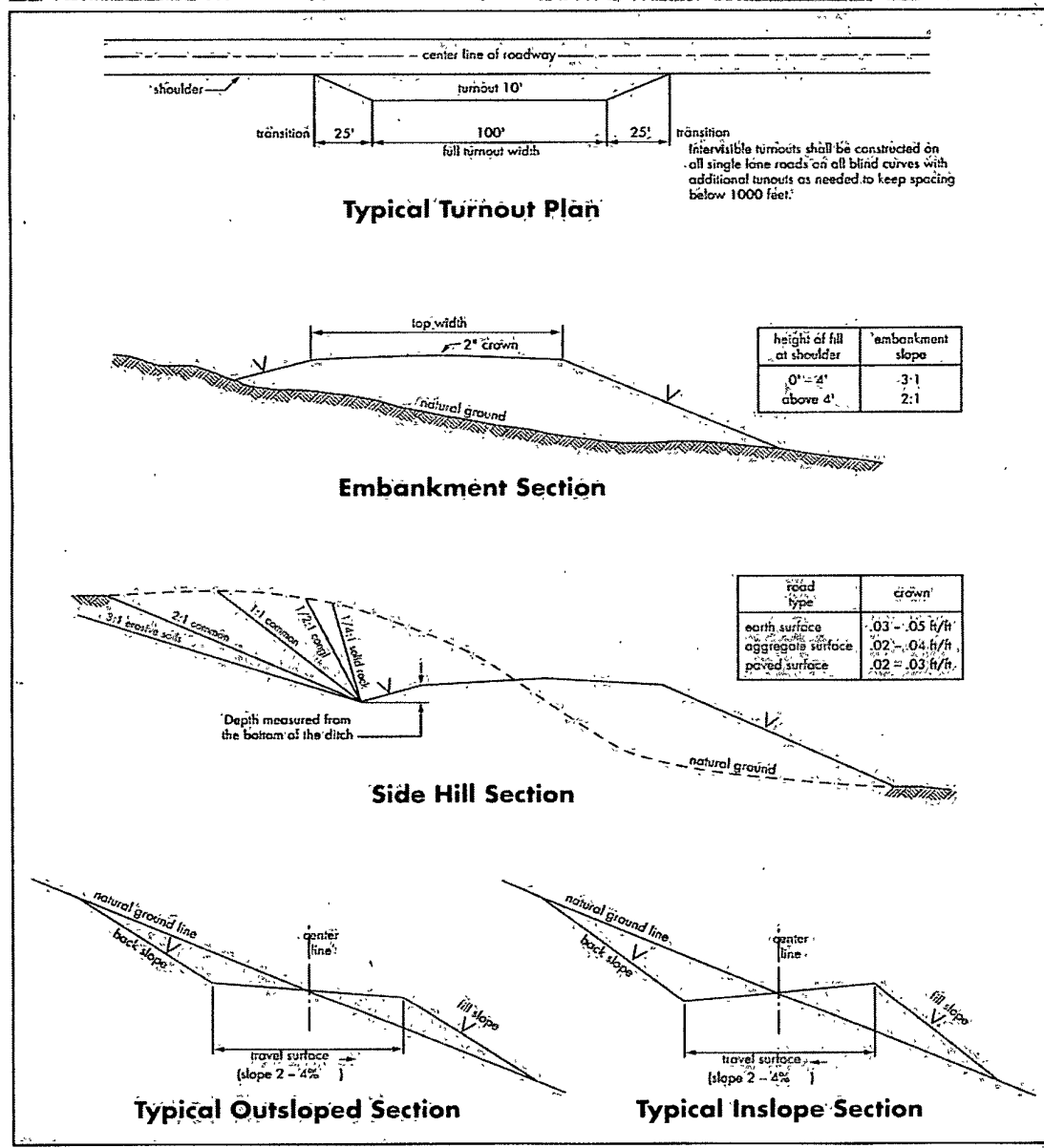
Where entry is required across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting.

The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Figure.1 – Cross Sections and Plans For Typical Road Sections



VII. DRILLING

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
- b. Setting and/or Cementing of all casing strings
- c. BOPE tests

☒ **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 is 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.

CRITICAL CAVE/KARST – A MINIMUM OF THREE CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN CRITICAL CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH THEREFORE, ONE INCH OPERATIONS WILL NOT BE PERMITTED. CONTACT BLM WITH MODIFICATIONS TO CEMENT PROGRAM AS NEEDED.

Possible lost circulation in the Redbeds and the Castile group.

1. The **13-3/8** inch surface casing shall be set at approximately **400** feet (in a competent bed and above the salt) and cemented to the surface.
 - 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 **9-5/8** inch intermediate casing 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 or potash.

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 to surface. If cement does not circulate, contact the appropriate BLM office.

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** inch 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, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- 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 results of the test shall be reported to the appropriate BLM office.
- d. 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.**
- e. 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.

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.

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VIII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Containment Structures

The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

Painting Requirement

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color Shale Green, Munsell Soil Color Chart # 5Y 4/2

B. PIPELINES (not applied for in APD)

C. ELECTRIC LINES (not applied for in APD)

IX. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

X. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Seed Mixture 1, for Loamy Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (small/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species

	<u>lb/acre</u>
Plains lovegrass (<i>Eragrostis intermedia</i>)	0.5
Sand dropseed (<i>Sporobolus cryptandrus</i>)	1.0
Sideoats grama (<i>Bouteloua curtipendula</i>)	5.0
Plains bristlegrass (<i>Setaria macrostachya</i>)	2.0

*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed