



COG Operating, LLC

Lea County, NM

Sec 16, T23S, R34E

Gettysburg State Com #11H

Wellbore #1

Plan: Design #1

QES Well Planning Report

24 October, 2017



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Gettysburg State Com #11H
Company:	COG Operating, LLC	TVD Reference:	KB @ 3441.0usft (Noram 21)
Project:	Lea County, NM	MD Reference:	KB @ 3441.0usft (Noram 21)
Site:	Sec 16, T23S, R34E	North Reference:	Grid
Well:	Gettysburg State Com #11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #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	Sec 16, T23S, R34E		
Site Position:		Northing:	478,042.00 usft
From:	Map	Easting:	765,915.40 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 18' 40.748 N
		Longitude:	103° 28' 21.433 W
		Grid Convergence:	0.46 °

Well	Gettysburg State Com #11H		
Well Position	+N/-S	-33.6 usft	Northing:
	+E/-W	680.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	
		Latitude:	32° 18' 40.361 N
		Longitude:	103° 28' 13.513 W
		Ground Level:	3,412.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2015	10/23/2017	6.87
			Dip Angle
			(°)
			Field Strength
			(nT)
			47,964.58040783

Design	Design #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
			(°)
			174.18

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	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,800.0	1.00	90.00	1,800.0	0.0	0.9	1.00	1.00	0.00	90.00	
10,870.0	1.00	90.00	10,868.6	0.0	159.2	0.00	0.00	0.00	0.00	
11,604.2	88.70	144.07	11,341.0	-374.0	438.3	12.00	11.94	7.36	54.09	
12,489.8	88.70	179.50	11,361.8	-1,201.5	710.7	4.00	0.00	4.00	90.42	
13,728.0	88.70	179.50	11,390.0	-2,439.4	721.5	0.00	0.00	0.00	0.00	T1 Gettysburg State C
13,748.5	88.29	179.50	11,390.5	-2,459.8	721.7	2.00	-2.00	0.00	179.97	
16,239.9	88.29	179.50	11,465.0	-4,950.1	743.5	0.00	0.00	0.00	0.00	T2 Gettysburg State C
16,297.2	89.43	179.50	11,466.1	-5,007.3	744.0	2.00	2.00	0.00	0.00	
18,805.8	89.43	179.50	11,491.0	-7,515.7	766.0	0.00	0.00	0.00	0.00	PBHL Gettysburg Sta

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Well: Gettysburg State Com #11H
Wellbore: Wellbore #1
Design: Design #1

