

Form 3160-3
(April 2004)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

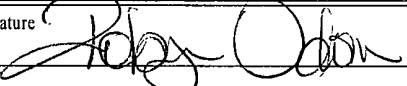
FORM APPROVED
OMB No. 1004-0137
Expires March 31, 2007

1a. Type of work: ☒ DRILL ☐ REENTER		5 Lease Serial No. NMNM-118710
1b Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☐ Single Zone ☐ Multiple Zone		6 If Indian, Allottee or Tribe Name N/A
2. Name of Operator COG Operating LLC (229137)		7 If Unit or CA Agreement, Name and No N/A
3a. Address 550 W. Texas, Suite 1300 Midland TX 79701		8 Lease Name and Well No High Lonesome 24 Federal #2 17 (38722)
3b Phone No. (include area code) (432) 685-4385		9 API Well No. 30-015- 39228 (97840)
4 Location of Well (Report location clearly and in accordance with any State requirements *) At surface SHL: 1980' FSL & 330' FWL, UL L At proposed prod. zone BHL: 1980' FSL & 330' FEL, UL I		10. Field and Pool, or Exploratory WILDCAT G-04-5162928A; WOLF CANYON
14 Distance in miles and direction from nearest town or post office* 2.5 miles north of Loco Hills, NM		11 Sec, T R M. or Blk. and Survey or Area Sec 24, T16S, R29E
15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drg. unit line, if any) 330'	16 No. of acres in lease 1560	12 County or Parish Eddy
17 Spacing Unit dedicated to this well 160	18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft 790'	13. State NM
19 Proposed Depth TYD 7,375'; MD 11,789' PH: 7620'	20 BLM/BIA Bond No. on file NMB000215 4 740 SA	
21 Elevations (Show whether DF, KDB, RT, GL, etc) 3712' GL	22 Approximate date work will start* 07/31/2011	23 Estimated duration 10 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 	Name (Printed/Typed) Robyn M. Odom	Date 04/21/2011
Title Regulatory Analyst		

Approved by (Signature) /s/ Don Peterson	Name (Printed/Typed) /s/ Don Peterson	Date JUN 23 2011
Title FOR 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

*(Instructions on page 2)

ROSWELL CONTROLLED WATER BASIN**SEE ATTACHED FOR
CONDITIONS OF APPROVAL****APPROVAL SUBJECT TO
GENERAL REQUIREMENTS
AND SPECIAL STIPULATIONS
ATTACHED**

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
High Lonesome 24 Federal #2
SHL: 1980' FSL & 330' FWL, Unit L
BHL: 1980' FSL & 330' FEL, Unit I
Sec 24, T16S, R29E
Eddy County, NM

1. Proration Unit Spacing: 160 Acres
2. Ground Elevation: 3712'
3. Proposed Depths: Pilot hole TD = 7620', Horizontal TVD = 7375', MD = 11789'
4. Estimated tops of geological markers:

Quaternary	Surface
Rustler	350'
Yates	1060'
Seven Rivers	1390'
Queen	1850'
Grayburg	2330'
San Andres	2610'
Glorietta	4095'
Paddock	4150'
Blinberry	4390'
Tubb	5360'
Drinkard	5500'
Abo	6050'
Lower Abo/Wolfcamp	7350'

5. Possible mineral bearing formations:

Water Sand	150'	Fresh Water
Yates	1060'	Oil / Gas
Queen	1850'	Oil / Gas
San Andres	2610'	Oil / Gas
Tubb	5360'	Oil / Gas
Abo	6050'	Oil / Gas
Lower Abo/Wolfcamp	7350'	Oil / Gas

6. Casing Program - Proposed

<u>Hole size</u>	<u>Interval</u>	<u>OD of Casing</u>	<u>Weight</u>	<u>Cond.</u>	<u>Collar</u>	<u>Grade</u>
17-1/2"	0' - +/-400'	13-3/8"	48#	New	STC	<u>H-40 or J/K-55</u>
Collapse sf - 2.98, Burst sf - 2.33, Tension sf - 13.42						
12 1/4"	0' - +/-2650'	9-5/8"	40#	New	STC	<u>J/K-55</u>
Collapse sf - 2.86, Burst sf - 1.42, Tension sf - 7.22						
8-3/4"	<u>0' - +/-6700'</u>	<u>7"</u>	<u>26#</u>	New	LTC	<u>P-110</u>
<u>Collapse sf - 2.18, Burst sf - 1.53, Tension sf - 4.37</u>						
<u>6-1/8"</u>	<u>6600' - 11789'</u>	<u>4-1/2"</u>	<u>11.6#</u>	New	<u>LTC</u>	<u>P-110</u>
<u>Collapse sf - 2.47, Burst sf - 1.64, Tension sf - 4.48</u>						

Respectfully request permission for 100' liner overlap to set pump as deep as possible.

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
High Lonesome 24 Federal #2
Page 2 of 3

7. Cement Program

13 3/8" Surf. Csg. Set at +/- 400', Lead: 200sx Class "C" w/ 2% CaCl₂ & 4% gel, 1.74 yd.
Tail: 200sx Class "C" w/ 2% CaCl₂, 1.35 yd. 122% excess, calculated to surface.

9 5/8" Intrmd. Csg. Set at +/- 2650'. Lead: 600sx 35:65:6 C:Poz:gel w/ 5pps LCM-1 0.2% sodium metasilicate, 0.3% FL5ZA, 5% NaCl, 2.05 yd. Tail: 200sx Class "C" w/ 2% CaCl₂, 1.35 yd. 102% excess, calculated to surface.

7" Production Casing set at +/- 6700' MD, Lead: 800 sx Class "C" w/ 4% gel & 2% CaCl₂, 1.72 yd. Tail: 200sx Class "C" w/ 2% CaCl₂, 0.35% R-3, 1.33 yd. 100% excess in open hole, calculated to surface.

6-1/8" Pilot hole 6700' to 7620' plugged back completely with 260 sx Class "C" with 0.3% R-3, 1.5% CD-32, 0.99 yd. 38% excess calculated to bottom of 7" at 6700'.

4 1/2" Production Liner set from +/- 6600' to +/- 11789' MD, 7375' TVD, Liner run with +/- 8 isolation Packers and Sliding sleeves in un-cemented Lateral.

