



COG Operating L L C
 Project: Lea County, NM (NAD27 NME)
 Site: Sec. 27, T 21S., R 33 E
 Well: Huckleberry State Com 506H
 Wellbore: Wellbore #1
 Plan: Plan #1 (Huckleberry State Com 506H/Wellbore #1)
 Scandril Freedom



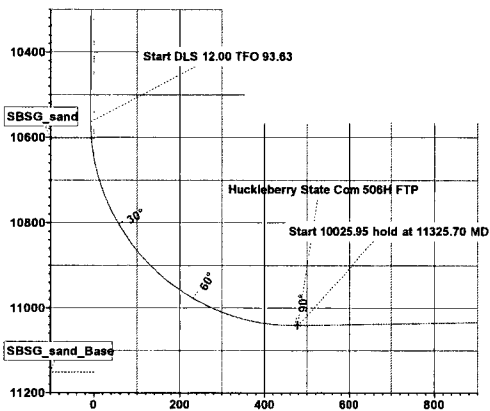
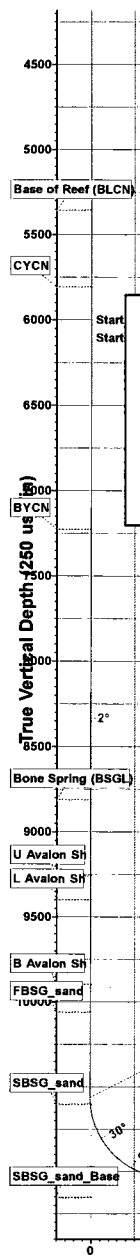
WELL DETAILS: Huckleberry State Com 506H

Ground Elevation:: 3715.50
 RKB Elevation: KB=26' @ 3741.50usft (Scandril Freedom)
 Rig Name: Scandril Freedom

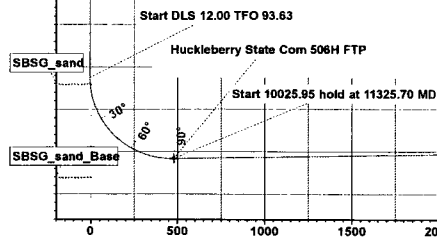
Northing	Easting	Latitude	Longitude
530663.90	737092.90	32.45656	-103.56468

Planned Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	6000.00	0.00	0.00	6000.00	0.00	0.00	0.00	0.00	0.00
3	6103.58	2.07	265.88	6103.55	-0.13	-1.87	2.00	265.88	-0.09
4	10566.27	2.07	265.88	10563.33	-11.74	-162.76	0.00	0.00	-7.64
5	11325.70	91.00	359.54	11041.50	473.90	-184.20	12.00	93.63	478.38
6	21351.64	91.00	359.54	10866.50	10498.00	-264.10	0.00	0.00	10501.32

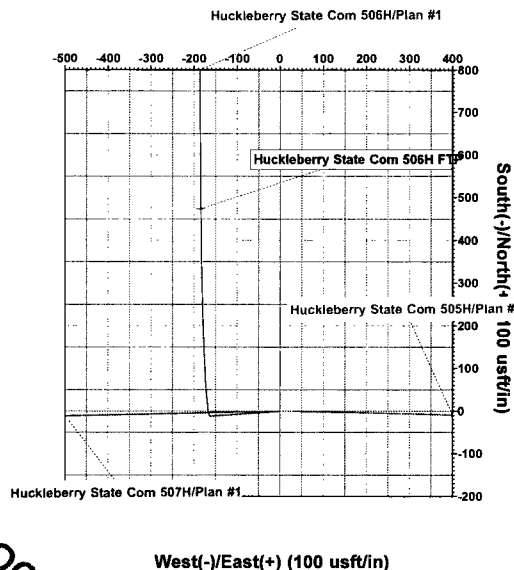
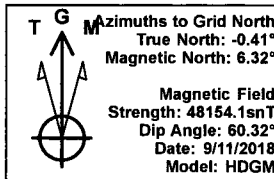


Vertical Section at 358.56° (100 usft/in)

