



PHOENIX
TECHNOLOGY SERVICES

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COG Operating LLC

**Lea County, NM (NAD27 NME)
Fez Federal Com
702H**

OH / 64150

Design: Surveys (Precision 595)

Standard Survey Report

01 April, 2019





Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 702H
Wellbore: OH / 64150
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

Project	Lea 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	Fez Federal Com				
Site Position:		Northing:	415,342.20 usft	Latitude:	32° 8' 17.8100 N
From:	Map	Easting:	795,972.50 usft	Longitude:	103° 22' 37.7348 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.51 °

Well	702H				
Well Position	+N/-S	0.00 usft	Northing:	415,342.70 usft	Latitude: 32° 8' 17.8097 N
	+E/-W	0.00 usft	Easting:	796,032.50 usft	Longitude: 103° 22' 37.0370 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level: 3,251.80 usft

Wellbore	OH / 64150				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	2/23/2019	6.64	59.79	47,793.79345162

Design	Surveys (Precision 595)				
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	2.15	

Survey Program	Date 4/1/2019				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	11,360.00	Scientific Gyro Surveys (OH / 64150)	Scientific Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
11,360.00	22,431.00	Phoenix MWD Survey (OH / 64150)	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	0.84	359.88	100.00	0.73	0.00	0.73	0.84	0.84	0.00
125.00	1.02	343.11	124.99	1.13	-0.07	1.13	1.30	0.72	-67.08
150.00	1.22	351.68	149.99	1.61	-0.17	1.60	1.04	0.80	34.28
175.00	1.45	348.66	174.98	2.18	-0.27	2.17	0.96	0.92	-12.08
200.00	1.57	351.50	199.97	2.83	-0.38	2.81	0.57	0.48	11.36
225.00	1.62	348.88	224.96	3.51	-0.50	3.49	0.35	0.20	-10.48
250.00	1.73	350.30	249.95	4.23	-0.63	4.21	0.47	0.44	5.68
275.00	1.79	347.06	274.94	4.98	-0.78	4.95	0.46	0.24	-12.96
300.00	1.83	343.82	299.93	5.75	-0.98	5.71	0.44	0.16	-12.96



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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	1.73	337.84	324.92	6.48	-1.24	6.43	0.84	-0.40	-23.92
350.00	1.36	340.37	349.91	7.11	-1.48	7.05	1.50	-1.48	10.12
375.00	1.35	338.15	374.90	7.66	-1.69	7.59	0.21	-0.04	-8.88
400.00	0.84	322.14	399.90	8.08	-1.91	8.00	2.36	-2.04	-64.04
425.00	0.71	315.37	424.89	8.34	-2.13	8.25	0.64	-0.52	-27.08
450.00	0.48	287.45	449.89	8.48	-2.34	8.38	1.45	-0.92	-111.68
475.00	0.50	267.16	474.89	8.50	-2.55	8.40	0.69	0.08	-81.16
500.00	0.59	230.23	499.89	8.42	-2.76	8.31	1.42	0.36	-147.72
525.00	0.74	223.18	524.89	8.22	-2.97	8.10	0.68	0.60	-28.20
550.00	0.94	217.46	549.89	7.94	-3.20	7.81	0.87	0.80	-22.88
575.00	1.09	216.84	574.88	7.58	-3.47	7.45	0.60	0.60	-2.48
600.00	1.23	217.26	599.88	7.18	-3.77	7.03	0.56	0.56	1.68
625.00	1.28	211.07	624.87	6.73	-4.08	6.57	0.58	0.20	-24.76
650.00	1.35	211.03	649.86	6.23	-4.38	6.07	0.28	0.28	-0.16
675.00	1.21	208.15	674.86	5.75	-4.65	5.57	0.62	-0.56	-11.52
700.00	1.30	211.50	699.85	5.27	-4.93	5.09	0.46	0.36	13.40
725.00	1.23	213.27	724.85	4.81	-5.22	4.61	0.32	-0.28	7.08
750.00	1.27	214.57	749.84	4.36	-5.53	4.15	0.20	0.16	5.20
775.00	1.28	215.06	774.83	3.90	-5.84	3.68	0.06	0.04	1.96
800.00	1.35	212.40	799.83	3.42	-6.16	3.19	0.37	0.28	-10.64
825.00	1.27	217.56	824.82	2.95	-6.49	2.71	0.57	-0.32	20.64
850.00	1.40	203.71	849.81	2.45	-6.78	2.20	1.39	0.52	-55.40
875.00	1.40	197.81	874.81	1.88	-7.00	1.62	0.58	0.00	-23.60
900.00	1.52	184.31	899.80	1.26	-7.11	0.99	1.45	0.48	-54.00
925.00	1.60	184.61	924.79	0.58	-7.17	0.31	0.32	0.32	1.20
950.00	1.59	181.69	949.78	-0.11	-7.21	-0.38	0.33	-0.04	-11.68
975.00	1.55	182.70	974.77	-0.79	-7.23	-1.07	0.19	-0.16	4.04
1,000.00	1.63	184.67	999.76	-1.49	-7.28	-1.76	0.39	0.32	7.88
1,025.00	1.64	183.88	1,024.75	-2.20	-7.33	-2.47	0.10	0.04	-3.16
1,050.00	1.64	182.00	1,049.74	-2.91	-7.37	-3.19	0.22	0.00	-7.52
1,075.00	1.61	181.46	1,074.73	-3.62	-7.39	-3.90	0.13	-0.12	-2.16
1,100.00	1.57	183.74	1,099.72	-4.31	-7.42	-4.59	0.30	-0.16	9.12
1,125.00	1.64	181.55	1,124.71	-5.01	-7.45	-5.29	0.37	0.28	-8.76
1,150.00	1.62	185.34	1,149.70	-5.72	-7.49	-6.00	0.44	-0.08	15.16
1,175.00	1.65	184.16	1,174.69	-6.43	-7.55	-6.71	0.18	0.12	-4.72
1,200.00	1.45	177.07	1,199.68	-7.11	-7.56	-7.39	1.11	-0.80	-28.36
1,225.00	1.14	159.49	1,224.67	-7.66	-7.46	-7.93	2.00	-1.24	-70.32
1,250.00	1.18	124.96	1,249.67	-8.04	-7.16	-8.30	2.76	0.16	-138.12
1,275.00	1.30	99.64	1,274.66	-8.23	-6.67	-8.48	2.22	0.48	-101.28
1,300.00	2.11	76.27	1,299.65	-8.17	-5.94	-8.39	4.21	3.24	-93.48
1,325.00	2.73	66.54	1,324.63	-7.83	-4.95	-8.01	2.97	2.48	-38.92
1,350.00	3.71	59.54	1,349.59	-7.18	-3.71	-7.31	4.22	3.92	-28.00
1,375.00	3.99	59.29	1,374.53	-6.32	-2.26	-6.40	1.12	1.12	-1.00