8. Pressure Control Equipment:

See
COA

After setting 13 3/8" casing and installing 3000 psi casing head, NU 13 5/8" 3000 psi annular BOP. Test annular BOP, casing and manifold with clear fluid to **1000** psi. After setting 9 5/8" casing and installing 3000 psi casing spool, NU 3000 psi double ram BOP and 3000 psi annular BOP. Test double ram BOP and manifold to 3000# with clear fluid and annular to 1500 psi using an independent tester, this equipment will be used continuously until TD is reached. Blind rams will be operationally checked on each trip out of hole. Pipe rams will be operationally checked each 24 hour period. These checks will be noted on daily tour sheets. Other accessories to the BOP equipment include a Kelly cock and floor safety valves, choke lines and choke manifold with 3000 psi WP rating.

9. Proposed Mud Circulating System

Interval	Mud Wt.	Visc.	FL	Type Mud System
0' - 400'	8.5	28	NC	Fresh water native mud w/ paper for seepage and sweeps. Lime for PH.
400' - 2650'	9.1	30	NC	Cut brine mud, lime for PH and paper for seepage and sweeps.
2650' - 6700'	9.1	29	NC	Drill section with fresh water/cut brine circulating the reserve utilizing periodic sweeps of paper as needed for seepage control and solids removal.
6600' - 11789'	9.5	36	10	Drill pilot hole, curve and horizontal section with XCD polymer / cut brine / starch.

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept at the well site at all times.

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
High Lonesome 24 Federal #2
Page 3 of 3

10. Production Hole Drilling Summary:

Set 7" production casing at +/- 6700'. Drill 6-1/8" pilot hole thru Lower Abo/Wolfcamp to +/- 7600', run open hole logs. Spot +/-250 sx. "C" Kick off plug from +/- 7600' to +/-6750'. Drill 6-1/8" hole and kick off at +/- 6942', building curve over +/- 450' to horizontal at 7420' TVD. Drill horizontal section in a Easterly direction for +/-4618' lateral to TD at +/-11833' MD, 7420' TVD. Run 4-1/2" production liner in Open hole lateral and set isolation packers and liner top packer @ +/- 6600' MD.

11789

11. Auxiliary Well Control and Monitoring Equipment

- A. Kelly cock will be kept in the drill string at all times.
- B. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

12. Logging, Testing and Coring Program:

See COA

- A. The electric logging program will consist of GR-Dual Laterolog, Spectral Density, Dual Spaced Neutron, CSNG Log and will be ran from T.D. in vertical pilot hole to 9 5/8" casing shoe.
- B. The mud logging program will consist of lagged 10' samples from intermediate casing point to T.D. in vertical pilot hole and from Kick off point to TD in Horizontal hole.
- C. Drill Stem test is not anticipated.
- D. No conventional coring is anticipated.
- E. Further testing procedures will be determined after the 4 1/2" production casing has been cemented at TD based on drill shows and log evaluation.

13. Abnormal Conditions, Pressures, Temperatures and Potential Hazards:

No abnormal pressures or temperatures are anticipated. The estimated bottom hole at TD is 120 degrees and estimated maximum bottom hole pressure is 3160 psig. Low levels of Hydrogen sulfide have been monitored in producing wells in the area, so H2S may be present while drilling of the well. An H2S plan is attached to the Drilling Program. No major loss of circulation zones has been reported in offsetting wells.

14. Anticipated Starting Date

Drilling operations will commence approximately on April 30, 2011 with drilling and completion operations lasting approximately 90 days.



COG Operating LLC

Eddy County(NAD83)
High Lonesome 24 Fed
#2H
OH

Plan: Design #1

Pathfinder X & Y Planning Report

13 April, 2011

PATHFINDER[®]
A Schlumberger Company



Pathfinder
Pathfinder X & Y Planning Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site High Lonesome 24 Fed
Project:	Eddy County(NAD83)	TVD Reference:	WELL @ 3730 00usft (Original Well Elev)
Site:	High Lonesome 24 Fed	MD Reference:	WELL @ 3730 00usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	EDM 5000.1 Single User Db

Project		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		High Lonesome 24 Fed									
Site Position:		Northing:		693,213 279 usft		Latitude:		32° 54' 19 100 N			
From:		Map		Easting:		632,669 743 usft		Longitude:		104° 2' 8 669 W	
Position Uncertainty:		0 00 usft		Slot Radius:		13-3/16 "		Grid Convergence:		0 16 °	

Well		#2H				
Well Position	+N/-S	0.00 usft	Northing:	693,213 279 usft	Latitude:	32° 54' 19 100 N
	+E/-W	0.00 usft	Easting:	632,669.743 usft	Longitude:	104° 2' 8 669 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,712 00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	02/09/11	7 88	60 77	49,042

Design:		Design #1		
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0 00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0 00	0 00	0 00	90 04

Survey Tool Program		Date 04/13/11		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	11,788 45	Design #1 (OH)	MWD	MWD - Standard



Pathfinder
Pathfinder X & Y Planning Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site High Lonesome 24 Fed
Project:	Eddy County(NAD83)	TVD Reference:	WELL @ 3730 00usft (Original Well Elev)
Site:	High Lonesome 24 Fed	MD Reference:	WELL @ 3730 00usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	EDM 5000.1 Single User Db

Planned Survey:												
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	3,730.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
100.00	0.00	0.00	100.00	3,630.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
200.00	0.00	0.00	200.00	3,530.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
300.00	0.00	0.00	300.00	3,430.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
400.00	0.00	0.00	400.00	3,330.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
500.00	0.00	0.00	500.00	3,230.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
600.00	0.00	0.00	600.00	3,130.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
700.00	0.00	0.00	700.00	3,030.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
800.00	0.00	0.00	800.00	2,930.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
900.00	0.00	0.00	900.00	2,830.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
1,000.00	0.00	0.00	1,000.00	2,730.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
1,100.00	0.00	0.00	1,100.00	2,630.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
1,200.00	0.00	0.00	1,200.00	2,530.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
1,300.00	0.00	0.00	1,300.00	2,430.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
1,400.00	0.00	0.00	1,400.00	2,330.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
1,500.00	0.00	0.00	1,500.00	2,230.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
1,600.00	0.00	0.00	1,600.00	2,130.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
1,700.00	0.00	0.00	1,700.00	2,030.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
1,800.00	0.00	0.00	1,800.00	1,930.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
1,900.00	0.00	0.00	1,900.00	1,830.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
2,000.00	0.00	0.00	2,000.00	1,730.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
2,100.00	0.00	0.00	2,100.00	1,630.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
2,200.00	0.00	0.00	2,200.00	1,530.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
2,300.00	0.00	0.00	2,300.00	1,430.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
2,400.00	0.00	0.00	2,400.00	1,330.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
2,500.00	0.00	0.00	2,500.00	1,230.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		
2,600.00	0.00	0.00	2,600.00	1,130.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74		



