



PHOENIX
TECHNOLOGY SERVICES

COG Operating LLC

Lea County, NM (NAD27 NME)
Fez Federal Com
705H

OH / 64139

Design: Surveys (Scan Quest)

Standard Survey Report

06 May, 2019

HOBBS OCD

JAN 15 2020

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Survey Report



Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Site: Fez Federal Com
 Well: 705H
 Wellbore: OH / 64139
 Design: Surveys (Scan Quest)

Local Co-ordinate Reference: Well 705H
 TVD Reference: RKB @ 3292.00usft (Scandril)
 MD Reference: RKB @ 3292.00usft (Scandril)
 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)
 Geo Datum: NAD 1927 (NADCON CONUS)
 Map Zone: New Mexico East 3001

System Datum: Mean Sea Level

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 705H

Well Position: +N/-S 0.00 usft Northing: 415,336.80 usft Latitude: 32° 8' 17.8123 N
 +E/-W 0.00 usft Easting: 795,337.50 usft Longitude: 103° 22' 45.1198 W
 Position Uncertainty 0.00 usft Wellhead Elevation: usft Ground Level: 3,262.00 usft

Wellbore OH / 64139

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	1/31/2019	6.68	59.80	47,834.29744749

Design Surveys (Scan Quest)

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	359.06

Survey Program Date 5/6/2019

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	11,678.00	Scientific Gyros (OH / 64139)	Scientific Keeper	Scientific Drilling Intl. Standard Wireline Keeper
11,848.00	22,679.00	Phoenix MWD Surveys - Post Gyro (OH /	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	66.98	100.00	0.22	0.52	0.21	0.65	0.65	0.00
125.00	0.81	70.25	125.00	0.34	0.82	0.32	0.66	0.64	13.08
150.00	0.92	72.86	149.99	0.46	1.18	0.44	0.47	0.44	10.44
175.00	0.98	77.14	174.99	0.56	1.58	0.54	0.37	0.24	17.12
200.00	1.02	83.54	199.99	0.64	2.01	0.60	0.47	0.16	25.60
225.00	1.00	83.76	224.98	0.68	2.44	0.64	0.08	-0.08	0.88
250.00	0.96	81.73	249.98	0.74	2.87	0.69	0.21	-0.16	-8.12
275.00	1.03	81.30	274.97	0.80	3.30	0.75	0.28	0.28	-1.72
300.00	1.07	80.62	299.97	0.87	3.75	0.81	0.17	0.16	-2.72



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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	1.04	82.94	324.97	0.94	4.21	0.87	0.21	-0.12	9.28
350.00	0.99	83.20	349.96	0.99	4.65	0.92	0.20	-0.20	1.04
375.00	1.11	82.03	374.96	1.05	5.10	0.97	0.49	0.48	-4.68
400.00	1.02	79.63	399.95	1.13	5.56	1.03	0.40	-0.36	-9.60
425.00	1.01	79.44	424.95	1.21	5.99	1.11	0.04	-0.04	-0.76
450.00	0.75	69.45	449.95	1.30	6.36	1.20	1.20	-1.04	-39.96
475.00	0.71	63.75	474.94	1.43	6.66	1.32	0.33	-0.16	-22.80
500.00	0.49	54.64	499.94	1.56	6.88	1.45	0.96	-0.88	-36.44
525.00	0.52	19.71	524.94	1.73	7.01	1.61	1.22	0.12	-139.72
550.00	0.54	357.77	549.94	1.95	7.04	1.84	0.81	0.08	-87.76
575.00	0.63	347.12	574.94	2.21	7.01	2.09	0.56	0.36	-42.60
600.00	0.63	354.85	599.94	2.48	6.96	2.36	0.34	0.00	30.92
625.00	0.61	356.44	624.94	2.75	6.94	2.63	0.11	-0.08	6.36
650.00	0.59	351.11	649.94	3.01	6.91	2.89	0.24	-0.08	-21.32
675.00	0.60	358.36	674.93	3.26	6.89	3.15	0.30	0.04	29.00
700.00	0.62	350.78	699.93	3.53	6.87	3.42	0.33	0.08	-30.32
725.00	0.55	348.61	724.93	3.78	6.82	3.67	0.29	-0.28	-8.68
750.00	0.51	2.36	749.93	4.01	6.80	3.90	0.53	-0.16	55.00
775.00	0.55	357.01	774.93	4.24	6.80	4.13	0.25	0.16	-21.40
800.00	0.47	12.78	799.93	4.46	6.82	4.35	0.64	-0.32	63.08
825.00	0.43	19.89	824.93	4.65	6.87	4.53	0.27	-0.16	28.44
850.00	0.49	22.99	849.93	4.83	6.94	4.72	0.26	0.24	12.40
875.00	0.49	29.84	874.93	5.03	7.04	4.91	0.23	0.00	27.40
900.00	0.44	35.60	899.93	5.20	7.15	5.08	0.27	-0.20	23.04
925.00	0.41	32.40	924.92	5.35	7.25	5.23	0.15	-0.12	-12.80
950.00	0.28	40.97	949.92	5.47	7.34	5.35	0.56	-0.52	34.28
975.00	0.14	65.53	974.92	5.53	7.41	5.41	0.65	-0.56	98.24
1,000.00	0.01	335.31	999.92	5.54	7.43	5.42	0.56	-0.52	-360.88
1,025.00	0.10	180.38	1,024.92	5.52	7.43	5.40	0.44	0.36	-619.72
1,050.00	0.17	215.01	1,049.92	5.47	7.41	5.35	0.42	0.28	138.52
1,075.00	0.28	198.77	1,074.92	5.38	7.37	5.26	0.50	0.44	-64.96
1,100.00	0.49	209.31	1,099.92	5.23	7.30	5.11	0.88	0.84	42.16
1,125.00	0.58	204.51	1,124.92	5.02	7.19	4.91	0.40	0.36	-19.20
1,150.00	0.59	211.37	1,149.92	4.80	7.07	4.68	0.28	0.04	27.44
1,175.00	0.59	210.48	1,174.92	4.58	6.94	4.46	0.04	0.00	-3.56
1,200.00	0.58	208.55	1,199.92	4.36	6.82	4.24	0.09	-0.04	-7.72
1,225.00	0.62	208.29	1,224.92	4.13	6.69	4.02	0.16	0.16	-1.04
1,250.00	0.65	207.78	1,249.92	3.88	6.56	3.77	0.12	0.12	-2.04
1,275.00	0.69	206.81	1,274.91	3.62	6.43	3.52	0.17	0.16	-3.88
1,300.00	0.70	214.29	1,299.91	3.36	6.27	3.26	0.36	0.04	29.92
1,325.00	0.57	202.96	1,324.91	3.12	6.14	3.02	0.72	-0.52	-45.32
1,350.00	0.64	203.00	1,349.91	2.88	6.04	2.78	0.28	0.28	0.16
1,375.00	0.68	203.26	1,374.91	2.61	5.92	2.52	0.16	0.16	1.04



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1,400.00	0.75	205.86	1,399.91	2.33	5.79	2.23	0.31	0.28	10.40
1,425.00	0.67	212.35	1,424.90	2.06	5.64	1.97	0.45	-0.32	25.96
1,450.00	0.85	201.09	1,449.90	1.76	5.50	1.67	0.93	0.72	-45.04
1,475.00	1.02	203.46	1,474.90	1.39	5.34	1.30	0.70	0.68	9.48
1,500.00	1.26	201.51	1,499.89	0.93	5.15	0.84	0.97	0.96	-7.80
1,525.00	1.56	200.89	1,524.89	0.35	4.93	0.27	1.20	1.20	-2.48
1,550.00	1.94	203.10	1,549.87	-0.36	4.64	-0.43	1.54	1.52	8.84
1,575.00	2.43	203.03	1,574.86	-1.23	4.27	-1.30	1.96	1.96	-0.28
1,600.00	2.99	201.59	1,599.83	-2.33	3.82	-2.39	2.26	2.24	-5.76
1,625.00	3.74	202.47	1,624.78	-3.69	3.27	-3.74	3.01	3.00	3.52
1,650.00	4.40	201.72	1,649.72	-5.33	2.61	-5.37	2.65	2.64	-3.00
1,675.00	4.77	200.72	1,674.64	-7.19	1.88	-7.22	1.51	1.48	-4.00
1,700.00	5.20	201.47	1,699.55	-9.22	1.10	-9.24	1.74	1.72	3.00
1,725.00	5.59	201.77	1,724.44	-11.41	0.23	-11.41	1.56	1.56	1.20
1,750.00	5.78	200.23	1,749.31	-13.72	-0.65	-13.70	0.97	0.76	-6.16
1,775.00	5.84	199.96	1,774.18	-16.09	-1.52	-16.07	0.26	0.24	-1.08
1,800.00	5.85	200.25	1,799.05	-18.48	-2.40	-18.44	0.12	0.04	1.16
1,825.00	5.93	199.81	1,823.92	-20.89	-3.28	-20.84	0.37	0.32	-1.76
1,850.00	5.75	200.39	1,848.79	-23.28	-4.15	-23.21	0.76	-0.72	2.32
1,875.00	5.78	199.20	1,873.67	-25.65	-5.00	-25.56	0.49	0.12	-4.76
1,900.00	5.89	200.10	1,898.54	-28.04	-5.85	-27.94	0.57	0.44	3.60
1,925.00	5.83	199.33	1,923.41	-30.44	-6.72	-30.33	0.40	-0.24	-3.08
1,950.00	5.93	199.40	1,948.27	-32.86	-7.57	-32.73	0.40	0.40	0.28
1,975.00	5.91	198.31	1,973.14	-35.30	-8.40	-35.16	0.46	-0.08	-4.36
2,000.00	5.84	197.92	1,998.01	-37.73	-9.19	-37.58	0.32	-0.28	-1.56
2,025.00	5.93	197.38	2,022.88	-40.17	-9.97	-40.00	0.42	0.36	-2.16
2,050.00	5.87	197.47	2,047.75	-42.63	-10.74	-42.44	0.24	-0.24	0.36
2,075.00	5.81	197.96	2,072.62	-45.05	-11.51	-44.85	0.31	-0.24	1.96
2,100.00	5.56	198.29	2,097.49	-47.40	-12.29	-47.19	1.01	-1.00	1.32
2,125.00	5.41	197.66	2,122.38	-49.68	-13.02	-49.46	0.65	-0.60	-2.52
2,150.00	5.21	197.67	2,147.27	-51.88	-13.72	-51.65	0.80	-0.80	0.04
2,175.00	5.12	196.85	2,172.17	-54.03	-14.39	-53.79	0.47	-0.36	-3.28
2,200.00	4.86	196.81	2,197.07	-56.11	-15.02	-55.86	1.04	-1.04	-0.16
2,225.00	4.62	196.65	2,221.99	-58.09	-15.62	-57.82	0.96	-0.96	-0.64
2,250.00	4.43	196.02	2,246.91	-59.98	-16.17	-59.71	0.79	-0.76	-2.52
2,275.00	4.42	194.75	2,271.84	-61.84	-16.68	-61.56	0.39	-0.04	-5.08
2,300.00	4.28	195.32	2,296.76	-63.67	-17.18	-63.38	0.59	-0.56	2.28
2,325.00	4.24	194.84	2,321.70	-65.47	-17.66	-65.17	0.21	-0.16	-1.92
2,350.00	4.37	194.84	2,346.62	-67.28	-18.14	-66.97	0.52	0.52	0.00
2,375.00	4.29	195.37	2,371.55	-69.10	-18.63	-68.79	0.36	-0.32	2.12
2,400.00	4.36	195.10	2,396.48	-70.92	-19.13	-70.60	0.29	0.28	-1.08
2,425.00	4.37	194.21	2,421.41	-72.76	-19.61	-72.43	0.27	0.04	-3.56
2,450.00	4.30	194.16	2,446.34	-74.59	-20.07	-74.25	0.28	-0.28	-0.20



