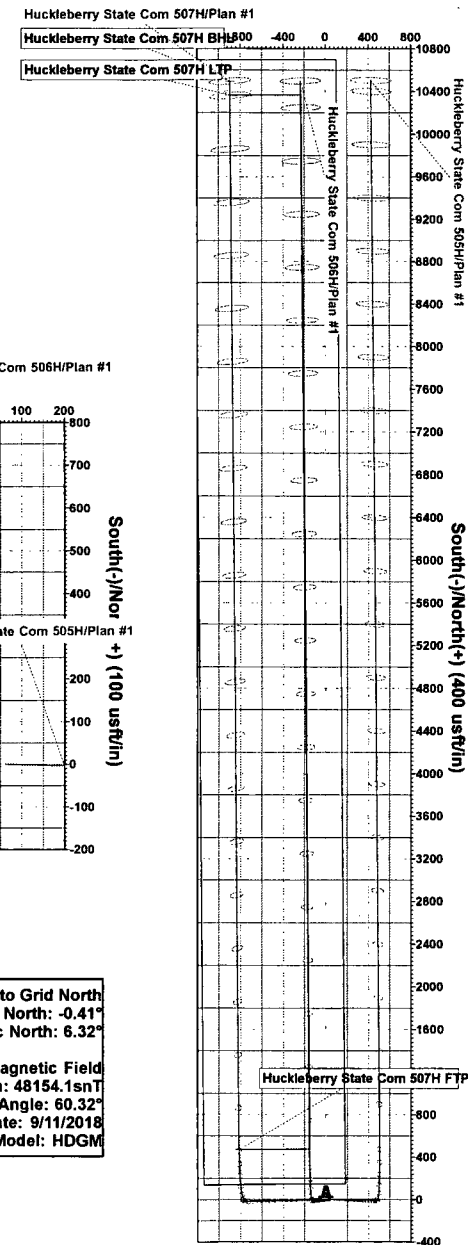




COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 27, T 21S., R 33 E
Well: Huckleberry State Com 507H
Wellbore: Wellbore #1
Plan: Plan #1 (Huckleberry State Com 507H/Wellbore #1)
Scandril Freedom

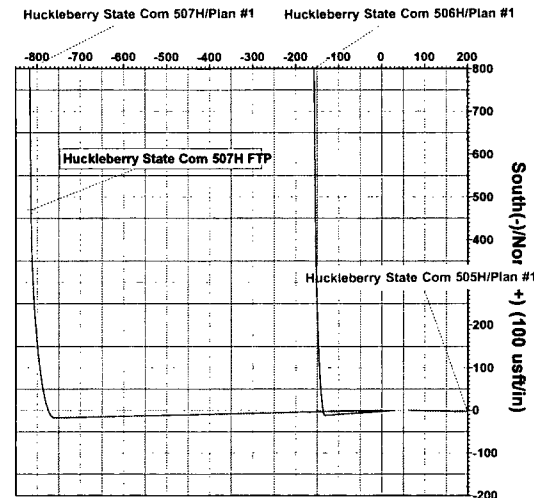


WELL DETAILS: Huckleberry State Com 507H

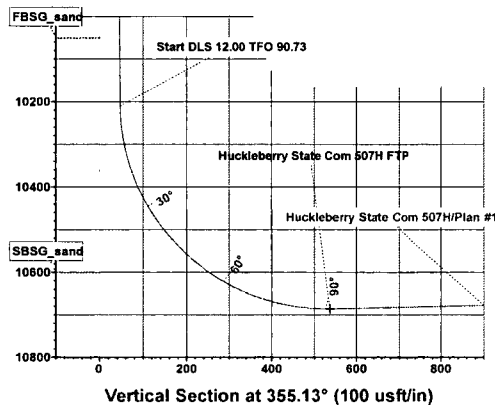
Ground Elevation:: 3714.80
RKB Elevation: KB=26' @ 3740.80usft (Scandril Freedom)
Rig Name: Scandril Freedom

