



NM OIL CONSERVATION
ARTESIA DISTRICT

OCT 29 2018

RECEIVED

COG Operating LLC

Eddy County, NM (NAD27 NME)

Myox 21 State Com

38H

30-015-45373

OH

Plan 1 10-19-18

Anticollision Report

19 October, 2018



RUP 12-24-18



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Com
Site Error: 0.00 usft
Reference Well: 38H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 38H
TVD Reference: KB @ 3001.90usft (Ensign 155)
MD Reference: KB @ 3001.90usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Reference	Plan 1 10-19-18		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 50,000.00 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 10/19/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name Description
0.00	19,573.91	Plan 1 10-19-18 (OH)	MWD+HDGM OWSG Rev.2 MWD + HDGM

Summary						
Site Name	Reference	Offset	Distance		Separation	Warning
	Measured	Measured	Between	Between		
Offset Well - Wellbore - Design	Depth	Depth	Centres	Ellipses	Factor	
Myox 21 State Com	(usft)	(usft)	(usft)	(usft)		
35H - OH - Plan 1 10-19-18	2,500.01	2,501.12	91.00	73.52	5.206	CC, ES
35H - OH - Plan 1 10-19-18	19,573.95	19,648.09	991.39	691.38	3.305	SF
36H - OH - Plan 1 10-19-18	2,513.90	2,514.49	61.00	43.43	3.471	CC
36H - OH - Plan 1 10-19-18	2,900.00	2,908.32	61.83	41.73	3.076	ES
36H - OH - Plan 1 10-19-18	19,573.95	19,483.98	650.17	348.88	2.158	SF
37H - OH - Plan 1 10-19-18	2,500.00	2,499.00	31.00	13.53	1.774	CC
37H - OH - Plan 1 10-19-18	3,000.00	3,004.33	31.08	10.40	1.503	ES
37H - OH - Plan 1 10-19-18	19,573.95	19,711.10	360.49	78.81	1.280	Level 3, SF

Offset Design Myox 21 State Com - 35H - OH - Plan 1 10-19-18												Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM												Offset Well Error: 0.00 usft
Reference	Offset		Semi Major Axis		Distance		Minimum Separation	Separation Factor	Warning			
	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	1.10	1.10	0.00	0.00	-90.50	-0.80 -91.00	91.00				
100.00	100.00	101.10	101.10	0.13	0.14	-90.50	-0.80 -91.00	91.00	90.73	0.27	333.594	
200.00	200.00	201.10	201.10	0.49	0.50	-90.50	-0.80 -91.00	91.00	90.01	0.99	91.947	
300.00	300.00	301.10	301.10	0.85	0.86	-90.50	-0.80 -91.00	91.00	89.30	1.71	53.322	
400.00	400.00	401.10	401.10	1.21	1.21	-90.50	-0.80 -91.00	91.00	88.58	2.42	37.548	
500.00	500.00	501.10	501.10	1.57	1.57	-90.50	-0.80 -91.00	91.00	87.88	3.14	28.977	
600.00	600.00	601.10	601.10	1.93	1.93	-90.50	-0.80 -91.00	91.00	87.15	3.86	23.591	
700.00	700.00	701.10	701.10	2.29	2.29	-90.50	-0.80 -91.00	91.00	86.43	4.57	19.894	
800.00	800.00	801.10	801.10	2.64	2.65	-90.50	-0.80 -91.00	91.00	85.71	5.29	17.198	
900.00	900.00	901.10	901.10	3.00	3.01	-90.50	-0.80 -91.00	91.00	85.00	6.01	15.146	
1,000.00	1,000.00	1,001.10	1,001.10	3.36	3.36	-90.50	-0.80 -91.00	91.00	84.28	6.73	13.532	
1,100.00	1,100.00	1,101.10	1,101.10	3.72	3.72	-90.50	-0.80 -91.00	91.00	83.56	7.44	12.228	
1,200.00	1,200.00	1,201.10	1,201.10	4.08	4.08	-90.50	-0.80 -91.00	91.00	82.84	8.16	11.154	
1,300.00	1,300.00	1,301.10	1,301.10	4.44	4.44	-90.50	-0.80 -91.00	91.00	82.13	8.88	10.253	
1,400.00	1,400.00	1,401.10	1,401.10	4.79	4.80	-90.50	-0.80 -91.00	91.00	81.41	9.59	9.488	
1,500.00	1,500.00	1,501.10	1,501.10	5.15	5.16	-90.50	-0.80 -91.00	91.00	80.69	10.31	8.827	
1,600.00	1,600.00	1,601.10	1,601.10	5.51	5.52	-90.50	-0.80 -91.00	91.00	79.98	11.03	8.253	
1,700.00	1,700.00	1,701.10	1,701.10	5.87	5.87	-90.50	-0.80 -91.00	91.00	79.26	11.74	7.749	
1,800.00	1,800.00	1,801.10	1,801.10	6.23	6.23	-90.50	-0.80 -91.00	91.00	78.54	12.46	7.303	
1,900.00	1,900.00	1,901.10	1,901.10	6.59	6.59	-90.50	-0.80 -91.00	91.00	77.83	13.18	6.906	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Corn - 35H - OH - Plan 1 10-19-18													Offset Site Error: 0.00 usft
Survey Program: O-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
2,000.00	2,000.00	2,001.10	2,001.10	6.95	6.95	-90.50	-0.80	-91.00	91.00	77.11	13.89	6.550	
2,100.00	2,100.00	2,101.10	2,101.10	7.30	7.31	-90.50	-0.80	-91.00	91.00	76.39	14.61	6.228	
2,200.00	2,200.00	2,201.10	2,201.10	7.66	7.67	-90.50	-0.80	-91.00	91.00	75.67	15.33	5.937	
2,300.00	2,300.00	2,301.10	2,301.10	8.02	8.02	-90.50	-0.80	-91.00	91.00	74.96	16.05	5.672	
2,400.00	2,400.00	2,401.10	2,401.10	8.38	8.38	-90.50	-0.80	-91.00	91.00	74.24	16.76	5.429	
2,500.00	2,500.00	2,501.10	2,501.10	8.74	8.74	-90.50	-0.80	-91.00	91.00	73.52	17.48	5.206	
2,500.01	2,500.01	2,501.12	2,501.12	8.74	8.74	-90.50	-0.80	-91.00	91.00	73.52	17.48	5.206 CC, ES	
2,600.00	2,599.98	2,601.09	2,601.07	9.09	9.08	173.18	-2.58	-90.96	92.73	74.56	18.17	5.104	
2,700.00	2,699.84	2,700.75	2,700.58	9.43	9.40	170.45	-7.83	-90.85	98.06	79.23	18.83	5.208	
2,800.00	2,799.45	2,799.99	2,799.48	9.77	9.73	166.78	-16.05	-90.68	107.29	87.80	19.49	5.505	
2,900.00	2,898.70	2,898.98	2,898.10	10.12	10.05	163.92	-24.67	-90.47	120.29	100.13	20.16	5.968	
3,000.00	2,997.47	2,997.53	2,996.27	10.47	10.38	162.04	-33.25	-90.29	138.80	115.97	20.83	6.568	
3,100.00	3,095.62	3,095.50	3,093.87	10.84	10.71	160.94	-41.79	-90.10	156.65	135.15	21.50	7.287	
3,200.00	3,193.44	3,193.15	3,191.15	11.21	11.04	160.38	-50.29	-89.91	178.13	155.96	22.17	8.035	
3,300.00	3,291.25	3,290.80	3,288.43	11.58	11.37	159.94	-58.79	-89.72	199.63	176.78	22.85	8.738	
3,400.00	3,389.07	3,388.46	3,385.71	11.97	11.71	159.59	-67.30	-89.54	221.14	197.61	23.53	9.399	
3,500.00	3,486.89	3,486.11	3,482.99	12.35	12.04	159.30	-75.80	-89.35	242.65	218.44	24.22	10.020	
3,600.00	3,584.70	3,583.76	3,580.27	12.75	12.38	159.06	-84.30	-89.16	264.17	239.26	24.91	10.606	
3,700.00	3,682.52	3,682.24	3,678.39	13.14	12.73	158.89	-92.68	-88.98	285.65	260.04	25.61	11.155	
3,800.00	3,780.33	3,782.52	3,778.50	13.55	13.07	159.25	-98.47	-88.85	306.48	280.16	26.32	11.645	
3,900.00	3,878.15	3,882.91	3,878.87	13.95	13.42	160.18	-100.76	-88.80	326.54	299.51	27.03	12.081	
4,000.00	3,975.96	3,981.11	3,977.06	14.36	13.77	161.34	-100.80	-88.80	346.22	318.49	27.73	12.485	
4,100.00	4,073.78	4,078.93	4,074.88	14.77	14.11	162.38	-100.80	-88.80	366.02	337.59	28.43	12.873	
4,200.00	4,171.60	4,176.74	4,172.70	15.19	14.46	163.31	-100.80	-88.80	385.92	356.78	29.14	13.245	
4,300.00	4,269.41	4,274.56	4,270.51	15.61	14.80	164.15	-100.80	-88.80	405.91	376.07	29.84	13.603	
4,400.00	4,367.23	4,372.38	4,368.33	16.03	15.15	164.91	-100.80	-88.80	425.97	395.43	30.55	13.946	
4,500.00	4,465.04	4,470.19	4,466.14	16.45	15.49	165.61	-100.80	-88.80	446.10	414.85	31.25	14.275	
4,600.00	4,562.86	4,568.01	4,563.96	16.88	15.84	166.24	-100.80	-88.80	466.29	434.33	31.96	14.590	
4,700.00	4,660.67	4,665.82	4,661.77	17.30	16.19	166.82	-100.80	-88.80	486.53	453.86	32.67	14.893	
4,800.00	4,758.49	4,763.64	4,759.59	17.73	16.53	167.36	-100.80	-88.80	506.82	473.44	33.38	15.185	
4,900.00	4,856.31	4,861.45	4,857.41	18.16	16.88	167.85	-100.80	-88.80	527.14	493.05	34.09	15.464	
5,000.00	4,954.12	4,959.27	4,955.22	18.59	17.22	168.31	-100.80	-88.80	547.50	512.70	34.80	15.733	
5,100.00	5,051.94	5,057.09	5,053.04	19.03	17.57	168.73	-100.80	-88.80	567.88	532.37	35.51	15.992	
5,200.00	5,149.75	5,154.90	5,150.85	19.46	17.92	169.13	-100.80	-88.80	588.30	552.08	36.22	16.241	
5,300.00	5,247.57	5,252.72	5,248.67	19.90	18.27	169.50	-100.80	-88.80	608.74	571.81	36.94	16.481	
5,400.00	5,345.38	5,350.53	5,346.48	20.34	18.61	169.84	-100.80	-88.80	629.21	591.56	37.65	16.712	
5,500.00	5,443.20	5,448.35	5,444.30	20.78	18.96	170.17	-100.80	-88.80	649.69	611.33	38.37	16.934	
5,600.00	5,541.02	5,546.16	5,542.12	21.22	19.31	170.47	-100.80	-88.80	670.19	631.11	39.08	17.149	
5,700.00	5,638.83	5,643.98	5,639.93	21.66	19.65	170.76	-100.80	-88.80	690.71	650.92	39.80	17.356	
5,800.00	5,736.65	5,741.80	5,737.75	22.10	20.00	171.02	-100.80	-88.80	711.25	670.74	40.51	17.556	
5,900.00	5,834.46	5,839.61	5,835.56	22.54	20.35	171.28	-100.80	-88.80	731.80	690.57	41.23	17.749	
6,000.00	5,932.28	5,937.43	5,933.38	22.98	20.70	171.52	-100.80	-88.80	752.36	710.41	41.95	17.935	
6,100.00	6,030.09	6,035.24	6,031.19	23.43	21.05	171.75	-100.80	-88.80	772.94	730.27	42.67	18.115	
6,200.00	6,127.91	6,133.06	6,129.01	23.87	21.39	171.96	-100.80	-88.80	793.52	750.14	43.39	18.290	
6,300.00	6,225.73	6,230.87	6,226.83	24.32	21.74	172.16	-100.80	-88.80	814.12	770.01	44.11	18.459	
6,400.00	6,323.54	6,328.69	6,324.64	24.76	22.09	172.36	-100.80	-88.80	834.72	789.90	44.83	18.622	
6,500.00	6,421.36	6,426.51	6,422.46	25.21	22.44	172.54	-100.80	-88.80	855.34	809.79	45.55	18.780	
6,600.00	6,519.17	6,524.32	6,520.27	25.66	22.79	172.72	-100.80	-88.80	875.96	829.70	46.27	18.933	
6,700.00	6,616.99	6,622.14	6,618.09	26.11	23.13	172.89	-100.80	-88.80	896.59	849.60	46.99	19.082	
6,800.00	6,714.80	6,719.95	6,715.90	26.55	23.48	173.05	-100.80	-88.80	917.23	869.52	47.71	19.226	
6,900.00	6,812.62	6,817.77	6,814.05	26.99	23.83	173.24	-100.80	-88.80	936.26	887.84	48.43	19.333	
7,000.00	6,910.44	6,915.59	6,912.79	27.41	24.18	173.38	-100.80	-88.80	955.89	907.75	49.15	19.368	

