

COG Operating LLC

Eddy County, NM (NAD27 NME)

Myox 21 State Com

1H

30-015-41745

NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 15 2018

OH / Job #61261

RECEIVED

Design: Surveys (Ensign 155)

Standard Survey Report

19 July, 2017



Phoenix Technology Services LP

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Site:	Myox 21 State Com	MD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Well:	1H	North Reference:	Grid
Wellbore:	OH / Job #61261	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	Compass 5000 GCR

Project	Eddy County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site		Myox 21 State Com			
Site Position:		Northing:	403,335.40 usft	Latitude:	32° 6' 31.10711 N
From:	Map	Easting:	577,031.40 usft	Longitude:	104° 5' 4.37007 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.13 °

Well	1H					
Well Position	+N/-S	0.00 usft	Northing:	403,283.40 usft	Latitude:	32° 6' 30.68988 N
	+E/-W	0.00 usft	Easting:	572,642.90 usft	Longitude:	104° 5' 55.39529 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	2,994.00 usft

Wellbore OH / Job #61261

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/15/2017	7.27	59.90	48,064

Design Surveys (Ensign 155)

Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	358.66

Survey Program Date 7/19/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	7,418.00	Scientific Gyro Surveys (OH / Job #61261)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
7,418.00	18,082.00	Phoenix MWD Surveys (OH / Job #61261)	MWD+IFR1+MS	OWSG Rev. 2 MWD + IFR1 + Multi-Station Corre

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
100.00	0.51	252.21	100.00	-0.14	-0.42	-0.13	0.51	0.51	0.00
125.00	0.59	245.62	125.00	-0.22	-0.65	-0.21	0.41	0.32	-26.36
150.00	0.56	246.30	150.00	-0.33	-0.88	-0.30	0.12	-0.12	2.72
175.00	0.59	251.68	175.00	-0.41	-1.11	-0.39	0.25	0.12	21.52
200.00	1.07	252.66	199.99	-0.52	-1.46	-0.49	1.92	1.92	3.92
225.00	0.60	253.56	224.99	-0.63	-1.80	-0.59	1.88	-1.88	3.60
250.00	0.57	257.60	249.99	-0.70	-2.05	-0.65	0.20	-0.12	16.16
275.00	0.39	250.32	274.99	-0.75	-2.25	-0.70	0.76	-0.72	-29.12
300.00	0.46	249.33	299.99	-0.81	-2.43	-0.76	0.28	0.28	-3.96

Phoenix Technology Services LP

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Site:	Myox 21 State Com	MD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Well:	1H	North Reference:	Grid
Wellbore:	OH / Job #61261	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	Compass 5000 GCR

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)
325.00	0.49	260.86	324.99	-0.87	-2.63	-0.81	0.40	0.12	46.12
350.00	0.47	252.30	349.98	-0.92	-2.83	-0.85	0.30	-0.08	-34.24
375.00	0.51	223.61	374.98	-1.03	-3.00	-0.96	0.98	0.16	-114.76
400.00	0.48	219.75	399.98	-1.19	-3.15	-1.11	0.18	-0.12	-15.44
425.00	0.54	222.27	424.98	-1.36	-3.29	-1.28	0.26	0.24	10.08
450.00	0.54	220.68	449.98	-1.53	-3.45	-1.45	0.06	0.00	-6.36
475.00	0.57	214.66	474.98	-1.72	-3.60	-1.64	0.26	0.12	-24.08
500.00	0.57	216.95	499.98	-1.93	-3.74	-1.84	0.09	0.00	9.16
525.00	0.55	210.70	524.98	-2.13	-3.88	-2.04	0.26	-0.08	-25.00
550.00	0.51	210.42	549.98	-2.33	-4.00	-2.23	0.16	-0.16	-1.12
575.00	0.55	218.17	574.98	-2.52	-4.13	-2.42	0.33	0.16	31.00
600.00	0.55	226.30	599.97	-2.69	-4.29	-2.59	0.31	0.00	32.52
625.00	0.63	227.81	624.97	-2.87	-4.48	-2.76	0.33	0.32	6.04
650.00	0.61	237.09	649.97	-3.03	-4.69	-2.92	0.41	-0.08	37.12
675.00	0.50	219.52	674.97	-3.19	-4.87	-3.08	0.81	-0.44	-70.28
700.00	0.56	233.68	699.97	-3.35	-5.04	-3.23	0.57	0.24	56.64
725.00	0.40	233.57	724.97	-3.47	-5.21	-3.35	0.64	-0.64	-0.44
750.00	0.43	233.97	749.97	-3.58	-5.35	-3.45	0.12	0.12	1.60
775.00	0.36	242.23	774.97	-3.67	-5.50	-3.54	0.36	-0.28	33.04
800.00	0.29	220.01	799.97	-3.76	-5.61	-3.62	0.57	-0.28	-88.88
825.00	0.12	248.84	824.97	-3.81	-5.67	-3.68	0.77	-0.68	115.32
850.00	0.16	272.34	849.97	-3.82	-5.73	-3.69	0.28	0.16	94.00
875.00	0.10	247.69	874.97	-3.83	-5.79	-3.69	0.32	-0.24	-98.60
900.00	0.19	248.99	899.97	-3.85	-5.85	-3.71	0.36	0.36	5.20
925.00	0.09	248.48	924.97	-3.87	-5.90	-3.73	0.40	-0.40	-2.04
950.00	0.05	75.66	949.97	-3.88	-5.91	-3.74	0.56	-0.16	-691.28
975.00	0.12	303.32	974.97	-3.86	-5.92	-3.72	0.63	0.28	-529.36
1,000.00	0.09	358.44	999.97	-3.83	-5.95	-3.69	0.40	-0.12	220.48
1,025.00	0.04	204.98	1,024.97	-3.82	-5.95	-3.67	0.51	-0.20	-613.84
1,050.00	0.30	226.41	1,049.97	-3.87	-6.00	-3.73	1.05	1.04	85.72
1,075.00	0.16	176.57	1,074.97	-3.95	-6.05	-3.81	0.93	-0.56	-199.36
1,100.00	0.29	202.53	1,099.97	-4.04	-6.07	-3.90	0.65	0.52	103.84
1,125.00	0.26	198.25	1,124.97	-4.15	-6.11	-4.01	0.15	-0.12	-17.12
1,150.00	0.26	215.25	1,149.97	-4.25	-6.16	-4.11	0.31	0.00	68.00
1,175.00	0.42	230.04	1,174.96	-4.36	-6.26	-4.21	0.72	0.64	59.16
1,200.00	0.42	247.16	1,199.96	-4.45	-6.42	-4.30	0.50	0.00	68.48
1,225.00	0.42	233.55	1,224.96	-4.54	-6.58	-4.39	0.40	0.00	-54.44
1,250.00	0.41	230.12	1,249.96	-4.66	-6.72	-4.50	0.11	-0.04	-13.72
1,275.00	0.34	233.68	1,274.96	-4.76	-6.85	-4.60	0.29	-0.28	14.24
1,300.00	0.48	244.57	1,299.96	-4.85	-7.00	-4.68	0.64	0.56	43.56
1,325.00	0.37	260.05	1,324.96	-4.90	-7.18	-4.74	0.63	-0.44	61.92
1,350.00	0.40	251.79	1,349.96	-4.95	-7.34	-4.77	0.25	0.12	-33.04
1,375.00	0.38	251.50	1,374.96	-5.00	-7.50	-4.82	0.08	-0.08	-1.16

