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Directional Survey**

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DISTRICT II-ARTESIA O.C.D.

COG OPERATING, LLC

Eddy County, NM (NAD27) NMEZ

Myox 21 State COM

#51H

30-015-44680

OH

Design: OH

Standard Survey Report

01 May, 2018

Survey Report

Company: COG OPERATING, LLC
Project: Eddy County, NM (NAD27) NMEZ
Site: Myox 21 State COM
Well: #51H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #51H
TVD Reference: RKB @ 3014.20usft (Latshaw 44 - KB=25')
MD Reference: RKB @ 3014.20usft (Latshaw 44 - KB=25')
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.14 Single User Db

Project	Eddy County, NM (NAD27) NMEZ		
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	Myox 21 State COM		
Site Position:		Northing:	403,283.40 usft
From:	Map	Easting:	572,642.90 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 6' 30.690 N
		Longitude:	104° 5' 55.395 W
		Grid Convergence:	0.12 °

Well	#51H		
Well Position	+N/-S	0.00 usft	Northing: 403,784.88 usft
	+E/-W	0.00 usft	Easting: 573,058.41 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 6' 35.644 N
		Longitude:	104° 5' 50.552 W
		Ground Level:	2,989.20 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	03/20/18	7.11
		Dip Angle (°)	59.86
		Field Strength (nT)	47,761.68688571

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
		Direction (°)	359.50

Survey Program	Date 05/01/18		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.00	9,464.00	Survey #1 - Gyro (OH)	GYD_DP_MS
9,639.00	20,009.00	Survey #2 - VON MWD (OH)	MWD
20,068.00	20,068.00	Survey #3 - PTB (OH)	Projection
			Description
			Gyrodata gyro-compassing and drop
			MWD v3:standard declination
			Projection

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
SHL(M21SCOM#51H)									
9.41	0.04	209.12	9.41	0.00	0.00	0.00	0.40	0.40	0.00
O-MC#8H									
16.42	0.07	209.12	16.42	-0.01	0.00	-0.01	0.40	0.40	0.00
O-MC #9H									
20.77	0.08	209.12	20.77	-0.01	-0.01	-0.01	0.40	0.40	0.00
O-MC #1H									
25.26	0.10	209.12	25.26	-0.02	-0.01	-0.02	0.40	0.40	0.00

Survey Report

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Project:	Eddy County, NM (NAD27) NMEZ	TVD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Site:	Myox 21 State COM	MD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Well:	#51H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14 Single User Db

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)
O-MC #33H									
25.35	0.10	209.12	25.35	-0.02	-0.01	-0.02	0.40	0.40	0.00
O-MC #31H									
26.23	0.10	209.12	26.23	-0.02	-0.01	-0.02	0.00	0.00	0.00
O-MC #32H									
100.00	0.40	209.12	100.00	-0.30	-0.17	-0.30	0.40	0.40	0.00
125.00	0.36	214.58	125.00	-0.45	-0.26	-0.44	0.22	-0.16	21.84
150.00	0.36	227.33	150.00	-0.56	-0.36	-0.56	0.32	0.00	51.00
175.00	0.44	215.91	175.00	-0.69	-0.47	-0.69	0.45	0.32	-45.68
200.00	0.45	208.99	200.00	-0.86	-0.58	-0.85	0.22	0.04	-27.68
225.00	0.50	193.83	225.00	-1.05	-0.65	-1.04	0.54	0.20	-60.64
250.00	0.81	172.44	249.99	-1.33	-0.65	-1.33	1.56	1.24	-85.56
275.00	1.04	160.73	274.99	-1.72	-0.56	-1.72	1.19	0.92	-46.84
300.00	1.34	157.43	299.99	-2.20	-0.37	-2.20	1.23	1.20	-13.20
325.00	1.68	151.45	324.98	-2.80	-0.08	-2.80	1.50	1.36	-23.92
350.00	2.15	145.36	349.96	-3.50	0.36	-3.51	2.05	1.88	-24.36
375.00	2.44	142.56	374.94	-4.31	0.95	-4.32	1.24	1.16	-11.20
400.00	2.48	141.40	399.92	-5.16	1.61	-5.17	0.26	0.16	-4.64
425.00	2.46	141.22	424.90	-6.00	2.29	-6.02	0.09	-0.08	-0.72
450.00	2.62	143.48	449.87	-6.88	2.96	-6.90	0.75	0.64	9.04
475.00	2.57	142.64	474.85	-7.78	3.64	-7.81	0.25	-0.20	-3.36
500.00	2.60	142.20	499.82	-8.67	4.33	-8.71	0.14	0.12	-1.76
525.00	2.64	142.35	524.79	-9.58	5.03	-9.62	0.16	0.16	0.60
550.00	2.46	141.48	549.77	-10.45	5.71	-10.50	0.74	-0.72	-3.48
575.00	2.31	140.18	574.75	-11.26	6.37	-11.32	0.64	-0.60	-5.20
600.00	2.23	141.07	599.73	-12.03	7.00	-12.09	0.35	-0.32	3.56
625.00	2.07	140.25	624.71	-12.75	7.59	-12.82	0.65	-0.64	-3.28
650.00	2.05	140.57	649.70	-13.44	8.17	-13.51	0.09	-0.08	1.28
675.00	1.95	140.91	674.68	-14.12	8.72	-14.20	0.40	-0.40	1.36
700.00	1.47	132.50	699.67	-14.67	9.22	-14.75	2.16	-1.92	-33.64
725.00	0.86	71.69	724.66	-14.82	9.64	-14.91	5.16	-2.44	-243.24
750.00	0.93	50.25	749.66	-14.64	9.97	-14.72	1.36	0.28	-85.76
775.00	1.03	37.13	774.66	-14.33	10.26	-14.42	0.98	0.40	-52.48
800.00	1.09	29.93	799.65	-13.94	10.52	-14.03	0.58	0.24	-28.80
825.00	1.08	28.10	824.65	-13.53	10.75	-13.62	0.14	-0.04	-7.32
850.00	1.06	20.85	849.64	-13.10	10.94	-13.20	0.55	-0.08	-29.00
875.00	1.03	21.60	874.64	-12.68	11.11	-12.77	0.13	-0.12	3.00
900.00	1.04	23.56	899.64	-12.26	11.28	-12.36	0.15	0.04	7.84
925.00	1.05	16.77	924.63	-11.83	11.44	-11.93	0.50	0.04	-27.16
950.00	1.00	18.41	949.63	-11.41	11.57	-11.51	0.23	-0.20	6.56
975.00	1.05	16.00	974.62	-10.98	11.70	-11.08	0.26	0.20	-9.64
1,000.00	0.96	17.06	999.62	-10.56	11.83	-10.66	0.37	-0.36	4.24
1,025.00	1.01	15.98	1,024.62	-10.15	11.95	-10.25	0.21	0.20	-4.32

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Well:	#51H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14 Single User Db