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2,475.00	4.23	193.46	2,471.27	-76.40	-20.51	-76.05	0.35	-0.28	-2.80
2,500.00	4.20	194.07	2,496.20	-78.18	-20.95	-77.83	0.22	-0.12	2.44
2,525.00	4.24	193.29	2,521.13	-79.97	-21.39	-79.61	0.28	0.16	-3.12
2,550.00	4.23	192.10	2,546.07	-81.77	-21.79	-81.40	0.35	-0.04	-4.76
2,575.00	4.15	192.05	2,571.00	-83.56	-22.17	-83.18	0.32	-0.32	-0.20
2,600.00	4.07	192.31	2,595.93	-85.31	-22.55	-84.93	0.33	-0.32	1.04
2,625.00	4.03	191.74	2,620.87	-87.04	-22.92	-86.65	0.23	-0.16	-2.28
2,650.00	3.98	191.06	2,645.81	-88.75	-23.27	-88.36	0.28	-0.20	-2.72
2,675.00	4.05	190.51	2,670.75	-90.47	-23.59	-90.07	0.32	0.28	-2.20
2,700.00	4.00	190.28	2,695.69	-92.19	-23.91	-91.79	0.21	-0.20	-0.92
2,725.00	4.17	189.47	2,720.62	-93.95	-24.22	-93.54	0.72	0.68	-3.24
2,750.00	4.08	189.83	2,745.56	-95.72	-24.52	-95.31	0.37	-0.36	1.44
2,775.00	4.04	191.38	2,770.50	-97.46	-24.84	-97.04	0.47	-0.16	6.20
2,800.00	4.14	192.35	2,795.43	-99.21	-25.21	-98.78	0.49	0.40	3.88
2,825.00	4.00	192.97	2,820.37	-100.94	-25.60	-100.50	0.59	-0.56	2.48
2,850.00	4.07	195.35	2,845.31	-102.64	-26.03	-102.20	0.73	0.28	9.52
2,875.00	4.23	198.10	2,870.24	-104.37	-26.55	-103.92	1.02	0.64	11.00
2,900.00	4.41	199.90	2,895.17	-106.15	-27.16	-105.69	0.90	0.72	7.20
2,925.00	4.28	200.22	2,920.10	-107.93	-27.81	-107.46	0.53	-0.52	1.28
2,950.00	4.31	200.41	2,945.03	-109.69	-28.46	-109.21	0.13	0.12	0.76
2,975.00	4.24	200.46	2,969.96	-111.44	-29.11	-110.94	0.28	-0.28	0.20
3,000.00	4.33	200.08	2,994.89	-113.19	-29.76	-112.68	0.38	0.36	-1.52
3,025.00	4.22	200.60	3,019.82	-114.94	-30.41	-114.42	0.47	-0.44	2.08
3,050.00	4.13	199.62	3,044.75	-116.64	-31.03	-116.12	0.46	-0.36	-3.92
3,075.00	4.08	201.07	3,069.69	-118.32	-31.66	-117.79	0.46	-0.20	5.80
3,100.00	4.02	200.24	3,094.63	-119.97	-32.28	-119.43	0.34	-0.24	-3.32
3,125.00	4.08	201.33	3,119.56	-121.62	-32.91	-121.07	0.39	0.24	4.36
3,150.00	4.04	200.97	3,144.50	-123.28	-33.54	-122.71	0.19	-0.16	-1.44
3,175.00	4.12	201.40	3,169.44	-124.93	-34.19	-124.36	0.34	0.32	1.72
3,200.00	4.10	200.33	3,194.37	-126.61	-34.83	-126.02	0.32	-0.08	-4.28
3,225.00	4.25	203.54	3,219.31	-128.30	-35.51	-127.70	1.11	0.60	12.84
3,250.00	4.35	206.67	3,244.24	-129.99	-36.30	-129.38	1.02	0.40	12.52
3,275.00	4.60	210.18	3,269.16	-131.71	-37.23	-131.08	1.48	1.00	14.04
3,300.00	4.55	211.33	3,294.08	-133.42	-38.25	-132.77	0.42	-0.20	4.60
3,325.00	4.60	212.34	3,319.00	-135.11	-39.30	-134.45	0.38	0.20	4.04
3,350.00	4.65	211.74	3,343.92	-136.82	-40.37	-136.14	0.28	0.20	-2.40
3,375.00	4.68	211.29	3,368.84	-138.56	-41.43	-137.86	0.19	0.12	-1.80
3,400.00	4.56	211.65	3,393.76	-140.27	-42.49	-139.56	0.49	-0.48	1.44
3,425.00	4.51	211.81	3,418.68	-141.95	-43.53	-141.22	0.21	-0.20	0.64
3,450.00	4.36	211.39	3,443.60	-143.60	-44.54	-142.85	0.61	-0.60	-1.68
3,475.00	4.22	211.75	3,468.53	-145.19	-45.52	-144.43	0.57	-0.56	1.44
3,500.00	4.07	210.69	3,493.47	-146.74	-46.45	-145.96	0.67	-0.60	-4.24
3,525.00	4.01	210.59	3,518.41	-148.26	-47.35	-147.46	0.24	-0.24	-0.40
3,550.00	3.89	210.48	3,543.35	-149.74	-48.23	-148.93	0.48	-0.48	-0.44



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Design: Surveys (Scan Quest)

