



HOBBS OCD

MAR 21 2016

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COG Operating LLC

Lea County, NM (NAD27 NME)

Tin Man Federal Com

#1H

OH

Plan: Design #1

Standard Planning Report

30 September, 2014



Wellplanning Planning Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well #1H
Company:	COG Operating LLC	TVD Reference:	WELL @ 3671.7usft (Original Well Elev)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	WELL @ 3671.7usft (Original Well Elev)
Site:	Tin Man Federal Com	North Reference:	Grid
Well:	#1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #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	Tin Man Federal Com				
Site Position:		Northing:	612,126.50 usft	Latitude:	32° 40' 53.631 N
From:	Map	Easting:	673,751.30 usft	Longitude:	103° 46' 7.041 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.30 °

Well	#1H					
Well Position	+N/-S	0.0 usft	Northing:	612,126.50 usft	Latitude:	32° 40' 53.631 N
	+E/-W	0.0 usft	Easting:	673,751.30 usft	Longitude:	103° 46' 7.041 W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	3,653.7 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/30/2014	7.31	60.49	48,539

Design	Design #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	179.63	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
8,912.5	0.00	0.00	8,912.5	0.0	0.0	0.00	0.00	0.00	0.00	
9,657.0	89.33	179.63	9,390.0	-471.9	3.0	12.00	12.00	0.00	179.63	
13,948.1	89.33	179.63	9,440.2	-4,762.6	30.8	0.00	0.00	0.00	0.00	PBHL(TM#1H)



Wellplanning Planning Report

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Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Tin Man Federal Com
Well: #1H
Wellbore: OH
Design: Design #1

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well #1H
WELL @ 3671.7usft (Original Well Elev)
WELL @ 3671.7usft (Original Well Elev)
Grid
Minimum Curvature

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



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Well:	#1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Design #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	
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,200.0	0.00	0.00	8,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,600.0	0.00	0.00	8,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,800.0	0.00	0.00	8,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,912.5	0.00	0.00	8,912.5	0.0	0.0	0.0	0.00	0.00	0.00	
KOP - 8912.5 'MD, 0.00° INC, 0.00° AZI										
8,925.0	1.50	179.63	8,925.0	-0.2	0.0	0.2	12.00	12.00	0.00	
8,950.0	4.50	179.63	8,950.0	-1.5	0.0	1.5	12.00	12.00	0.00	
8,975.0	7.50	179.63	8,974.8	-4.1	0.0	4.1	12.00	12.00	0.00	
9,000.0	10.50	179.63	8,999.5	-8.0	0.1	8.0	12.00	12.00	0.00	
9,025.0	13.50	179.63	9,024.0	-13.2	0.1	13.2	12.00	12.00	0.00	
9,050.0	16.50	179.63	9,048.1	-19.7	0.1	19.7	12.00	12.00	0.00	
9,075.0	19.50	179.63	9,071.9	-27.4	0.2	27.4	12.00	12.00	0.00	
9,100.0	22.50	179.63	9,095.2	-36.3	0.2	36.3	12.00	12.00	0.00	
9,125.0	25.50	179.63	9,118.1	-46.5	0.3	46.5	12.00	12.00	0.00	
9,150.0	28.50	179.63	9,140.3	-57.9	0.4	57.9	12.00	12.00	0.00	
9,175.0	31.50	179.63	9,162.0	-70.3	0.5	70.3	12.00	12.00	0.00	
9,200.0	34.50	179.63	9,182.9	-84.0	0.5	84.0	12.00	12.00	0.00	
9,225.0	37.49	179.63	9,203.2	-98.7	0.6	98.7	12.00	12.00	0.00	
9,250.0	40.49	179.63	9,222.6	-114.4	0.7	114.4	12.00	12.00	0.00	
9,275.0	43.49	179.63	9,241.2	-131.1	0.8	131.1	12.00	12.00	0.00	



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Survey Calculation Method:

Well #1H
WELL @ 3671.7usft (Original Well Elev)
WELL @ 3671.7usft (Original Well Elev)
Grid
Minimum Curvature