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)
1,050.00	0.87	15.44	1,049.61	-9.75	12.06	-9.86	0.56	-0.56	-2.16
1,075.00	0.78	14.88	1,074.61	-9.41	12.15	-9.51	0.36	-0.36	-2.24
1,100.00	0.86	13.87	1,099.61	-9.06	12.24	-9.17	0.33	0.32	-4.04
1,125.00	0.86	9.99	1,124.61	-8.69	12.32	-8.80	0.23	0.00	-15.52
1,150.00	0.83	14.26	1,149.60	-8.33	12.40	-8.44	0.28	-0.12	17.08
1,175.00	0.80	15.75	1,174.60	-7.99	12.49	-8.10	0.15	-0.12	5.96
1,200.00	0.89	8.71	1,199.60	-7.63	12.57	-7.74	0.55	0.36	-28.16
1,225.00	0.82	351.32	1,224.59	-7.26	12.57	-7.37	1.07	-0.28	-69.56
1,250.00	0.89	322.52	1,249.59	-6.93	12.42	-7.04	1.72	0.28	-115.20
1,275.00	1.05	308.72	1,274.59	-6.63	12.13	-6.74	1.13	0.64	-55.20
1,300.00	1.18	311.72	1,299.58	-6.32	11.76	-6.42	0.57	0.52	12.00
1,325.00	1.20	313.17	1,324.58	-5.97	11.37	-6.07	0.14	0.08	5.80
1,350.00	1.15	313.56	1,349.57	-5.62	11.00	-5.71	0.20	-0.20	1.56
1,375.00	1.15	312.46	1,374.57	-5.27	10.63	-5.37	0.09	0.00	-4.40
1,400.00	1.11	313.67	1,399.56	-4.94	10.27	-5.03	0.19	-0.16	4.84
1,425.00	1.12	313.29	1,424.56	-4.60	9.92	-4.69	0.05	0.04	-1.52
1,450.00	1.14	311.75	1,449.55	-4.27	9.56	-4.35	0.15	0.08	-6.16
1,475.00	1.19	314.06	1,474.55	-3.92	9.19	-4.00	0.27	0.20	9.24
1,500.00	1.20	311.07	1,499.54	-3.57	8.80	-3.65	0.25	0.04	-11.96
1,525.00	1.12	312.20	1,524.54	-3.23	8.42	-3.31	0.33	-0.32	4.52
1,550.00	1.12	310.23	1,549.53	-2.91	8.06	-2.98	0.15	0.00	-7.88
1,575.00	1.12	309.22	1,574.53	-2.60	7.68	-2.67	0.08	0.00	-4.04
1,600.00	1.13	306.04	1,599.52	-2.30	7.29	-2.36	0.25	0.04	-12.72
1,625.00	1.15	304.19	1,624.52	-2.01	6.88	-2.07	0.17	0.08	-7.40
1,650.00	1.20	305.41	1,649.51	-1.72	6.46	-1.78	0.22	0.20	4.88
1,675.00	1.16	302.37	1,674.51	-1.43	6.04	-1.49	0.30	-0.16	-12.16
1,700.00	1.03	299.31	1,699.50	-1.19	5.63	-1.24	0.57	-0.52	-12.24
1,725.00	0.98	296.75	1,724.50	-0.98	5.24	-1.03	0.27	-0.20	-10.24
1,750.00	1.03	299.39	1,749.50	-0.78	4.85	-0.82	0.27	0.20	10.56
1,775.00	1.06	299.53	1,774.49	-0.55	4.46	-0.59	0.12	0.12	0.56
1,800.00	0.98	297.66	1,799.49	-0.34	4.07	-0.37	0.35	-0.32	-7.48
1,825.00	0.92	296.82	1,824.48	-0.15	3.70	-0.18	0.25	-0.24	-3.36
1,850.00	0.89	292.88	1,849.48	0.02	3.34	-0.01	0.28	-0.12	-15.76
1,875.00	0.97	295.00	1,874.48	0.18	2.97	0.16	0.35	0.32	8.48
1,900.00	0.91	300.36	1,899.47	0.37	2.61	0.35	0.43	-0.24	21.44
1,925.00	0.91	295.72	1,924.47	0.56	2.25	0.54	0.29	0.00	-18.56
1,950.00	0.90	296.36	1,949.47	0.73	1.90	0.72	0.06	-0.04	2.56
1,975.00	0.95	297.24	1,974.46	0.91	1.54	0.90	0.21	0.20	3.52
2,000.00	0.93	298.28	1,999.46	1.11	1.18	1.09	0.11	-0.08	4.16
2,025.00	1.00	294.48	2,024.46	1.29	0.80	1.28	0.38	0.28	-15.20
2,050.00	1.11	291.33	2,049.45	1.47	0.38	1.47	0.50	0.44	-12.60
2,075.00	1.55	291.40	2,074.45	1.68	-0.16	1.68	1.76	1.76	0.28
2,100.00	1.61	292.10	2,099.44	1.94	-0.80	1.94	0.25	0.24	2.80
2,125.00	1.55	292.87	2,124.43	2.20	-1.44	2.21	0.25	-0.24	3.08

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well #51H
Project:	Eddy County, NM (NAD27) NMEZ	TVD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Site:	Myox 21 State COM	MD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Well:	#51H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14 Single User Db

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)
2,150.00	1.57	294.57	2,149.42	2.47	-2.06	2.49	0.20	0.08	6.80
2,175.00	1.57	291.16	2,174.41	2.74	-2.70	2.76	0.37	0.00	-13.64
2,200.00	1.44	288.26	2,199.40	2.96	-3.31	2.99	0.60	-0.52	-11.60
2,225.00	1.31	284.26	2,224.39	3.13	-3.89	3.17	0.65	-0.52	-16.00
2,250.00	1.31	287.01	2,249.39	3.29	-4.44	3.32	0.25	0.00	11.00
2,275.00	1.18	286.96	2,274.38	3.44	-4.96	3.49	0.52	-0.52	-0.20
2,300.00	1.16	287.06	2,299.38	3.59	-5.45	3.64	0.08	-0.08	0.40
2,325.00	1.15	268.93	2,324.37	3.66	-5.94	3.71	1.46	-0.04	-72.52
2,350.00	1.50	241.04	2,349.36	3.50	-6.48	3.56	2.89	1.40	-111.56
2,375.00	1.70	231.61	2,374.35	3.11	-7.05	3.17	1.32	0.80	-37.72
2,400.00	1.83	227.89	2,399.34	2.61	-7.64	2.68	0.69	0.52	-14.88
2,425.00	1.82	228.47	2,424.33	2.08	-8.23	2.15	0.08	-0.04	2.32
2,450.00	1.72	229.77	2,449.32	1.58	-8.82	1.65	0.43	-0.40	5.20
2,475.00	1.86	228.20	2,474.31	1.06	-9.41	1.15	0.59	0.56	-6.28
2,500.00	1.63	229.36	2,499.29	0.56	-9.98	0.65	0.93	-0.92	4.64
2,525.00	1.58	227.76	2,524.28	0.10	-10.50	0.19	0.27	-0.20	-6.40
2,550.00	1.58	225.22	2,549.27	-0.38	-11.00	-0.28	0.28	0.00	-10.16
2,575.00	1.55	226.46	2,574.27	-0.85	-11.49	-0.75	0.18	-0.12	4.96
2,600.00	1.56	224.75	2,599.26	-1.33	-11.98	-1.22	0.19	0.04	-6.84
2,625.00	1.54	224.45	2,624.25	-1.81	-12.45	-1.70	0.09	-0.08	-1.20
2,650.00	1.51	224.67	2,649.24	-2.28	-12.92	-2.17	0.12	-0.12	0.88
2,675.00	1.53	225.23	2,674.23	-2.75	-13.39	-2.63	0.10	0.08	2.24
2,700.00	1.48	224.00	2,699.22	-3.22	-13.85	-3.10	0.24	-0.20	-4.92
2,725.00	1.46	222.54	2,724.21	-3.69	-14.29	-3.56	0.17	-0.08	-5.84
2,750.00	1.36	221.92	2,749.21	-4.14	-14.70	-4.01	0.40	-0.40	-2.48
2,775.00	1.34	222.56	2,774.20	-4.58	-15.10	-4.44	0.10	-0.08	2.56
2,800.00	1.32	223.33	2,799.19	-5.00	-15.49	-4.87	0.11	-0.08	3.08
2,825.00	1.32	222.95	2,824.18	-5.42	-15.89	-5.28	0.04	0.00	-1.52
2,850.00	1.35	224.28	2,849.18	-5.84	-16.29	-5.70	0.17	0.12	5.32
2,875.00	1.39	225.92	2,874.17	-6.27	-16.71	-6.12	0.22	0.16	6.56
2,900.00	1.43	224.36	2,899.16	-6.70	-17.15	-6.55	0.22	0.16	-6.24
2,925.00	1.35	227.86	2,924.16	-7.12	-17.58	-6.97	0.47	-0.32	14.00
2,950.00	1.33	224.77	2,949.15	-7.52	-18.01	-7.37	0.30	-0.08	-12.36
2,975.00	1.28	224.93	2,974.14	-7.93	-18.41	-7.77	0.20	-0.20	0.64
3,000.00	1.36	239.99	2,999.14	-8.27	-18.86	-8.11	1.42	0.32	60.24
3,025.00	1.45	250.48	3,024.13	-8.53	-19.42	-8.36	1.09	0.36	41.96
3,050.00	1.51	255.67	3,049.12	-8.71	-20.04	-8.54	0.59	0.24	20.76
3,075.00	1.49	256.67	3,074.11	-8.87	-20.67	-8.69	0.13	-0.08	4.00
3,100.00	1.50	257.78	3,099.10	-9.01	-21.31	-8.83	0.12	0.04	4.44
3,125.00	1.41	255.49	3,124.10	-9.16	-21.92	-8.97	0.43	-0.36	-9.16
3,150.00	1.52	251.58	3,149.09	-9.34	-22.54	-9.15	0.59	0.44	-15.64
3,175.00	1.54	255.02	3,174.08	-9.53	-23.18	-9.33	0.38	0.08	13.76
3,200.00	1.54	256.79	3,199.07	-9.70	-23.83	-9.49	0.19	0.00	7.08