Northing	Easting	Latitude	Longitude
530663.80	737062.90	32.45656	-103.56478

Planned Section Details										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2500.00	0.00	0.00	2500.00	0.00	0.00	0.00	0.00	0.00	
3	2787.38	5.75	268.68	2786.90	-0.33	-14.40	2.00	268.68	0.89	
4	10248.23	5.75	268.68	10210.24	-17.48	-761.38	0.00	0.00	47.21	
5	11009.37	91.26	359.54	10685.80	470.00	-814.20	12.00	90.73	537.42	
6	21036.20	91.26	359.54	10465.80	10494.10	-894.00	0.00	0.00	10532.11	

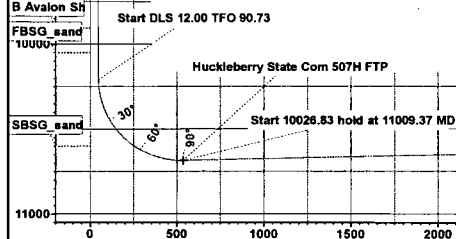
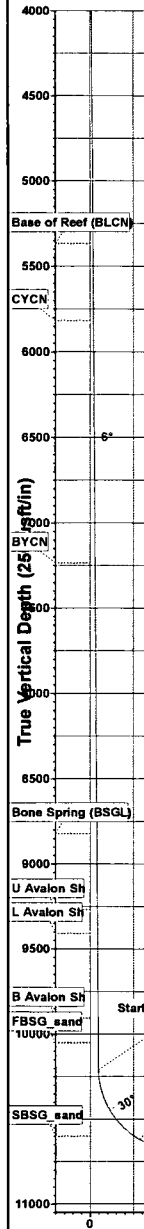
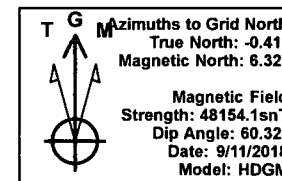


West(-)/East(+) (100 usft/in)

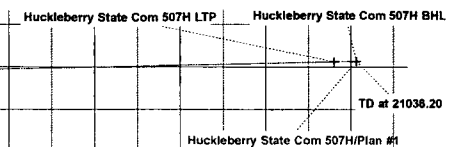


HOBBS OCD
SEP 13 2018
RECEIVED

PROJECT DETAILS: Lea County, NM (NAD27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid



Vertical Section at 355.13° (250 usft/in)





COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 27, T 21S. , R 33 E

Huckleberry State Com 507H

Wellbore #1

Plan: Plan #1

Standard Survey Report

11 September, 2018



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Huckleberry State Com 507H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3740.80usft (Scandril Freedom)
Site:	Sec. 27, T 21S., R 33 E	MD Reference:	KB=26' @ 3740.80usft (Scandril Freedom)
Well:	Huckleberry State Com 507H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1

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	Sec. 27, T 21S., R 33 E		
Site Position:		Northing:	525,881.09 usft
From:	Map	Easting:	741,064.50 usft
Position Uncertainty:	5.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.44334
		Longitude:	-103.55192
		Grid Convergence:	0.42 °

Well	Huckleberry State Com 507H		
Well Position	+N/-S	0.00 usft	Northing: 530,663.80 usft
	+E/-W	0.00 usft	Easting: 737,062.90 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32.45656
		Longitude:	-103.56478
		Ground Level:	3,714.80 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	9/11/2018	6.73
			Dip Angle (°) 60.32
			Field Strength (nT) 48,154

Design	Plan #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°) 355.13

Survey Tool Program	Date 9/11/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
0.00	21,036.21	Plan #1 (Wellbore #1)	MWD
			Description MWD - Standard

Planned 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	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	

Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 27, T 21S. , R 33 E
Well: Huckleberry State Com 507H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Huckleberry State Com 507H
TVD Reference: KB=26' @ 3740.80usft (Scandrell Freedom)
MD Reference: KB=26' @ 3740.80usft (Scandrell Freedom)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
2,600.00	2.00	268.68	2,599.98	-0.04	-1.74	0.11	2.00	2.00	0.00
2,700.00	4.00	268.68	2,699.84	-0.16	-6.98	0.43	2.00	2.00	0.00
2,787.38	5.75	268.68	2,786.90	-0.33	-14.40	0.89	2.00	2.00	0.00
Start 7460.85 hold at 2787.38 MD									
2,800.00	5.75	268.68	2,799.45	-0.36	-15.66	0.97	0.00	0.00	0.00
2,900.00	5.75	268.68	2,898.95	-0.59	-25.67	1.59	0.00	0.00	0.00
3,000.00	5.75	268.68	2,998.45	-0.82	-35.69	2.21	0.00	0.00	0.00
3,100.00	5.75	268.68	3,097.95	-1.05	-45.70	2.83	0.00	0.00	0.00
3,200.00	5.75	268.68	3,197.44	-1.28	-55.71	3.45	0.00	0.00	0.00
3,300.00	5.75	268.68	3,296.94	-1.51	-65.72	4.08	0.00	0.00	0.00
3,400.00	5.75	268.68	3,396.44	-1.74	-75.73	4.70	0.00	0.00	0.00
3,500.00	5.75	268.68	3,495.94	-1.97	-85.75	5.32	0.00	0.00	0.00
3,600.00	5.75	268.68	3,595.43	-2.20	-95.76	5.94	0.00	0.00	0.00
3,700.00	5.75	268.68	3,694.93	-2.43	-105.77	6.56	0.00	0.00	0.00
3,800.00	5.75	268.68	3,794.43	-2.66	-115.78	7.18	0.00	0.00	0.00
3,900.00	5.75	268.68	3,893.92	-2.89	-125.79	7.80	0.00	0.00	0.00
4,000.00	5.75	268.68	3,993.42	-3.12	-135.81	8.42	0.00	0.00	0.00
4,100.00	5.75	268.68	4,092.92	-3.35	-145.82	9.04	0.00	0.00	0.00
4,200.00	5.75	268.68	4,192.42	-3.58	-155.83	9.66	0.00	0.00	0.00
4,300.00	5.75	268.68	4,291.91	-3.81	-165.84	10.28	0.00	0.00	0.00
4,400.00	5.75	268.68	4,391.41	-4.04	-175.85	10.90	0.00	0.00	0.00
4,500.00	5.75	268.68	4,490.91	-4.27	-185.87	11.52	0.00	0.00	0.00
4,600.00	5.75	268.68	4,590.41	-4.50	-195.88	12.15	0.00	0.00	0.00
4,700.00	5.75	268.68	4,689.90	-4.73	-205.89	12.77	0.00	0.00	0.00
4,800.00	5.75	268.68	4,789.40	-4.96	-215.90	13.39	0.00	0.00	0.00
4,900.00	5.75	268.68	4,888.90	-5.19	-225.91	14.01	0.00	0.00	0.00
5,000.00	5.75	268.68	4,988.39	-5.42	-235.93	14.63	0.00	0.00	0.00

Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 27, T 21S., R 33 E
Well: Huckleberry State Com 507H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Huckleberry State Com 507H
TVD Reference: KB=26' @ 3740.80usft (Scandril Freedom)
MD Reference: KB=26' @ 3740.80usft (Scandril Freedom)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1