Pathfinder
Pathfinder X & Y Planning Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site High Lonesome 24 Fed
Project:	Eddy County(NAD83)	TVD Reference:	WELL @ 3730 00usft (Original Well Elev)
Site:	High Lonesome 24 Fed	MD Reference:	WELL @ 3730 00usft (Original Well Elev)
Well:	#2H	North Reference:	Grd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	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	1,030.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
2,800.00	0.00	0.00	2,800.00	930.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
2,900.00	0.00	0.00	2,900.00	830.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
3,000.00	0.00	0.00	3,000.00	730.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
3,100.00	0.00	0.00	3,100.00	630.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
3,200.00	0.00	0.00	3,200.00	530.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
3,300.00	0.00	0.00	3,300.00	430.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
3,400.00	0.00	0.00	3,400.00	330.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
3,500.00	0.00	0.00	3,500.00	230.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
3,600.00	0.00	0.00	3,600.00	130.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
3,700.00	0.00	0.00	3,700.00	30.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
3,800.00	0.00	0.00	3,800.00	-70.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
3,900.00	0.00	0.00	3,900.00	-170.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
4,000.00	0.00	0.00	4,000.00	-270.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
4,100.00	0.00	0.00	4,100.00	-370.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
4,200.00	0.00	0.00	4,200.00	-470.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
4,300.00	0.00	0.00	4,300.00	-570.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
4,400.00	0.00	0.00	4,400.00	-670.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
4,500.00	0.00	0.00	4,500.00	-770.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
4,600.00	0.00	0.00	4,600.00	-870.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
4,700.00	0.00	0.00	4,700.00	-970.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
4,800.00	0.00	0.00	4,800.00	-1,070.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
4,900.00	0.00	0.00	4,900.00	-1,170.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
5,000.00	0.00	0.00	5,000.00	-1,270.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
5,100.00	0.00	0.00	5,100.00	-1,370.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
5,200.00	0.00	0.00	5,200.00	-1,470.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	
5,300.00	0.00	0.00	5,300.00	-1,570.00	0.00	0.00	0.00	0.00	693,213.28	632,669.74	



Pathfinder
Pathfinder X & Y Planning Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site High Lonesome 24 Fed
Project:	Eddy County(NAD83)	TVD Reference:	WELL @ 3730.00usft (Original Well Elev)
Site:	High Lonesome 24 Fed	MD Reference:	WELL @ 3730 00usft (Original Well Elev)
Well:	#2H	North Reference:	Grnd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	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)	
5,400.00	0 00	0 00	5,400.00	-1,670 00	0 00	0.00	0 00	0 00	693,213.28	632,669.74	
5,500 00	0 00	0 00	5,500 00	-1,770 00	0 00	0 00	0 00	0.00	693,213.28	632,669.74	
5,600 00	0.00	0.00	5,600 00	-1,870.00	0.00	0 00	0 00	0 00	693,213.28	632,669.74	
5,700.00	0 00	0 00	5,700 00	-1,970 00	0 00	0 00	0 00	0.00	693,213.28	632,669.74	
5,800 00	0.00	0.00	5,800 00	-2,070.00	0.00	0 00	0.00	0 00	693,213.28	632,669.74	
5,900 00	0.00	0.00	5,900.00	-2,170 00	0 00	0.00	0 00	0 00	693,213.28	632,669.74	
6,000.00	0 00	0 00	6,000 00	-2,270 00	0 00	0.00	0 00	0.00	693,213.28	632,669.74	
6,100 00	0.00	0 00	6,100 00	-2,370 00	0 00	0.00	0 00	0.00	693,213.28	632,669.74	
6,200.00	0.00	0.00	6,200.00	-2,470 00	0.00	0 00	0.00	0 00	693,213.28	632,669.74	
6,300 00	0 00	0 00	6,300 00	-2,570.00	0 00	0.00	0 00	0.00	693,213.28	632,669.74	
6,400 00	0 00	0 00	6,400.00	-2,670 00	0 00	0.00	0 00	0.00	693,213.28	632,669.74	
6,500.00	0 00	0.00	6,500 00	-2,770.00	0.00	0 00	0.00	0 00	693,213.28	632,669.74	
6,600.00	0 00	0.00	6,600 00	-2,870 00	0.00	0 00	0 00	0 00	693,213.28	632,669.74	
6,700 00	0 00	0 00	6,700.00	-2,970 00	0 00	0.00	0 00	0.00	693,213.28	632,669.74	
6,800 00	0.00	0 00	6,800.00	-3,070 00	0 00	0.00	0 00	0 00	693,213.28	632,669.74	
6,897 50	0 00	0 00	6,897 50	-3,167 50	0.00	0 00	0 00	0 00	693,213.28	632,669.74	
6,900 00	0 30	90 04	6,900.00	-3,170 00	0.00	0 01	0.01	12 00	693,213.28	632,669.75	
6,925 00	3 30	90 04	6,924.98	-3,194 98	0 00	0 79	0.79	12 00	693,213.28	632,670.53	
6,950 00	6 30	90 04	6,949.89	-3,219 89	0.00	2 88	2.88	12 00	693,213.28	632,672.63	
6,975 00	9.30	90 04	6,974.66	-3,244 66	0.00	6.28	6.28	12.00	693,213.27	632,676.02	
7,000 00	12 30	90.04	6,999.21	-3,269.21	-0 01	10 96	10.96	12 00	693,213.27	632,680.70	
7,025 00	15 30	90 04	7,023.49	-3,293.49	-0.01	16.92	16.92	12 00	693,213.27	632,686.66	
7,050 00	18.30	90 04	7,047.42	-3,317.42	-0 02	24 15	24.15	12 00	693,213.26	632,693.89	
7,075.00	21.30	90 04	7,070.94	-3,340.94	-0 02	32 61	32.61	12 00	693,213.26	632,702.36	
7,100 00	24 30	90.04	7,093.98	-3,363.98	-0.03	42.30	42.30	12.00	693,213.25	632,712.04	
7,125.00	27 30	90.04	7,116.49	-3,386.49	-0 04	53 18	53.18	12 00	693,213.24	632,722.92	
7,150.00	30 30	90 04	7,138.40	-3,408.40	-0 05	65 22	65.22	12 00	693,213.23	632,734.96	