Phoenix Technology Services LP

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Site:	Myox 21 State Com	MD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Well:	1H	North Reference:	Grid
Wellbore:	OH / Job #61261	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	Compass 5000 GCR

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)
1,400.00	0.46	250.38	1,399.96	-5.06	-7.67	-4.88	0.32	0.32	-4.48
1,425.00	0.40	256.68	1,424.96	-5.11	-7.85	-4.93	0.31	-0.24	25.20
1,450.00	0.44	265.45	1,449.96	-5.14	-8.03	-4.95	0.30	0.16	35.08
1,475.00	0.32	251.54	1,474.96	-5.17	-8.19	-4.98	0.60	-0.48	-55.64
1,500.00	0.25	268.94	1,499.96	-5.19	-8.32	-5.00	0.44	-0.28	69.60
1,525.00	0.22	258.96	1,524.96	-5.20	-8.42	-5.01	0.20	-0.12	-39.92
1,550.00	0.29	241.43	1,549.96	-5.24	-8.52	-5.04	0.42	0.28	-70.12
1,575.00	0.28	247.94	1,574.96	-5.30	-8.63	-5.09	0.14	-0.04	26.04
1,600.00	0.18	252.45	1,599.96	-5.33	-8.73	-5.13	0.41	-0.40	18.04
1,625.00	0.10	210.58	1,624.96	-5.36	-8.77	-5.16	0.50	-0.32	-167.48
1,650.00	0.17	178.70	1,649.96	-5.42	-8.78	-5.21	0.40	0.28	-127.52
1,675.00	0.17	180.19	1,674.96	-5.49	-8.78	-5.28	0.02	0.00	5.96
1,700.00	0.32	107.56	1,699.96	-5.55	-8.72	-5.34	1.26	0.60	-290.52
1,725.00	0.54	106.82	1,724.95	-5.61	-8.54	-5.40	0.88	0.88	-2.96
1,750.00	0.66	117.18	1,749.95	-5.71	-8.30	-5.51	0.65	0.48	41.44
1,775.00	1.00	102.80	1,774.95	-5.82	-7.96	-5.63	1.58	1.36	-57.52
1,800.00	1.18	102.57	1,799.95	-5.92	-7.49	-5.75	0.72	0.72	-0.92
1,825.00	1.45	101.00	1,824.94	-6.04	-6.93	-5.88	1.09	1.08	-6.28
1,850.00	1.63	105.39	1,849.93	-6.19	-6.28	-6.05	0.86	0.72	17.56
1,875.00	1.82	107.46	1,874.92	-6.41	-5.56	-6.28	0.80	0.76	8.28
1,900.00	1.91	104.41	1,899.91	-6.63	-4.77	-6.52	0.54	0.36	-12.20
1,925.00	1.74	104.33	1,924.89	-6.83	-4.00	-6.73	0.68	-0.68	-0.32
1,950.00	0.91	90.98	1,949.89	-6.93	-3.44	-6.84	3.52	-3.32	-53.40
1,975.00	0.64	80.22	1,974.88	-6.91	-3.10	-6.83	1.22	-1.08	-43.04
2,000.00	0.43	80.53	1,999.88	-6.87	-2.87	-6.80	0.84	-0.84	1.24
2,025.00	0.44	79.20	2,024.88	-6.83	-2.68	-6.77	0.06	0.04	-5.32
2,050.00	0.44	82.62	2,049.88	-6.80	-2.49	-6.74	0.11	0.00	13.68
2,075.00	0.70	88.85	2,074.88	-6.79	-2.25	-6.73	1.07	1.04	24.92
2,100.00	1.04	92.57	2,099.88	-6.79	-1.87	-6.75	1.38	1.36	14.88
2,125.00	1.35	95.08	2,124.87	-6.83	-1.35	-6.80	1.26	1.24	10.04
2,150.00	1.48	98.83	2,149.86	-6.91	-0.73	-6.89	0.64	0.52	15.00
2,175.00	1.83	97.79	2,174.85	-7.01	-0.02	-7.01	1.41	1.40	-4.16
2,200.00	2.04	96.43	2,199.84	-7.11	0.82	-7.13	0.86	0.84	-5.44
2,225.00	2.11	96.70	2,224.82	-7.22	1.72	-7.26	0.28	0.28	1.08
2,250.00	2.12	100.39	2,249.81	-7.35	2.63	-7.41	0.55	0.04	14.76
2,275.00	2.19	99.19	2,274.79	-7.51	3.56	-7.60	0.33	0.28	-4.80
2,300.00	2.01	97.81	2,299.77	-7.65	4.46	-7.75	0.75	-0.72	-5.52
2,325.00	0.97	97.68	2,324.76	-7.74	5.11	-7.86	4.16	-4.16	-0.52
2,350.00	0.08	113.57	2,349.76	-7.77	5.33	-7.90	3.57	-3.56	63.56
2,375.00	0.92	270.05	2,374.76	-7.78	5.15	-7.90	3.98	3.36	625.92
2,400.00	1.21	269.10	2,399.76	-7.78	4.68	-7.89	1.16	1.16	-3.80
2,425.00	1.32	272.89	2,424.75	-7.77	4.13	-7.87	0.55	0.44	15.16
2,450.00	1.30	273.16	2,449.74	-7.74	3.56	-7.82	0.08	-0.08	1.08

Phoenix Technology Services LP

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Site:	Myox 21 State Com	MD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Well:	1H	North Reference:	Grid
Wellbore:	OH / Job #61261	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	Compass 5000 GCR

