



COG Operating LLC

Eddy County, NM (NAD27 NME)

Hambone Federal Com

706H

OH / 66292

Design: Surveys (Ensign 155)

Standard Survey Report

17 March, 2020



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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	706H		
Well Position	+N/-S	0.00 usft	Northing: 383,274.00 usft
	+E/-W	0.00 usft	Easting: 600,470.50 usft
Position Uncertainty	1.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 3' 11.953638 N
		Longitude:	104° 0' 32.552436 W
		Ground Level:	2,895.60 usft

Wellbore	OH / 66292		
Magnetics	Model Name	Sample Date	Declination (°)
	User Defined	2/28/2020	6.75
			Dip Angle (°) 59.64
			Field Strength (nT) 47,750.90000000

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)
	0.00	0.00	0.00
			Direction (°) 351.20

Survey Program	Date	3/17/2020			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	9,198.00	Scientific Keeper Gyro Surveys (OH / 6629	Scientific Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
9,298.00	18,882.00	Phoenix MWD Surveys (OH / 66292)	MWD+HRGM	OWSG MWD + HRGM	

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	0.65	347.26	100.00	0.55	-0.13	0.57	0.65	0.65	0.00	
125.00	0.52	331.83	125.00	0.79	-0.21	0.81	0.81	-0.52	-61.72	
150.00	0.42	339.60	150.00	0.98	-0.30	1.01	0.47	-0.40	31.08	
175.00	0.53	358.39	174.99	1.18	-0.33	1.22	0.76	0.44	75.16	
200.00	0.53	353.25	199.99	1.41	-0.35	1.45	0.19	0.00	-20.56	
225.00	0.53	0.72	224.99	1.64	-0.36	1.68	0.28	0.00	29.88	
250.00	0.38	8.44	249.99	1.84	-0.35	1.87	0.65	-0.60	30.88	
275.00	0.46	7.69	274.99	2.02	-0.32	2.04	0.32	0.32	-3.00	
300.00	0.50	0.78	299.99	2.23	-0.31	2.25	0.28	0.16	-27.64	

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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	0.42	11.97	324.99	2.43	-0.28	2.44	0.48	-0.32	44.76
350.00	0.36	8.62	349.99	2.59	-0.25	2.60	0.26	-0.24	-13.40
375.00	0.35	359.97	374.99	2.75	-0.24	2.75	0.22	-0.04	-34.60
400.00	0.35	337.74	399.99	2.89	-0.27	2.90	0.54	0.00	-88.92
425.00	0.37	323.32	424.99	3.03	-0.35	3.05	0.37	0.08	-57.68
450.00	0.38	312.12	449.99	3.15	-0.46	3.18	0.30	0.04	-44.80
475.00	0.44	323.51	474.99	3.28	-0.58	3.33	0.40	0.24	45.56
500.00	0.42	310.87	499.99	3.42	-0.70	3.49	0.39	-0.08	-50.56
525.00	0.61	300.02	524.98	3.55	-0.89	3.64	0.85	0.76	-43.40
550.00	0.64	302.03	549.98	3.69	-1.12	3.82	0.15	0.12	8.04
575.00	0.59	304.96	574.98	3.84	-1.35	4.00	0.24	-0.20	11.72
600.00	0.58	303.10	599.98	3.98	-1.56	4.17	0.09	-0.04	-7.44
625.00	0.66	303.70	624.98	4.13	-1.78	4.35	0.32	0.32	2.40
650.00	0.64	291.85	649.98	4.26	-2.03	4.52	0.54	-0.08	-47.40
675.00	0.44	234.20	674.98	4.25	-2.24	4.55	2.20	-0.80	-230.60
700.00	0.55	206.49	699.98	4.09	-2.37	4.41	1.04	0.44	-110.84
725.00	0.63	178.24	724.97	3.85	-2.42	4.17	1.19	0.32	-113.00
750.00	0.59	176.81	749.97	3.58	-2.41	3.91	0.17	-0.16	-5.72
775.00	0.64	195.82	774.97	3.32	-2.44	3.65	0.84	0.20	76.04
800.00	0.62	194.52	799.97	3.05	-2.51	3.40	0.10	-0.08	-5.20
825.00	0.38	185.66	824.97	2.84	-2.55	3.20	1.01	-0.96	-35.44
850.00	0.32	58.25	849.97	2.79	-2.50	3.14	2.51	-0.24	-509.64
875.00	0.84	41.51	874.97	2.97	-2.32	3.29	2.17	2.08	-66.96
900.00	0.79	33.08	899.96	3.25	-2.11	3.53	0.52	-0.20	-33.72
925.00	0.75	34.06	924.96	3.53	-1.92	3.78	0.17	-0.16	3.92
950.00	0.81	36.21	949.96	3.81	-1.72	4.03	0.27	0.24	8.60
975.00	0.75	41.20	974.96	4.07	-1.51	4.26	0.36	-0.24	19.96
1,000.00	0.65	339.39	999.96	4.33	-1.45	4.50	2.90	-0.40	-247.24
1,025.00	0.61	316.67	1,024.95	4.56	-1.60	4.75	1.01	-0.16	-90.88
1,050.00	0.68	315.34	1,049.95	4.76	-1.79	4.98	0.29	0.28	-5.32
1,075.00	0.65	318.14	1,074.95	4.97	-1.99	5.22	0.18	-0.12	11.20
1,100.00	0.73	312.23	1,099.95	5.18	-2.20	5.46	0.43	0.32	-23.64
1,125.00	0.64	316.16	1,124.95	5.39	-2.42	5.70	0.41	-0.36	15.72
1,150.00	0.42	289.78	1,149.95	5.52	-2.60	5.86	1.29	-0.88	-105.52
1,175.00	0.30	224.89	1,174.95	5.51	-2.73	5.86	1.60	-0.48	-259.56
1,200.00	0.54	184.06	1,199.95	5.34	-2.79	5.71	1.48	0.96	-163.32
1,225.00	0.68	188.90	1,224.94	5.08	-2.82	5.45	0.60	0.56	19.36
1,250.00	0.38	175.06	1,249.94	4.85	-2.83	5.23	1.30	-1.20	-55.36
1,275.00	0.17	99.36	1,274.94	4.76	-2.79	5.13	1.50	-0.84	-302.80
1,300.00	0.05	58.09	1,299.94	4.76	-2.74	5.13	0.55	-0.48	-165.08
1,325.00	0.24	37.28	1,324.94	4.81	-2.70	5.17	0.78	0.76	-83.24
1,350.00	0.28	359.20	1,349.94	4.91	-2.67	5.26	0.70	0.16	-152.32
1,375.00	0.31	21.93	1,374.94	5.04	-2.65	5.38	0.48	0.12	90.92