Local Co-ordinate Reference: Well 705H
TVD Reference: RKB @ 3292.00usft (Scandril)
MD Reference: RKB @ 3292.00usft (Scandril)
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	3.91	210.47	3,568.29	-151.20	-49.09	-150.38	0.08	0.08	-0.04
3,600.00	3.94	210.28	3,593.23	-152.68	-49.95	-151.84	0.13	0.12	-0.76
3,625.00	3.97	210.34	3,618.17	-154.17	-50.82	-153.32	0.12	0.12	0.24
3,650.00	4.46	207.88	3,643.10	-155.77	-51.72	-154.91	2.09	1.96	-9.84
3,675.00	4.64	207.38	3,668.02	-157.53	-52.64	-156.65	0.74	0.72	-2.00
3,700.00	4.76	206.07	3,692.94	-159.36	-53.56	-158.46	0.64	0.48	-5.24
3,725.00	4.84	205.83	3,717.85	-161.24	-54.47	-160.33	0.33	0.32	-0.96
3,750.00	4.83	205.74	3,742.76	-163.14	-55.39	-162.21	0.05	-0.04	-0.36
3,775.00	4.87	206.39	3,767.67	-165.04	-56.32	-164.09	0.27	0.16	2.60
3,800.00	4.98	204.69	3,792.58	-166.98	-57.24	-166.01	0.73	0.44	-6.80
3,825.00	5.30	203.39	3,817.48	-169.02	-58.15	-168.05	1.36	1.28	-5.20
3,850.00	5.51	202.09	3,842.37	-171.19	-59.06	-170.20	0.97	0.84	-5.20
3,875.00	5.63	202.35	3,867.25	-173.44	-59.98	-172.43	0.49	0.48	1.04
3,900.00	5.55	202.17	3,892.13	-175.69	-60.90	-174.67	0.33	-0.32	-0.72
3,925.00	5.50	202.39	3,917.02	-177.92	-61.82	-176.88	0.22	-0.20	0.88
3,950.00	5.55	201.86	3,941.90	-180.15	-62.72	-179.10	0.29	0.20	-2.12
3,975.00	5.38	202.44	3,966.79	-182.36	-63.62	-181.29	0.71	-0.68	2.32
4,000.00	5.16	203.33	3,991.68	-184.47	-64.51	-183.39	0.94	-0.88	3.56
4,025.00	5.07	202.72	4,016.58	-186.52	-65.39	-185.43	0.42	-0.36	-2.44
4,050.00	4.95	202.39	4,041.49	-188.54	-66.22	-187.43	0.49	-0.48	-1.32
4,075.00	4.86	201.51	4,066.39	-190.52	-67.02	-189.40	0.47	-0.36	-3.52
4,100.00	4.73	201.23	4,091.31	-192.47	-67.78	-191.33	0.53	-0.52	-1.12
4,125.00	4.56	201.41	4,116.23	-194.35	-68.52	-193.20	0.68	-0.68	0.72
4,150.00	4.43	200.15	4,141.15	-196.18	-69.21	-195.02	0.65	-0.52	-5.04
4,175.00	4.36	201.01	4,166.07	-197.98	-69.89	-196.81	0.38	-0.28	3.44
4,200.00	4.26	199.10	4,191.00	-199.74	-70.53	-198.56	0.70	-0.40	-7.64
4,225.00	4.13	198.97	4,215.94	-201.47	-71.13	-200.28	0.52	-0.52	-0.52
4,250.00	3.98	199.10	4,240.87	-203.14	-71.71	-201.94	0.60	-0.60	0.52
4,275.00	3.88	198.11	4,265.82	-204.77	-72.25	-203.55	0.48	-0.40	-3.96
4,300.00	3.85	195.80	4,290.76	-206.38	-72.74	-205.16	0.63	-0.12	-9.24
4,325.00	3.66	192.34	4,315.71	-207.96	-73.14	-206.74	1.18	-0.76	-13.84
4,350.00	3.51	191.66	4,340.66	-209.49	-73.47	-208.26	0.62	-0.60	-2.72
4,375.00	3.54	186.62	4,365.61	-211.01	-73.71	-209.77	1.24	0.12	-20.16
4,400.00	3.51	181.79	4,390.56	-212.54	-73.82	-211.30	1.19	-0.12	-19.32
4,425.00	3.57	176.81	4,415.51	-214.08	-73.81	-212.85	1.25	0.24	-19.92
4,450.00	3.52	171.88	4,440.47	-215.62	-73.65	-214.38	1.24	-0.20	-19.72
4,475.00	3.39	171.51	4,465.42	-217.11	-73.44	-215.88	0.53	-0.52	-1.48
4,500.00	3.48	171.42	4,490.38	-218.59	-73.21	-217.36	0.36	0.36	-0.36
4,525.00	3.44	170.72	4,515.33	-220.08	-72.98	-218.86	0.23	-0.16	-2.80
4,550.00	3.36	172.46	4,540.29	-221.55	-72.76	-220.33	0.52	-0.32	6.96
4,575.00	3.10	172.90	4,565.25	-222.95	-72.58	-221.73	1.04	-1.04	1.76
4,600.00	2.85	173.77	4,590.21	-224.24	-72.43	-223.02	1.02	-1.00	3.48
4,625.00	2.67	172.83	4,615.18	-225.43	-72.29	-224.22	0.74	-0.72	-3.76



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 705H
Wellbore: OH / 64139
Design: Surveys (Scan Quest)

Local Co-ordinate Reference: Well 705H
TVD Reference: RKB @ 3292.00usft (Scandril)
MD Reference: RKB @ 3292.00usft (Scandril)
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)
4,650.00	2.33	178.05	4,640.16	-226.52	-72.20	-225.30	1.64	-1.36	20.88
4,675.00	1.95	179.50	4,665.14	-227.45	-72.18	-226.24	1.54	-1.52	5.80
4,700.00	1.79	182.07	4,690.13	-228.27	-72.19	-227.05	0.72	-0.64	10.28
4,725.00	1.59	179.53	4,715.12	-229.00	-72.20	-227.79	0.85	-0.80	-10.16
4,750.00	1.43	182.68	4,740.11	-229.66	-72.21	-228.45	0.72	-0.64	12.60
4,775.00	1.19	184.01	4,765.10	-230.23	-72.25	-229.02	0.97	-0.96	5.32
4,800.00	1.03	182.16	4,790.10	-230.71	-72.27	-229.50	0.66	-0.64	-7.40
4,825.00	0.81	181.86	4,815.10	-231.12	-72.29	-229.90	0.88	-0.88	-1.20
4,850.00	0.71	180.33	4,840.09	-231.45	-72.29	-230.23	0.41	-0.40	-6.12
4,875.00	0.68	178.73	4,865.09	-231.75	-72.29	-230.53	0.14	-0.12	-6.40
4,900.00	0.65	181.71	4,890.09	-232.04	-72.29	-230.82	0.18	-0.12	11.92
4,925.00	0.67	183.56	4,915.09	-232.33	-72.31	-231.11	0.12	0.08	7.40
4,950.00	0.68	186.15	4,940.09	-232.62	-72.33	-231.41	0.13	0.04	10.36
4,975.00	0.62	199.31	4,965.08	-232.90	-72.39	-231.68	0.64	-0.24	52.64
5,000.00	0.68	194.35	4,990.08	-233.17	-72.47	-231.95	0.33	0.24	-19.84
5,025.00	0.59	207.34	5,015.08	-233.43	-72.57	-232.21	0.68	-0.36	51.96
5,050.00	0.77	231.22	5,040.08	-233.65	-72.76	-232.42	1.33	0.72	95.52
5,075.00	1.43	254.86	5,065.08	-233.83	-73.19	-232.60	3.15	2.64	94.56
5,100.00	1.56	256.44	5,090.07	-233.99	-73.82	-232.75	0.55	0.52	6.32
5,125.00	1.60	259.76	5,115.06	-234.14	-74.50	-232.88	0.40	0.16	13.28
5,150.00	1.61	259.70	5,140.05	-234.26	-75.19	-233.00	0.04	0.04	-0.24
5,175.00	1.56	259.68	5,165.04	-234.38	-75.87	-233.11	0.20	-0.20	-0.08
5,200.00	1.29	263.79	5,190.03	-234.48	-76.48	-233.19	1.15	-1.08	16.44
5,225.00	1.04	287.18	5,215.03	-234.44	-76.98	-233.15	2.13	-1.00	93.56
5,250.00	0.91	301.43	5,240.02	-234.27	-77.36	-232.97	1.10	-0.52	57.00
5,275.00	0.92	306.03	5,265.02	-234.05	-77.70	-232.74	0.30	0.04	18.40
5,300.00	0.96	307.64	5,290.02	-233.80	-78.02	-232.49	0.19	0.16	6.44
5,325.00	0.95	305.63	5,315.01	-233.55	-78.36	-232.24	0.14	-0.04	-8.04
5,350.00	0.96	305.90	5,340.01	-233.31	-78.70	-231.99	0.04	0.04	1.08
5,375.00	1.02	306.38	5,365.00	-233.05	-79.04	-231.73	0.24	0.24	1.92
5,400.00	0.99	305.75	5,390.00	-232.80	-79.40	-231.46	0.13	-0.12	-2.52
5,425.00	1.04	303.04	5,415.00	-232.55	-79.76	-231.21	0.28	0.20	-10.84
5,450.00	1.06	306.57	5,439.99	-232.28	-80.14	-230.94	0.27	0.08	14.12
5,475.00	0.95	312.08	5,464.99	-232.01	-80.48	-230.66	0.59	-0.44	22.04
5,500.00	0.99	309.08	5,489.98	-231.73	-80.80	-230.38	0.26	0.16	-12.00
5,525.00	1.00	305.33	5,514.98	-231.47	-81.15	-230.11	0.26	0.04	-15.00
5,550.00	0.95	308.11	5,539.98	-231.22	-81.49	-229.85	0.28	-0.20	11.12
5,575.00	0.97	306.79	5,564.97	-230.96	-81.82	-229.59	0.12	0.08	-5.28
5,600.00	1.08	304.81	5,589.97	-230.70	-82.18	-229.32	0.46	0.44	-7.92
5,625.00	1.03	307.14	5,614.97	-230.43	-82.56	-229.05	0.26	-0.20	9.32
5,650.00	0.93	305.83	5,639.96	-230.18	-82.90	-228.79	0.41	-0.40	-5.24
5,675.00	1.00	306.09	5,664.96	-229.93	-83.24	-228.53	0.28	0.28	1.04
5,700.00	0.98	307.26	5,689.95	-229.67	-83.59	-228.27	0.11	-0.08	4.68



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 705H
Wellbore: OH / 64139
Design: Surveys (Scan Quest)

