



30-015-38324

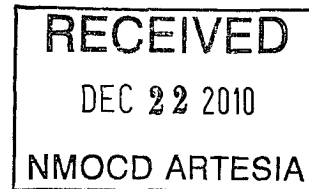
COG Operating LLC

Eddy County, NM (NAN27 NME)

Foran State #4

Foran State #4

OH



Plan: Plan #1 7-7/8" Hole

SHL = 2010' FNL & 485' FEL

BHL = 2300' FNL & 340' FEL

Top of Paddock = 2300' FNL & 340' FEL @ 5000' TVD

Standard Planning Report

20 December, 2010





Scientific Drilling
Planning Report



Database:	EDM-Julio	Local Co-ordinate Reference:	Site Foran State #4
Company:	COG Operating LLC	TVD Reference:	GLElev @ 3861.00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GLElev @ 3861.00usft
Site:	Foran State #4	North Reference:	Grid
Well:	Foran State #4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 7-7/8" Hole		

Project	Eddy County, NM (NAN27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site		Foran State #4			
Site Position:		Northing:	668,230.00 usft	Latitude:	32° 50' 10.255 N
From:	Map	Easting:	643,188.70 usft	Longitude:	103° 52' 1.734 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.25 °

Well	Foran State #4					
Well Position	+N/-S	0.00 usft	Northing:	668,230.00 usft	Latitude:	32° 50' 10.255 N
	+E/-W	0.00 usft	Easting:	643,188.70 usft	Longitude:	103° 52' 1.734 W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	3,861.00 usft

Wellbore	OH				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2010/12/20	7.83	60.71	48,998

Design	Plan #1 7-7/8" Hole			
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	153.75

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,358.12	7.16	153.75	2,357.19	-20.05	9.89	2.00	2.00	0.00	153.75	
4,661.72	7.16	153.75	4,642.81	-277.65	136.91	0.00	0.00	0.00	0.00	
5,019.84	0.00	0.00	5,000.00	-297.70	146.80	2.00	-2.00	0.00	180.00	TG1-Foran #4
6,719.84	0.00	0.00	6,700.00	-297.70	146.80	0.00	0.00	0.00	0.00	PBHL-Foran #4



Scientific Drilling
Planning Report



Database: EDM-Julio
Company: COG Operating LLC
Project: Eddy County, NM (NAN27 NME)
Site: Foran State #4
Well: Foran State #4
Wellbore: OH
Design: Plan #1 7-7/8" Hole