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well #51H
Project:	Eddy County, NM (NAD27) NMEZ	TVD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Site:	Myox 21 State COM	MD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Well:	#51H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14 Single User Db

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)
3,225.00	1.53	255.66	3,224.06	-9.86	-24.48	-9.64	0.13	-0.04	-4.52
3,250.00	1.59	255.27	3,249.05	-10.03	-25.14	-9.81	0.24	0.24	-1.56
3,275.00	1.60	260.84	3,274.04	-10.17	-25.82	-9.95	0.62	0.04	22.28
3,300.00	1.62	254.68	3,299.03	-10.32	-26.50	-10.09	0.70	0.08	-24.64
3,325.00	1.66	258.78	3,324.02	-10.49	-27.20	-10.25	0.50	0.16	16.40
3,350.00	1.69	254.08	3,349.01	-10.66	-27.91	-10.41	0.56	0.12	-18.80
3,375.00	1.74	255.28	3,374.00	-10.85	-28.63	-10.60	0.25	0.20	4.80
3,400.00	1.76	254.85	3,398.99	-11.05	-29.37	-10.79	0.10	0.08	-1.72
3,425.00	1.77	256.90	3,423.98	-11.24	-30.11	-10.98	0.26	0.04	8.20
3,450.00	1.73	258.80	3,448.96	-11.40	-30.86	-11.13	0.28	-0.16	7.60
3,475.00	1.76	257.06	3,473.95	-11.56	-31.60	-11.28	0.24	0.12	-6.96
3,500.00	1.78	254.08	3,498.94	-11.75	-32.35	-11.47	0.38	0.08	-11.92
3,525.00	1.74	256.73	3,523.93	-11.95	-33.09	-11.66	0.36	-0.16	10.60
3,550.00	1.81	255.94	3,548.92	-12.13	-33.85	-11.83	0.30	0.28	-3.16
3,575.00	1.76	255.46	3,573.90	-12.32	-34.60	-12.02	0.21	-0.20	-1.92
3,600.00	1.83	255.90	3,598.89	-12.51	-35.36	-12.20	0.29	0.28	1.76
3,625.00	1.81	259.08	3,623.88	-12.69	-36.14	-12.37	0.41	-0.08	12.72
3,650.00	1.82	255.56	3,648.87	-12.86	-36.91	-12.54	0.45	0.04	-14.08
3,675.00	1.81	259.11	3,673.85	-13.03	-37.68	-12.70	0.45	-0.04	14.20
3,700.00	1.78	255.22	3,698.84	-13.21	-38.44	-12.87	0.50	-0.12	-15.56
3,725.00	1.79	257.26	3,723.83	-13.39	-39.20	-13.05	0.26	0.04	8.16
3,750.00	1.73	256.83	3,748.82	-13.56	-39.95	-13.22	0.25	-0.24	-1.72
3,775.00	1.72	254.00	3,773.81	-13.75	-40.68	-13.40	0.34	-0.04	-11.32
3,800.00	1.82	255.81	3,798.80	-13.95	-41.42	-13.59	0.46	0.40	7.24
3,825.00	1.81	258.43	3,823.78	-14.13	-42.19	-13.76	0.33	-0.04	10.48
3,850.00	1.73	257.89	3,848.77	-14.29	-42.95	-13.91	0.33	-0.32	-2.16
3,875.00	1.80	258.11	3,873.76	-14.45	-43.70	-14.07	0.28	0.28	0.88
3,900.00	1.73	255.79	3,898.75	-14.62	-44.45	-14.23	0.40	-0.28	-9.28
3,925.00	1.80	257.17	3,923.74	-14.80	-45.20	-14.41	0.33	0.28	5.52
3,950.00	1.84	256.27	3,948.72	-14.99	-45.97	-14.58	0.20	0.16	-3.60
3,975.00	1.78	256.15	3,973.71	-15.17	-46.74	-14.76	0.24	-0.24	-0.48
4,000.00	1.75	255.97	3,998.70	-15.36	-47.49	-14.94	0.12	-0.12	-0.72
4,025.00	1.64	257.99	4,023.69	-15.53	-48.21	-15.10	0.50	-0.44	8.08
4,050.00	1.18	258.86	4,048.68	-15.65	-48.81	-15.22	1.84	-1.84	3.48
4,075.00	1.11	259.90	4,073.67	-15.74	-49.30	-15.31	0.29	-0.28	4.16
4,100.00	1.01	259.35	4,098.67	-15.83	-49.76	-15.39	0.40	-0.40	-2.20
4,125.00	0.98	247.78	4,123.67	-15.95	-50.17	-15.51	0.81	-0.12	-46.28
4,150.00	1.24	219.29	4,148.66	-16.24	-50.54	-15.80	2.41	1.04	-113.96
4,175.00	1.50	202.98	4,173.66	-16.75	-50.84	-16.30	1.86	1.04	-65.24
4,200.00	1.49	202.54	4,198.65	-17.35	-51.09	-16.90	0.06	-0.04	-1.76
4,225.00	1.62	200.91	4,223.64	-17.98	-51.34	-17.53	0.55	0.52	-6.52
4,250.00	1.63	202.61	4,248.63	-18.64	-51.60	-18.19	0.20	0.04	6.80
4,275.00	1.48	205.66	4,273.62	-19.26	-51.88	-18.80	0.69	-0.60	12.20

Survey Report

Company: COG OPERATING, LLC
 Project: Eddy County, NM (NAD27) NMEZ
 Site: Myox 21 State COM
 Well: #51H
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Well #51H
 TVD Reference: RKB @ 3014.20usft (Latshaw 44 - KB=25')
 MD Reference: RKB @ 3014.20usft (Latshaw 44 - KB=25')
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000.14 Single User Db

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)
4,300.00	1.54	201.89	4,298.61	-19.86	-52.15	-19.40	0.46	0.24	-15.08
4,325.00	1.63	200.12	4,323.60	-20.51	-52.39	-20.05	0.41	0.36	-7.08
4,350.00	1.81	198.18	4,348.59	-21.21	-52.64	-20.75	0.76	0.72	-7.76
4,375.00	1.69	200.63	4,373.58	-21.93	-52.89	-21.47	0.57	-0.48	9.80
4,400.00	1.39	205.20	4,398.57	-22.55	-53.15	-22.09	1.30	-1.20	18.28
4,425.00	1.12	211.82	4,423.56	-23.04	-53.41	-22.57	1.22	-1.08	26.48
4,450.00	1.03	215.09	4,448.56	-23.43	-53.67	-22.96	0.44	-0.36	13.08
4,475.00	0.98	217.43	4,473.55	-23.78	-53.93	-23.31	0.26	-0.20	9.36
4,500.00	1.00	216.20	4,498.55	-24.13	-54.18	-23.65	0.12	0.08	-4.92
4,525.00	0.97	218.19	4,523.55	-24.47	-54.44	-23.99	0.18	-0.12	7.96
4,550.00	0.94	220.21	4,548.54	-24.79	-54.71	-24.31	0.18	-0.12	8.08
4,575.00	0.91	222.49	4,573.54	-25.10	-54.97	-24.61	0.19	-0.12	9.12
4,600.00	1.07	221.38	4,598.54	-25.42	-55.26	-24.93	0.64	0.64	-4.44
4,625.00	1.02	220.97	4,623.53	-25.76	-55.56	-25.27	0.20	-0.20	-1.64
4,650.00	0.98	224.01	4,648.53	-26.08	-55.86	-25.59	0.27	-0.16	12.16
4,675.00	1.02	224.53	4,673.52	-26.39	-56.16	-25.90	0.16	0.16	2.08
4,700.00	0.95	224.56	4,698.52	-26.70	-56.46	-26.21	0.28	-0.28	0.12
4,725.00	1.04	220.54	4,723.52	-27.02	-56.76	-26.52	0.46	0.36	-16.08
4,750.00	1.07	225.18	4,748.51	-27.36	-57.07	-26.86	0.36	0.12	18.56
4,775.00	1.00	222.14	4,773.51	-27.68	-57.38	-27.18	0.36	-0.28	-12.16
4,800.00	1.05	222.12	4,798.50	-28.02	-57.68	-27.51	0.20	0.20	-0.08
4,825.00	0.99	220.39	4,823.50	-28.35	-57.97	-27.84	0.27	-0.24	-6.92
4,850.00	1.01	218.48	4,848.50	-28.69	-58.25	-28.18	0.16	0.08	-7.64
4,875.00	1.00	219.46	4,873.49	-29.03	-58.53	-28.52	0.08	-0.04	3.92
4,900.00	1.04	221.78	4,898.49	-29.37	-58.82	-28.85	0.23	0.16	9.28
4,925.00	1.00	219.38	4,923.48	-29.70	-59.11	-29.19	0.23	-0.16	-9.60
4,950.00	1.04	212.66	4,948.48	-30.06	-59.37	-29.54	0.50	0.16	-26.88
4,975.00	1.05	214.32	4,973.48	-30.44	-59.62	-29.92	0.13	0.04	6.64
5,000.00	1.06	214.94	4,998.47	-30.82	-59.88	-30.30	0.06	0.04	2.48
5,025.00	1.04	217.08	5,023.47	-31.19	-60.15	-30.67	0.18	-0.08	8.56
5,050.00	1.00	215.83	5,048.46	-31.55	-60.41	-31.02	0.18	-0.16	-5.00
5,075.00	1.05	219.13	5,073.46	-31.90	-60.69	-31.37	0.31	0.20	13.20
5,100.00	0.96	218.75	5,098.46	-32.25	-60.96	-31.71	0.36	-0.36	-1.52
5,125.00	1.01	220.54	5,123.45	-32.58	-61.24	-32.04	0.23	0.20	7.16
5,150.00	1.03	214.19	5,148.45	-32.93	-61.51	-32.39	0.46	0.08	-25.40
5,175.00	1.05	214.80	5,173.44	-33.30	-61.76	-32.76	0.09	0.08	2.44
5,200.00	1.22	218.60	5,198.44	-33.70	-62.06	-33.16	0.74	0.68	15.20
5,225.00	1.03	210.79	5,223.43	-34.10	-62.34	-33.56	0.97	-0.76	-31.24
5,250.00	1.07	213.66	5,248.43	-34.49	-62.59	-33.94	0.26	0.16	11.48
5,275.00	1.03	217.19	5,273.43	-34.86	-62.85	-34.31	0.30	-0.16	14.12
5,300.00	1.03	208.42	5,298.42	-35.24	-63.09	-34.69	0.63	0.00	-35.08
5,325.00	1.14	214.73	5,323.42	-35.64	-63.34	-35.09	0.65	0.44	25.24
5,350.00	1.16	212.59	5,348.41	-36.06	-63.62	-35.50	0.19	0.08	-8.56
5,375.00	1.06	215.77	5,373.41	-36.46	-63.89	-35.90	0.47	-0.40	12.72

