



COG Operating LLC

**Eddy County, NM (NAD27 NME)
Admiral Fed Com
503H**

OH / 66375

Design: Surveys (Pioneer 84)

Standard Survey Report

26 March, 2020



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 503H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 3011.20usft (Pioneer 84)
Site:	Admiral Fed Com	MD Reference:	RKB @ 3011.20usft (Pioneer 84)
Well:	503H	North Reference:	Grid
Wellbore:	OH / 66375	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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	Admiral Fed Com		
Site Position:		Northing:	398,093.60 usft
From:	Map	Easting:	604,917.40 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 5' 38.479918 N
		Longitude:	103° 59' 40.340397 W
		Grid Convergence:	0.18 °

Well	503H		
Well Position	+N/-S	0.00 usft	Northing: 398,101.30 usft
	+E/-W	0.00 usft	Easting: 606,667.40 usft
Position Uncertainty	1.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 5' 38.501256 N
		Longitude:	103° 59' 19.996798 W
		Ground Level:	2,986.20 usft

Wellbore	OH / 66375		
Magnetics	Model Name	Sample Date	Declination (°)
	User Defined	3/13/2020	6.74
			Dip Angle (°) 59.72
			Field Strength (nT) 47,771.20000000

Design	Surveys (Pioneer 84)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°) 359.55

Survey Program	Date	3/26/2020		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
20.00	597.00	Surface MWD Surveys (OH / 66375)	MWD+HRGM	OWSG MWD + HRGM
597.00	18,945.00	Phoenix MWD Surveys (OH / 66375)	MWD+IFR1+FDIR	OWSG MWD + IFR1 + FDIR Correction

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
20.00	0.09	48.41	20.00	0.01	0.01	0.01	0.45	0.45	0.00
97.00	0.37	208.28	97.00	-0.17	-0.06	-0.17	0.59	0.36	207.62
184.00	0.69	258.73	184.00	-0.52	-0.71	-0.51	0.62	0.37	57.99
282.00	1.26	262.83	281.98	-0.77	-2.36	-0.75	0.59	0.58	4.18
373.00	1.37	252.21	372.96	-1.23	-4.38	-1.19	0.29	0.12	-11.67
457.00	0.43	213.69	456.95	-1.79	-5.51	-1.75	1.27	-1.12	-45.86
548.00	0.26	216.94	547.95	-2.24	-5.83	-2.20	0.19	-0.19	3.57
597.00	0.56	262.80	596.94	-2.36	-6.13	-2.31	0.86	0.61	93.59
Tie In									