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)
2,475.00	1.29	280.08	2,474.74	-7.68	3.00	-7.75	0.63	-0.04	27.68
2,500.00	1.16	284.43	2,499.73	-7.57	2.48	-7.62	0.64	-0.52	17.40
2,525.00	1.12	285.62	2,524.73	-7.44	2.00	-7.48	0.19	-0.16	4.76
2,550.00	1.13	287.68	2,549.72	-7.30	1.53	-7.33	0.17	0.04	8.24
2,575.00	1.25	284.44	2,574.72	-7.15	1.03	-7.18	0.55	0.48	-12.96
2,600.00	1.15	281.45	2,599.71	-7.04	0.52	-7.05	0.47	-0.40	-11.96
2,625.00	1.16	284.07	2,624.71	-6.92	0.03	-6.92	0.21	0.04	10.48
2,650.00	1.14	286.53	2,649.70	-6.79	-0.46	-6.78	0.21	-0.08	9.84
2,675.00	1.11	288.21	2,674.70	-6.65	-0.93	-6.62	0.18	-0.12	6.72
2,700.00	1.20	282.35	2,699.69	-6.51	-1.41	-6.48	0.59	0.36	-23.44
2,725.00	1.23	288.11	2,724.69	-6.37	-1.92	-6.33	0.50	0.12	23.04
2,750.00	1.10	291.85	2,749.68	-6.20	-2.40	-6.14	0.60	-0.52	14.96
2,775.00	1.13	290.53	2,774.68	-6.03	-2.85	-5.96	0.16	0.12	-5.28
2,800.00	1.09	293.66	2,799.67	-5.84	-3.30	-5.77	0.29	-0.16	12.52
2,825.00	1.08	296.77	2,824.67	-5.64	-3.73	-5.55	0.24	-0.04	12.44
2,850.00	1.12	291.87	2,849.66	-5.45	-4.17	-5.35	0.41	0.16	-19.60
2,875.00	1.11	292.14	2,874.66	-5.26	-4.62	-5.15	0.05	-0.04	1.08
2,900.00	1.18	292.45	2,899.65	-5.07	-5.08	-4.95	0.28	0.28	1.24
2,925.00	1.04	292.35	2,924.65	-4.89	-5.53	-4.76	0.56	-0.56	-0.40
2,950.00	0.74	300.69	2,949.64	-4.72	-5.88	-4.58	1.30	-1.20	33.36
2,975.00	0.76	300.21	2,974.64	-4.56	-6.16	-4.41	0.08	0.08	-1.92
3,000.00	0.71	292.51	2,999.64	-4.41	-6.45	-4.26	0.44	-0.20	-30.80
3,025.00	0.53	308.91	3,024.64	-4.28	-6.68	-4.12	1.00	-0.72	65.60
3,050.00	0.57	352.51	3,049.64	-4.08	-6.78	-3.92	1.64	0.16	174.40
3,075.00	0.52	333.82	3,074.64	-3.86	-6.85	-3.70	0.73	-0.20	-74.76
3,100.00	0.55	334.26	3,099.64	-3.65	-6.95	-3.49	0.12	0.12	1.76
3,125.00	0.56	342.78	3,124.63	-3.42	-7.04	-3.26	0.33	0.04	34.08
3,150.00	0.66	332.69	3,149.63	-3.18	-7.14	-3.01	0.59	0.40	-40.36
3,175.00	0.60	339.77	3,174.63	-2.93	-7.26	-2.76	0.39	-0.24	28.32
3,200.00	0.63	340.27	3,199.63	-2.68	-7.35	-2.50	0.12	0.12	2.00
3,225.00	0.56	329.55	3,224.63	-2.44	-7.46	-2.27	0.52	-0.28	-42.88
3,250.00	0.68	340.52	3,249.63	-2.20	-7.57	-2.02	0.67	0.48	43.88
3,275.00	0.68	343.64	3,274.63	-1.92	-7.66	-1.74	0.15	0.00	12.48
3,300.00	0.68	333.30	3,299.62	-1.64	-7.77	-1.46	0.49	0.00	-41.36
3,325.00	0.69	320.93	3,324.62	-1.39	-7.93	-1.20	0.59	0.04	-49.48
3,350.00	0.65	325.44	3,349.62	-1.16	-8.10	-0.97	0.26	-0.16	18.04
3,375.00	0.70	317.35	3,374.62	-0.93	-8.29	-0.73	0.43	0.20	-32.36
3,400.00	0.65	308.82	3,399.62	-0.73	-8.50	-0.53	0.45	-0.20	-34.12
3,425.00	0.71	308.32	3,424.61	-0.54	-8.73	-0.34	0.24	0.24	-2.00
3,450.00	0.74	313.96	3,449.61	-0.33	-8.97	-0.12	0.31	0.12	22.56
3,475.00	0.68	305.94	3,474.61	-0.13	-9.21	0.08	0.46	-0.24	-32.08
3,500.00	0.78	309.12	3,499.61	0.06	-9.46	0.28	0.43	0.40	12.72
3,525.00	0.76	301.75	3,524.61	0.25	-9.73	0.48	0.40	-0.08	-29.48
3,550.00	0.73	301.55	3,549.60	0.43	-10.01	0.66	0.12	-0.12	-0.80

Phoenix Technology Services LP

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Site:	Myox 21 State Com	MD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Well:	1H	North Reference:	Grid
Wellbore:	OH / Job #61261	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	Compass 5000 GCR