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well #51H
Project:	Eddy County, NM (NAD27) NMEZ	TVD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Site:	Myox 21 State COM	MD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Well:	#51H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14 Single User Db

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)
5,400.00	1.13	217.41	5,398.40	-36.84	-64.18	-36.28	0.31	0.28	6.56
5,425.00	1.16	217.18	5,423.40	-37.24	-64.48	-36.68	0.12	0.12	-0.92
5,450.00	1.07	213.58	5,448.39	-37.64	-64.76	-37.07	0.46	-0.36	-14.40
5,475.00	1.12	212.19	5,473.39	-38.04	-65.02	-37.47	0.23	0.20	-5.56
5,500.00	1.16	216.27	5,498.38	-38.45	-65.30	-37.88	0.36	0.16	16.32
5,525.00	1.22	218.36	5,523.38	-38.86	-65.62	-38.29	0.30	0.24	8.36
5,550.00	1.06	210.19	5,548.37	-39.27	-65.90	-38.69	0.91	-0.64	-32.68
5,575.00	1.07	206.62	5,573.37	-39.68	-66.12	-39.10	0.27	0.04	-14.28
5,600.00	1.21	211.40	5,598.36	-40.11	-66.36	-39.53	0.68	0.56	19.12
5,625.00	1.23	211.82	5,623.36	-40.56	-66.64	-39.98	0.09	0.08	1.68
5,650.00	1.11	207.87	5,648.35	-41.01	-66.89	-40.42	0.58	-0.48	-15.80
5,675.00	1.17	210.25	5,673.35	-41.44	-67.14	-40.85	0.31	0.24	9.52
5,700.00	1.21	211.01	5,698.34	-41.89	-67.40	-41.30	0.17	0.16	3.04
5,725.00	1.20	212.41	5,723.34	-42.34	-67.68	-41.74	0.12	-0.04	5.60
5,750.00	1.16	205.76	5,748.33	-42.78	-67.93	-42.19	0.57	-0.16	-26.60
5,775.00	1.13	209.66	5,773.33	-43.23	-68.16	-42.63	0.33	-0.12	15.60
5,800.00	1.18	205.72	5,798.32	-43.67	-68.39	-43.07	0.38	0.20	-15.76
5,825.00	1.18	212.60	5,823.32	-44.12	-68.64	-43.52	0.57	0.00	27.52
5,850.00	1.17	214.53	5,848.31	-44.55	-68.93	-43.94	0.16	-0.04	7.72
5,875.00	1.18	224.14	5,873.31	-44.94	-69.25	-44.34	0.79	0.04	38.44
5,900.00	1.19	228.32	5,898.30	-45.30	-69.62	-44.69	0.35	0.04	16.72
5,925.00	1.27	232.97	5,923.30	-45.64	-70.04	-45.03	0.51	0.32	18.60
5,950.00	1.20	232.15	5,948.29	-45.97	-70.47	-45.35	0.29	-0.28	-3.28
5,975.00	1.17	231.51	5,973.28	-46.29	-70.87	-45.67	0.13	-0.12	-2.56
6,000.00	1.22	235.88	5,998.28	-46.60	-71.29	-45.97	0.42	0.20	17.48
6,025.00	1.14	236.15	6,023.27	-46.88	-71.72	-46.26	0.32	-0.32	1.08
6,050.00	1.13	232.99	6,048.27	-47.17	-72.12	-46.54	0.25	-0.04	-12.64
6,075.00	1.17	233.82	6,073.26	-47.47	-72.53	-46.83	0.17	0.16	3.32
6,100.00	1.11	239.15	6,098.26	-47.74	-72.94	-47.11	0.49	-0.24	21.32
6,125.00	1.11	241.76	6,123.25	-47.98	-73.36	-47.34	0.20	0.00	10.44
6,150.00	1.22	241.22	6,148.25	-48.23	-73.81	-47.58	0.44	0.44	-2.16
6,175.00	1.10	243.67	6,173.24	-48.46	-74.26	-47.81	0.52	-0.48	9.80
6,200.00	1.12	245.34	6,198.24	-48.67	-74.69	-48.01	0.15	0.08	6.68
6,225.00	0.96	253.63	6,223.24	-48.83	-75.12	-48.17	0.88	-0.64	33.16
6,250.00	0.90	265.00	6,248.23	-48.91	-75.51	-48.24	0.77	-0.24	45.48
6,275.00	0.80	281.78	6,273.23	-48.89	-75.88	-48.22	1.07	-0.40	67.12
6,300.00	0.77	274.60	6,298.23	-48.84	-76.22	-48.17	0.41	-0.12	-28.72
6,325.00	0.83	280.07	6,323.22	-48.79	-76.56	-48.12	0.39	0.24	21.88
6,350.00	0.80	280.60	6,348.22	-48.73	-76.91	-48.06	0.12	-0.12	2.12
6,375.00	0.81	282.89	6,373.22	-48.66	-77.26	-47.98	0.13	0.04	9.16
6,400.00	0.83	280.64	6,398.22	-48.58	-77.61	-47.91	0.15	0.08	-9.00
6,425.00	0.86	281.78	6,423.21	-48.51	-77.97	-47.83	0.14	0.12	4.56
6,450.00	0.82	276.04	6,448.21	-48.46	-78.33	-47.77	0.37	-0.16	-22.96

Survey Report

Company: COG OPERATING, LLC
 Project: Eddy County, NM (NAD27) NMEZ
 Site: Myox 21 State COM
 Well: #51H
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Well #51H
 TVD Reference: RKB @ 3014.20usft (Latshaw 44 - KB=25')
 MD Reference: RKB @ 3014.20usft (Latshaw 44 - KB=25')
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000.14 Single User Db