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

Well Gettysburg State Com #11H
 KB @ 3441.0usft (Noram 21)
 KB @ 3441.0usft (Noram 21)
 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
Drift 1°/100°									
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
Hold 1.00° Inc., 90.00° Azm									
1,800.0	1.00	90.00	1,800.0	0.0	0.9	0.1	1.00	1.00	0.00
1,900.0	1.00	90.00	1,900.0	0.0	2.6	0.3	0.00	0.00	0.00
2,000.0	1.00	90.00	2,000.0	0.0	4.4	0.4	0.00	0.00	0.00
2,100.0	1.00	90.00	2,099.9	0.0	6.1	0.6	0.00	0.00	0.00
2,200.0	1.00	90.00	2,199.9	0.0	7.9	0.8	0.00	0.00	0.00
2,300.0	1.00	90.00	2,299.9	0.0	9.6	1.0	0.00	0.00	0.00
2,400.0	1.00	90.00	2,399.9	0.0	11.3	1.2	0.00	0.00	0.00
2,500.0	1.00	90.00	2,499.9	0.0	13.1	1.3	0.00	0.00	0.00
2,600.0	1.00	90.00	2,599.9	0.0	14.8	1.5	0.00	0.00	0.00
2,700.0	1.00	90.00	2,699.9	0.0	16.6	1.7	0.00	0.00	0.00
2,800.0	1.00	90.00	2,799.8	0.0	18.3	1.9	0.00	0.00	0.00
2,900.0	1.00	90.00	2,899.8	0.0	20.1	2.0	0.00	0.00	0.00
3,000.0	1.00	90.00	2,999.8	0.0	21.8	2.2	0.00	0.00	0.00
3,100.0	1.00	90.00	3,099.8	0.0	23.6	2.4	0.00	0.00	0.00
3,200.0	1.00	90.00	3,199.8	0.0	25.3	2.6	0.00	0.00	0.00
3,300.0	1.00	90.00	3,299.8	0.0	27.1	2.7	0.00	0.00	0.00
3,400.0	1.00	90.00	3,399.8	0.0	28.8	2.9	0.00	0.00	0.00
3,500.0	1.00	90.00	3,499.7	0.0	30.5	3.1	0.00	0.00	0.00
3,600.0	1.00	90.00	3,599.7	0.0	32.3	3.3	0.00	0.00	0.00
3,700.0	1.00	90.00	3,699.7	0.0	34.0	3.5	0.00	0.00	0.00
3,800.0	1.00	90.00	3,799.7	0.0	35.8	3.6	0.00	0.00	0.00
3,900.0	1.00	90.00	3,899.7	0.0	37.5	3.8	0.00	0.00	0.00
4,000.0	1.00	90.00	3,999.7	0.0	39.3	4.0	0.00	0.00	0.00
4,100.0	1.00	90.00	4,099.6	0.0	41.0	4.2	0.00	0.00	0.00
4,200.0	1.00	90.00	4,199.6	0.0	42.8	4.3	0.00	0.00	0.00
4,300.0	1.00	90.00	4,299.6	0.0	44.5	4.5	0.00	0.00	0.00
4,400.0	1.00	90.00	4,399.6	0.0	46.2	4.7	0.00	0.00	0.00
4,500.0	1.00	90.00	4,499.6	0.0	48.0	4.9	0.00	0.00	0.00
4,600.0	1.00	90.00	4,599.6	0.0	49.7	5.0	0.00	0.00	0.00
4,700.0	1.00	90.00	4,699.6	0.0	51.5	5.2	0.00	0.00	0.00
4,800.0	1.00	90.00	4,799.5	0.0	53.2	5.4	0.00	0.00	0.00
4,900.0	1.00	90.00	4,899.5	0.0	55.0	5.6	0.00	0.00	0.00
5,000.0	1.00	90.00	4,999.5	0.0	56.7	5.8	0.00	0.00	0.00
5,100.0	1.00	90.00	5,099.5	0.0	58.5	5.9	0.00	0.00	0.00