Local Co-ordinate Reference: Well 705H
TVD Reference: RKB @ 3292.00usft (Scandril)
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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)
5,725.00	0.97	306.64	5,714.95	-229.42	-83.93	-228.01	0.06	-0.04	-2.48
5,750.00	0.99	307.76	5,739.95	-229.16	-84.27	-227.74	0.11	0.08	4.48
5,775.00	0.98	304.49	5,764.94	-228.90	-84.61	-227.49	0.23	-0.04	-13.08
5,800.00	0.93	304.88	5,789.94	-228.67	-84.96	-227.24	0.20	-0.20	1.56
5,825.00	1.02	307.96	5,814.94	-228.41	-85.30	-226.98	0.42	0.36	12.32
5,850.00	1.01	307.65	5,839.93	-228.14	-85.65	-226.71	0.05	-0.04	-1.24
5,875.00	0.83	305.71	5,864.93	-227.90	-85.97	-226.46	0.73	-0.72	-7.76
5,900.00	0.63	307.37	5,889.93	-227.71	-86.23	-226.27	0.80	-0.80	6.64
5,925.00	0.39	309.76	5,914.93	-227.57	-86.40	-226.13	0.96	-0.96	9.56
5,950.00	0.41	313.57	5,939.93	-227.46	-86.53	-226.01	0.13	0.08	15.24
5,975.00	0.41	304.34	5,964.93	-227.35	-86.67	-225.90	0.26	0.00	-36.92
6,000.00	0.38	307.82	5,989.92	-227.25	-86.81	-225.79	0.15	-0.12	13.92
6,025.00	0.45	308.85	6,014.92	-227.13	-86.95	-225.68	0.28	0.28	4.12
6,050.00	0.37	318.53	6,039.92	-227.01	-87.08	-225.55	0.42	-0.32	38.72
6,075.00	0.36	321.61	6,064.92	-226.89	-87.18	-225.43	0.09	-0.04	12.32
6,100.00	0.49	312.31	6,089.92	-226.76	-87.31	-225.29	0.59	0.52	-37.20
6,125.00	0.53	310.25	6,114.92	-226.61	-87.48	-225.14	0.18	0.16	-8.24
6,150.00	0.48	320.43	6,139.92	-226.45	-87.63	-224.99	0.41	-0.20	40.72
6,175.00	0.48	318.47	6,164.92	-226.29	-87.77	-224.82	0.07	0.00	-7.84
6,200.00	0.49	322.21	6,189.92	-226.13	-87.90	-224.66	0.13	0.04	14.96
6,225.00	0.45	329.36	6,214.92	-225.96	-88.02	-224.49	0.28	-0.16	28.60
6,250.00	0.55	323.89	6,239.92	-225.78	-88.14	-224.31	0.44	0.40	-21.88
6,275.00	0.47	326.74	6,264.92	-225.60	-88.27	-224.12	0.34	-0.32	11.40
6,300.00	0.40	330.03	6,289.92	-225.44	-88.37	-223.96	0.30	-0.28	13.16
6,325.00	0.44	335.43	6,314.91	-225.27	-88.45	-223.79	0.22	0.16	21.60
6,350.00	0.47	342.79	6,339.91	-225.09	-88.52	-223.61	0.26	0.12	29.44
6,375.00	0.43	344.02	6,364.91	-224.90	-88.58	-223.42	0.16	-0.16	4.92
6,400.00	0.43	350.85	6,389.91	-224.72	-88.62	-223.23	0.20	0.00	27.32
6,425.00	0.39	356.36	6,414.91	-224.54	-88.64	-223.06	0.22	-0.16	22.04
6,450.00	0.39	343.64	6,439.91	-224.37	-88.67	-222.89	0.35	0.00	-50.88
6,475.00	0.43	352.68	6,464.91	-224.20	-88.70	-222.71	0.30	0.16	36.16
6,500.00	0.38	347.47	6,489.91	-224.02	-88.73	-222.54	0.25	-0.20	-20.84
6,525.00	0.40	345.78	6,514.91	-223.86	-88.77	-222.37	0.09	0.08	-6.76
6,550.00	0.39	348.88	6,539.91	-223.69	-88.81	-222.21	0.09	-0.04	12.40
6,575.00	0.38	347.30	6,564.91	-223.53	-88.85	-222.04	0.06	-0.04	-6.32
6,600.00	0.48	353.77	6,589.91	-223.34	-88.88	-221.86	0.44	0.40	25.88
6,625.00	0.42	354.69	6,614.91	-223.15	-88.90	-221.66	0.24	-0.24	3.68
6,650.00	0.39	1.06	6,639.91	-222.97	-88.90	-221.48	0.22	-0.12	25.48
6,675.00	0.35	355.65	6,664.91	-222.81	-88.91	-221.32	0.21	-0.16	-21.64
6,700.00	0.51	9.67	6,689.90	-222.62	-88.89	-221.14	0.76	0.64	56.08
6,725.00	0.46	12.70	6,714.90	-222.42	-88.85	-220.93	0.22	-0.20	12.12
6,750.00	0.39	2.49	6,739.90	-222.23	-88.83	-220.75	0.41	-0.28	-40.84
6,775.00	0.41	358.16	6,764.90	-222.06	-88.83	-220.57	0.14	0.08	-17.32
6,800.00	0.38	2.23	6,789.90	-221.89	-88.83	-220.40	0.16	-0.12	16.28



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 705H
Wellbore: OH / 64139
Design: Surveys (Scan Quest)

Local Co-ordinate Reference: Well 705H
TVD Reference: RKB @ 3292.00usft (Scandril)
MD Reference: RKB @ 3292.00usft (Scandril)
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)
6,825.00	0.45	7.05	6,814.90	-221.71	-88.81	-220.22	0.31	0.28	19.28
6,850.00	0.45	358.44	6,839.90	-221.51	-88.80	-220.03	0.27	0.00	-34.44
6,875.00	0.38	15.12	6,864.90	-221.33	-88.78	-219.85	0.56	-0.28	66.72
6,900.00	0.43	10.05	6,889.90	-221.16	-88.74	-219.68	0.25	0.20	-20.28
6,925.00	0.52	17.12	6,914.90	-220.96	-88.69	-219.48	0.43	0.36	28.28
6,950.00	0.47	25.27	6,939.90	-220.76	-88.62	-219.28	0.34	-0.20	32.60
6,975.00	0.35	24.13	6,964.90	-220.60	-88.54	-219.11	0.48	-0.48	-4.56
7,000.00	0.50	22.15	6,989.90	-220.42	-88.47	-218.94	0.60	0.60	-7.92
7,025.00	0.43	21.17	7,014.90	-220.24	-88.40	-218.76	0.28	-0.28	-3.92
7,050.00	0.46	20.53	7,039.89	-220.05	-88.33	-218.58	0.12	0.12	-2.56
7,075.00	0.55	27.48	7,064.89	-219.85	-88.24	-218.38	0.43	0.36	27.80
7,100.00	0.50	36.83	7,089.89	-219.66	-88.11	-218.19	0.40	-0.20	37.40
7,125.00	0.44	41.22	7,114.89	-219.50	-87.99	-218.03	0.28	-0.24	17.56
7,150.00	0.39	46.25	7,139.89	-219.37	-87.86	-217.90	0.25	-0.20	20.12
7,175.00	0.42	55.81	7,164.89	-219.26	-87.72	-217.79	0.30	0.12	38.24
7,200.00	0.36	54.18	7,189.89	-219.16	-87.58	-217.70	0.24	-0.24	-6.52
7,225.00	0.46	57.29	7,214.89	-219.06	-87.44	-217.60	0.41	0.40	12.44
7,250.00	0.39	61.35	7,239.89	-218.97	-87.28	-217.51	0.30	-0.28	16.24
7,275.00	0.41	66.13	7,264.89	-218.89	-87.12	-217.43	0.16	0.08	19.12
7,300.00	0.42	63.23	7,289.89	-218.81	-86.96	-217.36	0.09	0.04	-11.60
7,325.00	0.47	67.25	7,314.89	-218.73	-86.78	-217.28	0.24	0.20	16.08
7,350.00	0.44	62.83	7,339.89	-218.65	-86.60	-217.20	0.18	-0.12	-17.68
7,375.00	0.44	68.45	7,364.88	-218.57	-86.43	-217.12	0.17	0.00	22.48
7,400.00	0.49	69.01	7,389.88	-218.50	-86.24	-217.05	0.20	0.20	2.24
7,425.00	0.48	73.18	7,414.88	-218.43	-86.04	-216.99	0.15	-0.04	16.68
7,450.00	0.46	67.19	7,439.88	-218.36	-85.84	-216.92	0.21	-0.08	-23.96
7,475.00	0.34	85.63	7,464.88	-218.31	-85.68	-216.88	0.70	-0.48	73.76
7,500.00	0.44	114.98	7,489.88	-218.35	-85.52	-216.92	0.88	0.40	117.40
7,525.00	0.49	123.42	7,514.88	-218.45	-85.34	-217.02	0.34	0.20	33.76
7,550.00	0.54	123.21	7,539.88	-218.57	-85.15	-217.15	0.20	0.20	-0.84
7,575.00	0.53	126.34	7,564.88	-218.70	-84.96	-217.28	0.12	-0.04	12.52
7,600.00	0.51	130.09	7,589.88	-218.84	-84.78	-217.42	0.16	-0.08	15.00
7,625.00	0.54	132.20	7,614.88	-218.99	-84.61	-217.58	0.14	0.12	8.44
7,650.00	0.48	131.58	7,639.88	-219.14	-84.45	-217.73	0.24	-0.24	-2.48
7,675.00	0.57	131.07	7,664.87	-219.29	-84.27	-217.88	0.36	0.36	-2.04
7,700.00	0.51	121.96	7,689.87	-219.44	-84.08	-218.03	0.42	-0.24	-36.44
7,725.00	0.53	132.68	7,714.87	-219.57	-83.91	-218.17	0.40	0.08	42.88
7,750.00	0.56	131.36	7,739.87	-219.73	-83.73	-218.33	0.13	0.12	-5.28
7,775.00	0.50	131.76	7,764.87	-219.88	-83.56	-218.49	0.24	-0.24	1.60
7,800.00	0.55	128.99	7,789.87	-220.03	-83.38	-218.64	0.22	0.20	-11.08
7,825.00	0.58	129.71	7,814.87	-220.19	-83.19	-218.80	0.12	0.12	2.88
7,850.00	0.52	130.52	7,839.87	-220.34	-83.01	-218.95	0.24	-0.24	3.24
7,875.00	0.61	131.54	7,864.87	-220.51	-82.82	-219.12	0.36	0.36	4.08