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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)	
1,400.00	0.29	10.10	1,399.94	5.16	-2.61	5.50	0.26	-0.08	-47.32	
1,425.00	0.24	357.67	1,424.94	5.28	-2.60	5.61	0.30	-0.20	-49.72	
1,450.00	0.26	346.91	1,449.94	5.38	-2.62	5.72	0.20	0.08	-43.04	
1,475.00	0.32	350.75	1,474.94	5.51	-2.64	5.85	0.25	0.24	15.36	
1,500.00	0.30	321.89	1,499.94	5.63	-2.69	5.97	0.62	-0.08	-115.44	
1,525.00	0.47	318.70	1,524.94	5.76	-2.80	6.12	0.69	0.68	-12.76	
1,550.00	0.54	320.46	1,549.94	5.92	-2.94	6.30	0.29	0.28	7.04	
1,575.00	0.62	312.99	1,574.94	6.11	-3.12	6.51	0.44	0.32	-29.88	
1,600.00	0.68	318.92	1,599.94	6.31	-3.31	6.74	0.36	0.24	23.72	
1,625.00	0.63	325.73	1,624.94	6.54	-3.49	6.99	0.37	-0.20	27.24	
1,650.00	0.77	322.74	1,649.93	6.78	-3.67	7.27	0.58	0.56	-11.96	
1,675.00	0.82	315.21	1,674.93	7.04	-3.90	7.56	0.46	0.20	-30.12	
1,700.00	0.78	303.96	1,699.93	7.27	-4.16	7.82	0.65	-0.16	-45.00	
1,725.00	0.70	289.27	1,724.93	7.41	-4.45	8.01	0.82	-0.32	-58.76	
1,750.00	0.76	268.84	1,749.92	7.46	-4.76	8.10	1.06	0.24	-81.72	
1,775.00	0.60	267.48	1,774.92	7.45	-5.06	8.14	0.64	-0.64	-5.44	
1,800.00	0.77	243.22	1,799.92	7.37	-5.34	8.10	1.33	0.68	-97.04	
1,825.00	0.72	245.05	1,824.92	7.23	-5.63	8.00	0.22	-0.20	7.32	
1,850.00	0.75	239.92	1,849.92	7.08	-5.91	7.90	0.29	0.12	-20.52	
1,875.00	0.76	243.27	1,874.91	6.92	-6.20	7.79	0.18	0.04	13.40	
1,900.00	0.75	256.84	1,899.91	6.81	-6.51	7.73	0.71	-0.04	54.28	
1,925.00	0.69	239.82	1,924.91	6.70	-6.80	7.66	0.88	-0.24	-68.08	
1,950.00	0.74	245.38	1,949.91	6.55	-7.08	7.56	0.34	0.20	22.24	
1,975.00	0.73	244.49	1,974.91	6.42	-7.37	7.47	0.06	-0.04	-3.56	
2,000.00	0.58	248.53	1,999.90	6.30	-7.63	7.40	0.63	-0.60	16.16	
2,025.00	0.41	247.93	2,024.90	6.22	-7.83	7.35	0.68	-0.68	-2.40	
2,050.00	0.30	207.82	2,049.90	6.13	-7.94	7.27	1.06	-0.44	-160.44	
2,075.00	0.34	160.52	2,074.90	6.00	-7.95	7.15	1.04	0.16	-189.20	
2,100.00	0.42	132.20	2,099.90	5.87	-7.86	7.01	0.81	0.32	-113.28	
2,125.00	0.74	112.99	2,124.90	5.75	-7.64	6.85	1.48	1.28	-76.84	
2,150.00	0.93	116.64	2,149.90	5.59	-7.31	6.65	0.79	0.76	14.60	
2,175.00	0.90	115.52	2,174.90	5.42	-6.95	6.42	0.14	-0.12	-4.48	
2,200.00	0.84	119.20	2,199.89	5.24	-6.61	6.19	0.33	-0.24	14.72	
2,225.00	0.80	122.17	2,224.89	5.06	-6.31	5.97	0.23	-0.16	11.88	
2,250.00	0.90	124.88	2,249.89	4.86	-6.00	5.72	0.43	0.40	10.84	
2,275.00	0.91	122.37	2,274.88	4.64	-5.67	5.45	0.16	0.04	-10.04	
2,300.00	1.03	121.95	2,299.88	4.41	-5.31	5.17	0.48	0.48	-1.68	
2,325.00	1.21	120.26	2,324.88	4.16	-4.89	4.86	0.73	0.72	-6.76	
2,350.00	1.27	119.15	2,349.87	3.89	-4.42	4.52	0.26	0.24	-4.44	
2,375.00	1.41	114.95	2,374.86	3.63	-3.90	4.18	0.68	0.56	-16.80	
2,400.00	1.73	113.88	2,399.85	3.35	-3.28	3.81	1.29	1.28	-4.28	
2,425.00	1.91	113.45	2,424.84	3.03	-2.55	3.38	0.72	0.72	-1.72	
2,450.00	2.16	115.86	2,449.83	2.66	-1.74	2.89	1.06	1.00	9.64	

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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)	
2,475.00	2.51	115.02	2,474.80	2.22	-0.82	2.32	1.41	1.40	-3.36	
2,500.00	2.62	113.53	2,499.78	1.76	0.20	1.71	0.51	0.44	-5.96	
2,525.00	2.61	111.46	2,524.75	1.32	1.25	1.12	0.38	-0.04	-8.28	
2,550.00	2.59	111.25	2,549.73	0.91	2.31	0.55	0.09	-0.08	-0.84	
2,575.00	2.50	109.91	2,574.70	0.52	3.35	0.00	0.43	-0.36	-5.36	
2,600.00	1.92	108.77	2,599.68	0.20	4.26	-0.45	2.33	-2.32	-4.56	
2,625.00	1.35	102.90	2,624.67	0.00	4.94	-0.76	2.37	-2.28	-23.48	
2,650.00	1.02	96.60	2,649.67	-0.09	5.45	-0.92	1.42	-1.32	-25.20	
2,675.00	0.79	72.46	2,674.67	-0.07	5.83	-0.96	1.76	-0.92	-96.56	
2,700.00	0.69	81.18	2,699.66	0.01	6.15	-0.93	0.60	-0.40	34.88	
2,725.00	0.52	64.23	2,724.66	0.08	6.40	-0.90	0.98	-0.68	-67.80	
2,750.00	0.39	35.55	2,749.66	0.20	6.55	-0.80	1.03	-0.52	-114.72	
2,775.00	0.70	26.63	2,774.66	0.41	6.67	-0.62	1.28	1.24	-35.68	
2,800.00	0.32	18.72	2,799.66	0.61	6.76	-0.43	1.54	-1.52	-31.64	
2,825.00	0.37	23.92	2,824.66	0.75	6.81	-0.30	0.24	0.20	20.80	
2,850.00	0.60	310.68	2,849.66	0.91	6.75	-0.14	2.43	0.92	-292.96	
2,875.00	1.45	290.90	2,874.65	1.11	6.35	0.12	3.63	3.40	-79.12	
2,900.00	2.25	282.78	2,899.64	1.33	5.58	0.46	3.36	3.20	-32.48	
2,925.00	2.76	280.48	2,924.62	1.54	4.51	0.84	2.08	2.04	-9.20	
2,950.00	3.20	279.29	2,949.58	1.77	3.23	1.25	1.78	1.76	-4.76	
2,975.00	4.46	278.36	2,974.53	2.02	1.58	1.76	5.05	5.04	-3.72	
3,000.00	5.32	277.85	2,999.44	2.32	-0.53	2.38	3.44	3.44	-2.04	
3,025.00	5.51	277.61	3,024.32	2.64	-2.87	3.05	0.77	0.76	-0.96	
3,050.00	6.53	276.25	3,049.19	2.95	-5.48	3.75	4.12	4.08	-5.44	
3,075.00	7.66	277.64	3,073.99	3.33	-8.54	4.60	4.57	4.52	5.56	
3,100.00	8.03	276.68	3,098.76	3.75	-11.93	5.53	1.57	1.48	-3.84	
3,125.00	8.18	276.87	3,123.51	4.17	-15.43	6.48	0.61	0.60	0.76	
3,150.00	8.18	276.96	3,148.26	4.60	-18.96	7.44	0.05	0.00	0.36	
3,175.00	8.21	276.34	3,173.00	5.01	-22.50	8.39	0.37	0.12	-2.48	
3,200.00	8.19	276.36	3,197.74	5.40	-26.04	9.32	0.08	-0.08	0.08	
3,225.00	8.09	276.23	3,222.49	5.79	-29.56	10.25	0.41	-0.40	-0.52	
3,250.00	8.06	275.19	3,247.24	6.14	-33.05	11.13	0.60	-0.12	-4.16	
3,275.00	8.13	275.11	3,272.00	6.46	-36.56	11.97	0.28	0.28	-0.32	
3,300.00	8.00	274.51	3,296.75	6.75	-40.05	12.80	0.62	-0.52	-2.40	
3,325.00	7.95	273.42	3,321.51	6.99	-43.51	13.57	0.64	-0.20	-4.36	
3,350.00	7.87	272.63	3,346.27	7.17	-46.95	14.27	0.54	-0.32	-3.16	
3,375.00	7.78	271.76	3,371.04	7.30	-50.35	14.92	0.60	-0.36	-3.48	
3,400.00	7.81	271.55	3,395.81	7.40	-53.74	15.54	0.17	0.12	-0.84	
3,425.00	7.73	270.36	3,420.58	7.46	-57.12	16.11	0.72	-0.32	-4.76	
3,450.00	7.76	270.30	3,445.35	7.48	-60.49	16.64	0.12	0.12	-0.24	
3,475.00	8.01	270.25	3,470.11	7.49	-63.92	17.18	1.00	1.00	-0.20	
3,500.00	7.78	269.79	3,494.87	7.50	-67.35	17.71	0.95	-0.92	-1.84	
3,525.00	7.73	269.13	3,519.65	7.46	-70.72	18.20	0.41	-0.20	-2.64	
3,550.00	7.57	268.09	3,544.42	7.38	-74.05	18.63	0.85	-0.64	-4.16	