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)
9,300.0	46.49	179.63	9,258.9	-148.8	1.0	148.8	12.00	12.00	0.00
9,325.0	49.49	179.63	9,275.6	-167.4	1.1	167.4	12.00	12.00	0.00
9,350.0	52.49	179.63	9,291.3	-186.8	1.2	186.8	12.00	12.00	0.00
9,375.0	55.49	179.63	9,306.0	-207.0	1.3	207.0	12.00	12.00	0.00
9,400.0	58.49	179.63	9,319.6	-228.0	1.5	228.0	12.00	12.00	0.00
9,425.0	61.49	179.63	9,332.1	-249.6	1.6	249.6	12.00	12.00	0.00
9,450.0	64.49	179.63	9,343.5	-271.9	1.8	271.9	12.00	12.00	0.00
9,475.0	67.49	179.63	9,353.7	-294.7	1.9	294.7	12.00	12.00	0.00
9,500.0	70.49	179.63	9,362.6	-318.0	2.1	318.1	12.00	12.00	0.00
9,525.0	73.49	179.63	9,370.3	-341.8	2.2	341.8	12.00	12.00	0.00
9,550.0	76.49	179.63	9,376.8	-366.0	2.4	366.0	12.00	12.00	0.00
9,575.0	79.49	179.63	9,382.0	-390.4	2.5	390.4	12.00	12.00	0.00
9,600.0	82.49	179.63	9,385.9	-415.1	2.7	415.1	12.00	12.00	0.00
9,625.0	85.49	179.63	9,388.6	-440.0	2.8	440.0	12.00	12.00	0.00
9,650.0	88.49	179.63	9,389.9	-464.9	3.0	464.9	12.00	12.00	0.00
9,657.0	89.33	179.63	9,390.0	-471.9	3.0	471.9	12.00	12.00	0.00
EOC- 9657.0 'MD, 89.33° INC, 179.63° AZI									
9,700.0	89.33	179.63	9,390.5	-514.9	3.3	514.9	0.00	0.00	0.00
9,800.0	89.33	179.63	9,391.7	-614.9	4.0	614.9	0.00	0.00	0.00
9,900.0	89.33	179.63	9,392.8	-714.9	4.6	714.9	0.00	0.00	0.00
10,000.0	89.33	179.63	9,394.0	-814.9	5.3	814.9	0.00	0.00	0.00
10,100.0	89.33	179.63	9,395.2	-914.9	5.9	914.9	0.00	0.00	0.00
10,200.0	89.33	179.63	9,396.3	-1,014.9	6.6	1,014.9	0.00	0.00	0.00
10,300.0	89.33	179.63	9,397.5	-1,114.9	7.2	1,114.9	0.00	0.00	0.00
10,400.0	89.33	179.63	9,398.7	-1,214.9	7.8	1,214.9	0.00	0.00	0.00
10,500.0	89.33	179.63	9,399.9	-1,314.8	8.5	1,314.9	0.00	0.00	0.00
10,600.0	89.33	179.63	9,401.0	-1,414.8	9.1	1,414.9	0.00	0.00	0.00
10,700.0	89.33	179.63	9,402.2	-1,514.8	9.8	1,514.9	0.00	0.00	0.00
10,800.0	89.33	179.63	9,403.4	-1,614.8	10.4	1,614.8	0.00	0.00	0.00
10,900.0	89.33	179.63	9,404.5	-1,714.8	11.1	1,714.8	0.00	0.00	0.00
11,000.0	89.33	179.63	9,405.7	-1,814.8	11.7	1,814.8	0.00	0.00	0.00
11,100.0	89.33	179.63	9,406.9	-1,914.8	12.4	1,914.8	0.00	0.00	0.00
11,200.0	89.33	179.63	9,408.0	-2,014.8	13.0	2,014.8	0.00	0.00	0.00
11,300.0	89.33	179.63	9,409.2	-2,114.8	13.7	2,114.8	0.00	0.00	0.00
11,400.0	89.33	179.63	9,410.4	-2,214.8	14.3	2,214.8	0.00	0.00	0.00
11,500.0	89.33	179.63	9,411.6	-2,314.8	14.9	2,314.8	0.00	0.00	0.00
11,600.0	89.33	179.63	9,412.7	-2,414.7	15.6	2,414.8	0.00	0.00	0.00
11,700.0	89.33	179.63	9,413.9	-2,514.7	16.2	2,514.8	0.00	0.00	0.00
11,800.0	89.33	179.63	9,415.1	-2,614.7	16.9	2,614.8	0.00	0.00	0.00
11,900.0	89.33	179.63	9,416.2	-2,714.7	17.5	2,714.8	0.00	0.00	0.00
12,000.0	89.33	179.63	9,417.4	-2,814.7	18.2	2,814.8	0.00	0.00	0.00
12,100.0	89.33	179.63	9,418.6	-2,914.7	18.8	2,914.8	0.00	0.00	0.00
12,200.0	89.33	179.63	9,419.7	-3,014.7	19.5	3,014.8	0.00	0.00	0.00
12,300.0	89.33	179.63	9,420.9	-3,114.7	20.1	3,114.7	0.00	0.00	0.00
12,400.0	89.33	179.63	9,422.1	-3,214.7	20.8	3,214.7	0.00	0.00	0.00
12,500.0	89.33	179.63	9,423.2	-3,314.7	21.4	3,314.7	0.00	0.00	0.00
12,600.0	89.33	179.63	9,424.4	-3,414.7	22.1	3,414.7	0.00	0.00	0.00
12,700.0	89.33	179.63	9,425.6	-3,514.6	22.7	3,514.7	0.00	0.00	0.00
12,800.0	89.33	179.63	9,426.8	-3,614.6	23.3	3,614.7	0.00	0.00	0.00
12,900.0	89.33	179.63	9,427.9	-3,714.6	24.0	3,714.7	0.00	0.00	0.00
13,000.0	89.33	179.63	9,429.1	-3,814.6	24.6	3,814.7	0.00	0.00	0.00
13,100.0	89.33	179.63	9,430.3	-3,914.6	25.3	3,914.7	0.00	0.00	0.00
13,200.0	89.33	179.63	9,431.4	-4,014.6	25.9	4,014.7	0.00	0.00	0.00
13,300.0	89.33	179.63	9,432.6	-4,114.6	26.6	4,114.7	0.00	0.00	0.00