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7,100.00	7,010.93	7,016.08	7,012.03	27.80	24.54	173.50	-100.80	-88.80	964.09	914.23	49.87	19.334	
7,200.00	7,110.54	7,115.69	7,111.64	28.17	24.89	173.57	-100.80	-88.80	972.84	922.26	50.58	19.234	
7,300.00	7,210.39	7,215.54	7,211.49	28.52	25.25	173.62	-100.80	-88.80	978.13	926.85	51.29	19.072	
7,400.00	7,310.37	7,315.52	7,311.47	28.85	25.61	173.64	-100.80	-88.80	979.96	927.97	51.99	18.850	
7,500.00	7,410.37	7,415.52	7,411.47	29.16	25.96	-91.04	-100.80	-88.80	979.96	927.28	52.68	18.602	
7,600.00	7,510.37	7,515.52	7,511.47	29.48	26.32	-91.04	-100.80	-88.80	979.96	926.59	53.37	18.360	
7,700.00	7,610.37	7,615.52	7,611.47	29.80	26.68	-91.04	-100.80	-88.80	979.96	925.89	54.07	18.125	
7,800.00	7,710.37	7,715.52	7,711.47	30.11	27.03	-91.04	-100.80	-88.80	979.96	925.20	54.76	17.895	
7,900.00	7,810.37	7,815.52	7,811.47	30.43	27.39	-91.04	-100.80	-88.80	979.96	924.50	55.46	17.670	
8,000.00	7,910.37	7,915.52	7,911.47	30.75	27.75	-91.04	-100.80	-88.80	979.96	923.81	56.15	17.451	
8,100.00	8,010.37	8,015.52	8,011.47	31.07	28.10	-91.04	-100.80	-88.80	979.96	923.11	56.85	17.238	
8,200.00	8,110.37	8,115.52	8,111.47	31.39	28.46	-91.04	-100.80	-88.80	979.96	922.41	57.55	17.029	
8,300.00	8,210.37	8,215.52	8,211.47	31.72	28.82	-91.04	-100.80	-88.80	979.96	921.72	58.24	16.825	
8,400.00	8,310.37	8,315.52	8,311.47	32.04	29.17	-91.04	-100.80	-88.80	979.96	921.02	58.94	16.626	
8,500.00	8,410.37	8,415.52	8,411.47	32.36	29.53	-91.04	-100.80	-88.80	979.96	920.32	59.64	16.431	
8,600.00	8,510.37	8,515.52	8,511.47	32.69	29.89	-91.04	-100.80	-88.80	979.96	919.62	60.34	16.241	
8,700.00	8,610.37	8,615.52	8,611.47	33.01	30.25	-91.04	-100.80	-88.80	979.96	918.92	61.04	16.055	
8,800.00	8,710.37	8,715.52	8,711.47	33.34	30.60	-91.04	-100.80	-88.80	979.96	918.22	61.74	15.873	
8,900.00	8,810.37	8,815.52	8,811.47	33.66	30.96	-91.04	-100.80	-88.80	979.96	917.52	62.44	15.695	
8,906.68	8,817.05	8,822.20	8,818.15	33.69	30.98	-90.54	-100.80	-88.80	979.96	917.48	62.48	15.683	
9,000.00	8,910.37	8,915.52	8,911.47	33.99	31.32	-90.55	-100.80	-88.80	979.96	916.83	63.14	15.521	
9,100.00	9,009.35	9,014.50	9,010.45	34.31	31.67	-91.26	-100.80	-88.80	980.17	916.34	63.83	15.355	
9,200.00	9,103.49	9,115.51	9,111.29	34.60	32.03	-92.88	-96.79	-88.84	981.29	916.75	64.54	15.205	
9,300.00	9,188.67	9,226.55	9,218.74	34.84	32.40	-94.57	-69.82	-89.07	983.32	918.08	65.24	15.072	
9,400.00	9,261.17	9,347.03	9,324.85	35.02	32.76	-96.13	-13.43	-89.57	985.91	920.03	65.88	14.964	
9,500.00	9,317.82	9,477.42	9,419.86	35.15	33.12	-97.44	75.27	-90.35	988.52	922.10	66.43	14.881	
9,600.00	9,356.15	9,616.60	9,490.86	35.24	33.47	-98.35	194.41	-91.40	990.52	923.61	66.91	14.803	
9,700.00	9,374.48	9,761.30	9,525.13	35.31	33.82	-98.71	334.41	-92.63	991.36	923.91	67.45	14.697	
9,799.95	9,376.63	9,874.02	9,527.22	35.43	34.10	-98.56	447.08	-93.62	990.96	922.95	68.01	14.570	
9,800.00	9,376.20	9,874.14	9,527.22	35.43	34.10	-98.70	447.19	-93.62	991.33	923.32	68.00	14.578	
9,900.00	9,376.50	9,974.14	9,527.53	35.61	34.40	-98.70	547.19	-94.50	991.33	922.70	68.62	14.448	
10,000.00	9,376.81	10,074.14	9,527.83	35.87	34.76	-98.70	647.18	-95.38	991.33	921.97	69.35	14.294	
10,100.00	9,377.11	10,174.14	9,528.14	36.20	35.18	-98.70	747.18	-96.26	991.33	921.13	70.19	14.123	
10,200.00	9,377.42	10,274.14	9,528.44	36.61	35.64	-98.70	847.18	-97.14	991.33	920.19	71.14	13.935	
10,300.00	9,377.72	10,374.14	9,528.74	37.08	36.16	-98.70	947.17	-98.02	991.33	919.14	72.19	13.733	
10,400.00	9,378.03	10,474.14	9,529.05	37.61	36.73	-98.70	1,047.17	-98.90	991.33	918.00	73.33	13.519	
10,500.00	9,378.33	10,574.14	9,529.35	38.20	37.35	-98.70	1,147.16	-99.78	991.33	916.77	74.56	13.295	
10,600.00	9,378.64	10,674.14	9,529.66	38.84	38.01	-98.70	1,247.16	-100.66	991.33	915.45	75.88	13.064	
10,700.00	9,378.94	10,774.14	9,529.96	39.52	38.71	-98.70	1,347.15	-101.54	991.33	914.04	77.29	12.826	
10,800.00	9,379.25	10,874.14	9,530.27	40.24	39.45	-98.70	1,447.15	-102.42	991.33	912.56	78.77	12.585	
10,900.00	9,379.55	10,974.14	9,530.57	41.00	40.23	-98.70	1,547.15	-103.31	991.33	911.00	80.33	12.341	
11,000.00	9,379.86	11,074.14	9,530.88	41.80	41.05	-98.70	1,647.14	-104.19	991.33	909.38	81.96	12.096	
11,100.00	9,380.16	11,174.14	9,531.18	42.64	41.90	-98.70	1,747.14	-105.07	991.33	907.68	83.65	11.851	
11,200.00	9,380.46	11,274.14	9,531.48	43.50	42.78	-98.70	1,847.13	-105.95	991.33	905.93	85.40	11.608	
11,300.00	9,380.77	11,374.14	9,531.79	44.40	43.69	-98.70	1,947.13	-106.83	991.33	904.12	87.22	11.366	
11,400.00	9,381.07	11,474.14	9,532.09	45.32	44.63	-98.70	2,047.12	-107.71	991.34	902.25	89.09	11.128	
11,500.00	9,381.38	11,574.14	9,532.40	46.27	45.59	-98.70	2,147.12	-108.59	991.34	900.33	91.00	10.893	
11,600.00	9,381.68	11,674.14	9,532.70	47.25	46.58	-98.70	2,247.11	-109.47	991.34	898.37	92.97	10.663	
11,700.00	9,381.99	11,774.14	9,533.01	48.24	47.60	-98.70	2,347.11	-110.35	991.34	896.35	94.98	10.437	
11,800.00	9,382.29	11,874.14	9,533.31	49.26	48.63	-98.70	2,447.11	-111.23	991.34	894.30	97.04	10.216	
11,900.00	9,382.60	11,974.14	9,533.62	50.30	49.68	-98.70	2,547.10	-112.11	991.34	892.21	99.13	10.000	
12,000.00	9,382.90	12,074.14	9,533.92	51.36	50.76	-98.70	2,647.10	-112.99	991.34	890.07	101.26	9.790	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD27 NME)
 Reference Site: Myox 21 State Com
 Site Error: 0.00 usft
 Reference Well: 38H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 38H
 TVD Reference: KB @ 3001.90usft (Ensign 155)
 MD Reference: KB @ 3001.90usft (Ensign 155)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 35H - OH - Plan 1 10-19-18													Offset Site Error: 0.00 usft
Survey Program: O-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +W-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)
12,100.00	9,383.21	12,174.14	9,534.23	52.44	51.85	-98.70	2,747.09	-113.87	991.34	887.91	103.43	9.585	
12,200.00	9,383.51	12,274.14	9,534.53	53.54	52.95	-98.70	2,847.09	-114.75	991.34	885.71	105.63	9.385	
12,300.00	9,383.82	12,374.14	9,534.83	54.65	54.08	-98.70	2,947.08	-115.63	991.34	883.48	107.86	9.191	
12,400.00	9,384.12	12,474.14	9,535.14	55.77	55.21	-98.70	3,047.08	-116.51	991.34	881.22	110.12	9.002	
12,500.00	9,384.43	12,574.14	9,535.44	56.91	56.36	-98.70	3,147.08	-117.39	991.34	878.94	112.41	8.819	
12,600.00	9,384.73	12,674.14	9,535.75	58.07	57.53	-98.70	3,247.07	-118.27	991.34	876.63	114.72	8.642	
12,700.00	9,385.04	12,774.14	9,536.05	59.23	58.71	-98.70	3,347.07	-119.15	991.34	874.29	117.05	8.469	
12,800.00	9,385.34	12,874.14	9,536.36	60.41	59.89	-98.70	3,447.06	-120.03	991.34	871.93	119.41	8.302	
12,900.00	9,385.65	12,974.14	9,536.66	61.60	61.09	-98.70	3,547.06	-120.91	991.34	869.55	121.79	8.140	
13,000.00	9,385.95	13,074.14	9,536.97	62.80	62.30	-98.70	3,647.05	-121.79	991.35	867.15	124.19	7.982	
13,100.00	9,386.26	13,174.14	9,537.27	64.01	63.52	-98.70	3,747.05	-122.67	991.35	864.74	126.61	7.830	
13,200.00	9,386.56	13,274.14	9,537.57	65.22	64.75	-98.70	3,847.05	-123.55	991.35	862.30	129.05	7.682	
13,300.00	9,386.87	13,374.14	9,537.88	66.45	65.98	-98.70	3,947.04	-124.43	991.35	859.85	131.50	7.539	
13,400.00	9,387.17	13,474.14	9,538.18	67.69	67.23	-98.70	4,047.04	-125.31	991.35	857.38	133.97	7.400	
13,500.00	9,387.48	13,574.14	9,538.49	68.93	68.48	-98.70	4,147.03	-126.19	991.35	854.90	136.45	7.265	
13,600.00	9,387.78	13,674.14	9,538.79	70.18	69.74	-98.70	4,247.03	-127.07	991.35	852.40	138.95	7.134	
13,700.00	9,388.09	13,774.14	9,539.10	71.44	71.01	-98.70	4,347.02	-127.95	991.35	849.89	141.46	7.008	
13,800.00	9,388.39	13,874.14	9,539.40	72.70	72.28	-98.70	4,447.02	-128.83	991.35	847.36	143.99	6.885	
13,900.00	9,388.70	13,974.14	9,539.71	73.97	73.56	-98.70	4,547.02	-129.71	991.35	844.83	146.53	6.766	
14,000.00	9,389.00	14,074.14	9,540.01	75.25	74.84	-98.70	4,647.01	-130.59	991.35	842.28	149.07	6.650	
14,100.00	9,389.31	14,174.14	9,540.32	76.53	76.13	-98.70	4,747.01	-131.47	991.35	839.72	151.63	6.538	
14,200.00	9,389.61	14,274.14	9,540.62	77.82	77.43	-98.70	4,847.00	-132.35	991.35	837.15	154.20	6.429	
14,300.00	9,389.92	14,374.14	9,540.92	79.12	78.73	-98.70	4,947.00	-133.23	991.35	834.57	156.78	6.323	
14,400.00	9,390.22	14,474.14	9,541.23	80.41	80.03	-98.70	5,046.99	-134.11	991.35	831.98	159.37	6.220	
14,500.00	9,390.53	14,574.14	9,541.53	81.72	81.34	-98.70	5,146.99	-134.99	991.35	829.38	161.97	6.121	
14,600.00	9,390.83	14,674.14	9,541.84	83.02	82.65	-98.70	5,246.98	-135.87	991.36	826.78	164.58	6.024	
14,700.00	9,391.14	14,774.14	9,542.14	84.34	83.97	-98.70	5,346.98	-136.75	991.36	824.16	167.19	5.929	
14,800.00	9,391.44	14,874.14	9,542.45	85.65	85.29	-98.70	5,446.98	-137.63	991.36	821.54	169.82	5.838	
14,900.00	9,391.75	14,974.14	9,542.75	86.97	86.62	-98.70	5,546.97	-138.51	991.36	818.91	172.45	5.749	
15,000.00	9,392.05	15,074.14	9,543.06	88.29	87.95	-98.70	5,646.97	-139.39	991.36	816.28	175.08	5.662	
15,100.00	9,392.36	15,174.14	9,543.36	89.62	89.28	-98.70	5,746.96	-140.27	991.36	813.63	177.73	5.578	
15,200.00	9,392.66	15,274.14	9,543.66	90.95	90.62	-98.70	5,846.96	-141.15	991.36	810.98	180.38	5.496	
15,300.00	9,392.97	15,374.14	9,543.97	92.29	91.96	-98.70	5,946.95	-142.03	991.36	808.33	183.03	5.416	
15,400.00	9,393.27	15,474.14	9,544.27	93.62	93.30	-98.70	6,046.95	-142.91	991.36	805.67	185.70	5.339	
15,500.00	9,393.58	15,574.14	9,544.58	94.96	94.64	-98.70	6,146.95	-143.79	991.36	803.00	188.36	5.263	
15,600.00	9,393.88	15,674.14	9,544.88	96.31	95.99	-98.70	6,246.94	-144.67	991.36	800.32	191.04	5.189	
15,700.00	9,394.19	15,774.14	9,545.19	97.65	97.34	-98.70	6,346.94	-145.55	991.36	797.65	193.72	5.118	
15,800.00	9,394.49	15,874.14	9,545.49	99.00	98.69	-98.70	6,446.93	-146.43	991.36	794.96	196.40	5.048	
15,900.00	9,394.80	15,974.14	9,545.80	100.35	100.05	-98.70	6,546.93	-147.31	991.36	792.28	199.09	4.980	
16,000.00	9,395.10	16,074.14	9,546.10	101.70	101.41	-98.70	6,646.92	-148.19	991.36	789.58	201.78	4.913	
16,100.00	9,395.41	16,174.14	9,546.40	103.06	102.77	-98.70	6,746.92	-149.07	991.36	786.89	204.48	4.848	
16,200.00	9,395.71	16,274.14	9,546.71	104.42	104.13	-98.70	6,846.92	-149.95	991.37	784.19	207.18	4.785	
16,300.00	9,396.02	16,374.14	9,547.01	105.77	105.49	-98.70	6,946.91	-150.83	991.37	781.48	209.89	4.723	
16,400.00	9,396.32	16,474.14	9,547.32	107.14	106.86	-98.70	7,046.91	-151.71	991.37	778.77	212.60	4.663	
16,500.00	9,396.63	16,574.14	9,547.62	108.50	108.23	-98.70	7,146.90	-152.59	991.37	776.06	215.31	4.604	
16,600.00	9,396.93	16,674.14	9,547.93	109.87	109.60	-98.70	7,246.90	-153.47	991.37	773.34	218.03	4.547	
16,700.00	9,397.24	16,774.14	9,548.23	111.23	110.97	-98.70	7,346.89	-154.35	991.37	770.62	220.75	4.491	
16,800.00	9,397.54	16,874.14	9,548.54	112.60	112.34	-98.70	7,446.89	-155.23	991.37	767.90	223.47	4.436	
16,900.00	9,397.85	16,974.14	9,548.84	113.97	113.72	-98.70	7,546.89	-156.11	991.37	765.17	226.20	4.383	
17,000.00	9,398.15	17,074.14	9,549.15	115.35	115.09	-98.70	7,646.88	-156.99	991.37	762.44	228.93	4.330	
17,100.00	9,398.46	17,174.14	9,549.45	116.72	116.47	-98.70	7,746.88	-157.87	991.37	759.71	231.66	4.279	
17,200.00	9,398.76	17,274.14	9,549.75	118.10	117.85	-98.70	7,846.87	-158.75	991.37	756.97	234.40	4.229	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Corn
Site Error: 0.00 usft
Reference Well: 38H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 38H
TVD Reference: KB @ 3001.90usft (Ensign 155)
MD Reference: KB @ 3001.90usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Corn - 35H - OH - Plan 1 10-19-18												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
17,300.00	9,399.07	17,374.14	9,550.06	119.47	119.23	-98.70	7,948.87	-159.63	991.37	754.24	237.14	4.181	
17,400.00	9,399.37	17,474.14	9,550.36	120.85	120.61	-98.70	8,046.86	-160.52	991.37	751.49	239.88	4.133	
17,500.00	9,399.68	17,574.14	9,550.67	122.23	121.99	-98.70	8,146.86	-161.40	991.37	748.75	242.62	4.086	
17,600.00	9,399.98	17,674.14	9,550.97	123.61	123.38	-98.70	8,246.85	-162.28	991.37	746.00	245.37	4.040	
17,700.00	9,400.29	17,774.14	9,551.28	125.00	124.77	-98.70	8,346.85	-163.16	991.37	743.26	248.12	3.996	
17,800.00	9,400.59	17,874.14	9,551.58	126.38	126.15	-98.70	8,446.85	-164.04	991.38	740.50	250.87	3.952	
17,900.00	9,400.90	17,974.14	9,551.89	127.77	127.54	-98.70	8,546.84	-164.92	991.38	737.75	253.63	3.909	
18,000.00	9,401.20	18,074.14	9,552.19	129.15	128.93	-98.70	8,646.84	-165.80	991.38	735.00	256.38	3.867	
18,100.00	9,401.51	18,174.14	9,552.49	130.54	130.32	-98.70	8,746.83	-166.68	991.38	732.24	259.14	3.826	
18,200.00	9,401.81	18,274.14	9,552.80	131.93	131.71	-98.70	8,846.83	-167.56	991.38	729.48	261.90	3.785	
18,300.00	9,402.12	18,374.14	9,553.10	133.32	133.10	-98.70	8,946.82	-168.44	991.38	726.72	264.66	3.746	
18,400.00	9,402.42	18,474.14	9,553.41	134.71	134.50	-98.70	9,046.82	-169.32	991.38	723.95	267.43	3.707	
18,500.00	9,402.73	18,574.14	9,553.71	136.10	135.89	-98.70	9,146.82	-170.20	991.38	721.19	270.19	3.669	
18,600.00	9,403.03	18,674.14	9,554.02	137.49	137.29	-98.70	9,246.81	-171.08	991.38	718.42	272.96	3.632	
18,700.00	9,403.34	18,774.14	9,554.32	138.89	138.68	-98.70	9,346.81	-171.96	991.38	715.65	275.73	3.595	
18,800.00	9,403.64	18,874.14	9,554.63	140.28	140.08	-98.70	9,446.80	-172.84	991.38	712.88	278.50	3.560	
18,900.00	9,403.95	18,974.14	9,554.93	141.68	141.48	-98.70	9,546.80	-173.72	991.38	710.10	281.28	3.525	
19,000.00	9,404.25	19,074.14	9,555.23	143.08	142.88	-98.70	9,646.79	-174.60	991.38	707.33	284.05	3.490	
19,100.00	9,404.55	19,174.14	9,555.54	144.47	144.28	-98.70	9,746.79	-175.48	991.38	704.55	286.83	3.456	
19,200.00	9,404.86	19,274.14	9,555.84	145.87	145.68	-98.70	9,846.79	-176.36	991.38	701.78	289.61	3.423	
19,300.00	9,405.16	19,374.14	9,556.15	147.27	147.08	-98.70	9,946.78	-177.24	991.38	699.00	292.39	3.391	
19,400.00	9,405.47	19,474.14	9,556.45	148.67	148.48	-98.70	10,046.78	-178.12	991.39	696.22	295.17	3.359	
19,500.00	9,405.77	19,574.14	9,556.76	150.07	149.88	-98.70	10,146.77	-179.00	991.39	693.44	297.95	3.327	
19,573.95	9,406.00	19,648.09	9,556.98	151.11	150.92	-98.70	10,220.72	-179.65	991.39	691.38	300.01	3.305 SF	