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)
3,575.00	0.80	303.94	3,574.60	0.61	-10.29	0.85	0.31	0.28	9.56
3,600.00	0.78	305.82	3,599.60	0.80	-10.57	1.05	0.13	-0.08	7.52
3,625.00	0.76	310.01	3,624.60	1.01	-10.84	1.26	0.24	-0.08	16.76
3,650.00	0.84	300.96	3,649.60	1.21	-11.12	1.47	0.60	0.32	-36.20
3,675.00	0.79	310.66	3,674.59	1.42	-11.41	1.68	0.59	-0.20	38.80
3,700.00	0.74	305.22	3,699.59	1.62	-11.67	1.89	0.35	-0.20	-21.76
3,725.00	0.85	305.94	3,724.59	1.82	-11.95	2.10	0.44	0.44	2.88
3,750.00	0.82	301.20	3,749.59	2.03	-12.26	2.31	0.30	-0.12	-18.96
3,775.00	0.75	301.27	3,774.58	2.20	-12.55	2.50	0.28	-0.28	0.28
3,800.00	0.78	299.93	3,799.58	2.37	-12.84	2.67	0.14	0.12	-5.36
3,825.00	0.57	302.06	3,824.58	2.52	-13.09	2.83	0.85	-0.84	8.52
3,850.00	0.17	301.92	3,849.58	2.61	-13.23	2.92	1.60	-1.60	-0.56
3,875.00	0.08	205.07	3,874.58	2.61	-13.27	2.92	0.79	-0.36	-387.40
3,900.00	0.19	143.43	3,899.58	2.56	-13.25	2.87	0.67	0.44	-246.56
3,925.00	0.17	158.38	3,924.58	2.50	-13.21	2.80	0.20	-0.08	59.80
3,950.00	0.30	158.78	3,949.58	2.40	-13.17	2.71	0.52	0.52	1.60
3,975.00	0.25	146.67	3,974.58	2.29	-13.12	2.60	0.31	-0.20	-48.44
4,000.00	0.27	130.80	3,999.58	2.21	-13.04	2.51	0.30	0.08	-63.48
4,025.00	0.21	160.88	4,024.58	2.13	-12.98	2.43	0.55	-0.24	120.32
4,050.00	0.38	150.33	4,049.58	2.01	-12.93	2.31	0.71	0.68	-42.20
4,075.00	0.27	135.01	4,074.58	1.90	-12.85	2.20	0.56	-0.44	-61.28
4,100.00	0.31	142.84	4,099.58	1.80	-12.76	2.10	0.22	0.16	31.32
4,125.00	0.30	113.78	4,124.58	1.72	-12.66	2.02	0.61	-0.04	-116.24
4,150.00	0.26	121.74	4,149.58	1.67	-12.55	1.96	0.22	-0.16	31.84
4,175.00	0.40	174.02	4,174.58	1.55	-12.50	1.84	1.27	0.56	209.12
4,200.00	0.37	137.99	4,199.57	1.40	-12.43	1.69	0.96	-0.12	-144.12
4,225.00	0.39	144.96	4,224.57	1.27	-12.33	1.56	0.20	0.08	27.88
4,250.00	0.40	139.04	4,249.57	1.14	-12.23	1.42	0.17	0.04	-23.68
4,275.00	0.42	126.68	4,274.57	1.02	-12.09	1.30	0.36	0.08	-49.44
4,300.00	0.45	152.67	4,299.57	0.88	-11.98	1.16	0.79	0.12	103.96
4,325.00	0.38	125.95	4,324.57	0.74	-11.86	1.02	0.81	-0.28	-106.88
4,350.00	0.32	122.51	4,349.57	0.65	-11.74	0.93	0.25	-0.24	-13.76
4,375.00	0.31	112.34	4,374.57	0.59	-11.62	0.86	0.23	-0.04	-40.68
4,400.00	0.37	116.06	4,399.57	0.53	-11.48	0.80	0.26	0.24	14.88
4,425.00	0.39	155.42	4,424.57	0.42	-11.37	0.68	1.03	0.08	157.44
4,450.00	0.34	122.30	4,449.57	0.30	-11.28	0.56	0.85	-0.20	-132.48
4,475.00	0.41	149.77	4,474.57	0.18	-11.17	0.44	0.76	0.28	109.88
4,500.00	0.42	144.30	4,499.57	0.03	-11.07	0.29	0.16	0.04	-21.88
4,525.00	0.38	130.38	4,524.57	-0.10	-10.95	0.16	0.42	-0.16	-55.68
4,550.00	0.36	122.50	4,549.57	-0.19	-10.82	0.06	0.22	-0.08	-31.52
4,575.00	0.50	161.54	4,574.57	-0.34	-10.72	-0.09	1.26	0.56	156.16
4,600.00	0.38	163.78	4,599.57	-0.52	-10.66	-0.27	0.48	-0.48	8.96
4,625.00	0.39	152.09	4,624.56	-0.68	-10.60	-0.43	0.32	0.04	-46.76

Phoenix Technology Services LP

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Site:	Myox 21 State Com	MD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Well:	1H	North Reference:	Grid
Wellbore:	OH / Job #61261	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	Compass 5000 GCR

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)
4,650.00	0.34	163.16	4,649.56	-0.82	-10.54	-0.58	0.34	-0.20	44.28
4,675.00	0.70	167.81	4,674.56	-1.04	-10.49	-0.80	1.45	1.44	18.60
4,700.00	0.53	159.25	4,699.56	-1.30	-10.41	-1.06	0.77	-0.68	-34.24
4,725.00	0.60	165.82	4,724.56	-1.54	-10.34	-1.29	0.38	0.28	26.28
4,750.00	0.75	167.94	4,749.56	-1.82	-10.27	-1.58	0.61	0.60	8.48
4,775.00	0.68	165.59	4,774.56	-2.13	-10.20	-1.89	0.30	-0.28	-9.40
4,800.00	0.78	173.16	4,799.56	-2.44	-10.15	-2.20	0.55	0.40	30.28
4,825.00	0.77	163.23	4,824.55	-2.77	-10.08	-2.53	0.54	-0.04	-39.72
4,850.00	0.67	158.83	4,849.55	-3.07	-9.98	-2.83	0.46	-0.40	-17.60
4,875.00	0.59	166.46	4,874.55	-3.33	-9.89	-3.09	0.46	-0.32	30.52
4,900.00	0.64	167.15	4,899.55	-3.59	-9.83	-3.36	0.20	0.20	2.76
4,925.00	0.71	171.48	4,924.55	-3.88	-9.78	-3.65	0.35	0.28	17.32
4,950.00	0.64	179.21	4,949.54	-4.17	-9.75	-3.94	0.46	-0.28	30.92
4,975.00	0.62	174.42	4,974.54	-4.44	-9.74	-4.22	0.23	-0.08	-19.16
5,000.00	0.68	181.06	4,999.54	-4.73	-9.73	-4.50	0.38	0.24	26.56
5,025.00	0.63	181.36	5,024.54	-5.01	-9.73	-4.78	0.20	-0.20	1.20
5,050.00	0.77	175.78	5,049.54	-5.32	-9.72	-5.09	0.62	0.56	-22.32
5,075.00	0.71	173.08	5,074.54	-5.64	-9.69	-5.41	0.28	-0.24	-10.80
5,100.00	0.59	177.47	5,099.53	-5.92	-9.67	-5.69	0.52	-0.48	17.56
5,125.00	0.69	179.01	5,124.53	-6.20	-9.66	-5.97	0.41	0.40	6.16
5,150.00	0.71	174.93	5,149.53	-6.51	-9.64	-6.28	0.21	0.08	-16.32
5,175.00	0.76	177.62	5,174.53	-6.83	-9.62	-6.60	0.24	0.20	10.76
5,200.00	0.79	179.10	5,199.53	-7.16	-9.61	-6.94	0.14	0.12	5.92
5,225.00	0.60	173.93	5,224.52	-7.47	-9.60	-7.24	0.80	-0.76	-20.68
5,250.00	0.76	184.01	5,249.52	-7.76	-9.60	-7.54	0.80	0.64	40.32
5,275.00	0.79	176.92	5,274.52	-8.10	-9.60	-7.87	0.40	0.12	-28.36
5,300.00	0.64	173.17	5,299.52	-8.41	-9.57	-8.18	0.63	-0.60	-15.00
5,325.00	0.63	178.24	5,324.52	-8.69	-9.55	-8.46	0.23	-0.04	20.28
5,350.00	0.67	169.07	5,349.52	-8.97	-9.52	-8.74	0.45	0.16	-36.68
5,375.00	0.74	178.47	5,374.51	-9.27	-9.49	-9.05	0.54	0.28	37.60
5,400.00	0.65	179.98	5,399.51	-9.57	-9.48	-9.35	0.37	-0.36	6.04
5,425.00	0.61	168.35	5,424.51	-9.85	-9.46	-9.62	0.53	-0.16	-46.52
5,450.00	0.36	133.35	5,449.51	-10.03	-9.37	-9.81	1.51	-1.00	-140.00
5,475.00	0.30	113.81	5,474.51	-10.11	-9.25	-9.89	0.51	-0.24	-78.16
5,500.00	0.29	110.39	5,499.51	-10.16	-9.14	-9.94	0.08	-0.04	-13.68
5,525.00	0.33	120.93	5,524.51	-10.22	-9.01	-10.01	0.28	0.16	42.16
5,550.00	0.27	113.06	5,549.51	-10.28	-8.90	-10.07	0.29	-0.24	-31.48
5,575.00	0.28	137.40	5,574.51	-10.35	-8.80	-10.14	0.47	0.04	97.36
5,600.00	0.32	111.99	5,599.51	-10.42	-8.70	-10.21	0.55	0.16	-101.64
5,625.00	0.27	123.24	5,624.51	-10.48	-8.58	-10.27	0.31	-0.20	45.00
5,650.00	0.29	120.84	5,649.51	-10.54	-8.48	-10.34	0.09	0.08	-9.60
5,675.00	0.34	102.77	5,674.51	-10.59	-8.35	-10.39	0.44	0.20	-72.28
5,700.00	0.25	137.08	5,699.51	-10.65	-8.24	-10.45	0.78	-0.36	137.24

