



COG Operating LLC

Eddy County, NM (NAD27 NME)

Hambone Federal Com

702H

OH / 66456

Design: Surveys (Pioneer 84)

Standard Survey Report

19 May, 2020



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2939.00usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2939.00usft (Pioneer 84)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 66456	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

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

Site	Hambone Federal Com		
Site Position:		Northing:	382,232.28 usft
From:	Map	Easting:	601,211.49 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 3' 1.622153 N
		Longitude:	104° 0' 23.979022 W
		Grid Convergence:	0.17 °

Well	702H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	1.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 3' 0.456952 N
		Longitude:	104° 0' 3.580639 W
		Ground Level:	2,914.00 usft

Wellbore	OH / 66456		
Magnetics	Model Name	Sample Date	Declination (°)
	User Defined	4/14/2020	6.72
			Dip Angle (°)
			59.63
			Field Strength (nT)
			47,733.00000000

Design	Surveys (Pioneer 84)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°)
			359.00

Survey Program	Date	5/18/2020		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	9,041.30	Scientific Gyro Surveys (OH / 66456)	Scientific Keeper	Scientific Drilling Intl. Standard Wireline Keeper
9,110.00	19,989.00	Phoenix MWD Surveys (OH / 66456)	MWD+IFR1+FDIR	OWSG MWD + IFR1 + FDIR Correction

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.75	287.40	100.00	0.20	-0.62	0.21	0.75	0.75	0.00	
125.00	0.94	287.78	124.99	0.31	-0.98	0.32	0.76	0.76	1.52	
150.00	0.98	288.54	149.99	0.44	-1.37	0.46	0.17	0.16	3.04	
175.00	0.99	287.17	174.99	0.57	-1.78	0.60	0.10	0.04	-5.48	
200.00	0.97	288.01	199.98	0.70	-2.19	0.74	0.10	-0.08	3.36	
225.00	1.08	285.01	224.98	0.83	-2.62	0.87	0.49	0.44	-12.00	
250.00	1.16	283.65	249.97	0.95	-3.09	1.00	0.34	0.32	-5.44	
275.00	1.11	286.20	274.97	1.07	-3.57	1.14	0.28	-0.20	10.20	
300.00	1.10	286.02	299.97	1.21	-4.03	1.28	0.04	-0.04	-0.72	

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Well:	702H	North Reference:	Grid
Wellbore:	OH / 66456	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
325.00	0.94	286.08	324.96	1.33	-4.46	1.41	0.64	-0.64	0.24
350.00	1.10	292.08	349.96	1.48	-4.88	1.56	0.77	0.64	24.00
375.00	1.11	294.74	374.95	1.67	-5.32	1.76	0.21	0.04	10.64
400.00	1.14	297.10	399.95	1.88	-5.77	1.98	0.22	0.12	9.44
425.00	1.18	298.59	424.94	2.12	-6.21	2.23	0.20	0.16	5.96
450.00	1.13	299.51	449.94	2.36	-6.65	2.48	0.21	-0.20	3.68
475.00	1.18	299.25	474.93	2.61	-7.09	2.73	0.20	0.20	-1.04
500.00	1.28	298.17	499.93	2.87	-7.56	3.00	0.41	0.40	-4.32
525.00	1.31	297.69	524.92	3.13	-8.06	3.27	0.13	0.12	-1.92
550.00	1.39	297.14	549.91	3.40	-8.59	3.55	0.32	0.32	-2.20
575.00	1.33	296.85	574.91	3.67	-9.11	3.83	0.24	-0.24	-1.16
600.00	0.88	287.42	599.90	3.86	-9.56	4.03	1.94	-1.80	-37.72
625.00	1.05	254.30	624.90	3.86	-9.96	4.03	2.29	0.68	-132.48
650.00	1.07	224.23	649.89	3.63	-10.34	3.81	2.20	0.08	-120.28
675.00	1.43	216.55	674.89	3.21	-10.69	3.40	1.59	1.44	-30.72
700.00	1.48	209.63	699.88	2.68	-11.04	2.87	0.73	0.20	-27.68
725.00	1.53	212.05	724.87	2.12	-11.37	2.31	0.32	0.20	9.68
750.00	1.67	211.79	749.86	1.52	-11.74	1.73	0.56	0.56	-1.04
775.00	1.67	210.61	774.85	0.90	-12.12	1.11	0.14	0.00	-4.72
800.00	1.76	212.56	799.84	0.26	-12.51	0.48	0.43	0.36	7.80
825.00	1.83	215.29	824.83	-0.39	-12.95	-0.16	0.44	0.28	10.92
850.00	1.83	215.54	849.82	-1.04	-13.41	-0.80	0.03	0.00	1.00
875.00	1.92	215.49	874.80	-1.70	-13.89	-1.46	0.36	0.36	-0.20
900.00	2.05	218.22	899.79	-2.39	-14.41	-2.14	0.64	0.52	10.92
925.00	2.18	217.92	924.77	-3.12	-14.98	-2.86	0.52	0.52	-1.20
950.00	2.23	218.43	949.75	-3.88	-15.57	-3.60	0.21	0.20	2.04
975.00	2.50	217.27	974.73	-4.69	-16.20	-4.41	1.10	1.08	-4.64
1,000.00	2.64	214.84	999.70	-5.60	-16.86	-5.30	0.71	0.56	-9.72
1,025.00	2.97	213.00	1,024.67	-6.61	-17.54	-6.31	1.37	1.32	-7.36
1,050.00	3.04	213.65	1,049.64	-7.71	-18.26	-7.39	0.31	0.28	2.60
1,075.00	3.10	213.33	1,074.60	-8.83	-19.00	-8.49	0.25	0.24	-1.28
1,100.00	3.23	214.15	1,099.57	-9.97	-19.77	-9.63	0.55	0.52	3.28
1,125.00	3.24	213.60	1,124.53	-11.14	-20.56	-10.78	0.13	0.04	-2.20
1,150.00	3.26	214.50	1,149.49	-12.32	-21.35	-11.94	0.22	0.08	3.60
1,175.00	3.32	215.43	1,174.45	-13.49	-22.17	-13.11	0.32	0.24	3.72
1,200.00	2.98	218.49	1,199.41	-14.59	-23.00	-14.19	1.52	-1.36	12.24
1,225.00	2.01	230.71	1,224.38	-15.38	-23.74	-14.96	4.40	-3.88	48.88
1,250.00	1.60	245.24	1,249.37	-15.80	-24.40	-15.38	2.45	-1.64	58.12
1,275.00	1.53	256.83	1,274.36	-16.03	-25.04	-15.59	1.29	-0.28	46.36
1,300.00	1.49	260.08	1,299.35	-16.16	-25.68	-15.71	0.38	-0.16	13.00
1,325.00	1.41	263.25	1,324.35	-16.25	-26.31	-15.79	0.45	-0.32	12.68
1,350.00	1.47	262.27	1,349.34	-16.33	-26.93	-15.86	0.26	0.24	-3.92
1,375.00	1.48	263.83	1,374.33	-16.41	-27.57	-15.92	0.17	0.04	6.24