Pathfinder
Pathfinder X & Y Planning Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site High Lonesome 24 Fed
Project:	Eddy County(NAD83)	TVD Reference:	WELL @ 3730 00usft (Original Well Elev)
Site:	High Lonesome 24 Fed	MD Reference:	WELL @ 3730 00usft (Original Well Elev)
Well:	#2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	EDM 5000 1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
7,175.00	33.30	90.04	7,159.64	-3,429.64	-0.05	78.39	78.39	12.00	693,213.22	632,748.13	
7,200.00	36.30	90.04	7,180.17	-3,450.17	-0.06	92.66	92.66	12.00	693,213.21	632,762.40	
7,225.00	39.30	90.04	7,199.92	-3,469.92	-0.08	107.98	107.98	12.00	693,213.20	632,777.72	
7,250.00	42.30	90.04	7,218.84	-3,488.84	-0.09	124.31	124.31	12.00	693,213.19	632,794.05	
7,275.00	45.30	90.04	7,236.89	-3,506.89	-0.10	141.61	141.61	12.00	693,213.18	632,811.35	
7,300.00	48.30	90.04	7,254.00	-3,524.00	-0.11	159.83	159.83	12.00	693,213.17	632,829.57	
7,325.00	51.30	90.04	7,270.14	-3,540.14	-0.12	178.92	178.92	12.00	693,213.15	632,848.67	
7,350.00	54.30	90.04	7,285.25	-3,555.25	-0.14	198.83	198.83	12.00	693,213.14	632,868.57	
7,375.00	57.30	90.04	7,299.30	-3,569.30	-0.15	219.51	219.51	12.00	693,213.13	632,889.25	
7,400.00	60.30	90.04	7,312.25	-3,582.25	-0.17	240.89	240.89	12.00	693,213.11	632,910.63	
7,425.00	63.30	90.04	7,324.07	-3,594.07	-0.18	262.92	262.92	12.00	693,213.10	632,932.66	
7,450.00	66.30	90.04	7,334.71	-3,604.71	-0.20	285.53	285.53	12.00	693,213.08	632,955.28	
7,475.00	69.29	90.04	7,344.16	-3,614.16	-0.22	308.68	308.68	12.00	693,213.06	632,978.42	
7,500.00	72.29	90.04	7,352.38	-3,622.38	-0.23	332.28	332.28	12.00	693,213.05	633,002.02	
7,525.00	75.29	90.04	7,359.36	-3,629.36	-0.25	356.29	356.29	12.00	693,213.03	633,026.03	
7,550.00	78.29	90.04	7,365.07	-3,635.07	-0.27	380.62	380.62	12.00	693,213.01	633,050.36	
7,575.00	81.29	90.04	7,369.50	-3,639.50	-0.28	405.22	405.22	12.00	693,213.00	633,074.97	
7,600.00	84.29	90.04	7,372.63	-3,642.63	-0.30	430.02	430.02	12.00	693,212.98	633,099.77	
7,625.00	87.29	90.04	7,374.47	-3,644.47	-0.32	454.95	454.95	12.00	693,212.96	633,124.70	
7,647.56	90.00	90.04	7,375.00	-3,645.00	-0.33	477.50	477.50	12.00	693,212.95	633,147.24	
7,700.00	90.00	90.04	7,375.00	-3,645.00	-0.37	529.94	529.94	0.01	693,212.91	633,199.69	
7,723.67	90.00	90.04	7,375.00	-3,645.00	-0.39	553.62	553.62	0.01	693,212.89	633,223.36	
7,800.00	90.00	90.04	7,375.00	-3,645.00	-0.45	629.94	629.94	0.00	693,212.83	633,299.69	
7,900.00	90.00	90.04	7,375.00	-3,645.00	-0.53	729.94	729.94	0.00	693,212.75	633,399.69	
8,000.00	90.00	90.04	7,375.00	-3,645.00	-0.60	829.94	829.94	0.00	693,212.68	633,499.69	
8,100.00	90.00	90.04	7,375.00	-3,645.00	-0.68	929.94	929.94	0.00	693,212.60	633,599.69	
8,200.00	90.00	90.04	7,375.00	-3,645.00	-0.76	1,029.94	1,029.94	0.00	693,212.52	633,699.69	