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Survey

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697.00	0.36	354.47	696.94	-2.11	-6.65	-2.06	0.67	-0.20	91.67
First Phoenix MWD Survey									
774.00	0.41	9.99	773.94	-1.60	-6.62	-1.55	0.15	0.06	20.16
869.00	0.36	46.64	868.94	-1.06	-6.35	-1.01	0.26	-0.05	38.58
963.00	0.51	70.68	962.94	-0.72	-5.74	-0.67	0.25	0.16	25.57
1,058.00	0.75	82.68	1,057.93	-0.50	-4.72	-0.46	0.29	0.25	12.63
1,153.00	1.12	90.94	1,152.92	-0.43	-3.18	-0.41	0.41	0.39	8.69
1,248.00	1.53	113.01	1,247.89	-0.95	-1.08	-0.94	0.68	0.43	23.23
1,342.00	1.50	115.50	1,341.86	-1.97	1.18	-1.98	0.08	-0.03	2.65
1,437.00	1.62	113.45	1,436.82	-3.04	3.54	-3.06	0.14	0.13	-2.16
1,532.00	1.72	115.52	1,531.78	-4.18	6.06	-4.23	0.12	0.11	2.18
1,627.00	1.91	118.66	1,626.74	-5.56	8.73	-5.63	0.23	0.20	3.31
1,722.00	1.80	116.45	1,721.69	-6.98	11.46	-7.07	0.14	-0.12	-2.33
1,817.00	1.59	118.62	1,816.64	-8.28	13.95	-8.39	0.23	-0.22	2.28
1,912.00	1.51	114.64	1,911.61	-9.43	16.25	-9.56	0.14	-0.08	-4.19
2,006.00	1.12	116.54	2,005.58	-10.36	18.19	-10.50	0.42	-0.41	2.02
2,101.00	1.09	106.67	2,100.57	-11.03	19.89	-11.19	0.20	-0.03	-10.39
2,196.00	1.28	116.27	2,195.55	-11.76	21.71	-11.93	0.29	0.20	10.11
2,291.00	2.13	113.96	2,290.50	-12.95	24.27	-13.14	0.90	0.89	-2.43
2,386.00	3.63	114.71	2,385.38	-14.92	28.62	-15.15	1.58	1.58	0.79
2,480.00	3.27	108.09	2,479.21	-17.00	33.87	-17.26	0.57	-0.38	-7.04
2,575.00	2.63	99.30	2,574.09	-18.19	38.59	-18.49	0.82	-0.67	-9.25
2,670.00	4.49	113.42	2,668.90	-20.02	44.16	-20.37	2.15	1.96	14.86
2,765.00	3.64	150.09	2,763.68	-24.11	49.08	-24.50	2.82	-0.89	38.60
2,860.00	4.03	204.50	2,858.49	-29.77	49.19	-30.15	3.71	0.41	57.27
2,955.00	3.91	207.48	2,953.26	-35.68	46.32	-36.04	0.25	-0.13	3.14
2,961.00	3.89	208.01	2,959.25	-36.04	46.13	-36.40	0.69	-0.33	8.83
3,052.00	3.70	207.53	3,050.05	-41.37	43.32	-41.71	0.21	-0.21	-0.53
3,147.00	3.65	204.95	3,144.86	-46.83	40.63	-47.15	0.18	-0.05	-2.72
3,242.00	3.52	205.59	3,239.67	-52.20	38.09	-52.50	0.14	-0.14	0.67
3,336.00	3.34	204.36	3,333.50	-57.30	35.72	-57.58	0.21	-0.19	-1.31
3,432.00	3.17	207.51	3,429.35	-62.20	33.34	-62.46	0.26	-0.18	3.28
3,526.00	2.84	203.64	3,523.22	-66.64	31.20	-66.88	0.41	-0.35	-4.12
3,621.00	2.64	204.07	3,618.11	-70.79	29.37	-71.02	0.21	-0.21	0.45
3,716.00	2.59	201.53	3,713.01	-74.79	27.69	-75.00	0.13	-0.05	-2.67
3,811.00	2.51	205.78	3,807.92	-78.66	25.99	-78.86	0.22	-0.08	4.47
3,906.00	2.21	201.97	3,902.83	-82.23	24.40	-82.42	0.36	-0.32	-4.01
4,001.00	2.00	203.34	3,997.77	-85.45	23.06	-85.63	0.23	-0.22	1.44
4,096.00	2.13	208.61	4,092.71	-88.52	21.56	-88.69	0.24	0.14	5.55
4,190.00	1.91	206.99	4,186.65	-91.45	20.01	-91.60	0.24	-0.23	-1.72
4,285.00	1.96	203.99	4,281.60	-94.35	18.63	-94.49	0.12	0.05	-3.16
4,380.00	1.99	216.82	4,376.54	-97.15	16.98	-97.28	0.47	0.03	13.51
4,475.00	1.79	212.58	4,471.49	-99.72	15.20	-99.84	0.26	-0.21	-4.46