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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	7.53	267.15	3,569.21	7.25	-77.33	18.99	0.52	-0.16	-3.76
3,600.00	7.48	266.30	3,593.99	7.06	-80.59	19.31	0.49	-0.20	-3.40
3,625.00	7.39	265.56	3,618.78	6.83	-83.82	19.57	0.53	-0.36	-2.96
3,650.00	7.31	265.12	3,643.58	6.57	-87.01	19.80	0.39	-0.32	-1.76
3,675.00	7.17	263.71	3,668.38	6.26	-90.14	19.98	0.90	-0.56	-5.64
3,700.00	7.32	263.11	3,693.18	5.90	-93.28	20.10	0.67	0.60	-2.40
3,725.00	7.31	263.31	3,717.97	5.53	-96.44	20.21	0.11	-0.04	0.80
3,750.00	7.40	262.92	3,742.77	5.14	-99.61	20.32	0.41	0.36	-1.56
3,775.00	7.23	262.68	3,767.56	4.74	-102.77	20.41	0.69	-0.68	-0.96
3,800.00	7.21	261.83	3,792.37	4.32	-105.88	20.47	0.43	-0.08	-3.40
3,825.00	7.30	261.81	3,817.17	3.87	-109.01	20.50	0.36	0.36	-0.08
3,850.00	7.31	261.23	3,841.96	3.40	-112.15	20.52	0.30	0.04	-2.32
3,875.00	7.28	261.26	3,866.76	2.92	-115.29	20.52	0.12	-0.12	0.12
3,900.00	7.30	261.20	3,891.56	2.44	-118.43	20.52	0.09	0.08	-0.24
3,925.00	7.30	260.73	3,916.36	1.94	-121.56	20.51	0.24	0.00	-1.88
3,950.00	7.33	260.30	3,941.15	1.41	-124.70	20.47	0.25	0.12	-1.72
3,975.00	7.34	261.33	3,965.95	0.90	-127.85	20.45	0.53	0.04	4.12
4,000.00	7.43	263.65	3,990.74	0.48	-131.04	20.52	1.25	0.36	9.28
4,025.00	7.98	267.97	4,015.52	0.24	-134.38	20.80	3.19	2.20	17.28
4,050.00	8.31	269.84	4,040.26	0.18	-137.92	21.27	1.69	1.32	7.48
4,075.00	8.19	270.22	4,065.00	0.18	-141.51	21.82	0.53	-0.48	1.52
4,100.00	8.29	269.13	4,089.75	0.16	-145.09	22.35	0.74	0.40	-4.36
4,125.00	8.36	269.68	4,114.48	0.12	-148.71	22.87	0.42	0.28	2.20
4,150.00	8.49	268.83	4,139.21	0.07	-152.37	23.38	0.72	0.52	-3.40
4,175.00	8.40	268.40	4,163.94	-0.02	-156.04	23.86	0.44	-0.36	-1.72
4,200.00	8.31	267.55	4,188.68	-0.14	-159.67	24.29	0.61	-0.36	-3.40
4,225.00	8.23	267.95	4,213.42	-0.29	-163.27	24.70	0.39	-0.32	1.60
4,250.00	8.23	267.43	4,238.16	-0.43	-166.84	25.10	0.30	0.00	-2.08
4,275.00	8.19	266.40	4,262.90	-0.62	-170.41	25.46	0.61	-0.16	-4.12
4,300.00	8.20	265.89	4,287.65	-0.86	-173.96	25.76	0.29	0.04	-2.04
4,325.00	8.27	265.36	4,312.39	-1.13	-177.53	26.04	0.41	0.28	-2.12
4,350.00	8.23	265.36	4,337.13	-1.42	-181.11	26.30	0.16	-0.16	0.00
4,375.00	8.04	264.58	4,361.88	-1.73	-184.63	26.53	0.88	-0.76	-3.12
4,400.00	8.06	264.26	4,386.63	-2.08	-188.12	26.73	0.20	0.08	-1.28
4,425.00	8.05	264.36	4,411.39	-2.42	-191.60	26.92	0.07	-0.04	0.40
4,450.00	8.06	264.76	4,436.14	-2.75	-195.09	27.12	0.23	0.04	1.60
4,475.00	8.11	265.39	4,460.89	-3.06	-198.59	27.36	0.41	0.20	2.52
4,500.00	8.72	269.34	4,485.62	-3.22	-202.25	27.76	3.36	2.44	15.80
4,525.00	8.85	270.23	4,510.33	-3.23	-206.06	28.33	0.75	0.52	3.56
4,550.00	8.90	270.22	4,535.03	-3.22	-209.92	28.93	0.20	0.20	-0.04
4,575.00	9.01	270.24	4,559.73	-3.20	-213.81	29.54	0.44	0.44	0.08
4,600.00	8.98	269.76	4,584.42	-3.20	-217.72	30.14	0.32	-0.12	-1.92
4,625.00	8.79	269.65	4,609.12	-3.22	-221.58	30.71	0.76	-0.76	-0.44