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1,400.00	1.47	263.27	1,399.32	-16.48	-28.21	-15.98	0.07	-0.04	-2.24
1,425.00	1.46	263.32	1,424.31	-16.55	-28.84	-16.05	0.04	-0.04	0.20
1,450.00	1.42	258.55	1,449.30	-16.65	-29.46	-16.14	0.51	-0.16	-19.08
1,475.00	1.03	234.36	1,474.30	-16.84	-29.95	-16.32	2.56	-1.56	-96.76
1,500.00	0.92	222.15	1,499.30	-17.12	-30.27	-16.59	0.94	-0.44	-48.84
1,525.00	0.97	220.66	1,524.29	-17.43	-30.54	-16.90	0.22	0.20	-5.96
1,550.00	1.02	225.67	1,549.29	-17.75	-30.84	-17.21	0.40	0.20	20.04
1,575.00	1.03	223.32	1,574.28	-18.07	-31.15	-17.52	0.17	0.04	-9.40
1,600.00	1.15	227.28	1,599.28	-18.40	-31.49	-17.85	0.57	0.48	15.84
1,625.00	1.42	229.94	1,624.27	-18.77	-31.91	-18.21	1.11	1.08	10.64
1,650.00	1.63	230.47	1,649.26	-19.20	-32.42	-18.63	0.84	0.84	2.12
1,675.00	1.83	234.41	1,674.25	-19.66	-33.02	-19.08	0.93	0.80	15.76
1,700.00	1.94	234.96	1,699.24	-20.13	-33.69	-19.54	0.45	0.44	2.20
1,725.00	2.08	233.01	1,724.22	-20.65	-34.40	-20.04	0.62	0.56	-7.80
1,750.00	2.19	233.14	1,749.21	-21.21	-35.15	-20.59	0.44	0.44	0.52
1,775.00	2.27	231.80	1,774.19	-21.80	-35.92	-21.17	0.38	0.32	-5.36
1,800.00	2.41	233.26	1,799.17	-22.42	-36.73	-21.78	0.61	0.56	5.84
1,825.00	2.58	233.42	1,824.14	-23.07	-37.60	-22.41	0.68	0.68	0.64
1,850.00	2.57	232.63	1,849.12	-23.75	-38.50	-23.07	0.15	-0.04	-3.16
1,875.00	2.57	232.02	1,874.09	-24.43	-39.38	-23.74	0.11	0.00	-2.44
1,900.00	2.49	232.12	1,899.07	-25.11	-40.25	-24.40	0.32	-0.32	0.40
1,925.00	1.97	234.07	1,924.05	-25.69	-41.03	-24.97	2.10	-2.08	7.80
1,950.00	0.96	237.44	1,949.04	-26.06	-41.56	-25.33	4.05	-4.04	13.48
1,975.00	0.43	252.30	1,974.04	-26.20	-41.82	-25.47	2.22	-2.12	59.44
2,000.00	0.32	275.24	1,999.04	-26.22	-41.98	-25.49	0.74	-0.44	91.76
2,025.00	0.19	296.24	2,024.04	-26.20	-42.09	-25.46	0.63	-0.52	84.00
2,050.00	0.25	292.22	2,049.04	-26.16	-42.18	-25.42	0.25	0.24	-16.08
2,075.00	0.24	295.56	2,074.04	-26.12	-42.27	-25.37	0.07	-0.04	13.36
2,100.00	0.18	296.97	2,099.04	-26.08	-42.36	-25.33	0.24	-0.24	5.64
2,125.00	0.19	304.27	2,124.04	-26.03	-42.42	-25.29	0.10	0.04	29.20
2,150.00	0.21	304.74	2,149.04	-25.99	-42.50	-25.24	0.08	0.08	1.88
2,175.00	0.14	310.07	2,174.04	-25.94	-42.56	-25.19	0.29	-0.28	21.32
2,200.00	0.18	76.48	2,199.04	-25.91	-42.54	-25.16	1.14	0.16	505.64
2,225.00	0.64	91.56	2,224.04	-25.91	-42.36	-25.16	1.87	1.84	60.32
2,250.00	0.95	97.97	2,249.03	-25.94	-42.02	-25.20	1.29	1.24	25.64
2,275.00	1.25	105.02	2,274.03	-26.04	-41.55	-25.31	1.31	1.20	28.20
2,300.00	1.56	105.26	2,299.02	-26.20	-40.96	-25.48	1.24	1.24	0.96
2,325.00	1.55	106.02	2,324.01	-26.38	-40.31	-25.67	0.09	-0.04	3.04
2,350.00	1.55	107.06	2,349.00	-26.57	-39.66	-25.88	0.11	0.00	4.16
2,375.00	1.53	106.60	2,373.99	-26.77	-39.02	-26.08	0.09	-0.08	-1.84
2,400.00	1.52	108.19	2,398.99	-26.97	-38.38	-26.29	0.17	-0.04	6.36
2,425.00	1.69	106.58	2,423.98	-27.17	-37.71	-26.51	0.70	0.68	-6.44
2,450.00	1.84	107.56	2,448.96	-27.40	-36.98	-26.75	0.61	0.60	3.92

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2,475.00	2.20	108.90	2,473.95	-27.68	-36.14	-27.04	1.45	1.44	5.36	
2,500.00	2.56	108.11	2,498.93	-28.01	-35.15	-27.39	1.45	1.44	-3.16	
2,525.00	3.06	107.31	2,523.90	-28.38	-33.99	-27.78	2.01	2.00	-3.20	
2,550.00	3.44	107.45	2,548.86	-28.80	-32.63	-28.23	1.52	1.52	0.56	
2,575.00	3.99	107.39	2,573.80	-29.29	-31.09	-28.74	2.20	2.20	-0.24	
2,600.00	4.29	108.49	2,598.74	-29.84	-29.37	-29.33	1.24	1.20	4.40	
2,625.00	4.40	107.82	2,623.67	-30.43	-27.57	-29.95	0.48	0.44	-2.68	
2,650.00	4.32	108.07	2,648.59	-31.02	-25.76	-30.56	0.33	-0.32	1.00	
2,675.00	3.59	112.44	2,673.53	-31.61	-24.15	-31.18	3.16	-2.92	17.48	
2,700.00	2.48	121.13	2,698.50	-32.19	-22.96	-31.78	4.79	-4.44	34.76	
2,725.00	2.00	129.19	2,723.48	-32.74	-22.16	-32.35	2.29	-1.92	32.24	
2,750.00	1.58	138.30	2,748.47	-33.28	-21.59	-32.89	2.02	-1.68	36.44	
2,775.00	1.46	144.84	2,773.46	-33.79	-21.18	-33.42	0.84	-0.48	26.16	
2,800.00	1.40	141.48	2,798.45	-34.29	-20.80	-33.93	0.41	-0.24	-13.44	
2,825.00	1.39	143.49	2,823.44	-34.78	-20.43	-34.41	0.20	-0.04	8.04	
2,850.00	1.63	141.04	2,848.44	-35.30	-20.03	-34.94	0.99	0.96	-9.80	
2,875.00	1.49	140.90	2,873.43	-35.83	-19.60	-35.48	0.56	-0.56	-0.56	
2,900.00	1.47	141.41	2,898.42	-36.33	-19.20	-35.99	0.10	-0.08	2.04	
2,925.00	1.54	140.61	2,923.41	-36.84	-18.78	-36.50	0.29	0.28	-3.20	
2,950.00	1.46	143.67	2,948.40	-37.35	-18.38	-37.03	0.45	-0.32	12.24	
2,975.00	1.47	145.05	2,973.39	-37.87	-18.01	-37.55	0.15	0.04	5.52	
3,000.00	1.55	142.59	2,998.38	-38.41	-17.62	-38.09	0.41	0.32	-9.84	
3,025.00	1.51	142.63	3,023.38	-38.94	-17.21	-38.63	0.16	-0.16	0.16	
3,050.00	1.52	145.05	3,048.37	-39.47	-16.82	-39.17	0.26	0.04	9.68	
3,075.00	1.55	143.60	3,073.36	-40.01	-16.43	-39.72	0.20	0.12	-5.80	
3,100.00	1.52	147.68	3,098.35	-40.57	-16.06	-40.28	0.45	-0.12	16.32	
3,125.00	1.54	145.73	3,123.34	-41.12	-15.69	-40.84	0.22	0.08	-7.80	
3,150.00	1.45	174.52	3,148.33	-41.72	-15.47	-41.44	2.99	-0.36	115.16	
3,175.00	1.74	196.12	3,173.32	-42.40	-15.55	-42.12	2.65	1.16	86.40	
3,200.00	1.88	205.04	3,198.31	-43.13	-15.82	-42.85	1.26	0.56	35.68	
3,225.00	1.90	207.12	3,223.30	-43.87	-16.19	-43.58	0.29	0.08	8.32	
3,250.00	2.08	208.21	3,248.28	-44.64	-16.59	-44.34	0.74	0.72	4.36	
3,275.00	3.41	218.42	3,273.25	-45.62	-17.27	-45.31	5.65	5.32	40.84	
3,300.00	4.06	221.62	3,298.20	-46.87	-18.32	-46.54	2.73	2.60	12.80	
3,325.00	4.11	221.57	3,323.13	-48.20	-19.50	-47.85	0.20	0.20	-0.20	
3,350.00	4.13	221.28	3,348.07	-49.55	-20.69	-49.18	0.12	0.08	-1.16	
3,375.00	4.15	221.26	3,373.01	-50.90	-21.88	-50.51	0.08	0.08	-0.08	
3,400.00	4.16	221.03	3,397.94	-52.27	-23.07	-51.86	0.08	0.04	-0.92	
3,425.00	4.23	217.62	3,422.87	-53.68	-24.23	-53.25	1.04	0.28	-13.64	
3,450.00	4.88	206.67	3,447.79	-55.36	-25.27	-54.91	4.33	2.60	-43.80	
3,475.00	5.40	199.92	3,472.69	-57.42	-26.15	-56.95	3.19	2.08	-27.00	
3,500.00	5.47	198.84	3,497.58	-59.65	-26.93	-59.17	0.50	0.28	-4.32	
3,525.00	5.52	197.90	3,522.47	-61.92	-27.69	-61.43	0.41	0.20	-3.76	
3,550.00	5.51	198.41	3,547.35	-64.21	-28.43	-63.70	0.20	-0.04	2.04	