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Survey

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4,570.00	1.59	214.14	4,566.45	-102.06	13.66	-102.17	0.22	-0.21	1.64
4,665.00	1.64	214.38	4,661.41	-104.27	12.15	-104.37	0.05	0.05	0.25
4,759.00	1.67	223.73	4,755.37	-106.37	10.44	-106.45	0.29	0.03	9.95
4,854.00	1.65	228.76	4,850.33	-108.28	8.46	-108.34	0.15	-0.02	5.29
4,949.00	1.64	227.75	4,945.29	-110.09	6.42	-110.14	0.03	-0.01	-1.06
5,044.00	1.49	235.55	5,040.26	-111.70	4.40	-111.74	0.27	-0.16	8.21
5,139.00	1.86	227.59	5,135.22	-113.44	2.24	-113.46	0.46	0.39	-8.38
5,234.00	2.29	225.21	5,230.15	-115.82	-0.24	-115.81	0.46	0.45	-2.51
5,328.00	2.42	223.18	5,324.07	-118.59	-2.93	-118.56	0.16	0.14	-2.16
5,423.00	2.26	226.41	5,418.99	-121.34	-5.66	-121.30	0.22	-0.17	3.40
5,518.00	2.02	222.47	5,513.93	-123.87	-8.15	-123.80	0.30	-0.25	-4.15
5,613.00	1.94	212.67	5,608.87	-126.46	-10.15	-126.38	0.37	-0.08	-10.32
5,707.00	1.87	212.75	5,702.82	-129.09	-11.84	-128.99	0.07	-0.07	0.09
5,802.00	1.81	214.48	5,797.77	-131.63	-13.53	-131.52	0.09	-0.06	1.82
5,897.00	1.92	210.61	5,892.72	-134.24	-15.19	-134.11	0.18	0.12	-4.07
5,992.00	1.62	204.60	5,987.68	-136.83	-16.55	-136.69	0.37	-0.32	-6.33
6,086.00	3.29	143.47	6,081.60	-140.20	-15.50	-140.08	3.06	1.78	-65.03
6,181.00	2.74	145.75	6,176.47	-144.27	-12.60	-144.17	0.59	-0.58	2.40
6,276.00	2.54	148.26	6,271.37	-147.94	-10.22	-147.85	0.24	-0.21	2.64
6,371.00	2.50	143.82	6,366.27	-151.40	-7.89	-151.33	0.21	-0.04	-4.67
6,466.00	2.63	147.57	6,461.18	-154.91	-5.49	-154.86	0.22	0.14	3.95
6,560.00	2.58	152.01	6,555.08	-158.60	-3.34	-158.57	0.22	-0.05	4.72
6,655.00	2.23	154.70	6,650.00	-162.16	-1.55	-162.14	0.39	-0.37	2.83
6,750.00	2.62	149.45	6,744.91	-165.70	0.34	-165.70	0.47	0.41	-5.53
6,845.00	2.22	157.49	6,839.83	-169.27	2.15	-169.28	0.55	-0.42	8.46
6,940.00	1.32	247.95	6,934.80	-171.38	1.84	-171.39	2.73	-0.95	95.22
7,034.00	0.92	216.60	7,028.78	-172.39	0.39	-172.39	0.76	-0.43	-33.35
7,129.00	0.53	200.34	7,123.77	-173.42	-0.22	-173.41	0.46	-0.41	-17.12
7,224.00	0.47	200.13	7,218.77	-174.20	-0.51	-174.19	0.06	-0.06	-0.22
7,319.00	0.54	162.71	7,313.76	-174.99	-0.51	-174.98	0.35	0.07	-39.39
7,413.00	0.76	217.08	7,407.76	-175.91	-0.75	-175.90	0.67	0.23	57.84
7,508.00	1.63	141.77	7,502.74	-177.47	-0.30	-177.47	1.70	0.92	-79.27
7,603.00	1.51	127.62	7,597.71	-179.30	1.53	-179.31	0.43	-0.13	-14.89
7,698.00	0.99	149.53	7,692.68	-180.77	2.94	-180.79	0.73	-0.55	23.06
7,793.00	1.36	176.71	7,787.66	-182.60	3.42	-182.62	0.69	0.39	28.61
7,887.00	1.49	188.60	7,881.64	-184.92	3.30	-184.95	0.34	0.14	12.65
7,937.00	0.88	189.64	7,931.62	-185.95	3.14	-185.97	1.22	-1.22	2.08
7,996.00	0.63	196.92	7,990.62	-186.70	2.97	-186.72	0.45	-0.42	12.34
8,044.00	2.00	311.25	8,038.61	-186.40	2.26	-186.42	4.86	2.85	238.19
8,091.00	5.60	334.30	8,085.50	-183.80	0.65	-183.79	8.17	7.66	49.04
8,138.00	11.13	337.83	8,131.98	-177.52	-2.06	-177.50	11.81	11.77	7.51
8,185.00	14.28	345.40	8,177.83	-167.71	-5.23	-167.66	7.57	6.70	16.11
8,233.00	18.08	348.97	8,223.92	-154.67	-8.15	-154.60	8.18	7.92	7.44
8,280.00	21.16	351.81	8,268.19	-139.11	-10.75	-139.02	6.86	6.55	6.04