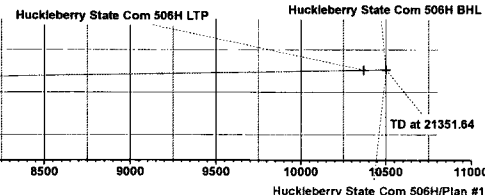
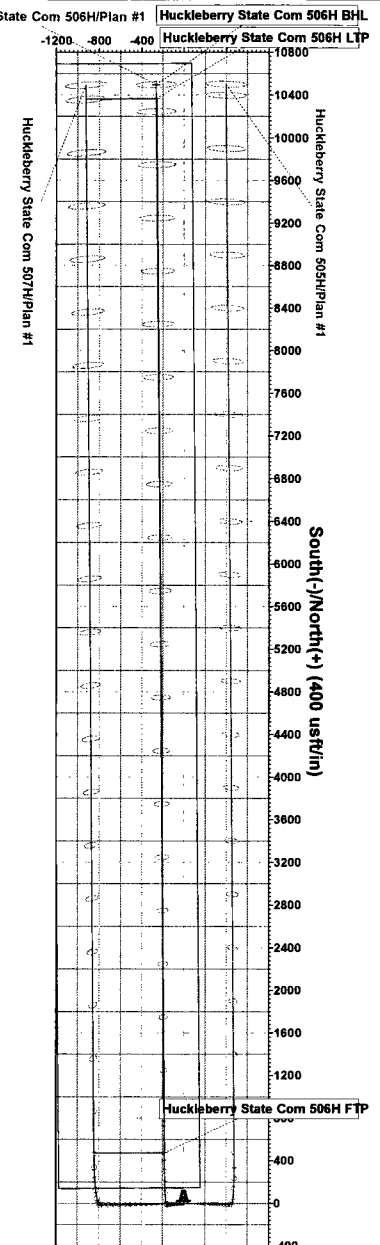


HOBBS OCD
 SEP 13 2018
 RECEIVED

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



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



Vertical Section at 358.56° (250 usft/in)

Huckleberry State Com 506H/Plan #1



C O N C H O

COG Operating L L C

Lea County, NM (NAD27 NME)

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

Huckleberry State Com 506H

Wellbore #1

Plan: Plan #1

Standard Survey Report

11 September, 2018



INTEGRITY
DIRECTIONAL

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Huckleberry State Com 506H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3741.50usft (Scandril Freedom)
Site:	Sec. 27, T 21S. , R 33 E	MD Reference:	KB=26' @ 3741.50usft (Scandril Freedom)
Well:	Huckleberry State Com 506H	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 506H		
Well Position	+N/-S	0.00 usft	Northing: 530,663.90 usft
	+E/-W	0.00 usft	Easting: 737,092.90 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32.45656
		Longitude:	-103.56468
		Ground Level:	3,715.50 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 (°) 358.56

Survey Tool Program	Date 9/11/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
0.00	21,351.64	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	Local Co-ordinate Reference:	Well Huckleberry State Com 506H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3741.50usft (Scandril Freedom)
Site:	Sec. 27, T 21S. , R 33 E	MD Reference:	KB=26' @ 3741.50usft (Scandril Freedom)
Well:	Huckleberry State Com 506H	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)	
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	
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00	