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 705H
Wellbore: OH / 64139
Design: Surveys (Scan Quest)

Local Co-ordinate Reference: Well 705H
TVD Reference: RKB @ 3292.00usft (Scandril)
MD Reference: RKB @ 3292.00usft (Scandril)
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	0.60	140.98	7,889.86	-220.70	-82.64	-219.31	0.40	-0.04	37.76
7,925.00	0.59	146.48	7,914.86	-220.90	-82.49	-219.52	0.23	-0.04	22.00
7,950.00	0.64	142.92	7,939.86	-221.12	-82.33	-219.74	0.25	0.20	-14.24
7,975.00	0.69	146.15	7,964.86	-221.36	-82.16	-219.98	0.25	0.20	12.92
8,000.00	0.72	140.72	7,989.86	-221.61	-81.98	-220.23	0.29	0.12	-21.72
8,025.00	0.55	145.86	8,014.86	-221.83	-81.81	-220.46	0.72	-0.68	20.56
8,050.00	0.71	141.62	8,039.85	-222.05	-81.65	-220.68	0.67	0.64	-16.96
8,075.00	0.74	140.49	8,064.85	-222.29	-81.45	-220.93	0.13	0.12	-4.52
8,100.00	0.68	137.87	8,089.85	-222.53	-81.25	-221.17	0.27	-0.24	-10.48
8,125.00	0.79	139.51	8,114.85	-222.77	-81.04	-221.41	0.45	0.44	6.56
8,150.00	0.81	142.75	8,139.85	-223.04	-80.82	-221.69	0.20	0.08	12.96
8,175.00	0.79	143.46	8,164.84	-223.32	-80.61	-221.97	0.09	-0.08	2.84
8,200.00	0.75	140.26	8,189.84	-223.59	-80.40	-222.24	0.23	-0.16	-12.80
8,225.00	0.72	141.87	8,214.84	-223.83	-80.20	-222.49	0.15	-0.12	6.44
8,250.00	0.82	140.04	8,239.84	-224.10	-79.99	-222.75	0.41	0.40	-7.32
8,275.00	0.82	138.86	8,264.83	-224.37	-79.75	-223.03	0.07	0.00	-4.72
8,300.00	0.77	139.84	8,289.83	-224.63	-79.53	-223.30	0.21	-0.20	3.92
8,325.00	0.86	138.23	8,314.83	-224.90	-79.30	-223.57	0.37	0.36	-6.44
8,350.00	0.90	137.20	8,339.83	-225.18	-79.04	-223.86	0.17	0.16	-4.12
8,375.00	0.97	135.03	8,364.82	-225.48	-78.75	-224.16	0.31	0.28	-8.68
8,400.00	0.97	133.97	8,389.82	-225.77	-78.45	-224.46	0.07	0.00	-4.24
8,425.00	0.99	139.80	8,414.82	-226.08	-78.16	-224.77	0.41	0.08	23.32
8,450.00	1.04	135.36	8,439.81	-226.41	-77.86	-225.10	0.37	0.20	-17.76
8,475.00	0.91	134.35	8,464.81	-226.71	-77.56	-225.41	0.52	-0.52	-4.04
8,500.00	0.94	135.95	8,489.81	-227.00	-77.28	-225.70	0.16	0.12	6.40
8,525.00	1.02	137.75	8,514.80	-227.31	-76.98	-226.02	0.34	0.32	7.20
8,550.00	0.90	136.99	8,539.80	-227.62	-76.70	-226.33	0.48	-0.48	-3.04
8,575.00	0.80	137.83	8,564.80	-227.89	-76.45	-226.61	0.40	-0.40	3.36
8,600.00	0.93	131.22	8,589.79	-228.15	-76.18	-226.87	0.65	0.52	-26.44
8,625.00	0.86	134.84	8,614.79	-228.42	-75.89	-227.15	0.36	-0.28	14.48
8,650.00	0.80	132.79	8,639.79	-228.67	-75.63	-227.40	0.27	-0.24	-8.20
8,675.00	0.81	134.65	8,664.78	-228.91	-75.38	-227.65	0.11	0.04	7.44
8,700.00	0.82	129.79	8,689.78	-229.15	-75.12	-227.89	0.28	0.04	-19.44
8,725.00	0.85	126.16	8,714.78	-229.38	-74.83	-228.12	0.24	0.12	-14.52
8,750.00	0.79	131.16	8,739.78	-229.60	-74.55	-228.35	0.37	-0.24	20.00
8,775.00	0.84	128.80	8,764.77	-229.83	-74.28	-228.58	0.24	0.20	-9.44
8,800.00	0.87	130.62	8,789.77	-230.07	-73.99	-228.82	0.16	0.12	7.28
8,825.00	0.76	137.41	8,814.77	-230.31	-73.73	-229.07	0.58	-0.44	27.16
8,850.00	0.63	138.57	8,839.77	-230.54	-73.53	-229.30	0.52	-0.52	4.64
8,875.00	0.67	152.71	8,864.77	-230.77	-73.37	-229.54	0.66	0.16	56.56
8,900.00	0.73	151.79	8,889.76	-231.04	-73.23	-229.81	0.24	0.24	-3.68
8,925.00	0.71	157.44	8,914.76	-231.32	-73.09	-230.09	0.29	-0.08	22.60
8,950.00	0.72	155.74	8,939.76	-231.61	-72.97	-230.38	0.09	0.04	-6.80



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 705H
Wellbore: OH / 64139
Design: Surveys (Scan Quest)

Local Co-ordinate Reference: Well 705H
TVD Reference: RKB @ 3292.00usft (Scandril)
MD Reference: RKB @ 3292.00usft (Scandril)
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	0.73	157.71	8,964.76	-231.90	-72.85	-230.67	0.11	0.04	7.88
9,000.00	0.66	153.70	8,989.76	-232.18	-72.72	-230.95	0.34	-0.28	-16.04
9,025.00	0.70	149.65	9,014.75	-232.44	-72.58	-231.22	0.25	0.16	-16.20
9,050.00	0.67	139.44	9,039.75	-232.68	-72.41	-231.46	0.50	-0.12	-40.84
9,075.00	0.66	131.83	9,064.75	-232.89	-72.21	-231.67	0.36	-0.04	-30.44
9,100.00	0.58	124.34	9,089.75	-233.05	-71.99	-231.84	0.45	-0.32	-29.96
9,125.00	0.60	118.73	9,114.75	-233.19	-71.78	-231.98	0.24	0.08	-22.44
9,150.00	0.55	112.51	9,139.75	-233.30	-71.55	-232.09	0.32	-0.20	-24.88
9,175.00	0.52	110.85	9,164.75	-233.38	-71.33	-232.18	0.14	-0.12	-6.64
9,200.00	0.54	104.82	9,189.74	-233.45	-71.11	-232.26	0.24	0.08	-24.12
9,225.00	0.58	107.75	9,214.74	-233.52	-70.88	-232.33	0.20	0.16	11.72
9,250.00	0.53	101.20	9,239.74	-233.58	-70.64	-232.39	0.32	-0.20	-26.20
9,275.00	0.56	97.63	9,264.74	-233.62	-70.41	-232.44	0.18	0.12	-14.28
9,300.00	0.32	110.22	9,289.74	-233.66	-70.22	-232.48	1.03	-0.96	50.36
9,325.00	0.10	81.30	9,314.74	-233.68	-70.14	-232.50	0.95	-0.88	-115.68
9,350.00	0.05	80.69	9,339.74	-233.68	-70.10	-232.50	0.20	-0.20	-2.44
9,375.00	0.22	306.59	9,364.74	-233.65	-70.13	-232.47	1.03	0.68	-536.40
9,400.00	0.39	278.86	9,389.74	-233.61	-70.25	-232.42	0.88	0.68	-110.92
9,425.00	0.41	291.22	9,414.74	-233.56	-70.42	-232.38	0.35	0.08	49.44
9,450.00	0.58	293.80	9,439.74	-233.48	-70.62	-232.29	0.69	0.68	10.32
9,475.00	0.55	282.20	9,464.74	-233.40	-70.85	-232.21	0.47	-0.12	-46.40
9,500.00	0.50	287.97	9,489.74	-233.34	-71.07	-232.15	0.29	-0.20	23.08
9,525.00	0.64	285.27	9,514.73	-233.27	-71.31	-232.07	0.57	0.56	-10.80
9,550.00	0.61	292.17	9,539.73	-233.18	-71.57	-231.98	0.32	-0.12	27.60
9,575.00	0.71	280.45	9,564.73	-233.11	-71.85	-231.90	0.67	0.40	-46.88
9,600.00	0.93	291.45	9,589.73	-233.00	-72.19	-231.79	1.08	0.88	44.00
9,625.00	0.79	282.82	9,614.73	-232.89	-72.54	-231.67	0.76	-0.56	-34.52
9,650.00	0.91	283.51	9,639.72	-232.81	-72.91	-231.58	0.48	0.48	2.76
9,675.00	0.90	277.11	9,664.72	-232.74	-73.29	-231.50	0.41	-0.04	-25.60
9,700.00	0.95	277.74	9,689.72	-232.68	-73.69	-231.45	0.20	0.20	2.52
9,725.00	1.12	277.73	9,714.71	-232.62	-74.14	-231.38	0.68	0.68	-0.04
9,750.00	1.17	273.54	9,739.71	-232.57	-74.64	-231.32	0.39	0.20	-16.76
9,775.00	1.13	268.52	9,764.70	-232.57	-75.14	-231.30	0.43	-0.16	-20.08
9,800.00	1.28	270.45	9,789.70	-232.57	-75.67	-231.30	0.62	0.60	7.72
9,825.00	1.12	270.10	9,814.69	-232.57	-76.19	-231.29	0.64	-0.64	-1.40
9,850.00	1.25	269.51	9,839.69	-232.57	-76.71	-231.28	0.52	0.52	-2.36
9,875.00	1.30	265.29	9,864.68	-232.59	-77.26	-231.30	0.43	0.20	-16.88
9,900.00	1.16	265.37	9,889.67	-232.64	-77.80	-231.33	0.56	-0.56	0.32
9,925.00	1.24	268.49	9,914.67	-232.67	-78.32	-231.35	0.41	0.32	12.48
9,950.00	1.31	267.45	9,939.66	-232.69	-78.87	-231.36	0.29	0.28	-4.16
9,975.00	1.19	267.00	9,964.66	-232.71	-79.42	-231.38	0.48	-0.48	-1.80
10,000.00	1.25	267.90	9,989.65	-232.74	-79.95	-231.39	0.25	0.24	3.60
10,025.00	1.31	267.61	10,014.64	-232.76	-80.51	-231.41	0.24	0.24	-1.16
10,050.00	1.40	264.44	10,039.64	-232.80	-81.10	-231.44	0.47	0.36	-12.68