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8,328.00	24.12	352.88	8,312.49	-120.80	-13.20	-120.69	6.23	6.17	2.23
8,328.63	24.18	352.89	8,313.06	-120.54	-13.24	-120.43	9.62	9.62	1.00
FTP @ 8328.6' MD									
8,375.00	28.64	353.28	8,354.58	-100.07	-15.71	-99.94	9.62	9.62	0.85
8,423.00	33.63	353.10	8,395.65	-75.43	-18.66	-75.28	10.40	10.40	-0.38
8,470.00	37.61	353.87	8,433.85	-48.24	-21.75	-48.07	8.52	8.47	1.64
8,518.00	39.81	357.50	8,471.31	-18.32	-23.99	-18.13	6.58	4.58	7.56
8,565.00	44.24	0.30	8,506.22	13.12	-24.56	13.32	10.23	9.43	5.96
8,613.00	48.98	1.36	8,539.18	47.99	-24.04	48.18	10.00	9.88	2.21
8,660.00	55.80	1.28	8,567.85	85.19	-23.19	85.37	14.51	14.51	-0.17
8,707.00	61.76	0.17	8,592.20	125.36	-22.69	125.54	12.84	12.68	-2.36
8,754.00	67.96	359.03	8,612.16	167.89	-23.00	168.06	13.37	13.19	-2.43
8,803.00	73.64	359.01	8,628.27	214.14	-23.79	214.32	11.59	11.59	-0.04
8,850.00	80.19	359.39	8,638.90	259.89	-24.43	260.07	13.96	13.94	0.81
8,897.00	83.87	0.72	8,645.42	306.42	-24.38	306.61	8.32	7.83	2.83
8,992.00	85.08	1.21	8,654.56	400.97	-22.79	401.13	1.37	1.27	0.52
9,087.00	84.87	0.57	8,662.88	495.59	-21.32	495.74	0.71	-0.22	-0.67
9,182.00	85.65	0.51	8,670.73	590.26	-20.42	590.40	0.82	0.82	-0.06
9,276.00	90.68	1.55	8,673.74	684.17	-18.73	684.29	5.46	5.35	1.11
9,371.00	92.87	3.25	8,670.80	779.03	-14.76	779.12	2.92	2.31	1.79
9,466.00	93.85	3.08	8,665.23	873.72	-9.52	873.77	1.05	1.03	-0.18
9,561.00	91.33	0.98	8,660.94	968.55	-6.16	968.57	3.45	-2.65	-2.21
9,655.00	91.43	0.93	8,658.68	1,062.51	-4.60	1,062.51	0.12	0.11	-0.05
9,750.00	89.84	0.05	8,657.62	1,157.50	-3.79	1,157.49	1.91	-1.67	-0.93
9,845.00	91.02	0.44	8,656.91	1,252.49	-3.38	1,252.48	1.31	1.24	0.41
9,939.00	89.36	359.22	8,656.60	1,346.48	-3.66	1,346.47	2.19	-1.77	-1.30
10,034.00	89.45	358.73	8,657.59	1,441.46	-5.36	1,441.46	0.52	0.09	-0.52
10,129.00	89.44	358.76	8,658.51	1,536.44	-7.44	1,536.45	0.03	-0.01	0.03
10,224.00	87.78	359.13	8,660.81	1,631.39	-9.19	1,631.41	1.79	-1.75	0.39
10,318.00	86.88	359.41	8,665.19	1,725.28	-10.38	1,725.31	1.00	-0.96	0.30
10,413.00	87.45	359.01	8,669.89	1,820.15	-11.69	1,820.19	0.73	0.60	-0.42
10,508.00	87.97	358.70	8,673.68	1,915.06	-13.59	1,915.10	0.64	0.55	-0.33
10,603.00	88.95	358.67	8,676.24	2,010.00	-15.77	2,010.06	1.03	1.03	-0.03
10,697.00	92.09	1.21	8,675.38	2,103.97	-15.87	2,104.03	4.30	3.34	2.70
10,792.00	92.36	2.55	8,671.70	2,198.85	-12.75	2,198.88	1.44	0.28	1.41
10,887.00	90.54	1.62	8,669.29	2,293.75	-9.30	2,293.75	2.15	-1.92	-0.98
10,982.00	89.78	2.40	8,669.03	2,388.69	-5.97	2,388.66	1.15	-0.80	0.82
11,077.00	87.39	0.26	8,671.37	2,483.62	-3.76	2,483.58	3.38	-2.52	-2.25
11,171.00	86.56	359.22	8,676.33	2,577.49	-4.19	2,577.44	1.41	-0.88	-1.11
11,266.00	87.69	359.09	8,681.10	2,672.36	-5.59	2,672.32	1.20	1.19	-0.14
11,361.00	89.28	359.49	8,683.61	2,767.31	-6.76	2,767.28	1.73	1.67	0.42
11,456.00	90.36	359.95	8,683.91	2,862.31	-7.23	2,862.28	1.24	1.14	0.48
11,551.00	90.97	359.14	8,682.80	2,957.30	-7.98	2,957.27	1.07	0.64	-0.85