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2939.00usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2939.00usft (Pioneer 84)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 66456	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,575.00	5.53	198.08	3,572.23	-66.49	-29.19	-65.97	0.15	0.08	-1.32
3,600.00	5.45	197.32	3,597.12	-68.77	-29.91	-68.24	0.43	-0.32	-3.04
3,625.00	5.38	196.09	3,622.01	-71.03	-30.59	-70.48	0.54	-0.28	-4.92
3,650.00	5.26	196.14	3,646.90	-73.25	-31.24	-72.70	0.48	-0.48	0.20
3,675.00	5.16	194.60	3,671.80	-75.44	-31.84	-74.88	0.69	-0.40	-6.16
3,700.00	5.27	195.16	3,696.69	-77.64	-32.42	-77.06	0.48	0.44	2.24
3,725.00	5.01	194.24	3,721.59	-79.81	-32.99	-79.22	1.09	-1.04	-3.68
3,750.00	4.88	193.28	3,746.50	-81.90	-33.50	-81.30	0.62	-0.52	-3.84
3,775.00	4.82	192.70	3,771.41	-83.96	-33.98	-83.35	0.31	-0.24	-2.32
3,800.00	4.76	191.41	3,796.32	-86.00	-34.41	-85.39	0.49	-0.24	-5.16
3,825.00	4.81	191.05	3,821.24	-88.05	-34.82	-87.42	0.23	0.20	-1.44
3,850.00	4.82	191.05	3,846.15	-90.10	-35.22	-89.48	0.04	0.04	0.00
3,875.00	4.82	191.15	3,871.06	-92.17	-35.63	-91.53	0.03	0.00	0.40
3,900.00	4.77	190.76	3,895.97	-94.22	-36.02	-93.57	0.24	-0.20	-1.56
3,925.00	4.75	189.42	3,920.89	-96.26	-36.39	-95.61	0.45	-0.08	-5.36
3,950.00	4.67	188.71	3,945.80	-98.29	-36.71	-97.63	0.40	-0.32	-2.84
3,975.00	4.64	187.52	3,970.72	-100.30	-37.00	-99.63	0.40	-0.12	-4.76
4,000.00	4.62	187.70	3,995.64	-102.30	-37.26	-101.63	0.10	-0.08	0.72
4,025.00	4.62	187.78	4,020.56	-104.29	-37.54	-103.62	0.03	0.00	0.32
4,050.00	4.54	187.09	4,045.48	-106.27	-37.79	-105.60	0.39	-0.32	-2.76
4,075.00	4.51	186.00	4,070.40	-108.23	-38.02	-107.55	0.36	-0.12	-4.36
4,100.00	4.55	185.19	4,095.32	-110.20	-38.21	-109.51	0.30	0.16	-3.24
4,125.00	4.49	185.31	4,120.24	-112.16	-38.39	-111.47	0.24	-0.24	0.48
4,150.00	4.51	185.58	4,145.17	-114.11	-38.58	-113.42	0.12	0.08	1.08
4,175.00	4.54	185.31	4,170.09	-116.07	-38.77	-115.38	0.15	0.12	-1.08
4,200.00	4.51	185.09	4,195.01	-118.04	-38.94	-117.34	0.14	-0.12	-0.88
4,225.00	4.49	185.04	4,219.93	-119.99	-39.12	-119.29	0.08	-0.08	-0.20
4,250.00	4.48	184.24	4,244.86	-121.94	-39.28	-121.24	0.25	-0.04	-3.20
4,275.00	4.44	183.80	4,269.78	-123.88	-39.41	-123.17	0.21	-0.16	-1.76
4,300.00	4.46	183.63	4,294.70	-125.81	-39.54	-125.11	0.10	0.08	-0.68
4,325.00	4.41	183.10	4,319.63	-127.74	-39.65	-127.03	0.26	-0.20	-2.12
4,350.00	4.47	183.76	4,344.56	-129.68	-39.77	-128.96	0.32	0.24	2.64
4,375.00	4.48	182.91	4,369.48	-131.62	-39.88	-130.91	0.27	0.04	-3.40
4,400.00	4.47	182.98	4,394.40	-133.57	-39.98	-132.85	0.05	-0.04	0.28
4,425.00	4.47	183.67	4,419.33	-135.52	-40.09	-134.80	0.22	0.00	2.76
4,450.00	4.53	184.51	4,444.25	-137.47	-40.23	-136.75	0.36	0.24	3.36
4,475.00	4.53	184.13	4,469.17	-139.44	-40.38	-138.72	0.12	0.00	-1.52
4,500.00	4.49	188.77	4,494.09	-141.39	-40.60	-140.66	1.47	-0.16	18.56
4,525.00	4.44	193.42	4,519.02	-143.30	-40.98	-142.57	1.46	-0.20	18.60
4,550.00	4.49	194.72	4,543.94	-145.19	-41.45	-144.44	0.45	0.20	5.20
4,575.00	4.48	194.95	4,568.87	-147.08	-41.95	-146.33	0.08	-0.04	0.92
4,600.00	4.47	194.38	4,593.79	-148.97	-42.44	-148.20	0.18	-0.04	-2.28
4,625.00	4.49	194.72	4,618.71	-150.86	-42.93	-150.08	0.13	0.08	1.36