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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	9.00	268.92	4,633.82	-3.27	-225.45	31.26	0.95	0.84	-2.92
4,675.00	9.12	268.21	4,658.51	-3.37	-229.38	31.76	0.66	0.48	-2.84
4,700.00	9.00	268.21	4,683.19	-3.49	-233.32	32.24	0.48	-0.48	0.00
4,725.00	8.84	267.44	4,707.89	-3.64	-237.19	32.69	0.80	-0.64	-3.08
4,750.00	8.95	267.02	4,732.59	-3.83	-241.05	33.10	0.51	0.44	-1.68
4,775.00	8.76	266.29	4,757.29	-4.05	-244.89	33.46	0.88	-0.76	-2.92
4,800.00	8.87	266.16	4,782.00	-4.30	-248.72	33.80	0.45	0.44	-0.52
4,825.00	8.81	265.48	4,806.70	-4.58	-252.55	34.11	0.48	-0.24	-2.72
4,850.00	8.76	264.76	4,831.41	-4.91	-256.35	34.37	0.48	-0.20	-2.88
4,875.00	8.77	263.91	4,856.12	-5.28	-260.14	34.58	0.52	0.04	-3.40
4,900.00	8.77	263.94	4,880.82	-5.69	-263.93	34.76	0.02	0.00	0.12
4,925.00	8.53	262.69	4,905.54	-6.13	-267.67	34.90	1.22	-0.96	-5.00
4,950.00	8.51	262.83	4,930.26	-6.59	-271.34	35.00	0.12	-0.08	0.56
4,975.00	8.47	262.56	4,954.99	-7.06	-275.00	35.09	0.23	-0.16	-1.08
5,000.00	8.45	262.28	4,979.72	-7.55	-278.65	35.17	0.18	-0.08	-1.12
5,025.00	8.44	262.04	5,004.45	-8.05	-282.29	35.23	0.15	-0.04	-0.96
5,050.00	8.31	263.96	5,029.18	-8.49	-285.90	35.35	1.23	-0.52	7.68
5,075.00	8.10	267.68	5,053.92	-8.75	-289.46	35.63	2.28	-0.84	14.88
5,100.00	8.07	268.71	5,078.67	-8.86	-292.97	36.06	0.59	-0.12	4.12
5,125.00	8.19	268.28	5,103.42	-8.96	-296.50	36.51	0.54	0.48	-1.72
5,150.00	8.17	268.58	5,128.17	-9.05	-300.06	36.96	0.19	-0.08	1.20
5,175.00	8.10	268.72	5,152.92	-9.14	-303.60	37.42	0.29	-0.28	0.56
5,200.00	8.03	267.87	5,177.67	-9.24	-307.10	37.85	0.55	-0.28	-3.40
5,225.00	8.07	267.85	5,202.42	-9.37	-310.60	38.26	0.16	0.16	-0.08
5,250.00	7.84	267.09	5,227.18	-9.52	-314.06	38.63	1.01	-0.92	-3.04
5,275.00	8.15	267.85	5,251.94	-9.68	-317.53	39.01	1.31	1.24	3.04
5,300.00	8.01	266.85	5,276.69	-9.84	-321.04	39.39	0.79	-0.56	-4.00
5,325.00	8.15	266.84	5,301.44	-10.03	-324.55	39.74	0.56	0.56	-0.04
5,350.00	8.45	271.58	5,326.18	-10.08	-328.16	40.24	2.99	1.20	18.96
5,375.00	8.79	275.32	5,350.90	-9.85	-331.89	41.04	2.62	1.36	14.96
5,400.00	9.05	276.33	5,375.60	-9.46	-335.75	42.02	1.21	1.04	4.04
5,425.00	9.00	276.25	5,400.29	-9.03	-339.65	43.04	0.21	-0.20	-0.32
5,450.00	9.05	276.42	5,424.98	-8.60	-343.55	44.06	0.23	0.20	0.68
5,475.00	8.81	275.61	5,449.68	-8.19	-347.40	45.06	1.08	-0.96	-3.24
5,500.00	8.81	275.41	5,474.38	-7.82	-351.22	46.00	0.12	0.00	-0.80
5,525.00	8.69	275.62	5,499.09	-7.46	-355.00	46.94	0.50	-0.48	0.84
5,550.00	8.62	276.00	5,523.81	-7.08	-358.74	47.89	0.36	-0.28	1.52
5,575.00	8.58	275.09	5,548.52	-6.71	-362.47	48.82	0.57	-0.16	-3.64
5,600.00	8.51	274.27	5,573.25	-6.41	-366.17	49.68	0.56	-0.28	-3.28
5,625.00	8.32	273.67	5,597.98	-6.16	-369.82	50.49	0.84	-0.76	-2.40
5,650.00	8.08	273.19	5,622.72	-5.94	-373.38	51.25	1.00	-0.96	-1.92
5,675.00	8.10	272.62	5,647.47	-5.77	-376.89	51.96	0.33	0.08	-2.28
5,700.00	8.16	272.85	5,672.22	-5.60	-380.42	52.67	0.27	0.24	0.92

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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	7.94	272.65	5,696.98	-5.43	-383.92	53.37	0.89	-0.88	-0.80	
5,750.00	7.89	271.67	5,721.74	-5.30	-387.36	54.02	0.58	-0.20	-3.92	
5,775.00	7.82	271.38	5,746.50	-5.21	-390.77	54.64	0.32	-0.28	-1.16	
5,800.00	7.76	271.14	5,771.27	-5.13	-394.16	55.23	0.27	-0.24	-0.96	
5,825.00	7.78	270.84	5,796.04	-5.07	-397.54	55.80	0.18	0.08	-1.20	
5,850.00	7.83	270.40	5,820.81	-5.04	-400.94	56.36	0.31	0.20	-1.76	
5,875.00	7.70	270.35	5,845.58	-5.02	-404.31	56.90	0.52	-0.52	-0.20	
5,900.00	7.85	270.80	5,870.35	-4.98	-407.70	57.45	0.65	0.60	1.80	
5,925.00	8.05	273.91	5,895.11	-4.84	-411.15	58.12	1.90	0.80	12.44	
5,950.00	8.36	277.47	5,919.86	-4.48	-414.70	59.01	2.38	1.24	14.24	
5,975.00	8.77	277.62	5,944.58	-3.99	-418.39	60.06	1.64	1.64	0.60	
6,000.00	8.58	278.75	5,969.29	-3.46	-422.12	61.16	1.02	-0.76	4.52	
6,025.00	8.62	278.25	5,994.01	-2.91	-425.82	62.27	0.34	0.16	-2.00	
6,050.00	8.62	277.33	6,018.73	-2.40	-429.53	63.34	0.55	0.00	-3.68	
6,075.00	8.42	277.63	6,043.45	-1.92	-433.20	64.38	0.82	-0.80	1.20	
6,100.00	8.22	277.39	6,068.19	-1.44	-436.79	65.40	0.81	-0.80	-0.96	
6,125.00	8.04	276.51	6,092.94	-1.01	-440.30	66.36	0.88	-0.72	-3.52	
6,150.00	8.01	276.67	6,117.69	-0.61	-443.77	67.28	0.15	-0.12	0.64	
6,175.00	7.97	276.64	6,142.45	-0.21	-447.22	68.21	0.16	-0.16	-0.12	
6,200.00	7.85	275.45	6,167.21	0.15	-450.64	69.09	0.81	-0.48	-4.76	
6,225.00	7.66	274.76	6,191.98	0.45	-454.00	69.90	0.85	-0.76	-2.76	
6,250.00	7.51	274.25	6,216.76	0.71	-457.29	70.66	0.66	-0.60	-2.04	
6,275.00	7.61	274.08	6,241.55	0.95	-460.57	71.40	0.41	0.40	-0.68	
6,300.00	7.60	273.44	6,266.33	1.17	-463.87	72.12	0.34	-0.04	-2.56	
6,325.00	7.35	272.52	6,291.11	1.34	-467.12	72.78	1.11	-1.00	-3.68	
6,350.00	7.36	271.88	6,315.91	1.46	-470.32	73.39	0.33	0.04	-2.56	
6,375.00	7.41	272.34	6,340.70	1.58	-473.53	74.00	0.31	0.20	1.84	
6,400.00	7.58	271.33	6,365.49	1.68	-476.79	74.60	0.86	0.68	-4.04	
6,425.00	8.41	269.61	6,390.25	1.71	-480.26	75.16	3.45	3.32	-6.88	
6,450.00	8.70	268.88	6,414.97	1.66	-483.98	75.68	1.24	1.16	-2.92	
6,475.00	8.64	268.92	6,439.68	1.59	-487.75	76.19	0.24	-0.24	0.16	
6,500.00	8.70	268.39	6,464.40	1.50	-491.52	76.67	0.40	0.24	-2.12	
6,525.00	8.59	267.78	6,489.11	1.37	-495.27	77.13	0.57	-0.44	-2.44	
6,550.00	8.45	267.13	6,513.84	1.21	-498.97	77.53	0.68	-0.56	-2.60	
6,575.00	8.25	265.38	6,538.57	0.97	-502.59	77.85	1.29	-0.80	-7.00	
6,600.00	8.20	263.88	6,563.31	0.64	-506.15	78.06	0.88	-0.20	-6.00	
6,625.00	8.16	263.24	6,588.06	0.24	-509.69	78.21	0.40	-0.16	-2.56	
6,650.00	8.15	262.74	6,612.81	-0.20	-513.21	78.32	0.29	-0.04	-2.00	
6,675.00	8.06	261.23	6,637.56	-0.69	-516.70	78.37	0.92	-0.36	-6.04	
6,700.00	7.97	260.43	6,662.31	-1.24	-520.14	78.35	0.57	-0.36	-3.20	
6,725.00	7.80	259.61	6,687.08	-1.84	-523.52	78.28	0.82	-0.68	-3.28	
6,750.00	7.45	258.14	6,711.85	-2.47	-526.77	78.14	1.60	-1.40	-5.88	
6,775.00	7.62	258.04	6,736.64	-3.15	-529.98	77.97	0.68	0.68	-0.40	
6,800.00	7.12	258.04	6,761.43	-3.82	-533.12	77.79	2.00	-2.00	0.00	