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1,400.00	4.37	58.21	1,399.47	-5.38	-0.70	-5.40	1.55	1.52	-4.32
1,425.00	4.48	58.67	1,424.39	-4.37	0.94	-4.33	0.46	0.44	1.84
1,450.00	4.47	57.97	1,449.32	-3.34	2.60	-3.24	0.22	-0.04	-2.80
1,475.00	4.49	61.20	1,474.24	-2.36	4.28	-2.19	1.01	0.08	12.92
1,500.00	4.53	63.38	1,499.16	-1.44	6.02	-1.22	0.70	0.16	8.72
1,525.00	4.85	73.93	1,524.08	-0.71	7.92	-0.41	3.67	1.28	42.20
1,550.00	5.02	79.30	1,548.99	-0.21	10.01	0.16	1.97	0.68	21.48
1,575.00	5.36	84.34	1,573.89	0.11	12.25	0.57	2.27	1.36	20.16
1,600.00	5.26	88.76	1,598.78	0.25	14.56	0.79	1.68	-0.40	17.68
1,625.00	5.63	96.83	1,623.67	0.13	16.92	0.76	3.40	1.48	32.28
1,650.00	5.73	101.53	1,648.54	-0.27	19.36	0.46	1.90	0.40	18.80
1,675.00	6.07	105.73	1,673.41	-0.88	21.85	-0.06	2.20	1.36	16.80
1,700.00	5.97	105.91	1,698.27	-1.59	24.38	-0.68	0.41	-0.40	0.72
1,725.00	6.07	106.34	1,723.14	-2.32	26.90	-1.31	0.44	0.40	1.72
1,750.00	6.08	106.97	1,747.99	-3.08	29.43	-1.97	0.27	0.04	2.52
1,775.00	6.21	106.75	1,772.85	-3.85	31.99	-2.65	0.53	0.52	-0.88
1,800.00	6.26	106.98	1,797.70	-4.64	34.59	-3.34	0.22	0.20	0.92
1,825.00	6.26	107.61	1,822.55	-5.45	37.19	-4.05	0.27	0.00	2.52
1,850.00	6.30	107.18	1,847.40	-6.27	39.80	-4.77	0.25	0.16	-1.72
1,875.00	6.32	108.11	1,872.25	-7.10	42.42	-5.51	0.42	0.08	3.72
1,900.00	6.28	108.99	1,897.10	-7.98	45.02	-6.28	0.42	-0.16	3.52
1,925.00	6.41	108.87	1,921.95	-8.87	47.63	-7.08	0.52	0.52	-0.48
1,950.00	6.36	109.11	1,946.79	-9.78	50.26	-7.89	0.23	-0.20	0.96
1,975.00	6.24	115.63	1,971.64	-10.82	52.80	-8.83	2.90	-0.48	26.08
2,000.00	6.36	117.69	1,996.49	-12.05	55.25	-9.97	1.02	0.48	8.24
2,025.00	6.29	122.88	2,021.34	-13.44	57.62	-11.27	2.30	-0.28	20.76
2,050.00	6.28	124.07	2,046.19	-14.95	59.91	-12.69	0.52	-0.04	4.76
2,075.00	6.34	124.74	2,071.04	-16.50	62.17	-14.16	0.38	0.24	2.68
2,100.00	6.36	125.84	2,095.88	-18.10	64.43	-15.67	0.49	0.08	4.40
2,125.00	6.33	126.38	2,120.73	-19.72	66.66	-17.21	0.27	-0.12	2.16
2,150.00	6.34	128.97	2,145.58	-21.41	68.85	-18.81	1.14	0.04	10.36
2,175.00	6.25	130.88	2,170.43	-23.17	70.95	-20.49	0.91	-0.36	7.64
2,200.00	6.27	131.40	2,195.28	-24.96	73.00	-22.21	0.24	0.08	2.08
2,225.00	6.32	132.15	2,220.13	-26.79	75.04	-23.95	0.38	0.20	3.00
2,250.00	6.25	132.47	2,244.98	-28.63	77.07	-25.72	0.31	-0.28	1.28
2,275.00	6.33	132.84	2,269.83	-30.49	79.08	-27.50	0.36	0.32	1.48
2,300.00	6.32	133.64	2,294.68	-32.37	81.09	-29.31	0.35	-0.04	3.20
2,325.00	6.39	132.98	2,319.52	-34.27	83.10	-31.13	0.40	0.28	-2.64
2,350.00	6.39	133.79	2,344.37	-36.18	85.13	-32.96	0.36	0.00	3.24
2,375.00	6.40	134.02	2,369.21	-38.11	87.13	-34.82	0.11	0.04	0.92
2,400.00	6.39	134.59	2,394.06	-40.06	89.12	-36.69	0.26	-0.04	2.28
2,425.00	5.85	139.99	2,418.91	-42.01	90.93	-38.57	3.16	-2.16	21.60
2,450.00	5.76	141.63	2,443.79	-43.97	92.53	-40.47	0.75	-0.36	6.56



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2,475.00	5.47	143.94	2,468.67	-45.92	94.01	-42.36	1.47	-1.16	9.24
2,500.00	5.39	143.78	2,493.55	-47.83	95.41	-44.22	0.33	-0.32	-0.64
2,525.00	5.42	144.04	2,518.44	-49.73	96.79	-46.07	0.15	0.12	1.04
2,550.00	5.51	144.45	2,543.33	-51.66	98.19	-47.94	0.39	0.36	1.64
2,575.00	5.52	143.65	2,568.21	-53.61	99.60	-49.83	0.31	0.04	-3.20
2,600.00	5.41	144.04	2,593.10	-55.53	101.00	-51.70	0.46	-0.44	1.56
2,625.00	5.53	143.31	2,617.98	-57.45	102.41	-53.57	0.55	0.48	-2.92
2,650.00	5.56	144.06	2,642.87	-59.40	103.84	-55.46	0.31	0.12	3.00
2,675.00	5.50	145.12	2,667.75	-61.36	105.24	-57.37	0.47	-0.24	4.24
2,700.00	5.45	142.05	2,692.64	-63.28	106.65	-59.23	1.19	-0.20	-12.28
2,725.00	5.47	142.26	2,717.52	-65.16	108.11	-61.06	0.11	0.08	0.84
2,750.00	5.47	142.65	2,742.41	-67.05	109.57	-62.89	0.15	0.00	1.56
2,775.00	5.56	141.42	2,767.29	-68.94	111.04	-64.73	0.59	0.36	-4.92
2,800.00	5.51	139.85	2,792.18	-70.80	112.57	-66.53	0.64	-0.20	-6.28
2,825.00	5.51	139.28	2,817.06	-72.63	114.13	-68.30	0.22	0.00	-2.28
2,850.00	5.57	138.26	2,841.95	-74.45	115.72	-70.05	0.46	0.24	-4.08
2,875.00	5.42	132.92	2,866.83	-76.16	117.39	-71.70	2.13	-0.60	-21.36
2,900.00	5.32	127.83	2,891.72	-77.67	119.17	-73.15	1.95	-0.40	-20.36
2,925.00	5.09	122.83	2,916.62	-78.98	121.02	-74.39	2.03	-0.92	-20.00
2,950.00	5.18	121.13	2,941.52	-80.17	122.92	-75.50	0.71	0.36	-6.80
2,975.00	5.17	118.17	2,966.42	-81.28	124.88	-76.54	1.07	-0.04	-11.84
3,000.00	5.18	117.97	2,991.31	-82.34	126.87	-77.53	0.08	0.04	-0.80
3,025.00	5.26	116.61	3,016.21	-83.39	128.89	-78.49	0.59	0.32	-5.44
3,050.00	5.31	115.88	3,041.10	-84.40	130.95	-79.43	0.34	0.20	-2.92
3,075.00	5.32	115.08	3,066.00	-85.40	133.04	-80.35	0.30	0.04	-3.20
3,100.00	5.30	113.65	3,090.89	-86.36	135.15	-81.23	0.54	-0.08	-5.72
3,125.00	5.46	111.82	3,115.78	-87.26	137.31	-82.05	0.94	0.64	-7.32
3,150.00	5.31	111.96	3,140.67	-88.14	139.49	-82.84	0.60	-0.60	0.56
3,175.00	5.42	110.78	3,165.56	-88.99	141.67	-83.61	0.62	0.44	-4.72
3,200.00	5.45	110.32	3,190.45	-89.82	143.88	-84.36	0.21	0.12	-1.84
3,225.00	5.47	110.05	3,215.33	-90.64	146.12	-85.10	0.13	0.08	-1.08
3,250.00	5.60	109.01	3,240.22	-91.44	148.39	-85.82	0.66	0.52	-4.16
3,275.00	5.69	108.01	3,265.10	-92.23	150.72	-86.51	0.53	0.36	-4.00
3,300.00	5.65	108.67	3,289.97	-93.00	153.07	-87.20	0.31	-0.16	2.64
3,325.00	5.71	108.13	3,314.85	-93.78	155.41	-87.89	0.32	0.24	-2.16
3,350.00	5.85	107.62	3,339.72	-94.56	157.81	-88.57	0.60	0.56	-2.04
3,375.00	5.86	107.50	3,364.59	-95.33	160.24	-89.25	0.06	0.04	-0.48
3,400.00	5.98	108.49	3,389.46	-96.12	162.69	-89.95	0.63	0.48	3.96
3,425.00	6.08	107.01	3,414.32	-96.92	165.19	-90.66	0.74	0.40	-5.92
3,450.00	6.16	108.10	3,439.18	-97.73	167.74	-91.37	0.56	0.32	4.36
3,475.00	6.19	108.37	3,464.03	-98.57	170.29	-92.11	0.17	0.12	1.08
3,500.00	6.58	111.90	3,488.88	-99.53	172.90	-92.97	2.21	1.56	14.12
3,525.00	7.02	114.41	3,513.70	-100.69	175.62	-94.04	2.12	1.76	10.04
3,550.00	7.25	117.00	3,538.51	-102.04	178.42	-95.28	1.58	0.92	10.36

