

COG Operating L L C
 Project: Lea County, NM (NAD27 NME)
 Site: Sec. 25, T 24 S., R 34 E
 Well: Baseball Cap Federal Com 24H
 Wellbore: Wellbore #1
 Plan: Plan #1 (Baseball Cap Federal Com 24H/Wellbore #1)
 McVay 8



WELL DETAILS: Baseball Cap Federal Com 24H

Ground Elevation:: 3382.00
 RKB Elevation: KB=26' @ 3408.00ft (McVay 8)
 Rig Name: McVay 8

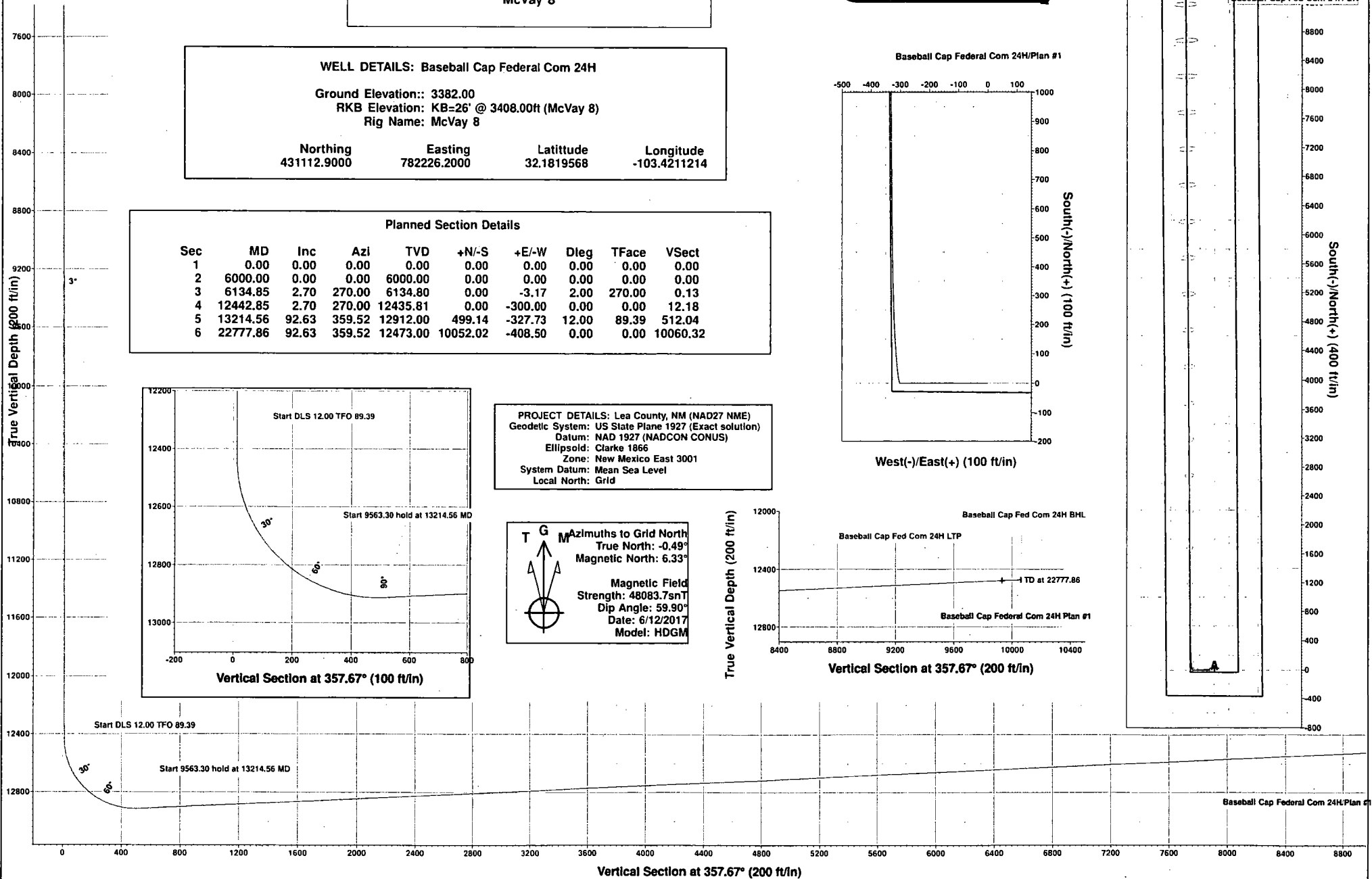
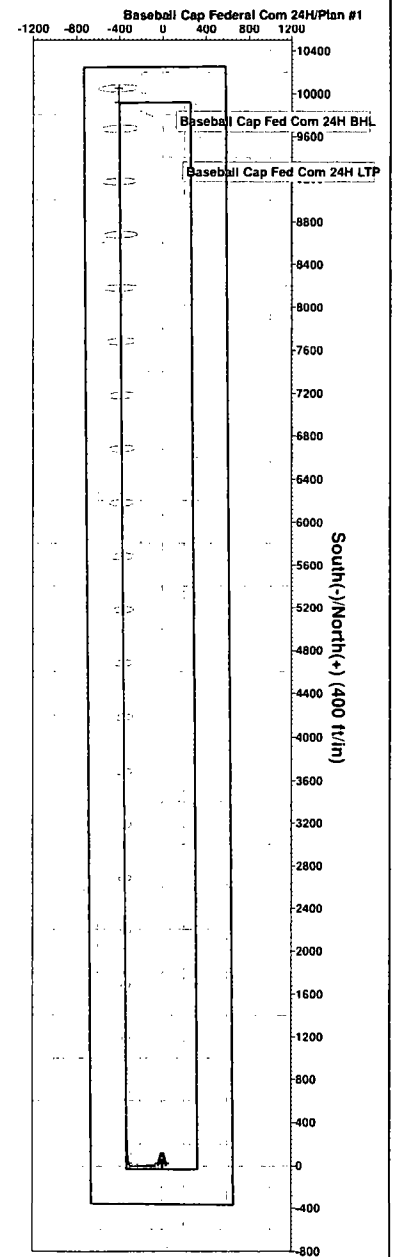
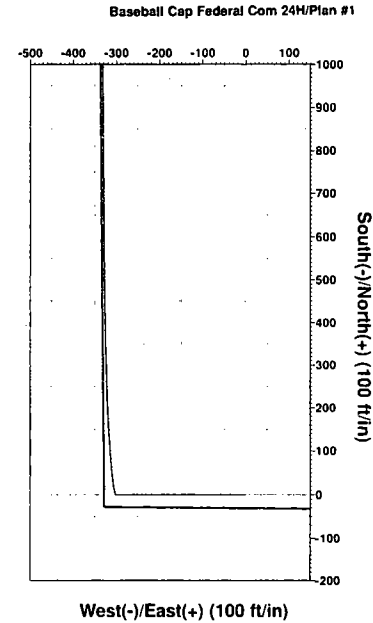
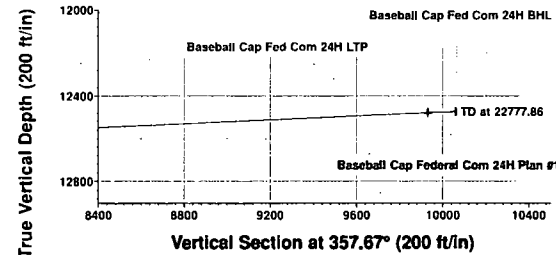
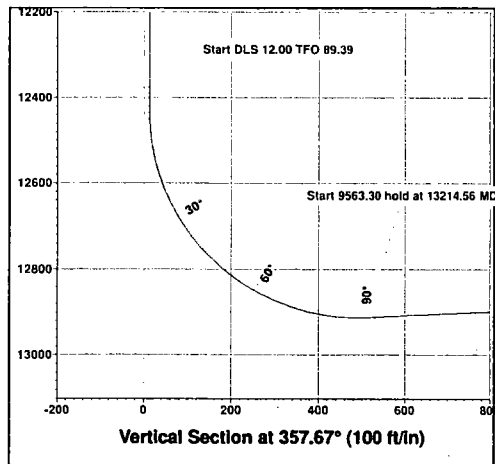
Northing	Easting	Latitude	Longitude
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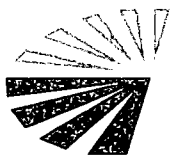
Planned Section Details