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Well:	Huckleberry State Com 506H	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)
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
6,100.00	2.00	265.88	6,099.98	-0.13	-1.74	-0.08	2.00	2.00	0.00
6,103.58	2.07	265.88	6,103.55	-0.13	-1.87	-0.09	2.00	2.00	0.00
Start 4462.69 hold at 6103.58 MD									
6,200.00	2.07	265.88	6,199.91	-0.39	-5.34	-0.25	0.00	0.00	0.00
6,300.00	2.07	265.88	6,299.85	-0.65	-8.95	-0.42	0.00	0.00	0.00
6,400.00	2.07	265.88	6,399.78	-0.91	-12.55	-0.59	0.00	0.00	0.00
6,500.00	2.07	265.88	6,499.72	-1.17	-16.16	-0.76	0.00	0.00	0.00
6,600.00	2.07	265.88	6,599.65	-1.43	-19.76	-0.93	0.00	0.00	0.00
6,700.00	2.07	265.88	6,699.59	-1.69	-23.37	-1.10	0.00	0.00	0.00
6,800.00	2.07	265.88	6,799.52	-1.95	-26.98	-1.27	0.00	0.00	0.00
6,900.00	2.07	265.88	6,899.46	-2.21	-30.58	-1.44	0.00	0.00	0.00
7,000.00	2.07	265.88	6,999.39	-2.47	-34.19	-1.60	0.00	0.00	0.00
7,100.00	2.07	265.88	7,099.33	-2.73	-37.79	-1.77	0.00	0.00	0.00
7,200.00	2.07	265.88	7,199.26	-2.99	-41.40	-1.94	0.00	0.00	0.00
7,300.00	2.07	265.88	7,299.20	-3.25	-45.00	-2.11	0.00	0.00	0.00
7,400.00	2.07	265.88	7,399.13	-3.51	-48.61	-2.28	0.00	0.00	0.00
7,500.00	2.07	265.88	7,499.07	-3.77	-52.21	-2.45	0.00	0.00	0.00
7,600.00	2.07	265.88	7,599.00	-4.02	-55.82	-2.62	0.00	0.00	0.00
7,700.00	2.07	265.88	7,698.93	-4.28	-59.42	-2.79	0.00	0.00	0.00
7,800.00	2.07	265.88	7,798.87	-4.54	-63.03	-2.96	0.00	0.00	0.00
7,900.00	2.07	265.88	7,898.80	-4.80	-66.63	-3.13	0.00	0.00	0.00
8,000.00	2.07	265.88	7,998.74	-5.06	-70.24	-3.30	0.00	0.00	0.00
8,100.00	2.07	265.88	8,098.67	-5.32	-73.84	-3.47	0.00	0.00	0.00
8,200.00	2.07	265.88	8,198.61	-5.58	-77.45	-3.64	0.00	0.00	0.00
8,300.00	2.07	265.88	8,298.54	-5.84	-81.06	-3.80	0.00	0.00	0.00
8,400.00	2.07	265.88	8,398.48	-6.10	-84.66	-3.97	0.00	0.00	0.00
8,500.00	2.07	265.88	8,498.41	-6.36	-88.27	-4.14	0.00	0.00	0.00
8,600.00	2.07	265.88	8,598.35	-6.62	-91.87	-4.31	0.00	0.00	0.00
8,700.00	2.07	265.88	8,698.28	-6.88	-95.48	-4.48	0.00	0.00	0.00
8,800.00	2.07	265.88	8,798.22	-7.14	-99.08	-4.65	0.00	0.00	0.00
8,900.00	2.07	265.88	8,898.15	-7.40	-102.69	-4.82	0.00	0.00	0.00
9,000.00	2.07	265.88	8,998.08	-7.66	-106.29	-4.99	0.00	0.00	0.00
9,100.00	2.07	265.88	9,098.02	-7.92	-109.90	-5.16	0.00	0.00	0.00
9,200.00	2.07	265.88	9,197.95	-8.18	-113.50	-5.33	0.00	0.00	0.00
9,300.00	2.07	265.88	9,297.89	-8.44	-117.11	-5.50	0.00	0.00	0.00