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Com
Site Error: 0.00 usft
Reference Well: 38H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 38H
TVD Reference: KB @ 3001.90usft (Ensign 155)
MD Reference: KB @ 3001.90usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 36H - OH - Plan 1 10-19-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
0.00	0.00	0.30	0.30	0.00	0.00	-90.47	-0.50	-61.00	61.00				
100.00	100.00	100.30	100.30	0.13	0.14	-90.47	-0.50	-61.00	61.00	60.73	0.27	225.993	
200.00	200.00	200.30	200.30	0.49	0.49	-90.47	-0.50	-61.00	61.00	60.02	0.99	61.814	
300.00	300.00	300.30	300.30	0.85	0.85	-90.47	-0.50	-61.00	61.00	59.30	1.70	35.803	
400.00	400.00	400.30	400.30	1.21	1.21	-90.47	-0.50	-61.00	61.00	58.58	2.42	25.200	
500.00	500.00	500.30	500.30	1.57	1.57	-90.47	-0.50	-61.00	61.00	57.86	3.14	19.442	
600.00	600.00	600.30	600.30	1.93	1.93	-90.47	-0.50	-61.00	61.00	57.15	3.85	15.826	
700.00	700.00	700.30	700.30	2.29	2.29	-90.47	-0.50	-61.00	61.00	56.43	4.57	13.344	
800.00	800.00	800.30	800.30	2.64	2.64	-90.47	-0.50	-61.00	61.00	55.71	5.29	11.535	
900.00	900.00	900.30	900.30	3.00	3.00	-90.47	-0.50	-61.00	61.00	55.00	6.01	10.158	
1,000.00	1,000.00	1,000.30	1,000.30	3.36	3.36	-90.47	-0.50	-61.00	61.00	54.28	6.72	9.074	
1,100.00	1,100.00	1,100.30	1,100.30	3.72	3.72	-90.47	-0.50	-61.00	61.00	53.56	7.44	8.200	
1,200.00	1,200.00	1,200.30	1,200.30	4.08	4.08	-90.47	-0.50	-61.00	61.00	52.85	8.16	7.479	
1,300.00	1,300.00	1,300.30	1,300.30	4.44	4.44	-90.47	-0.50	-61.00	61.00	52.13	8.87	6.875	
1,400.00	1,400.00	1,400.30	1,400.30	4.79	4.80	-90.47	-0.50	-61.00	61.00	51.41	9.59	6.361	
1,500.00	1,500.00	1,500.30	1,500.30	5.15	5.15	-90.47	-0.50	-61.00	61.00	50.69	10.31	5.918	
1,600.00	1,600.00	1,600.30	1,600.30	5.51	5.51	-90.47	-0.50	-61.00	61.00	49.98	11.02	5.534	
1,700.00	1,700.00	1,700.30	1,700.30	5.87	5.87	-90.47	-0.50	-61.00	61.00	49.26	11.74	5.196	
1,800.00	1,800.00	1,800.30	1,800.30	6.23	6.23	-90.47	-0.50	-61.00	61.00	48.54	12.46	4.897	
1,900.00	1,900.00	1,900.30	1,900.30	6.59	6.59	-90.47	-0.50	-61.00	61.00	47.83	13.17	4.630	
2,000.00	2,000.00	2,000.30	2,000.30	6.95	6.95	-90.47	-0.50	-61.00	61.00	47.11	13.89	4.391	
2,100.00	2,100.00	2,100.30	2,100.30	7.30	7.30	-90.47	-0.50	-61.00	61.00	46.39	14.61	4.176	
2,200.00	2,200.00	2,200.30	2,200.30	7.66	7.66	-90.47	-0.50	-61.00	61.00	45.68	15.33	3.980	
2,300.00	2,300.00	2,300.30	2,300.30	8.02	8.02	-90.47	-0.50	-61.00	61.00	44.96	16.04	3.802	
2,400.00	2,400.00	2,400.30	2,400.30	8.38	8.38	-90.47	-0.50	-61.00	61.00	44.24	16.76	3.640	
2,500.00	2,500.00	2,500.31	2,500.31	8.74	8.74	-90.47	-0.50	-61.00	61.00	43.53	17.48	3.491	
2,513.90	2,513.90	2,514.49	2,514.49	8.79	8.79	174.20	-0.51	-60.96	61.00	43.43	17.57	3.471 CC	
2,600.00	2,599.98	2,602.38	2,602.38	9.09	9.09	173.86	-1.03	-59.25	61.03	42.86	18.17	3.359	
2,700.00	2,699.84	2,704.44	2,704.27	9.43	9.44	172.84	-2.63	-54.03	61.15	42.32	18.83	3.248	
2,800.00	2,799.45	2,806.48	2,805.89	9.77	9.79	171.14	-5.28	-45.33	61.39	41.82	19.47	3.154	
2,900.00	2,898.70	2,908.32	2,906.94	10.12	10.14	168.80	-8.97	-33.22	61.83	41.73	20.10	3.076 ES	
3,000.00	2,997.47	3,008.25	3,005.90	10.47	10.49	166.69	-13.03	-19.92	64.41	43.62	20.79	3.098	
3,100.00	3,095.62	3,108.08	3,104.73	10.84	10.84	165.47	-17.08	-6.63	70.43	46.95	21.48	3.279	
3,200.00	3,193.44	3,207.75	3,203.46	11.21	11.20	164.81	-21.12	6.64	78.16	55.98	22.18	3.524	
3,300.00	3,291.25	3,307.45	3,302.19	11.58	11.56	164.27	-25.17	19.92	85.89	63.02	22.88	3.755	
3,400.00	3,389.07	3,407.15	3,400.91	11.97	11.92	163.82	-29.22	33.19	93.63	70.05	23.58	3.971	
3,500.00	3,486.89	3,506.85	3,499.64	12.35	12.29	163.44	-33.27	46.47	101.38	77.09	24.29	4.174	
3,600.00	3,584.70	3,606.54	3,598.37	12.75	12.65	163.11	-37.31	59.74	109.13	84.13	25.00	4.365	
3,700.00	3,682.52	3,708.24	3,697.09	13.14	13.02	162.83	-41.36	73.01	116.88	91.16	25.72	4.544	
3,800.00	3,780.33	3,805.94	3,795.82	13.55	13.40	162.58	-45.41	86.29	124.64	98.20	26.44	4.714	
3,900.00	3,878.15	3,905.64	3,894.55	13.95	13.77	162.36	-49.45	99.56	132.40	105.23	27.17	4.874	
4,000.00	3,975.96	4,005.33	3,993.28	14.36	14.15	162.16	-53.50	112.84	140.16	112.26	27.89	5.025	
4,100.00	4,073.78	4,105.03	4,092.00	14.77	14.53	161.99	-57.55	126.11	147.92	119.29	28.62	5.168	
4,200.00	4,171.60	4,204.73	4,190.73	15.19	14.90	161.83	-61.59	139.38	155.68	126.32	29.36	5.303	
4,300.00	4,269.41	4,304.43	4,289.46	15.61	15.29	161.69	-65.64	152.66	163.44	133.35	30.09	5.431	
4,400.00	4,367.23	4,404.12	4,388.18	16.03	15.67	161.56	-69.69	165.93	171.20	140.37	30.83	5.553	
4,500.00	4,465.04	4,503.82	4,486.91	16.45	16.05	161.44	-73.74	179.21	178.97	147.40	31.57	5.669	
4,600.00	4,562.86	4,603.52	4,585.64	16.88	16.43	161.33	-77.78	192.48	186.73	154.42	32.31	5.779	
4,700.00	4,660.67	4,703.22	4,684.36	17.30	16.82	161.23	-81.83	205.75	194.50	161.44	33.06	5.884	
4,800.00	4,758.49	4,800.00	4,780.23	17.73	17.19	161.17	-85.70	218.45	202.47	168.66	33.81	5.989	
4,900.00	4,856.31	4,894.38	4,874.03	18.16	17.55	161.46	-89.75	228.46	212.69	178.15	34.54	6.158	
5,000.00	4,954.12	4,987.32	4,966.67	18.59	17.89	162.10	-90.88	235.44	225.74	190.50	35.24	6.407	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Com
Site Error: 0.00 usft
Reference Well: 38H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 38H
TVD Reference: KB @ 3001.90usft (Ensign 155)
MD Reference: KB @ 3001.90usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 36H - OH - Plan 1 10-19-18