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	6000.00	0.00	0.00	6000.00	0.00	0.00	0.00	0.00	0.00
3	6134.85	2.70	270.00	6134.80	0.00	-3.17	2.00	270.00	0.13
4	12442.85	2.70	270.00	12435.81	0.00	-300.00	0.00	0.00	12.18
5	13214.56	92.63	359.52	12912.00	499.14	-327.73	12.00	89.39	512.04
6	22777.86	92.63	359.52	12473.00	10052.02	-408.50	0.00	0.00	10060.32

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

T G M
 Azimuths to Grid North
 True North: -0.49°
 Magnetic North: 6.33°
 Magnetic Field
 Strength: 48083.7nT
 Dip Angle: 59.90°
 Date: 6/12/2017
 Model: HDGM





CONCHO

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 25, T 24 S. , R 34 E

Baseball Cap Federal Com 24H

Wellbore #1

Plan: Plan #1

Standard Survey Report

13 June, 2017

HOBBS OCD

OCT 30 2017

RECEIVED





Integrity Directional Services, LLC

Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Baseball Cap Federal Com 24H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3408.00ft (McVay 8)
Site:	Sec. 25, T 24 S. , R 34 E	MD Reference:	KB=26' @ 3408.00ft (McVay 8)
Well:	Baseball Cap Federal Com 24H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Project	Lea County, NM (NAD27 NME)	System Datum:	Mean Sea Level
Map System:	US State Plane 1927 (Exact solution)		
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sec. 25, T 24 S. , R 34 E				
Site Position:		Northing:	431,112.9000 usft	Latitude:	32.1819568
From:	Map	Easting:	782,226.2000 usft	Longitude:	-103.4211214
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.49 °

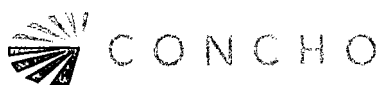
Well	Baseball Cap Federal Com 24H					
Well Position	+N/-S	0.00 ft	Northing:	431,112.9000 usft	Latitude:	32.1819568
	+E/-W	0.00 ft	Easting:	782,226.2000 usft	Longitude:	-103.4211214
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	3,382.00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	HDGM	6/12/2017	6.82	59.90	48,084

Design	Plan #1				
Audit Notes:					
Version:		Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	357.67	

Survey Tool Program	Date	6/13/2017			
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
0.00	22,777.82	Plan #1 (Wellbore #1)	MWD	MWD - Standard	

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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