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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	2.07	265.88	9,397.82	-8.70	-120.71	-5.67	0.00	0.00	0.00
9,500.00	2.07	265.88	9,497.76	-8.96	-124.32	-5.84	0.00	0.00	0.00
9,600.00	2.07	265.88	9,597.69	-9.22	-127.92	-6.00	0.00	0.00	0.00
9,700.00	2.07	265.88	9,697.63	-9.48	-131.53	-6.17	0.00	0.00	0.00
9,800.00	2.07	265.88	9,797.56	-9.74	-135.14	-6.34	0.00	0.00	0.00
9,900.00	2.07	265.88	9,897.50	-10.00	-138.74	-6.51	0.00	0.00	0.00
10,000.00	2.07	265.88	9,997.43	-10.26	-142.35	-6.68	0.00	0.00	0.00
10,100.00	2.07	265.88	10,097.37	-10.52	-145.95	-6.85	0.00	0.00	0.00
10,200.00	2.07	265.88	10,197.30	-10.78	-149.56	-7.02	0.00	0.00	0.00
10,300.00	2.07	265.88	10,297.24	-11.04	-153.16	-7.19	0.00	0.00	0.00
10,400.00	2.07	265.88	10,397.17	-11.30	-156.77	-7.36	0.00	0.00	0.00
10,500.00	2.07	265.88	10,497.10	-11.56	-160.37	-7.53	0.00	0.00	0.00
10,566.27	2.07	265.88	10,563.33	-11.74	-162.76	-7.64	0.00	0.00	0.00
Start DLS 12.00 TFO 93.63									
10,600.00	4.43	331.72	10,597.01	-10.63	-163.99	-6.51	12.00	6.99	195.20
10,700.00	16.05	352.30	10,695.28	6.53	-167.68	10.74	12.00	11.62	20.57
10,800.00	27.99	355.61	10,787.82	43.75	-171.34	48.05	12.00	11.94	3.31
10,900.00	39.96	357.04	10,870.60	99.42	-174.81	103.79	12.00	11.97	1.43
11,000.00	51.95	357.89	10,940.00	171.10	-177.93	175.52	12.00	11.98	0.85
11,100.00	63.94	358.50	10,992.98	255.66	-180.57	260.12	12.00	11.99	0.61
11,200.00	75.93	358.99	11,027.23	349.39	-182.61	353.87	12.00	11.99	0.49
11,300.00	87.92	359.43	11,041.26	448.21	-183.97	452.69	12.00	11.99	0.44
11,325.70	91.00	359.54	11,041.50	473.90	-184.20	478.38	12.00	11.99	0.43
Start 10025.95 hold at 11325.70 MD - Huckleberry State Com 506H FTP									
11,400.00	91.00	359.54	11,040.20	548.19	-184.79	552.66	0.00	0.00	0.00
11,500.00	91.00	359.54	11,038.46	648.17	-185.59	652.63	0.00	0.00	0.00
11,600.00	91.00	359.54	11,036.71	748.15	-186.39	752.60	0.00	0.00	0.00
11,700.00	91.00	359.54	11,034.97	848.13	-187.18	852.57	0.00	0.00	0.00
11,800.00	91.00	359.54	11,033.22	948.11	-187.98	952.54	0.00	0.00	0.00
11,900.00	91.00	359.54	11,031.48	1,048.10	-188.78	1,052.51	0.00	0.00	0.00
12,000.00	91.00	359.54	11,029.73	1,148.08	-189.57	1,152.48	0.00	0.00	0.00
12,100.00	91.00	359.54	11,027.99	1,248.06	-190.37	1,252.45	0.00	0.00	0.00
12,200.00	91.00	359.54	11,026.24	1,348.04	-191.17	1,352.42	0.00	0.00	0.00
12,300.00	91.00	359.54	11,024.49	1,448.02	-191.96	1,452.39	0.00	0.00	0.00
12,400.00	91.00	359.54	11,022.75	1,548.00	-192.76	1,552.36	0.00	0.00	0.00
12,500.00	91.00	359.54	11,021.00	1,647.99	-193.56	1,652.33	0.00	0.00	0.00
12,600.00	91.00	359.54	11,019.26	1,747.97	-194.36	1,752.30	0.00	0.00	0.00
12,700.00	91.00	359.54	11,017.51	1,847.95	-195.15	1,852.27	0.00	0.00	0.00
12,800.00	91.00	359.54	11,015.77	1,947.93	-195.95	1,952.24	0.00	0.00	0.00
12,900.00	91.00	359.54	11,014.02	2,047.91	-196.75	2,052.21	0.00	0.00	0.00
13,000.00	91.00	359.54	11,012.28	2,147.89	-197.54	2,152.18	0.00	0.00	0.00
13,100.00	91.00	359.54	11,010.53	2,247.88	-198.34	2,252.15	0.00	0.00	0.00
13,200.00	91.00	359.54	11,008.78	2,347.86	-199.14	2,352.12	0.00	0.00	0.00
13,300.00	91.00	359.54	11,007.04	2,447.84	-199.93	2,452.09	0.00	0.00	0.00