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Wellbore:	Wellbore #1		
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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)
5,200.0	1.00	90.00	5,199.5	0.0	60.2	6.1	0.00	0.00	0.00
5,300.0	1.00	90.00	5,299.5	0.0	62.0	6.3	0.00	0.00	0.00
5,400.0	1.00	90.00	5,399.4	0.0	63.7	6.5	0.00	0.00	0.00
5,500.0	1.00	90.00	5,499.4	0.0	65.4	6.6	0.00	0.00	0.00
5,600.0	1.00	90.00	5,599.4	0.0	67.2	6.8	0.00	0.00	0.00
5,700.0	1.00	90.00	5,699.4	0.0	68.9	7.0	0.00	0.00	0.00
5,800.0	1.00	90.00	5,799.4	0.0	70.7	7.2	0.00	0.00	0.00
5,900.0	1.00	90.00	5,899.4	0.0	72.4	7.3	0.00	0.00	0.00
6,000.0	1.00	90.00	5,999.4	0.0	74.2	7.5	0.00	0.00	0.00
6,100.0	1.00	90.00	6,099.3	0.0	75.9	7.7	0.00	0.00	0.00
6,200.0	1.00	90.00	6,199.3	0.0	77.7	7.9	0.00	0.00	0.00
6,300.0	1.00	90.00	6,299.3	0.0	79.4	8.1	0.00	0.00	0.00
6,400.0	1.00	90.00	6,399.3	0.0	81.2	8.2	0.00	0.00	0.00
6,500.0	1.00	90.00	6,499.3	0.0	82.9	8.4	0.00	0.00	0.00
6,600.0	1.00	90.00	6,599.3	0.0	84.6	8.6	0.00	0.00	0.00
6,700.0	1.00	90.00	6,699.2	0.0	86.4	8.8	0.00	0.00	0.00
6,800.0	1.00	90.00	6,799.2	0.0	88.1	8.9	0.00	0.00	0.00
6,900.0	1.00	90.00	6,899.2	0.0	89.9	9.1	0.00	0.00	0.00
7,000.0	1.00	90.00	6,999.2	0.0	91.6	9.3	0.00	0.00	0.00
7,100.0	1.00	90.00	7,099.2	0.0	93.4	9.5	0.00	0.00	0.00
7,200.0	1.00	90.00	7,199.2	0.0	95.1	9.6	0.00	0.00	0.00
7,300.0	1.00	90.00	7,299.2	0.0	96.9	9.8	0.00	0.00	0.00
7,400.0	1.00	90.00	7,399.1	0.0	98.6	10.0	0.00	0.00	0.00
7,500.0	1.00	90.00	7,499.1	0.0	100.4	10.2	0.00	0.00	0.00
7,600.0	1.00	90.00	7,599.1	0.0	102.1	10.4	0.00	0.00	0.00
7,700.0	1.00	90.00	7,699.1	0.0	103.8	10.5	0.00	0.00	0.00
7,800.0	1.00	90.00	7,799.1	0.0	105.6	10.7	0.00	0.00	0.00
7,900.0	1.00	90.00	7,899.1	0.0	107.3	10.9	0.00	0.00	0.00
8,000.0	1.00	90.00	7,999.1	0.0	109.1	11.1	0.00	0.00	0.00
8,100.0	1.00	90.00	8,099.0	0.0	110.8	11.2	0.00	0.00	0.00
8,200.0	1.00	90.00	8,199.0	0.0	112.6	11.4	0.00	0.00	0.00
8,300.0	1.00	90.00	8,299.0	0.0	114.3	11.6	0.00	0.00	0.00
8,400.0	1.00	90.00	8,399.0	0.0	116.1	11.8	0.00	0.00	0.00
8,500.0	1.00	90.00	8,499.0	0.0	117.8	11.9	0.00	0.00	0.00
8,600.0	1.00	90.00	8,599.0	0.0	119.5	12.1	0.00	0.00	0.00
8,700.0	1.00	90.00	8,698.9	0.0	121.3	12.3	0.00	0.00	0.00
8,800.0	1.00	90.00	8,798.9	0.0	123.0	12.5	0.00	0.00	0.00
8,900.0	1.00	90.00	8,898.9	0.0	124.8	12.7	0.00	0.00	0.00
9,000.0	1.00	90.00	8,998.9	0.0	126.5	12.8	0.00	0.00	0.00
9,100.0	1.00	90.00	9,098.9	0.0	128.3	13.0	0.00	0.00	0.00
9,200.0	1.00	90.00	9,198.9	0.0	130.0	13.2	0.00	0.00	0.00
9,300.0	1.00	90.00	9,298.9	0.0	131.8	13.4	0.00	0.00	0.00
9,400.0	1.00	90.00	9,398.8	0.0	133.5	13.5	0.00	0.00	0.00
9,500.0	1.00	90.00	9,498.8	0.0	135.3	13.7	0.00	0.00	0.00
9,600.0	1.00	90.00	9,598.8	0.0	137.0	13.9	0.00	0.00	0.00
9,700.0	1.00	90.00	9,698.8	0.0	138.7	14.1	0.00	0.00	0.00
9,800.0	1.00	90.00	9,798.8	0.0	140.5	14.2	0.00	0.00	0.00
9,900.0	1.00	90.00	9,898.8	0.0	142.2	14.4	0.00	0.00	0.00
10,000.0	1.00	90.00	9,998.7	0.0	144.0	14.6	0.00	0.00	0.00
10,100.0	1.00	90.00	10,098.7	0.0	145.7	14.8	0.00	0.00	0.00