Local Co-ordinate Reference: Site Foran State #4
TVD Reference: GLElev @ 3861.00usft
MD Reference: GLElev @ 3861.00usft
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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
East HL-Foran #4									
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8-5/8" Casing									
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start Build 2.00°/100'									
2,100.00	2.00	153.75	2,099.98	-1.57	0.77	1.75	2.00	2.00	0.00
2,200.00	4.00	153.75	2,199.84	-6.26	3.09	6.98	2.00	2.00	0.00
2,300.00	6.00	153.75	2,299.45	-14.08	6.94	15.69	2.00	2.00	0.00
2,358.12	7.16	153.75	2,357.19	-20.05	9.89	22.35	2.00	2.00	0.00
EOC hold 7.16°									
2,400.00	7.16	153.75	2,398.74	-24.73	12.20	27.58	0.00	0.00	0.00
2,500.00	7.16	153.75	2,497.96	-35.92	17.71	40.04	0.00	0.00	0.00
2,600.00	7.16	153.75	2,597.18	-47.10	23.22	52.51	0.00	0.00	0.00
2,700.00	7.16	153.75	2,696.40	-58.28	28.74	64.98	0.00	0.00	0.00
2,800.00	7.16	153.75	2,795.62	-69.46	34.25	77.45	0.00	0.00	0.00
2,900.00	7.16	153.75	2,894.84	-80.65	39.77	89.92	0.00	0.00	0.00
3,000.00	7.16	153.75	2,994.06	-91.83	45.28	102.39	0.00	0.00	0.00
3,100.00	7.16	153.75	3,093.28	-103.01	50.80	114.85	0.00	0.00	0.00
3,200.00	7.16	153.75	3,192.50	-114.19	56.31	127.32	0.00	0.00	0.00
3,300.00	7.16	153.75	3,291.72	-125.38	61.82	139.79	0.00	0.00	0.00
3,400.00	7.16	153.75	3,390.94	-136.56	67.34	152.26	0.00	0.00	0.00
3,500.00	7.16	153.75	3,490.16	-147.74	72.85	164.73	0.00	0.00	0.00
3,600.00	7.16	153.75	3,589.38	-158.92	78.37	177.19	0.00	0.00	0.00
3,700.00	7.16	153.75	3,688.60	-170.11	83.88	189.66	0.00	0.00	0.00
3,800.00	7.16	153.75	3,787.82	-181.29	89.40	202.13	0.00	0.00	0.00
3,900.00	7.16	153.75	3,887.04	-192.47	94.91	214.60	0.00	0.00	0.00
4,000.00	7.16	153.75	3,986.26	-203.65	100.42	227.07	0.00	0.00	0.00
4,100.00	7.16	153.75	4,085.48	-214.84	105.94	239.54	0.00	0.00	0.00
4,200.00	7.16	153.75	4,184.70	-226.02	111.45	252.00	0.00	0.00	0.00
4,300.00	7.16	153.75	4,283.92	-237.20	116.97	264.47	0.00	0.00	0.00
4,400.00	7.16	153.75	4,383.13	-248.38	122.48	276.94	0.00	0.00	0.00
4,500.00	7.16	153.75	4,482.35	-259.57	128.00	289.41	0.00	0.00	0.00
4,600.00	7.16	153.75	4,581.57	-270.75	133.51	301.88	0.00	0.00	0.00
4,661.72	7.16	153.75	4,642.81	-277.65	136.91	309.57	0.00	0.00	0.00
Start Drop 2.00°/100'									
4,700.00	6.40	153.75	4,680.82	-281.70	138.91	314.09	2.00	-2.00	0.00
4,800.00	4.40	153.75	4,780.38	-290.14	143.07	323.50	2.00	-2.00	0.00
4,900.00	2.40	153.75	4,880.20	-295.45	145.69	329.42	2.00	-2.00	0.00
5,000.00	0.40	153.75	4,980.16	-297.64	146.77	331.86	2.00	-2.00	0.00
5,019.84	0.00	0.00	5,000.00	-297.70	146.80	331.93	2.00	-2.00	-774.97
EOC hold 0.00° - TG1-Foran #4									
6,719.84	0.00	0.00	6,700.00	-297.70	146.80	331.93	0.00	0.00	0.00
PBHL-Foran #4									



Scientific Drilling Planning Report



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Company:	COG Operating LLC	TVD Reference:	GLElev @ 3861.00usft
Project:	Eddy County, NM (NAN27 NME)	MD Reference:	GLElev @ 3861.00usft
Site:	Foran State #4	North Reference:	Grid
Well:	Foran State #4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 7-7/8" Hole		