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2939.00usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2939.00usft (Pioneer 84)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 66456	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,650.00	4.43	195.67	4,643.64	-152.73	-43.44	-151.95	0.38	-0.24	3.80
4,675.00	3.72	199.81	4,668.57	-154.43	-43.98	-153.63	3.07	-2.84	16.56
4,700.00	2.92	201.89	4,693.53	-155.78	-44.49	-154.98	3.24	-3.20	8.32
4,725.00	2.71	202.93	4,718.50	-156.91	-44.96	-156.11	0.86	-0.84	4.16
4,750.00	2.65	201.29	4,743.47	-158.00	-45.40	-157.18	0.39	-0.24	-6.56
4,775.00	2.60	202.43	4,768.45	-159.06	-45.83	-158.24	0.29	-0.20	4.56
4,800.00	2.59	201.90	4,793.42	-160.11	-46.25	-159.28	0.10	-0.04	-2.12
4,825.00	2.60	201.28	4,818.40	-161.16	-46.67	-160.32	0.12	0.04	-2.48
4,850.00	2.60	202.40	4,843.37	-162.21	-47.09	-161.37	0.20	0.00	4.48
4,875.00	2.45	201.40	4,868.35	-163.24	-47.50	-162.38	0.63	-0.60	-4.00
4,900.00	1.21	202.98	4,893.33	-163.98	-47.80	-163.12	4.96	-4.96	6.32
4,925.00	0.81	207.01	4,918.33	-164.38	-47.98	-163.51	1.62	-1.60	16.12
4,950.00	0.78	208.25	4,943.33	-164.68	-48.14	-163.82	0.14	-0.12	4.96
4,975.00	0.76	201.39	4,968.33	-164.99	-48.29	-164.12	0.38	-0.08	-27.44
5,000.00	0.80	216.72	4,993.32	-165.28	-48.45	-164.41	0.85	0.16	61.32
5,025.00	0.99	208.05	5,018.32	-165.61	-48.66	-164.74	0.93	0.76	-34.68
5,050.00	1.00	216.49	5,043.32	-165.98	-48.89	-165.10	0.59	0.04	33.76
5,075.00	1.08	223.28	5,068.31	-166.33	-49.18	-165.44	0.59	0.32	27.16
5,100.00	1.12	222.65	5,093.31	-166.68	-49.51	-165.79	0.17	0.16	-2.52
5,125.00	1.07	220.19	5,118.30	-167.03	-49.82	-166.14	0.27	-0.20	-9.84
5,150.00	1.11	221.03	5,143.30	-167.40	-50.13	-166.50	0.17	0.16	3.36
5,175.00	1.15	226.70	5,168.29	-167.75	-50.47	-166.84	0.47	0.16	22.68
5,200.00	1.18	224.99	5,193.29	-168.10	-50.84	-167.19	0.18	0.12	-6.84
5,225.00	1.31	224.92	5,218.28	-168.49	-51.22	-167.57	0.52	0.52	-0.28
5,250.00	1.44	224.58	5,243.28	-168.92	-51.64	-167.99	0.52	0.52	-1.36
5,275.00	1.56	221.66	5,268.27	-169.39	-52.09	-168.46	0.57	0.48	-11.68
5,300.00	1.62	225.83	5,293.26	-169.89	-52.57	-168.95	0.52	0.24	16.68
5,325.00	1.60	222.49	5,318.25	-170.40	-53.06	-169.45	0.38	-0.08	-13.36
5,350.00	1.62	223.57	5,343.24	-170.91	-53.54	-169.95	0.15	0.08	4.32
5,375.00	1.60	224.07	5,368.23	-171.42	-54.02	-170.45	0.10	-0.08	2.00
5,400.00	1.62	224.69	5,393.22	-171.92	-54.52	-170.94	0.11	0.08	2.48
5,425.00	1.66	224.64	5,418.21	-172.43	-55.02	-171.44	0.16	0.16	-0.20
5,450.00	1.62	226.06	5,443.20	-172.93	-55.53	-171.94	0.23	-0.16	5.68
5,475.00	1.75	223.10	5,468.19	-173.46	-56.04	-172.45	0.63	0.52	-11.84
5,500.00	1.81	223.13	5,493.17	-174.02	-56.57	-173.01	0.24	0.24	0.12
5,525.00	1.81	226.42	5,518.16	-174.58	-57.13	-173.56	0.42	0.00	13.16
5,550.00	1.84	224.27	5,543.15	-175.14	-57.70	-174.11	0.30	0.12	-8.60
5,575.00	1.90	226.00	5,568.14	-175.72	-58.27	-174.67	0.33	0.24	6.92
5,600.00	1.91	226.22	5,593.12	-176.29	-58.87	-175.24	0.05	0.04	0.88
5,625.00	1.97	224.84	5,618.11	-176.89	-59.48	-175.82	0.30	0.24	-5.52
5,650.00	1.99	227.06	5,643.09	-177.49	-60.10	-176.41	0.32	0.08	8.88
5,675.00	1.98	225.52	5,668.08	-178.09	-60.72	-177.00	0.22	-0.04	-6.16
5,700.00	2.07	226.33	5,693.06	-178.70	-61.36	-177.60	0.38	0.36	3.24

