

HOBBS OCD

APR 25 2016

RECEIVED



COG Operating LLC

Lea County, NM
Haas 6 Federal Com
#4H

OH

Plan: Plan #1

Standard Planning Report

19 May, 2015



APR 25 2016



TDS
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #4H
Company:	COG Operating LLC	TVD Reference:	KB @ 3678.0usft (McVay 6)
Project:	Lea County, NM	MD Reference:	KB @ 3678.0usft (McVay 6)
Site:	Haas 6 Federal Com	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Project:	Lea County, NM		
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:	Haas 6 Federal Com		
Site Position:	Northings:	615,643.50 usft	Latitude: 32° 41' 28.890 N
From: Map	Easting:	664,831.90 usft	Longitude: 103° 47' 51.190 W
Position Uncertainty:	0.0 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.29 °

Well:	#4H		
Well Position	+N/-S	-0.4 usft	Northings: 615,643.10 usft
	+E/-W	-140.0 usft	Easting: 664,691.90 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
			Ground Level: 3,660.0 usft

Wellbore:	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	5/18/2015	7.24
			Dip Angle
			60.48
			Field Strength
			48,478

Design:	Plan #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			265.66

Plan Sections										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Dogleg Rate	Build Rate	Turn Rate	TFO	Target
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)	(°)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
7,812.6	0.00	0.00	7,812.6	0.0	0.0	0.00	0.00	0.00	0.00	
8,570.3	90.92	256.20	8,290.0	-115.7	-471.1	12.00	12.00	0.00	256.20	
9,120.3	90.92	256.20	8,281.2	-246.9	-1,005.2	0.00	0.00	0.00	0.00	
9,440.2	90.91	269.00	8,276.0	-288.0	-1,321.8	4.00	0.00	4.00	89.94	
12,655.4	90.91	269.00	8,225.0	-344.1	-4,536.0	0.00	0.00	0.00	0.00	PBHL (H6FC #4H/OH)



TDS
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #4H
Company:	COG Operating LLC	TVD Reference:	KB @ 3678.0usft (McVay 6)
Project:	Lea County, NM	MD Reference:	KB @ 3678.0usft (McVay 6)
Site:	Haas 6 Federal Com	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00



TDS
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #4H
Company:	COG Operating LLC	TVD Reference:	KB @ 3678.0usft (McVay 6)
Project:	Lea County, NM	MD Reference:	KB @ 3678.0usft (McVay 6)
Site:	Haas 6 Federal Com	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #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)	
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,800.0	0.00	0.00	7,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,812.6	0.00	0.00	7,812.6	0.0	0.0	0.0	0.00	0.00	0.00	
KOP - Start Build 12.00										
7,825.0	1.49	256.20	7,825.0	0.0	-0.2	0.2	12.00	12.00	0.00	
7,850.0	4.49	256.20	7,850.0	-0.3	-1.4	1.4	12.00	12.00	0.00	
7,875.0	7.49	256.20	7,874.8	-1.0	-4.0	4.0	12.00	12.00	0.00	
7,900.0	10.49	256.20	7,899.5	-1.9	-7.7	7.9	12.00	12.00	0.00	
7,925.0	13.49	256.20	7,924.0	-3.1	-12.8	13.0	12.00	12.00	0.00	
7,950.0	16.49	256.20	7,948.1	-4.7	-19.1	19.4	12.00	12.00	0.00	
7,975.0	19.49	256.20	7,971.9	-6.5	-26.6	27.0	12.00	12.00	0.00	
8,000.0	22.49	256.20	7,995.2	-8.7	-35.3	35.8	12.00	12.00	0.00	
8,025.0	25.49	256.20	8,018.1	-11.1	-45.1	45.8	12.00	12.00	0.00	
8,050.0	28.49	256.20	8,040.3	-13.8	-56.1	57.0	12.00	12.00	0.00	
8,075.0	31.49	256.20	8,062.0	-16.8	-68.3	69.4	12.00	12.00	0.00	
8,100.0	34.49	256.20	8,083.0	-20.0	-81.5	82.8	12.00	12.00	0.00	
8,125.0	37.49	256.20	8,103.2	-23.5	-95.8	97.3	12.00	12.00	0.00	
8,150.0	40.49	256.20	8,122.6	-27.3	-111.0	112.8	12.00	12.00	0.00	
8,175.0	43.49	256.20	8,141.2	-31.3	-127.3	129.3	12.00	12.00	0.00	
8,200.0	46.49	256.20	8,158.9	-35.5	-144.4	146.7	12.00	12.00	0.00	
8,225.0	49.49	256.20	8,175.6	-39.9	-162.5	165.0	12.00	12.00	0.00	
8,250.0	52.49	256.20	8,191.3	-44.5	-181.3	184.2	12.00	12.00	0.00	
8,275.0	55.49	256.20	8,206.0	-49.4	-201.0	204.1	12.00	12.00	0.00	
8,300.0	58.49	256.20	8,219.7	-54.4	-221.3	224.8	12.00	12.00	0.00	
8,325.0	61.49	256.20	8,232.2	-59.5	-242.3	246.2	12.00	12.00	0.00	
8,350.0	64.49	256.20	8,243.5	-64.8	-264.0	268.1	12.00	12.00	0.00	
8,375.0	67.49	256.20	8,253.7	-70.3	-286.1	290.6	12.00	12.00	0.00	
8,400.0	70.49	256.20	8,262.6	-75.9	-308.8	313.7	12.00	12.00	0.00	
8,425.0	73.49	256.20	8,270.4	-81.5	-331.9	337.1	12.00	12.00	0.00	
8,450.0	76.49	256.20	8,276.8	-87.3	-355.3	360.9	12.00	12.00	0.00	