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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	6.63	257.97	6,786.25	-4.44	-536.05	77.62	1.96	-1.96	-0.28
6,850.00	6.60	258.49	6,811.09	-5.03	-538.86	77.47	0.27	-0.12	2.08
6,875.00	6.59	259.56	6,835.92	-5.57	-541.68	77.36	0.49	-0.04	4.28
6,900.00	6.05	264.08	6,860.77	-5.97	-544.40	77.39	2.94	-2.16	18.08
6,925.00	5.85	265.27	6,885.63	-6.21	-546.98	77.55	0.94	-0.80	4.76
6,950.00	5.91	268.59	6,910.50	-6.35	-549.54	77.80	1.38	0.24	13.28
6,975.00	5.97	272.85	6,935.37	-6.31	-552.13	78.23	1.78	0.24	17.04
7,000.00	6.12	273.78	6,960.23	-6.16	-554.75	78.78	0.72	0.60	3.72
7,025.00	6.18	273.56	6,985.09	-5.99	-557.43	79.36	0.26	0.24	-0.88
7,050.00	6.23	273.31	7,009.94	-5.83	-560.12	79.93	0.23	0.20	-1.00
7,075.00	6.11	273.09	7,034.79	-5.68	-562.81	80.49	0.49	-0.48	-0.88
7,100.00	6.29	272.50	7,059.65	-5.55	-565.50	81.03	0.76	0.72	-2.36
7,125.00	6.34	272.61	7,084.50	-5.42	-568.25	81.58	0.21	0.20	0.44
7,150.00	6.39	273.01	7,109.34	-5.29	-571.02	82.13	0.27	0.20	1.60
7,175.00	6.55	274.05	7,134.18	-5.11	-573.83	82.74	0.79	0.64	4.16
7,200.00	6.84	276.20	7,159.01	-4.85	-576.73	83.44	1.53	1.16	8.60
7,225.00	6.83	276.54	7,183.84	-4.52	-579.69	84.22	0.17	-0.04	1.36
7,250.00	6.95	276.49	7,208.65	-4.18	-582.67	85.01	0.48	0.48	-0.20
7,275.00	7.11	277.28	7,233.47	-3.81	-585.71	85.84	0.75	0.64	3.16
7,300.00	7.30	278.00	7,258.27	-3.40	-588.81	86.72	0.84	0.76	2.88
7,325.00	7.47	277.95	7,283.06	-2.95	-592.00	87.65	0.68	0.68	-0.20
7,350.00	8.03	275.24	7,307.83	-2.57	-595.35	88.54	2.67	2.24	-10.84
7,375.00	8.84	271.77	7,332.56	-2.35	-599.00	89.32	3.83	3.24	-13.88
7,400.00	9.11	271.08	7,357.26	-2.25	-602.90	90.01	1.16	1.08	-2.76
7,425.00	9.16	269.71	7,381.94	-2.22	-606.87	90.64	0.89	0.20	-5.48
7,450.00	9.46	267.30	7,406.61	-2.33	-610.91	91.16	1.97	1.20	-9.64
7,475.00	9.63	266.24	7,431.26	-2.56	-615.05	91.56	0.98	0.68	-4.24
7,500.00	9.43	265.40	7,455.92	-2.87	-619.18	91.89	0.97	-0.80	-3.36
7,525.00	9.20	264.22	7,480.59	-3.23	-623.21	92.15	1.20	-0.92	-4.72
7,550.00	8.84	263.01	7,505.28	-3.67	-627.11	92.31	1.63	-1.44	-4.84
7,575.00	8.52	262.17	7,529.99	-4.15	-630.85	92.41	1.38	-1.28	-3.36
7,600.00	8.03	261.61	7,554.73	-4.66	-634.41	92.45	1.99	-1.96	-2.24
7,625.00	8.03	261.95	7,579.49	-5.16	-637.87	92.49	0.19	0.00	1.36
7,650.00	8.11	261.80	7,604.24	-5.66	-641.34	92.53	0.33	0.32	-0.60
7,675.00	8.10	261.80	7,628.99	-6.16	-644.83	92.56	0.04	-0.04	0.00
7,700.00	7.95	262.90	7,653.75	-6.62	-648.29	92.63	0.86	-0.60	4.40
7,725.00	7.88	263.22	7,678.51	-7.04	-651.70	92.75	0.33	-0.28	1.28
7,750.00	7.88	264.91	7,703.27	-7.39	-655.11	92.92	0.93	0.00	6.76
7,775.00	8.09	266.01	7,728.03	-7.67	-658.58	93.18	1.04	0.84	4.40
7,800.00	8.21	266.10	7,752.78	-7.91	-662.11	93.48	0.48	0.48	0.36
7,825.00	8.34	266.28	7,777.52	-8.15	-665.70	93.79	0.53	0.52	0.72
7,850.00	8.78	268.86	7,802.24	-8.31	-669.42	94.20	2.34	1.76	10.32
7,875.00	9.29	270.08	7,826.93	-8.34	-673.34	94.77	2.18	2.04	4.88