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Huckleberry State Com 506H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3741.50usft (Scandril Freedom)
Site:	Sec. 27, T 21S. , R 33 E	MD Reference:	KB=26' @ 3741.50usft (Scandril Freedom)
Well:	Huckleberry State Com 506H	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	91.00	359.54	11,005.29	2,547.82	-200.73	2,552.06	0.00	0.00	0.00	
13,500.00	91.00	359.54	11,003.55	2,647.80	-201.53	2,652.03	0.00	0.00	0.00	
13,600.00	91.00	359.54	11,001.80	2,747.78	-202.32	2,752.00	0.00	0.00	0.00	
13,700.00	91.00	359.54	11,000.06	2,847.76	-203.12	2,851.97	0.00	0.00	0.00	
13,800.00	91.00	359.54	10,998.31	2,947.75	-203.92	2,951.94	0.00	0.00	0.00	
13,900.00	91.00	359.54	10,996.57	3,047.73	-204.72	3,051.91	0.00	0.00	0.00	
14,000.00	91.00	359.54	10,994.82	3,147.71	-205.51	3,151.88	0.00	0.00	0.00	
14,100.00	91.00	359.54	10,993.08	3,247.69	-206.31	3,251.85	0.00	0.00	0.00	
14,200.00	91.00	359.54	10,991.33	3,347.67	-207.11	3,351.82	0.00	0.00	0.00	
14,300.00	91.00	359.54	10,989.58	3,447.65	-207.90	3,451.79	0.00	0.00	0.00	
14,400.00	91.00	359.54	10,987.84	3,547.64	-208.70	3,551.76	0.00	0.00	0.00	
14,500.00	91.00	359.54	10,986.09	3,647.62	-209.50	3,651.73	0.00	0.00	0.00	
14,600.00	91.00	359.54	10,984.35	3,747.60	-210.29	3,751.70	0.00	0.00	0.00	
14,700.00	91.00	359.54	10,982.60	3,847.58	-211.09	3,851.67	0.00	0.00	0.00	
14,800.00	91.00	359.54	10,980.86	3,947.56	-211.89	3,951.64	0.00	0.00	0.00	
14,900.00	91.00	359.54	10,979.11	4,047.54	-212.68	4,051.61	0.00	0.00	0.00	
15,000.00	91.00	359.54	10,977.37	4,147.53	-213.48	4,151.58	0.00	0.00	0.00	
15,100.00	91.00	359.54	10,975.62	4,247.51	-214.28	4,251.55	0.00	0.00	0.00	
15,200.00	91.00	359.54	10,973.88	4,347.49	-215.08	4,351.52	0.00	0.00	0.00	
15,300.00	91.00	359.54	10,972.13	4,447.47	-215.87	4,451.49	0.00	0.00	0.00	
15,400.00	91.00	359.54	10,970.38	4,547.45	-216.67	4,551.46	0.00	0.00	0.00	
15,500.00	91.00	359.54	10,968.64	4,647.43	-217.47	4,651.43	0.00	0.00	0.00	
15,600.00	91.00	359.54	10,966.89	4,747.41	-218.26	4,751.40	0.00	0.00	0.00	
15,700.00	91.00	359.54	10,965.15	4,847.40	-219.06	4,851.37	0.00	0.00	0.00	
15,800.00	91.00	359.54	10,963.40	4,947.38	-219.86	4,951.34	0.00	0.00	0.00	
15,900.00	91.00	359.54	10,961.66	5,047.36	-220.65	5,051.31	0.00	0.00	0.00	
16,000.00	91.00	359.54	10,959.91	5,147.34	-221.45	5,151.28	0.00	0.00	0.00	
16,100.00	91.00	359.54	10,958.17	5,247.32	-222.25	5,251.25	0.00	0.00	0.00	
16,200.00	91.00	359.54	10,956.42	5,347.30	-223.04	5,351.22	0.00	0.00	0.00	
16,300.00	91.00	359.54	10,954.68	5,447.29	-223.84	5,451.19	0.00	0.00	0.00	
16,400.00	91.00	359.54	10,952.93	5,547.27	-224.64	5,551.16	0.00	0.00	0.00	
16,500.00	91.00	359.54	10,951.18	5,647.25	-225.44	5,651.13	0.00	0.00	0.00	
16,600.00	91.00	359.54	10,949.44	5,747.23	-226.23	5,751.10	0.00	0.00	0.00	
16,700.00	91.00	359.54	10,947.69	5,847.21	-227.03	5,851.07	0.00	0.00	0.00	
16,800.00	91.00	359.54	10,945.95	5,947.19	-227.83	5,951.04	0.00	0.00	0.00	
16,900.00	91.00	359.54	10,944.20	6,047.18	-228.62	6,051.01	0.00	0.00	0.00	
17,000.00	91.00	359.54	10,942.46	6,147.16	-229.42	6,150.98	0.00	0.00	0.00	
17,100.00	91.00	359.54	10,940.71	6,247.14	-230.22	6,250.95	0.00	0.00	0.00	
17,200.00	91.00	359.54	10,938.97	6,347.12	-231.01	6,350.92	0.00	0.00	0.00	
17,300.00	91.00	359.54	10,937.22	6,447.10	-231.81	6,450.89	0.00	0.00	0.00	
17,400.00	91.00	359.54	10,935.48	6,547.08	-232.61	6,550.86	0.00	0.00	0.00	
17,500.00	91.00	359.54	10,933.73	6,647.07	-233.41	6,650.83	0.00	0.00	0.00	
17,600.00	91.00	359.54	10,931.98	6,747.05	-234.20	6,750.80	0.00	0.00	0.00	