TDS
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #4H
Company:	COG Operating LLC	TVD Reference:	KB @ 3678.0usft (McVay 6)
Project:	Lea County, NM	MD Reference:	KB @ 3678.0usft (McVay 6)
Site:	Haas 6 Federal Com	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #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)
8,475.0	79.49	256.20	8,282.1	-93.1	-379.1	385.0	12.00	12.00	0.00
8,500.0	82.49	256.20	8,286.0	-99.0	-403.1	409.4	12.00	12.00	0.00
8,525.0	85.49	256.20	8,288.6	-104.9	-427.2	433.9	12.00	12.00	0.00
8,550.0	88.49	256.20	8,289.9	-110.9	-451.4	458.5	12.00	12.00	0.00
8,570.3	90.92	256.20	8,290.0	-115.7	-471.1	478.5	12.00	12.00	0.00
EOC - Start 550.0 hold at 8570.3 MD									
8,600.0	90.92	256.20	8,289.5	-122.8	-500.0	507.9	0.00	0.00	0.00
8,700.0	90.92	256.20	8,287.9	-146.7	-597.1	606.5	0.00	0.00	0.00
8,800.0	90.92	256.20	8,286.3	-170.5	-694.2	705.1	0.00	0.00	0.00
8,900.0	90.92	256.20	8,284.7	-194.4	-791.3	803.7	0.00	0.00	0.00
9,000.0	90.92	256.20	8,283.1	-218.2	-888.4	902.4	0.00	0.00	0.00
9,100.0	90.92	256.20	8,281.5	-242.1	-985.5	1,001.0	0.00	0.00	0.00
9,120.3	90.92	256.20	8,281.2	-246.9	-1,005.2	1,021.0	0.00	0.00	0.00
TURN - Start DLS 4.00 TFO 89.94									
9,200.0	90.92	259.39	8,279.9	-263.7	-1,083.1	1,099.9	4.00	0.00	4.00
9,300.0	90.92	263.39	8,278.3	-278.7	-1,181.9	1,199.6	4.00	0.00	4.00
9,400.0	90.91	267.39	8,276.7	-286.7	-1,281.6	1,299.6	4.00	-0.01	4.00
9,440.2	90.91	269.00	8,276.0	-288.0	-1,321.8	1,339.8	4.00	-0.01	4.00
END TURN - Start 3215.1 hold at 9440.2 MD									
9,500.0	90.91	269.00	8,275.1	-289.1	-1,381.5	1,399.4	0.00	0.00	0.00
9,600.0	90.91	269.00	8,273.5	-290.8	-1,481.5	1,499.3	0.00	0.00	0.00
9,700.0	90.91	269.00	8,271.9	-292.5	-1,581.5	1,599.1	0.00	0.00	0.00
9,800.0	90.91	269.00	8,270.3	-294.3	-1,681.5	1,698.9	0.00	0.00	0.00
9,900.0	90.91	269.00	8,268.7	-296.0	-1,781.4	1,798.7	0.00	0.00	0.00
10,000.0	90.91	269.00	8,267.2	-297.8	-1,881.4	1,898.5	0.00	0.00	0.00