Survey Program: O-MWD+HDGM

Offset Site Error: 0.00 usft

Offset Well Error: 0.00 usft

Reference		Offset		Semi Major Axis			Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)				Between Centres (usft)
5,100.00	5,051.94	5,079.39	5,058.65	19.03	18.22	163.02	-92.12	239.50	241.62	205.73	35.89	6.732
5,200.00	5,149.75	5,170.81	5,150.05	19.46	18.54	164.13	-92.50	240.75	260.35	223.84	36.51	7.130
5,300.00	5,247.57	5,268.63	5,247.87	19.90	18.87	165.29	-92.50	240.75	280.44	243.23	37.20	7.538
5,400.00	5,345.38	5,366.44	5,345.68	20.34	19.21	166.29	-92.50	240.75	300.61	262.72	37.90	7.933
5,500.00	5,443.20	5,464.26	5,443.50	20.78	19.55	167.17	-92.50	240.75	320.87	282.28	38.59	8.314
5,600.00	5,541.02	5,562.08	5,541.32	21.22	19.88	167.94	-92.50	240.75	341.19	301.90	39.29	8.683
5,700.00	5,638.83	5,659.89	5,639.13	21.66	20.22	168.63	-92.50	240.75	361.56	321.57	39.99	9.040
5,800.00	5,736.65	5,757.71	5,736.95	22.10	20.56	169.25	-92.50	240.75	381.98	341.28	40.70	9.386
5,900.00	5,834.46	5,855.52	5,834.76	22.54	20.90	169.80	-92.50	240.75	402.43	361.03	41.40	9.720
6,000.00	5,932.28	5,953.34	5,932.58	22.98	21.24	170.30	-92.50	240.75	422.92	380.81	42.11	10.043
6,100.00	6,030.09	6,051.15	6,030.39	23.43	21.57	170.75	-92.50	240.75	443.43	400.62	42.82	10.356
6,200.00	6,127.91	6,148.97	6,128.21	23.87	21.91	171.16	-92.50	240.75	463.97	420.45	43.53	10.659
6,300.00	6,225.73	6,246.79	6,226.03	24.32	22.25	171.54	-92.50	240.75	484.53	440.30	44.24	10.953
6,400.00	6,323.54	6,344.60	6,323.84	24.76	22.59	171.89	-92.50	240.75	505.11	460.16	44.95	11.237
6,500.00	6,421.36	6,442.42	6,421.66	25.21	22.93	172.21	-92.50	240.75	525.71	480.05	45.66	11.513
6,600.00	6,519.17	6,540.23	6,519.47	25.66	23.27	172.50	-92.50	240.75	546.32	499.94	46.37	11.780
6,700.00	6,616.99	6,638.05	6,617.29	26.11	23.62	172.77	-92.50	240.75	566.94	519.85	47.09	12.040
6,800.00	6,714.80	6,735.86	6,715.10	26.55	23.96	173.03	-92.50	240.75	587.57	539.77	47.80	12.291
6,900.00	6,812.95	6,834.01	6,813.25	26.99	24.30	173.29	-92.50	240.75	608.61	559.09	48.52	12.503
7,000.00	6,911.69	6,932.75	6,911.99	27.41	24.64	173.50	-92.50	240.75	622.24	573.01	49.23	12.639
7,100.00	7,010.93	7,031.99	7,011.23	27.80	24.99	173.65	-92.50	240.75	634.44	584.50	49.95	12.703
7,200.00	7,110.54	7,131.60	7,110.84	28.17	25.34	173.76	-92.50	240.75	643.20	592.54	50.65	12.698
7,300.00	7,210.39	7,231.45	7,210.69	28.52	25.69	173.82	-92.50	240.75	648.49	597.13	51.36	12.627
7,400.00	7,310.37	7,331.43	7,310.67	28.85	26.04	173.84	-92.50	240.75	650.32	598.26	52.05	12.493
7,500.00	7,410.37	7,431.43	7,410.67	29.16	26.39	-90.84	-92.50	240.75	650.32	597.58	52.74	12.330
7,600.00	7,510.37	7,531.43	7,510.67	29.48	26.74	-90.84	-92.50	240.75	650.32	596.88	53.43	12.170
7,700.00	7,610.37	7,631.43	7,610.67	29.80	27.09	-90.84	-92.50	240.75	650.32	596.19	54.13	12.015
7,800.00	7,710.37	7,731.43	7,710.67	30.11	27.44	-90.84	-92.50	240.75	650.32	595.50	54.82	11.863
7,900.00	7,810.37	7,831.43	7,810.67	30.43	27.79	-90.84	-92.50	240.75	650.32	594.81	55.51	11.715
8,000.00	7,910.37	7,931.43	7,910.67	30.75	28.15	-90.84	-92.50	240.75	650.32	594.12	56.20	11.571
8,100.00	8,010.37	8,031.43	8,010.67	31.07	28.50	-90.84	-92.50	240.75	650.32	593.42	56.90	11.430
8,200.00	8,110.37	8,131.43	8,110.67	31.39	28.85	-90.84	-92.50	240.75	650.32	592.73	57.59	11.292
8,300.00	8,210.37	8,231.43	8,210.67	31.72	29.20	-90.84	-92.50	240.75	650.32	592.03	58.28	11.158
8,400.00	8,310.37	8,331.43	8,310.67	32.04	29.55	-90.84	-92.50	240.75	650.32	591.34	58.98	11.026
8,500.00	8,410.37	8,431.43	8,410.67	32.36	29.91	-90.84	-92.50	240.75	650.32	590.64	59.68	10.898
8,600.00	8,510.37	8,531.43	8,510.67	32.69	30.26	-90.84	-92.50	240.75	650.32	589.95	60.37	10.772
8,700.00	8,610.37	8,631.43	8,610.67	33.01	30.61	-90.84	-92.50	240.75	650.32	589.25	61.07	10.649
8,800.00	8,710.37	8,731.43	8,710.67	33.34	30.96	-90.84	-92.50	240.75	650.32	588.55	61.77	10.529
8,900.00	8,810.37	8,831.43	8,810.67	33.66	31.32	-90.84	-92.50	240.75	650.32	587.86	62.46	10.411
9,000.00	8,910.37	8,931.66	8,910.86	33.99	31.67	-90.22	-91.04	240.74	650.31	587.15	63.16	10.296
9,047.43	8,957.65	8,979.14	8,957.94	34.14	31.83	-89.99	-84.98	240.68	650.31	586.83	63.48	10.245
9,100.00	9,009.35	9,031.48	9,008.84	34.31	32.01	-89.75	-72.93	240.58	650.31	586.49	63.82	10.190
9,200.00	9,103.49	9,130.22	9,099.97	34.60	32.31	-89.29	-35.39	240.25	650.36	585.94	64.42	10.095
9,300.00	9,188.67	9,227.95	9,180.69	34.84	32.55	-88.87	18.41	239.77	650.43	585.47	64.96	10.012
9,400.00	9,261.17	9,325.00	9,248.16	35.02	32.73	-88.49	88.93	239.16	650.53	585.07	65.48	9.938
9,500.00	9,317.82	9,420.93	9,299.70	35.15	32.85	-88.18	169.65	238.45	650.63	584.71	65.92	9.870
9,600.00	9,356.15	9,516.49	9,334.00	35.24	33.02	-87.95	258.66	237.67	650.71	584.36	66.36	9.806
9,700.00	9,374.48	9,611.65	9,349.89	35.31	33.26	-87.80	352.32	236.85	650.77	583.98	66.79	9.743
9,800.00	9,376.20	9,710.03	9,351.28	35.43	33.52	-87.78	450.68	235.99	650.78	583.51	67.27	9.674
9,900.00	9,376.50	9,810.03	9,351.68	35.61	33.83	-87.79	550.67	235.11	650.77	582.91	67.87	9.589
10,000.00	9,376.81	9,910.03	9,352.09	35.87	34.20	-87.80	650.67	234.24	650.77	582.19	68.58	9.489
10,100.00	9,377.11	10,010.03	9,352.49	36.20	34.62	-87.81	750.66	233.36	650.76	581.35	69.41	9.376