Wellplanning Planning Report

Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Tin Man Federal Com
Well: #1H
Wellbore: OH
Design: Design #1

Local Co-ordinate Reference: Well #1H
TVD Reference: WELL @ 3671.7usft (Original Well Elev)
MD Reference: WELL @ 3671.7usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
13,400.0	89.33	179.63	9,433.8	-4,214.6	27.2	4,214.7	0.00	0.00	0.00
13,500.0	89.33	179.63	9,434.9	-4,314.6	27.9	4,314.7	0.00	0.00	0.00
13,600.0	89.33	179.63	9,436.1	-4,414.6	28.5	4,414.7	0.00	0.00	0.00
13,700.0	89.33	179.63	9,437.3	-4,514.6	29.2	4,514.6	0.00	0.00	0.00
13,800.0	89.33	179.63	9,438.4	-4,614.5	29.8	4,614.6	0.00	0.00	0.00
13,900.0	89.33	179.63	9,439.6	-4,714.5	30.4	4,714.6	0.00	0.00	0.00
13,948.1	89.33	179.63	9,440.2	-4,762.6	30.8	4,762.7	0.00	0.00	0.00
TD at 13948.1 - PBHL(TM#1H)									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL(TM#1H)	0.00	0.00	9,440.0	-4,762.6	31.1	607,363.90	673,782.40	32° 40' 6.503 N	103° 46' 6.973 W
- plan misses target center by 0.4usft at 13948.1usft MD (9440.2 TVD, -4762.6 N, 30.8 E)									
- Point									