Planned 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)
5,100.00	5.75	268.68	5,087.89	-5.65	-245.94	15.25	0.00	0.00	0.00
5,200.00	5.75	268.68	5,187.39	-5.88	-255.95	15.87	0.00	0.00	0.00
5,300.00	5.75	268.68	5,286.89	-6.11	-265.96	16.49	0.00	0.00	0.00
5,400.00	5.75	268.68	5,386.38	-6.34	-275.97	17.11	0.00	0.00	0.00
5,500.00	5.75	268.68	5,485.88	-6.57	-285.99	17.73	0.00	0.00	0.00
5,600.00	5.75	268.68	5,585.38	-6.80	-296.00	18.35	0.00	0.00	0.00
5,700.00	5.75	268.68	5,684.88	-7.03	-306.01	18.97	0.00	0.00	0.00
5,800.00	5.75	268.68	5,784.37	-7.26	-316.02	19.60	0.00	0.00	0.00
5,900.00	5.75	268.68	5,883.87	-7.49	-326.03	20.22	0.00	0.00	0.00
6,000.00	5.75	268.68	5,983.37	-7.72	-336.05	20.84	0.00	0.00	0.00
6,100.00	5.75	268.68	6,082.86	-7.95	-346.06	21.46	0.00	0.00	0.00
6,200.00	5.75	268.68	6,182.36	-8.18	-356.07	22.08	0.00	0.00	0.00
6,300.00	5.75	268.68	6,281.86	-8.41	-366.08	22.70	0.00	0.00	0.00
6,400.00	5.75	268.68	6,381.36	-8.64	-376.09	23.32	0.00	0.00	0.00
6,500.00	5.75	268.68	6,480.85	-8.86	-386.11	23.94	0.00	0.00	0.00
6,600.00	5.75	268.68	6,580.35	-9.09	-396.12	24.56	0.00	0.00	0.00
6,700.00	5.75	268.68	6,679.85	-9.32	-406.13	25.18	0.00	0.00	0.00
6,800.00	5.75	268.68	6,779.35	-9.55	-416.14	25.80	0.00	0.00	0.00
6,900.00	5.75	268.68	6,878.84	-9.78	-426.15	26.42	0.00	0.00	0.00
7,000.00	5.75	268.68	6,978.34	-10.01	-436.17	27.04	0.00	0.00	0.00
7,100.00	5.75	268.68	7,077.84	-10.24	-446.18	27.67	0.00	0.00	0.00
7,200.00	5.75	268.68	7,177.33	-10.47	-456.19	28.29	0.00	0.00	0.00
7,300.00	5.75	268.68	7,276.83	-10.70	-466.20	28.91	0.00	0.00	0.00
7,400.00	5.75	268.68	7,376.33	-10.93	-476.21	29.53	0.00	0.00	0.00
7,500.00	5.75	268.68	7,475.83	-11.16	-486.23	30.15	0.00	0.00	0.00
7,600.00	5.75	268.68	7,575.32	-11.39	-496.24	30.77	0.00	0.00	0.00
7,700.00	5.75	268.68	7,674.82	-11.62	-506.25	31.39	0.00	0.00	0.00
7,800.00	5.75	268.68	7,774.32	-11.85	-516.26	32.01	0.00	0.00	0.00
7,900.00	5.75	268.68	7,873.82	-12.08	-526.27	32.63	0.00	0.00	0.00
8,000.00	5.75	268.68	7,973.31	-12.31	-536.29	33.25	0.00	0.00	0.00
8,100.00	5.75	268.68	8,072.81	-12.54	-546.30	33.87	0.00	0.00	0.00
8,200.00	5.75	268.68	8,172.31	-12.77	-556.31	34.49	0.00	0.00	0.00
8,300.00	5.75	268.68	8,271.80	-13.00	-566.32	35.12	0.00	0.00	0.00
8,400.00	5.75	268.68	8,371.30	-13.23	-576.33	35.74	0.00	0.00	0.00
8,500.00	5.75	268.68	8,470.80	-13.46	-586.35	36.36	0.00	0.00	0.00
8,600.00	5.75	268.68	8,570.30	-13.69	-596.36	36.98	0.00	0.00	0.00
8,700.00	5.75	268.68	8,669.79	-13.92	-606.37	37.60	0.00	0.00	0.00
8,800.00	5.75	268.68	8,769.29	-14.15	-616.38	38.22	0.00	0.00	0.00
8,900.00	5.75	268.68	8,868.79	-14.38	-626.39	38.84	0.00	0.00	0.00
9,000.00	5.75	268.68	8,968.29	-14.61	-636.41	39.46	0.00	0.00	0.00
9,100.00	5.75	268.68	9,067.78	-14.84	-646.42	40.08	0.00	0.00	0.00
9,200.00	5.75	268.68	9,167.28	-15.07	-656.43	40.70	0.00	0.00	0.00
9,300.00	5.75	268.68	9,266.78	-15.30	-666.44	41.32	0.00	0.00	0.00

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Huckleberry State Com 507H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3740.80usft (Scandrift Freedom)
Site:	Sec. 27, T 21S., R 33 E	MD Reference:	KB=26' @ 3740.80usft (Scandrift Freedom)
Well:	Huckleberry State Com 507H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1