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 503H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 3011.20usft (Pioneer 84)
Site:	Admiral Fed Com	MD Reference:	RKB @ 3011.20usft (Pioneer 84)
Well:	503H	North Reference:	Grid
Wellbore:	OH / 66375	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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)
11,645.00	92.56	359.04	8,679.91	3,051.24	-9.47	3,051.22	1.69	1.69	-0.11
11,740.00	91.03	358.76	8,676.93	3,146.17	-11.30	3,146.16	1.64	-1.61	-0.29
11,835.00	90.85	359.16	8,675.38	3,241.14	-13.02	3,241.15	0.46	-0.19	0.42
11,930.00	91.67	358.41	8,673.29	3,336.10	-15.03	3,336.11	1.17	0.86	-0.79
12,024.00	90.39	359.79	8,671.60	3,430.07	-16.51	3,430.09	2.00	-1.36	1.47
12,120.00	90.05	0.28	8,671.23	3,526.07	-16.45	3,526.09	0.62	-0.35	0.51
12,214.00	92.19	359.78	8,669.39	3,620.04	-16.40	3,620.06	2.34	2.28	-0.53
12,309.00	89.32	0.95	8,668.14	3,715.02	-15.80	3,715.03	3.26	-3.02	1.23
12,404.00	87.97	0.37	8,670.39	3,809.98	-14.70	3,809.98	1.55	-1.42	-0.61
12,499.00	88.37	359.93	8,673.42	3,904.94	-14.45	3,904.93	0.63	0.42	-0.46
12,594.00	89.79	0.53	8,674.94	3,999.92	-14.07	3,999.91	1.62	1.49	0.63
12,688.00	89.88	359.05	8,675.22	4,093.92	-14.42	4,093.90	1.58	0.10	-1.57
12,783.00	92.07	0.23	8,673.60	4,188.89	-15.01	4,188.88	2.62	2.31	1.24
12,878.00	89.81	358.84	8,672.04	4,283.87	-15.79	4,283.86	2.79	-2.38	-1.46
12,973.00	90.09	359.93	8,672.12	4,378.86	-16.80	4,378.86	1.18	0.29	1.15
13,068.00	92.39	0.77	8,670.07	4,473.83	-16.22	4,473.82	2.58	2.42	0.88
13,162.00	88.46	1.36	8,669.37	4,567.79	-14.48	4,567.77	4.23	-4.18	0.63
13,257.00	87.06	0.83	8,673.08	4,662.70	-12.66	4,662.66	1.58	-1.47	-0.56
13,352.00	87.85	0.66	8,677.30	4,757.60	-11.43	4,757.54	0.85	0.83	-0.18
13,447.00	88.92	0.47	8,679.98	4,852.55	-10.49	4,852.49	1.14	1.13	-0.20
13,541.00	90.34	0.19	8,680.59	4,946.55	-9.95	4,946.47	1.54	1.51	-0.30
13,636.00	92.22	0.31	8,678.46	5,041.52	-9.54	5,041.44	1.98	1.98	0.13
13,731.00	89.72	359.81	8,676.86	5,136.50	-9.44	5,136.41	2.68	-2.63	-0.53
13,826.00	89.25	358.09	8,677.71	5,231.47	-11.18	5,231.40	1.88	-0.49	-1.81
13,919.00	90.34	357.70	8,678.04	5,324.41	-14.60	5,324.36	1.24	1.17	-0.42
14,014.00	88.52	353.68	8,678.99	5,419.11	-21.73	5,419.12	4.64	-1.92	-4.23
14,109.00	89.86	354.34	8,680.33	5,513.58	-31.64	5,513.66	1.57	1.41	0.69
14,204.00	91.42	356.11	8,679.27	5,608.24	-39.55	5,608.38	2.48	1.64	1.86
14,298.00	90.35	358.35	8,677.82	5,702.11	-44.09	5,702.28	2.64	-1.14	2.38
14,393.00	91.30	357.61	8,676.45	5,797.04	-47.44	5,797.23	1.27	1.00	-0.78
14,488.00	91.28	357.75	8,674.31	5,891.94	-51.29	5,892.16	0.15	-0.02	0.15
14,583.00	90.73	359.10	8,672.65	5,986.89	-53.90	5,987.12	1.53	-0.58	1.42
14,678.00	90.53	357.49	8,671.60	6,081.83	-56.72	6,082.09	1.71	-0.21	-1.69
14,773.00	89.71	359.96	8,671.40	6,176.80	-58.84	6,177.07	2.74	-0.86	2.60
14,868.00	90.96	1.65	8,670.85	6,271.79	-57.50	6,272.04	2.21	1.32	1.78
14,963.00	89.74	359.75	8,670.27	6,366.77	-56.34	6,367.02	2.38	-1.28	-2.00
15,058.00	89.98	358.55	8,670.50	6,461.76	-57.75	6,462.01	1.29	0.25	-1.26
15,152.00	90.72	358.40	8,669.92	6,555.72	-60.25	6,555.99	0.80	0.79	-0.16
15,247.00	91.32	358.41	8,668.23	6,650.67	-62.90	6,650.96	0.63	0.63	0.01
15,342.00	92.84	358.42	8,664.78	6,745.57	-65.52	6,745.88	1.60	1.60	0.01
15,437.00	91.42	359.47	8,661.25	6,840.48	-67.27	6,840.80	1.86	-1.49	1.11
15,532.00	90.10	1.31	8,659.99	6,935.47	-66.62	6,935.78	2.38	-1.39	1.94
15,627.00	89.43	2.45	8,660.38	7,030.41	-63.51	7,030.69	1.39	-0.71	1.20