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Com
Site Error: 0.00 usft
Reference Well: 38H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 38H
TVD Reference: KB @ 3001.90usft (Ensign 155)
MD Reference: KB @ 3001.90usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 36H - OH - Plan 1 10-19-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)					
10,200.00	9,377.42	10,110.03	9,352.90	36.61	35.09	-87.81	850.66	232.48	650.75	580.41	70.34	9.252	
10,300.00	9,377.72	10,210.03	9,353.31	37.08	35.62	-87.82	950.65	231.61	650.75	579.37	71.38	9.117	
10,400.00	9,378.03	10,310.03	9,353.71	37.61	36.19	-87.83	1,050.65	230.73	650.74	578.23	72.51	8.974	
10,500.00	9,378.33	10,410.03	9,354.12	38.20	36.81	-87.84	1,150.64	229.85	650.73	576.99	73.75	8.824	
10,600.00	9,378.64	10,510.03	9,354.53	38.84	37.48	-87.85	1,250.64	228.98	650.73	575.66	75.07	8.669	
10,700.00	9,378.94	10,610.03	9,354.93	39.52	38.19	-87.86	1,350.63	228.10	650.72	574.24	76.48	8.509	
10,800.00	9,379.25	10,710.03	9,355.34	40.24	38.94	-87.87	1,450.63	227.23	650.71	572.75	77.96	8.348	
10,900.00	9,379.55	10,810.03	9,355.75	41.00	39.72	-87.88	1,550.63	226.35	650.71	571.18	79.53	8.182	
11,000.00	9,379.86	10,910.03	9,356.15	41.80	40.55	-87.89	1,650.62	225.47	650.70	569.53	81.17	8.017	
11,100.00	9,380.16	11,010.03	9,356.56	42.64	41.40	-87.89	1,750.62	224.60	650.69	567.82	82.87	7.852	
11,200.00	9,380.46	11,110.03	9,356.96	43.50	42.29	-87.90	1,850.61	223.72	650.68	566.05	84.64	7.688	
11,300.00	9,380.77	11,210.03	9,357.37	44.40	43.21	-87.91	1,950.61	222.84	650.68	564.21	86.47	7.525	
11,400.00	9,381.07	11,310.03	9,357.78	45.32	44.15	-87.92	2,050.60	221.97	650.67	562.32	88.35	7.365	
11,500.00	9,381.38	11,410.03	9,358.18	46.27	45.12	-87.93	2,150.60	221.09	650.66	560.38	90.28	7.207	
11,600.00	9,381.68	11,510.03	9,358.59	47.25	46.12	-87.94	2,250.59	220.21	650.66	558.39	92.27	7.052	
11,700.00	9,381.99	11,610.03	9,359.00	48.24	47.13	-87.95	2,350.59	219.34	650.65	556.35	94.30	6.900	
11,800.00	9,382.29	11,710.03	9,359.40	49.26	48.17	-87.96	2,450.58	218.46	650.64	554.27	96.38	6.751	
11,900.00	9,382.60	11,810.03	9,359.81	50.30	49.23	-87.97	2,550.58	217.58	650.64	552.15	98.49	6.606	
12,000.00	9,382.90	11,910.03	9,360.21	51.36	50.31	-87.98	2,650.57	216.71	650.63	549.99	100.64	6.465	
12,100.00	9,383.21	12,010.03	9,360.62	52.44	51.41	-87.98	2,750.57	215.83	650.62	547.79	102.83	6.327	
12,200.00	9,383.51	12,110.03	9,361.03	53.54	52.52	-87.99	2,850.56	214.96	650.62	545.56	105.05	6.193	
12,300.00	9,383.82	12,210.03	9,361.43	54.65	53.65	-88.00	2,950.56	214.08	650.61	543.30	107.31	6.063	
12,400.00	9,384.12	12,310.03	9,361.84	55.77	54.79	-88.01	3,050.55	213.20	650.60	541.02	109.59	5.937	
12,500.00	9,384.43	12,410.03	9,362.25	56.91	55.95	-88.02	3,150.55	212.33	650.60	538.70	111.90	5.814	
12,600.00	9,384.73	12,510.03	9,362.65	58.07	57.12	-88.03	3,250.55	211.45	650.59	536.38	114.23	5.695	
12,700.00	9,385.04	12,610.03	9,363.06	59.23	58.30	-88.04	3,350.54	210.57	650.59	533.99	116.59	5.580	
12,800.00	9,385.34	12,710.03	9,363.46	60.41	59.49	-88.05	3,450.54	209.70	650.58	531.60	118.98	5.468	
12,900.00	9,385.65	12,810.03	9,363.87	61.60	60.69	-88.06	3,550.53	208.82	650.57	529.19	121.38	5.360	
13,000.00	9,385.95	12,910.03	9,364.28	62.80	61.91	-88.06	3,650.53	207.94	650.57	526.78	123.80	5.255	
13,100.00	9,386.26	13,010.03	9,364.68	64.01	63.13	-88.07	3,750.52	207.07	650.56	524.31	126.25	5.153	
13,200.00	9,386.56	13,110.03	9,365.09	65.22	64.36	-88.08	3,850.52	206.19	650.55	521.84	128.71	5.054	
13,300.00	9,386.87	13,210.03	9,365.50	66.45	65.60	-88.09	3,950.51	205.32	650.55	519.36	131.19	4.959	
13,400.00	9,387.17	13,310.03	9,365.90	67.69	66.85	-88.10	4,050.51	204.44	650.54	516.88	133.68	4.866	
13,500.00	9,387.48	13,410.03	9,366.31	68.93	68.11	-88.11	4,150.50	203.56	650.53	514.34	136.19	4.777	
13,600.00	9,387.78	13,510.03	9,366.71	70.18	69.37	-88.12	4,250.50	202.69	650.53	511.81	138.72	4.690	
13,700.00	9,388.09	13,610.03	9,367.12	71.44	70.64	-88.13	4,350.49	201.81	650.52	509.27	141.25	4.605	
13,800.00	9,388.39	13,710.03	9,367.53	72.70	71.91	-88.14	4,450.49	200.93	650.51	506.71	143.80	4.524	
13,900.00	9,388.70	13,810.03	9,367.93	73.97	73.20	-88.14	4,550.48	200.06	650.51	504.14	146.37	4.444	
14,000.00	9,389.00	13,910.03	9,368.34	75.25	74.48	-88.15	4,650.48	199.18	650.50	501.56	148.94	4.368	
14,100.00	9,389.31	14,010.03	9,368.75	76.53	75.78	-88.16	4,750.47	198.30	650.50	498.97	151.53	4.293	
14,200.00	9,389.61	14,110.03	9,369.15	77.82	77.08	-88.17	4,850.47	197.43	650.49	496.37	154.12	4.221	
14,300.00	9,389.92	14,210.03	9,369.56	79.12	78.38	-88.18	4,950.47	196.55	650.48	493.76	156.73	4.150	
14,400.00	9,390.22	14,310.03	9,369.97	80.41	79.69	-88.19	5,050.46	195.67	650.48	491.13	159.34	4.082	
14,500.00	9,390.53	14,410.03	9,370.37	81.72	81.00	-88.20	5,150.46	194.80	650.47	488.50	161.97	4.016	
14,600.00	9,390.83	14,510.03	9,370.78	83.02	82.32	-88.21	5,250.45	193.92	650.46	485.87	164.60	3.952	
14,700.00	9,391.14	14,610.03	9,371.18	84.34	83.64	-88.22	5,350.45	193.05	650.46	483.22	167.24	3.889	
14,800.00	9,391.44	14,710.03	9,371.59	85.65	84.96	-88.22	5,450.44	192.17	650.45	480.56	169.89	3.829	
14,900.00	9,391.75	14,810.03	9,372.00	86.97	86.29	-88.23	5,550.44	191.29	650.45	477.90	172.54	3.770	
15,000.00	9,392.05	14,910.03	9,372.40	88.29	87.62	-88.24	5,650.43	190.42	650.44	475.23	175.21	3.712	
15,100.00	9,392.36	15,010.03	9,372.81	89.62	88.96	-88.25	5,750.43	189.54	650.43	472.56	177.88	3.657	
15,200.00	9,392.66	15,110.03	9,373.22	90.95	90.29	-88.26	5,850.42	188.66	650.43	469.88	180.55	3.602	
15,300.00	9,392.97	15,210.03	9,373.62	92.29	91.64	-88.27	5,950.42	187.79	650.42	467.19	183.23	3.550	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Corn
Site Error: 0.00 usft
Reference Well: 38H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 38H
TVD Reference: KB @ 3001.90usft (Ensign 155)
MD Reference: KB @ 3001.90usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Corn - 36H - OH - Plan 1 10-19-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toothface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)					
15,400.00	9,393.27	15,310.03	9,374.03	93.62	92.98	-88.28	6,050.41	186.91	650.42	464.49	185.92	3.498	
15,500.00	9,393.58	15,410.03	9,374.43	94.96	94.33	-88.29	6,150.41	186.03	650.41	461.79	188.62	3.448	
15,600.00	9,393.88	15,510.03	9,374.84	96.31	95.68	-88.30	6,250.40	185.16	650.40	459.09	191.31	3.400	
15,700.00	9,394.19	15,610.03	9,375.25	97.65	97.03	-88.30	6,350.40	184.28	650.40	456.38	194.02	3.352	
15,800.00	9,394.49	15,710.03	9,375.65	99.00	98.38	-88.31	6,450.39	183.41	650.39	453.68	196.73	3.306	
15,900.00	9,394.80	15,810.03	9,376.06	100.35	99.74	-88.32	6,550.39	182.53	650.38	450.94	199.44	3.261	
16,000.00	9,395.10	15,910.03	9,376.47	101.70	101.10	-88.33	6,650.39	181.65	650.38	448.22	202.16	3.217	
16,100.00	9,395.41	16,010.03	9,376.87	103.06	102.46	-88.34	6,750.38	180.78	650.37	445.49	204.88	3.174	
16,200.00	9,395.71	16,110.03	9,377.28	104.42	103.83	-88.35	6,850.38	179.90	650.37	442.76	207.61	3.133	
16,300.00	9,396.02	16,210.03	9,377.68	105.77	105.19	-88.36	6,950.37	179.02	650.36	440.02	210.34	3.092	
16,400.00	9,396.32	16,310.03	9,378.09	107.14	106.56	-88.37	7,050.37	178.15	650.36	437.28	213.08	3.052	
16,500.00	9,396.63	16,410.03	9,378.50	108.50	107.93	-88.38	7,150.38	177.27	650.35	434.53	215.82	3.013	
16,600.00	9,396.93	16,510.03	9,378.90	109.87	109.30	-88.39	7,250.38	176.39	650.34	431.78	218.56	2.976	
16,700.00	9,397.24	16,610.03	9,379.31	111.23	110.67	-88.39	7,350.35	175.52	650.34	429.03	221.30	2.939	
16,800.00	9,397.54	16,710.03	9,379.72	112.60	112.05	-88.40	7,450.35	174.64	650.33	426.28	224.05	2.903	
16,900.00	9,397.85	16,810.03	9,380.12	113.97	113.42	-88.41	7,550.34	173.76	650.33	423.52	226.81	2.867	
17,000.00	9,398.15	16,910.03	9,380.53	115.35	114.80	-88.42	7,650.34	172.89	650.32	420.76	229.56	2.833	
17,100.00	9,398.46	17,010.03	9,380.93	116.72	116.18	-88.43	7,750.33	172.01	650.31	417.99	232.32	2.799	
17,200.00	9,398.76	17,110.03	9,381.34	118.10	117.56	-88.44	7,850.33	171.14	650.31	415.23	235.08	2.766	
17,300.00	9,399.07	17,210.03	9,381.75	119.47	118.94	-88.45	7,950.32	170.26	650.30	412.48	237.85	2.734	
17,400.00	9,399.37	17,310.03	9,382.15	120.85	120.33	-88.46	8,050.32	169.38	650.30	409.68	240.61	2.703	
17,500.00	9,399.68	17,410.03	9,382.56	122.23	121.71	-88.47	8,150.31	168.51	650.29	406.91	243.38	2.672	
17,600.00	9,399.98	17,510.03	9,382.97	123.61	123.10	-88.47	8,250.31	167.63	650.28	404.13	246.16	2.642	
17,700.00	9,400.29	17,610.03	9,383.37	125.00	124.48	-88.48	8,350.30	166.75	650.28	401.35	248.93	2.612	
17,800.00	9,400.59	17,710.03	9,383.78	126.38	125.87	-88.49	8,450.30	165.88	650.27	398.57	251.71	2.583	
17,900.00	9,400.90	17,810.03	9,384.19	127.77	127.26	-88.50	8,550.30	165.00	650.27	395.78	254.49	2.555	
18,000.00	9,401.20	17,910.03	9,384.59	129.15	128.65	-88.51	8,650.29	164.12	650.26	392.99	257.27	2.528	
18,100.00	9,401.51	18,010.03	9,385.00	130.54	130.05	-88.52	8,750.29	163.25	650.26	390.20	260.05	2.500	
18,200.00	9,401.81	18,110.03	9,385.40	131.93	131.44	-88.53	8,850.28	162.37	650.25	387.41	262.84	2.474	
18,300.00	9,402.12	18,210.03	9,385.81	133.32	132.83	-88.54	8,950.28	161.50	650.25	384.62	265.63	2.448	
18,400.00	9,402.42	18,310.03	9,386.22	134.71	134.23	-88.55	9,050.27	160.62	650.24	381.82	268.42	2.423	
18,500.00	9,402.73	18,410.03	9,386.62	136.10	135.62	-88.55	9,150.27	159.74	650.23	379.03	271.21	2.398	
18,600.00	9,403.03	18,510.03	9,387.03	137.49	137.02	-88.56	9,250.26	158.87	650.23	376.23	274.00	2.373	
18,700.00	9,403.34	18,610.03	9,387.44	138.89	138.42	-88.57	9,350.26	157.99	650.22	373.43	276.80	2.349	
18,800.00	9,403.64	18,710.03	9,387.84	140.28	139.81	-88.58	9,450.25	157.11	650.22	370.62	279.59	2.326	
18,900.00	9,403.95	18,810.03	9,388.25	141.68	141.21	-88.59	9,550.25	156.24	650.21	367.82	282.39	2.303	
19,000.00	9,404.25	18,910.03	9,388.65	143.08	142.61	-88.60	9,650.24	155.38	650.21	365.02	285.19	2.280	
19,100.00	9,404.55	19,010.03	9,389.06	144.47	144.01	-88.61	9,750.24	154.48	650.20	362.21	287.99	2.258	
19,200.00	9,404.86	19,110.03	9,389.47	145.87	145.41	-88.62	9,850.23	153.61	650.20	359.40	290.80	2.236	
19,300.00	9,405.16	19,210.03	9,389.87	147.27	146.82	-88.63	9,950.23	152.73	650.19	356.59	293.60	2.215	
19,400.00	9,405.47	19,310.03	9,390.28	148.67	148.22	-88.63	10,050.22	151.85	650.18	353.78	296.41	2.194	
19,500.00	9,405.77	19,410.03	9,390.69	150.07	149.62	-88.64	10,150.22	150.98	650.18	350.96	299.21	2.173	
19,573.95	9,406.00	19,483.98	9,390.99	151.11	150.66	-88.65	10,224.17	150.33	650.17	348.88	301.29	2.158 SF	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Com
Site Error: 0.00 usft
Reference Well: 38H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 38H
TVD Reference: KB @ 3001.90usft (Ensign 155)
MD Reference: KB @ 3001.90usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 37H - OH - Plan 1 10-19-18														Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore +N-S (usft)	Centre +E/-W (usft)						Between Centres (usft)
0.00	0.00	0.00	0.00	0.00	0.00	-90.55	-0.30	-31.00	31.02					
100.00	100.00	99.00	99.00	0.13	0.13	-90.55	-0.30	-31.00	31.00	30.73	0.27	115.125		
200.00	200.00	199.00	199.00	0.49	0.49	-90.55	-0.30	-31.00	31.00	30.02	0.98	31.505		
300.00	300.00	299.00	299.00	0.85	0.85	-90.55	-0.30	-31.00	31.00	29.30	1.70	18.228		
400.00	400.00	399.00	399.00	1.21	1.21	-90.55	-0.30	-31.00	31.00	28.58	2.42	12.822		
500.00	500.00	499.00	499.00	1.57	1.57	-90.55	-0.30	-31.00	31.00	27.87	3.13	9.889		
600.00	600.00	599.00	599.00	1.93	1.92	-90.55	-0.30	-31.00	31.00	27.15	3.85	8.049		
700.00	700.00	699.00	699.00	2.29	2.28	-90.55	-0.30	-31.00	31.00	26.43	4.57	6.786		
800.00	800.00	799.00	799.00	2.64	2.64	-90.55	-0.30	-31.00	31.00	25.72	5.29	5.865		
900.00	900.00	899.00	899.00	3.00	3.00	-90.55	-0.30	-31.00	31.00	25.00	6.00	5.165		
1,000.00	1,000.00	999.00	999.00	3.36	3.36	-90.55	-0.30	-31.00	31.00	24.28	6.72	4.614		
1,100.00	1,100.00	1,099.00	1,099.00	3.72	3.72	-90.55	-0.30	-31.00	31.00	23.56	7.44	4.169		
1,200.00	1,200.00	1,199.00	1,199.00	4.08	4.08	-90.55	-0.30	-31.00	31.00	22.85	8.15	3.802		
1,300.00	1,300.00	1,299.00	1,299.00	4.44	4.43	-90.55	-0.30	-31.00	31.00	22.13	8.87	3.495		
1,400.00	1,400.00	1,399.00	1,399.00	4.79	4.79	-90.55	-0.30	-31.00	31.00	21.41	9.59	3.234		
1,500.00	1,500.00	1,499.00	1,499.00	5.15	5.15	-90.55	-0.30	-31.00	31.00	20.70	10.30	3.009		
1,600.00	1,600.00	1,599.00	1,599.00	5.51	5.51	-90.55	-0.30	-31.00	31.00	19.98	11.02	2.813		
1,700.00	1,700.00	1,699.00	1,699.00	5.87	5.87	-90.55	-0.30	-31.00	31.00	19.26	11.74	2.641		
1,800.00	1,800.00	1,799.00	1,799.00	6.23	6.23	-90.55	-0.30	-31.00	31.00	18.55	12.46	2.489		
1,900.00	1,900.00	1,899.00	1,899.00	6.59	6.59	-90.55	-0.30	-31.00	31.00	17.83	13.17	2.354		
2,000.00	2,000.00	1,999.00	1,999.00	6.95	6.94	-90.55	-0.30	-31.00	31.00	17.11	13.89	2.232		
2,100.00	2,100.00	2,099.00	2,099.00	7.30	7.30	-90.55	-0.30	-31.00	31.00	16.40	14.61	2.123		
2,200.00	2,200.00	2,199.00	2,199.00	7.66	7.66	-90.55	-0.30	-31.00	31.00	15.68	15.32	2.023		
2,300.00	2,300.00	2,299.00	2,299.00	8.02	8.02	-90.55	-0.30	-31.00	31.00	14.96	16.04	1.933		
2,400.00	2,400.00	2,399.00	2,399.00	8.38	8.38	-90.55	-0.30	-31.00	31.00	14.24	16.76	1.850		
2,500.00	2,500.00	2,499.00	2,499.00	8.74	8.74	-90.55	-0.30	-31.00	31.00	13.53	17.47	1.774 CC		
2,600.00	2,599.98	2,600.07	2,600.05	9.09	9.09	173.96	-0.55	-29.27	31.03	12.86	18.16	1.708		
2,700.00	2,699.84	2,701.15	2,700.99	9.43	9.43	173.47	-1.31	-24.01	31.04	12.23	18.82	1.650		
2,800.00	2,799.45	2,802.23	2,801.67	9.77	9.78	172.63	-2.58	-15.24	31.05	11.60	19.45	1.596		
2,900.00	2,898.70	2,903.30	2,901.97	10.12	10.13	171.46	-4.36	-2.95	31.06	10.88	20.07	1.547		
2,902.66	2,901.33	2,905.99	2,904.63	10.13	10.14	171.43	-4.41	-2.58	31.06	10.97	20.09	1.546		
3,000.00	2,997.47	3,004.33	3,001.73	10.47	10.49	169.96	-6.63	12.82	31.08	10.40	20.68	1.503 ES		
3,100.00	3,095.62	3,104.30	3,100.18	10.84	10.85	168.98	-9.12	30.00	32.98	11.61	21.37	1.543		
3,200.00	3,193.44	3,204.24	3,198.60	11.21	11.21	168.68	-11.60	47.17	36.59	14.52	22.06	1.658		
3,300.00	3,291.25	3,304.17	3,297.02	11.58	11.58	168.43	-14.08	64.35	40.20	17.44	22.76	1.766		
3,400.00	3,389.07	3,404.10	3,395.43	11.97	11.96	168.23	-16.57	81.52	43.82	20.35	23.47	1.887		
3,500.00	3,486.89	3,504.04	3,493.85	12.35	12.33	168.05	-19.05	98.69	47.43	23.25	24.18	1.962		
3,600.00	3,584.70	3,603.97	3,592.26	12.75	12.71	167.90	-21.53	115.87	51.05	26.16	24.89	2.051		
3,700.00	3,682.52	3,703.91	3,690.68	13.14	13.10	167.77	-24.01	133.04	54.66	29.05	25.61	2.135		
3,800.00	3,780.33	3,803.84	3,789.10	13.55	13.48	167.66	-26.50	150.21	58.28	31.95	26.33	2.214		
3,900.00	3,878.15	3,903.78	3,887.51	13.95	13.87	167.55	-28.98	167.39	61.89	34.84	27.05	2.288		
4,000.00	3,975.96	4,003.71	3,985.93	14.36	14.27	167.46	-31.46	184.56	65.51	37.73	27.78	2.358		
4,100.00	4,073.78	4,103.65	4,084.35	14.77	14.66	167.38	-33.95	201.73	69.12	40.62	28.51	2.425		
4,200.00	4,171.60	4,203.58	4,182.76	15.19	15.06	167.31	-36.43	218.91	72.74	43.50	29.24	2.488		
4,300.00	4,269.41	4,303.52	4,281.18	15.61	15.46	167.25	-38.91	236.08	76.36	46.38	29.97	2.548		
4,400.00	4,367.23	4,403.45	4,379.60	16.03	15.86	167.19	-41.39	253.25	79.97	49.26	30.71	2.604		
4,500.00	4,465.04	4,503.38	4,478.01	16.45	16.26	167.13	-43.88	270.43	83.59	52.14	31.45	2.658		
4,600.00	4,562.86	4,603.32	4,576.43	16.88	16.66	167.08	-46.36	287.60	87.21	55.02	32.19	2.709		
4,700.00	4,660.67	4,703.25	4,674.85	17.30	17.07	167.04	-48.84	304.77	90.82	57.89	32.93	2.758		
4,800.00	4,758.49	4,803.19	4,773.26	17.73	17.47	166.99	-51.32	321.95	94.44	60.77	33.67	2.805		
4,900.00	4,856.31	4,903.12	4,871.68	18.16	17.88	166.95	-53.81	339.12	98.06	63.64	34.42	2.849		
5,000.00	4,954.12	5,003.06	4,970.10	18.59	18.29	166.92	-56.29	356.29	101.67	66.51	35.17	2.891		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Com
Site Error: 0.00 usft
Reference Well: 38H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 38H
TVD Reference: KB @ 3001.90usft (Ensign 155)
MD Reference: KB @ 3001.90usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 37H - OH - Plan 1 10-19-18