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 702H
Wellbore: OH / 64150
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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	7.35	118.62	3,563.31	-103.52	181.22	-96.65	0.92	0.40	6.48
3,600.00	7.46	118.52	3,588.10	-105.06	184.05	-98.09	0.44	0.44	-0.40
3,625.00	7.47	119.61	3,612.89	-106.64	186.89	-99.56	0.57	0.04	4.36
3,650.00	7.60	119.68	3,637.67	-108.26	189.74	-101.07	0.52	0.52	0.28
3,675.00	7.41	122.89	3,662.46	-109.96	192.53	-102.66	1.84	-0.76	12.84
3,700.00	7.32	129.24	3,687.25	-111.84	195.12	-104.44	3.27	-0.36	25.40
3,725.00	7.13	133.20	3,712.05	-113.91	197.48	-106.42	2.13	-0.76	15.84
3,750.00	7.18	135.35	3,736.86	-116.08	199.71	-108.51	1.09	0.20	8.60
3,775.00	7.14	137.06	3,761.66	-118.33	201.87	-110.68	0.87	-0.16	6.84
3,800.00	7.22	137.33	3,786.47	-120.62	203.99	-112.89	0.35	0.32	1.08
3,825.00	7.02	139.39	3,811.27	-122.94	206.05	-115.13	1.30	-0.80	8.24
3,850.00	7.03	139.10	3,836.09	-125.25	208.05	-117.36	0.15	0.04	-1.16
3,875.00	6.27	144.24	3,860.92	-127.52	209.85	-119.56	3.86	-3.04	20.56
3,900.00	6.10	144.82	3,885.77	-129.71	211.41	-121.69	0.72	-0.68	2.32
3,925.00	5.72	147.92	3,910.64	-131.85	212.84	-123.78	1.98	-1.52	12.40
3,950.00	5.80	147.16	3,935.51	-133.97	214.18	-125.84	0.44	0.32	-3.04
3,975.00	5.66	147.16	3,960.39	-136.07	215.54	-127.89	0.56	-0.56	0.00
4,000.00	5.84	147.16	3,985.26	-138.17	216.90	-129.94	0.72	0.72	0.00
4,025.00	5.78	147.70	4,010.13	-140.30	218.26	-132.02	0.32	-0.24	2.16
4,050.00	5.87	147.74	4,035.01	-142.45	219.61	-134.11	0.36	0.36	0.16
4,075.00	5.81	148.06	4,059.88	-144.60	220.97	-136.22	0.27	-0.24	1.28
4,100.00	5.92	147.38	4,084.75	-146.76	222.33	-138.32	0.52	0.44	-2.72
4,125.00	5.84	147.50	4,109.61	-148.92	223.71	-140.43	0.32	-0.32	0.48
4,150.00	5.91	148.52	4,134.48	-151.09	225.06	-142.55	0.50	0.28	4.08
4,175.00	5.92	146.98	4,159.35	-153.27	226.44	-144.67	0.64	0.04	-6.16
4,200.00	5.92	146.13	4,184.22	-155.42	227.86	-146.77	0.35	0.00	-3.40
4,225.00	6.12	142.80	4,209.08	-157.56	229.38	-148.84	1.61	0.80	-13.32
4,250.00	6.39	140.54	4,233.93	-159.69	231.07	-150.91	1.46	1.08	-9.04
4,275.00	6.37	140.28	4,258.77	-161.83	232.84	-152.99	0.14	-0.08	-1.04
4,300.00	6.49	139.26	4,283.62	-163.97	234.65	-155.05	0.66	0.48	-4.08
4,325.00	6.45	139.78	4,308.46	-166.11	236.48	-157.13	0.28	-0.16	2.08
4,350.00	6.68	138.63	4,333.29	-168.28	238.35	-159.22	1.06	0.92	-4.60
4,375.00	6.60	138.57	4,358.13	-170.44	240.26	-161.31	0.32	-0.32	-0.24
4,400.00	6.54	138.00	4,382.96	-172.58	242.16	-163.38	0.35	-0.24	-2.28
4,425.00	6.34	137.60	4,407.80	-174.66	244.05	-165.38	0.82	-0.80	-1.60
4,450.00	5.83	135.27	4,432.66	-176.58	245.87	-167.23	2.27	-2.04	-9.32
4,475.00	5.45	132.70	4,457.54	-178.28	247.64	-168.87	1.82	-1.52	-10.28
4,500.00	5.27	131.83	4,482.43	-179.86	249.37	-170.38	0.79	-0.72	-3.48
4,525.00	5.21	131.78	4,507.33	-181.38	251.07	-171.84	0.24	-0.24	-0.20
4,550.00	5.12	130.51	4,532.23	-182.86	252.76	-173.25	0.58	-0.36	-5.08
4,575.00	5.48	128.47	4,557.12	-184.33	254.54	-174.65	1.63	1.44	-8.16
4,600.00	5.55	126.78	4,582.00	-185.79	256.45	-176.04	0.71	0.28	-6.76
4,625.00	5.50	125.42	4,606.89	-187.21	258.39	-177.39	0.56	-0.20	-5.44



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 702H
Wellbore: OH / 64150
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: USA Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
4,650.00	5.70	123.18	4,631.77	-188.58	260.41	-178.69	1.18	0.80	-8.96
4,675.00	6.10	121.00	4,656.64	-189.95	262.59	-179.97	1.83	1.60	-8.72
4,700.00	6.29	120.26	4,681.49	-191.32	264.91	-181.25	0.82	0.76	-2.96
4,725.00	6.66	118.19	4,706.33	-192.70	267.37	-182.54	1.75	1.48	-8.28
4,750.00	7.06	118.54	4,731.15	-194.12	269.99	-183.85	1.61	1.60	1.40
4,775.00	7.22	118.40	4,755.96	-195.60	272.73	-185.23	0.64	0.64	-0.56
4,800.00	7.35	117.71	4,780.76	-197.09	275.52	-186.62	0.63	0.52	-2.76
4,825.00	7.37	118.50	4,805.55	-198.60	278.35	-188.02	0.41	0.08	3.16
4,850.00	7.32	118.11	4,830.35	-200.11	281.16	-189.43	0.28	-0.20	-1.56
4,875.00	7.40	118.02	4,855.14	-201.62	283.99	-190.83	0.32	0.32	-0.36
4,900.00	7.44	118.44	4,879.93	-203.15	286.83	-192.25	0.27	0.16	1.68
4,925.00	7.32	118.47	4,904.72	-204.68	289.66	-193.67	0.48	-0.48	0.12
4,950.00	7.48	118.05	4,929.51	-206.20	292.49	-195.09	0.68	0.64	-1.68
4,975.00	7.42	118.98	4,954.30	-207.75	295.34	-196.53	0.54	-0.24	3.72
5,000.00	7.45	118.62	4,979.09	-209.31	298.18	-197.98	0.22	0.12	-1.44
5,025.00	7.14	118.26	5,003.89	-210.82	300.97	-199.38	1.25	-1.24	-1.44
5,050.00	6.51	116.42	5,028.71	-212.18	303.60	-200.65	2.67	-2.52	-7.36
5,075.00	5.82	116.08	5,053.57	-213.37	306.01	-201.75	2.76	-2.76	-1.36
5,100.00	5.40	115.48	5,078.45	-214.44	308.21	-202.73	1.70	-1.68	-2.40
5,125.00	3.85	115.13	5,103.37	-215.30	310.03	-203.52	6.20	-6.20	-1.40
5,150.00	3.11	117.20	5,128.32	-215.96	311.40	-204.14	3.00	-2.96	8.28
5,175.00	2.33	119.19	5,153.29	-216.52	312.44	-204.65	3.14	-3.12	7.96
5,200.00	1.94	125.88	5,178.28	-217.02	313.23	-205.12	1.85	-1.56	26.76
5,225.00	1.79	116.98	5,203.26	-217.44	313.92	-205.52	1.30	-0.60	-35.60
5,250.00	1.74	117.37	5,228.25	-217.80	314.61	-205.84	0.21	-0.20	1.56
5,275.00	1.81	115.95	5,253.24	-218.14	315.30	-206.17	0.33	0.28	-5.68
5,300.00	1.77	117.70	5,278.23	-218.49	316.00	-206.49	0.27	-0.16	7.00
5,325.00	1.83	118.31	5,303.21	-218.86	316.69	-206.83	0.25	0.24	2.44
5,350.00	1.72	117.43	5,328.20	-219.23	317.37	-207.17	0.45	-0.44	-3.52
5,375.00	1.76	117.26	5,353.19	-219.57	318.05	-207.49	0.16	0.16	-0.68
5,400.00	1.81	117.69	5,378.18	-219.93	318.74	-207.83	0.21	0.20	1.72
5,425.00	1.83	115.30	5,403.17	-220.29	319.45	-208.15	0.31	0.08	-9.56
5,450.00	1.89	116.92	5,428.15	-220.64	320.18	-208.48	0.32	0.24	6.48
5,475.00	1.85	116.79	5,453.14	-221.01	320.91	-208.82	0.16	-0.16	-0.52
5,500.00	1.84	118.08	5,478.13	-221.38	321.62	-209.17	0.17	-0.04	5.16
5,525.00	1.91	122.85	5,503.11	-221.80	322.32	-209.56	0.68	0.28	19.08
5,550.00	1.86	120.78	5,528.10	-222.23	323.02	-209.96	0.34	-0.20	-8.28
5,575.00	2.03	123.59	5,553.08	-222.69	323.74	-210.39	0.78	0.68	11.24
5,600.00	1.93	121.68	5,578.07	-223.15	324.47	-210.83	0.48	-0.40	-7.64
5,625.00	2.00	123.46	5,603.05	-223.61	325.19	-211.26	0.37	0.28	7.12
5,650.00	2.00	121.45	5,628.04	-224.08	325.93	-211.70	0.28	0.00	-8.04
5,675.00	2.02	121.90	5,653.02	-224.54	326.67	-212.13	0.10	0.08	1.80
5,700.00	1.97	118.28	5,678.01	-224.98	327.42	-212.54	0.54	-0.20	-14.48