Planned 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)
9,400.00	5.75	268.68	9,366.28	-15.53	-676.45	41.94	0.00	0.00	0.00
9,500.00	5.75	268.68	9,465.77	-15.76	-686.47	42.57	0.00	0.00	0.00
9,600.00	5.75	268.68	9,565.27	-15.99	-696.48	43.19	0.00	0.00	0.00
9,700.00	5.75	268.68	9,664.77	-16.22	-706.49	43.81	0.00	0.00	0.00
9,800.00	5.75	268.68	9,764.26	-16.45	-716.50	44.43	0.00	0.00	0.00
9,900.00	5.75	268.68	9,863.76	-16.68	-726.51	45.05	0.00	0.00	0.00
10,000.00	5.75	268.68	9,963.26	-16.91	-736.52	45.67	0.00	0.00	0.00
10,100.00	5.75	268.68	10,062.76	-17.14	-746.54	46.29	0.00	0.00	0.00
10,200.00	5.75	268.68	10,162.25	-17.37	-756.55	46.91	0.00	0.00	0.00
10,248.23	5.75	268.68	10,210.24	-17.48	-761.38	47.21	0.00	0.00	0.00
Start DLS 12.00 TFO 90.73									
10,300.00	8.40	316.46	10,261.65	-14.80	-766.58	50.33	12.00	5.13	92.29
10,400.00	19.00	342.42	10,358.75	6.09	-776.56	71.99	12.00	10.60	25.96
10,500.00	30.63	349.63	10,449.38	46.82	-786.10	113.38	12.00	11.63	7.21
10,600.00	42.46	353.10	10,529.59	105.60	-794.77	172.68	12.00	11.82	3.47
10,700.00	54.35	355.28	10,595.86	179.87	-802.20	247.31	12.00	11.89	2.18
10,800.00	66.27	356.88	10,645.31	266.38	-808.05	334.01	12.00	11.92	1.60
10,900.00	78.20	358.21	10,675.77	361.35	-812.09	428.98	12.00	11.93	1.33
11,000.00	90.14	359.43	10,685.91	460.63	-814.12	528.07	12.00	11.94	1.22
11,009.37	91.26	359.54	10,685.80	470.00	-814.20	537.42	12.00	11.94	1.20
Start 10026.83 hold at 11009.37 MD - Huckleberry State Com 507H FTP									
11,100.00	91.26	359.54	10,683.81	560.60	-814.92	627.75	0.00	0.00	0.00
11,200.00	91.26	359.54	10,681.62	660.57	-815.72	727.43	0.00	0.00	0.00
11,300.00	91.26	359.54	10,679.42	760.55	-816.51	827.11	0.00	0.00	0.00
11,400.00	91.26	359.54	10,677.23	860.52	-817.31	926.79	0.00	0.00	0.00
11,500.00	91.26	359.54	10,675.04	960.49	-818.10	1,026.47	0.00	0.00	0.00
11,600.00	91.26	359.54	10,672.84	1,060.47	-818.90	1,126.15	0.00	0.00	0.00
11,700.00	91.26	359.54	10,670.65	1,160.44	-819.70	1,225.83	0.00	0.00	0.00
11,800.00	91.26	359.54	10,668.45	1,260.41	-820.49	1,325.51	0.00	0.00	0.00
11,900.00	91.26	359.54	10,666.26	1,360.38	-821.29	1,425.19	0.00	0.00	0.00
12,000.00	91.26	359.54	10,664.06	1,460.36	-822.08	1,524.87	0.00	0.00	0.00
12,100.00	91.26	359.54	10,661.87	1,560.33	-822.88	1,624.55	0.00	0.00	0.00
12,200.00	91.26	359.54	10,659.68	1,660.30	-823.68	1,724.23	0.00	0.00	0.00
12,300.00	91.26	359.54	10,657.48	1,760.28	-824.47	1,823.91	0.00	0.00	0.00
12,400.00	91.26	359.54	10,655.29	1,860.25	-825.27	1,923.59	0.00	0.00	0.00
12,500.00	91.26	359.54	10,653.09	1,960.22	-826.06	2,023.27	0.00	0.00	0.00
12,600.00	91.26	359.54	10,650.90	2,060.19	-826.86	2,122.94	0.00	0.00	0.00
12,700.00	91.26	359.54	10,648.71	2,160.17	-827.66	2,222.62	0.00	0.00	0.00
12,800.00	91.26	359.54	10,646.51	2,260.14	-828.45	2,322.30	0.00	0.00	0.00
12,900.00	91.26	359.54	10,644.32	2,360.11	-829.25	2,421.98	0.00	0.00	0.00
13,000.00	91.26	359.54	10,642.12	2,460.08	-830.04	2,521.66	0.00	0.00	0.00
13,100.00	91.26	359.54	10,639.93	2,560.06	-830.84	2,621.34	0.00	0.00	0.00
13,200.00	91.26	359.54	10,637.74	2,660.03	-831.63	2,721.02	0.00	0.00	0.00
13,300.00	91.26	359.54	10,635.54	2,760.00	-832.43	2,820.70	0.00	0.00	0.00