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2939.00usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2939.00usft (Pioneer 84)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 66456	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,725.00	2.04	225.09	5,718.05	-179.33	-62.00	-178.22	0.21	-0.12	-4.96	
5,750.00	2.01	224.51	5,743.03	-179.95	-62.62	-178.83	0.15	-0.12	-2.32	
5,775.00	2.06	225.75	5,768.01	-180.58	-63.25	-179.45	0.27	0.20	4.96	
5,800.00	2.04	226.85	5,793.00	-181.20	-63.90	-180.05	0.18	-0.08	4.40	
5,825.00	2.04	224.22	5,817.98	-181.82	-64.53	-180.67	0.37	0.00	-10.52	
5,850.00	2.10	223.25	5,842.97	-182.47	-65.16	-181.31	0.28	0.24	-3.88	
5,875.00	2.10	225.72	5,867.95	-183.13	-65.80	-181.95	0.36	0.00	9.88	
5,900.00	2.07	224.14	5,892.93	-183.77	-66.44	-182.58	0.26	-0.12	-6.32	
5,925.00	2.01	223.34	5,917.92	-184.41	-67.06	-183.21	0.27	-0.24	-3.20	
5,950.00	1.95	222.09	5,942.90	-185.05	-67.64	-183.84	0.30	-0.24	-5.00	
5,975.00	1.95	221.32	5,967.89	-185.68	-68.21	-184.46	0.10	0.00	-3.08	
6,000.00	1.94	221.09	5,992.87	-186.32	-68.77	-185.09	0.05	-0.04	-0.92	
6,025.00	1.82	219.96	6,017.86	-186.94	-69.30	-185.71	0.50	-0.48	-4.52	
6,050.00	1.81	218.21	6,042.85	-187.56	-69.80	-186.31	0.23	-0.04	-7.00	
6,075.00	1.79	218.94	6,067.84	-188.17	-70.29	-186.92	0.12	-0.08	2.92	
6,100.00	1.75	219.10	6,092.82	-188.77	-70.78	-187.51	0.16	-0.16	0.64	
6,125.00	1.73	218.01	6,117.81	-189.37	-71.25	-188.09	0.15	-0.08	-4.36	
6,150.00	1.78	219.24	6,142.80	-189.96	-71.73	-188.68	0.25	0.20	4.92	
6,175.00	1.75	217.10	6,167.79	-190.57	-72.20	-189.28	0.29	-0.12	-8.56	
6,200.00	1.38	217.82	6,192.78	-191.11	-72.62	-189.81	1.48	-1.48	2.88	
6,225.00	0.10	28.09	6,217.78	-191.33	-72.79	-190.03	5.91	-5.12	681.08	
6,250.00	0.47	38.49	6,242.78	-191.23	-72.72	-189.93	1.49	1.48	41.60	
6,275.00	0.58	45.00	6,267.78	-191.06	-72.56	-189.76	0.50	0.44	26.04	
6,300.00	0.57	38.20	6,292.77	-190.87	-72.40	-189.58	0.28	-0.04	-27.20	
6,325.00	0.52	50.00	6,317.77	-190.70	-72.23	-189.41	0.49	-0.20	47.20	
6,350.00	0.53	66.50	6,342.77	-190.58	-72.04	-189.30	0.60	0.04	66.00	
6,375.00	0.43	75.21	6,367.77	-190.51	-71.85	-189.23	0.49	-0.40	34.84	
6,400.00	0.45	93.99	6,392.77	-190.50	-71.66	-189.22	0.58	0.08	75.12	
6,425.00	0.47	98.14	6,417.77	-190.52	-71.46	-189.24	0.16	0.08	16.60	
6,450.00	0.48	109.81	6,442.77	-190.57	-71.26	-189.29	0.39	0.04	46.68	
6,475.00	0.34	116.82	6,467.77	-190.64	-71.09	-189.37	0.59	-0.56	28.04	
6,500.00	0.39	109.35	6,492.77	-190.70	-70.95	-189.43	0.28	0.20	-29.88	
6,525.00	0.51	114.17	6,517.77	-190.77	-70.76	-189.51	0.50	0.48	19.28	
6,550.00	0.46	113.29	6,542.77	-190.86	-70.57	-189.60	0.20	-0.20	-3.52	
6,575.00	0.51	82.19	6,567.76	-190.88	-70.37	-189.62	1.06	0.20	-124.40	
6,600.00	0.58	39.19	6,592.76	-190.77	-70.18	-189.51	1.62	0.28	-172.00	
6,625.00	0.71	49.83	6,617.76	-190.57	-69.98	-189.32	0.70	0.52	42.56	
6,650.00	0.68	48.85	6,642.76	-190.37	-69.75	-189.13	0.13	-0.12	-3.92	
6,675.00	0.60	50.77	6,667.76	-190.19	-69.54	-188.95	0.33	-0.32	7.68	
6,700.00	0.49	43.34	6,692.76	-190.03	-69.36	-188.79	0.52	-0.44	-29.72	
6,725.00	0.20	18.31	6,717.76	-189.91	-69.27	-188.67	1.28	-1.16	-100.12	
6,750.00	0.10	260.35	6,742.76	-189.87	-69.28	-188.64	1.05	-0.40	-471.84	
6,775.00	0.33	264.70	6,767.76	-189.89	-69.38	-188.65	0.92	0.92	17.40	
6,800.00	0.47	257.97	6,792.76	-189.91	-69.55	-188.67	0.59	0.56	-26.92	

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2939.00usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2939.00usft (Pioneer 84)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 66456	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,825.00	0.49	240.89	6,817.76	-189.99	-69.74	-188.74	0.58	0.08	-68.32
6,850.00	0.68	228.43	6,842.75	-190.14	-69.95	-188.89	0.91	0.76	-49.84
6,875.00	0.77	220.23	6,867.75	-190.36	-70.16	-189.11	0.55	0.36	-32.80
6,900.00	0.98	205.02	6,892.75	-190.69	-70.36	-189.43	1.25	0.84	-60.84
6,925.00	1.09	206.20	6,917.75	-191.09	-70.56	-189.83	0.45	0.44	4.72
6,950.00	1.12	206.26	6,942.74	-191.53	-70.77	-190.26	0.12	0.12	0.24
6,975.00	1.19	203.22	6,967.74	-191.98	-70.98	-190.71	0.37	0.28	-12.16
7,000.00	1.23	201.66	6,992.73	-192.47	-71.18	-191.20	0.21	0.16	-6.24
7,025.00	1.43	194.44	7,017.72	-193.02	-71.36	-191.75	1.04	0.80	-28.88
7,050.00	1.63	188.65	7,042.71	-193.68	-71.49	-192.40	1.01	0.80	-23.16
7,075.00	1.71	186.10	7,067.70	-194.40	-71.59	-193.12	0.44	0.32	-10.20
7,100.00	1.94	181.05	7,092.69	-195.19	-71.63	-193.91	1.12	0.92	-20.20
7,125.00	1.94	176.65	7,117.68	-196.04	-71.62	-194.76	0.60	0.00	-17.60
7,150.00	1.79	160.43	7,142.66	-196.83	-71.46	-195.55	2.19	-0.60	-64.88
7,175.00	1.81	129.06	7,167.65	-197.44	-71.02	-196.18	3.89	0.08	-125.48
7,200.00	1.64	139.79	7,192.64	-197.97	-70.49	-196.71	1.46	-0.68	42.92
7,225.00	1.51	141.38	7,217.63	-198.50	-70.05	-197.24	0.55	-0.52	6.36
7,250.00	1.25	147.96	7,242.62	-198.99	-69.70	-197.74	1.22	-1.04	26.32
7,275.00	1.19	157.49	7,267.62	-199.46	-69.45	-198.21	0.85	-0.24	38.12
7,300.00	1.04	164.62	7,292.61	-199.92	-69.29	-198.68	0.82	-0.60	28.52
7,325.00	0.96	174.60	7,317.61	-200.34	-69.22	-199.10	0.77	-0.32	39.92
7,350.00	0.59	196.30	7,342.61	-200.67	-69.23	-199.44	1.86	-1.48	86.80
7,375.00	0.45	259.32	7,367.61	-200.82	-69.36	-199.58	2.23	-0.56	252.08
7,400.00	0.41	267.67	7,392.61	-200.84	-69.55	-199.59	0.30	-0.16	33.40
7,425.00	0.50	270.13	7,417.61	-200.84	-69.75	-199.59	0.37	0.36	9.84
7,450.00	0.59	229.93	7,442.60	-200.92	-69.96	-199.67	1.54	0.36	-160.80
7,475.00	0.65	216.57	7,467.60	-201.12	-70.14	-199.87	0.62	0.24	-53.44
7,500.00	0.61	216.79	7,492.60	-201.34	-70.30	-200.08	0.16	-0.16	0.88
7,525.00	0.23	299.70	7,517.60	-201.42	-70.43	-200.16	2.50	-1.52	331.64
7,550.00	1.54	4.02	7,542.60	-201.06	-70.45	-199.80	5.82	5.24	257.28
7,575.00	2.38	7.21	7,567.58	-200.21	-70.36	-198.95	3.39	3.36	12.76
7,600.00	2.60	7.29	7,592.56	-199.14	-70.22	-197.88	0.88	0.88	0.32
7,625.00	2.55	6.42	7,617.53	-198.02	-70.09	-196.77	0.25	-0.20	-3.48
7,650.00	2.57	8.31	7,642.51	-196.91	-69.94	-195.66	0.35	0.08	7.56
7,675.00	2.46	358.83	7,667.48	-195.82	-69.87	-194.57	1.72	-0.44	-37.92
7,700.00	2.43	359.41	7,692.46	-194.76	-69.89	-193.51	0.16	-0.12	2.32
7,725.00	2.43	355.25	7,717.44	-193.70	-69.94	-192.45	0.71	0.00	-16.64
7,750.00	2.38	353.14	7,742.42	-192.65	-70.04	-191.40	0.41	-0.20	-8.44
7,775.00	2.30	350.87	7,767.40	-191.64	-70.19	-190.39	0.49	-0.32	-9.08
7,800.00	2.33	347.68	7,792.38	-190.65	-70.37	-189.39	0.53	0.12	-12.76
7,825.00	2.34	347.04	7,817.36	-189.66	-70.60	-188.40	0.11	0.04	-2.56
7,850.00	2.29	346.28	7,842.34	-188.68	-70.83	-187.41	0.23	-0.20	-3.04
7,875.00	2.23	345.42	7,867.32	-187.72	-71.07	-186.45	0.28	-0.24	-3.44