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=25' @ 3276.80usft (Precision 595)
Site:	Fez Federal Com	MD Reference:	KB=25' @ 3276.80usft (Precision 595)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 64150	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 595)	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	1.97	121.10	5,702.99	-225.40	328.17	-212.94	0.39	0.00	11.28
5,750.00	1.95	122.35	5,727.98	-225.85	328.90	-213.36	0.19	-0.08	5.00
5,775.00	2.03	119.53	5,752.96	-226.30	329.64	-213.78	0.51	0.32	-11.28
5,800.00	2.14	120.91	5,777.95	-226.76	330.43	-214.21	0.48	0.44	5.52
5,825.00	2.07	123.24	5,802.93	-227.24	331.21	-214.66	0.44	-0.28	9.32
5,850.00	1.44	113.10	5,827.92	-227.62	331.87	-215.01	2.80	-2.52	-40.56
5,875.00	1.30	102.13	5,852.91	-227.80	332.44	-215.17	1.19	-0.56	-43.88
5,900.00	1.16	91.49	5,877.91	-227.86	332.97	-215.22	1.07	-0.56	-42.56
5,925.00	1.15	91.21	5,902.90	-227.88	333.47	-215.21	0.05	-0.04	-1.12
5,950.00	1.12	90.69	5,927.90	-227.88	333.97	-215.20	0.13	-0.12	-2.08
5,975.00	0.95	88.76	5,952.89	-227.88	334.42	-215.18	0.69	-0.68	-7.72
6,000.00	1.07	84.61	5,977.89	-227.86	334.86	-215.14	0.56	0.48	-16.60
6,025.00	1.18	88.92	6,002.88	-227.83	335.35	-215.09	0.55	0.44	17.24
6,050.00	1.18	89.69	6,027.88	-227.82	335.86	-215.07	0.06	0.00	3.08
6,075.00	1.19	90.45	6,052.87	-227.82	336.38	-215.05	0.07	0.04	3.04
6,100.00	1.06	92.32	6,077.87	-227.84	336.87	-215.04	0.54	-0.52	7.48
6,125.00	1.00	88.10	6,102.86	-227.84	337.32	-215.03	0.39	-0.24	-16.88
6,150.00	1.20	87.07	6,127.86	-227.82	337.80	-214.99	0.80	0.80	-4.12
6,175.00	1.11	90.03	6,152.85	-227.80	338.30	-214.96	0.43	-0.36	11.84
6,200.00	1.06	90.20	6,177.85	-227.80	338.78	-214.94	0.20	-0.20	0.68
6,225.00	1.04	84.65	6,202.85	-227.78	339.23	-214.90	0.41	-0.08	-22.20
6,250.00	1.22	84.95	6,227.84	-227.74	339.73	-214.84	0.72	0.72	1.20
6,275.00	1.16	91.21	6,252.84	-227.72	340.24	-214.80	0.57	-0.24	25.04
6,300.00	1.03	87.45	6,277.83	-227.72	340.72	-214.78	0.59	-0.52	-15.04
6,325.00	1.09	81.83	6,302.83	-227.67	341.18	-214.72	0.48	0.24	-22.48
6,350.00	1.12	82.92	6,327.82	-227.61	341.66	-214.64	0.15	0.12	4.36
6,375.00	1.17	84.51	6,352.82	-227.55	342.16	-214.56	0.24	0.20	6.36
6,400.00	1.25	90.38	6,377.81	-227.53	342.68	-214.52	0.59	0.32	23.48
6,425.00	1.07	87.03	6,402.81	-227.52	343.19	-214.49	0.77	-0.72	-13.40
6,450.00	1.21	89.64	6,427.80	-227.51	343.68	-214.46	0.60	0.56	10.44
6,475.00	1.18	85.01	6,452.80	-227.48	344.21	-214.42	0.40	-0.12	-18.52
6,500.00	1.22	85.66	6,477.79	-227.44	344.73	-214.35	0.17	0.16	2.60
6,525.00	1.33	85.83	6,502.78	-227.40	345.28	-214.29	0.44	0.44	0.68
6,550.00	1.29	82.94	6,527.78	-227.34	345.85	-214.21	0.31	-0.16	-11.56
6,575.00	1.29	83.86	6,552.77	-227.28	346.41	-214.13	0.08	0.00	3.68
6,600.00	1.32	86.50	6,577.77	-227.23	346.98	-214.06	0.27	0.12	10.56
6,625.00	1.35	88.83	6,602.76	-227.21	347.56	-214.01	0.25	0.12	9.32
6,650.00	1.22	87.48	6,627.75	-227.19	348.12	-213.98	0.53	-0.52	-5.40
6,675.00	1.27	85.78	6,652.75	-227.16	348.66	-213.92	0.25	0.20	-6.80
6,700.00	1.31	90.18	6,677.74	-227.14	349.22	-213.88	0.43	0.16	17.60
6,725.00	1.30	93.55	6,702.73	-227.16	349.79	-213.88	0.31	-0.04	13.48
6,750.00	0.68	122.93	6,727.73	-227.26	350.20	-213.96	3.13	-2.48	117.52
6,775.00	0.65	140.72	6,752.73	-227.45	350.41	-214.15	0.83	-0.12	71.16
6,800.00	0.54	183.44	6,777.73	-227.67	350.50	-214.37	1.78	-0.44	170.88

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 702H
Wellbore: OH / 64150
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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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	0.56	191.67	6,802.73	-227.91	350.46	-214.61	0.33	0.08	32.92
6,850.00	0.66	188.23	6,827.72	-228.17	350.42	-214.87	0.43	0.40	-13.76
6,875.00	0.73	194.46	6,852.72	-228.47	350.36	-215.17	0.41	0.28	24.92
6,900.00	0.71	197.90	6,877.72	-228.77	350.27	-215.47	0.19	-0.08	13.76
6,925.00	0.72	197.92	6,902.72	-229.07	350.18	-215.78	0.04	0.04	0.08
6,950.00	0.58	190.93	6,927.72	-229.34	350.10	-216.05	0.64	-0.56	-27.96
6,975.00	0.72	199.02	6,952.72	-229.61	350.03	-216.33	0.67	0.56	32.36
7,000.00	0.79	203.62	6,977.71	-229.92	349.91	-216.64	0.37	0.28	18.40
7,025.00	0.72	200.30	7,002.71	-230.23	349.78	-216.95	0.33	-0.28	-13.28
7,050.00	0.64	205.98	7,027.71	-230.50	349.67	-217.22	0.42	-0.32	22.72
7,075.00	0.61	202.42	7,052.71	-230.75	349.56	-217.48	0.20	-0.12	-14.24
7,100.00	0.65	192.45	7,077.71	-231.01	349.48	-217.74	0.47	0.16	-39.88
7,125.00	0.74	195.10	7,102.70	-231.30	349.40	-218.04	0.38	0.36	10.60
7,150.00	0.66	212.81	7,127.70	-231.58	349.28	-218.32	0.92	-0.32	70.84
7,175.00	0.69	225.82	7,152.70	-231.81	349.10	-218.55	0.62	0.12	52.04
7,200.00	0.74	254.15	7,177.70	-231.96	348.83	-218.71	1.41	0.20	113.32
7,225.00	0.85	261.57	7,202.70	-232.03	348.49	-218.79	0.60	0.44	29.68
7,250.00	1.02	276.56	7,227.69	-232.03	348.09	-218.81	1.19	0.68	59.96
7,275.00	1.08	281.03	7,252.69	-231.96	347.64	-218.76	0.41	0.24	17.88
7,300.00	1.12	282.27	7,277.68	-231.86	347.17	-218.68	0.19	0.16	4.96
7,325.00	1.14	277.56	7,302.68	-231.78	346.68	-218.61	0.38	0.08	-18.84
7,350.00	1.13	277.36	7,327.67	-231.71	346.19	-218.57	0.04	-0.04	-0.80
7,375.00	1.23	279.86	7,352.67	-231.63	345.68	-218.51	0.45	0.40	10.00
7,400.00	1.34	280.06	7,377.66	-231.54	345.13	-218.43	0.44	0.44	0.80
7,425.00	1.28	282.19	7,402.66	-231.43	344.57	-218.34	0.31	-0.24	8.52
7,450.00	1.39	280.63	7,427.65	-231.31	344.00	-218.25	0.46	0.44	-6.24
7,475.00	1.29	282.62	7,452.64	-231.19	343.43	-218.15	0.44	-0.40	7.96
7,500.00	1.36	281.61	7,477.64	-231.07	342.86	-218.05	0.30	0.28	-4.04
7,525.00	1.34	281.42	7,502.63	-230.96	342.28	-217.96	0.08	-0.08	-0.76
7,550.00	1.39	284.09	7,527.62	-230.82	341.70	-217.85	0.32	0.20	10.68
7,575.00	1.41	278.79	7,552.61	-230.70	341.11	-217.75	0.52	0.08	-21.20
7,600.00	1.48	279.35	7,577.61	-230.60	340.48	-217.67	0.29	0.28	2.24
7,625.00	1.50	278.77	7,602.60	-230.50	339.84	-217.60	0.10	0.08	-2.32
7,650.00	1.44	279.01	7,627.59	-230.40	339.21	-217.52	0.24	-0.24	0.96
7,675.00	1.42	283.31	7,652.58	-230.28	338.60	-217.42	0.44	-0.08	17.20
7,700.00	1.43	280.81	7,677.57	-230.15	337.99	-217.32	0.25	0.04	-10.00
7,725.00	1.53	280.33	7,702.57	-230.03	337.35	-217.22	0.40	0.40	-1.92
7,750.00	1.38	281.53	7,727.56	-229.91	336.73	-217.12	0.61	-0.60	4.80
7,775.00	1.46	281.10	7,752.55	-229.79	336.12	-217.03	0.32	0.32	-1.72
7,800.00	1.43	276.80	7,777.54	-229.69	335.50	-216.95	0.45	-0.12	-17.20
7,825.00	1.48	278.09	7,802.53	-229.61	334.87	-216.89	0.24	0.20	5.16
7,850.00	1.48	278.85	7,827.53	-229.52	334.23	-216.82	0.08	0.00	3.04
7,875.00	1.54	281.42	7,852.52	-229.40	333.58	-216.73	0.36	0.24	10.28