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,912.5	8,912.5	0.0	0.0	KOP - 8912.5 'MD, 0.00° INC, 0.00° AZI
9,657.0	9,390.0	-471.9	3.0	EOC- 9657.0 'MD, 89.33° INC, 179.63° AZI
13,948.1	9,440.2	-4,762.6	30.8	TD at 13948.1



COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Tin Man Federal Com
Well: #1H

Plan: Design #1 (#1H/OH)

WELL DETAILS: #1H

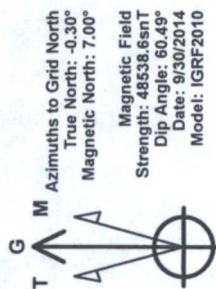
Ground Elevation: 3653.7
RKB Elevation: WELL @ 3671.7usft (Original Well Elev)
Rig Name: Original Well Elev

Northing 612126.50
Easting 673751.30
Latitude 32° 40' 53.631 N
Longitude 103° 46' 7.041 W

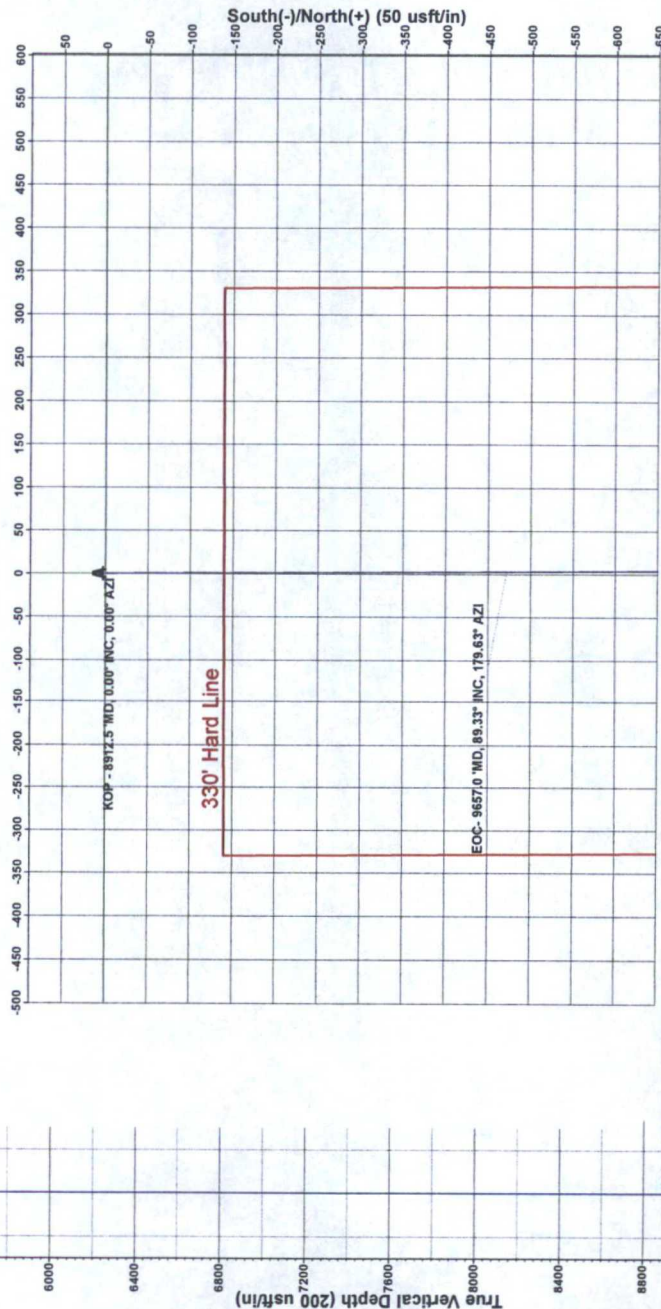
Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0
2	8912.5	0.00	0.00	8912.5	0.0	0.0	0.00	0.00	0.0
3	9657.0	89.33	179.63	9390.0	-471.9	3.0	12.00	179.63	471.9
4	13948.1	89.33	179.63	9440.2	-4762.6	30.8	0.00	0.00	4762.7