10,100.0	90.91	269.00	8,265.6	-299.5	-1,981.4	1,998.3	0.00	0.00	0.00
10,200.0	90.91	269.00	8,264.0	-301.3	-2,081.3	2,098.2	0.00	0.00	0.00
10,300.0	90.91	269.00	8,262.4	-303.0	-2,181.3	2,198.0	0.00	0.00	0.00
10,400.0	90.91	269.00	8,260.8	-304.8	-2,281.3	2,297.8	0.00	0.00	0.00
10,500.0	90.91	269.00	8,259.2	-306.5	-2,381.3	2,397.6	0.00	0.00	0.00
10,600.0	90.91	269.00	8,257.6	-308.2	-2,481.2	2,497.4	0.00	0.00	0.00
10,700.0	90.91	269.00	8,256.0	-310.0	-2,581.2	2,597.3	0.00	0.00	0.00
10,800.0	90.91	269.00	8,254.5	-311.7	-2,681.2	2,697.1	0.00	0.00	0.00
10,900.0	90.91	269.00	8,252.9	-313.5	-2,781.1	2,796.9	0.00	0.00	0.00
11,000.0	90.91	269.00	8,251.3	-315.2	-2,881.1	2,896.7	0.00	0.00	0.00
11,100.0	90.91	269.00	8,249.7	-317.0	-2,981.1	2,996.5	0.00	0.00	0.00
11,200.0	90.91	269.00	8,248.1	-318.7	-3,081.1	3,096.3	0.00	0.00	0.00
11,300.0	90.91	269.00	8,246.5	-320.5	-3,181.0	3,196.2	0.00	0.00	0.00
11,400.0	90.91	269.00	8,244.9	-322.2	-3,281.0	3,296.0	0.00	0.00	0.00
11,500.0	90.91	269.00	8,243.3	-324.0	-3,381.0	3,395.8	0.00	0.00	0.00
11,600.0	90.91	269.00	8,241.8	-325.7	-3,480.9	3,495.6	0.00	0.00	0.00
11,700.0	90.91	269.00	8,240.2	-327.4	-3,580.9	3,595.4	0.00	0.00	0.00
11,800.0	90.91	269.00	8,238.6	-329.2	-3,680.9	3,695.2	0.00	0.00	0.00
11,900.0	90.91	269.00	8,237.0	-330.9	-3,780.9	3,795.1	0.00	0.00	0.00
12,000.0	90.91	269.00	8,235.4	-332.7	-3,880.8	3,894.9	0.00	0.00	0.00
12,100.0	90.91	269.00	8,233.8	-334.4	-3,980.8	3,994.7	0.00	0.00	0.00
12,200.0	90.91	269.00	8,232.2	-336.2	-4,080.8	4,094.5	0.00	0.00	0.00
12,300.0	90.91	269.00	8,230.6	-337.9	-4,180.8	4,194.3	0.00	0.00	0.00
12,400.0	90.91	269.00	8,229.1	-339.7	-4,280.7	4,294.2	0.00	0.00	0.00
12,500.0	90.91	269.00	8,227.5	-341.4	-4,380.7	4,394.0	0.00	0.00	0.00
12,600.0	90.91	269.00	8,225.9	-343.1	-4,480.7	4,493.8	0.00	0.00	0.00
12,655.4	90.91	269.00	8,225.0	-344.1	-4,536.0	4,549.1	0.00	0.00	0.00
TD at 12655.4									