Pathfinder
Pathfinder X & Y Planning Report

PATHFINDER
A Schlumberger Company

Company:	COG Operating LLC	Local Co-ordinate Reference:	Site High Lonesome 24 Fed
Project:	Eddy County(NAD83)	TVD Reference:	WELL @ 3730.00usft (Original Well Elev)
Site:	High Lonesome 24 Fed	MD Reference:	WELL @ 3730.00usft (Original Well Elev)
Well:	#2H	North Reference:	Grnd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	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)	
8,300.00	90.00	90.04	7,375.00	-3,645.00	-0.84	1,129.94	1,129.94	0.00	693,212.44	633,799.69	
8,400.00	90.00	90.04	7,375.00	-3,645.00	-0.91	1,229.94	1,229.94	0.00	693,212.37	633,899.69	
8,500.00	90.00	90.04	7,375.00	-3,645.00	-0.99	1,329.94	1,329.94	0.00	693,212.29	633,999.69	
8,600.00	90.00	90.04	7,375.00	-3,645.00	-1.07	1,429.94	1,429.94	0.00	693,212.21	634,099.69	
8,700.00	90.00	90.04	7,375.00	-3,645.00	-1.15	1,529.94	1,529.94	0.00	693,212.13	634,199.69	
8,800.00	90.00	90.04	7,375.00	-3,645.00	-1.22	1,629.94	1,629.94	0.00	693,212.06	634,299.69	
8,900.00	90.00	90.04	7,375.00	-3,645.00	-1.30	1,729.94	1,729.94	0.00	693,211.98	634,399.69	
9,000.00	90.00	90.04	7,375.00	-3,645.00	-1.38	1,829.94	1,829.94	0.00	693,211.90	634,499.69	
9,100.00	90.00	90.04	7,375.00	-3,645.00	-1.46	1,929.94	1,929.94	0.00	693,211.82	634,599.69	
9,200.00	90.00	90.04	7,375.00	-3,645.00	-1.53	2,029.94	2,029.94	0.00	693,211.74	634,699.69	
9,300.00	90.00	90.04	7,375.00	-3,645.00	-1.61	2,129.94	2,129.94	0.00	693,211.67	634,799.69	
9,400.00	90.00	90.04	7,375.00	-3,645.00	-1.69	2,229.94	2,229.94	0.00	693,211.59	634,899.69	
9,500.00	90.00	90.04	7,375.00	-3,645.00	-1.77	2,329.94	2,329.94	0.00	693,211.51	634,999.69	
9,600.00	90.00	90.04	7,375.00	-3,645.00	-1.84	2,429.94	2,429.94	0.00	693,211.43	635,099.69	
9,700.00	90.00	90.04	7,375.00	-3,645.00	-1.92	2,529.94	2,529.94	0.00	693,211.36	635,199.69	
9,800.00	90.00	90.04	7,375.00	-3,645.00	-2.00	2,629.94	2,629.94	0.00	693,211.28	635,299.69	
9,900.00	90.00	90.04	7,375.00	-3,645.00	-2.08	2,729.94	2,729.94	0.00	693,211.20	635,399.69	
10,000.00	90.00	90.04	7,375.00	-3,645.00	-2.15	2,829.94	2,829.94	0.00	693,211.12	635,499.69	
10,100.00	90.00	90.04	7,375.00	-3,645.00	-2.23	2,929.94	2,929.94	0.00	693,211.05	635,599.69	
10,200.00	90.00	90.04	7,375.00	-3,645.00	-2.31	3,029.94	3,029.94	0.00	693,210.97	635,699.69	
10,300.00	90.00	90.04	7,375.00	-3,645.00	-2.39	3,129.94	3,129.94	0.00	693,210.89	635,799.69	
10,400.00	90.00	90.04	7,375.00	-3,645.00	-2.46	3,229.94	3,229.94	0.00	693,210.81	635,899.69	
10,500.00	90.00	90.04	7,375.00	-3,645.00	-2.54	3,329.94	3,329.94	0.00	693,210.74	635,999.69	
10,600.00	90.00	90.04	7,375.00	-3,645.00	-2.62	3,429.94	3,429.94	0.00	693,210.66	636,099.69	
10,700.00	90.00	90.04	7,375.00	-3,645.00	-2.70	3,529.94	3,529.94	0.00	693,210.58	636,199.69	
10,800.00	90.00	90.04	7,375.00	-3,645.00	-2.78	3,629.94	3,629.94	0.00	693,210.50	636,299.69	
10,900.00	90.00	90.04	7,375.00	-3,645.00	-2.85	3,729.94	3,729.94	0.00	693,210.43	636,399.69	



Pathfinder
Pathfinder X & Y Planning Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Site High Lonesome 24 Fed
Project:	Eddy County(NAD83)	TVD Reference:	WELL @ 3730.00usft (Original Well Elev)
Site:	High Lonesome 24 Fed	MD Reference:	WELL @ 3730.00usft (Original Well Elev)
Well:	#2H	North Reference:	Grd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	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)	
11,000.00	90.00	90.04	7,375.00	-3,645.00	-2.93	3,829.94	3,829.94	0.00	693,210.35	636,499.69	
11,100.00	90.00	90.04	7,375.00	-3,645.00	-3.01	3,929.94	3,929.94	0.00	693,210.27	636,599.69	
11,200.00	90.00	90.04	7,375.00	-3,645.00	-3.09	4,029.94	4,029.94	0.00	693,210.19	636,699.69	
11,300.00	90.00	90.04	7,375.00	-3,645.00	-3.16	4,129.94	4,129.94	0.00	693,210.12	636,799.69	
11,400.00	90.00	90.04	7,375.00	-3,645.00	-3.24	4,229.94	4,229.94	0.00	693,210.04	636,899.69	
11,500.00	90.00	90.04	7,375.00	-3,645.00	-3.32	4,329.94	4,329.94	0.00	693,209.96	636,999.69	
11,600.00	90.00	90.04	7,375.00	-3,645.00	-3.40	4,429.94	4,429.94	0.00	693,209.88	637,099.69	
11,700.00	90.00	90.04	7,375.00	-3,645.00	-3.47	4,529.94	4,529.94	0.00	693,209.81	637,199.69	
11,788.45	90.00	90.04	7,375.00	-3,645.00	-3.54	4,618.40	4,618.40	0.00	693,209.74	637,288.14	
PBHL (HL24)											

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------



Project: Eddy County(NAD83)
 Site: High Lonesome 24 Fed
 Well: #2H
 Wellbore: OH
 Plan: Design #1 (#2H/OH)



Azimuths to Grid North
 True North: -0.16°
 Magnetic North: 7.72°

Magnetic Field
 Strength: 49041.8snT
 Dip Angle: 60.77°
 Date: 02/09/2011
 Model: IGRF200510

PATHFINDER
 A Schlumberger Company

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
PBHL (HL24)	7375.00	-3.54	4618.40	693209.737	637288.141	Point