10,200.0	1.00	90.00	10,198.7	0.0	147.5	15.0	0.00	0.00	0.00
10,300.0	1.00	90.00	10,298.7	0.0	149.2	15.1	0.00	0.00	0.00
10,400.0	1.00	90.00	10,398.7	0.0	151.0	15.3	0.00	0.00	0.00
10,500.0	1.00	90.00	10,498.7	0.0	152.7	15.5	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)
10,600.0	1.00	90.00	10,598.7	0.0	154.5	15.7	0.00	0.00	0.00
10,700.0	1.00	90.00	10,698.6	0.0	156.2	15.8	0.00	0.00	0.00
10,800.0	1.00	90.00	10,798.6	0.0	157.9	16.0	0.00	0.00	0.00
KOP: Build 12°/100' @ 10870.0' MD									
10,870.0	1.00	90.00	10,868.6	0.0	159.2	16.1	0.00	0.00	0.00
10,875.0	1.44	109.81	10,873.6	0.0	159.3	16.2	12.00	8.74	395.12
10,900.0	4.27	133.16	10,898.6	-0.8	160.2	17.0	12.00	11.31	93.40
10,925.0	7.23	137.69	10,923.5	-2.6	162.0	19.0	12.00	11.87	18.12
10,950.0	10.22	139.59	10,948.2	-5.4	164.5	22.1	12.00	11.95	7.59
10,975.0	13.21	140.63	10,972.6	-9.3	167.7	26.3	12.00	11.97	4.18
11,000.0	16.21	141.30	10,996.8	-14.2	171.7	31.6	12.00	11.98	2.66
11,025.0	19.20	141.76	11,020.6	-20.2	176.5	38.0	12.00	11.99	1.85
11,050.0	22.20	142.10	11,044.0	-27.2	181.9	45.5	12.00	11.99	1.36
11,075.0	25.20	142.36	11,066.9	-35.1	188.1	54.0	12.00	11.99	1.05
11,100.0	28.20	142.57	11,089.2	-44.0	194.9	63.5	12.00	11.99	0.84
11,125.0	31.20	142.75	11,110.9	-53.9	202.4	74.1	12.00	12.00	0.69
11,150.0	34.20	142.89	11,132.0	-64.6	210.6	85.6	12.00	12.00	0.58
11,175.0	37.20	143.02	11,152.3	-76.3	219.4	98.1	12.00	12.00	0.50
11,200.0	40.19	143.13	11,171.8	-88.8	228.7	111.5	12.00	12.00	0.43
11,225.0	43.19	143.22	11,190.5	-102.1	238.7	125.7	12.00	12.00	0.38
11,250.0	46.19	143.31	11,208.2	-116.2	249.2	140.8	12.00	12.00	0.34
11,275.0	49.19	143.39	11,225.1	-131.0	260.3	156.7	12.00	12.00	0.31
11,300.0	52.19	143.46	11,240.9	-146.5	271.8	173.3	12.00	12.00	0.28
11,325.0	55.19	143.52	11,255.7	-162.7	283.8	190.6	12.00	12.00	0.26
11,350.0	58.19	143.58	11,269.4	-179.5	296.2	208.6	12.00	12.00	0.24
11,375.0	61.19	143.64	11,282.0	-196.9	309.0	227.2	12.00	12.00	0.23
11,400.0	64.19	143.69	11,293.5	-214.8	322.1	246.3	12.00	12.00	0.21
11,425.0	67.19	143.74	11,303.8	-233.1	335.6	266.0	12.00	12.00	0.20
11,450.0	70.19	143.79	11,312.9	-251.9	349.4	286.1	12.00	12.00	0.20
11,475.0	73.19	143.84	11,320.7	-271.1	363.4	306.5	12.00	12.00	0.19
11,500.0	76.19	143.89	11,327.3	-290.6	377.6	327.3	12.00	12.00	0.18
11,525.0	79.19	143.93	11,332.7	-310.3	392.0	348.4	12.00	12.00	0.18
11,550.0	82.19	143.97	11,336.7	-330.2	406.5	369.7	12.00	12.00	0.17
11,575.0	85.19	144.02	11,339.4	-350.3	421.1	391.2	12.00	12.00	0.17
11,600.0	88.19	144.06	11,340.9	-370.5	435.8	412.8	12.00	12.00	0.17
EOC: 11604.2' MD, 88.69° Inc, 144.07° Azm / Turn 4°/100'									
11,604.2	88.70	144.07	11,341.0	-374.0	438.3	416.5	12.00	12.00	0.17
11,700.0	88.67	147.90	11,343.2	-453.3	491.8	500.8	4.00	-0.03	4.00
11,800.0	88.65	151.90	11,345.5	-539.8	541.9	591.9	4.00	-0.02	4.00
11,900.0	88.64	155.90	11,347.9	-629.5	585.9	685.7	4.00	-0.01	4.00
12,000.0	88.63	159.90	11,350.3	-722.1	623.5	781.6	4.00	-0.01	4.00
12,100.0	88.63	163.90	11,352.7	-817.1	654.6	879.3	4.00	0.00	4.00
