



COG Operating LLC

Eddy County, NM (NAD27 NME)

Stonewall 9 Fee

#7H

WB1

30-015-43006

Plan: Plan #1 03-10-15

Surface: 150' FSL, 1650' FEL, Sec 9, T19S, R26E, Unit O

PP: 330' FSL, 1650' FEL, Sec 9, T19S, R26E, Unit O

BHL: 330' FNL, 1650' FEL, Sec 9, T19S, R26E, Unit B

Standard Planning Report

10 March, 2015





Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #7H
Company:	COG Operating LLC	TVD Reference:	KB @ 3364.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3364.00usft (Silver Oak 3)
Site:	Stonewall 9 Fee	North Reference:	Grid
Well:	#7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 03-10-15		

Project	Eddy County, NM (NAD27 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	Stonewall 9 Fee		
Site Position:		Northing:	611,835.50 usft
From:	Map	Easting:	482,702.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 40' 55.28160 N
		Longitude:	104° 23' 22.39586 W
		Grid Convergence:	-0.03 °

Well	#7H		
Well Position	+N/-S	-5,048.40 usft	Northing:
	+E/-W	2,044.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	Ground Level:
			3,346.00 usft

Wellbore	WB1		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	2/11/2015	(°)
			7.61
			Dip Angle
			(°)
			60.37
			Field Strength
			(nT)
			48,356

Design	Plan #1 03-10-15		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			13.63

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,668.81	0.00	0.00	2,668.81	0.00	0.00	0.00	0.00	0.00	0.00	
3,487.90	90.10	358.43	3,189.68	521.58	-14.31	11.00	11.00	0.00	358.43	
7,848.87	90.10	358.43	3,182.07	4,880.90	-133.90	0.00	0.00	0.00	0.00	PBHL-Stonewall 9 #7



Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #7H
Company:	COG Operating LLC	TVD Reference:	KB @ 3364.00usft (Silver Oak 3)
Project:	Eddy County NM (NAD27:NME)	MD Reference:	KB @ 3364.00usft (Silver Oak 3)
Site:	Stonewall 9 Fee	North Reference:	Grid
Well:	#7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1-03-10-15		