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 705H
Wellbore: OH / 64139
Design: Surveys (Scan Quest)

Local Co-ordinate Reference: Well 705H
TVD Reference: RKB @ 3292.00usft (Scandril)
MD Reference: RKB @ 3292.00usft (Scandril)
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)
10,075.00	1.31	267.52	10,064.63	-232.84	-81.69	-231.47	0.46	-0.36	12.32
10,100.00	1.32	267.20	10,089.62	-232.87	-82.26	-231.49	0.05	0.04	-1.28
10,125.00	1.31	265.53	10,114.62	-232.90	-82.83	-231.51	0.16	-0.04	-6.68
10,150.00	1.39	263.52	10,139.61	-232.96	-83.42	-231.56	0.37	0.32	-8.04
10,175.00	1.25	267.40	10,164.60	-233.01	-83.99	-231.60	0.66	-0.56	15.52
10,200.00	1.29	272.18	10,189.60	-233.01	-84.55	-231.59	0.45	0.16	19.12
10,225.00	1.32	271.48	10,214.59	-232.99	-85.12	-231.56	0.14	0.12	-2.80
10,250.00	1.41	269.92	10,239.58	-232.98	-85.71	-231.55	0.39	0.36	-6.24
10,275.00	1.40	268.73	10,264.58	-232.99	-86.32	-231.54	0.12	-0.04	-4.76
10,300.00	1.43	270.05	10,289.57	-233.00	-86.94	-231.54	0.18	0.12	5.28
10,325.00	1.46	272.34	10,314.56	-232.98	-87.57	-231.52	0.26	0.12	9.16
10,350.00	1.46	268.93	10,339.55	-232.98	-88.21	-231.50	0.35	0.00	-13.64
10,375.00	1.33	266.25	10,364.55	-233.00	-88.82	-231.51	0.58	-0.52	-10.72
10,400.00	1.26	263.94	10,389.54	-233.05	-89.38	-231.55	0.35	-0.28	-9.24
10,425.00	1.31	271.61	10,414.53	-233.07	-89.94	-231.57	0.72	0.20	30.68
10,450.00	1.32	265.58	10,439.53	-233.08	-90.51	-231.57	0.55	0.04	-24.12
10,475.00	1.36	264.14	10,464.52	-233.14	-91.09	-231.61	0.21	0.16	-5.76
10,500.00	1.32	269.63	10,489.51	-233.17	-91.68	-231.64	0.54	-0.16	21.96
10,525.00	1.26	270.32	10,514.51	-233.17	-92.24	-231.63	0.25	-0.24	2.76
10,550.00	1.41	269.16	10,539.50	-233.17	-92.82	-231.62	0.61	0.60	-4.64
10,575.00	1.40	261.97	10,564.49	-233.22	-93.43	-231.66	0.71	-0.04	-28.76
10,600.00	1.31	267.75	10,589.49	-233.27	-94.02	-231.70	0.65	-0.36	23.12
10,625.00	1.62	266.17	10,614.48	-233.31	-94.66	-231.73	1.25	1.24	-6.32
10,650.00	1.70	269.55	10,639.47	-233.34	-95.38	-231.74	0.51	0.32	13.52
10,675.00	1.69	269.14	10,664.46	-233.34	-96.12	-231.74	0.06	-0.04	-1.64
10,700.00	1.71	271.64	10,689.44	-233.34	-96.86	-231.72	0.31	0.08	10.00
10,725.00	1.94	269.17	10,714.43	-233.33	-97.66	-231.70	0.97	0.92	-9.88
10,750.00	1.78	268.48	10,739.42	-233.35	-98.47	-231.70	0.65	-0.64	-2.76
10,775.00	1.84	270.98	10,764.41	-233.35	-99.26	-231.70	0.40	0.24	10.00
10,800.00	1.60	273.46	10,789.39	-233.33	-100.01	-231.66	1.00	-0.96	9.92
10,825.00	0.70	294.65	10,814.39	-233.24	-100.50	-231.56	3.92	-3.60	84.76
10,850.00	0.56	306.84	10,839.39	-233.10	-100.73	-231.42	0.77	-0.56	48.76
10,875.00	0.64	318.83	10,864.39	-232.93	-100.92	-231.24	0.59	0.32	47.96
10,900.00	0.57	307.27	10,889.39	-232.75	-101.11	-231.06	0.56	-0.28	-46.24
10,925.00	0.63	313.83	10,914.38	-232.57	-101.31	-230.88	0.36	0.24	26.24
10,950.00	0.61	311.10	10,939.38	-232.39	-101.51	-230.70	0.14	-0.08	-10.92
10,975.00	0.65	306.89	10,964.38	-232.22	-101.72	-230.52	0.24	0.16	-16.84
11,000.00	0.66	310.88	10,989.38	-232.04	-101.95	-230.34	0.19	0.04	15.96
11,025.00	0.61	316.20	11,014.38	-231.85	-102.15	-230.14	0.31	-0.20	21.28
11,050.00	0.70	318.02	11,039.38	-231.64	-102.34	-229.93	0.37	0.36	7.28
11,075.00	0.75	311.47	11,064.37	-231.42	-102.57	-229.71	0.39	0.20	-26.20
11,100.00	0.73	313.37	11,089.37	-231.20	-102.80	-229.48	0.13	-0.08	7.60
11,125.00	0.70	315.07	11,114.37	-230.98	-103.03	-229.26	0.15	-0.12	6.80



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 705H
Wellbore: OH / 64139
Design: Surveys (Scan Quest)