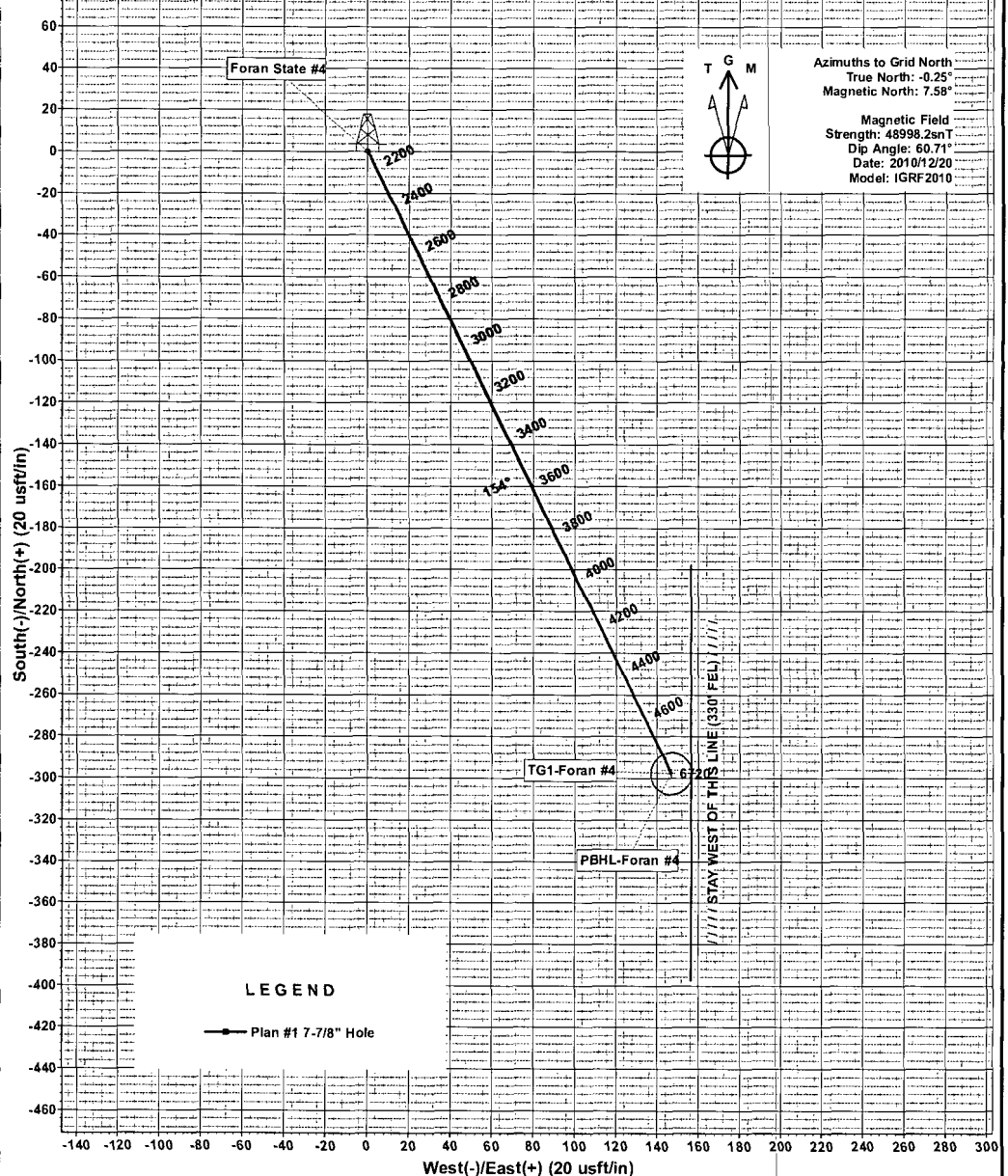
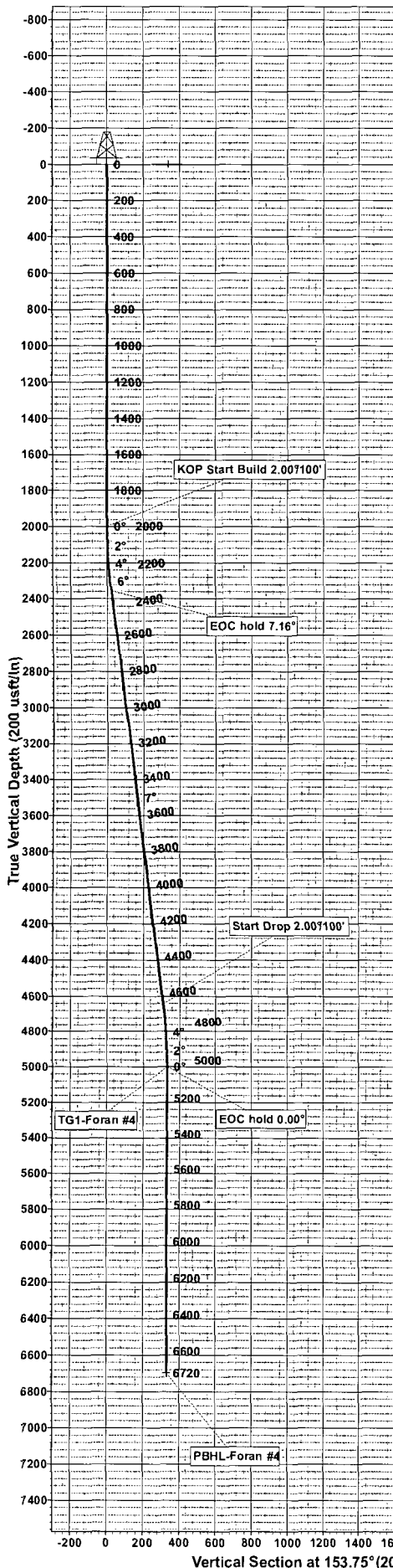
Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
East HL-Foran #4 - plan misses target center by 336.47usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Rectangle (sides W0.00 H200.00 D0.00)	0.00	0.00	0.00	-297.70	156.80	667,932.30	643,345.50	32° 50' 7.302 N	103° 51' 59.912 W
TG1-Foran #4 - plan hits target center - Point	0.00	0.00	5,000.00	-297.70	146.80	667,932.30	643,335.50	32° 50' 7.303 N	103° 52' 0.029 W
PBHL-Foran #4 - plan hits target center - Circle (radius 10.00)	0.00	0.01	6,700.00	-297.70	146.80	667,932.30	643,335.50	32° 50' 7.303 N	103° 52' 0.029 W