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 503H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 3011.20usft (Pioneer 84)
Site:	Admiral Fed Com	MD Reference:	RKB @ 3011.20usft (Pioneer 84)
Well:	503H	North Reference:	Grid
Wellbore:	OH / 66375	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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)
15,722.00	90.59	2.54	8,660.37	7,125.32	-59.37	7,125.57	1.22	1.22	0.09
15,816.00	88.59	3.42	8,661.04	7,219.19	-54.48	7,219.39	2.32	-2.13	0.94
15,911.00	88.49	4.10	8,663.46	7,313.95	-48.26	7,314.10	0.72	-0.11	0.72
16,006.00	86.37	3.49	8,667.72	7,408.64	-41.98	7,408.74	2.32	-2.23	-0.64
16,101.00	86.27	2.77	8,673.82	7,503.30	-36.80	7,503.36	0.76	-0.11	-0.76
16,195.00	85.96	2.84	8,680.19	7,596.97	-32.21	7,596.99	0.34	-0.33	0.07
16,290.00	85.81	359.42	8,687.00	7,691.70	-30.34	7,691.70	3.59	-0.16	-3.60
16,385.00	86.68	358.66	8,693.23	7,786.48	-31.93	7,786.49	1.21	0.92	-0.80
16,480.00	87.82	358.35	8,697.78	7,881.33	-34.40	7,881.36	1.24	1.20	-0.33
16,575.00	90.20	358.99	8,699.43	7,976.29	-36.61	7,976.33	2.59	2.51	0.67
16,670.00	91.47	358.32	8,698.04	8,071.25	-38.84	8,071.30	1.51	1.34	-0.71
16,764.00	92.85	358.01	8,694.50	8,165.13	-41.85	8,165.21	1.50	1.47	-0.33
16,859.00	91.77	358.46	8,690.67	8,260.01	-44.77	8,260.10	1.23	-1.14	0.47
16,954.00	91.56	358.61	8,687.91	8,354.94	-47.20	8,355.05	0.27	-0.22	0.16
17,049.00	90.66	359.95	8,686.07	8,449.91	-48.39	8,450.03	1.70	-0.95	1.41
17,144.00	90.27	0.45	8,685.30	8,544.90	-48.06	8,545.02	0.67	-0.41	0.53
17,239.00	89.02	359.03	8,685.89	8,639.90	-48.49	8,640.01	1.99	-1.32	-1.49
17,334.00	90.34	358.94	8,686.42	8,734.88	-50.17	8,735.00	1.39	1.39	-0.09
17,429.00	91.40	358.67	8,684.97	8,829.84	-52.15	8,829.98	1.15	1.12	-0.28
17,524.00	92.50	358.41	8,681.74	8,924.76	-54.57	8,924.91	1.19	1.16	-0.27
17,618.00	91.76	359.68	8,678.25	9,018.68	-56.14	9,018.84	1.56	-0.79	1.35