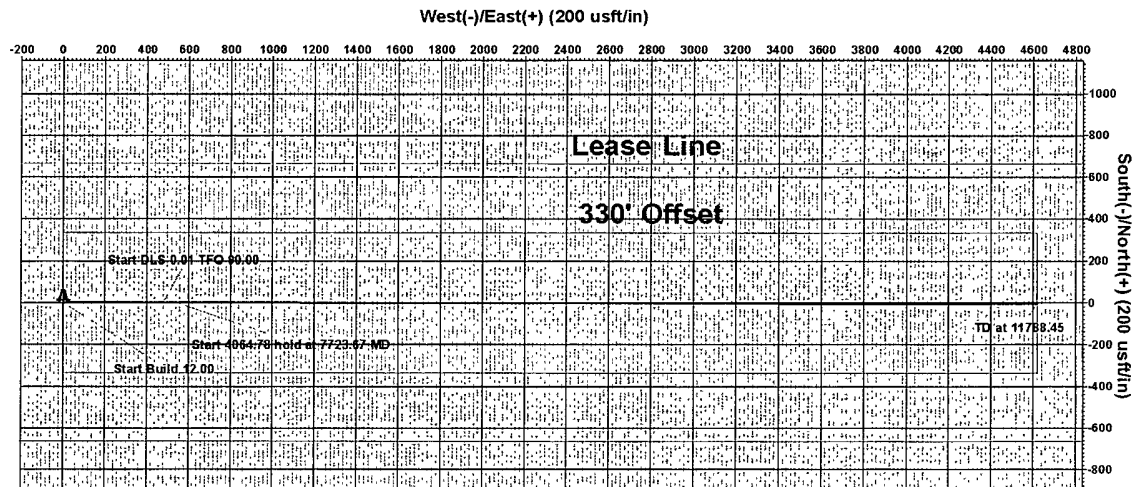
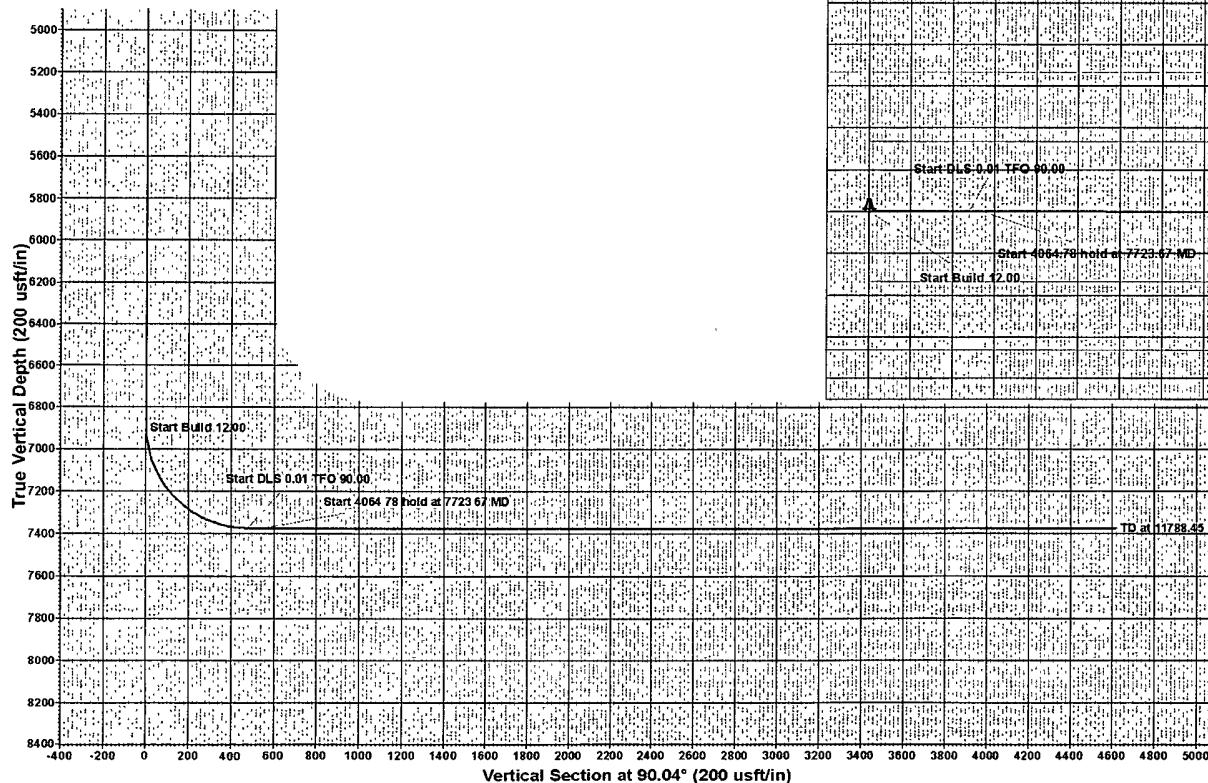
WELL DETAILS #2H

Ground Elevation: 3712.00
 RKB Elevation: WELL @ 3730.00usft (Original Well Elev)
 Rig Name: Original Well Elev

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	693213.279	632669.743	32° 54' 19.100 N	104° 2' 8.669 W	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	26997.50	0.00	0.00	6897.50	0.00	0.00	0.00	0.00	0.00	
	37847.56	90.00	90.04	7375.00	-0.33	477.50	12.00	90.04	477.50	
	47723.67	90.00	90.04	7375.00	-0.39	553.62	0.01	90.00	553.62	
	51788.45	90.00	90.04	7375.00	-3.54	4618.40	0.00	0.00	4618.40	PBHL (HL24)