Phoenix Technology Services LP

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Site:	Myox 21 State Com	MD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Well:	1H	North Reference:	Grid
Wellbore:	OH / Job #61261	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	Compass 5000 GCR

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)
5,725.00	0.28	128.65	5,724.51	-10.72	-8.16	-10.53	0.20	0.12	-33.72
5,750.00	0.31	131.79	5,749.51	-10.81	-8.06	-10.62	0.14	0.12	12.56
5,775.00	0.26	131.04	5,774.50	-10.89	-7.97	-10.70	0.20	-0.20	-3.00
5,800.00	0.29	151.56	5,799.50	-10.98	-7.89	-10.80	0.41	0.12	82.08
5,825.00	0.30	147.83	5,824.50	-11.09	-7.83	-10.91	0.09	0.04	-14.92
5,850.00	0.29	149.64	5,849.50	-11.20	-7.76	-11.02	0.05	-0.04	7.24
5,875.00	0.28	166.29	5,874.50	-11.32	-7.72	-11.13	0.33	-0.04	66.60
5,900.00	0.37	158.16	5,899.50	-11.45	-7.67	-11.27	0.40	0.36	-32.52
5,925.00	0.31	149.88	5,924.50	-11.59	-7.61	-11.40	0.31	-0.24	-33.12
5,950.00	0.24	172.83	5,949.50	-11.70	-7.57	-11.52	0.52	-0.28	91.80
5,975.00	0.26	171.41	5,974.50	-11.80	-7.55	-11.62	0.08	0.08	-5.68
6,000.00	0.24	157.40	5,999.50	-11.91	-7.52	-11.73	0.26	-0.08	-56.04
6,025.00	0.38	171.80	6,024.50	-12.04	-7.49	-11.86	0.64	0.56	57.60
6,050.00	0.27	158.88	6,049.50	-12.18	-7.46	-12.00	0.53	-0.44	-51.68
6,075.00	0.52	171.35	6,074.50	-12.34	-7.42	-12.17	1.05	1.00	49.88
6,100.00	0.34	152.73	6,099.50	-12.52	-7.37	-12.35	0.90	-0.72	-74.48
6,125.00	0.43	156.62	6,124.50	-12.67	-7.30	-12.50	0.37	0.36	15.56
6,150.00	1.34	182.36	6,149.50	-13.05	-7.27	-12.88	3.88	3.64	102.96
6,175.00	0.62	163.52	6,174.49	-13.47	-7.25	-13.30	3.12	-2.88	-75.36
6,200.00	0.59	174.06	6,199.49	-13.73	-7.19	-13.56	0.46	-0.12	42.16
6,225.00	0.72	176.43	6,224.49	-14.02	-7.17	-13.84	0.53	0.52	9.48
6,250.00	0.61	177.49	6,249.49	-14.31	-7.16	-14.13	0.44	-0.44	4.24
6,275.00	0.65	179.41	6,274.49	-14.58	-7.15	-14.41	0.18	0.16	7.68
6,300.00	0.65	179.39	6,299.48	-14.86	-7.15	-14.69	0.00	0.00	-0.08
6,325.00	0.63	190.74	6,324.48	-15.14	-7.17	-14.97	0.51	-0.08	45.40
6,350.00	0.50	198.24	6,349.48	-15.38	-7.23	-15.21	0.60	-0.52	30.00
6,375.00	0.49	207.82	6,374.48	-15.58	-7.31	-15.40	0.33	-0.04	38.32
6,400.00	0.51	230.76	6,399.48	-15.74	-7.45	-15.56	0.80	0.08	91.76
6,425.00	0.45	237.93	6,424.48	-15.87	-7.62	-15.68	0.34	-0.24	28.68
6,450.00	0.55	254.71	6,449.48	-15.95	-7.82	-15.76	0.71	0.40	67.12
6,475.00	0.59	267.99	6,474.48	-15.98	-8.06	-15.79	0.55	0.16	53.12
6,500.00	0.70	270.92	6,499.48	-15.99	-8.34	-15.79	0.46	0.44	11.72
6,525.00	0.74	271.31	6,524.47	-15.98	-8.66	-15.77	0.16	0.16	1.56
6,550.00	0.72	273.17	6,549.47	-15.97	-8.98	-15.75	0.12	-0.08	7.44
6,575.00	0.80	271.39	6,574.47	-15.96	-9.31	-15.73	0.33	0.32	-7.12
6,600.00	0.80	271.79	6,599.47	-15.95	-9.66	-15.72	0.02	0.00	1.60
6,625.00	0.90	295.21	6,624.46	-15.86	-10.01	-15.62	1.43	0.40	93.68
6,650.00	0.96	291.21	6,649.46	-15.70	-10.38	-15.45	0.35	0.24	-16.00
6,675.00	1.12	306.66	6,674.46	-15.48	-10.77	-15.22	1.29	0.64	61.80
6,700.00	1.06	314.70	6,699.45	-15.17	-11.13	-14.90	0.66	-0.24	32.16
6,725.00	1.31	320.22	6,724.45	-14.78	-11.48	-14.51	1.10	1.00	22.08
6,750.00	1.33	322.50	6,749.44	-14.34	-11.84	-14.05	0.22	0.08	9.12
6,775.00	1.67	337.30	6,774.43	-13.77	-12.16	-13.48	2.05	1.36	59.20
6,800.00	1.78	340.73	6,799.42	-13.07	-12.43	-12.77	0.60	0.44	13.72