Integrity Directional Services, LLC

Survey Report

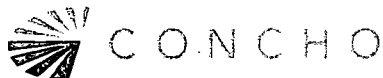


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MD Reference: KB=26' @ 3408.00ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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	270.00	6,099.98	0.00	-1.75	0.07	2.00	2.00	0.00
6,134.85	2.70	270.00	6,134.80	0.00	-3.17	0.13	2.00	2.00	0.00
Start 6307.99 hold at 6134.85 MD									
6,200.00	2.70	270.00	6,199.88	0.00	-6.24	0.25	0.00	0.00	0.00
6,300.00	2.70	270.00	6,299.77	0.00	-10.94	0.44	0.00	0.00	0.00
6,400.00	2.70	270.00	6,399.66	0.00	-15.65	0.64	0.00	0.00	0.00
6,500.00	2.70	270.00	6,499.55	0.00	-20.36	0.83	0.00	0.00	0.00
6,600.00	2.70	270.00	6,599.44	0.00	-25.06	1.02	0.00	0.00	0.00
6,700.00	2.70	270.00	6,699.32	0.00	-29.77	1.21	0.00	0.00	0.00
6,800.00	2.70	270.00	6,799.21	0.00	-34.47	1.40	0.00	0.00	0.00
6,900.00	2.70	270.00	6,899.10	0.00	-39.18	1.59	0.00	0.00	0.00
7,000.00	2.70	270.00	6,998.99	0.00	-43.88	1.78	0.00	0.00	0.00
7,100.00	2.70	270.00	7,098.88	0.00	-48.59	1.97	0.00	0.00	0.00
7,200.00	2.70	270.00	7,198.77	0.00	-53.29	2.16	0.00	0.00	0.00
7,300.00	2.70	270.00	7,298.66	0.00	-58.00	2.36	0.00	0.00	0.00
7,400.00	2.70	270.00	7,398.55	0.00	-62.71	2.55	0.00	0.00	0.00
7,500.00	2.70	270.00	7,498.44	0.00	-67.41	2.74	0.00	0.00	0.00
7,600.00	2.70	270.00	7,598.33	0.00	-72.12	2.93	0.00	0.00	0.00
7,700.00	2.70	270.00	7,698.22	0.00	-76.82	3.12	0.00	0.00	0.00
7,800.00	2.70	270.00	7,798.11	0.00	-81.53	3.31	0.00	0.00	0.00
7,900.00	2.70	270.00	7,898.00	0.00	-86.23	3.50	0.00	0.00	0.00
8,000.00	2.70	270.00	7,997.88	0.00	-90.94	3.69	0.00	0.00	0.00
8,100.00	2.70	270.00	8,097.77	0.00	-95.64	3.88	0.00	0.00	0.00
8,200.00	2.70	270.00	8,197.66	0.00	-100.35	4.07	0.00	0.00	0.00
8,300.00	2.70	270.00	8,297.55	0.00	-105.06	4.27	0.00	0.00	0.00
8,400.00	2.70	270.00	8,397.44	0.00	-109.76	4.46	0.00	0.00	0.00
8,500.00	2.70	270.00	8,497.33	0.00	-114.47	4.65	0.00	0.00	0.00
8,600.00	2.70	270.00	8,597.22	0.00	-119.17	4.84	0.00	0.00	0.00
8,700.00	2.70	270.00	8,697.11	0.00	-123.88	5.03	0.00	0.00	0.00
8,800.00	2.70	270.00	8,797.00	0.00	-128.58	5.22	0.00	0.00	0.00
8,900.00	2.70	270.00	8,896.89	0.00	-133.29	5.41	0.00	0.00	0.00
9,000.00	2.70	270.00	8,996.78	0.00	-137.99	5.60	0.00	0.00	0.00
9,100.00	2.70	270.00	9,096.67	0.00	-142.70	5.79	0.00	0.00	0.00
9,200.00	2.70	270.00	9,196.56	0.00	-147.41	5.99	0.00	0.00	0.00
9,300.00	2.70	270.00	9,296.44	0.00	-152.11	6.18	0.00	0.00	0.00