Local Co-ordinate Reference: Well 705H
TVD Reference: RKB @ 3292.00usft (Scandril)
MD Reference: RKB @ 3292.00usft (Scandril)
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	0.79	320.79	11,139.37	-230.74	-103.24	-229.02	0.47	0.36	22.88
11,175.00	0.88	336.63	11,164.37	-230.43	-103.43	-228.71	0.99	0.36	63.36
11,200.00	0.86	269.25	11,189.36	-230.26	-103.69	-228.53	3.86	-0.08	-269.52
11,225.00	0.81	299.66	11,214.36	-230.17	-104.03	-228.44	1.76	-0.20	121.64
11,250.00	0.90	306.16	11,239.36	-229.97	-104.35	-228.23	0.53	0.36	26.00
11,275.00	0.91	307.31	11,264.35	-229.73	-104.66	-227.99	0.08	0.04	4.60
11,300.00	0.91	306.53	11,289.35	-229.50	-104.98	-227.74	0.05	0.00	-3.12
11,325.00	0.94	309.32	11,314.35	-229.25	-105.30	-227.49	0.22	0.12	11.16
11,350.00	0.96	310.91	11,339.34	-228.98	-105.62	-227.22	0.13	0.08	6.36
11,375.00	0.77	332.91	11,364.34	-228.69	-105.85	-226.93	1.52	-0.76	88.00
11,400.00	0.86	9.05	11,389.34	-228.36	-105.90	-226.59	2.05	0.36	144.56
11,425.00	0.93	18.88	11,414.34	-227.98	-105.80	-226.22	0.67	0.28	39.32
11,450.00	0.93	17.09	11,439.33	-227.60	-105.68	-225.83	0.12	0.00	-7.16
11,475.00	0.96	17.20	11,464.33	-227.20	-105.56	-225.44	0.12	0.12	0.44
11,500.00	0.99	18.34	11,489.33	-226.80	-105.43	-225.04	0.14	0.12	4.56
11,525.00	0.83	9.80	11,514.32	-226.41	-105.33	-224.66	0.84	-0.64	-34.16
11,550.00	0.86	6.57	11,539.32	-226.05	-105.27	-224.29	0.23	0.12	-12.92
11,575.00	0.91	3.82	11,564.32	-225.66	-105.24	-223.91	0.26	0.20	-11.00
11,600.00	0.93	8.00	11,589.31	-225.26	-105.20	-223.51	0.28	0.08	16.72
11,625.00	0.69	0.04	11,614.31	-224.91	-105.17	-223.16	1.06	-0.96	-31.84
11,650.00	0.95	358.82	11,639.31	-224.56	-105.17	-222.80	1.04	1.04	-4.88
11,675.00	0.90	359.82	11,664.31	-224.15	-105.18	-222.40	0.21	-0.20	4.00
11,678.00	0.89	359.95	11,667.31	-224.10	-105.18	-222.35	0.34	-0.33	4.33
Tie In									
11,848.00	0.66	334.00	11,837.29	-221.90	-105.61	-220.14	0.24	-0.14	-15.26
First Phoenix MWD Survey									
11,880.00	0.53	346.63	11,869.29	-221.59	-105.72	-219.83	0.57	-0.41	39.47
11,911.00	0.84	341.42	11,900.29	-221.24	-105.83	-219.48	1.02	1.00	-16.81
11,942.00	1.42	1.58	11,931.28	-220.64	-105.89	-218.88	2.24	1.87	65.03
11,974.00	4.19	7.01	11,963.24	-219.08	-105.74	-217.32	8.69	8.66	16.97
12,005.00	6.77	5.66	11,994.09	-216.14	-105.42	-214.38	8.33	8.32	-4.35
12,037.00	6.34	5.37	12,025.89	-212.50	-105.07	-210.75	1.35	-1.34	-0.91
12,068.00	10.42	9.69	12,056.55	-208.04	-104.44	-206.30	13.31	13.16	13.94
12,100.00	14.52	8.21	12,087.79	-201.21	-103.38	-199.49	12.85	12.81	-4.63
12,131.00	15.53	10.63	12,117.73	-193.28	-102.06	-191.59	3.83	3.26	7.81
12,162.00	16.16	11.80	12,147.55	-184.98	-100.41	-183.31	2.28	2.03	3.77
12,193.00	18.22	10.50	12,177.16	-175.99	-98.64	-174.35	6.76	6.65	-4.19
12,225.00	20.12	9.56	12,207.39	-165.65	-96.82	-164.04	6.02	5.94	-2.94
12,256.00	23.81	7.26	12,236.13	-154.18	-95.14	-152.60	12.22	11.90	-7.42
12,288.00	26.88	3.50	12,265.05	-140.54	-93.88	-138.99	10.83	9.59	-11.75
12,319.00	30.52	1.01	12,292.24	-125.67	-93.31	-124.13	12.36	11.74	-8.03
12,350.00	35.00	358.66	12,318.30	-108.91	-93.38	-107.36	15.02	14.45	-7.58
12,382.00	37.98	356.01	12,344.03	-89.90	-94.28	-88.35	10.53	9.31	-8.28
12,413.00	38.93	355.20	12,368.30	-70.68	-95.76	-69.10	3.47	3.06	-2.61



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Corn
Well: 705H
Wellbore: OH / 64139
Design: Surveys (Scan Quest)

Local Co-ordinate Reference: Well 705H
TVD Reference: RKB @ 3292.00usft (Scandril)
MD Reference: RKB @ 3292.00usft (Scandril)
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)
12,445.00	41.03	357.14	12,392.82	-50.17	-97.13	-48.57	7.63	6.56	6.06
12,476.00	44.22	358.78	12,415.63	-29.19	-97.87	-27.59	10.90	10.29	5.29
12,507.00	45.59	359.76	12,437.59	-7.31	-98.14	-5.70	4.95	4.42	3.16
12,539.00	46.48	0.17	12,459.80	15.72	-98.16	17.33	2.93	2.78	1.28
12,570.00	49.74	0.75	12,480.50	38.79	-97.97	40.39	10.61	10.52	1.87
12,583.00	51.35	0.72	12,488.76	48.83	-97.84	50.43	12.38	12.37	-0.19
FTP: 12583' MD									
12,602.00	53.70	0.69	12,500.32	63.90	-97.65	65.50	12.38	12.38	-0.18
12,633.00	58.07	359.70	12,517.70	89.56	-97.57	91.15	14.34	14.10	-3.19
12,664.00	62.80	0.22	12,532.99	116.52	-97.59	118.10	15.33	15.26	1.68
12,696.00	66.13	1.91	12,546.79	145.38	-97.04	146.95	11.44	10.41	5.28
12,727.00	69.92	4.52	12,558.39	174.08	-95.42	175.62	14.51	12.23	8.42
12,759.00	72.63	3.99	12,568.66	204.30	-93.18	205.80	8.61	8.47	-1.66
12,790.00	77.06	4.13	12,576.76	234.14	-91.06	235.60	14.30	14.29	0.45
12,821.00	81.55	3.68	12,582.51	264.52	-88.99	265.94	14.55	14.48	-1.45
12,853.00	85.28	4.43	12,586.18	296.22	-86.74	297.60	11.89	11.66	2.34
12,865.00	87.16	4.78	12,586.97	308.16	-85.78	309.52	15.93	15.67	2.92
12,955.00	95.41	4.30	12,584.96	397.77	-78.66	399.01	9.18	9.17	-0.53
13,049.00	92.26	4.95	12,578.67	491.25	-71.10	492.34	3.42	-3.35	0.69
13,144.00	89.36	2.99	12,577.33	585.99	-64.52	586.97	3.68	-3.05	-2.06
13,238.00	88.13	2.33	12,579.38	679.87	-60.16	680.76	1.48	-1.31	-0.70
13,332.00	87.40	0.64	12,583.05	773.76	-57.73	774.60	1.96	-0.78	-1.80
13,427.00	86.49	358.32	12,588.11	868.61	-58.59	869.46	2.62	-0.96	-2.44
13,521.00	89.11	357.02	12,591.72	962.46	-62.40	963.35	3.11	2.79	-1.38
13,615.00	92.13	356.30	12,590.71	1,056.28	-67.88	1,057.25	3.30	3.21	-0.77
13,710.00	92.27	355.73	12,587.06	1,150.98	-74.48	1,152.05	0.62	0.15	-0.60
13,804.00	93.14	357.11	12,582.62	1,244.69	-80.34	1,245.84	1.73	0.93	1.47
13,898.00	92.10	358.11	12,578.33	1,338.51	-84.26	1,339.71	1.53	-1.11	1.06
13,992.00	89.92	359.03	12,576.67	1,432.46	-86.60	1,433.68	2.52	-2.32	0.98
14,086.00	90.96	359.73	12,575.95	1,526.45	-87.62	1,527.68	1.33	1.11	0.74
14,181.00	91.69	359.45	12,573.75	1,621.42	-88.30	1,622.65	0.82	0.77	-0.29
14,275.00	90.76	359.16	12,571.74	1,715.39	-89.44	1,716.62	1.04	-0.99	-0.31
14,369.00	90.18	357.82	12,570.97	1,809.35	-91.91	1,810.61	1.55	-0.62	-1.43
14,464.00	90.24	357.08	12,570.62	1,904.25	-96.14	1,905.57	0.78	0.06	-0.78
14,558.00	91.02	356.89	12,569.59	1,998.12	-101.08	1,999.51	0.85	0.83	-0.20
14,652.00	92.43	0.85	12,566.76	2,092.04	-102.94	2,093.44	4.47	1.50	4.21
14,746.00	92.26	358.35	12,562.91	2,185.95	-103.59	2,187.35	2.66	-0.18	-2.66
14,840.00	93.88	0.02	12,557.88	2,279.80	-104.93	2,281.21	2.47	1.72	1.78
14,935.00	92.01	3.29	12,552.99	2,374.61	-102.19	2,375.97	3.96	-1.97	3.44
15,029.00	89.85	4.18	12,551.47	2,468.40	-96.07	2,469.64	2.49	-2.30	0.95
15,123.00	90.90	4.85	12,550.85	2,562.10	-88.67	2,563.21	1.33	1.12	0.71
15,218.00	91.69	5.02	12,548.71	2,656.72	-80.50	2,657.68	0.85	0.83	0.18
15,312.00	87.53	2.09	12,549.35	2,750.51	-74.67	2,751.36	5.41	-4.43	-3.12



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 705H
Wellbore: OH / 64139
Design: Surveys (Scan Quest)