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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	9.46	270.25	7,851.59	-8.33	-677.42	95.40	0.69	0.68	0.68	
7,925.00	10.16	270.50	7,876.23	-8.30	-681.68	96.08	2.81	2.80	1.00	
7,950.00	11.14	270.79	7,900.80	-8.25	-686.30	96.84	3.93	3.92	1.16	
7,975.00	11.65	271.06	7,925.31	-8.17	-691.23	97.68	2.05	2.04	1.08	
8,000.00	11.76	270.72	7,949.79	-8.09	-696.31	98.53	0.52	0.44	-1.36	
8,025.00	11.59	270.04	7,974.27	-8.06	-701.36	99.34	0.87	-0.68	-2.72	
8,050.00	10.80	269.57	7,998.79	-8.07	-706.22	100.06	3.18	-3.16	-1.88	
8,075.00	10.08	269.94	8,023.38	-8.09	-710.75	100.74	2.89	-2.88	1.48	
8,100.00	9.62	270.16	8,048.01	-8.09	-715.02	101.40	1.85	-1.84	0.88	
8,125.00	9.17	270.73	8,072.67	-8.06	-719.11	102.05	1.84	-1.80	2.28	
8,150.00	8.83	269.57	8,097.37	-8.05	-723.02	102.66	1.54	-1.36	-4.64	
8,175.00	8.48	268.53	8,122.08	-8.11	-726.78	103.17	1.53	-1.40	-4.16	
8,200.00	8.29	268.33	8,146.81	-8.21	-730.42	103.63	0.77	-0.76	-0.80	
8,225.00	8.32	268.35	8,171.55	-8.31	-734.03	104.08	0.12	0.12	0.08	
8,250.00	8.30	268.89	8,196.29	-8.40	-737.64	104.55	0.32	-0.08	2.16	
8,275.00	8.26	269.01	8,221.03	-8.47	-741.24	105.03	0.17	-0.16	0.48	
8,300.00	8.18	269.06	8,245.77	-8.53	-744.82	105.52	0.32	-0.32	0.20	
8,325.00	8.19	269.43	8,270.52	-8.57	-748.38	106.02	0.21	0.04	1.48	
8,350.00	7.60	269.19	8,295.28	-8.61	-751.81	106.50	2.36	-2.36	-0.96	
8,375.00	7.69	268.46	8,320.06	-8.68	-755.13	106.95	0.53	0.36	-2.92	
8,400.00	7.23	268.32	8,344.85	-8.77	-758.38	107.35	1.84	-1.84	-0.56	
8,425.00	6.78	267.88	8,369.66	-8.87	-761.43	107.72	1.81	-1.80	-1.76	
8,450.00	6.40	267.22	8,394.49	-9.00	-764.29	108.04	1.55	-1.52	-2.64	
8,475.00	6.46	266.13	8,419.34	-9.16	-767.09	108.30	0.54	0.24	-4.36	
8,500.00	6.18	265.42	8,444.19	-9.36	-769.83	108.52	1.16	-1.12	-2.84	
8,525.00	5.96	264.33	8,469.05	-9.60	-772.47	108.69	0.99	-0.88	-4.36	
8,550.00	5.57	266.34	8,493.92	-9.80	-774.97	108.87	1.76	-1.56	8.04	
8,575.00	5.49	267.27	8,518.80	-9.94	-777.37	109.11	0.48	-0.32	3.72	
8,600.00	5.50	267.80	8,543.69	-10.04	-779.76	109.37	0.21	0.04	2.12	
8,625.00	5.51	266.65	8,568.57	-10.16	-782.16	109.62	0.44	0.04	-4.60	
8,650.00	5.54	264.68	8,593.46	-10.34	-784.56	109.81	0.77	0.12	-7.88	
8,675.00	5.45	264.58	8,618.34	-10.56	-786.94	109.95	0.36	-0.36	-0.40	
8,700.00	5.92	267.97	8,643.22	-10.72	-789.41	110.18	2.31	1.88	13.56	
8,725.00	6.50	268.73	8,668.07	-10.80	-792.12	110.51	2.34	2.32	3.04	
8,750.00	6.63	268.97	8,692.91	-10.85	-794.97	110.89	0.53	0.52	0.96	
8,775.00	6.71	269.59	8,717.74	-10.89	-797.88	111.30	0.43	0.32	2.48	
8,800.00	7.42	272.50	8,742.55	-10.83	-800.95	111.83	3.18	2.84	11.64	
8,825.00	8.06	272.66	8,767.32	-10.68	-804.31	112.50	2.56	2.56	0.64	
8,850.00	8.59	273.58	8,792.06	-10.48	-807.93	113.24	2.19	2.12	3.68	
8,875.00	8.75	273.83	8,816.77	-10.24	-811.69	114.06	0.66	0.64	1.00	
8,900.00	9.43	273.98	8,841.46	-9.97	-815.63	114.93	2.72	2.72	0.60	
8,925.00	9.54	273.02	8,866.12	-9.72	-819.74	115.81	0.77	0.44	-3.84	
8,950.00	9.11	272.36	8,890.79	-9.53	-823.79	116.61	1.77	-1.72	-2.64	

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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	8.83	271.75	8,915.48	-9.39	-827.68	117.35	1.18	-1.12	-2.44	
9,000.00	8.69	270.08	8,940.19	-9.32	-831.49	117.99	1.16	-0.56	-6.68	
9,025.00	8.49	269.12	8,964.91	-9.35	-835.22	118.54	0.98	-0.80	-3.84	
9,050.00	7.93	268.98	8,989.65	-9.41	-838.79	119.02	2.24	-2.24	-0.56	
9,075.00	7.03	269.64	9,014.44	-9.45	-842.05	119.48	3.62	-3.60	2.64	
9,100.00	6.87	269.16	9,039.25	-9.48	-845.07	119.91	0.68	-0.64	-1.92	
9,125.00	6.45	268.24	9,064.09	-9.55	-847.97	120.29	1.73	-1.68	-3.68	
9,150.00	6.25	266.85	9,088.93	-9.66	-850.73	120.60	1.01	-0.80	-5.56	
9,175.00	6.67	268.01	9,113.77	-9.79	-853.54	120.91	1.76	1.68	4.64	
9,198.00	7.08	267.93	9,136.61	-9.89	-856.29	121.23	1.78	1.78	-0.35	
9,355.00	5.07	272.10	9,292.72	-9.98	-872.90	123.68	1.31	-1.28	2.66	
First Phoenix MWD Survey										
9,399.00	4.81	271.35	9,336.56	-9.87	-876.69	124.37	0.61	-0.59	-1.70	
9,430.00	7.44	301.25	9,367.38	-8.80	-879.70	125.89	13.07	8.48	96.45	
9,462.00	13.71	313.86	9,398.83	-5.09	-884.21	130.24	20.77	19.59	39.41	
9,494.00	19.22	315.32	9,429.50	1.29	-890.66	137.53	17.27	17.22	4.56	
9,526.00	23.73	314.28	9,459.28	9.53	-898.97	146.95	14.14	14.09	-3.25	
9,558.00	27.41	315.11	9,488.14	19.25	-908.78	158.06	11.55	11.50	2.59	
9,589.00	30.60	316.92	9,515.25	30.07	-919.21	170.34	10.67	10.29	5.84	
9,621.00	33.63	318.57	9,542.35	42.67	-930.64	184.54	9.86	9.47	5.16	
9,653.00	36.93	320.01	9,568.47	56.68	-942.69	200.23	10.63	10.31	4.50	
9,685.00	39.73	321.63	9,593.57	72.07	-955.22	217.35	9.30	8.75	5.06	
9,717.00	41.99	323.49	9,617.77	88.69	-967.93	235.73	8.02	7.06	5.81	
9,749.00	42.51	324.27	9,641.45	106.07	-980.62	254.84	2.31	1.63	2.44	
9,781.00	44.06	325.59	9,664.75	124.03	-993.22	274.52	5.61	4.84	4.13	
9,812.00	46.06	327.69	9,686.65	142.36	-1,005.28	294.48	8.04	6.45	6.77	
9,844.00	46.92	329.04	9,708.68	162.12	-1,017.45	315.86	4.07	2.69	4.22	
9,876.00	49.25	330.46	9,730.05	182.69	-1,029.44	338.03	7.99	7.28	4.44	
9,908.00	51.33	331.09	9,750.50	204.17	-1,041.45	361.10	6.67	6.50	1.97	
9,940.00	54.99	331.23	9,769.68	226.60	-1,053.81	385.15	11.44	11.44	0.44	
9,972.00	57.06	330.96	9,787.56	249.83	-1,066.63	410.07	6.51	6.47	-0.84	
10,003.00	59.20	330.96	9,803.93	272.85	-1,079.41	434.77	6.90	6.90	0.00	
10,035.00	61.50	331.75	9,819.76	297.25	-1,092.74	460.93	7.50	7.19	2.47	
10,067.00	63.24	331.35	9,834.60	322.18	-1,106.25	487.63	5.55	5.44	-1.25	
10,099.00	65.28	331.72	9,848.50	347.52	-1,119.98	514.77	6.46	6.38	1.16	
10,131.00	68.45	332.15	9,861.07	373.48	-1,133.82	542.54	9.98	9.91	1.34	
10,163.00	71.54	333.04	9,872.01	400.17	-1,147.66	571.04	10.00	9.66	2.78	
10,195.00	74.39	333.91	9,881.39	427.55	-1,161.32	600.18	9.28	8.91	2.72	
10,227.00	78.38	334.74	9,888.92	455.57	-1,174.79	629.93	12.72	12.47	2.59	
10,258.00	81.94	335.43	9,894.22	483.27	-1,187.66	659.27	11.69	11.48	2.23	
10,290.00	85.35	335.71	9,897.76	512.22	-1,200.81	689.90	10.69	10.66	0.88	
10,322.00	88.22	336.13	9,899.55	541.39	-1,213.84	720.71	9.06	8.97	1.31	
10,354.00	89.30	337.33	9,900.24	570.77	-1,226.48	751.69	5.04	3.38	3.75	
10,417.00	88.45	336.96	9,901.48	628.82	-1,250.94	812.79	1.47	-1.35	-0.59	