17,713.00	89.71	0.10	8,677.03	9,113.66	-56.32	9,113.82	2.20	-2.16	0.44
17,808.00	89.63	359.96	8,677.58	9,208.66	-56.27	9,208.82	0.17	-0.08	-0.15
17,902.00	86.33	0.09	8,680.89	9,302.59	-56.23	9,302.74	3.51	-3.51	0.14
17,997.00	87.21	0.03	8,686.24	9,397.44	-56.13	9,397.59	0.93	0.93	-0.06
18,092.00	88.84	359.62	8,689.52	9,492.38	-56.42	9,492.53	1.77	1.72	-0.43
18,187.00	89.34	358.48	8,691.02	9,587.35	-58.00	9,587.51	1.31	0.53	-1.20
18,282.00	90.55	357.84	8,691.12	9,682.30	-61.05	9,682.48	1.44	1.27	-0.67
18,377.00	87.93	356.92	8,692.38	9,777.18	-65.39	9,777.39	2.92	-2.76	-0.97
18,472.00	88.53	357.79	8,695.31	9,872.03	-69.77	9,872.28	1.11	0.63	0.92
18,567.00	89.97	357.59	8,696.55	9,966.95	-73.60	9,967.22	1.53	1.52	-0.21
18,661.00	90.93	356.68	8,695.82	10,060.82	-78.30	10,061.13	1.41	1.02	-0.97
18,756.00	92.70	356.33	8,692.81	10,155.60	-84.08	10,155.94	1.90	1.86	-0.37
18,851.00	94.12	356.18	8,687.16	10,250.22	-90.28	10,250.62	1.50	1.49	-0.16
18,888.00	94.63	356.02	8,684.33	10,287.03	-92.79	10,287.44	1.44	1.38	-0.43
Final Phoenix MWD Survey									
18,895.92	94.63	356.02	8,683.69	10,294.91	-93.34	10,295.32	0.00	0.00	0.00
LTP @ 18896' MD									
18,945.00	94.63	356.02	8,679.73	10,343.71	-96.73	10,344.15	0.00	0.00	0.00
Projection @ TD									

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 503H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 3011.20usft (Pioneer 84)
Site:	Admiral Fed Com	MD Reference:	RKB @ 3011.20usft (Pioneer 84)
Well:	503H	North Reference:	Grid
Wellbore:	OH / 66375	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
597.00	596.94	-2.36	-6.13	Tie In
697.00	696.94	-2.11	-6.65	First Phoenix MWD Survey
8,328.63	8,313.06	-120.54	-13.24	FTP @ 8328.6' MD
18,888.00	8,684.33	10,287.03	-92.79	Final Phoenix MWD Survey
18,895.92	8,683.69	10,294.91	-93.34	LTP @ 18896' MD
18,945.00	8,679.73	10,343.71	-96.73	Projection @ TD