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2939.00usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2939.00usft (Pioneer 84)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 66456	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,900.00	2.27	339.65	7,892.30	-186.78	-71.37	-185.51	0.92	0.16	-23.08
7,925.00	2.08	336.95	7,917.28	-185.90	-71.72	-184.62	0.86	-0.76	-10.80
7,950.00	1.98	332.12	7,942.26	-185.10	-72.10	-183.82	0.79	-0.40	-19.32
7,975.00	1.79	324.00	7,967.25	-184.41	-72.53	-183.11	1.31	-0.76	-32.48
8,000.00	1.60	312.26	7,992.24	-183.86	-73.01	-182.55	1.58	-0.76	-46.96
8,025.00	1.51	307.70	8,017.23	-183.42	-73.53	-182.11	0.61	-0.36	-18.24
8,050.00	1.43	301.54	8,042.22	-183.05	-74.06	-181.73	0.71	-0.32	-24.64
8,075.00	1.49	293.15	8,067.21	-182.76	-74.62	-181.43	0.89	0.24	-33.56
8,100.00	1.56	290.26	8,092.20	-182.52	-75.24	-181.18	0.42	0.28	-11.56
8,125.00	1.57	294.58	8,117.19	-182.26	-75.87	-180.91	0.47	0.04	17.28
8,150.00	1.56	290.65	8,142.19	-182.00	-76.50	-180.63	0.43	-0.04	-15.72
8,175.00	1.62	291.58	8,167.18	-181.75	-77.15	-180.37	0.26	0.24	3.72
8,200.00	1.69	295.80	8,192.17	-181.45	-77.81	-180.07	0.56	0.28	16.88
8,225.00	1.69	297.14	8,217.15	-181.13	-78.47	-179.73	0.16	0.00	5.36
8,250.00	1.74	299.29	8,242.14	-180.77	-79.13	-179.36	0.33	0.20	8.60
8,275.00	1.84	297.83	8,267.13	-180.40	-79.82	-178.98	0.44	0.40	-5.84
8,300.00	1.83	297.30	8,292.12	-180.03	-80.53	-178.60	0.08	-0.04	-2.12
8,325.00	1.72	297.67	8,317.11	-179.67	-81.21	-178.23	0.44	-0.44	1.48
8,350.00	1.68	299.50	8,342.10	-179.32	-81.86	-177.86	0.27	-0.16	7.32
8,375.00	1.66	298.54	8,367.08	-178.96	-82.50	-177.50	0.14	-0.08	-3.84
8,400.00	1.52	308.22	8,392.07	-178.59	-83.08	-177.11	1.21	-0.56	38.72
8,425.00	1.60	335.80	8,417.07	-178.06	-83.48	-176.58	2.99	0.32	110.32
8,450.00	1.81	341.44	8,442.05	-177.37	-83.75	-175.88	1.07	0.84	22.56
8,475.00	1.75	342.55	8,467.04	-176.63	-83.99	-175.14	0.28	-0.24	4.44
8,500.00	1.68	338.02	8,492.03	-175.93	-84.24	-174.43	0.61	-0.28	-18.12
8,525.00	1.72	338.60	8,517.02	-175.24	-84.52	-173.74	0.17	0.16	2.32
8,550.00	1.73	337.27	8,542.01	-174.54	-84.80	-173.03	0.17	0.04	-5.32
8,575.00	1.76	337.11	8,567.00	-173.84	-85.10	-172.33	0.12	0.12	-0.64
8,600.00	1.79	350.26	8,591.99	-173.10	-85.31	-171.58	1.63	0.12	52.60
8,625.00	1.84	358.03	8,616.97	-172.31	-85.39	-170.80	1.00	0.20	31.08
8,650.00	2.00	0.37	8,641.96	-171.48	-85.40	-169.96	0.71	0.64	9.36
8,675.00	1.88	3.51	8,666.95	-170.63	-85.37	-169.12	0.64	-0.48	12.56
8,700.00	1.94	2.25	8,691.93	-169.80	-85.33	-168.28	0.29	0.24	-5.04
8,725.00	1.90	10.86	8,716.92	-168.97	-85.24	-167.46	1.16	-0.16	34.44
8,750.00	1.74	17.48	8,741.90	-168.20	-85.05	-166.69	1.06	-0.64	26.48
8,775.00	1.83	22.10	8,766.89	-167.47	-84.78	-165.96	0.68	0.36	18.48
8,800.00	1.74	29.42	8,791.88	-166.77	-84.44	-165.27	0.98	-0.36	29.28
8,825.00	1.75	25.56	8,816.87	-166.09	-84.09	-164.60	0.47	0.04	-15.44
8,850.00	2.05	28.86	8,841.85	-165.36	-83.71	-163.87	1.28	1.20	13.20
8,875.00	2.14	24.16	8,866.84	-164.54	-83.31	-163.06	0.78	0.36	-18.80
8,900.00	2.18	27.18	8,891.82	-163.69	-82.90	-162.22	0.48	0.16	12.08
8,925.00	2.21	20.38	8,916.80	-162.82	-82.51	-161.35	1.05	0.12	-27.20
8,950.00	2.32	24.82	8,941.78	-161.90	-82.13	-160.45	0.83	0.44	17.76