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 702H
Wellbore: OH / 64150
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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	1.51	281.40	7,877.51	-229.27	332.93	-216.62	0.12	-0.12	-0.08
7,925.00	1.49	276.96	7,902.50	-229.16	332.29	-216.54	0.47	-0.08	-17.76
7,950.00	1.52	283.33	7,927.49	-229.05	331.64	-216.45	0.68	0.12	25.48
7,975.00	1.48	282.48	7,952.48	-228.90	331.00	-216.33	0.18	-0.16	-3.40
8,000.00	1.45	279.09	7,977.47	-228.78	330.38	-216.23	0.37	-0.12	-13.56
8,025.00	1.52	278.27	8,002.47	-228.69	329.73	-216.16	0.29	0.28	-3.28
8,050.00	1.51	277.02	8,027.46	-228.60	329.08	-216.10	0.14	-0.04	-5.00
8,075.00	1.46	278.31	8,052.45	-228.51	328.44	-216.03	0.24	-0.20	5.16
8,100.00	1.47	278.11	8,077.44	-228.42	327.80	-215.97	0.04	0.04	-0.80
8,125.00	1.47	282.96	8,102.43	-228.30	327.17	-215.87	0.50	0.00	19.40
8,150.00	1.58	282.52	8,127.42	-228.16	326.53	-215.75	0.44	0.44	-1.76
8,175.00	1.22	288.50	8,152.42	-228.00	325.94	-215.61	1.55	-1.44	23.92
8,200.00	0.62	323.13	8,177.41	-227.80	325.60	-215.43	3.17	-2.40	138.52
8,225.00	0.56	354.62	8,202.41	-227.57	325.51	-215.21	1.30	-0.24	125.96
8,250.00	0.66	21.98	8,227.41	-227.32	325.55	-214.95	1.22	0.40	109.44
8,275.00	0.70	20.25	8,252.41	-227.04	325.66	-214.67	0.18	0.16	-6.92
8,300.00	0.64	21.98	8,277.41	-226.77	325.77	-214.39	0.25	-0.24	6.92
8,325.00	0.68	27.71	8,302.41	-226.51	325.89	-214.13	0.31	0.16	22.92
8,350.00	0.70	19.23	8,327.40	-226.23	326.01	-213.85	0.42	0.08	-33.92
8,375.00	0.71	21.75	8,352.40	-225.94	326.11	-213.56	0.13	0.04	10.08
8,400.00	0.79	28.39	8,377.40	-225.65	326.25	-213.26	0.47	0.32	26.56
8,425.00	0.84	38.87	8,402.40	-225.36	326.45	-212.95	0.63	0.20	41.92
8,450.00	0.60	29.49	8,427.40	-225.10	326.63	-212.69	1.07	-0.96	-37.52
8,475.00	0.74	28.80	8,452.39	-224.84	326.77	-212.43	0.56	0.56	-2.76
8,500.00	0.75	32.66	8,477.39	-224.56	326.94	-212.15	0.20	0.04	15.44
8,525.00	0.77	26.79	8,502.39	-224.28	327.10	-211.85	0.32	0.08	-23.48
8,550.00	0.80	32.89	8,527.39	-223.98	327.27	-211.55	0.35	0.12	24.40
8,575.00	0.68	22.48	8,552.38	-223.70	327.42	-211.26	0.72	-0.48	-41.64
8,600.00	0.76	27.86	8,577.38	-223.41	327.56	-210.97	0.42	0.32	21.52
8,625.00	0.81	29.02	8,602.38	-223.11	327.72	-210.66	0.21	0.20	4.64
8,650.00	0.80	27.94	8,627.38	-222.80	327.89	-210.35	0.07	-0.04	-4.32
8,675.00	0.77	25.88	8,652.38	-222.50	328.04	-210.04	0.16	-0.12	-8.24
8,700.00	0.78	28.31	8,677.37	-222.20	328.20	-209.73	0.14	0.04	9.72
8,725.00	0.71	27.18	8,702.37	-221.91	328.35	-209.44	0.29	-0.28	-4.52
8,750.00	0.80	21.49	8,727.37	-221.61	328.48	-209.13	0.47	0.36	-22.76
8,775.00	0.86	33.41	8,752.37	-221.29	328.65	-208.81	0.73	0.24	47.68
8,800.00	0.74	38.90	8,777.36	-221.01	328.86	-208.52	0.57	-0.48	21.96
8,825.00	0.61	31.15	8,802.36	-220.77	329.03	-208.27	0.63	-0.52	-31.00
8,850.00	0.72	24.23	8,827.36	-220.51	329.16	-208.01	0.54	0.44	-27.68
8,875.00	0.75	28.85	8,852.36	-220.22	329.30	-207.72	0.27	0.12	18.48
8,900.00	0.61	26.03	8,877.36	-219.96	329.44	-207.45	0.58	-0.56	-11.28
8,925.00	0.53	37.54	8,902.36	-219.75	329.57	-207.24	0.56	-0.32	46.04
8,950.00	0.51	38.75	8,927.35	-219.57	329.71	-207.05	0.09	-0.08	4.84



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 702H
Wellbore: OH / 64150
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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	0.57	52.29	8,952.35	-219.41	329.88	-206.88	0.56	0.24	54.16
9,000.00	0.40	56.16	8,977.35	-219.28	330.05	-206.75	0.69	-0.68	15.48
9,025.00	0.40	56.16	9,002.35	-219.19	330.19	-206.65	0.00	0.00	0.00
9,050.00	0.28	61.86	9,027.35	-219.11	330.32	-206.57	0.50	-0.48	22.80
9,075.00	0.16	115.66	9,052.35	-219.10	330.40	-206.55	0.90	-0.48	215.20
9,100.00	0.06	336.34	9,077.35	-219.10	330.43	-206.55	0.84	-0.40	-557.28
9,125.00	0.14	94.96	9,102.35	-219.09	330.46	-206.54	0.71	0.32	474.48
9,150.00	0.15	137.55	9,127.35	-219.12	330.51	-206.57	0.42	0.04	170.36
9,175.00	0.22	180.27	9,152.35	-219.19	330.53	-206.64	0.60	0.28	170.88
9,200.00	0.33	200.11	9,177.35	-219.30	330.51	-206.76	0.58	0.44	79.36
9,225.00	0.28	220.42	9,202.35	-219.42	330.44	-206.87	0.47	-0.20	81.24
9,250.00	0.34	199.14	9,227.35	-219.53	330.38	-206.99	0.52	0.24	-85.12
9,275.00	0.41	211.26	9,252.35	-219.68	330.31	-207.14	0.42	0.28	48.48
9,300.00	0.55	208.78	9,277.35	-219.86	330.20	-207.33	0.57	0.56	-9.92
9,325.00	0.60	206.45	9,302.35	-220.09	330.09	-207.55	0.22	0.20	-9.32
9,350.00	0.61	213.58	9,327.35	-220.31	329.95	-207.78	0.30	0.04	28.52
9,375.00	0.63	216.24	9,352.34	-220.54	329.80	-208.01	0.14	0.08	10.64
9,400.00	0.68	212.21	9,377.34	-220.77	329.64	-208.25	0.27	0.20	-16.12
9,425.00	0.77	207.28	9,402.34	-221.05	329.48	-208.53	0.44	0.36	-19.72
9,450.00	0.77	207.68	9,427.34	-221.34	329.33	-208.84	0.02	0.00	1.60
9,475.00	0.74	209.33	9,452.34	-221.63	329.17	-209.13	0.15	-0.12	6.60
9,500.00	0.68	208.48	9,477.33	-221.90	329.02	-209.41	0.24	-0.24	-3.40
9,525.00	0.79	206.75	9,502.33	-222.19	328.87	-209.70	0.45	0.44	-6.92
9,550.00	0.80	206.25	9,527.33	-222.50	328.72	-210.02	0.05	0.04	-2.00
9,575.00	0.76	201.37	9,552.33	-222.81	328.58	-210.33	0.31	-0.16	-19.52
9,600.00	0.82	197.04	9,577.33	-223.14	328.47	-210.66	0.34	0.24	-17.32
9,625.00	1.06	201.74	9,602.32	-223.52	328.33	-211.05	1.01	0.96	18.80
9,650.00	1.03	199.92	9,627.32	-223.95	328.17	-211.48	0.18	-0.12	-7.28
9,675.00	1.20	196.01	9,652.31	-224.41	328.02	-211.95	0.74	0.68	-15.64
9,700.00	1.24	193.31	9,677.31	-224.93	327.88	-212.47	0.28	0.16	-10.80
9,725.00	1.17	189.64	9,702.30	-225.44	327.78	-212.99	0.42	-0.28	-14.68
9,750.00	1.08	189.15	9,727.30	-225.92	327.70	-213.48	0.36	-0.36	-1.96
9,775.00	1.04	194.02	9,752.29	-226.38	327.61	-213.93	0.39	-0.16	19.48
9,800.00	1.05	193.70	9,777.29	-226.82	327.50	-214.38	0.05	0.04	-1.28
9,825.00	1.08	197.56	9,802.28	-227.27	327.37	-214.83	0.31	0.12	15.44
9,850.00	1.22	200.92	9,827.28	-227.74	327.21	-215.31	0.62	0.56	13.44
9,875.00	1.22	203.48	9,852.27	-228.23	327.00	-215.81	0.22	0.00	10.24
9,900.00	1.37	204.38	9,877.27	-228.75	326.77	-216.33	0.61	0.60	3.60
9,925.00	1.54	202.55	9,902.26	-229.33	326.52	-216.93	0.70	0.68	-7.32
9,950.00	1.47	202.38	9,927.25	-229.94	326.27	-217.54	0.28	-0.28	-0.68
9,975.00	1.52	202.28	9,952.24	-230.54	326.02	-218.15	0.20	0.20	-0.40
10,000.00	1.39	198.99	9,977.23	-231.14	325.80	-218.76	0.62	-0.52	-13.16
10,025.00	1.31	197.62	10,002.23	-231.69	325.61	-219.32	0.35	-0.32	-5.48
10,050.00	1.31	193.32	10,027.22	-232.25	325.46	-219.88	0.39	0.00	-17.20