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
2,668.81	0.00	0.00	2,668.81	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start 11°/100' Build									
2,700.00	3.43	358.43	2,699.98	0.93	-0.03	0.90	11.00	11.00	0.00
2,800.00	14.43	358.43	2,798.62	16.43	-0.45	15.86	11.00	11.00	0.00
2,900.00	25.43	358.43	2,892.48	50.45	-1.38	48.70	11.00	11.00	0.00
3,000.00	36.43	358.43	2,978.13	101.75	-2.79	98.23	11.00	11.00	0.00
3,100.00	47.43	358.43	3,052.41	168.45	-4.62	162.61	11.00	11.00	0.00
3,115.45	49.13	358.43	3,062.70	179.98	-4.94	173.75	11.00	11.00	0.00
PP-Stonewall 9 #7H									
3,200.00	58.43	358.43	3,112.60	248.09	-6.81	239.49	11.00	11.00	0.00
3,300.00	69.43	358.43	3,156.48	337.74	-9.27	326.04	11.00	11.00	0.00
3,400.00	80.43	358.43	3,182.43	434.12	-11.91	419.08	11.00	11.00	0.00
3,463.07	87.37	358.43	3,189.13	496.77	-13.63	479.56	11.00	11.00	0.00
TL 3190' TVD @ 0.1°/100' Inc									
3,487.90	90.10	358.43	3,189.68	521.58	-14.31	503.52	11.00	11.00	0.00
LP Hold 90.1° Inc									
3,500.00	90.10	358.43	3,189.66	533.68	-14.64	515.19	0.00	0.00	0.00
3,600.00	90.10	358.43	3,189.49	633.64	-17.38	611.69	0.00	0.00	0.00
3,700.00	90.10	358.43	3,189.31	733.60	-20.13	708.19	0.00	0.00	0.00
3,800.00	90.10	358.43	3,189.14	833.56	-22.87	804.69	0.00	0.00	0.00
3,900.00	90.10	358.43	3,188.96	933.53	-25.61	901.19	0.00	0.00	0.00
4,000.00	90.10	358.43	3,188.79	1,033.49	-28.35	997.69	0.00	0.00	0.00
4,100.00	90.10	358.43	3,188.61	1,133.45	-31.09	1,094.19	0.00	0.00	0.00
4,200.00	90.10	358.43	3,188.44	1,233.41	-33.84	1,190.69	0.00	0.00	0.00
4,300.00	90.10	358.43	3,188.26	1,333.37	-36.58	1,287.19	0.00	0.00	0.00
4,400.00	90.10	358.43	3,188.09	1,433.34	-39.32	1,383.69	0.00	0.00	0.00
4,500.00	90.10	358.43	3,187.91	1,533.30	-42.06	1,480.19	0.00	0.00	0.00
4,600.00	90.10	358.43	3,187.74	1,633.26	-44.81	1,576.69	0.00	0.00	0.00
4,700.00	90.10	358.43	3,187.57	1,733.22	-47.55	1,673.19	0.00	0.00	0.00
4,800.00	90.10	358.43	3,187.39	1,833.19	-50.29	1,769.69	0.00	0.00	0.00
4,900.00	90.10	358.43	3,187.22	1,933.15	-53.03	1,866.19	0.00	0.00	0.00
5,000.00	90.10	358.43	3,187.04	2,033.11	-55.78	1,962.69	0.00	0.00	0.00
5,100.00	90.10	358.43	3,186.87	2,133.07	-58.52	2,059.19	0.00	0.00	0.00
5,200.00	90.10	358.43	3,186.69	2,233.03	-61.26	2,155.69	0.00	0.00	0.00
5,300.00	90.10	358.43	3,186.52	2,333.00	-64.00	2,252.19	0.00	0.00	0.00
5,400.00	90.10	358.43	3,186.34	2,432.96	-66.74	2,348.69	0.00	0.00	0.00
5,500.00	90.10	358.43	3,186.17	2,532.92	-69.49	2,445.19	0.00	0.00	0.00
5,600.00	90.10	358.43	3,186.00	2,632.88	-72.23	2,541.69	0.00	0.00	0.00
5,700.00	90.10	358.43	3,185.82	2,732.85	-74.97	2,638.19	0.00	0.00	0.00
5,800.00	90.10	358.43	3,185.65	2,832.81	-77.71	2,734.69	0.00	0.00	0.00
5,900.00	90.10	358.43	3,185.47	2,932.77	-80.46	2,831.19	0.00	0.00	0.00
6,000.00	90.10	358.43	3,185.30	3,032.73	-83.20	2,927.69	0.00	0.00	0.00
6,100.00	90.10	358.43	3,185.12	3,132.70	-85.94	3,024.19	0.00	0.00	0.00
6,200.00	90.10	358.43	3,184.95	3,232.66	-88.68	3,120.69	0.00	0.00	0.00
6,300.00	90.10	358.43	3,184.77	3,332.62	-91.43	3,217.19	0.00	0.00	0.00
6,400.00	90.10	358.43	3,184.60	3,432.58	-94.17	3,313.69	0.00	0.00	0.00
6,500.00	90.10	358.43	3,184.42	3,532.54	-96.91	3,410.19	0.00	0.00	0.00
6,600.00	90.10	358.43	3,184.25	3,632.51	-99.65	3,506.69	0.00	0.00	0.00
6,700.00	90.10	358.43	3,184.08	3,732.47	-102.39	3,603.19	0.00	0.00	0.00
6,800.00	90.10	358.43	3,183.90	3,832.43	-105.14	3,699.69	0.00	0.00	0.00
6,900.00	90.10	358.43	3,183.73	3,932.39	-107.88	3,796.19	0.00	0.00	0.00
7,000.00	90.10	358.43	3,183.55	4,032.36	-110.62	3,892.69	0.00	0.00	0.00
7,100.00	90.10	358.43	3,183.38	4,132.32	-113.36	3,989.19	0.00	0.00	0.00



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Site:	Stonewall 9 Fee	North Reference:	Grid
Well:	#7H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1-03-10-15		

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)
7,200.00	90.10	358.43	3,183.20	4,232.28	-116.11	4,085.69	0.00	0.00	0.00
7,300.00	90.10	358.43	3,183.03	4,332.24	-118.85	4,182.19	0.00	0.00	0.00
7,400.00	90.10	358.43	3,182.85	4,432.20	-121.59	4,278.69	0.00	0.00	0.00
7,500.00	90.10	358.43	3,182.68	4,532.17	-124.33	4,375.19	0.00	0.00	0.00
7,600.00	90.10	358.43	3,182.50	4,632.13	-127.08	4,471.68	0.00	0.00	0.00
7,700.00	90.10	358.43	3,182.33	4,732.09	-129.82	4,568.18	0.00	0.00	0.00
7,800.00	90.10	358.43	3,182.16	4,832.05	-132.56	4,664.68	0.00	0.00	0.00
7,848.87	90.10	358.43	3,182.07	4,880.90	-133.90	4,711.84	0.00	0.00	0.00

TD at 7848.87' MD - PBHL-Stonewall 9 #7H

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PP-Stonewall 9 #7H - hit/miss target - Shape - Point	0.00	0.00	3,062.71	180.00	-4.94	606,967.10	484,741.06	32° 40' 7.11563 N	104° 22' 58.51114 W
PBHL-Stonewall 9 #7H - plan hits target center - Point	0.00	0.00	3,182.07	4,880.90	-133.90	611,668.00	484,612.10	32° 40' 53.63354 N	104° 23' 0.04575 W

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,463.07	3,189.13	TL, 3190' TVD @ 0 VZ, 90.1° Inc		-0.10	358.43

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates	Comment
2,668.81	2,668.81	+N/-S (usft) 0.00 +E/-W (usft) 0.00	KOP, Start 11°/100' Build
3,487.90	3,189.68	521.58 -14.31	LP, Hold 90.1° Inc
7,848.87	3,182.07	4,880.90 -133.90	TD at 7848.87' MD