Survey Program: 0-MWD+HDGM

Offset Site Error: 0.00 usft
Offset Well Error: 0.00 usft

Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)			
5,100.00	5,051.84	5,102.99	5,068.51	19.03	18.70	166.88	-58.77	373.47	105.29	69.38	2.932
5,200.00	5,149.75	5,202.93	5,166.93	19.46	19.11	166.85	-61.25	390.64	108.91	72.24	2.970
5,300.00	5,247.57	5,302.86	5,265.35	19.90	19.52	166.82	-63.74	407.81	112.52	75.11	3.008
5,400.00	5,345.38	5,402.80	5,363.76	20.34	19.93	166.79	-66.22	424.99	116.14	77.97	3.043
5,500.00	5,443.20	5,502.73	5,462.18	20.78	20.35	166.77	-68.70	442.16	119.76	80.84	3.077
5,600.00	5,541.02	5,602.66	5,560.60	21.22	20.76	166.74	-71.19	459.33	123.37	83.70	3.110
5,700.00	5,638.83	5,702.60	5,659.01	21.66	21.18	166.72	-73.67	476.51	126.99	86.56	3.141
5,800.00	5,736.65	5,802.53	5,757.43	22.10	21.59	166.70	-76.15	493.68	130.61	89.42	3.171
5,900.00	5,834.46	5,902.47	5,855.85	22.54	22.01	166.68	-78.63	510.85	134.22	92.28	3.200
6,000.00	5,932.28	6,000.69	5,952.58	22.98	22.42	166.66	-81.07	527.73	137.85	95.14	3.227
6,100.00	6,030.09	6,097.70	6,048.38	23.43	22.82	166.82	-83.25	542.80	143.11	99.63	3.291
6,200.00	6,127.91	6,192.64	6,142.58	23.87	23.19	167.30	-84.93	554.43	151.57	107.36	3.428
6,300.00	6,225.73	6,286.94	6,236.49	24.32	23.54	168.02	-86.16	562.91	163.22	118.32	3.635
6,400.00	6,323.54	6,380.41	6,329.80	24.76	23.88	168.89	-86.94	568.30	178.04	132.52	3.911
6,500.00	6,421.36	6,472.86	6,422.21	25.21	24.19	169.82	-87.28	570.67	196.02	149.92	4.252
6,600.00	6,519.17	6,568.82	6,518.17	25.66	24.51	170.77	-87.30	570.80	216.38	169.64	4.629
6,700.00	6,616.99	6,666.64	6,615.99	26.11	24.83	171.57	-87.30	570.80	236.93	189.50	4.995
6,800.00	6,714.80	6,764.45	6,713.80	26.55	25.16	172.25	-87.30	570.80	257.52	209.40	5.351
6,900.00	6,812.62	6,862.59	6,811.95	26.99	25.48	172.83	-87.30	570.80	278.54	227.71	5.664
7,000.00	6,911.69	6,961.34	6,910.69	27.41	25.81	173.25	-87.30	570.80	292.16	242.63	5.899
7,100.00	7,010.93	7,060.58	7,009.93	27.80	26.14	173.55	-87.30	570.80	304.35	254.13	6.060
7,200.00	7,110.54	7,160.19	7,109.54	28.17	26.47	173.75	-87.30	570.80	313.11	262.18	6.149
7,300.00	7,210.39	7,260.04	7,209.39	28.52	26.80	173.87	-87.30	570.80	318.40	266.78	6.168
7,400.00	7,310.37	7,360.02	7,309.37	28.85	27.14	173.91	-87.30	570.80	320.23	267.92	6.122
7,500.00	7,410.37	7,460.02	7,409.37	29.16	27.47	-90.77	-87.30	570.80	320.23	267.24	6.043
7,600.00	7,510.37	7,560.02	7,509.37	29.48	27.81	-90.77	-87.30	570.80	320.23	266.56	5.966
7,700.00	7,610.37	7,660.02	7,609.37	29.80	28.15	-90.77	-87.30	570.80	320.23	265.87	5.891
7,800.00	7,710.37	7,760.02	7,709.37	30.11	28.48	-90.77	-87.30	570.80	320.23	265.19	5.818
7,900.00	7,810.37	7,860.02	7,809.37	30.43	28.82	-90.77	-87.30	570.80	320.23	264.50	5.747
8,000.00	7,910.37	7,960.02	7,909.37	30.75	29.16	-90.77	-87.30	570.80	320.23	263.82	5.677
8,100.00	8,010.37	8,060.02	8,009.37	31.07	29.50	-90.77	-87.30	570.80	320.23	263.13	5.608
8,200.00	8,110.37	8,160.02	8,109.37	31.39	29.84	-90.77	-87.30	570.80	320.23	262.44	5.542
8,300.00	8,210.37	8,260.02	8,209.37	31.72	30.17	-90.77	-87.30	570.80	320.23	261.75	5.476
8,400.00	8,310.37	8,360.02	8,309.37	32.04	30.51	-90.77	-87.30	570.80	320.23	261.06	5.413
8,500.00	8,410.37	8,460.02	8,409.37	32.36	30.85	-90.77	-87.30	570.80	320.23	260.37	5.350
8,600.00	8,510.37	8,560.02	8,509.37	32.69	31.19	-90.77	-87.30	570.80	320.23	259.68	5.289
8,700.00	8,610.37	8,660.02	8,609.37	33.01	31.54	-90.77	-87.30	570.80	320.23	258.99	5.229
8,800.00	8,710.37	8,760.02	8,709.37	33.34	31.88	-90.77	-87.30	570.80	320.23	258.30	5.171
8,900.00	8,810.37	8,860.02	8,809.37	33.66	32.22	-90.77	-87.30	570.80	320.23	257.61	5.114
8,906.87	8,817.24	8,866.88	8,816.24	33.69	32.24	-90.27	-87.30	570.80	320.23	257.56	5.110
9,000.00	8,910.37	8,960.02	8,909.37	33.99	32.56	-90.29	-87.30	570.80	320.23	256.92	5.058
9,100.00	9,009.35	9,059.00	9,008.35	34.31	32.90	-92.53	-87.30	570.80	320.55	256.52	5.006
9,200.00	9,103.49	9,156.30	9,105.63	34.60	33.23	-97.73	-86.22	570.79	323.62	258.75	4.989
9,300.00	9,188.67	9,264.29	9,211.64	34.84	33.59	-103.62	-66.89	570.62	330.78	264.97	5.026
9,400.00	9,261.17	9,383.54	9,320.33	35.02	33.93	-109.04	-18.58	570.20	340.72	274.43	5.140
9,500.00	9,317.82	9,515.79	9,422.69	35.15	34.21	-113.65	64.48	569.47	351.43	285.58	5.337
9,600.00	9,356.15	9,661.09	9,504.23	35.24	34.40	-117.01	184.06	568.42	360.35	295.61	5.566
9,700.00	9,374.48	9,816.15	9,547.48	35.31	34.55	-118.68	332.28	567.12	365.06	300.91	5.691
9,800.00	9,376.20	9,937.15	9,551.13	35.43	34.75	-118.79	453.11	566.06	365.36	300.66	5.647
9,900.00	9,376.50	10,037.15	9,551.34	35.61	35.01	-118.77	553.10	565.18	365.31	299.95	5.589
10,000.00	9,376.81	10,137.15	9,551.54	35.87	35.35	-118.76	653.10	564.30	365.26	299.14	5.524
10,100.00	9,377.11	10,237.15	9,551.74	36.20	35.75	-118.74	753.10	563.43	365.21	298.24	5.453