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=25' @ 3276.80usft (Precision 595)
Site:	Fez Federal Com	MD Reference:	KB=25' @ 3276.80usft (Precision 595)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 64150	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 595)	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)
10,075.00	1.34	196.58	10,052.21	-232.80	325.31	-220.44	0.32	0.12	13.04
10,100.00	1.42	199.73	10,077.21	-233.38	325.12	-221.02	0.44	0.32	12.60
10,125.00	1.35	197.38	10,102.20	-233.95	324.93	-221.60	0.36	-0.28	-9.40
10,150.00	1.42	198.17	10,127.19	-234.52	324.75	-222.18	0.29	0.28	3.16
10,175.00	1.48	198.92	10,152.18	-235.12	324.55	-222.79	0.25	0.24	3.00
10,200.00	1.51	200.71	10,177.18	-235.74	324.33	-223.41	0.22	0.12	7.16
10,225.00	1.55	201.12	10,202.17	-236.36	324.09	-224.04	0.17	0.16	1.64
10,250.00	1.69	201.14	10,227.16	-237.02	323.83	-224.71	0.56	0.56	0.08
10,275.00	1.46	199.11	10,252.15	-237.66	323.59	-225.36	0.95	-0.92	-8.12
10,300.00	1.05	195.43	10,277.14	-238.19	323.43	-225.89	1.67	-1.64	-14.72
10,325.00	0.69	179.85	10,302.14	-238.56	323.37	-226.26	1.71	-1.44	-62.32
10,350.00	0.60	168.76	10,327.14	-238.84	323.40	-226.54	0.61	-0.36	-44.36
10,375.00	0.57	133.48	10,352.14	-239.05	323.51	-226.75	1.42	-0.12	-141.12
10,400.00	0.64	131.24	10,377.13	-239.23	323.71	-226.92	0.30	0.28	-8.96
10,425.00	0.77	133.76	10,402.13	-239.44	323.93	-227.12	0.53	0.52	10.08
10,450.00	1.04	124.02	10,427.13	-239.68	324.24	-227.35	1.24	1.08	-38.96
10,475.00	1.07	113.94	10,452.12	-239.90	324.64	-227.56	0.75	0.12	-40.32
10,500.00	0.82	113.34	10,477.12	-240.07	325.02	-227.71	1.00	-1.00	-2.40
10,525.00	0.87	130.17	10,502.12	-240.26	325.33	-227.89	1.01	0.20	67.32
10,550.00	1.22	125.48	10,527.11	-240.54	325.69	-228.15	1.44	1.40	-18.76
10,575.00	0.96	112.27	10,552.11	-240.77	326.10	-228.37	1.44	-1.04	-52.84
10,600.00	0.93	127.97	10,577.11	-240.97	326.46	-228.56	1.04	-0.12	62.80
10,625.00	1.23	121.24	10,602.10	-241.24	326.85	-228.81	1.30	1.20	-26.92
10,650.00	1.16	110.59	10,627.10	-241.47	327.31	-229.02	0.93	-0.28	-42.60
10,675.00	1.01	127.15	10,652.09	-241.69	327.72	-229.23	1.38	-0.60	66.24
10,700.00	1.25	118.07	10,677.09	-241.95	328.14	-229.47	1.19	0.96	-36.32
10,725.00	0.91	114.31	10,702.08	-242.16	328.56	-229.67	1.39	-1.36	-15.04
10,750.00	0.81	120.94	10,727.08	-242.33	328.89	-229.83	0.56	-0.40	26.52
10,775.00	0.72	98.81	10,752.08	-242.45	329.20	-229.93	1.23	-0.36	-88.52
10,800.00	0.72	118.42	10,777.08	-242.55	329.49	-230.02	0.98	0.00	78.44
10,825.00	0.64	88.49	10,802.07	-242.62	329.77	-230.08	1.44	-0.32	-119.72
10,850.00	0.74	111.69	10,827.07	-242.67	330.06	-230.13	1.18	0.40	92.80
10,875.00	0.62	88.01	10,852.07	-242.73	330.35	-230.17	1.21	-0.48	-94.72
10,900.00	0.66	77.17	10,877.07	-242.69	330.62	-230.12	0.51	0.16	-43.36
10,925.00	0.89	104.49	10,902.07	-242.71	330.95	-230.13	1.72	0.92	109.28
10,950.00	0.77	106.04	10,927.06	-242.80	331.30	-230.21	0.49	-0.48	6.20
10,975.00	0.76	104.85	10,952.06	-242.89	331.62	-230.29	0.08	-0.04	-4.76
11,000.00	1.02	110.07	10,977.06	-243.01	331.99	-230.39	1.09	1.04	20.88
11,025.00	0.96	124.06	11,002.06	-243.20	332.37	-230.57	0.99	-0.24	55.96
11,050.00	0.78	130.37	11,027.05	-243.43	332.68	-230.79	0.81	-0.72	25.24
11,075.00	0.84	122.73	11,052.05	-243.64	332.96	-230.98	0.49	0.24	-30.56
11,100.00	0.81	150.80	11,077.05	-243.89	333.20	-231.23	1.60	-0.12	112.28
11,125.00	0.69	185.76	11,102.05	-244.20	333.27	-231.53	1.86	-0.48	139.84



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 702H
Wellbore: OH / 64150
Design: Surveys (Precision 595)