TDS
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #4H
Company:	COG Operating LLC	TVD Reference:	KB @ 3678.0usft (McVay 6)
Project:	Lea County, NM	MD Reference:	KB @ 3678.0usft (McVay 6)
Site:	Haas 6 Federal Com	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
A-1 Radius of Uncertain!	-1.09	257.69	0.0	-53.9	-1,199.8	615,589.21	663,492.09	32° 41' 28.420 N	103° 48' 6.870 W
- plan misses target center by 1201.0usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Circle (radius 225.0)									
B-1 Radius of Uncertain!	-1.09	268.96	0.0	-58.7	-2,885.6	615,584.39	661,806.29	32° 41' 28.455 N	103° 48' 26.596 W
- plan misses target center by 2886.2usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Circle (radius 225.0)									
PBHL (H6FC #4H/OH)	0.00	0.00	8,225.0	-344.1	-4,536.0	615,298.99	660,155.87	32° 41' 25.712 N	103° 48' 45.925 W
- plan hits target center									
- Point									
EOC (H6FC #4H/OH Plc)	0.00	0.00	8,290.0	-115.7	-471.2	615,527.38	664,220.74	32° 41' 27.772 N	103° 47' 58.348 W
- plan hits target center									
- Point									

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
7,812.6	7,812.6	0.0	0.0	KOP - Start Build 12.00
8,570.3	8,290.0	-115.7	-471.1	EOC - Start 550.0 hold at 8570.3 MD
9,120.3	8,281.2	-246.9	-1,005.2	TURN - Start DLS 4.00 TFO 89.94
9,440.2	8,276.0	-288.0	-1,321.8	END TURN - Start 3215.1 hold at 9440.2 MD
12,655.4	8,225.0	-344.1	-4,536.0	TD at 12655.4



COG Operating LLC
Project: Lea County, NM
Site: Haas 6 Federal Com
Well: #4H
Wellbore: OH
Plan: Plan #1 (#4H/OH)

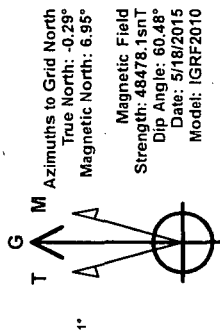
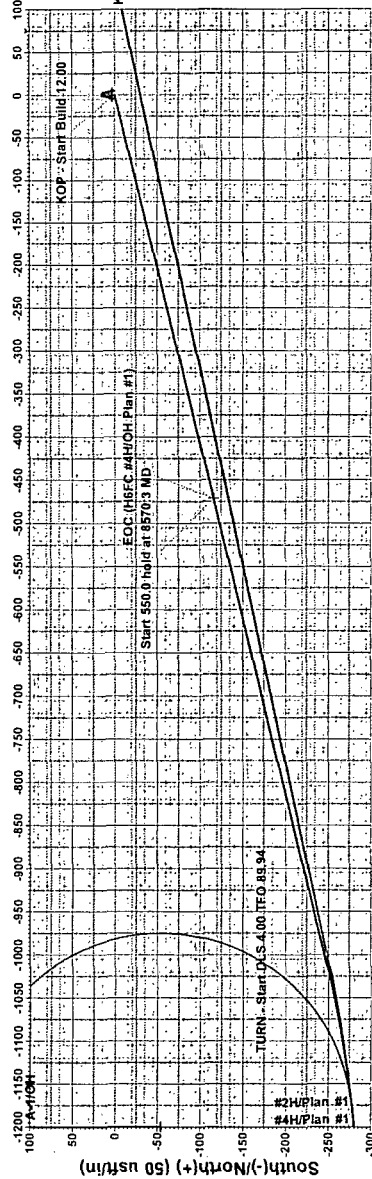
Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	7812.6	0.00	0.00	7812.6	0.0	0.0	0.00	0.00	0.0	
3	8570.3	90.92	256.20	8290.0	-115.7	-471.1	12.00	256.20	478.5	
4	9120.3	90.92	256.20	8281.2	-246.9	-1005.2	0.00	0.00	1021.0	
5	9440.2	90.91	269.00	8276.0	-288.0	-1321.8	4.00	89.94	1339.8	
6	12655.4	90.91	269.00	8225.0	-344.1	-4536.0	0.00	0.00	4549.1	PBHL (H6FC #4H/OH)