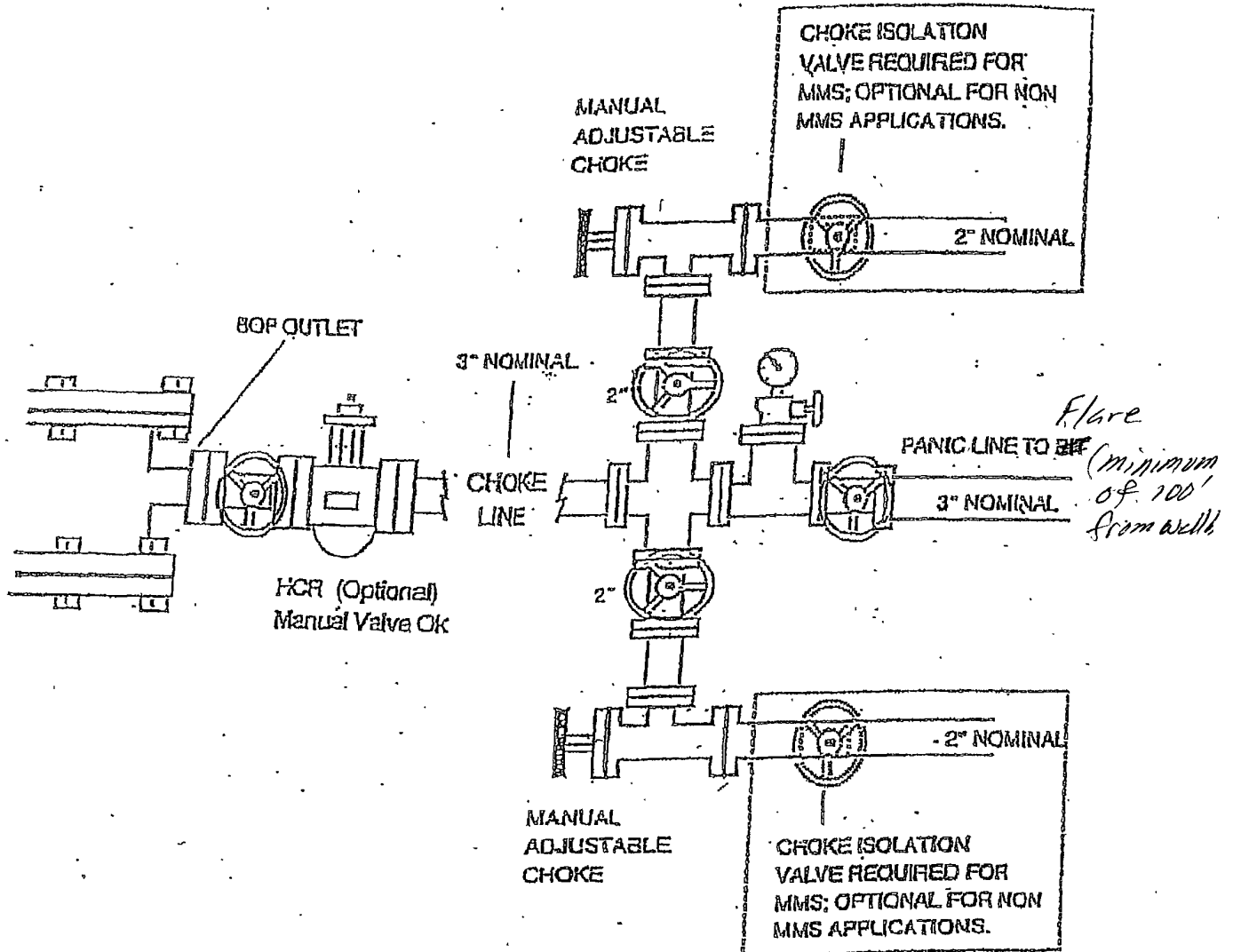
PROJECT DETAILS: Eddy County(NAD83)
 Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: New Mexico Eastern Zone
 System Datum: Mean Sea Level
 Local North: Grid

Plan Design #1 (#2H/OH)

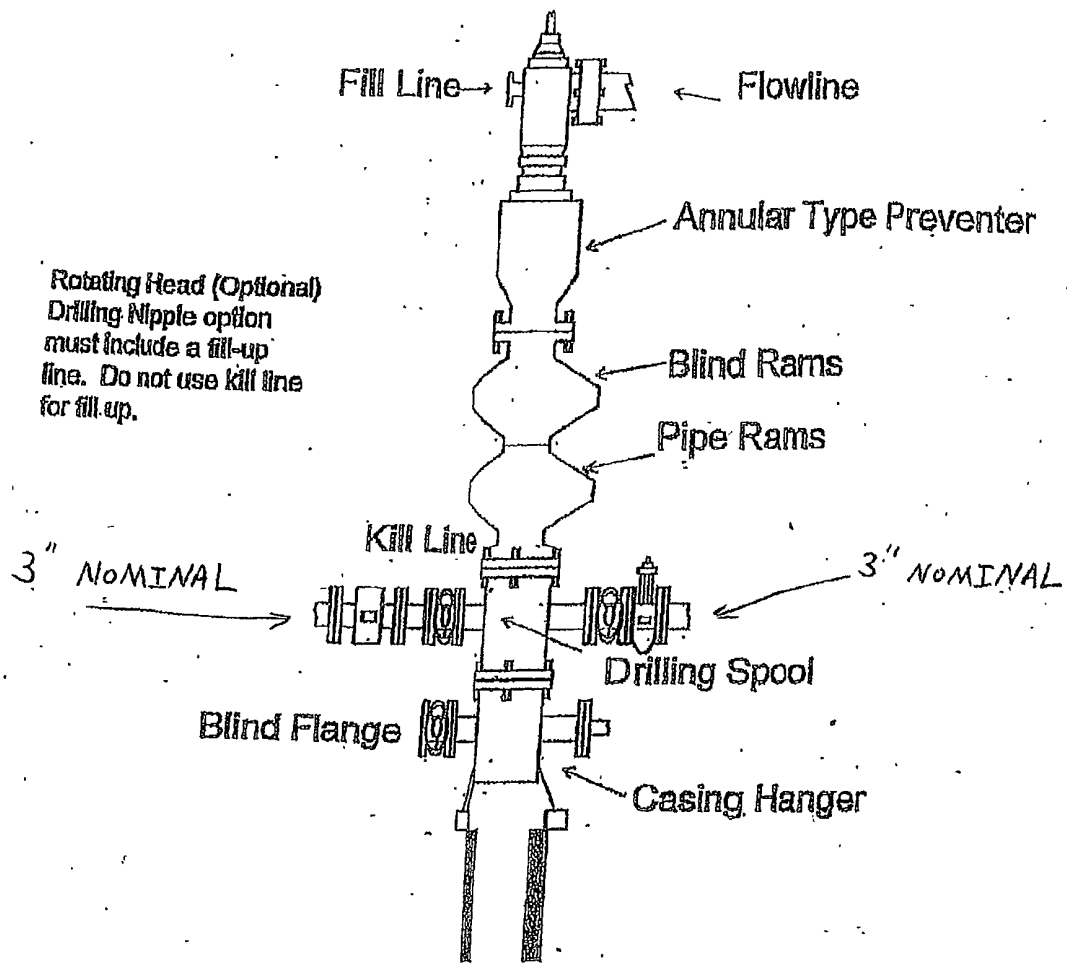
Created By: Nate Bingham Date: 11/41, April 13 2011
 Checked: _____ Date: _____