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2939.00usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2939.00usft (Pioneer 84)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 66456	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,975.00	2.12	22.82	8,966.76	-161.02	-81.74	-159.57	0.86	-0.80	-8.00
9,000.00	1.96	28.01	8,991.75	-160.22	-81.36	-158.77	0.98	-0.64	20.76
9,025.00	1.91	22.52	9,016.73	-159.45	-81.00	-158.02	0.77	-0.20	-21.96
9,041.30	1.80	23.50	9,033.03	-158.97	-80.79	-157.53	0.70	-0.67	6.01
Tie In									
9,110.00	1.25	23.27	9,101.70	-157.29	-80.07	-155.87	0.80	-0.80	-0.33
First Phoenix MWD Survey - OH									
9,210.00	0.91	25.19	9,201.68	-155.57	-79.30	-154.16	0.34	-0.34	1.92
9,242.00	0.82	18.28	9,233.68	-155.12	-79.12	-153.72	0.43	-0.28	-21.59
9,289.00	4.55	358.11	9,280.62	-152.94	-79.07	-151.53	8.07	7.94	-42.91
9,337.00	11.38	356.60	9,328.13	-146.30	-79.42	-144.89	14.23	14.23	-3.15
9,384.00	18.19	355.80	9,373.55	-134.34	-80.23	-132.92	14.50	14.49	-1.70
9,432.00	24.06	354.08	9,418.30	-117.12	-81.79	-115.68	12.30	12.23	-3.58
9,479.00	26.49	354.21	9,460.80	-97.16	-83.84	-95.68	5.17	5.17	0.28
9,527.00	28.64	354.58	9,503.35	-75.06	-86.00	-73.54	4.49	4.48	0.77
9,574.00	32.40	355.72	9,543.83	-51.28	-88.01	-49.73	8.09	8.00	2.43
9,622.00	36.56	357.50	9,583.39	-24.16	-89.59	-22.59	8.92	8.67	3.71
9,669.00	40.24	358.10	9,620.22	5.01	-90.71	6.59	7.87	7.83	1.28
9,716.00	44.08	358.01	9,655.05	36.53	-91.78	38.13	8.17	8.17	-0.19
9,763.00	46.46	358.21	9,688.12	69.90	-92.88	71.51	5.07	5.06	0.43
9,811.00	48.25	0.35	9,720.64	105.20	-93.31	106.81	4.97	3.73	4.46
9,858.00	50.39	1.40	9,751.28	140.84	-92.76	142.43	4.86	4.55	2.23
9,906.00	54.01	2.41	9,780.69	178.74	-91.49	180.31	7.72	7.54	2.10
9,953.00	59.79	2.35	9,806.35	218.06	-89.86	219.59	12.30	12.30	-0.13
10,001.00	64.60	2.10	9,828.73	260.47	-88.21	261.97	10.03	10.02	-0.52
10,048.00	67.18	2.16	9,847.93	303.34	-86.62	304.80	5.49	5.49	0.13
10,096.00	68.30	2.39	9,866.11	347.72	-84.86	349.15	2.38	2.33	0.48
10,143.00	69.09	2.78	9,883.19	391.47	-82.88	392.85	1.85	1.68	0.83
10,191.00	76.72	3.30	9,897.29	437.25	-80.45	438.59	15.93	15.90	1.08
10,286.00	88.39	4.17	9,909.58	531.08	-74.31	532.30	12.32	12.28	0.92
10,381.00	89.13	2.67	9,911.63	625.89	-68.64	626.99	1.76	0.78	-1.58
10,476.00	88.60	1.10	9,913.51	720.82	-65.52	721.85	1.74	-0.56	-1.65
10,571.00	86.80	359.74	9,917.33	815.73	-64.82	816.74	2.37	-1.89	-1.43
10,666.00	91.12	0.58	9,919.05	910.69	-64.56	911.68	4.63	4.55	0.88
10,761.00	90.09	3.54	9,918.05	1,005.61	-61.14	1,006.53	3.30	-1.08	3.12
10,855.00	95.56	3.29	9,913.42	1,099.30	-55.55	1,100.10	5.83	5.82	-0.27
10,950.00	93.35	1.64	9,906.04	1,193.91	-51.48	1,194.63	2.90	-2.33	-1.74
11,079.00	90.15	359.93	9,902.10	1,322.82	-49.72	1,323.48	2.81	-2.48	-1.33
11,173.00	89.91	0.39	9,902.05	1,416.82	-49.45	1,417.46	0.55	-0.26	0.49
11,268.00	90.56	1.02	9,901.66	1,511.81	-48.29	1,512.42	0.95	0.68	0.66
11,363.00	90.90	358.49	9,900.45	1,606.79	-48.69	1,607.40	2.69	0.36	-2.66
11,458.00	91.13	358.46	9,898.77	1,701.74	-51.22	1,702.38	0.24	0.24	-0.03
11,552.00	87.56	358.36	9,899.84	1,795.69	-53.83	1,796.35	3.80	-3.80	-0.11
11,647.00	87.91	357.88	9,903.59	1,890.56	-56.94	1,891.27	0.63	0.37	-0.51

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2939.00usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2939.00usft (Pioneer 84)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 66456	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,742.00	87.54	357.37	9,907.37	1,985.40	-60.88	1,986.16	0.66	-0.39	-0.54
11,837.00	86.43	356.69	9,912.36	2,080.14	-65.79	2,080.97	1.37	-1.17	-0.72
11,931.00	87.62	355.78	9,917.24	2,173.81	-71.95	2,174.73	1.59	1.27	-0.97
12,026.00	91.68	357.17	9,917.82	2,268.61	-77.79	2,269.62	4.52	4.27	1.46
12,121.00	93.09	358.35	9,913.87	2,363.45	-81.50	2,364.51	1.93	1.48	1.24
12,216.00	93.30	359.26	9,908.57	2,458.28	-83.48	2,459.36	0.98	0.22	0.96
12,311.00	94.64	1.25	9,902.00	2,553.04	-83.06	2,554.10	2.52	1.41	2.09
12,405.00	92.75	2.62	9,895.94	2,646.79	-79.89	2,647.78	2.48	-2.01	1.46
12,499.00	91.87	4.03	9,892.15	2,740.55	-74.45	2,741.43	1.77	-0.94	1.50
12,595.00	88.69	1.81	9,891.68	2,836.41	-69.56	2,837.19	4.04	-3.31	-2.31
12,690.00	87.06	0.20	9,895.20	2,931.32	-67.89	2,932.06	2.41	-1.72	-1.69
12,785.00	88.86	359.54	9,898.58	3,026.25	-68.11	3,026.98	2.02	1.89	-0.69
12,879.00	88.60	358.40	9,900.67	3,120.21	-69.80	3,120.96	1.24	-0.28	-1.21
12,974.00	88.15	358.09	9,903.36	3,215.13	-72.70	3,215.91	0.58	-0.47	-0.33
13,069.00	90.56	356.56	9,904.43	3,310.01	-77.14	3,310.85	3.00	2.54	-1.61
13,164.00	91.68	356.36	9,902.57	3,404.81	-83.00	3,405.74	1.20	1.18	-0.21
13,259.00	91.93	356.77	9,899.58	3,499.59	-88.69	3,500.61	0.51	0.26	0.43
13,354.00	92.61	357.65	9,895.82	3,594.40	-93.31	3,595.49	1.17	0.72	0.93
13,450.00	92.56	358.51	9,891.49	3,690.25	-96.52	3,691.37	0.90	-0.05	0.90
13,545.00	92.44	358.01	9,887.34	3,785.12	-99.41	3,786.28	0.54	-0.13	-0.53
13,640.00	92.86	358.57	9,882.95	3,879.97	-102.24	3,881.17	0.74	0.44	0.59
13,735.00	93.25	358.81	9,877.89	3,974.81	-104.41	3,976.03	0.48	0.41	0.25
13,829.00	93.34	359.23	9,872.49	4,068.64	-106.01	4,069.87	0.46	0.10	0.45
13,924.00	91.46	356.33	9,868.51	4,163.47	-109.69	4,164.75	3.64	-1.98	-3.05
14,019.00	91.48	356.42	9,866.07	4,258.25	-115.69	4,259.62	0.10	0.02	0.09
14,114.00	91.51	356.38	9,863.59	4,353.03	-121.66	4,354.49	0.05	0.03	-0.04
14,209.00	91.49	356.40	9,861.11	4,447.81	-127.64	4,449.36	0.03	-0.02	0.02
14,304.00	91.24	356.59	9,858.84	4,542.61	-133.44	4,544.24	0.33	-0.26	0.20
14,399.00	91.20	356.57	9,856.82	4,637.42	-139.11	4,639.14	0.05	-0.04	-0.02
14,494.00	93.01	359.30	9,853.33	4,732.28	-142.53	4,734.04	3.45	1.91	2.87
14,589.00	92.80	359.51	9,848.52	4,827.15	-143.52	4,828.92	0.31	-0.22	0.22
14,684.00	90.38	1.44	9,845.88	4,922.10	-142.73	4,923.84	3.26	-2.55	2.03
14,779.00	91.53	2.11	9,844.30	5,017.04	-139.79	5,018.71	1.40	1.21	0.71
14,874.00	88.33	2.67	9,844.41	5,111.94	-135.83	5,113.54	3.42	-3.37	0.59
14,970.00	87.06	3.24	9,848.27	5,207.74	-130.88	5,209.23	1.45	-1.32	0.59
15,065.00	86.42	3.93	9,853.68	5,302.40	-124.95	5,303.77	0.99	-0.67	0.73
15,160.00	86.06	4.49	9,859.91	5,396.93	-117.99	5,398.17	0.70	-0.38	0.59
15,255.00	86.02	4.35	9,866.47	5,491.43	-110.69	5,492.52	0.15	-0.04	-0.15
15,350.00	85.47	4.25	9,873.51	5,585.90	-103.58	5,586.85	0.59	-0.58	-0.11
15,445.00	84.64	0.28	9,881.71	5,680.45	-99.84	5,681.33	4.25	-0.87	-4.18
15,540.00	88.53	357.31	9,887.37	5,775.23	-101.84	5,776.13	5.15	4.09	-3.13
15,635.00	88.38	356.40	9,889.93	5,870.05	-107.05	5,871.03	0.97	-0.16	-0.96
15,730.00	88.21	356.37	9,892.75	5,964.82	-113.04	5,965.89	0.18	-0.18	-0.03