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)
6,475.00	0.80	281.57	6,473.21	-48.40	-78.68	-47.71	0.32	-0.08	22.12
6,500.00	0.82	269.31	6,498.21	-48.37	-79.03	-47.68	0.70	0.08	-49.04
6,525.00	0.82	243.27	6,523.20	-48.45	-79.37	-47.76	1.48	0.00	-104.16
6,550.00	1.00	233.63	6,548.20	-48.66	-79.70	-47.96	0.94	0.72	-38.56
6,575.00	1.04	230.32	6,573.20	-48.94	-80.05	-48.24	0.28	0.16	-13.24
6,600.00	0.97	227.70	6,598.19	-49.22	-80.38	-48.52	0.33	-0.28	-10.48
6,625.00	1.19	223.49	6,623.19	-49.55	-80.72	-48.85	0.93	0.88	-16.84
6,650.00	1.21	221.20	6,648.18	-49.94	-81.07	-49.23	0.21	0.08	-9.16
6,675.00	1.24	210.51	6,673.18	-50.37	-81.38	-49.66	0.92	0.12	-42.76
6,700.00	1.26	205.51	6,698.17	-50.85	-81.64	-50.14	0.44	0.08	-20.00
6,725.00	1.28	196.25	6,723.17	-51.37	-81.83	-50.65	0.82	0.08	-37.04
6,750.00	1.37	196.24	6,748.16	-51.92	-82.00	-51.21	0.36	0.36	-0.04
6,775.00	1.40	193.84	6,773.15	-52.51	-82.15	-51.79	0.26	0.12	-9.60
6,800.00	1.38	197.22	6,798.14	-53.09	-82.32	-52.37	0.34	-0.08	13.52
6,825.00	1.20	204.03	6,823.14	-53.62	-82.51	-52.90	0.94	-0.72	27.24
6,850.00	1.15	210.22	6,848.13	-54.07	-82.74	-53.35	0.55	-0.20	24.76
6,875.00	1.13	215.56	6,873.13	-54.49	-83.01	-53.77	0.43	-0.08	21.36
6,900.00	1.15	222.93	6,898.12	-54.88	-83.33	-54.15	0.59	0.08	29.48
6,925.00	1.17	227.15	6,923.12	-55.23	-83.69	-54.50	0.35	0.08	16.88
6,950.00	1.29	230.97	6,948.11	-55.58	-84.09	-54.85	0.58	0.48	15.28
6,975.00	1.46	232.87	6,973.10	-55.95	-84.56	-55.21	0.70	0.68	7.60
7,000.00	1.34	235.66	6,998.10	-56.31	-85.06	-55.57	0.55	-0.48	11.16
7,025.00	1.40	234.61	7,023.09	-56.65	-85.55	-55.90	0.26	0.24	-4.20
7,050.00	1.36	240.56	7,048.08	-56.98	-86.06	-56.22	0.59	-0.16	23.80
7,075.00	1.38	243.99	7,073.08	-57.25	-86.59	-56.50	0.34	0.08	13.72
7,100.00	1.42	245.01	7,098.07	-57.52	-87.14	-56.75	0.19	0.16	4.08
7,125.00	1.44	246.66	7,123.06	-57.77	-87.71	-57.00	0.18	0.08	6.60
7,150.00	1.57	250.49	7,148.05	-58.01	-88.32	-57.24	0.66	0.52	15.32
7,175.00	1.79	256.77	7,173.04	-58.21	-89.02	-57.43	1.15	0.88	25.12
7,200.00	1.89	258.29	7,198.03	-58.39	-89.80	-57.60	0.45	0.40	6.08
7,225.00	1.93	259.79	7,223.01	-58.55	-90.62	-57.75	0.26	0.16	6.00
7,250.00	1.91	258.78	7,248.00	-58.70	-91.45	-57.90	0.16	-0.08	-4.04
7,275.00	2.01	257.60	7,272.99	-58.88	-92.28	-58.07	0.43	0.40	-4.72
7,300.00	2.27	250.86	7,297.97	-59.13	-93.18	-58.32	1.45	1.04	-26.96
7,325.00	2.40	248.48	7,322.95	-59.49	-94.13	-58.66	0.65	0.52	-9.52
7,350.00	2.61	243.85	7,347.92	-59.93	-95.13	-59.10	1.17	0.84	-18.52
7,375.00	2.58	239.92	7,372.90	-60.46	-96.13	-59.62	0.72	-0.12	-15.72
7,400.00	2.64	237.57	7,397.87	-61.05	-97.10	-60.20	0.49	0.24	-9.40
7,425.00	2.71	234.69	7,422.84	-61.70	-98.07	-60.85	0.61	0.28	-11.52
7,450.00	2.67	235.06	7,447.82	-62.38	-99.03	-61.51	0.17	-0.16	1.48
7,475.00	2.68	234.04	7,472.79	-63.06	-99.98	-62.18	0.19	0.04	-4.08
7,500.00	2.60	232.79	7,497.76	-63.74	-100.90	-62.86	0.39	-0.32	-5.00
7,525.00	2.61	232.87	7,522.74	-64.43	-101.81	-63.54	0.04	0.04	0.32

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well #51H
Project:	Eddy County, NM (NAD27) NMEZ	TVD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Site:	Myox 21 State COM	MD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Well:	#51H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14 Single User Db

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)
7,550.00	2.60	233.04	7,547.71	-65.11	-102.72	-64.21	0.05	-0.04	0.68
7,575.00	2.64	232.12	7,572.69	-65.81	-103.62	-64.90	0.23	0.16	-3.68
7,600.00	2.73	229.29	7,597.66	-66.55	-104.53	-65.63	0.64	0.36	-11.32
7,625.00	2.78	229.00	7,622.63	-67.33	-105.44	-66.41	0.21	0.20	-1.16
7,650.00	2.79	229.66	7,647.60	-68.13	-106.36	-67.20	0.13	0.04	2.64
7,675.00	2.77	230.16	7,672.57	-68.91	-107.29	-67.97	0.13	-0.08	2.00
7,700.00	2.70	234.47	7,697.54	-69.64	-108.23	-68.69	0.87	-0.28	17.24
7,725.00	2.57	237.31	7,722.52	-70.28	-109.18	-69.33	0.74	-0.52	11.36
7,750.00	2.55	234.74	7,747.49	-70.91	-110.11	-69.94	0.47	-0.08	-10.28
7,775.00	2.72	237.03	7,772.46	-71.55	-111.06	-70.58	0.80	0.68	9.16
7,800.00	2.83	237.06	7,797.43	-72.21	-112.08	-71.23	0.44	0.44	0.12
7,825.00	2.91	238.70	7,822.40	-72.87	-113.14	-71.88	0.46	0.32	6.56
7,850.00	2.93	237.69	7,847.37	-73.54	-114.22	-72.54	0.22	0.08	-4.04
7,875.00	3.09	232.83	7,872.34	-74.29	-115.29	-73.28	1.20	0.64	-19.44
7,900.00	3.61	227.78	7,897.29	-75.23	-116.41	-74.21	2.39	2.08	-20.20
7,925.00	3.69	226.62	7,922.24	-76.31	-117.58	-75.28	0.44	0.32	-4.64
7,950.00	3.72	226.74	7,947.19	-77.42	-118.76	-76.38	0.12	0.12	0.48
7,975.00	3.72	227.49	7,972.14	-78.52	-119.95	-77.47	0.19	0.00	3.00
8,000.00	3.70	227.25	7,997.09	-79.62	-121.14	-78.56	0.10	-0.08	-0.96
8,025.00	3.58	227.67	8,022.04	-80.69	-122.31	-79.62	0.49	-0.48	1.68
8,050.00	3.40	228.39	8,046.99	-81.71	-123.44	-80.63	0.74	-0.72	2.88
8,075.00	3.26	230.33	8,071.95	-82.65	-124.54	-81.56	0.72	-0.56	7.76
8,100.00	3.28	230.12	8,096.91	-83.57	-125.63	-82.47	0.09	0.08	-0.84
8,125.00	3.20	230.18	8,121.87	-84.47	-126.72	-83.36	0.32	-0.32	0.24
8,150.00	3.07	227.87	8,146.83	-85.37	-127.75	-84.25	0.72	-0.52	-9.24
8,175.00	3.13	229.14	8,171.79	-86.26	-128.76	-85.14	0.36	0.24	5.08
8,200.00	2.85	230.06	8,196.76	-87.11	-129.76	-85.97	1.14	-1.12	3.68
8,225.00	2.69	229.87	8,221.73	-87.89	-130.68	-86.74	0.64	-0.64	-0.76
8,250.00	2.62	229.15	8,246.70	-88.64	-131.56	-87.49	0.31	-0.28	-2.88
8,275.00	2.56	229.07	8,271.68	-89.38	-132.42	-88.22	0.24	-0.24	-0.32
8,300.00	2.58	230.36	8,296.65	-90.10	-133.27	-88.94	0.24	0.08	5.16
8,325.00	2.63	229.58	8,321.63	-90.83	-134.14	-89.66	0.25	0.20	-3.12
8,350.00	2.67	228.77	8,346.60	-91.59	-135.02	-90.41	0.22	0.16	-3.24
8,375.00	2.71	229.74	8,371.57	-92.36	-135.90	-91.17	0.24	0.16	3.88
8,400.00	2.73	229.90	8,396.54	-93.12	-136.81	-91.92	0.09	0.08	0.64
8,425.00	2.81	231.12	8,421.51	-93.89	-137.74	-92.68	0.40	0.32	4.88
8,450.00	2.77	231.08	8,446.48	-94.65	-138.69	-93.44	0.16	-0.16	-0.16
8,475.00	2.82	232.85	8,471.45	-95.40	-139.65	-94.18	0.40	0.20	7.08
8,500.00	2.78	235.18	8,496.42	-96.12	-140.64	-94.89	0.48	-0.16	9.32
8,525.00	2.80	235.18	8,521.39	-96.82	-141.64	-95.58	0.08	0.08	0.00
8,550.00	2.86	235.52	8,546.36	-97.52	-142.65	-96.27	0.25	0.24	1.36
8,575.00	2.87	235.57	8,571.33	-98.22	-143.68	-96.97	0.04	0.04	0.20
8,600.00	2.88	235.70	8,596.30	-98.93	-144.72	-97.67	0.05	0.04	0.52
8,625.00	2.93	235.71	8,621.27	-99.65	-145.77	-98.37	0.20	0.20	0.04