12,200.0	88.64	167.90	11,355.1	-914.1	678.9	978.2	4.00	0.01	4.00
12,300.0	88.65	171.90	11,357.4	-1,012.5	696.4	1,077.9	4.00	0.01	4.00
12,400.0	88.67	175.91	11,359.8	-1,111.9	707.1	1,177.8	4.00	0.02	4.00
Hold 88.70° Inc., 179.50° Azm									
12,489.8	88.70	179.50	11,361.8	-1,201.5	710.7	1,267.4	4.00	0.03	4.00
12,500.0	88.70	179.50	11,362.1	-1,211.8	710.7	1,277.6	0.00	0.00	0.00
12,600.0	88.70	179.50	11,364.3	-1,311.7	711.6	1,377.1	0.00	0.00	0.00
12,700.0	88.70	179.50	11,366.6	-1,411.7	712.5	1,476.7	0.00	0.00	0.00
12,800.0	88.70	179.50	11,368.9	-1,511.7	713.4	1,576.2	0.00	0.00	0.00
12,900.0	88.70	179.50	11,371.2	-1,611.6	714.2	1,675.8	0.00	0.00	0.00
13,000.0	88.70	179.50	11,373.4	-1,711.6	715.1	1,775.3	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Gettysburg State Com #11H
Company:	COG Operating, LLC	TVD Reference:	KB @ 3441.0usft (Noram 21)
Project:	Lea County, NM	MD Reference:	KB @ 3441.0usft (Noram 21)
Site:	Sec 16, T23S, R34E	North Reference:	Grid
Well:	Gettysburg State Com #11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
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)
13,100.0	88.70	179.50	11,375.7	-1,811.6	716.0	1,874.8	0.00	0.00	0.00
13,200.0	88.70	179.50	11,378.0	-1,911.6	716.9	1,974.4	0.00	0.00	0.00
13,300.0	88.70	179.50	11,380.3	-2,011.5	717.8	2,073.9	0.00	0.00	0.00
13,400.0	88.70	179.50	11,382.5	-2,111.5	718.6	2,173.5	0.00	0.00	0.00
13,500.0	88.70	179.50	11,384.8	-2,211.5	719.5	2,273.0	0.00	0.00	0.00
13,600.0	88.70	179.50	11,387.1	-2,311.4	720.4	2,372.6	0.00	0.00	0.00
13,700.0	88.70	179.50	11,389.4	-2,411.4	721.3	2,472.1	0.00	0.00	0.00
Drop 2°/100'									
13,728.0	88.70	179.50	11,390.0	-2,439.4	721.5	2,500.0	0.00	0.00	0.00
Hold 88.29° Inc., 179.50° Azm									
13,748.5	88.29	179.50	11,390.5	-2,459.8	721.7	2,520.3	2.00	-2.00	0.00
13,800.0	88.29	179.50	11,392.1	-2,511.4	722.1	2,571.6	0.00	0.00	0.00
13,900.0	88.29	179.50	11,395.1	-2,611.3	723.0	2,671.2	0.00	0.00	0.00
14,000.0	88.29	179.50	11,398.1	-2,711.3	723.9	2,770.7	0.00	0.00	0.00
14,100.0	88.29	179.50	11,401.0	-2,811.2	724.8	2,870.2	0.00	0.00	0.00
14,200.0	88.29	179.50	11,404.0	-2,911.2	725.6	2,969.7	0.00	0.00	0.00
14,300.0	88.29	179.50	11,407.0	-3,011.1	726.5	3,069.3	0.00	0.00	0.00
14,400.0	88.29	179.50	11,410.0	-3,111.1	727.4	3,168.8	0.00	0.00	0.00
14,500.0	88.29	179.50	11,413.0	-3,211.0	728.3	3,268.3	0.00	0.00	0.00
14,600.0	88.29	179.50	11,416.0	-3,311.0	729.1	3,367.8	0.00	0.00	0.00
14,700.0	88.29	179.50	11,419.0	-3,410.9	730.0	3,467.4	0.00	0.00	0.00
14,800.0	88.29	179.50	11,422.0	-3,510.9	730.9	3,566.9	0.00	0.00	0.00
14,900.0	88.29	179.50	11,425.0	-3,610.8	731.8	3,666.4	0.00	0.00	0.00
15,000.0	88.29	179.50	11,427.9	-3,710.8	732.7	3,765.9	0.00	0.00	0.00
15,100.0	88.29	179.50	11,430.9	-3,810.7	733.5	3,865.5	0.00	0.00	0.00
15,200.0	88.29	179.50	11,433.9	-3,910.7	734.4	3,965.0	0.00	0.00	0.00
15,300.0	88.29	179.50	11,436.9	-4,010.6	735.3	4,064.5	0.00	0.00	0.00
15,400.0	88.29	179.50	11,439.9	-4,110.6	736.2	4,164.0	0.00	0.00	0.00