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Huckleberry State Com 506H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3741.50usft (Scandril Freedom)
Site:	Sec. 27, T 21S. , R 33 E	MD Reference:	KB=26' @ 3741.50usft (Scandril Freedom)
Well:	Huckleberry State Com 506H	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)
17,700.00	91.00	359.54	10,930.24	6,847.03	-235.00	6,850.77	0.00	0.00	0.00
17,800.00	91.00	359.54	10,928.49	6,947.01	-235.80	6,950.74	0.00	0.00	0.00
17,900.00	91.00	359.54	10,926.75	7,046.99	-236.59	7,050.71	0.00	0.00	0.00
18,000.00	91.00	359.54	10,925.00	7,146.97	-237.39	7,150.68	0.00	0.00	0.00
18,100.00	91.00	359.54	10,923.26	7,246.95	-238.19	7,250.65	0.00	0.00	0.00
18,200.00	91.00	359.54	10,921.51	7,346.94	-238.98	7,350.62	0.00	0.00	0.00
18,300.00	91.00	359.54	10,919.77	7,446.92	-239.78	7,450.59	0.00	0.00	0.00
18,400.00	91.00	359.54	10,918.02	7,546.90	-240.58	7,550.56	0.00	0.00	0.00
18,500.00	91.00	359.54	10,916.27	7,646.88	-241.37	7,650.53	0.00	0.00	0.00
18,600.00	91.00	359.54	10,914.53	7,746.86	-242.17	7,750.50	0.00	0.00	0.00
18,700.00	91.00	359.54	10,912.78	7,846.84	-242.97	7,850.47	0.00	0.00	0.00
18,800.00	91.00	359.54	10,911.04	7,946.83	-243.77	7,950.44	0.00	0.00	0.00
18,900.00	91.00	359.54	10,909.29	8,046.81	-244.56	8,050.41	0.00	0.00	0.00
19,000.00	91.00	359.54	10,907.55	8,146.79	-245.36	8,150.38	0.00	0.00	0.00
19,100.00	91.00	359.54	10,905.80	8,246.77	-246.16	8,250.35	0.00	0.00	0.00
19,200.00	91.00	359.54	10,904.06	8,346.75	-246.95	8,350.32	0.00	0.00	0.00
19,300.00	91.00	359.54	10,902.31	8,446.73	-247.75	8,450.29	0.00	0.00	0.00
19,400.00	91.00	359.54	10,900.57	8,546.72	-248.55	8,550.26	0.00	0.00	0.00
19,500.00	91.00	359.54	10,898.82	8,646.70	-249.34	8,650.23	0.00	0.00	0.00
19,600.00	91.00	359.54	10,897.07	8,746.68	-250.14	8,750.20	0.00	0.00	0.00
19,700.00	91.00	359.54	10,895.33	8,846.66	-250.94	8,850.17	0.00	0.00	0.00
19,800.00	91.00	359.54	10,893.58	8,946.64	-251.73	8,950.14	0.00	0.00	0.00
19,900.00	91.00	359.54	10,891.84	9,046.62	-252.53	9,050.11	0.00	0.00	0.00
20,000.00	91.00	359.54	10,890.09	9,146.60	-253.33	9,150.08	0.00	0.00	0.00
20,100.00	91.00	359.54	10,888.35	9,246.59	-254.13	9,250.05	0.00	0.00	0.00
20,200.00	91.00	359.54	10,886.60	9,346.57	-254.92	9,350.02	0.00	0.00	0.00
20,300.00	91.00	359.54	10,884.86	9,446.55	-255.72	9,449.99	0.00	0.00	0.00
20,400.00	91.00	359.54	10,883.11	9,546.53	-256.52	9,549.96	0.00	0.00	0.00
20,500.00	91.00	359.54	10,881.37	9,646.51	-257.31	9,649.93	0.00	0.00	0.00
20,600.00	91.00	359.54	10,879.62	9,746.49	-258.11	9,749.90	0.00	0.00	0.00
20,700.00	91.00	359.54	10,877.87	9,846.48	-258.91	9,849.87	0.00	0.00	0.00
20,800.00	91.00	359.54	10,876.13	9,946.46	-259.70	9,949.84	0.00	0.00	0.00
20,900.00	91.00	359.54	10,874.38	10,046.44	-260.50	10,049.81	0.00	0.00	0.00
21,000.00	91.00	359.54	10,872.64	10,146.42	-261.30	10,149.78	0.00	0.00	0.00
21,100.00	91.00	359.54	10,870.89	10,246.40	-262.09	10,249.75	0.00	0.00	0.00
21,200.00	91.00	359.54	10,869.15	10,346.38	-262.89	10,349.72	0.00	0.00	0.00
21,221.72	91.00	359.54	10,868.77	10,368.10	-263.06	10,371.44	0.00	0.00	0.00
Huckleberry State Com 506H LTP									
21,300.00	91.00	359.54	10,867.40	10,446.37	-263.69	10,449.69	0.00	0.00	0.00
21,351.64	91.00	359.54	10,866.50	10,498.00	-264.10	10,501.32	0.00	0.00	0.00
TD at 21351.64 - Huckleberry State Com 506H BHL									