Phoenix Technology Services LP

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Site:	Myox 21 State Com	MD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Well:	1H	North Reference:	Grid
Wellbore:	OH / Job #61261	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	Compass 5000 GCR

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)
6,825.00	1.88	342.31	6,824.41	-12.31	-12.68	-12.01	0.45	0.40	6.32
6,850.00	1.88	340.19	6,849.39	-11.53	-12.94	-11.23	0.28	0.00	-8.48
6,875.00	1.67	336.03	6,874.38	-10.81	-13.23	-10.50	0.98	-0.84	-16.64
6,900.00	1.59	333.59	6,899.37	-10.17	-13.53	-9.85	0.42	-0.32	-9.76
6,925.00	1.41	325.34	6,924.36	-9.61	-13.86	-9.28	1.12	-0.72	-33.00
6,950.00	1.46	322.17	6,949.36	-9.10	-14.23	-8.77	0.38	0.20	-12.68
6,975.00	1.40	324.35	6,974.35	-8.60	-14.60	-8.26	0.32	-0.24	8.72
7,000.00	1.52	324.92	6,999.34	-8.08	-14.97	-7.73	0.48	0.48	2.28
7,025.00	1.67	331.41	7,024.33	-7.49	-15.34	-7.13	0.94	0.60	25.96
7,050.00	1.49	328.43	7,049.32	-6.89	-15.68	-6.53	0.79	-0.72	-11.92
7,075.00	1.46	327.77	7,074.31	-6.35	-16.02	-5.97	0.14	-0.12	-2.64
7,100.00	1.57	331.22	7,099.30	-5.78	-16.36	-5.39	0.57	0.44	13.80
7,125.00	1.43	328.38	7,124.30	-5.21	-16.68	-4.82	0.63	-0.56	-11.36
7,150.00	1.45	331.18	7,149.29	-4.67	-17.00	-4.27	0.29	0.08	11.20
7,175.00	1.32	327.59	7,174.28	-4.15	-17.31	-3.74	0.62	-0.52	-14.36
7,200.00	1.33	332.04	7,199.27	-3.65	-17.60	-3.24	0.41	0.04	17.80
7,225.00	1.52	337.12	7,224.27	-3.09	-17.86	-2.67	0.91	0.76	20.32
7,250.00	1.23	331.29	7,249.26	-2.55	-18.12	-2.12	1.29	-1.16	-23.32
7,275.00	1.12	333.36	7,274.25	-2.09	-18.36	-1.66	0.47	-0.44	8.28
7,300.00	0.98	331.04	7,299.25	-1.69	-18.57	-1.25	0.59	-0.56	-9.28
7,325.00	0.75	326.53	7,324.25	-1.37	-18.77	-0.93	0.96	-0.92	-18.04
7,350.00	0.80	321.15	7,349.24	-1.09	-18.97	-0.65	0.35	0.20	-21.52
7,375.00	0.73	310.81	7,374.24	-0.85	-19.20	-0.40	0.62	-0.28	-41.36
7,400.00	0.86	334.52	7,399.24	-0.58	-19.40	-0.13	1.40	0.52	94.84
7,418.00	0.65	316.53	7,417.24	-0.38	-19.53	0.07	1.75	-1.17	-99.94
Tie In									
7,529.00	0.85	40.18	7,528.23	0.70	-19.43	1.16	0.91	0.18	75.36
First Phoenix MWD Survey									
7,623.00	9.13	353.20	7,621.80	8.66	-19.86	9.12	9.12	8.81	-49.98
7,668.00	14.82	345.13	7,665.81	17.77	-21.76	18.28	13.15	12.64	-17.93
7,717.00	19.79	342.19	7,712.58	31.73	-25.91	32.33	10.30	10.14	-6.00
7,762.00	23.54	340.18	7,754.39	47.45	-31.29	48.17	8.49	8.33	-4.47
7,811.00	28.72	341.96	7,798.37	67.86	-38.26	68.74	10.69	10.57	3.63
7,856.00	33.71	346.72	7,836.85	90.31	-44.48	91.33	12.36	11.09	10.58
7,906.00	39.97	351.91	7,876.86	119.75	-49.93	120.89	13.97	12.52	10.38
7,937.00	44.60	353.13	7,899.78	140.43	-52.64	141.62	15.18	14.95	3.92
First Take Point									
7,951.00	46.70	353.61	7,909.57	150.37	-53.79	151.59	15.18	14.97	3.46
8,000.00	51.19	354.69	7,941.74	187.12	-57.55	188.42	9.31	9.16	2.20
8,045.00	55.40	354.21	7,968.63	223.02	-61.04	224.39	9.39	9.36	-1.07
8,093.00	62.35	353.25	7,993.43	263.84	-65.54	265.30	14.58	14.48	-2.00
8,138.00	69.63	353.23	8,011.73	304.63	-70.37	306.19	16.18	16.18	-0.04
8,187.00	73.98	352.88	8,027.02	350.83	-76.00	352.51	8.90	8.88	-0.71

Phoenix Technology Services LP

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Site:	Myox 21 State Com	MD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Well:	1H	North Reference:	Grid
Wellbore:	OH / Job #61261	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	Compass 5000 GCR