Survey Report

Company: COG OPERATING, LLC
 Project: Eddy County, NM (NAD27) NMEZ
 Site: Myox 21 State COM
 Well: #51H
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Well #51H
 TVD Reference: RKB @ 3014.20usft (Latshaw 44 - KB=25')
 MD Reference: RKB @ 3014.20usft (Latshaw 44 - KB=25')
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000.14 Single User Db

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)
8,650.00	2.98	233.74	8,646.24	-100.39	-146.82	-99.11	0.45	0.20	-7.88
8,675.00	3.08	232.02	8,671.20	-101.19	-147.87	-99.89	0.54	0.40	-6.88
8,700.00	3.10	228.15	8,696.17	-102.05	-148.90	-100.75	0.84	0.08	-15.48
8,725.00	3.05	225.34	8,721.13	-102.97	-149.88	-101.66	0.64	-0.20	-11.24
8,750.00	3.04	225.70	8,746.09	-103.90	-150.83	-102.58	0.09	-0.04	1.44
8,775.00	3.18	225.83	8,771.06	-104.85	-151.80	-103.52	0.56	0.56	0.52
8,800.00	3.12	223.77	8,796.02	-105.82	-152.77	-104.49	0.51	-0.24	-8.24
8,825.00	2.98	224.80	8,820.98	-106.77	-153.70	-105.43	0.60	-0.56	4.12
8,850.00	2.94	223.84	8,845.95	-107.70	-154.60	-106.35	0.25	-0.16	-3.84
8,875.00	2.64	222.52	8,870.92	-108.59	-155.43	-107.22	1.23	-1.20	-5.28
8,900.00	2.58	223.69	8,895.89	-109.42	-156.21	-108.05	0.32	-0.24	4.68
8,925.00	2.46	221.40	8,920.87	-110.23	-156.95	-108.85	0.63	-0.48	-9.16
8,950.00	2.43	222.36	8,945.85	-111.02	-157.66	-109.64	0.20	-0.12	3.84
8,975.00	2.54	220.96	8,970.82	-111.83	-158.38	-110.44	0.50	0.44	-5.60
9,000.00	2.61	221.76	8,995.80	-112.67	-159.13	-111.28	0.31	0.28	3.20
9,025.00	2.77	221.41	9,020.77	-113.55	-159.91	-112.15	0.64	0.64	-1.40
9,050.00	2.83	222.15	9,045.74	-114.46	-160.72	-113.05	0.28	0.24	2.96
9,075.00	2.95	221.53	9,070.71	-115.40	-161.56	-113.99	0.50	0.48	-2.48
9,100.00	3.03	222.15	9,095.68	-116.37	-162.43	-114.95	0.35	0.32	2.48
9,125.00	3.11	221.37	9,120.64	-117.37	-163.32	-115.94	0.36	0.32	-3.12
9,150.00	3.21	221.43	9,145.60	-118.40	-164.23	-116.97	0.40	0.40	0.24
9,175.00	3.30	222.18	9,170.56	-119.46	-165.18	-118.02	0.40	0.36	3.00
9,200.00	3.24	221.40	9,195.52	-120.53	-166.13	-119.07	0.30	-0.24	-3.12
9,225.00	3.22	221.82	9,220.48	-121.58	-167.07	-120.12	0.12	-0.08	1.68
9,250.00	3.19	221.15	9,245.44	-122.63	-167.99	-121.15	0.19	-0.12	-2.68
9,275.00	3.20	221.45	9,270.40	-123.67	-168.91	-122.19	0.08	0.04	1.20
9,300.00	3.24	219.93	9,295.36	-124.74	-169.83	-123.25	0.38	0.16	-6.08
9,325.00	3.06	222.66	9,320.33	-125.77	-170.73	-124.27	0.94	-0.72	10.92
9,350.00	2.91	224.69	9,345.29	-126.71	-171.63	-125.21	0.73	-0.60	8.12
9,375.00	2.90	223.76	9,370.26	-127.62	-172.51	-126.11	0.19	-0.04	-3.72
9,384.00	2.95	223.78	9,379.25	-127.95	-172.83	-126.44	0.60	0.60	0.21
Last MWD Survey: 9384.00' MD, 2.86°INC, 226.35°AZ									
9,400.00	3.05	223.81	9,395.23	-128.56	-173.41	-127.04	0.60	0.60	0.20
9,425.00	3.05	224.64	9,420.19	-129.51	-174.34	-127.98	0.18	0.00	3.32
9,450.00	3.12	222.12	9,445.15	-130.49	-175.26	-128.95	0.61	0.28	-10.08
9,464.00	3.00	222.39	9,459.13	-131.04	-175.77	-129.50	0.86	-0.86	1.93
9,639.00	2.31	225.52	9,633.95	-136.89	-181.37	-135.31	0.40	-0.39	1.79
9,670.00	2.18	224.94	9,664.92	-137.75	-182.23	-136.15	0.43	-0.42	-1.87
9,702.00	2.14	221.83	9,696.90	-138.62	-183.06	-137.02	0.39	-0.13	-9.72
9,764.00	3.51	259.32	9,758.83	-139.84	-185.70	-138.21	3.60	2.21	60.47
9,796.00	7.38	283.04	9,790.68	-139.56	-188.66	-137.91	13.74	12.09	74.13
KOP: 9796.00' MD, 9790.68' TVD									
9,828.00	10.39	297.56	9,822.30	-137.76	-193.23	-136.07	11.66	9.41	45.38

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well #51H
Project:	Eddy County, NM (NAD27) NMEZ	TVD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Site:	Myox 21 State COM	MD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Well:	#51H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14 Single User Db