Local Co-ordinate Reference: Well 705H
TVD Reference: RKB @ 3292.00usft (Scandril)
MD Reference: RKB @ 3292.00usft (Scandril)
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)
15,406.00	86.63	0.07	12,554.13	2,844.36	-72.90	2,845.18	2.35	-0.96	-2.15
15,500.00	87.30	358.76	12,559.11	2,938.22	-73.86	2,939.04	1.56	0.71	-1.39
15,595.00	88.19	354.70	12,562.85	3,032.98	-79.27	3,033.87	4.37	0.94	-4.27
15,689.00	93.88	355.36	12,561.15	3,126.57	-87.41	3,127.58	6.09	6.05	0.70
15,783.00	92.98	356.48	12,555.53	3,220.16	-94.09	3,221.27	1.53	-0.96	1.19
15,877.00	93.86	357.65	12,549.92	3,313.87	-98.89	3,315.04	1.56	0.94	1.24
15,971.00	93.29	358.96	12,544.06	3,407.64	-101.67	3,408.85	1.52	-0.61	1.39
16,065.00	94.26	1.96	12,537.87	3,501.42	-100.92	3,502.60	3.35	1.03	3.19
16,160.00	92.72	3.53	12,532.09	3,596.13	-96.37	3,597.23	2.31	-1.62	1.65
16,254.00	91.84	4.35	12,528.35	3,689.83	-89.92	3,690.81	1.28	-0.94	0.87
16,348.00	89.56	4.67	12,527.20	3,783.53	-82.53	3,784.37	2.45	-2.43	0.34
16,442.00	87.85	4.11	12,529.32	3,877.22	-75.34	3,877.94	1.91	-1.82	-0.60
16,500.00	86.88	2.64	12,531.99	3,935.06	-71.92	3,935.71	3.03	-1.67	-2.53
16,595.00	86.40	359.85	12,537.56	4,029.86	-69.86	4,030.47	2.98	-0.51	-2.94
16,689.00	86.96	358.16	12,543.00	4,123.69	-71.49	4,124.31	1.89	0.60	-1.80
16,783.00	88.70	355.30	12,546.56	4,217.45	-76.85	4,218.15	3.56	1.85	-3.04
16,877.00	90.45	353.71	12,547.26	4,311.01	-85.85	4,311.84	2.52	1.86	-1.69
16,972.00	89.84	353.91	12,547.02	4,405.46	-96.10	4,406.44	0.68	-0.64	0.21
17,066.00	92.16	354.49	12,545.38	4,498.96	-105.59	4,500.08	2.54	2.47	0.62
17,160.00	95.08	355.30	12,539.45	4,592.39	-113.94	4,593.64	3.22	3.11	0.86
17,254.00	94.26	356.87	12,531.79	4,685.85	-120.34	4,687.19	1.88	-0.87	1.67
17,349.00	95.62	358.62	12,523.61	4,780.42	-124.06	4,781.81	2.33	1.43	1.84
17,443.00	94.85	358.63	12,515.03	4,874.00	-126.31	4,875.42	0.82	-0.82	0.01
17,537.00	91.96	359.69	12,509.45	4,967.81	-127.68	4,969.24	3.27	-3.07	1.13
17,631.00	89.81	1.02	12,508.00	5,061.79	-127.10	5,063.20	2.69	-2.29	1.41
17,725.00	90.56	1.26	12,507.70	5,155.77	-125.23	5,157.13	0.84	0.80	0.26
17,819.00	92.33	0.64	12,505.33	5,249.72	-123.67	5,251.05	2.00	1.88	-0.66
17,913.00	93.15	359.71	12,500.83	5,343.62	-123.38	5,344.92	1.32	0.87	-0.99
18,008.00	92.30	358.48	12,496.32	5,438.49	-124.88	5,439.81	1.57	-0.89	-1.29
18,102.00	91.66	358.09	12,493.07	5,532.39	-127.70	5,533.74	0.80	-0.68	-0.41
18,196.00	88.50	356.30	12,492.94	5,626.27	-132.29	5,627.68	3.86	-3.36	-1.90
18,290.00	87.17	356.20	12,496.49	5,720.00	-138.44	5,721.50	1.42	-1.41	-0.11
18,384.00	87.74	356.32	12,500.66	5,813.70	-144.56	5,815.29	0.62	0.61	0.13
18,479.00	86.94	355.80	12,505.07	5,908.37	-151.08	5,910.06	1.00	-0.84	-0.55
18,573.00	87.20	355.66	12,509.88	6,001.99	-158.07	6,003.78	0.31	0.28	-0.15
18,667.00	86.93	355.04	12,514.69	6,095.56	-165.68	6,097.46	0.72	-0.29	-0.66
18,820.00	85.78	353.99	12,524.42	6,247.55	-180.28	6,249.66	1.02	-0.75	-0.69
18,914.00	90.07	359.73	12,527.82	6,341.28	-185.41	6,343.47	7.62	4.56	6.11
19,009.00	89.64	359.86	12,528.06	6,436.28	-185.75	6,438.46	0.47	-0.45	0.14
19,103.00	92.78	1.98	12,526.08	6,530.23	-184.25	6,532.37	4.03	3.34	2.26
19,197.00	93.48	2.83	12,520.94	6,624.01	-180.31	6,626.07	1.17	0.74	0.90
19,292.00	90.45	3.12	12,517.69	6,718.81	-175.38	6,720.78	3.20	-3.19	0.31
19,386.00	90.53	3.32	12,516.88	6,812.66	-170.10	6,814.53	0.23	0.09	0.21



Survey Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 705H
Wellbore: OH / 64139
Design: Surveys (Scan Quest)

Local Co-ordinate Reference: Well 705H
TVD Reference: RKB @ 3292.00usft (Scandril)
MD Reference: RKB @ 3292.00usft (Scandril)
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)
19,480.00	91.99	5.09	12,514.82	6,906.38	-163.21	6,908.12	2.44	1.55	1.88
19,575.00	92.35	5.11	12,511.22	7,000.93	-154.77	7,002.53	0.38	0.38	0.02
19,669.00	91.73	3.78	12,507.87	7,094.59	-147.49	7,096.05	1.56	-0.66	-1.41
19,763.00	92.83	3.65	12,504.13	7,188.32	-141.41	7,189.67	1.18	1.17	-0.14
19,857.00	89.73	2.87	12,502.03	7,282.13	-136.06	7,283.38	3.40	-3.30	-0.83
19,951.00	89.73	2.93	12,502.48	7,376.01	-131.31	7,377.17	0.06	0.00	0.06
20,045.00	89.53	2.94	12,503.08	7,469.88	-126.49	7,470.95	0.21	-0.21	0.01
20,139.00	89.25	3.02	12,504.08	7,563.75	-121.61	7,564.73	0.31	-0.30	0.09
20,234.00	88.79	3.18	12,505.71	7,658.59	-116.47	7,659.48	0.51	-0.48	0.17
20,299.00	88.56	2.89	12,507.21	7,723.49	-113.03	7,724.30	0.57	-0.35	-0.45
20,393.00	87.73	0.15	12,510.25	7,817.39	-110.54	7,818.16	3.04	-0.88	-2.91
20,488.00	87.03	359.94	12,514.60	7,912.29	-110.46	7,913.04	0.77	-0.74	-0.22
20,582.00	89.68	359.15	12,517.30	8,006.24	-111.21	8,006.99	2.94	2.82	-0.84
20,676.00	90.45	358.86	12,517.19	8,100.23	-112.84	8,100.99	0.88	0.82	-0.31
20,770.00	90.53	357.94	12,516.39	8,194.19	-115.47	8,194.98	0.98	0.09	-0.98
20,865.00	90.56	356.95	12,515.48	8,289.09	-119.70	8,289.94	1.04	0.03	-1.04
20,959.00	90.24	355.44	12,514.83	8,382.88	-125.94	8,383.81	1.64	-0.34	-1.61
21,053.00	89.41	356.45	12,515.11	8,476.64	-132.59	8,477.67	1.39	-0.88	1.07
21,148.00	88.27	357.03	12,517.04	8,571.46	-137.99	8,572.57	1.35	-1.20	0.61
21,242.00	89.38	358.84	12,518.96	8,665.38	-141.37	8,666.53	2.26	1.18	1.93
21,336.00	89.28	359.43	12,520.06	8,759.36	-142.79	8,760.52	0.64	-0.11	0.63
21,430.00	89.24	358.93	12,521.28	8,853.34	-144.14	8,854.51	0.53	-0.04	-0.53
21,524.00	89.48	357.41	12,522.33	8,947.28	-147.14	8,948.49	1.64	0.26	-1.62
21,618.00	89.45	358.82	12,523.20	9,041.23	-150.23	9,042.47	1.50	-0.03	1.50
21,712.00	88.71	1.98	12,524.71	9,135.20	-149.57	9,136.42	3.45	-0.79	3.36
21,807.00	89.28	4.46	12,526.38	9,230.03	-144.24	9,231.15	2.68	0.60	2.61
21,900.00	89.35	4.13	12,527.49	9,322.76	-137.27	9,323.76	0.36	0.08	-0.35
21,995.00	88.31	0.57	12,529.43	9,417.64	-133.38	9,418.56	3.90	-1.09	-3.75
22,089.00	87.65	357.22	12,532.75	9,511.55	-135.19	9,512.49	3.63	-0.70	-3.56
22,183.00	89.47	358.73	12,535.11	9,605.46	-138.51	9,606.44	2.52	1.94	1.61
22,278.00	89.27	359.84	12,536.15	9,700.44	-139.70	9,701.43	1.19	-0.21	1.17
22,372.00	90.32	359.85	12,536.49	9,794.44	-139.95	9,795.42	1.12	1.12	0.01
22,466.00	90.36	357.82	12,535.93	9,888.42	-141.86	9,889.41	2.16	0.04	-2.16
22,549.00	90.31	358.44	12,535.45	9,971.37	-144.57	9,972.40	0.75	-0.06	0.74
LTP: 22549' MD									
22,560.00	90.30	358.52	12,535.39	9,982.37	-144.86	9,983.40	0.75	-0.06	0.74
22,599.00	90.59	359.61	12,535.09	10,021.36	-145.50	10,022.40	2.89	0.74	2.79
Final Phoenix MWD Survey									
22,679.00	90.59	359.61	12,534.26	10,101.35	-146.04	10,102.39	0.00	0.00	0.00
Projection to TD									



Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well 705H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3292.00usft (Scandril)
Site:	Fez Federal Com	MD Reference:	RKB @ 3292.00usft (Scandril)
Well:	705H	North Reference:	Grid
Wellbore:	OH / 64139	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Scan Quest)	Database:	USA Compass

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
11,678.00	11,667.31	-224.10	-105.18	Tie In
11,848.00	11,837.29	-221.90	-105.61	First Phoenix MWD Survey
12,583.00	12,488.76	48.83	-97.84	FTP: 12583' MD
22,549.00	12,535.45	9,971.37	-144.57	LTP: 22549' MD
22,599.00	12,535.09	10,021.36	-145.50	Final Phoenix MWD Survey
22,679.00	12,534.26	10,101.35	-146.04	Projection to TD