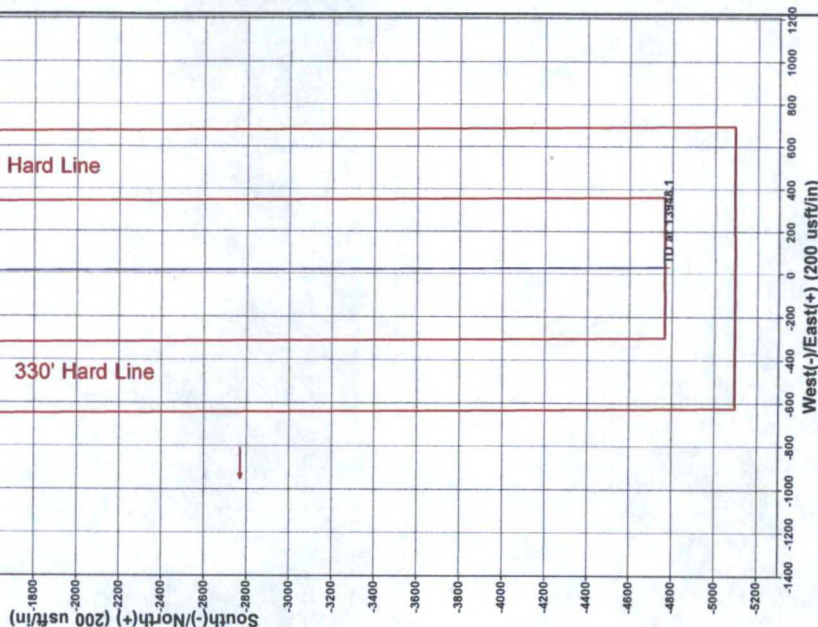
PBHL(TM#1H)



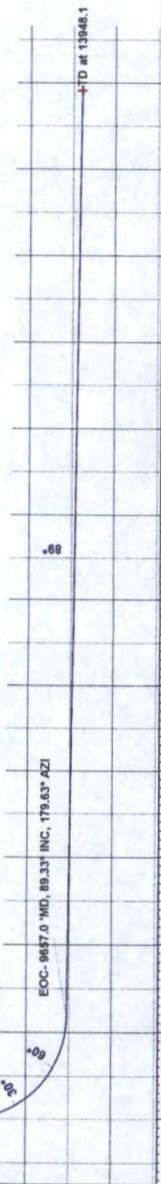
West(-)/East(+) (50 usft/in)



South(-)/North(+) (200 usft/in)



Vertical Section at 179.63° (200 usft/in)



Nexus Directional

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



HOBBS OCD

MAR 21 2016

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COG Operating LLC

Lea County, NM (NAD27 NME)

Tin Man Federal Com

#1H

OH

Design #1

Anticollision Report

08 September, 2015

Reference	Design #1				
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria				
Interpolation Method:	Stations	Error Model:	ISCWSA		
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D		
Results Limited by:	Maximum separation factor of 10.00	Error Surface:	Circular Conic		
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied		

Survey Tool Program	Date 9/30/2014				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	13,948.1	Design #1 (OH)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Dorothy-McKay Federal						
#1H - OH - OH	12,629.2	9,413.3	192.1	106.3	2.238	CC, ES, SF