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2939.00usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2939.00usft (Pioneer 84)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 66456	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,825.00	88.22	355.63	9,895.71	6,059.54	-119.66	6,060.71	0.78	0.01	-0.78
15,920.00	88.10	355.75	9,898.76	6,154.23	-126.80	6,155.50	0.18	-0.13	0.13
16,015.00	87.89	355.69	9,902.09	6,248.90	-133.88	6,250.29	0.23	-0.22	-0.06
16,110.00	86.91	356.01	9,906.40	6,343.55	-140.75	6,345.04	1.09	-1.03	0.34
16,201.00	86.47	356.73	9,911.65	6,434.22	-146.50	6,435.80	0.93	-0.48	0.79
16,297.00	89.89	358.56	9,914.70	6,530.07	-150.44	6,531.70	4.04	3.56	1.91
16,393.00	88.57	356.45	9,915.99	6,625.96	-154.62	6,627.65	2.59	-1.38	-2.20
16,488.00	89.41	356.47	9,917.66	6,720.77	-160.49	6,722.54	0.88	0.88	0.02
16,583.00	88.62	356.33	9,919.30	6,815.57	-166.45	6,817.43	0.84	-0.83	-0.15
16,679.00	88.68	358.70	9,921.56	6,911.44	-170.61	6,913.37	2.47	0.06	2.47
16,774.00	86.84	358.13	9,925.27	7,006.33	-173.24	7,008.28	2.03	-1.94	-0.60
16,869.00	88.15	0.06	9,929.42	7,101.22	-174.74	7,103.19	2.45	1.38	2.03
16,964.00	89.09	0.56	9,931.71	7,196.19	-174.22	7,198.13	1.12	0.99	0.53
17,059.00	90.51	359.54	9,932.04	7,291.18	-174.14	7,293.11	1.84	1.49	-1.07
17,153.00	91.19	359.46	9,930.65	7,385.17	-174.96	7,387.10	0.73	0.72	-0.09
17,247.00	92.22	359.68	9,927.85	7,479.12	-175.66	7,481.05	1.12	1.10	0.23
17,342.00	92.19	358.93	9,924.20	7,574.05	-176.82	7,575.98	0.79	-0.03	-0.79
17,437.00	92.13	359.34	9,920.62	7,668.97	-178.25	7,670.91	0.44	-0.06	0.43
17,532.00	91.74	359.12	9,917.41	7,763.90	-179.52	7,765.86	0.47	-0.41	-0.23
17,627.00	92.05	359.28	9,914.27	7,858.84	-180.85	7,860.80	0.37	0.33	0.17
17,722.00	88.56	0.46	9,913.76	7,953.83	-181.07	7,955.77	3.88	-3.67	1.24
17,817.00	87.13	0.13	9,917.33	8,048.75	-180.58	8,050.68	1.54	-1.51	-0.35
17,911.00	87.52	0.55	9,921.72	8,142.65	-180.02	8,144.55	0.61	0.41	0.45
18,007.00	87.37	0.13	9,926.00	8,238.55	-179.45	8,240.43	0.46	-0.16	-0.44
18,102.00	88.45	0.58	9,929.47	8,333.49	-178.86	8,335.34	1.23	1.14	0.47
18,197.00	88.37	1.15	9,932.10	8,428.44	-177.43	8,430.25	0.61	-0.08	0.60
18,291.00	89.11	1.23	9,934.17	8,522.39	-175.48	8,524.16	0.79	0.79	0.09
18,386.00	89.77	0.77	9,935.10	8,617.37	-173.82	8,619.10	0.85	0.69	-0.48
18,480.00	89.53	1.17	9,935.67	8,711.36	-172.23	8,713.04	0.50	-0.26	0.43
18,575.00	89.43	0.90	9,936.53	8,806.34	-170.51	8,807.97	0.30	-0.11	-0.28
18,668.00	89.12	0.42	9,937.71	8,899.33	-169.44	8,900.93	0.61	-0.33	-0.52
18,762.00	90.73	1.09	9,937.83	8,993.31	-168.20	8,994.88	1.86	1.71	0.71
18,857.00	84.28	358.80	9,941.97	9,088.17	-168.29	9,089.72	7.20	-6.79	-2.41
18,952.00	87.81	356.42	9,948.52	9,182.84	-172.24	9,184.44	4.48	3.72	-2.51
19,047.00	89.97	358.26	9,950.36	9,277.71	-176.65	9,279.38	2.99	2.27	1.94
19,142.00	93.49	0.57	9,947.49	9,372.64	-177.62	9,374.31	4.43	3.71	2.43
19,236.00	94.07	1.16	9,941.30	9,466.42	-176.21	9,468.05	0.88	0.62	0.63
19,331.00	92.09	1.35	9,936.19	9,561.26	-174.13	9,562.84	2.09	-2.08	0.20
19,426.00	90.08	1.01	9,934.39	9,656.21	-172.17	9,657.75	2.15	-2.12	-0.36
19,521.00	89.16	0.79	9,935.02	9,751.20	-170.68	9,752.69	1.00	-0.97	-0.23
19,616.00	90.51	0.59	9,935.30	9,846.19	-169.54	9,847.65	1.44	1.42	-0.21
19,711.00	89.70	0.82	9,935.12	9,941.18	-168.37	9,942.61	0.89	-0.85	0.24
19,806.00	89.02	0.94	9,936.18	10,036.16	-166.91	10,037.55	0.73	-0.72	0.13
19,900.00	87.86	0.67	9,938.74	10,130.12	-165.59	10,131.47	1.27	-1.23	-0.29

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2939.00usft (Pioneer 84)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2939.00usft (Pioneer 84)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 66456	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 84)	Database:	USA Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
19,931.00	87.98	0.86	9,939.87	10,161.10	-165.17	10,162.43	0.72	0.39	0.61
Final Phoenix MWD Survey - OH									
19,989.00	87.98	0.86	9,941.91	10,219.05	-164.30	10,220.36	0.00	0.00	0.00
Projection @ TD - OH									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,041.30	9,033.03	-158.97	-80.79	Tie In
9,110.00	9,101.70	-157.29	-80.07	First Phoenix MWD Survey - OH
19,931.00	9,939.87	10,161.10	-165.17	Final Phoenix MWD Survey - OH
19,989.00	9,941.91	10,219.05	-164.30	Projection @ TD - OH

Checked By: _____	Approved By: _____	Date: _____
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