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)
8,232.00	77.37	353.15	8,038.16	394.10	-81.30	395.89	7.56	7.53	0.60
8,281.00	80.53	353.85	8,047.55	441.87	-86.75	443.78	6.60	6.45	1.43
8,325.00	82.76	354.66	8,053.94	485.18	-91.10	487.18	5.39	5.07	1.84
8,453.00	91.01	351.06	8,060.89	611.87	-106.99	614.21	7.03	6.45	-2.81
8,547.00	91.99	351.81	8,058.43	704.79	-120.98	707.43	1.31	1.04	0.80
8,641.00	90.98	353.75	8,056.00	798.01	-132.79	800.90	2.33	-1.07	2.06
8,735.00	91.52	353.76	8,053.95	891.43	-143.01	894.53	0.57	0.57	0.01
8,830.00	90.00	355.89	8,052.69	986.02	-151.58	989.30	2.75	-1.60	2.24
8,924.00	89.16	359.21	8,053.37	1,079.92	-155.60	1,083.27	3.64	-0.89	3.53
9,019.00	89.83	359.85	8,054.21	1,174.91	-156.38	1,178.25	0.98	0.71	0.67
9,113.00	87.62	359.27	8,056.30	1,268.88	-157.10	1,272.21	2.43	-2.35	-0.62
9,207.00	88.07	359.44	8,059.84	1,362.81	-158.16	1,366.14	0.51	0.48	0.18
9,301.00	88.46	359.61	8,062.68	1,456.76	-158.93	1,460.08	0.45	0.41	0.18
9,395.00	89.21	359.95	8,064.59	1,550.74	-159.30	1,554.04	0.88	0.80	0.36
9,489.00	89.97	0.48	8,065.27	1,644.74	-158.94	1,648.01	0.99	0.81	0.56
9,584.00	91.07	1.16	8,064.41	1,739.72	-157.58	1,742.93	1.36	1.16	0.72
9,678.00	90.42	359.01	8,063.18	1,833.71	-157.44	1,836.89	2.39	-0.69	-2.29
9,773.00	90.87	359.32	8,062.11	1,928.69	-158.83	1,931.88	0.58	0.47	0.33
9,867.00	90.19	357.92	8,061.24	2,022.66	-161.09	2,025.87	1.66	-0.72	-1.49
9,961.00	89.83	357.81	8,061.23	2,116.59	-164.59	2,119.86	0.40	-0.38	-0.12
10,055.00	90.28	358.41	8,061.14	2,210.54	-167.69	2,213.86	0.80	0.48	0.64
10,149.00	90.39	358.57	8,060.59	2,304.51	-170.17	2,307.86	0.21	0.12	0.17
10,243.00	90.14	358.90	8,060.15	2,398.48	-172.25	2,401.86	0.44	-0.27	0.35
10,337.00	89.69	359.21	8,060.29	2,492.47	-173.80	2,495.85	0.58	-0.48	0.33
10,431.00	89.19	359.38	8,061.21	2,586.46	-174.95	2,589.84	0.56	-0.53	0.18
10,522.00	89.50	0.42	8,062.25	2,677.45	-175.11	2,680.81	1.19	0.34	1.14
10,612.00	89.19	0.69	8,063.28	2,767.44	-174.24	2,770.76	0.46	-0.34	0.30
10,703.00	87.81	0.12	8,065.66	2,858.40	-173.60	2,861.68	1.64	-1.52	-0.63
10,794.00	89.02	359.78	8,068.18	2,949.37	-173.68	2,952.62	1.38	1.33	-0.37
10,880.00	91.37	0.72	8,067.89	3,035.36	-173.30	3,038.58	2.94	2.73	1.09
10,976.00	91.31	0.99	8,065.64	3,131.32	-171.87	3,134.48	0.29	-0.06	0.28
11,067.00	89.83	0.07	8,064.74	3,222.31	-171.03	3,225.43	1.91	-1.63	-1.01
11,157.00	89.61	1.24	8,065.18	3,312.30	-170.00	3,315.37	1.32	-0.24	1.30
11,247.00	89.36	1.59	8,065.99	3,402.27	-167.78	3,405.26	0.48	-0.28	0.39
11,338.00	89.27	359.74	8,067.07	3,493.25	-166.72	3,496.20	2.04	-0.10	-2.03
11,432.00	90.56	357.69	8,067.21	3,587.22	-168.83	3,590.19	2.58	1.37	-2.18
11,527.00	90.28	357.62	8,066.52	3,682.14	-172.72	3,685.17	0.30	-0.29	-0.07
11,621.00	90.11	358.19	8,066.20	3,776.07	-176.15	3,779.16	0.63	-0.18	0.61
11,715.00	90.36	358.81	8,065.81	3,870.04	-178.61	3,873.16	0.71	0.27	0.66
11,810.00	89.97	359.26	8,065.54	3,965.03	-180.21	3,968.16	0.63	-0.41	0.47
11,903.00	89.52	359.86	8,065.95	4,058.02	-180.93	4,061.15	0.81	-0.48	0.65
11,998.00	88.85	359.86	8,067.30	4,153.01	-181.16	4,156.11	0.71	-0.71	0.00
12,092.00	89.47	0.02	8,068.68	4,247.00	-181.26	4,250.08	0.68	0.66	0.17
12,186.00	91.07	359.63	8,068.24	4,341.00	-181.54	4,344.06	1.75	1.70	-0.41

Phoenix Technology Services LP

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Site:	Myox 21 State Com	MD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Well:	1H	North Reference:	Grid
Wellbore:	OH / Job #61261	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	Compass 5000 GCR