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9,400.00	2.70	270.00	9,396.33	0.00	-156.82	6.37	0.00	0.00	0.00
9,500.00	2.70	270.00	9,496.22	0.00	-161.52	6.56	0.00	0.00	0.00
9,600.00	2.70	270.00	9,596.11	0.00	-166.23	6.75	0.00	0.00	0.00
9,700.00	2.70	270.00	9,696.00	0.00	-170.93	6.94	0.00	0.00	0.00
9,800.00	2.70	270.00	9,795.89	0.00	-175.64	7.13	0.00	0.00	0.00
9,900.00	2.70	270.00	9,895.78	0.00	-180.34	7.32	0.00	0.00	0.00
10,000.00	2.70	270.00	9,995.67	0.00	-185.05	7.51	0.00	0.00	0.00
10,100.00	2.70	270.00	10,095.56	0.00	-189.76	7.71	0.00	0.00	0.00
10,200.00	2.70	270.00	10,195.45	0.00	-194.46	7.90	0.00	0.00	0.00
10,300.00	2.70	270.00	10,295.34	0.00	-199.17	8.09	0.00	0.00	0.00
10,400.00	2.70	270.00	10,395.23	0.00	-203.87	8.28	0.00	0.00	0.00
10,500.00	2.70	270.00	10,495.12	0.00	-208.58	8.47	0.00	0.00	0.00
10,600.00	2.70	270.00	10,595.00	0.00	-213.28	8.66	0.00	0.00	0.00
10,700.00	2.70	270.00	10,694.89	0.00	-217.99	8.85	0.00	0.00	0.00
10,800.00	2.70	270.00	10,794.78	0.00	-222.69	9.04	0.00	0.00	0.00
10,900.00	2.70	270.00	10,894.67	0.00	-227.40	9.23	0.00	0.00	0.00
11,000.00	2.70	270.00	10,994.56	0.00	-232.11	9.42	0.00	0.00	0.00
11,100.00	2.70	270.00	11,094.45	0.00	-236.81	9.62	0.00	0.00	0.00
11,200.00	2.70	270.00	11,194.34	0.00	-241.52	9.81	0.00	0.00	0.00
11,300.00	2.70	270.00	11,294.23	0.00	-246.22	10.00	0.00	0.00	0.00
11,400.00	2.70	270.00	11,394.12	0.00	-250.93	10.19	0.00	0.00	0.00
11,500.00	2.70	270.00	11,494.01	0.00	-255.63	10.38	0.00	0.00	0.00
11,600.00	2.70	270.00	11,593.90	0.00	-260.34	10.57	0.00	0.00	0.00
11,700.00	2.70	270.00	11,693.79	0.00	-265.04	10.76	0.00	0.00	0.00
11,800.00	2.70	270.00	11,793.68	0.00	-269.75	10.95	0.00	0.00	0.00
11,900.00	2.70	270.00	11,893.56	0.00	-274.46	11.14	0.00	0.00	0.00
12,000.00	2.70	270.00	11,993.45	0.00	-279.16	11.34	0.00	0.00	0.00
12,100.00	2.70	270.00	12,093.34	0.00	-283.87	11.53	0.00	0.00	0.00
12,200.00	2.70	270.00	12,193.23	0.00	-288.57	11.72	0.00	0.00	0.00
12,300.00	2.70	270.00	12,293.12	0.00	-293.28	11.91	0.00	0.00	0.00
12,400.00	2.70	270.00	12,393.01	0.00	-297.98	12.10	0.00	0.00	0.00
12,442.85	2.70	270.00	12,435.81	0.00	-300.00	12.18	0.00	0.00	0.00
Start DLS 12.00 TFO 89.39									
12,500.00	7.39	338.11	12,492.76	3.42	-302.72	15.71	12.00	8.22	119.17
12,600.00	19.07	351.56	12,589.96	25.63	-307.53	38.09	12.00	11.68	13.45
12,700.00	30.99	354.89	12,680.41	67.59	-312.24	80.21	12.00	11.92	3.33
12,800.00	42.96	356.49	12,760.15	127.46	-316.63	140.21	12.00	11.96	1.60
12,900.00	54.93	357.50	12,825.71	202.62	-320.52	215.47	12.00	11.98	1.01
13,000.00	66.91	358.24	12,874.23	289.80	-323.73	302.71	12.00	11.98	0.74
13,100.00	78.90	358.86	12,903.57	385.18	-326.13	398.10	12.00	11.99	0.62
13,200.00	90.89	359.43	12,912.45	484.59	-327.60	497.49	12.00	11.99	0.57
13,214.56	92.63	359.52	12,912.01	499.14	-327.73	512.04	12.00	11.99	0.57
Start 9563.30 hold at 13214.56 MD									
13,300.00	92.63	359.52	12,908.08	584.49	-328.45	597.34	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 25, T 24 S., R 34 E