CHOKE MANIFOLD

3M SERVICE

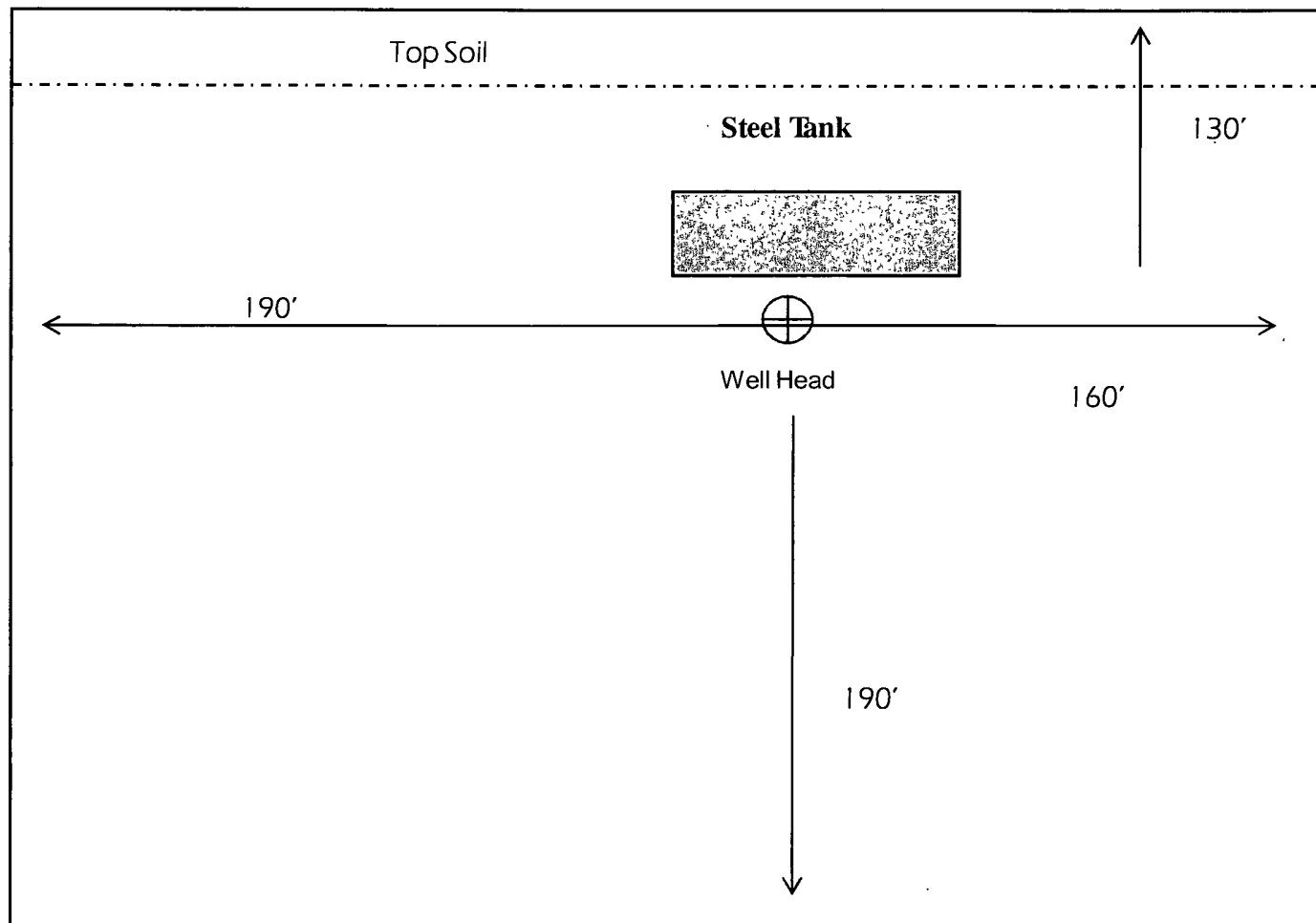


BOPE SCHEMATIC



Rotating Head (Optional)
Drilling Nipple option
must include a fill-up
line. Do not use kill line
for fill up.

900 SERIES



Not To Scale

COG OPERATING LLC
Rig Layout-Closed Loop
System

DISTRICT I --- CHECKLIST FOR INTENTS TO DRILL

Operator COG OPERATING LLC OGRID # 229137
 38722 Well Name & # HIGH LONESOME 24 FBD #2H Surface Type (F) (S) (P)
 Location: UL 4, Sect 24, Twnship 16 s, RNG 29 e, Sub-surface Type (F) (S) (P)
R - 24 - 16 s - 29 e

A. Date C101 rec'd / / C101 reviewed / /

B. 1. Check mark, Information is OK on Forms:

OGRID ☒ BONDING PA, PROP CODE ☒ WELL # 1, SIGNATURE

2. Inactive Well list as of: 7/21/11 # wells 2936 # Inactive wells 8

a. District Grant APD but see number of inactive wells:

No letter required ☒; Sent Letter to Operator , to Santa Fe

3. Additional Bonding as of: 7/26/11

a. District Denial because operator needs addition bonding:

No Letter required ☒; Sent Letter to Operator , To Santa Fe

b. District Denial because of Inactive well list and Financial Assurance:

No Letter required ☒; Sent Letter to Operator , To Santa Fe

C. C102 YES , NO , Signature

1. Pool WILDCAT G-04 5162928A WC, Code 92840

a. Dedicated acreage 160 What Units FTKL

b. SUR. Location Standard ☒: Non-Standard Location

c. Well shares acres: Yes , No ☒ # of wells plus this well #

2. 2nd. Operator in same acreage, Yes , No ☒

Agreement Letter , Disagreement letter

3. Intent to Directional Drill Yes ☒ No

a. Dedicated acreage 160 What Units FTKL

b. Bottomhole Location Standard ☒ Non-Standard Bottomhole

4. Downhole Commingle: Yes , No ☒

a. Pool #2 , Code , Acres

Pool #3 , Code , Acres

Pool #4 , Code , Acres

5. POTASH Area Yes No FB

D. Blowout Preventer Yes ☒ No

E. H2S Yes ☒ No

F. C144 Pit Registration Yes , No need

G. Does APD require Santa Fe Approval:

1. Non-Standard Location: Yes , No ☒ NSL #

2. Non-Standard Proration: Yes , No ☒ NSP #

3. Simultaneous Dedication: Yes , No , SD #

Number of wells Plus #

4. Injection order Yes , No ☒; PMX # or WFX #

5. SWD order Yes , NO ☒; SWD #

6. DHC from SF ; DHC-HOB ; Holding

7. OCD Approval Date / /

API #30-015 -- 39228

8. Reviewers