Local Co-ordinate Reference: Well 702H
TVD Reference: KB=25' @ 3276.80usft (Precision 595)
MD Reference: KB=25' @ 3276.80usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
11,150.00	1.12	246.68	11,127.04	-244.45	333.03	-231.78	3.96	1.72	243.68
11,175.00	2.04	267.22	11,152.03	-244.56	332.36	-231.93	4.26	3.68	82.16
11,200.00	2.82	269.30	11,177.01	-244.59	331.30	-232.00	3.14	3.12	8.32
11,225.00	2.98	273.42	11,201.98	-244.56	330.04	-232.01	1.05	0.64	16.48
11,250.00	3.62	272.92	11,226.94	-244.48	328.60	-231.99	2.56	2.56	-2.00
11,275.00	4.12	274.25	11,251.88	-244.38	326.92	-231.94	2.03	2.00	5.32
11,300.00	4.63	274.80	11,276.81	-244.22	325.02	-231.86	2.05	2.04	2.20
11,325.00	5.53	274.04	11,301.71	-244.06	322.81	-231.78	3.61	3.60	-3.04
11,350.00	6.14	277.74	11,326.58	-243.79	320.29	-231.61	2.87	2.44	14.80
11,360.00	6.59	278.95	11,336.52	-243.63	319.19	-231.49	4.70	4.50	12.10
Tie In									
11,553.00	5.86	277.64	11,528.38	-240.60	298.48	-229.23	0.39	-0.38	-0.68
First Phoenix MWD Survey									
11,598.00	5.18	279.66	11,573.17	-239.95	294.20	-228.75	1.57	-1.51	4.49
11,643.00	2.89	275.42	11,618.05	-239.50	291.07	-228.42	5.13	-5.09	-9.42
11,688.00	0.57	329.69	11,663.03	-239.20	289.83	-228.16	5.77	-5.16	120.60
11,733.00	5.43	347.39	11,707.96	-236.93	289.25	-225.92	10.87	10.80	39.33
11,778.00	9.61	336.40	11,752.56	-231.41	287.28	-220.47	9.78	9.29	-24.42
11,823.00	11.52	335.65	11,796.80	-223.87	283.92	-213.07	4.26	4.24	-1.67
11,867.00	15.93	339.66	11,839.53	-214.20	280.01	-203.55	10.25	10.02	9.11
11,912.00	20.20	338.84	11,882.30	-201.16	275.06	-190.70	9.51	9.49	-1.82
11,957.00	23.86	341.67	11,924.01	-185.27	269.39	-175.04	8.47	8.13	6.29
12,002.00	27.52	345.85	11,964.56	-166.54	263.98	-156.52	9.07	8.13	9.29
12,047.00	31.94	349.97	12,003.63	-144.72	259.37	-134.90	10.82	9.82	9.16
12,092.00	37.51	353.04	12,040.61	-119.38	255.63	-109.71	12.97	12.38	6.82
12,137.00	41.28	355.61	12,075.38	-90.97	252.83	-81.42	9.13	8.38	5.71
12,181.00	47.87	356.73	12,106.70	-60.17	250.79	-50.73	15.08	14.98	2.55
12,226.00	51.74	358.20	12,135.74	-25.84	249.28	-16.48	8.95	8.60	3.27
12,271.00	52.28	2.01	12,163.45	9.61	249.35	18.95	6.78	1.20	8.47
12,316.00	56.29	4.30	12,189.71	46.08	251.38	55.47	9.82	8.91	5.09
12,323.00	57.41	4.35	12,193.54	51.92	251.82	61.33	16.01	16.00	0.65
FTP: 12323' MD									
12,360.00	63.33	4.57	12,211.82	83.97	254.32	93.45	16.01	16.00	0.61
12,405.00	67.65	5.74	12,230.49	124.74	258.01	134.33	9.89	9.60	2.60
12,450.00	75.37	7.63	12,244.75	167.09	262.99	176.84	17.61	17.16	4.20
12,495.00	81.61	8.62	12,253.73	210.72	269.22	220.67	14.03	13.87	2.20
12,539.00	83.55	9.78	12,259.41	253.79	276.20	263.97	5.13	4.41	2.64
12,584.00	86.44	9.81	12,263.33	297.96	283.82	308.39	6.42	6.42	0.07
12,627.00	86.81	9.63	12,265.86	340.27	291.07	350.94	0.96	0.86	-0.42
12,671.00	86.25	10.45	12,268.53	383.52	298.73	394.45	2.25	-1.27	1.86
12,716.00	85.49	12.02	12,271.77	427.54	307.47	438.77	3.87	-1.69	3.49
12,761.00	84.36	13.88	12,275.75	471.22	317.51	482.79	4.82	-2.51	4.13
12,806.00	84.58	13.92	12,280.09	514.70	328.27	526.64	0.50	0.49	0.09
12,850.00	84.16	14.19	12,284.40	557.17	338.91	569.49	1.13	-0.95	0.61



Survey Report



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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)
12,895.00	84.15	13.70	12,288.99	600.62	349.70	613.31	1.08	-0.02	-1.09
12,940.00	83.90	14.82	12,293.67	644.00	360.72	657.07	2.54	-0.56	2.49
12,984.00	85.88	15.34	12,297.59	686.31	372.12	699.78	4.65	4.50	1.18
13,029.00	86.94	15.03	12,300.41	729.65	383.88	743.53	2.45	2.36	-0.69
13,074.00	89.85	14.83	12,301.67	773.11	395.47	787.40	6.48	6.47	-0.44
13,119.00	91.95	14.56	12,300.96	816.63	406.89	831.32	4.71	4.67	-0.60
13,163.00	92.15	15.26	12,299.39	859.12	418.20	874.20	1.65	0.45	1.59
13,208.00	91.98	15.21	12,297.76	902.51	430.02	918.00	0.39	-0.38	-0.11
13,252.00	91.41	14.16	12,296.46	945.06	441.17	960.94	2.71	-1.30	-2.39
13,297.00	90.69	12.82	12,295.64	988.81	451.66	1,005.05	3.38	-1.60	-2.98
13,342.00	89.51	10.02	12,295.56	1,032.91	460.57	1,049.46	6.75	-2.62	-6.22
13,387.00	90.95	7.50	12,295.38	1,077.38	467.42	1,094.15	6.45	3.20	-5.60
13,431.00	91.52	5.19	12,294.43	1,121.10	472.28	1,138.02	5.41	1.30	-5.25
13,476.00	92.63	2.66	12,292.80	1,165.96	475.36	1,182.96	6.14	2.47	-5.62
13,520.00	92.50	359.86	12,290.83	1,209.90	476.33	1,226.91	6.36	-0.30	-6.36
13,610.00	91.87	359.03	12,287.40	1,299.83	475.46	1,316.74	1.16	-0.70	-0.92
13,699.00	91.96	358.13	12,284.43	1,388.75	473.25	1,405.52	1.02	0.10	-1.01
13,789.00	91.76	358.34	12,281.51	1,478.66	470.48	1,495.26	0.32	-0.22	0.23
13,878.00	91.50	357.80	12,278.97	1,567.57	467.49	1,584.00	0.67	-0.29	-0.61
13,968.00	91.30	357.50	12,276.77	1,657.47	463.80	1,673.70	0.40	-0.22	-0.33
14,057.00	90.84	357.49	12,275.11	1,746.37	459.91	1,762.39	0.52	-0.52	-0.01
14,146.00	90.53	357.65	12,274.05	1,835.28	456.14	1,851.10	0.39	-0.35	0.18
14,236.00	92.50	357.76	12,271.67	1,925.17	452.53	1,940.79	2.19	2.19	0.12
14,325.00	92.16	357.54	12,268.05	2,014.03	448.89	2,029.44	0.45	-0.38	-0.25
14,415.00	91.53	359.58	12,265.15	2,103.95	446.63	2,119.21	2.37	-0.70	2.27
14,505.00	91.76	0.64	12,262.57	2,193.91	446.80	2,209.12	1.20	0.26	1.18
14,594.00	91.50	0.75	12,260.04	2,282.86	447.88	2,298.05	0.32	-0.29	0.12
14,684.00	90.69	359.46	12,258.32	2,372.85	448.04	2,387.98	1.69	-0.90	-1.43
14,773.00	91.02	359.97	12,256.99	2,461.83	447.60	2,476.89	0.68	0.37	0.57
14,863.00	88.91	358.50	12,257.04	2,551.82	446.40	2,566.76	2.86	-2.34	-1.63
14,952.00	88.61	358.82	12,258.97	2,640.77	444.32	2,655.58	0.49	-0.34	0.36
15,042.00	87.94	359.30	12,261.68	2,730.72	442.84	2,745.41	0.92	-0.74	0.53
15,131.00	89.75	358.42	12,263.47	2,819.68	441.07	2,834.24	2.26	2.03	-0.99
15,221.00	90.25	359.50	12,263.47	2,909.66	439.44	2,924.10	1.32	0.56	1.20
15,311.00	89.41	359.79	12,263.74	2,999.66	438.88	3,014.01	0.99	-0.93	0.32
15,400.00	90.79	358.05	12,263.59	3,088.64	437.20	3,102.86	2.50	1.55	-1.96
15,490.00	91.70	358.95	12,261.63	3,178.58	434.85	3,192.66	1.42	1.01	1.00
15,579.00	91.95	0.00	12,258.80	3,267.53	434.03	3,281.51	1.21	0.28	1.18
15,669.00	91.93	0.36	12,255.75	3,357.48	434.31	3,371.41	0.40	-0.02	0.40
15,758.00	91.87	0.72	12,252.80	3,446.43	435.15	3,460.32	0.41	-0.07	0.40
15,848.00	90.21	357.93	12,251.16	3,536.40	434.09	3,550.19	3.61	-1.84	-3.10
15,937.00	90.05	357.36	12,250.96	3,625.32	430.44	3,638.91	0.67	-0.18	-0.64
16,027.00	91.30	356.86	12,249.90	3,715.20	425.90	3,728.56	1.50	1.39	-0.56