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)	
12,280.00	92.94	359.13	8,064.95	4,434.93	-182.56	4,437.99	2.06	1.99	-0.53	
12,374.00	95.00	359.60	8,058.44	4,528.69	-183.60	4,531.75	2.25	2.19	0.50	
12,469.00	92.60	359.00	8,052.15	4,623.47	-184.76	4,626.53	2.60	-2.53	-0.63	
12,563.00	89.90	358.90	8,050.10	4,717.42	-186.48	4,720.49	2.87	-2.87	-0.11	
12,657.00	91.40	359.05	8,049.03	4,811.40	-188.16	4,814.48	1.60	1.60	0.16	
12,750.00	89.44	359.70	8,048.35	4,904.39	-189.18	4,907.47	2.22	-2.11	0.70	
12,845.00	87.62	358.84	8,050.78	4,999.34	-190.39	5,002.43	2.12	-1.92	-0.91	
12,939.00	89.21	358.94	8,053.38	5,093.29	-192.21	5,096.39	1.69	1.69	0.11	
13,033.00	87.93	358.84	8,055.73	5,187.24	-194.03	5,190.36	1.37	-1.36	-0.11	
13,125.00	88.88	358.79	8,058.29	5,279.18	-195.93	5,282.32	1.03	1.03	-0.05	
13,221.00	90.22	358.65	8,059.04	5,375.15	-198.07	5,378.31	1.40	1.40	-0.15	
13,316.00	88.43	358.67	8,060.16	5,470.11	-200.29	5,473.30	1.88	-1.88	0.02	
13,410.00	89.83	358.95	8,061.59	5,564.08	-202.25	5,567.29	1.52	1.49	0.30	
13,504.00	91.23	359.20	8,060.72	5,658.06	-203.76	5,661.28	1.51	1.49	0.27	
13,598.00	89.55	357.82	8,060.08	5,752.02	-206.21	5,755.27	2.31	-1.79	-1.47	
13,693.00	87.59	358.60	8,062.45	5,846.94	-209.17	5,850.24	2.22	-2.06	0.82	
13,787.00	88.49	358.81	8,065.67	5,940.86	-211.30	5,944.18	0.98	0.96	0.22	
13,881.00	89.86	359.14	8,067.02	6,034.83	-212.98	6,038.17	1.50	1.46	0.35	
13,976.00	91.18	359.45	8,066.16	6,129.82	-214.15	6,133.15	1.43	1.39	0.33	
14,070.00	89.33	359.48	8,065.74	6,223.81	-215.03	6,227.14	1.97	-1.97	0.03	
14,164.00	90.03	359.17	8,066.27	6,317.80	-216.13	6,321.13	0.81	0.74	-0.33	
14,258.00	91.18	358.78	8,065.27	6,411.78	-217.81	6,415.12	1.29	1.22	-0.41	
14,352.00	89.44	0.00	8,064.76	6,505.77	-218.81	6,509.11	2.26	-1.85	1.30	
14,446.00	89.69	359.72	8,065.48	6,599.77	-219.04	6,603.08	0.40	0.27	-0.30	
14,540.00	88.54	1.63	8,066.93	6,693.74	-217.94	6,697.01	2.37	-1.22	2.03	
14,635.00	89.39	2.00	8,068.65	6,788.68	-214.93	6,791.85	0.98	0.89	0.39	
14,728.00	90.36	2.07	8,068.85	6,881.62	-211.63	6,884.69	1.05	1.04	0.08	
14,822.00	87.76	0.45	8,070.39	6,975.57	-209.56	6,978.57	3.26	-2.77	-1.72	
14,915.00	87.87	359.92	8,073.94	7,068.50	-209.26	7,071.46	0.58	0.12	-0.57	
15,009.00	88.99	0.32	8,076.51	7,162.47	-209.06	7,165.40	1.27	1.19	0.43	
15,103.00	89.97	0.68	8,077.37	7,256.46	-208.24	7,259.34	1.11	1.04	0.38	
15,197.00	91.21	0.89	8,076.40	7,350.44	-206.95	7,353.27	1.34	1.32	0.22	
15,291.00	92.38	1.12	8,073.45	7,444.38	-205.31	7,447.15	1.27	1.24	0.24	
15,385.00	89.91	358.83	8,071.57	7,538.35	-205.35	7,541.09	3.58	-2.63	-2.44	
15,479.00	90.17	358.26	8,071.51	7,632.32	-207.74	7,635.09	0.67	0.28	-0.61	
15,573.00	91.26	358.55	8,070.34	7,726.27	-210.35	7,729.08	1.20	1.16	0.31	
15,667.00	89.72	357.58	8,069.53	7,820.21	-213.53	7,823.07	1.94	-1.64	-1.03	
15,761.00	90.67	357.40	8,069.21	7,914.12	-217.64	7,917.04	1.03	1.01	-0.19	
15,855.00	91.65	357.54	8,067.31	8,008.01	-221.79	8,011.00	1.05	1.04	0.15	
15,949.00	89.52	357.65	8,066.35	8,101.91	-225.73	8,104.98	2.27	-2.27	0.12	
16,042.00	90.28	357.82	8,066.51	8,194.84	-229.41	8,197.96	0.84	0.82	0.18	
16,137.00	91.23	358.06	8,065.26	8,289.77	-232.82	8,292.95	1.03	1.00	0.25	
16,231.00	89.39	359.05	8,064.75	8,383.73	-235.19	8,386.94	2.22	-1.96	1.05	

Phoenix Technology Services LP

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Site:	Myox 21 State Com	MD Reference:	GL + KB @ 3018.00usft (Ensign 155)
Well:	1H	North Reference:	Grid
Wellbore:	OH / Job #61261	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	Database:	Compass 5000 GCR

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)	
16,325.00	90.87	359.52	8,064.54	8,477.72	-236.37	8,480.93	1.65	1.57	0.50	
16,419.00	88.60	359.99	8,064.97	8,571.71	-236.77	8,574.91	2.47	-2.41	0.50	
16,513.00	88.93	0.04	8,067.00	8,665.69	-236.75	8,668.86	0.36	0.35	0.05	
16,607.00	90.36	0.16	8,067.58	8,759.69	-236.58	8,762.82	1.53	1.52	0.13	
16,701.00	91.65	0.45	8,065.93	8,853.67	-236.08	8,856.77	1.41	1.37	0.31	
16,796.00	88.96	0.44	8,065.43	8,948.66	-235.34	8,951.71	2.83	-2.83	-0.01	
16,889.00	88.96	0.68	8,067.11	9,041.64	-234.43	9,044.65	0.26	0.00	0.26	
16,984.00	89.21	0.58	8,068.63	9,136.62	-233.39	9,139.58	0.28	0.26	-0.11	
17,078.00	90.28	1.17	8,069.05	9,230.60	-231.95	9,233.50	1.30	1.14	0.63	
17,172.00	87.90	0.21	8,070.54	9,324.58	-230.82	9,327.43	2.73	-2.53	-1.02	
17,266.00	88.04	0.37	8,073.87	9,418.52	-230.35	9,421.33	0.23	0.15	0.17	
17,361.00	88.80	1.00	8,076.49	9,513.47	-229.21	9,516.23	1.04	0.80	0.66	
17,455.00	90.14	2.28	8,077.36	9,607.43	-226.52	9,610.10	1.97	1.43	1.36	
17,548.00	88.49	0.52	8,078.47	9,700.39	-224.25	9,702.98	2.59	-1.77	-1.89	
17,642.00	89.11	0.83	8,080.44	9,794.36	-223.14	9,796.90	0.74	0.66	0.33	
17,736.00	89.21	0.64	8,081.82	9,888.34	-221.94	9,890.83	0.23	0.11	-0.20	
17,830.00	89.94	0.60	8,082.52	9,982.33	-220.92	9,984.77	0.78	0.78	-0.04	
17,924.00	90.20	359.69	8,082.40	10,076.33	-220.68	10,078.73	1.01	0.28	-0.97	
17,961.00	90.16	359.58	8,082.28	10,113.33	-220.92	10,115.73	0.30	-0.10	-0.29	
Last Take Point										
18,018.00	90.11	359.42	8,082.15	10,170.33	-221.41	10,172.72	0.30	-0.10	-0.29	
Final Phoenix MWD Survey										
18,082.00	90.11	359.42	8,082.03	10,234.32	-222.06	10,236.72	0.00	0.00	0.00	
Projection to TD										

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,418.00	7,417.24	-0.38	-19.53	Tie In
7,529.00	7,528.23	0.70	-19.43	First Phoenix MWD Survey
7,937.00	7,899.78	140.43	-52.64	First Take Point
17,961.00	8,082.28	10,113.33	-220.92	Last Take Point
18,018.00	8,082.15	10,170.33	-221.41	Final Phoenix MWD Survey
18,082.00	8,082.03	10,234.32	-222.06	Projection to TD