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)
9,859.00	12.73	303.22	9,852.67	-134.59	-198.56	-132.85	8.38	7.55	18.26
9,891.00	14.05	316.80	9,883.80	-129.83	-204.17	-128.04	10.63	4.13	42.44
9,922.00	16.51	325.44	9,913.71	-123.46	-209.25	-121.62	10.79	7.94	27.87
9,954.00	19.92	332.86	9,944.11	-114.86	-214.32	-112.98	12.87	10.66	23.19
9,986.00	22.67	329.68	9,973.92	-104.68	-219.92	-102.76	9.32	8.59	-9.94
10,017.00	24.88	329.47	10,002.29	-93.90	-226.25	-91.93	7.13	7.13	-0.68
10,048.00	26.97	332.10	10,030.17	-82.07	-232.85	-80.04	7.69	6.74	8.48
10,079.00	30.22	335.48	10,057.38	-68.76	-239.38	-66.67	11.71	10.48	10.90
10,111.00	33.41	335.37	10,084.57	-53.42	-246.39	-51.27	9.97	9.97	-0.34
10,142.00	37.55	334.66	10,109.81	-37.12	-254.00	-34.90	13.42	13.35	-2.29
10,174.00	40.19	331.37	10,134.73	-19.23	-263.12	-16.94	10.47	8.25	-10.28
10,205.00	42.58	331.89	10,157.98	-1.20	-272.86	1.18	7.79	7.71	1.68
10,216.09	43.27	332.36	10,166.10	5.47	-276.39	7.89	6.87	6.23	4.22
FTP(M21SCOM#51H)									
10,237.00	44.58	333.21	10,181.16	18.37	-283.02	20.84	6.87	6.26	4.07
10,268.00	46.69	333.94	10,202.84	38.22	-292.88	40.78	7.01	6.81	2.35
10,300.00	51.00	333.96	10,223.89	59.86	-303.46	62.51	13.47	13.47	0.06
10,331.00	52.09	334.42	10,243.17	81.72	-314.03	84.45	3.70	3.52	1.48
10,363.00	53.80	337.81	10,262.46	105.06	-324.36	107.89	10.00	5.34	10.59
10,394.00	57.77	336.83	10,279.88	128.71	-334.24	131.62	13.07	12.81	-3.16
10,426.00	60.73	337.19	10,296.24	154.02	-344.98	157.03	9.30	9.25	1.13
10,457.00	65.54	337.65	10,310.25	179.55	-355.60	182.65	15.57	15.52	1.48
10,488.00	69.91	337.32	10,322.00	206.04	-366.58	209.24	14.13	14.10	-1.06
10,520.00	73.52	337.29	10,332.03	234.07	-378.30	237.36	11.28	11.28	-0.09
10,551.00	80.03	338.02	10,339.12	261.97	-389.76	265.36	21.12	21.00	2.35
10,582.00	83.59	338.79	10,343.54	290.49	-401.05	293.98	11.74	11.48	2.48
10,614.00	86.02	339.09	10,346.44	320.23	-412.51	323.82	7.65	7.59	0.94
10,645.00	87.42	339.71	10,348.21	349.20	-423.39	352.88	4.84	4.52	2.00
10,676.00	90.34	338.37	10,348.82	378.14	-434.48	381.92	10.36	9.42	-4.32
10,707.00	91.23	336.71	10,348.39	406.79	-446.32	410.66	6.08	2.87	-5.35
10,739.00	91.18	336.42	10,347.72	436.14	-459.05	440.13	0.92	-0.16	-0.91
EOC: 10739.00' MD, 10347.72' TVD, 91.18° INC, 336.42° AZ, 440.13° VS									
10,770.00	91.01	336.27	10,347.12	464.53	-471.48	468.63	0.73	-0.55	-0.48
10,801.00	93.03	337.40	10,346.03	493.01	-483.67	497.21	7.47	6.52	3.65
10,833.00	94.49	338.49	10,343.93	522.60	-495.66	526.91	5.69	4.56	3.41
10,895.00	95.22	341.30	10,338.69	580.61	-516.89	585.10	4.67	1.18	4.53
10,989.00	92.24	347.82	10,332.56	670.97	-541.84	675.67	7.61	-3.17	6.94
11,084.00	93.48	353.51	10,327.82	764.55	-557.23	769.39	6.12	1.31	5.99
11,115.00	93.03	355.79	10,326.06	795.37	-560.11	800.22	7.49	-1.45	7.35
11,141.00	91.12	356.65	10,325.12	821.29	-561.82	826.16	8.06	-7.35	3.31
11,232.00	90.62	358.87	10,323.74	912.20	-565.38	917.10	2.50	-0.55	2.44
11,322.00	90.90	358.98	10,322.54	1,002.18	-567.07	1,007.09	0.33	0.31	0.12
11,412.00	91.06	359.35	10,321.00	1,092.16	-568.38	1,097.08	0.45	0.18	0.41
11,503.00	91.29	358.45	10,319.14	1,183.12	-570.13	1,188.05	1.02	0.25	-0.99

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well #51H
Project:	Eddy County, NM (NAD27) NMEZ	TVD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Site:	Myox 21 State COM	MD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Well:	#51H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14 Single User Db

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)
11,593.00	89.89	359.46	10,318.21	1,273.10	-571.77	1,278.04	1.92	-1.56	1.12
11,684.00	90.11	359.63	10,318.21	1,364.10	-572.49	1,369.04	0.31	0.24	0.19
11,775.00	90.28	359.32	10,317.90	1,455.09	-573.32	1,460.04	0.39	0.19	-0.34
11,869.00	90.00	359.13	10,317.67	1,549.08	-574.59	1,554.04	0.36	-0.30	-0.20
11,964.00	91.20	1.40	10,316.68	1,644.07	-574.16	1,649.02	2.70	1.26	2.39
12,059.00	92.07	3.08	10,313.97	1,738.95	-570.44	1,743.86	1.99	0.92	1.77
12,154.00	89.66	2.24	10,312.53	1,833.83	-566.04	1,838.70	2.69	-2.54	-0.88
12,249.00	89.89	2.77	10,312.90	1,928.74	-561.88	1,933.57	0.61	0.24	0.56
12,344.00	90.45	2.56	10,312.62	2,023.64	-557.47	2,028.42	0.63	0.59	-0.22
12,438.00	89.16	1.91	10,312.94	2,117.56	-553.80	2,122.31	1.54	-1.37	-0.69
12,533.00	88.09	358.66	10,315.22	2,212.52	-553.33	2,217.26	3.60	-1.13	-3.42
12,628.00	88.66	358.21	10,317.92	2,307.44	-555.92	2,312.21	0.76	0.60	-0.47
12,722.00	90.56	357.72	10,318.56	2,401.38	-559.26	2,406.17	2.09	2.02	-0.52
12,817.00	89.66	356.99	10,318.37	2,496.27	-563.64	2,501.10	1.22	-0.95	-0.77
12,911.00	90.67	357.87	10,318.10	2,590.18	-567.86	2,595.03	1.43	1.07	0.94
13,006.00	90.50	357.61	10,317.13	2,685.10	-571.60	2,689.98	0.33	-0.18	-0.27
13,101.00	89.05	355.68	10,317.51	2,779.93	-577.16	2,784.86	2.54	-1.53	-2.03
13,195.00	89.44	355.92	10,318.75	2,873.67	-584.05	2,878.65	0.49	0.41	0.26
13,290.00	90.84	359.55	10,318.51	2,968.57	-587.80	2,973.59	4.10	1.47	3.82
13,385.00	91.06	359.12	10,316.94	3,063.56	-588.90	3,068.58	0.51	0.23	-0.45
13,479.00	91.23	357.67	10,315.06	3,157.50	-591.54	3,162.54	1.55	0.18	-1.54
13,573.00	89.72	357.86	10,314.28	3,251.42	-595.20	3,256.49	1.62	-1.61	0.20
13,668.00	90.28	357.75	10,314.28	3,346.35	-598.84	3,351.45	0.60	0.59	-0.12
13,763.00	91.63	359.80	10,312.70	3,441.31	-600.87	3,446.42	2.58	1.42	2.16
13,858.00	92.13	1.42	10,309.58	3,536.25	-599.86	3,541.35	1.78	0.53	1.71
13,953.00	91.96	1.12	10,306.19	3,631.16	-597.76	3,636.24	0.36	-0.18	-0.32
14,047.00	92.07	3.79	10,302.88	3,725.01	-593.73	3,730.05	2.84	0.12	2.84
14,142.00	88.88	4.60	10,302.10	3,819.74	-586.78	3,824.71	3.46	-3.36	0.85
14,237.00	88.71	3.85	10,304.09	3,914.46	-579.79	3,919.37	0.81	-0.18	-0.79
14,331.00	88.99	2.00	10,305.98	4,008.31	-574.99	4,013.18	1.99	0.30	-1.97
14,425.00	90.17	0.44	10,306.67	4,102.29	-572.99	4,107.13	2.08	1.26	-1.66
14,519.00	90.28	0.84	10,306.30	4,196.28	-571.94	4,201.11	0.44	0.12	0.43
14,614.00	91.01	359.84	10,305.23	4,291.27	-571.38	4,296.09	1.30	0.77	-1.05
14,709.00	90.45	358.93	10,304.02	4,386.25	-572.40	4,391.08	1.12	-0.59	-0.96
14,803.00	89.33	357.82	10,304.20	4,480.21	-575.06	4,485.06	1.68	-1.19	-1.18
14,896.00	89.22	357.14	10,305.38	4,573.12	-579.15	4,578.00	0.74	-0.12	-0.73
14,991.00	87.64	356.26	10,307.98	4,667.92	-584.62	4,672.84	1.90	-1.66	-0.93
15,086.00	88.99	355.83	10,310.78	4,762.65	-591.17	4,767.63	1.49	1.42	-0.45
15,180.00	90.22	357.20	10,311.42	4,856.47	-596.88	4,861.49	1.96	1.31	1.46
15,274.00	92.80	359.16	10,308.95	4,950.38	-599.86	4,955.42	3.45	2.74	2.09
15,369.00	90.73	358.63	10,306.02	5,045.31	-601.70	5,050.37	2.25	-2.18	-0.56
15,464.00	90.56	357.77	10,304.95	5,140.25	-604.68	5,145.34	0.92	-0.18	-0.91
15,558.00	90.95	358.64	10,303.71	5,234.20	-607.62	5,239.30	1.01	0.41	0.93