15,500.0	88.29	179.50	11,442.9	-4,210.5	737.0	4,263.6	0.00	0.00	0.00
15,600.0	88.29	179.50	11,445.9	-4,310.5	737.9	4,363.1	0.00	0.00	0.00
15,700.0	88.29	179.50	11,448.9	-4,410.4	738.8	4,462.6	0.00	0.00	0.00
15,800.0	88.29	179.50	11,451.9	-4,510.4	739.7	4,562.1	0.00	0.00	0.00
15,900.0	88.29	179.50	11,454.8	-4,610.3	740.5	4,661.7	0.00	0.00	0.00
16,000.0	88.29	179.50	11,457.8	-4,710.3	741.4	4,761.2	0.00	0.00	0.00
16,100.0	88.29	179.50	11,460.8	-4,810.2	742.3	4,860.7	0.00	0.00	0.00
16,200.0	88.29	179.50	11,463.8	-4,910.2	743.2	4,960.2	0.00	0.00	0.00
Build 2°/100'									
16,239.9	88.29	179.50	11,465.0	-4,950.1	743.5	5,000.0	0.00	0.00	0.00
Hold 89.43° Inc., 179.50° Azm									
16,297.2	89.43	179.50	11,466.1	-5,007.3	744.0	5,057.0	2.00	2.00	0.00
16,300.0	89.43	179.50	11,466.2	-5,010.2	744.0	5,059.8	0.00	0.00	0.00
16,400.0	89.43	179.50	11,467.2	-5,110.2	744.9	5,159.3	0.00	0.00	0.00
16,500.0	89.43	179.50	11,468.1	-5,210.1	745.8	5,258.9	0.00	0.00	0.00
16,600.0	89.43	179.50	11,469.1	-5,310.1	746.7	5,358.5	0.00	0.00	0.00
16,700.0	89.43	179.50	11,470.1	-5,410.1	747.5	5,458.0	0.00	0.00	0.00
16,800.0	89.43	179.50	11,471.1	-5,510.1	748.4	5,557.6	0.00	0.00	0.00
16,900.0	89.43	179.50	11,472.1	-5,610.1	749.3	5,657.2	0.00	0.00	0.00
17,000.0	89.43	179.50	11,473.1	-5,710.1	750.2	5,756.7	0.00	0.00	0.00
17,100.0	89.43	179.50	11,474.1	-5,810.1	751.1	5,856.3	0.00	0.00	0.00
17,200.0	89.43	179.50	11,475.1	-5,910.1	751.9	5,955.9	0.00	0.00	0.00
17,300.0	89.43	179.50	11,476.1	-6,010.1	752.8	6,055.4	0.00	0.00	0.00
17,400.0	89.43	179.50	11,477.1	-6,110.1	753.7	6,155.0	0.00	0.00	0.00
17,500.0	89.43	179.50	11,478.1	-6,210.1	754.6	6,254.6	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Gettysburg State Com #11H
Company:	COG Operating, LLC	TVD Reference:	KB @ 3441.0usft (Noram 21)
Project:	Lea County, NM	MD Reference:	KB @ 3441.0usft (Noram 21)
Site:	Sec 16, T23S, R34E	North Reference:	Grid
Well:	Gettysburg State Com #11H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
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)
17,600.0	89.43	179.50	11,479.1	-6,310.0	755.4	6,354.1	0.00	0.00	0.00
17,700.0	89.43	179.50	11,480.0	-6,410.0	756.3	6,453.7	0.00	0.00	0.00
17,800.0	89.43	179.50	11,481.0	-6,510.0	757.2	6,553.3	0.00	0.00	0.00
17,900.0	89.43	179.50	11,482.0	-6,610.0	758.1	6,652.8	0.00	0.00	0.00
18,000.0	89.43	179.50	11,483.0	-6,710.0	758.9	6,752.4	0.00	0.00	0.00
18,100.0	89.43	179.50	11,484.0	-6,810.0	759.8	6,851.9	0.00	0.00	0.00
18,200.0	89.43	179.50	11,485.0	-6,910.0	760.7	6,951.5	0.00	0.00	0.00
18,300.0	89.43	179.50	11,486.0	-7,010.0	761.6	7,051.1	0.00	0.00	0.00
18,400.0	89.43	179.50	11,487.0	-7,110.0	762.4	7,150.6	0.00	0.00	0.00
18,500.0	89.43	179.50	11,488.0	-7,210.0	763.3	7,250.2	0.00	0.00	0.00
18,600.0	89.43	179.50	11,489.0	-7,310.0	764.2	7,349.8	0.00	0.00	0.00
18,700.0	89.43	179.50	11,490.0	-7,410.0	765.1	7,449.3	0.00	0.00	0.00
TD @ 18805.8' MD/11491.0' TVD									
18,805.8	89.43	179.50	11,491.0	-7,515.7	766.0	7,554.6	0.00	0.00	0.00