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Com
Site Error: 0.00 usft
Reference Well: 38H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 38H
TVD Reference: KB @ 3001.90usft (Ensign 155)
MD Reference: KB @ 3001.90usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 37H - OH - Plan 1 10-19-18												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance		Minimum		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
10,200.00	9,377.42	10,337.15	9,551.95	36.61	36.21	-118.73	853.09	562.55	365.16	297.24	67.92	5.376	
10,300.00	9,377.72	10,437.15	9,552.15	37.08	36.72	-118.72	953.09	561.67	365.11	296.16	68.95	5.295	
10,400.00	9,378.03	10,537.15	9,552.35	37.61	37.27	-118.70	1,053.08	560.80	365.06	294.99	70.07	5.210	
10,500.00	9,378.33	10,637.15	9,552.56	38.20	37.88	-118.69	1,153.08	559.92	365.01	293.74	71.27	5.121	
10,600.00	9,378.64	10,737.15	9,552.76	38.84	38.53	-118.68	1,253.07	559.04	364.96	292.41	72.55	5.031	
10,700.00	9,378.94	10,837.15	9,552.96	39.52	39.22	-118.66	1,353.07	558.16	364.91	291.01	73.89	4.938	
10,800.00	9,379.25	10,937.15	9,553.17	40.24	39.95	-118.65	1,453.07	557.29	364.86	289.55	75.31	4.845	
10,900.00	9,379.55	11,037.15	9,553.37	41.00	40.72	-118.63	1,553.06	556.41	364.81	288.02	76.79	4.751	
11,000.00	9,379.86	11,137.15	9,553.57	41.80	41.53	-118.62	1,653.06	555.53	364.75	286.42	78.33	4.657	
11,100.00	9,380.16	11,237.15	9,553.78	42.64	42.37	-118.61	1,753.05	554.65	364.70	284.77	79.93	4.563	
11,200.00	9,380.46	11,337.15	9,553.98	43.50	43.24	-118.59	1,853.05	553.78	364.65	283.07	81.59	4.470	
11,300.00	9,380.77	11,437.15	9,554.18	44.40	44.14	-118.58	1,953.05	552.90	364.60	281.31	83.29	4.377	
11,400.00	9,381.07	11,537.15	9,554.39	45.32	45.06	-118.56	2,053.04	552.02	364.55	279.51	85.04	4.287	
11,500.00	9,381.38	11,637.15	9,554.59	46.27	46.02	-118.55	2,153.04	551.15	364.50	277.66	86.84	4.197	
11,600.00	9,381.68	11,737.15	9,554.79	47.25	46.99	-118.54	2,253.03	550.27	364.45	275.77	88.68	4.110	
11,700.00	9,381.99	11,837.15	9,555.00	48.24	47.99	-118.52	2,353.03	549.39	364.40	273.84	90.56	4.024	
11,800.00	9,382.29	11,937.15	9,555.20	49.26	49.02	-118.51	2,453.03	548.51	364.35	271.87	92.48	3.940	
11,900.00	9,382.60	12,037.15	9,555.40	50.30	50.06	-118.50	2,553.02	547.64	364.30	269.88	94.44	3.858	
12,000.00	9,382.90	12,137.15	9,555.60	51.36	51.12	-118.48	2,653.02	546.76	364.25	267.83	96.42	3.778	
12,100.00	9,383.21	12,237.15	9,555.81	52.44	52.20	-118.47	2,753.01	545.88	364.20	265.78	98.44	3.700	
12,200.00	9,383.51	12,337.15	9,556.01	53.54	53.30	-118.45	2,853.01	545.01	364.15	263.66	100.49	3.624	
12,300.00	9,383.82	12,437.15	9,556.21	54.65	54.41	-118.44	2,953.00	544.13	364.10	261.53	102.57	3.550	
12,400.00	9,384.12	12,537.15	9,556.42	55.77	55.54	-118.43	3,053.00	543.25	364.05	259.38	104.67	3.478	
12,500.00	9,384.43	12,637.15	9,556.62	56.91	56.68	-118.41	3,153.00	542.37	364.00	257.20	106.79	3.408	
12,600.00	9,384.73	12,737.15	9,556.82	58.07	57.84	-118.40	3,252.99	541.50	363.95	255.00	108.94	3.341	
12,700.00	9,385.04	12,837.15	9,557.03	59.23	59.01	-118.38	3,352.98	540.62	363.90	252.78	111.11	3.275	
12,800.00	9,385.34	12,937.15	9,557.23	60.41	60.19	-118.37	3,452.98	539.74	363.85	250.54	113.30	3.211	
12,900.00	9,385.65	13,037.15	9,557.43	61.60	61.38	-118.36	3,552.98	538.86	363.80	248.28	115.52	3.149	
13,000.00	9,385.95	13,137.15	9,557.64	62.80	62.58	-118.34	3,652.98	537.99	363.75	246.00	117.75	3.089	
13,100.00	9,386.26	13,237.15	9,557.84	64.01	63.79	-118.33	3,752.97	537.11	363.70	243.70	119.99	3.031	
13,200.00	9,386.56	13,337.15	9,558.04	65.22	65.01	-118.31	3,852.97	536.23	363.65	241.39	122.26	2.974	
13,300.00	9,386.87	13,437.15	9,558.25	66.45	66.24	-118.30	3,952.96	535.36	363.60	239.06	124.53	2.920	
13,400.00	9,387.17	13,537.15	9,558.45	67.69	67.48	-118.29	4,052.96	534.48	363.54	236.72	126.83	2.866	
13,500.00	9,387.48	13,637.15	9,558.65	68.93	68.72	-118.27	4,152.96	533.60	363.49	234.38	129.14	2.815	
13,600.00	9,387.78	13,737.15	9,558.86	70.18	69.97	-118.26	4,252.95	532.72	363.44	231.99	131.46	2.765	
13,700.00	9,388.09	13,837.15	9,559.06	71.44	71.23	-118.24	4,352.95	531.85	363.39	229.60	133.79	2.716	
13,800.00	9,388.39	13,937.15	9,559.26	72.70	72.50	-118.23	4,452.94	530.97	363.34	227.21	136.14	2.669	
13,900.00	9,388.70	14,037.15	9,559.47	73.97	73.77	-118.22	4,552.94	530.09	363.29	224.80	138.49	2.623	
14,000.00	9,389.00	14,137.15	9,559.67	75.25	75.05	-118.20	4,652.94	529.21	363.24	222.38	140.88	2.579	
14,100.00	9,389.31	14,237.15	9,559.87	76.53	76.33	-118.19	4,752.93	528.34	363.19	219.95	143.24	2.536	
14,200.00	9,389.61	14,337.15	9,560.08	77.82	77.62	-118.17	4,852.93	527.46	363.14	217.52	145.63	2.494	
14,300.00	9,389.92	14,437.15	9,560.28	79.12	78.92	-118.16	4,952.92	526.58	363.09	215.07	148.03	2.453	
14,400.00	9,390.22	14,537.15	9,560.48	80.41	80.22	-118.15	5,052.92	525.71	363.04	212.61	150.43	2.413	
14,500.00	9,390.53	14,637.15	9,560.69	81.72	81.52	-118.13	5,152.91	524.83	362.99	210.15	152.85	2.375	
14,600.00	9,390.83	14,737.15	9,560.89	83.02	82.83	-118.12	5,252.91	523.95	362.94	207.67	155.27	2.337	
14,700.00	9,391.14	14,837.15	9,561.09	84.34	84.15	-118.10	5,352.91	523.07	362.89	205.19	157.70	2.301	
14,800.00	9,391.44	14,937.15	9,561.29	85.65	85.46	-118.09	5,452.90	522.20	362.84	202.70	160.14	2.266	
14,900.00	9,391.75	15,037.15	9,561.50	86.97	86.78	-118.08	5,552.90	521.32	362.80	200.21	162.59	2.231	
15,000.00	9,392.05	15,137.15	9,561.70	88.29	88.11	-118.06	5,652.89	520.44	362.75	197.70	165.04	2.198	
15,100.00	9,392.36	15,237.15	9,561.90	89.62	89.44	-118.05	5,752.89	519.57	362.70	195.19	167.50	2.165	
15,200.00	9,392.66	15,337.15	9,562.11	90.95	90.77	-118.03	5,852.89	518.69	362.65	192.68	169.97	2.134	
15,300.00	9,392.97	15,437.15	9,562.31	92.29	92.10	-118.02	5,952.88	517.81	362.60	190.15	172.44	2.103	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Com
Site Error: 0.00 usft
Reference Well: 38H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 38H
TVD Reference: KB @ 3001.90usft (Ensign 155)
MD Reference: KB @ 3001.90usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Myox 21 State Com - 37H - OH - Plan 1 10-19-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
15,400.00	9,393.27	15,537.15	9,562.51	93.82	93.44	-118.01	6,052.88	516.93	362.55	187.63	174.92	2.073	
15,500.00	9,393.58	15,637.15	9,562.72	94.96	94.78	-117.99	6,152.87	516.06	362.50	185.09	177.40	2.043	
15,600.00	9,393.88	15,737.15	9,562.92	96.31	96.13	-117.98	6,252.87	515.18	362.45	182.55	179.89	2.015	
15,700.00	9,394.19	15,837.15	9,563.12	97.65	97.47	-117.96	6,352.87	514.30	362.40	180.01	182.39	1.987	
15,800.00	9,394.49	15,937.15	9,563.33	99.00	98.82	-117.95	6,452.86	513.42	362.35	177.46	184.89	1.960	
15,900.00	9,394.80	16,037.15	9,563.53	100.35	100.17	-117.94	6,552.86	512.55	362.30	174.91	187.39	1.933	
16,000.00	9,395.10	16,137.15	9,563.73	101.70	101.53	-117.92	6,652.85	511.67	362.25	172.35	189.90	1.908	
16,100.00	9,395.41	16,237.15	9,563.94	103.06	102.88	-117.91	6,752.85	510.79	362.20	169.78	192.41	1.882	
16,200.00	9,395.71	16,337.15	9,564.14	104.42	104.24	-117.89	6,852.84	509.92	362.15	167.22	194.93	1.858	
16,300.00	9,396.02	16,437.15	9,564.34	105.77	105.60	-117.88	6,952.84	509.04	362.10	164.65	197.45	1.834	
16,400.00	9,396.32	16,537.15	9,564.55	107.14	106.97	-117.87	7,052.84	508.16	362.05	162.07	199.98	1.810	
16,500.00	9,396.63	16,637.15	9,564.75	108.50	108.33	-117.85	7,152.83	507.28	362.00	159.49	202.51	1.788	
16,600.00	9,396.93	16,737.15	9,564.95	109.87	109.70	-117.84	7,252.83	506.41	361.95	156.91	205.04	1.765	
16,700.00	9,397.24	16,837.15	9,565.16	111.23	111.07	-117.82	7,352.82	505.53	361.90	154.32	207.58	1.743	
16,800.00	9,397.54	16,937.15	9,565.36	112.60	112.44	-117.81	7,452.82	504.65	361.85	151.73	210.12	1.722	
16,900.00	9,397.85	17,037.15	9,565.56	113.97	113.81	-117.80	7,552.82	503.77	361.80	149.14	212.67	1.701	
17,000.00	9,398.15	17,137.15	9,565.77	115.35	115.18	-117.78	7,652.81	502.90	361.75	146.54	215.22	1.681	
17,100.00	9,398.46	17,237.15	9,565.97	116.72	116.56	-117.77	7,752.81	502.02	361.70	143.94	217.77	1.661	
17,200.00	9,398.76	17,337.15	9,566.17	118.10	117.93	-117.75	7,852.80	501.14	361.65	141.33	220.32	1.641	
17,300.00	9,399.07	17,437.15	9,566.38	119.47	119.31	-117.74	7,952.80	500.27	361.61	138.73	222.88	1.622	
17,400.00	9,399.37	17,537.15	9,566.58	120.85	120.69	-117.73	8,052.80	499.39	361.56	136.12	225.44	1.604	
17,500.00	9,399.68	17,637.15	9,566.78	122.23	122.07	-117.71	8,152.79	498.51	361.51	133.50	228.00	1.586	
17,600.00	9,399.98	17,737.15	9,566.98	123.61	123.46	-117.70	8,252.79	497.63	361.46	130.89	230.57	1.568	
17,700.00	9,400.29	17,837.15	9,567.19	125.00	124.84	-117.68	8,352.78	496.76	361.41	128.27	233.14	1.550	
17,800.00	9,400.59	17,937.15	9,567.39	126.38	126.22	-117.67	8,452.78	495.88	361.36	125.65	235.71	1.533	
17,900.00	9,400.90	18,037.15	9,567.59	127.77	127.61	-117.65	8,552.78	495.00	361.31	123.03	238.28	1.516	
18,000.00	9,401.20	18,137.15	9,567.80	129.15	129.00	-117.64	8,652.77	494.13	361.26	120.40	240.86	1.500 Level 3	
18,100.00	9,401.51	18,237.15	9,568.00	130.54	130.39	-117.63	8,752.77	493.25	361.21	117.77	243.44	1.484 Level 3	
18,200.00	9,401.81	18,337.15	9,568.20	131.93	131.78	-117.61	8,852.76	492.37	361.16	115.14	246.02	1.468 Level 3	
18,300.00	9,402.12	18,437.15	9,568.41	133.32	133.17	-117.60	8,952.76	491.49	361.11	112.51	248.60	1.453 Level 3	
18,400.00	9,402.42	18,537.15	9,568.61	134.71	134.56	-117.58	9,052.75	490.62	361.06	109.87	251.19	1.437 Level 3	
18,500.00	9,402.73	18,637.15	9,568.81	136.10	135.95	-117.57	9,152.75	489.74	361.02	107.24	253.78	1.423 Level 3	
18,600.00	9,403.03	18,737.15	9,569.02	137.49	137.34	-117.56	9,252.75	488.86	360.97	104.60	256.37	1.408 Level 3	
18,700.00	9,403.34	18,837.15	9,569.22	138.89	138.74	-117.54	9,352.74	487.98	360.92	101.96	258.96	1.394 Level 3	
18,800.00	9,403.64	18,937.15	9,569.42	140.28	140.13	-117.53	9,452.74	487.11	360.87	99.31	261.56	1.380 Level 3	
18,900.00	9,403.95	19,037.15	9,569.63	141.68	141.53	-117.51	9,552.73	486.23	360.82	96.67	264.15	1.366 Level 3	
19,000.00	9,404.25	19,137.15	9,569.83	143.08	142.93	-117.50	9,652.73	485.35	360.77	94.02	266.75	1.352 Level 3	
19,100.00	9,404.55	19,237.15	9,570.03	144.47	144.32	-117.48	9,752.73	484.48	360.72	91.37	269.35	1.339 Level 3	
19,200.00	9,404.86	19,337.15	9,570.24	145.87	145.72	-117.47	9,852.72	483.60	360.67	88.72	271.95	1.326 Level 3	
19,300.00	9,405.16	19,437.15	9,570.44	147.27	147.12	-117.46	9,952.72	482.72	360.62	86.07	274.56	1.313 Level 3	
19,400.00	9,405.47	19,537.15	9,570.64	148.67	148.52	-117.44	10,052.71	481.84	360.57	83.41	277.16	1.301 Level 3	
19,500.00	9,405.77	19,637.15	9,570.85	150.07	149.92	-117.43	10,152.71	480.97	360.53	80.75	279.77	1.289 Level 3	
19,573.95	9,406.00	19,711.10	9,571.00	151.11	150.94	-117.42	10,226.68	480.32	360.49	78.81	281.68	1.280 Level 3, SF	