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Huckleberry State Com 506H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3741.50usft (Scandriill Freedom)
Site:	Sec. 27, T 21S. , R 33 E	MD Reference:	KB=26' @ 3741.50usft (Scandriill Freedom)
Well:	Huckleberry State Com 506H	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 Cor	0.00	0.00	10,866.5 0	10,498.00	-264.10	541,161.90	736,828.80	32.48542	-103.56529
- plan hits target center - Point									
Huckleberry State Cor	0.00	0.00	10,868.7 7	10,368.10	-263.00	541,032.00	736,829.90	32.48507	-103.56529
- plan misses target center by 0.06usft at 21221.72usft MD (10868.77 TVD, 10368.10 N, -263.06 E) - Point									
Huckleberry State Cor	0.00	0.00	11,041.50	473.90	-184.20	531,137.80	736,908.70	32.45787	-103.56527
- plan hits target center - Point									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,806.50	1,806.50	Rustler		0.00	
1,900.50	1,900.50	TOS		0.00	
3,540.50	3,540.50	BOS / Tansill		0.00	
3,735.50	3,735.50	Yates		0.00	
3,803.50	3,803.50	Seven Rivers			
3,961.50	3,961.50	Capitan Reef			
5,358.50	5,358.50	Base of Reef (BLCN)			
5,808.50	5,808.50	CYCN			
7,226.26	7,225.50	BYCN			
8,813.29	8,811.50	Bone Spring (BSGL)			
9,261.59	9,259.50	U Avalon Sh			
9,401.68	9,399.50	L Avalon Sh			
9,901.00	9,898.50	B Avalon Sh			
10,064.11	10,061.50	FBSG_sand			
10,604.50	10,601.50	SBSG_sand			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6000	6000	0	0	Start Build 2.00
6104	6104	0	-2	Start 4462.69 hold at 6103.58 MD
10,566	10,563	-12	-163	Start DLS 12.00 TFO 93.63
11,326	11,041	474	-184	Start 10025.95 hold at 11325.70 MD
21,352	10,867	10,498	-264	TD at 21351.64

Checked By: _____ Approved By: _____ Date: _____