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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)
10,513.00	87.84	339.72	9,904.59	717.98	-1,286.36	906.32	2.94	-0.64	2.88
10,608.00	89.48	343.77	9,906.81	808.16	-1,316.10	999.99	4.60	1.73	4.26
10,704.00	91.39	350.99	9,906.08	901.77	-1,337.06	1,095.70	7.78	1.99	7.52
10,799.00	90.99	354.42	9,904.11	995.96	-1,349.12	1,190.63	3.63	-0.42	3.61
10,895.00	91.44	357.08	9,902.07	1,091.67	-1,356.23	1,286.30	2.81	0.47	2.77
10,990.00	90.92	355.69	9,900.12	1,186.46	-1,362.22	1,380.89	1.56	-0.55	-1.46
11,085.00	90.75	358.99	9,898.73	1,281.33	-1,366.62	1,475.32	3.48	-0.18	3.47
11,181.00	91.81	1.44	9,896.59	1,377.30	-1,366.26	1,570.10	2.78	1.10	2.55
11,277.00	93.09	1.66	9,892.48	1,473.17	-1,363.67	1,664.45	1.35	1.33	0.23
11,372.00	89.08	0.17	9,890.68	1,568.12	-1,362.16	1,758.05	4.50	-4.22	-1.57
11,468.00	88.24	359.04	9,892.93	1,664.09	-1,362.82	1,852.99	1.47	-0.88	-1.18
11,564.00	89.58	1.65	9,894.75	1,760.06	-1,362.24	1,947.75	3.06	1.40	2.72
11,659.00	89.08	2.25	9,895.87	1,855.00	-1,359.01	2,041.07	0.82	-0.53	0.63
11,755.00	91.22	2.91	9,895.61	1,950.90	-1,354.68	2,135.18	2.33	2.23	0.69
11,851.00	90.78	1.41	9,893.94	2,046.81	-1,351.07	2,229.41	1.63	-0.46	-1.56
11,946.00	90.48	359.90	9,892.89	2,141.79	-1,349.98	2,323.11	1.62	-0.32	-1.59
12,042.00	90.50	0.26	9,892.07	2,237.79	-1,349.85	2,417.96	0.38	0.02	0.38
12,138.00	90.38	0.14	9,891.34	2,333.79	-1,349.51	2,512.77	0.18	-0.13	-0.13
12,234.00	91.62	1.44	9,889.66	2,429.76	-1,348.19	2,607.41	1.87	1.29	1.35
12,329.00	88.13	359.41	9,889.87	2,524.74	-1,347.48	2,701.16	4.25	-3.67	-2.14
12,425.00	87.82	359.14	9,893.26	2,620.67	-1,348.70	2,796.15	0.43	-0.32	-0.28
12,520.00	87.77	359.04	9,896.92	2,715.59	-1,350.21	2,890.18	0.12	-0.05	-0.11
12,616.00	87.00	358.58	9,901.30	2,811.47	-1,352.20	2,985.24	0.93	-0.80	-0.48
12,711.00	85.94	357.59	9,907.14	2,906.23	-1,355.37	3,079.37	1.53	-1.12	-1.04
12,806.00	89.04	358.40	9,911.30	3,001.07	-1,358.68	3,173.60	3.37	3.26	0.85
12,900.00	92.57	0.78	9,909.98	3,095.04	-1,359.36	3,266.56	4.53	3.76	2.53
12,995.00	92.72	0.41	9,905.60	3,189.93	-1,358.37	3,360.19	0.42	0.16	-0.39
13,090.00	92.26	359.74	9,901.47	3,284.84	-1,358.25	3,453.96	0.85	-0.48	-0.71
13,185.00	92.38	359.83	9,897.63	3,379.76	-1,358.60	3,547.82	0.16	0.13	0.09
13,280.00	92.24	0.52	9,893.80	3,474.68	-1,358.31	3,641.58	0.74	-0.15	0.73
13,374.00	90.99	358.77	9,891.15	3,568.64	-1,358.90	3,734.52	2.29	-1.33	-1.86
13,469.00	90.61	357.65	9,889.82	3,663.58	-1,361.86	3,828.80	1.24	-0.40	-1.18
13,564.00	89.35	358.72	9,889.86	3,758.53	-1,364.87	3,923.09	1.74	-1.33	1.13
13,659.00	92.18	359.50	9,888.59	3,853.50	-1,366.35	4,017.17	3.09	2.98	0.82
13,754.00	88.47	357.72	9,888.05	3,948.45	-1,368.65	4,111.35	4.33	-3.91	-1.87
13,847.00	88.58	356.91	9,890.44	4,041.31	-1,373.01	4,203.79	0.88	0.12	-0.87
13,942.00	88.36	359.64	9,892.98	4,136.23	-1,375.87	4,298.03	2.88	-0.23	2.87
14,037.00	86.66	359.34	9,897.11	4,231.13	-1,376.71	4,391.94	1.82	-1.79	-0.32
14,131.00	86.59	358.80	9,902.64	4,324.96	-1,378.23	4,484.89	0.58	-0.07	-0.57
14,225.00	88.02	1.31	9,907.06	4,418.84	-1,378.14	4,577.66	3.07	1.52	2.67
14,319.00	86.45	1.03	9,911.59	4,512.71	-1,376.23	4,670.13	1.70	-1.67	-0.30
14,414.00	92.44	2.87	9,912.51	4,607.60	-1,372.99	4,763.41	6.60	6.31	1.94
14,509.00	93.69	3.20	9,907.44	4,702.33	-1,367.97	4,856.26	1.36	1.32	0.35