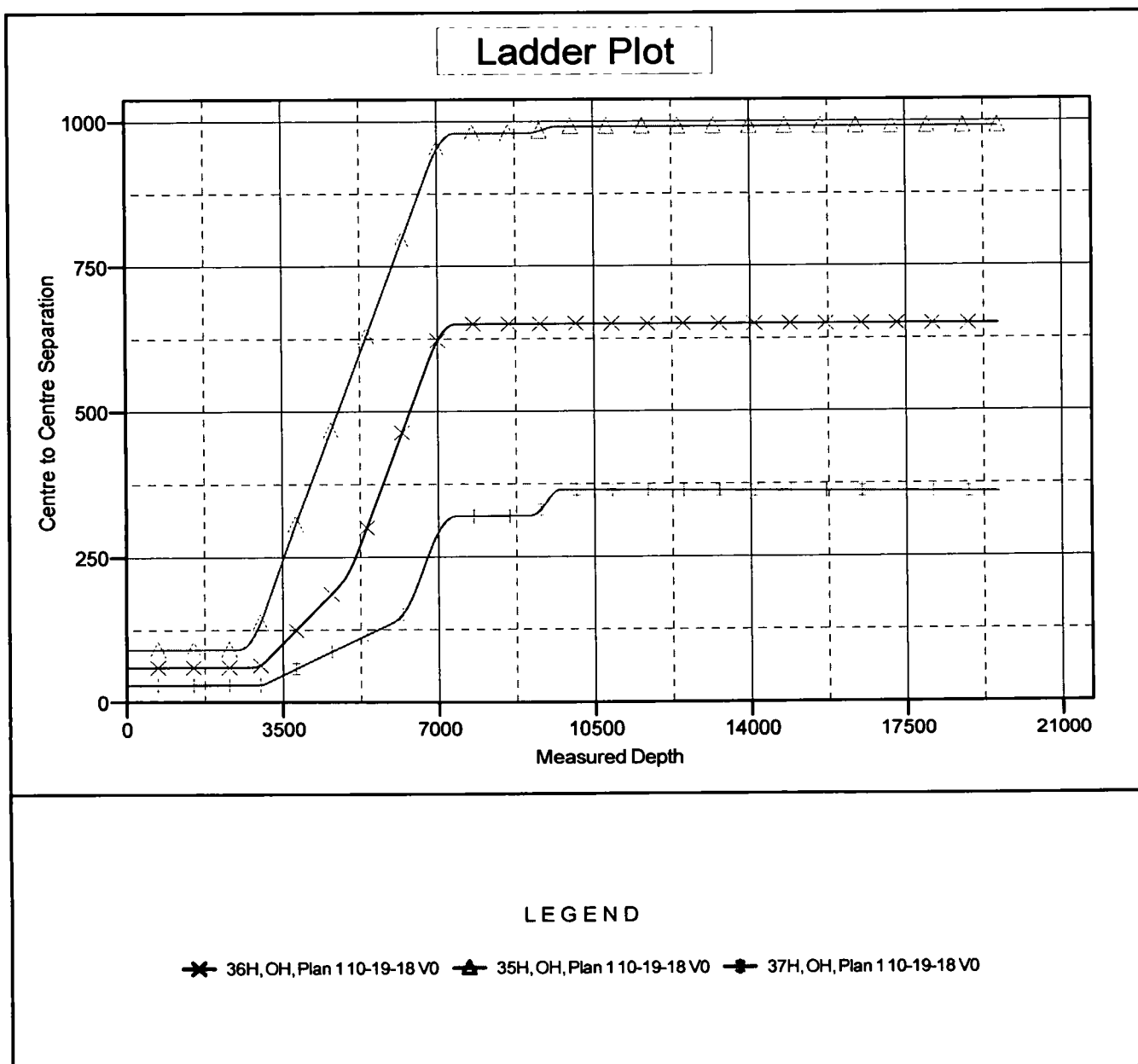
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company: COG Operating LLC
Project: Eddy County, NM (NAD27 NME)
Reference Site: Myox 21 State Com
Site Error: 0.00 usft
Reference Well: 38H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-19-18

Local Co-ordinate Reference: Well 38H
TVD Reference: KB @ 3001.90usft (Ensign 155)
MD Reference: KB @ 3001.90usft (Ensign 155)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3001.90usft (Ensign 155)
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: 38H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.13°



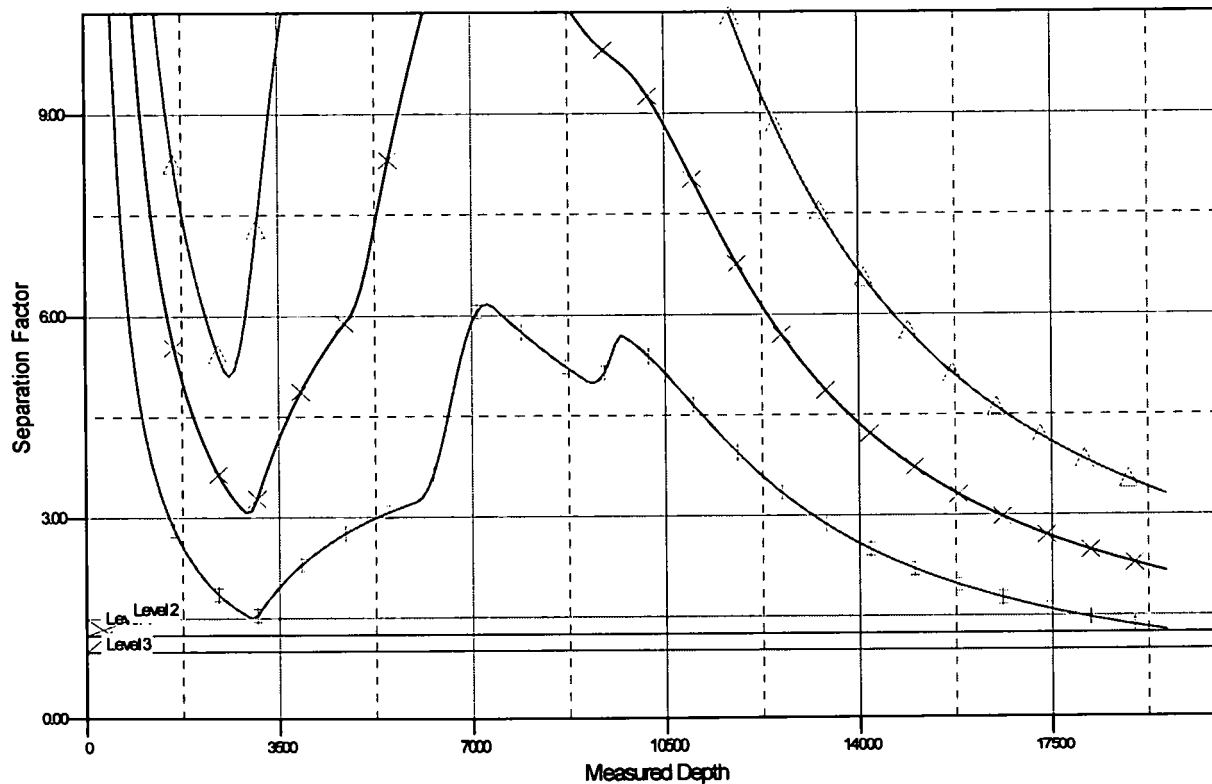
Company: COG Operating LLC
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Separation Factor Plot



LEGEND

x 36H, OH, Plan 1 10-19-18 V0 △ 35H, OH, Plan 1 10-19-18 V0 ■ 37H, OH, Plan 1 10-19-18 V0