Offset Design													Offset Site Error:	3.0 usft
Dorothy-McKay Federal - #1H - OH - OH													Offset Well Error:	0.0 usft
Survey Program:		200-MWD												
Reference	Offset	Semi Major Axis							Distance					Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
12,000.0	9,417.4	9,406.0	9,404.6	55.0	19.9	-88.96	-3,442.6	214.5	657.9	582.9	74.99	8.772		
12,100.0	9,418.6	9,407.2	9,405.7	56.8	19.9	-89.31	-3,442.6	214.4	563.0	486.3	76.70	7.340		
12,200.0	9,419.7	9,408.3	9,406.9	58.5	20.0	-89.65	-3,442.6	214.4	470.2	391.8	78.41	5.997		
12,300.0	9,420.9	9,409.5	9,408.0	60.2	20.0	-90.00	-3,442.6	214.4	381.2	301.0	80.13	4.757		
12,400.0	9,422.1	9,410.6	9,409.2	61.9	20.0	-90.34	-3,442.6	214.4	299.1	217.2	81.86	3.654		
12,500.0	9,423.2	9,411.8	9,410.4	63.6	20.0	-90.69	-3,442.6	214.3	231.5	147.9	83.59	2.770		
12,600.0	9,424.4	9,413.0	9,411.5	65.4	20.0	-91.04	-3,442.6	214.3	194.3	109.0	85.33	2.277		
12,629.2	9,424.8	9,413.3	9,411.9	65.9	20.0	-91.14	-3,442.6	214.3	192.1	106.3	85.84	2.238	CC, ES, SF	
12,700.0	9,425.6	9,414.1	9,412.7	67.1	20.0	-91.38	-3,442.6	214.3	204.7	117.7	87.07	2.351		
12,800.0	9,426.8	9,415.3	9,413.8	68.9	20.0	-91.73	-3,442.6	214.3	257.0	168.2	88.82	2.894		
12,900.0	9,427.9	9,416.4	9,415.0	70.6	20.0	-92.07	-3,442.6	214.2	332.0	241.4	90.57	3.666		
13,000.0	9,429.1	9,417.6	9,416.2	72.4	20.0	-92.42	-3,442.6	214.2	417.6	325.2	92.32	4.523		
13,100.0	9,430.3	9,418.8	9,417.3	74.1	20.0	-92.77	-3,442.6	214.2	508.4	414.3	94.08	5.404		
13,200.0	9,431.4	9,419.9	9,418.5	75.9	20.0	-93.11	-3,442.6	214.2	602.2	506.3	95.85	6.283		
13,300.0	9,432.6	9,421.1	9,419.6	77.6	20.0	-93.46	-3,442.6	214.2	697.7	600.1	97.61	7.147		
13,400.0	9,433.8	9,422.3	9,420.8	79.4	20.0	-93.80	-3,442.6	214.1	794.3	694.9	99.38	7.992		
13,500.0	9,434.9	9,423.4	9,422.0	81.2	20.0	-94.15	-3,442.6	214.1	891.6	790.5	101.16	8.814		
13,600.0	9,436.1	9,424.6	9,423.1	82.9	20.0	-94.49	-3,442.6	214.1	989.5	886.6	102.93	9.613		



New Mexico Office of the State Engineer **Water Column/Average Depth to Water**

No records found.

PLSS Search:

Section(s): 9

Township: 19S

Range: 32E

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

5/6/15 3:26 PM

Page 1 of 1

WATER COLUMN/ AVERAGE
DEPTH TO WATER



New Mexico Office of the State Engineer Water Column/Average Depth to Water

(A CLW##### in the
POD suffix indicates the
POD has been replaced
& no longer serves a
water right file.)

(R=POD has
been replaced,
O=orphaned,
C=the file is
closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest) (NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-Code	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
<u>CP 00073</u>			LE	2	4	34	19S	32E		617502	3609301	575		
<u>CP 00075</u>			LE	2	4	34	19S	32E		617502	3609301	575		
<u>CP 00563</u>			LE	1	1	2	19	19S	32E	612118	3613376*	300		
<u>CP 00639</u>			LE	3	1	20	19S	32E		613029	3612880*	350	345	5
<u>CP 00640</u>			LE	2	2	19	19S	32E		612621	3613280*	260	102	158
<u>CP 00812</u>			LE	4	4	01	19S	32E		620623	3616973*	200		

Average Depth to Water: **223 feet**

Minimum Depth: **102 feet**

Maximum Depth: **345 feet**

Record Count: 6

PLSS Search:

Township: 19S

Range: 32E

*UTM location was derived from PLSS - see Help

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