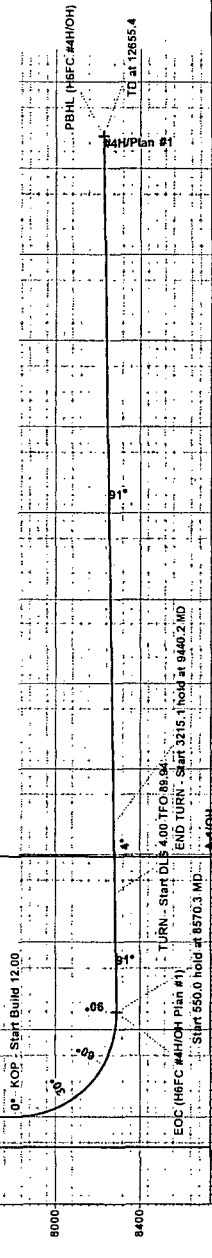
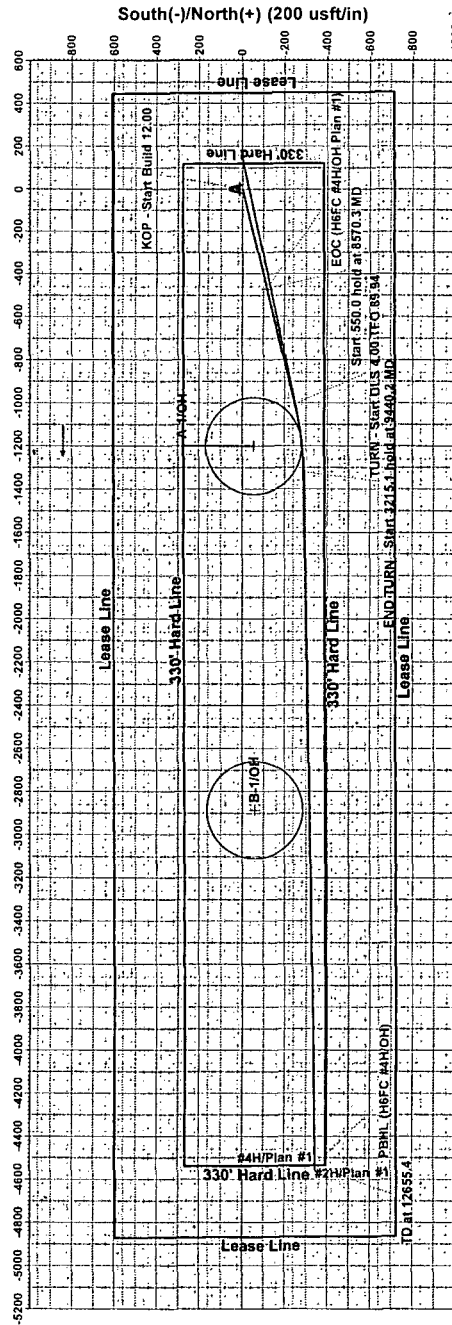
Ground Elevation: 3660.0
RKB Elevation: KB @ 3678.0usft (McVay 6)

Northing 615643.10
Easting 664691.90
Latitude 32° 41' 28.893 N
Longitude 103° 47' 52.828 W

West(-)/East(+) (50 usft/in)



West(-)/East(+) (200 usft/in)



Vertical Section at 265.66° (200 usft/in)
Terra Directional Services LLC
322 Spring Hill Drive, Suite A300, Spring, Tx 77386
Phone: 432-425-7532

PROJECT DETAILS: Lea County, NM
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