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well #51H
Project:	Eddy County, NM (NAD27) NMEZ	TVD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Site:	Myox 21 State COM	MD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Well:	#51H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14 Single User Db

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)
15,653.00	93.98	2.52	10,299.63	5,329.08	-606.67	5,334.17	5.18	3.19	4.08
15,748.00	93.42	1.59	10,293.49	5,423.82	-603.27	5,428.87	1.14	-0.59	-0.98
15,842.00	91.90	1.44	10,289.13	5,517.68	-600.79	5,522.71	1.62	-1.62	-0.16
15,937.00	90.50	0.50	10,287.14	5,612.64	-599.18	5,617.66	1.77	-1.47	-0.99
16,031.00	89.33	0.20	10,287.28	5,706.64	-598.60	5,711.64	1.28	-1.24	-0.32
16,126.00	87.93	359.18	10,289.55	5,801.61	-599.12	5,806.61	1.82	-1.47	-1.07
16,220.00	88.43	358.84	10,292.54	5,895.54	-600.74	5,900.56	0.64	0.53	-0.36
16,315.00	89.16	358.86	10,294.54	5,990.50	-602.65	5,995.53	0.77	0.77	0.02
16,410.00	89.05	358.08	10,296.02	6,085.46	-605.18	6,090.51	0.83	-0.12	-0.82
16,505.00	89.83	358.51	10,296.95	6,180.41	-608.01	6,185.48	0.94	0.82	0.45
16,600.00	90.22	357.66	10,296.91	6,275.36	-611.18	6,280.45	0.98	0.41	-0.89
16,695.00	89.10	358.85	10,297.47	6,370.31	-614.08	6,375.42	1.72	-1.18	1.25
16,789.00	87.76	0.56	10,300.05	6,464.26	-614.56	6,469.38	2.31	-1.43	1.82
16,884.00	86.75	0.59	10,304.60	6,559.15	-613.61	6,564.25	1.06	-1.06	0.03
16,979.00	87.03	359.85	10,309.75	6,654.01	-613.24	6,659.11	0.83	0.29	-0.78
17,075.00	87.81	0.72	10,314.07	6,749.91	-612.77	6,755.00	1.22	0.81	0.91
17,169.00	88.94	0.55	10,316.74	6,843.86	-611.73	6,848.94	1.22	1.20	-0.18
17,264.00	89.83	359.81	10,317.76	6,938.86	-611.43	6,943.93	1.22	0.94	-0.78
17,358.00	89.83	359.33	10,318.04	7,032.85	-612.13	7,037.93	0.51	0.00	-0.51
17,453.00	90.56	359.11	10,317.71	7,127.84	-613.43	7,132.92	0.80	0.77	-0.23
17,548.00	90.56	359.39	10,316.78	7,222.83	-614.67	7,227.92	0.29	0.00	0.29
17,643.00	90.56	359.50	10,315.86	7,317.82	-615.59	7,322.91	0.12	0.00	0.12
17,737.00	90.39	359.92	10,315.08	7,411.82	-616.07	7,416.91	0.48	-0.18	0.45
17,831.00	89.83	359.78	10,314.90	7,505.81	-616.31	7,510.91	0.61	-0.60	-0.15
17,926.00	89.89	359.47	10,315.13	7,600.81	-616.93	7,605.91	0.33	0.06	-0.33
18,021.00	89.55	359.34	10,315.59	7,695.81	-617.92	7,700.91	0.38	-0.36	-0.14
18,116.00	89.05	358.97	10,316.75	7,790.79	-619.32	7,795.90	0.65	-0.53	-0.39
18,211.00	88.49	358.47	10,318.79	7,885.74	-621.44	7,890.86	0.79	-0.59	-0.53
18,306.00	88.21	358.61	10,321.53	7,980.67	-623.86	7,985.81	0.33	-0.29	0.15
18,401.00	87.93	358.67	10,324.73	8,075.59	-626.12	8,080.75	0.30	-0.29	0.06
18,495.00	91.06	359.36	10,325.56	8,169.56	-627.73	8,174.73	3.41	3.33	0.73
18,590.00	90.73	359.60	10,324.07	8,264.55	-628.59	8,269.72	0.43	-0.35	0.25
18,685.00	89.94	0.07	10,323.52	8,359.54	-628.87	8,364.71	0.97	-0.83	0.49
18,779.00	89.38	359.41	10,324.07	8,453.54	-629.29	8,458.71	0.92	-0.60	-0.70
18,874.00	88.99	359.51	10,325.43	8,548.52	-630.19	8,553.70	0.42	-0.41	0.11
18,969.00	89.22	359.25	10,326.91	8,643.51	-631.22	8,648.69	0.37	0.24	-0.27
19,064.00	89.55	359.45	10,327.93	8,738.50	-632.29	8,743.68	0.41	0.35	0.21
19,158.00	89.33	357.69	10,328.85	8,832.46	-634.64	8,837.66	1.89	-0.23	-1.87
19,253.00	89.44	358.51	10,329.87	8,927.40	-637.79	8,932.63	0.87	0.12	0.86
19,347.00	89.94	358.31	10,330.38	9,021.36	-640.40	9,026.61	0.57	0.53	-0.21
19,442.00	90.34	358.55	10,330.14	9,116.33	-643.00	9,121.59	0.49	0.42	0.25
19,537.00	90.50	357.57	10,329.45	9,211.27	-646.22	9,216.56	1.05	0.17	-1.03
19,632.00	91.68	359.62	10,327.64	9,306.21	-648.55	9,311.52	2.49	1.24	2.16
19,726.00	92.24	0.24	10,324.43	9,400.16	-648.66	9,405.46	0.89	0.60	0.66

Survey Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well #51H
Project:	Eddy County, NM (NAD27) NMEZ	TVD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Site:	Myox 21 State COM	MD Reference:	RKB @ 3014.20usft (Latshaw 44 - KB=25')
Well:	#51H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14 Single User Db

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)
19,821.00	93.48	359.04	10,319.69	9,495.03	-649.26	9,500.34	1.82	1.31	-1.26
19,915.00	93.53	359.56	10,313.94	9,588.85	-650.40	9,594.16	0.55	0.05	0.55
19,937.99	93.46	359.40	10,312.54	9,611.80	-650.61	9,617.11	0.75	-0.29	-0.69
Cross 330' Offset: 19937.99' MD, 10312.54' TVD, 93.46° INC									
19,938.09	93.46	359.40	10,312.53	9,611.89	-650.61	9,617.21	0.00	0.00	0.00
LTP(M12SCOM#51H)									
20,009.00	93.26	358.91	10,308.37	9,682.68	-651.65	9,688.00	0.75	-0.29	-0.69
Final MWD Survey: 20009.00' MD, 10308.37' TVD									
20,066.89	93.26	358.91	10,305.08	9,740.46	-652.75	9,745.79	0.00	0.00	0.00
PBHL(M21SCOM#51H) - TW(M21SCOM#51H)									
20,068.00	93.26	358.91	10,305.02	9,741.57	-652.78	9,746.90	0.00	0.00	0.00
BHL: 20068.00' MD, 10305.02' TVD, 93.26° INC, 358.91° AZ, 9741.57' +N/-S, -652.78' +E/-W, 9746.90' VS - 333' FWL / 200' FNL									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,384.00	9,379.25	-127.95	-172.83	Last MWD Survey: 9384.00' MD, 2.86° INC, 226.35° AZ
9,796.00	9,790.68	-139.56	-188.66	KOP: 9796.00' MD, 9790.68' TVD
10,739.00	10,347.72	436.14	-459.05	EOC: 10739.00' MD, 10347.72' TVD, 91.18° INC, 336.42° AZ, 440.13' VS
19,937.99	10,312.54	9,611.80	-650.61	Cross 330' Offset: 19937.99' MD, 10312.54' TVD, 93.46° INC
20,009.00	10,308.37	9,682.68	-651.65	Final MWD Survey: 20009.00' MD, 10308.37' TVD
20,068.00	10,305.02	9,741.57	-652.78	BHL: 20068.00' MD, 10305.02' TVD, 93.26° INC, 358.91° AZ, 9741.57' +N/-S, -652.78' +E/-W, 9746.90' VS
20,068.00	10,305.02	9,741.57	-652.78	333' FWL / 200' FNL

Checked By: _____ Approved By: _____ Date: _____