Well: Baseball Cap Federal Com 24H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Baseball Cap Federal Com 24H
TVD Reference: KB=26' @ 3408.00ft (McVay 8)
MD Reference: KB=26' @ 3408.00ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,400.00	92.63	359.52	12,903.49	684.38	-329.30	697.19	0.00	0.00	0.00
13,500.00	92.63	359.52	12,898.90	784.27	-330.14	797.03	0.00	0.00	0.00
13,600.00	92.63	359.52	12,894.31	884.16	-330.99	896.87	0.00	0.00	0.00
13,700.00	92.63	359.52	12,889.72	984.05	-331.83	996.71	0.00	0.00	0.00
13,800.00	92.63	359.52	12,885.13	1,083.94	-332.68	1,096.56	0.00	0.00	0.00
13,900.00	92.63	359.52	12,880.54	1,183.83	-333.52	1,196.40	0.00	0.00	0.00
14,000.00	92.63	359.52	12,875.95	1,283.73	-334.37	1,296.24	0.00	0.00	0.00
14,100.00	92.63	359.52	12,871.36	1,383.62	-335.21	1,396.09	0.00	0.00	0.00
14,200.00	92.63	359.52	12,866.77	1,483.51	-336.06	1,495.93	0.00	0.00	0.00
14,300.00	92.63	359.52	12,862.18	1,583.40	-336.90	1,595.77	0.00	0.00	0.00
14,400.00	92.63	359.52	12,857.59	1,683.29	-337.74	1,695.62	0.00	0.00	0.00
14,500.00	92.63	359.52	12,853.00	1,783.18	-338.59	1,795.46	0.00	0.00	0.00
14,600.00	92.63	359.52	12,848.41	1,883.07	-339.43	1,895.30	0.00	0.00	0.00
14,700.00	92.63	359.52	12,843.82	1,982.96	-340.28	1,995.14	0.00	0.00	0.00
14,800.00	92.63	359.52	12,839.23	2,082.85	-341.12	2,094.99	0.00	0.00	0.00
14,900.00	92.63	359.52	12,834.63	2,182.74	-341.97	2,194.83	0.00	0.00	0.00
15,000.00	92.63	359.52	12,830.04	2,282.64	-342.81	2,294.67	0.00	0.00	0.00
15,100.00	92.63	359.52	12,825.45	2,382.53	-343.66	2,394.52	0.00	0.00	0.00
15,200.00	92.63	359.52	12,820.86	2,482.42	-344.50	2,494.36	0.00	0.00	0.00
15,300.00	92.63	359.52	12,816.27	2,582.31	-345.35	2,594.20	0.00	0.00	0.00
15,400.00	92.63	359.52	12,811.68	2,682.20	-346.19	2,694.04	0.00	0.00	0.00
15,500.00	92.63	359.52	12,807.09	2,782.09	-347.04	2,793.89	0.00	0.00	0.00
15,600.00	92.63	359.52	12,802.50	2,881.98	-347.88	2,893.73	0.00	0.00	0.00
15,700.00	92.63	359.52	12,797.91	2,981.87	-348.72	2,993.57	0.00	0.00	0.00
15,800.00	92.63	359.52	12,793.32	3,081.76	-349.57	3,093.42	0.00	0.00	0.00
15,900.00	92.63	359.52	12,788.73	3,181.65	-350.41	3,193.26	0.00	0.00	0.00
16,000.00	92.63	359.52	12,784.14	3,281.55	-351.26	3,293.10	0.00	0.00	0.00
16,100.00	92.63	359.52	12,779.55	3,381.44	-352.10	3,392.95	0.00	0.00	0.00
16,200.00	92.63	359.52	12,774.96	3,481.33	-352.95	3,492.79	0.00	0.00	0.00
16,300.00	92.63	359.52	12,770.37	3,581.22	-353.79	3,592.63	0.00	0.00	0.00
16,400.00	92.63	359.52	12,765.78	3,681.11	-354.64	3,692.47	0.00	0.00	0.00
16,500.00	92.63	359.52	12,761.19	3,781.00	-355.48	3,792.32	0.00	0.00	0.00
16,600.00	92.63	359.52	12,756.60	3,880.89	-356.33	3,892.16	0.00	0.00	0.00
16,700.00	92.63	359.52	12,752.01	3,980.78	-357.17	3,992.00	0.00	0.00	0.00
16,800.00	92.63	359.52	12,747.41	4,080.67	-358.01	4,091.85	0.00	0.00	0.00
16,900.00	92.63	359.52	12,742.82	4,180.56	-358.86	4,191.69	0.00	0.00	0.00