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,900.00	1,900.00	8-5/8" Casing	8-5/8	12-1/4	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
2,000.00	2,000.00	0.00	0.00	KOP Start Build 2.00°/100'	
2,358.12	2,357.19	-20.05	9.89	EOC hold 7.16°	
4,661.72	4,642.81	-277.65	136.91	Start Drop 2.00°/100'	
5,019.84	5,000.00	-297.70	146.80	EOC hold 0.00°	



Scientific Drilling for COG Operating LLC
Site: Eddy County, NM (NAN27 NME)
Well: Foran State #4
Wellbore: OH
Design: Plan #1 7-7/8" Hole



LEGEND

Plan #1 7-7/8" Hole

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
East HL-Foran #4	0.00	-297.70	156.80	667932.30	643345.50	32°50' 7.302 N	103°51' 59.912 W	Rectangle (Sides: L 200.00 W0.00)
TG1-Foran #4	5000.00	-297.70	146.80	667932.30	643335.50	32°50' 7.303 N	103°52' 0.029 W	Point
PBHL-Foran #4	6700.00	-297.70	146.80	667932.30	643335.50	32°50' 7.303 N	103°52' 0.029 W	Circle (Radius: 10.0 0)

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2000.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	0.00	
3	2358.12	7.16	153.75	2357.19	-20.05	9.89	2.00	153.75	22.35	
4	4661.72	7.16	153.75	4642.81	-277.65	136.91	0.00	0.00	309.57	
5	5019.84	0.00	0.00	5000.00	-297.70	146.80	2.00	180.00	331.93	TG1-Foran #4
6	6719.84	0.00	0.00	6700.00	-297.70	146.80	0.00	0.00	331.93	PBHL-Foran #4

WELL DETAILS: Foran State #4

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	668230.00	643188.70	32°50' 10.255 N	103°52' 1.734 W	

PROJECT DETAILS: Eddy County, NM (NAN27 NME)

Plan: Plan #1 7-7/8" Hole (Foran State #4/OH)

Geodetic System: US State Plane 1927 (Exact solution)	Created By: Julio Pina	Date: 20-Dec-10
Datum: NAD 1927 (NADCON CONUS)		
Ellipsoid: Clarke 1866	Checked: _____	Date: _____
Zone: New Mexico Zone 3001		
System Datum: Mean Sea Level	Reviewed: _____	Date: _____
	Approved: _____	Date: _____