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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)	
14,604.00	93.15	3.46	9,901.77	4,797.00	-1,362.46	4,948.97	0.63	-0.57	0.27	
14,699.00	92.77	1.43	9,896.86	4,891.78	-1,358.42	5,042.02	2.17	-0.40	-2.14	
14,794.00	94.80	1.98	9,890.59	4,986.53	-1,355.60	5,135.22	2.21	2.14	0.58	
14,889.00	92.27	1.13	9,884.73	5,081.31	-1,353.02	5,228.48	2.81	-2.66	-0.89	
14,984.00	89.90	359.05	9,882.93	5,176.28	-1,352.88	5,322.31	3.32	-2.49	-2.19	
15,079.00	86.45	358.89	9,885.96	5,271.20	-1,354.58	5,416.38	3.64	-3.63	-0.17	
15,175.00	87.51	359.60	9,891.02	5,367.05	-1,355.85	5,511.30	1.33	1.10	0.74	
15,270.00	87.97	359.78	9,894.76	5,461.98	-1,356.36	5,605.19	0.52	0.48	0.19	
15,366.00	88.34	359.74	9,897.85	5,557.93	-1,356.76	5,700.07	0.39	0.39	-0.04	
15,461.00	85.98	358.58	9,902.56	5,652.79	-1,358.15	5,794.03	2.77	-2.48	-1.22	
15,557.00	87.28	357.30	9,908.20	5,748.56	-1,361.60	5,889.20	1.90	1.35	-1.33	
15,652.00	90.08	357.44	9,910.39	5,843.43	-1,365.95	5,983.61	2.95	2.95	0.15	
15,748.00	91.24	358.58	9,909.29	5,939.36	-1,369.29	6,078.92	1.69	1.21	1.19	
15,844.00	91.07	358.20	9,907.35	6,035.30	-1,371.98	6,174.15	0.43	-0.18	-0.40	
15,940.00	92.16	359.10	9,904.65	6,131.23	-1,374.25	6,269.30	1.47	1.14	0.94	
16,035.00	92.42	358.78	9,900.85	6,226.14	-1,376.00	6,363.36	0.43	0.27	-0.34	
16,130.00	89.27	359.73	9,899.45	6,321.11	-1,377.24	6,457.40	3.46	-3.32	1.00	
16,225.00	89.73	359.91	9,900.28	6,416.11	-1,377.53	6,551.32	0.52	0.48	0.19	
16,320.00	88.05	359.38	9,902.12	6,511.08	-1,378.12	6,645.27	1.85	-1.77	-0.56	
16,415.00	88.39	359.64	9,905.07	6,606.03	-1,378.93	6,739.23	0.45	0.36	0.27	
16,511.00	89.21	0.66	9,907.08	6,702.01	-1,378.68	6,834.03	1.36	0.85	1.06	
16,605.00	87.63	359.42	9,909.67	6,795.97	-1,378.62	6,926.88	2.14	-1.68	-1.32	
16,700.00	91.21	359.32	9,910.63	6,890.94	-1,379.66	7,020.89	3.77	3.77	-0.11	
16,795.00	91.62	358.98	9,908.29	6,985.90	-1,381.07	7,114.95	0.56	0.43	-0.36	
16,890.00	92.02	358.38	9,905.27	7,080.83	-1,383.26	7,209.10	0.76	0.42	-0.63	
16,985.00	92.73	358.11	9,901.33	7,175.70	-1,386.16	7,303.30	0.80	0.75	-0.28	
17,079.00	90.58	359.42	9,898.62	7,269.63	-1,388.19	7,396.43	2.68	-2.29	1.39	
17,174.00	90.85	359.59	9,897.43	7,364.62	-1,389.01	7,490.43	0.34	0.28	0.18	
17,268.00	91.21	359.57	9,895.74	7,458.60	-1,389.70	7,583.41	0.38	0.38	-0.02	
17,364.00	92.36	0.27	9,892.75	7,554.56	-1,389.83	7,678.25	1.40	1.20	0.73	
17,459.00	90.50	1.58	9,890.38	7,649.51	-1,388.30	7,771.85	2.39	-1.96	1.38	
17,555.00	91.18	2.03	9,888.98	7,745.45	-1,385.28	7,866.20	0.85	0.71	0.47	
17,651.00	89.31	1.19	9,888.56	7,841.41	-1,382.58	7,960.61	2.14	-1.95	-0.88	
17,747.00	86.74	1.09	9,891.87	7,937.32	-1,380.67	8,055.11	2.68	-2.68	-0.10	
17,842.00	85.34	1.15	9,898.43	8,032.07	-1,378.82	8,148.46	1.48	-1.47	0.06	
17,938.00	86.42	0.23	9,905.33	8,127.82	-1,377.67	8,242.90	1.48	1.13	-0.96	
18,034.00	85.47	0.00	9,912.12	8,223.57	-1,377.47	8,337.50	1.02	-0.99	-0.24	
18,129.00	87.85	359.99	9,917.65	8,318.41	-1,377.48	8,431.22	2.51	2.51	-0.01	
18,225.00	89.50	0.43	9,919.87	8,414.38	-1,377.13	8,526.01	1.78	1.72	0.46	
18,320.00	92.12	1.22	9,918.53	8,509.35	-1,375.76	8,619.65	2.88	2.76	0.83	
18,416.00	92.19	1.01	9,914.92	8,605.26	-1,373.90	8,714.15	0.23	0.07	-0.22	
18,511.00	91.15	358.18	9,912.15	8,700.21	-1,374.57	8,808.08	3.17	-1.09	-2.98	
18,607.00	94.94	359.35	9,907.05	8,796.03	-1,376.63	8,903.09	4.13	3.95	1.22	

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 706H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RKB @ 2919.60usft (Ensign 155)
Site:	Hambone Federal Com	MD Reference:	RKB @ 2919.60usft (Ensign 155)
Well:	706H	North Reference:	Grid
Wellbore:	OH / 66292	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 155)	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)	
18,703.00	94.27	358.37	9,899.35	8,891.70	-1,378.54	8,997.93	1.23	-0.70	-1.02	
18,753.00	94.15	358.43	9,895.68	8,941.55	-1,379.93	9,047.40	0.28	-0.25	0.13	
LTP: 18753' MD										
18,799.00	94.03	358.49	9,892.40	8,987.41	-1,381.16	9,092.91	0.28	-0.25	0.12	
18,824.00	93.98	358.55	9,890.65	9,012.34	-1,381.81	9,117.65	0.31	-0.20	0.24	
Final Phoenix MWD Survey										
18,882.00	93.98	358.55	9,886.63	9,070.19	-1,383.27	9,175.04	0.00	0.00	0.00	
Projection to TD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
9,355.00	9,292.72	-9.98	-872.90	First Phoenix MWD Survey	
18,753.00	9,895.68	8,941.55	-1,379.93	LTP: 18753' MD	
18,824.00	9,890.65	9,012.34	-1,381.81	Final Phoenix MWD Survey	
18,882.00	9,886.63	9,070.19	-1,383.27	Projection to TD	