17,000.00	92.63	359.52	12,738.23	4,280.46	-359.70	4,291.53	0.00	0.00	0.00
17,100.00	92.63	359.52	12,733.64	4,380.35	-360.55	4,391.37	0.00	0.00	0.00
17,200.00	92.63	359.52	12,729.05	4,480.24	-361.39	4,491.22	0.00	0.00	0.00
17,300.00	92.63	359.52	12,724.46	4,580.13	-362.24	4,591.06	0.00	0.00	0.00
17,400.00	92.63	359.52	12,719.87	4,680.02	-363.08	4,690.90	0.00	0.00	0.00
17,500.00	92.63	359.52	12,715.28	4,779.91	-363.93	4,790.75	0.00	0.00	0.00
17,600.00	92.63	359.52	12,710.69	4,879.80	-364.77	4,890.59	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 25, T 24 S., R 34 E
Well: Baseball Cap Federal Com 24H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Baseball Cap Federal Com 24H
TVD Reference: KB=26' @ 3408.00ft (McVay 8)
MD Reference: KB=26' @ 3408.00ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
17,700.00	92.63	359.52	12,706.10	4,979.69	-365.62	4,990.43	0.00	0.00	0.00
17,800.00	92.63	359.52	12,701.51	5,079.58	-366.46	5,090.27	0.00	0.00	0.00
17,900.00	92.63	359.52	12,696.92	5,179.47	-367.30	5,190.12	0.00	0.00	0.00
18,000.00	92.63	359.52	12,692.33	5,279.37	-368.15	5,289.96	0.00	0.00	0.00
18,100.00	92.63	359.52	12,687.74	5,379.26	-368.99	5,389.80	0.00	0.00	0.00
18,200.00	92.63	359.52	12,683.15	5,479.15	-369.84	5,489.65	0.00	0.00	0.00
18,300.00	92.63	359.52	12,678.56	5,579.04	-370.68	5,589.49	0.00	0.00	0.00
18,400.00	92.63	359.52	12,673.97	5,678.93	-371.53	5,689.33	0.00	0.00	0.00
18,500.00	92.63	359.52	12,669.38	5,778.82	-372.37	5,789.18	0.00	0.00	0.00
18,600.00	92.63	359.52	12,664.79	5,878.71	-373.22	5,889.02	0.00	0.00	0.00
18,700.00	92.63	359.52	12,660.20	5,978.60	-374.06	5,988.86	0.00	0.00	0.00
18,800.00	92.63	359.52	12,655.60	6,078.49	-374.91	6,088.70	0.00	0.00	0.00
18,900.00	92.63	359.52	12,651.01	6,178.38	-375.75	6,188.55	0.00	0.00	0.00
19,000.00	92.63	359.52	12,646.42	6,278.28	-376.59	6,288.39	0.00	0.00	0.00
19,100.00	92.63	359.52	12,641.83	6,378.17	-377.44	6,388.23	0.00	0.00	0.00
19,200.00	92.63	359.52	12,637.24	6,478.06	-378.28	6,488.08	0.00	0.00	0.00
19,300.00	92.63	359.52	12,632.65	6,577.95	-379.13	6,587.92	0.00	0.00	0.00
19,400.00	92.63	359.52	12,628.06	6,677.84	-379.97	6,687.76	0.00	0.00	0.00
19,500.00	92.63	359.52	12,623.47	6,777.73	-380.82	6,787.60	0.00	0.00	0.00
19,600.00	92.63	359.52	12,618.88	6,877.62	-381.66	6,887.45	0.00	0.00	0.00
19,700.00	92.63	359.52	12,614.29	6,977.51	-382.51	6,987.29	0.00	0.00	0.00
19,800.00	92.63	359.52	12,609.70	7,077.40	-383.35	7,087.13	0.00	0.00	0.00
19,900.00	92.63	359.52	12,605.11	7,177.30	-384.20	7,186.98	0.00	0.00	0.00
20,000.00	92.63	359.52	12,600.52	7,277.19	-385.04	7,286.82	0.00	0.00	0.00
20,100.00	92.63	359.52	12,595.93	7,377.08	-385.88	7,386.66	0.00	0.00	0.00
20,200.00	92.63	359.52	12,591.34	7,476.97	-386.73	7,486.50	0.00	0.00	0.00
20,300.00	92.63	359.52	12,586.75	7,576.86	-387.57	7,586.35	0.00	0.00	0.00
20,400.00	92.63	359.52	12,582.16	7,676.75	-388.42	7,686.19	0.00	0.00	0.00