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Huckleberry State Com 507H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3740.80usft (Scandrift Freedom)
Site:	Sec. 27, T 21S., R 33 E	MD Reference:	KB=26' @ 3740.80usft (Scandrift Freedom)
Well:	Huckleberry State Com 507H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1

Planned 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)
13,400.00	91.26	359.54	10,633.35	2,859.98	-833.23	2,920.38	0.00	0.00	0.00
13,500.00	91.26	359.54	10,631.15	2,959.95	-834.02	3,020.06	0.00	0.00	0.00
13,600.00	91.26	359.54	10,628.96	3,059.92	-834.82	3,119.74	0.00	0.00	0.00
13,700.00	91.26	359.54	10,626.76	3,159.89	-835.61	3,219.42	0.00	0.00	0.00
13,800.00	91.26	359.54	10,624.57	3,259.87	-836.41	3,319.10	0.00	0.00	0.00
13,900.00	91.26	359.54	10,622.38	3,359.84	-837.21	3,418.78	0.00	0.00	0.00
14,000.00	91.26	359.54	10,620.18	3,459.81	-838.00	3,518.46	0.00	0.00	0.00
14,100.00	91.26	359.54	10,617.99	3,559.79	-838.80	3,618.14	0.00	0.00	0.00
14,200.00	91.26	359.54	10,615.79	3,659.76	-839.59	3,717.82	0.00	0.00	0.00
14,300.00	91.26	359.54	10,613.60	3,759.73	-840.39	3,817.50	0.00	0.00	0.00
14,400.00	91.26	359.54	10,611.41	3,859.70	-841.18	3,917.18	0.00	0.00	0.00
14,500.00	91.26	359.54	10,609.21	3,959.68	-841.98	4,016.86	0.00	0.00	0.00
14,600.00	91.26	359.54	10,607.02	4,059.65	-842.78	4,116.53	0.00	0.00	0.00
14,700.00	91.26	359.54	10,604.82	4,159.62	-843.57	4,216.21	0.00	0.00	0.00
14,800.00	91.26	359.54	10,602.63	4,259.59	-844.37	4,315.89	0.00	0.00	0.00
14,900.00	91.26	359.54	10,600.44	4,359.57	-845.16	4,415.57	0.00	0.00	0.00
15,000.00	91.26	359.54	10,598.24	4,459.54	-845.96	4,515.25	0.00	0.00	0.00
15,100.00	91.26	359.54	10,596.05	4,559.51	-846.76	4,614.93	0.00	0.00	0.00
15,200.00	91.26	359.54	10,593.85	4,659.49	-847.55	4,714.61	0.00	0.00	0.00
15,300.00	91.26	359.54	10,591.66	4,759.46	-848.35	4,814.29	0.00	0.00	0.00
15,400.00	91.26	359.54	10,589.46	4,859.43	-849.14	4,913.97	0.00	0.00	0.00
15,500.00	91.26	359.54	10,587.27	4,959.40	-849.94	5,013.65	0.00	0.00	0.00
15,600.00	91.26	359.54	10,585.08	5,059.38	-850.74	5,113.33	0.00	0.00	0.00
15,700.00	91.26	359.54	10,582.88	5,159.35	-851.53	5,213.01	0.00	0.00	0.00
15,800.00	91.26	359.54	10,580.69	5,259.32	-852.33	5,312.69	0.00	0.00	0.00
15,900.00	91.26	359.54	10,578.49	5,359.29	-853.12	5,412.37	0.00	0.00	0.00
16,000.00	91.26	359.54	10,576.30	5,459.27	-853.92	5,512.05	0.00	0.00	0.00
16,100.00	91.26	359.54	10,574.11	5,559.24	-854.71	5,611.73	0.00	0.00	0.00
16,200.00	91.26	359.54	10,571.91	5,659.21	-855.51	5,711.41	0.00	0.00	0.00
16,300.00	91.26	359.54	10,569.72	5,759.19	-856.31	5,811.09	0.00	0.00	0.00
16,400.00	91.26	359.54	10,567.52	5,859.16	-857.10	5,910.77	0.00	0.00	0.00
16,500.00	91.26	359.54	10,565.33	5,959.13	-857.90	6,010.45	0.00	0.00	0.00
16,600.00	91.26	359.54	10,563.14	6,059.10	-858.69	6,110.12	0.00	0.00	0.00
16,700.00	91.26	359.54	10,560.94	6,159.08	-859.49	6,209.80	0.00	0.00	0.00
16,800.00	91.26	359.54	10,558.75	6,259.05	-860.29	6,309.48	0.00	0.00	0.00
16,900.00	91.26	359.54	10,556.55	6,359.02	-861.08	6,409.16	0.00	0.00	0.00
17,000.00	91.26	359.54	10,554.36	6,459.00	-861.88	6,508.84	0.00	0.00	0.00
17,100.00	91.26	359.54	10,552.17	6,558.97	-862.67	6,608.52	0.00	0.00	0.00
17,200.00	91.26	359.54	10,549.97	6,658.94	-863.47	6,708.20	0.00	0.00	0.00
17,300.00	91.26	359.54	10,547.78	6,758.91	-864.26	6,807.88	0.00	0.00	0.00
17,400.00	91.26	359.54	10,545.58	6,858.89	-865.06	6,907.56	0.00	0.00	0.00
17,500.00	91.26	359.54	10,543.39	6,958.86	-865.86	7,007.24	0.00	0.00	0.00
17,600.00	91.26	359.54	10,541.19	7,058.83	-866.65	7,106.92	0.00	0.00	0.00

Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 27, T 21S. , R 33 E
Well: Huckleberry State Com 507H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Huckleberry State Com 507H
TVD Reference: KB=26' @ 3740.80usft (Scandril Freedom)
MD Reference: KB=26' @ 3740.80usft (Scandril Freedom)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1

Planned 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)
17,700.00	91.26	359.54	10,539.00	7,158.80	-867.45	7,206.60	0.00	0.00	0.00
17,800.00	91.26	359.54	10,536.81	7,258.78	-868.24	7,306.28	0.00	0.00	0.00
17,900.00	91.26	359.54	10,534.61	7,358.75	-869.04	7,405.96	0.00	0.00	0.00
18,000.00	91.26	359.54	10,532.42	7,458.72	-869.84	7,505.64	0.00	0.00	0.00
18,100.00	91.26	359.54	10,530.22	7,558.70	-870.63	7,605.32	0.00	0.00	0.00
18,200.00	91.26	359.54	10,528.03	7,658.67	-871.43	7,705.00	0.00	0.00	0.00
18,300.00	91.26	359.54	10,525.84	7,758.64	-872.22	7,804.68	0.00	0.00	0.00
18,400.00	91.26	359.54	10,523.64	7,858.61	-873.02	7,904.36	0.00	0.00	0.00
18,500.00	91.26	359.54	10,521.45	7,958.59	-873.82	8,004.04	0.00	0.00	0.00
18,600.00	91.26	359.54	10,519.25	8,058.56	-874.61	8,103.71	0.00	0.00	0.00
18,700.00	91.26	359.54	10,517.06	8,158.53	-875.41	8,203.39	0.00	0.00	0.00
18,800.00	91.26	359.54	10,514.87	8,258.50	-876.20	8,303.07	0.00	0.00	0.00
18,900.00	91.26	359.54	10,512.67	8,358.48	-877.00	8,402.75	0.00	0.00	0.00
19,000.00	91.26	359.54	10,510.48	8,458.45	-877.79	8,502.43	0.00	0.00	0.00
19,100.00	91.26	359.54	10,508.28	8,558.42	-878.59	8,602.11	0.00	0.00	0.00
19,200.00	91.26	359.54	10,506.09	8,658.40	-879.39	8,701.79	0.00	0.00	0.00
19,300.00	91.26	359.54	10,503.89	8,758.37	-880.18	8,801.47	0.00	0.00	0.00
19,400.00	91.26	359.54	10,501.70	8,858.34	-880.98	8,901.15	0.00	0.00	0.00
19,500.00	91.26	359.54	10,499.51	8,958.31	-881.77	9,000.83	0.00	0.00	0.00
19,600.00	91.26	359.54	10,497.31	9,058.29	-882.57	9,100.51	0.00	0.00	0.00
19,700.00	91.26	359.54	10,495.12	9,158.26	-883.37	9,200.19	0.00	0.00	0.00
19,800.00	91.26	359.54	10,492.92	9,258.23	-884.16	9,299.87	0.00	0.00	0.00
19,900.00	91.26	359.54	10,490.73	9,358.21	-884.96	9,399.55	0.00	0.00	0.00
20,000.00	91.26	359.54	10,488.54	9,458.18	-885.75	9,499.23	0.00	0.00	0.00
20,100.00	91.26	359.54	10,486.34	9,558.15	-886.55	9,598.91	0.00	0.00	0.00
20,200.00	91.26	359.54	10,484.15	9,658.12	-887.34	9,698.59	0.00	0.00	0.00
20,300.00	91.26	359.54	10,481.95	9,758.10	-888.14	9,798.27	0.00	0.00	0.00
20,400.00	91.26	359.54	10,479.76	9,858.07	-888.94	9,897.95	0.00	0.00	0.00
20,500.00	91.26	359.54	10,477.57	9,958.04	-889.73	9,997.63	0.00	0.00	0.00
20,600.00	91.26	359.54	10,475.37	10,058.01	-890.53	10,097.31	0.00	0.00	0.00
20,700.00	91.26	359.54	10,473.18	10,157.99	-891.32	10,196.98	0.00	0.00	0.00
20,800.00	91.26	359.54	10,470.98	10,257.96	-892.12	10,296.66	0.00	0.00	0.00
20,900.00	91.26	359.54	10,468.79	10,357.93	-892.92	10,396.34	0.00	0.00	0.00
20,906.17	91.26	359.54	10,468.65	10,364.10	-892.97	10,402.49	0.00	0.00	0.00
Huckleberry State Com 507H LTP									
21,000.00	91.26	359.54	10,466.59	10,457.91	-893.71	10,496.02	0.00	0.00	0.00
21,036.21	91.26	359.54	10,465.80	10,494.10	-894.00	10,532.11	0.00	0.00	0.00
TD at 21036.20 - Huckleberry State Com 507H BHL									