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16,117.00	92.47	359.13	12,246.94	3,805.09	422.75	3,818.26	2.84	1.30	2.52
16,206.00	93.32	0.14	12,242.45	3,893.97	422.18	3,907.06	1.48	0.96	1.13
16,296.00	93.55	0.25	12,237.05	3,983.81	422.49	3,996.85	0.28	0.26	0.12
16,386.00	90.62	0.03	12,233.78	4,073.74	422.71	4,086.72	3.26	-3.26	-0.24
16,475.00	90.98	0.46	12,232.54	4,162.73	423.09	4,175.66	0.63	0.40	0.48
16,564.00	91.21	0.73	12,230.84	4,251.71	424.01	4,264.62	0.40	0.26	0.30
16,654.00	91.10	0.77	12,229.02	4,341.68	425.19	4,354.57	0.13	-0.12	0.04
16,744.00	92.27	0.80	12,226.38	4,431.63	426.42	4,444.50	1.30	1.30	0.03
16,833.00	91.26	0.07	12,223.63	4,520.58	427.10	4,533.42	1.40	-1.13	-0.82
16,923.00	91.42	0.45	12,221.53	4,610.56	427.51	4,623.35	0.46	0.18	0.42
16,972.00	91.16	0.65	12,220.43	4,659.54	427.98	4,672.32	0.67	-0.53	0.41
17,061.00	89.38	358.82	12,220.01	4,748.53	427.57	4,761.23	2.87	-2.00	-2.06
17,151.00	90.61	359.51	12,220.02	4,838.52	426.25	4,851.10	1.57	1.37	0.77
17,241.00	90.72	359.92	12,218.97	4,928.51	425.81	4,941.02	0.47	0.12	0.46
17,330.00	90.93	359.59	12,217.69	5,017.50	425.43	5,029.93	0.44	0.24	-0.37
17,420.00	91.49	357.88	12,215.79	5,107.46	423.44	5,119.75	2.00	0.62	-1.90
17,509.00	92.01	356.55	12,213.07	5,196.31	419.12	5,208.37	1.60	0.58	-1.49
17,598.00	90.36	356.76	12,211.23	5,285.14	413.93	5,296.94	1.87	-1.85	0.24
17,688.00	90.13	356.19	12,210.84	5,374.96	408.39	5,386.50	0.68	-0.26	-0.63
17,777.00	90.76	356.29	12,210.15	5,463.77	402.56	5,475.02	0.72	0.71	0.11
17,867.00	90.65	357.07	12,209.05	5,553.61	397.35	5,564.61	0.88	-0.12	0.87
17,956.00	90.76	358.11	12,207.95	5,642.52	393.60	5,653.32	1.17	0.12	1.17
18,046.00	91.10	359.67	12,206.49	5,732.49	391.86	5,743.16	1.77	0.38	1.73
18,136.00	90.90	359.50	12,204.92	5,822.48	391.21	5,833.05	0.29	-0.22	-0.19
18,225.00	91.01	0.06	12,203.44	5,911.46	390.87	5,921.96	0.64	0.12	0.63
18,315.00	91.18	1.88	12,201.72	6,001.43	392.39	6,011.92	2.03	0.19	2.02
18,404.00	88.64	2.20	12,201.86	6,090.37	395.56	6,100.92	2.88	-2.85	0.36
18,494.00	88.71	2.66	12,203.94	6,180.26	399.37	6,190.89	0.52	0.08	0.51
18,583.00	88.76	3.03	12,205.90	6,269.13	403.79	6,279.86	0.42	0.06	0.42
18,673.00	88.47	2.34	12,208.08	6,359.00	408.00	6,369.83	0.83	-0.32	-0.77
18,763.00	88.88	2.56	12,210.16	6,448.90	411.85	6,459.81	0.52	0.46	0.24
18,853.00	88.68	1.34	12,212.07	6,538.82	414.91	6,549.78	1.37	-0.22	-1.36
18,942.00	88.14	0.63	12,214.54	6,627.78	416.44	6,638.73	1.00	-0.61	-0.80
19,032.00	88.08	0.05	12,217.51	6,717.72	416.98	6,728.64	0.65	-0.07	-0.64
19,122.00	88.82	359.75	12,219.95	6,807.69	416.82	6,818.53	0.89	0.82	-0.33
19,212.00	89.07	359.30	12,221.60	6,897.67	416.07	6,908.42	0.57	0.28	-0.50
19,300.00	88.39	358.45	12,223.55	6,985.63	414.34	6,996.26	1.24	-0.77	-0.97
19,390.00	88.56	356.95	12,225.95	7,075.52	410.73	7,085.95	1.68	0.19	-1.67
19,479.00	87.87	356.46	12,228.72	7,164.33	405.62	7,174.51	0.95	-0.78	-0.55
19,568.00	87.76	356.10	12,232.12	7,253.08	399.85	7,262.97	0.42	-0.12	-0.40
19,658.00	87.54	355.23	12,235.81	7,342.75	393.05	7,352.32	1.00	-0.24	-0.97
19,748.00	87.40	354.82	12,239.78	7,432.32	385.26	7,441.54	0.48	-0.16	-0.46
19,837.00	87.50	354.40	12,243.74	7,520.84	376.90	7,529.68	0.48	0.11	-0.47



Survey Report



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19,927.00	87.70	354.01	12,247.51	7,610.30	367.83	7,618.74	0.49	0.22	-0.43
20,016.00	87.68	353.23	12,251.09	7,698.68	357.94	7,706.68	0.88	-0.02	-0.88
20,106.00	87.42	353.07	12,254.94	7,787.95	347.22	7,795.50	0.34	-0.29	-0.18
20,195.00	87.33	352.45	12,259.02	7,876.15	336.02	7,883.21	0.70	-0.10	-0.70
20,239.00	87.44	352.20	12,261.03	7,919.71	330.14	7,926.52	0.62	0.25	-0.57
20,328.00	87.10	353.64	12,265.26	8,007.93	319.19	8,014.27	1.66	-0.38	1.62
20,418.00	87.40	355.39	12,269.58	8,097.41	310.60	8,103.36	1.97	0.33	1.94
20,507.00	86.45	357.58	12,274.36	8,186.11	305.15	8,191.79	2.68	-1.07	2.46
20,597.00	88.02	357.86	12,278.70	8,275.93	301.57	8,281.42	1.77	1.74	0.31
20,687.00	88.47	359.70	12,281.46	8,365.86	299.66	8,371.22	2.10	0.50	2.04
20,777.00	88.38	0.86	12,283.93	8,455.83	300.09	8,461.13	1.29	-0.10	1.29
20,820.00	88.05	1.41	12,285.27	8,498.80	300.95	8,504.10	1.49	-0.77	1.28
20,910.00	90.16	2.75	12,286.67	8,588.72	304.21	8,594.09	2.78	2.34	1.49
20,999.00	90.42	4.63	12,286.22	8,677.53	309.94	8,683.05	2.13	0.29	2.11
21,089.00	90.70	5.66	12,285.34	8,767.16	318.01	8,772.92	1.19	0.31	1.14
21,178.00	91.29	7.73	12,283.80	8,855.54	328.38	8,861.62	2.42	0.66	2.33
21,268.00	90.58	7.25	12,282.33	8,944.76	340.11	8,951.22	0.95	-0.79	-0.53
21,357.00	88.99	4.91	12,282.66	9,033.25	349.54	9,040.00	3.18	-1.79	-2.63
21,447.00	89.44	3.97	12,283.90	9,122.97	356.51	9,129.92	1.16	0.50	-1.04
21,537.00	89.44	3.34	12,284.78	9,212.78	362.24	9,219.88	0.70	0.00	-0.70
21,626.00	89.78	3.26	12,285.38	9,301.63	367.37	9,308.86	0.39	0.38	-0.09
21,716.00	89.61	2.20	12,285.86	9,391.52	371.65	9,398.85	1.19	-0.19	-1.18
21,805.00	90.41	3.71	12,285.85	9,480.40	376.24	9,487.84	1.92	0.90	1.70
21,895.00	89.39	4.02	12,286.00	9,570.20	382.31	9,577.80	1.18	-1.13	0.34
21,984.00	89.45	2.48	12,286.90	9,659.05	387.35	9,666.78	1.73	0.07	-1.73
22,074.00	89.44	0.73	12,287.78	9,749.00	389.87	9,756.77	1.94	-0.01	-1.94
22,163.00	89.45	358.63	12,288.64	9,837.99	389.38	9,845.67	2.36	0.01	-2.36
22,253.00	88.45	358.08	12,290.29	9,927.94	386.79	9,935.46	1.27	-1.11	-0.61
22,302.00	88.28	357.54	12,291.69	9,976.88	384.92	9,984.30	1.15	-0.35	-1.10
LTP: 22302' MD									
22,342.00	88.14	357.10	12,292.94	10,016.82	383.05	10,024.14	1.15	-0.35	-1.10
Final Phoenix MWD Survey									
22,431.00	88.14	357.10	12,295.82	10,105.66	378.55	10,112.75	0.00	0.00	0.00
Projection to TD									

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 702H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=25' @ 3276.80usft (Precision 595)
Site:	Fez Federal Com	MD Reference:	KB=25' @ 3276.80usft (Precision 595)
Well:	702H	North Reference:	Grid
Wellbore:	OH / 64150	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 595)	Database:	USA Compass

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
11,360.00	11,336.52	-243.63	319.19	Tie In
11,553.00	11,528.38	-240.60	298.48	First Phoenix MWD Survey
12,323.00	12,193.54	51.92	251.82	FTP: 12323' MD
22,302.00	12,291.69	9,976.88	384.92	LTP: 22302' MD
22,342.00	12,292.94	10,016.82	383.05	Final Phoenix MWD Survey
22,431.00	12,295.82	10,105.66	378.55	Projection to TD