20,500.00	92.63	359.52	12,577.57	7,776.64	-389.26	7,786.03	0.00	0.00	0.00
20,600.00	92.63	359.52	12,572.98	7,876.53	-390.11	7,885.88	0.00	0.00	0.00
20,700.00	92.63	359.52	12,568.38	7,976.42	-390.95	7,985.72	0.00	0.00	0.00
20,800.00	92.63	359.52	12,563.79	8,076.31	-391.80	8,085.56	0.00	0.00	0.00
20,900.00	92.63	359.52	12,559.20	8,176.21	-392.64	8,185.41	0.00	0.00	0.00
21,000.00	92.63	359.52	12,554.61	8,276.10	-393.49	8,285.25	0.00	0.00	0.00
21,100.00	92.63	359.52	12,550.02	8,375.99	-394.33	8,385.09	0.00	0.00	0.00
21,200.00	92.63	359.52	12,545.43	8,475.88	-395.17	8,484.93	0.00	0.00	0.00
21,300.00	92.63	359.52	12,540.84	8,575.77	-396.02	8,584.78	0.00	0.00	0.00
21,400.00	92.63	359.52	12,536.25	8,675.66	-396.86	8,684.62	0.00	0.00	0.00
21,500.00	92.63	359.52	12,531.66	8,775.55	-397.71	8,784.46	0.00	0.00	0.00
21,600.00	92.63	359.52	12,527.07	8,875.44	-398.55	8,884.31	0.00	0.00	0.00
21,700.00	92.63	359.52	12,522.48	8,975.33	-399.40	8,984.15	0.00	0.00	0.00
21,800.00	92.63	359.52	12,517.89	9,075.22	-400.24	9,083.99	0.00	0.00	0.00
21,900.00	92.63	359.52	12,513.30	9,175.12	-401.09	9,183.83	0.00	0.00	0.00
22,000.00	92.63	359.52	12,508.71	9,275.01	-401.93	9,283.68	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Baseball Cap Federal Com 24H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3408.00ft (McVay 8)
Site:	Sec. 25, T 24 S. , R 34 E	MD Reference:	KB=26' @ 3408.00ft (McVay 8)
Well:	Baseball Cap Federal Com 24H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
22,100.00	92.63	359.52	12,504.12	9,374.90	-402.78	9,383.52	0.00	0.00	0.00
22,200.00	92.63	359.52	12,499.53	9,474.79	-403.62	9,483.36	0.00	0.00	0.00
22,300.00	92.63	359.52	12,494.94	9,574.68	-404.47	9,583.21	0.00	0.00	0.00
22,400.00	92.63	359.52	12,490.35	9,674.57	-405.31	9,683.05	0.00	0.00	0.00
22,500.00	92.63	359.52	12,485.76	9,774.46	-406.15	9,782.89	0.00	0.00	0.00
22,600.00	92.63	359.52	12,481.17	9,874.35	-407.00	9,882.73	0.00	0.00	0.00
22,700.00	92.63	359.52	12,476.57	9,974.24	-407.84	9,982.58	0.00	0.00	0.00
22,777.86	92.63	359.52	12,473.00	10,052.02	-408.50	10,060.32	0.00	0.00	0.00
TD at 22777.86									

Design Targets

Target Name

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Baseball Cap Fed Cor	0.00	0.00	12,473.00	10,052.02	-408.50	441,164.9000	781,817.7000	32.2095958	-103.4221663
- plan hits target center - Point									
Baseball Cap Fed Cor	0.00	0.00	12,478.97	9,922.02	-407.20	441,034.9000	781,819.0000	32.2092385	-103.4221657
- plan misses target center by 0.20ft at 22647.72ft MD (12478.97 TVD, 9922.02 N, -407.40 E) - Point									

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6000	6000	0	0	Start Build 2.00
6135	6135	0	-3	Start 6307.99 hold at 6134.85 MD
12,443	12,436	0	-300	Start DLS 12.00 TFO 89.39
13,215	12,912	499	-328	Start 9563.30 hold at 13214.56 MD
22,778	12,473	10,052	-409	TD at 22777.86

Checked By: _____	Approved By: _____	Date: _____
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