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Huckleberry State Com 507H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3740.80usft (Scandrell Freedom)
Site:	Sec. 27, T 21S., R 33 E	MD Reference:	KB=26' @ 3740.80usft (Scandrell Freedom)
Well:	Huckleberry State Com 507H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1

Design Targets
Target Name

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Huckleberry State Coi	0.00	0.00	10,465.8 0	10,494.10	-894.00	541,157.90	736,168.90	32.48542	-103.56743
- plan hits target center - Point									
Huckleberry State Coi	0.00	0.00	10,468.6 5	10,364.10	-893.00	541,027.90	736,169.90	32.48507	-103.56743
- plan misses target center by 0.04usft at 20906.17usft MD (10468.65 TVD, 10364.10 N, -892.97 E) - Point									
Huckleberry State Coi	0.00	0.00	10,685.8 0	470.00	-814.20	531,133.80	736,248.70	32.45787	-103.56741
- plan hits target center - Point									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,815.80	1,815.80	Rustler		0.00	
1,909.80	1,909.80	TOS		0.00	
3,554.14	3,549.80	BOS / Tansill		0.00	
3,750.12	3,744.80	Yates			
3,818.47	3,812.80	Seven Rivers			
3,977.26	3,970.80	Capitan Reef			
5,381.32	5,367.80	Base of Reef (BLCN)			
5,833.60	5,817.80	CYCN			
7,257.76	7,234.80	BYCN			
8,851.77	8,820.80	Bone Spring (BSGL)			
9,302.03	9,268.80	U Avalon Sh			
9,442.74	9,408.80	L Avalon Sh			
9,944.26	9,907.80	B Avalon Sh			
10,087.98	10,050.80	FBSG_sand			
10,708.58	10,600.80	SBSG_sand			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2500	2500	0	0	Start Build 2.00
2787	2787	0	-14	Start 7460.85 hold at 2787.38 MD
10,248	10,210	-17	-761	Start DLS 12.00 TFO 90.73
11,009	10,686	470	-814	Start 10026.83 hold at 11009.37 MD
21,036	10,466	10,494	-894	TD at 21036.20

Checked By: _____	Approved By: _____	Date: _____
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