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
FTP Gettysburg State Co - plan misses target center by 712.0usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E) - Point	0.00	0.00	0.0	-123.7	701.2	477,884.75	767,296.61	32° 18' 39.082 N	103° 28' 5.354 W
LTP Gettysburg State Co - plan misses target center by 7425.1usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E) - Point	0.00	0.00	0.0	-7,385.6	764.8	470,622.78	767,360.15	32° 17' 27.218 N	103° 28' 5.297 W
T1 Gettysburg State Cor - plan hits target center - Point	0.00	0.00	11,390.0	-2,439.4	721.5	475,568.99	767,316.90	32° 18' 16.165 N	103° 28' 5.336 W
T2 Gettysburg State Cor - plan hits target center - Point	0.00	0.00	11,465.0	-4,950.1	743.5	473,058.28	767,338.91	32° 17' 51.320 N	103° 28' 5.315 W
PBHL Gettysburg State Co - plan hits target center - Point	0.00	0.00	11,491.0	-7,515.7	766.0	470,492.70	767,361.40	32° 17' 25.931 N	103° 28' 5.295 W

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,700.0	1,700.0	0.0	0.0	Drift 1°/100'
1,800.0	1,800.0	0.0	0.9	Hold 1.00° Inc., 90.00° Azm
10,870.0	10,868.6	0.0	159.2	KOP: Build 12°/100' @ 10870.0' MD
11,604.2	11,341.0	-374.0	438.3	EOC: 11604.2' MD, 88.69° Inc, 144.07° Azm / Turn 4°/100'
12,489.8	11,361.8	-1,201.5	710.7	Hold 88.70° Inc., 179.50° Azm
13,728.0	11,390.0	-2,439.4	721.5	Drop 2°/100'
13,748.5	11,390.5	-2,459.8	721.7	Hold 88.29° Inc., 179.50° Azm
16,239.9	11,465.0	-4,950.1	743.5	Build 2°/100'
16,297.2	11,466.1	-5,007.3	744.0	Hold 89.43° Inc., 179.50° Azm
18,805.8	11,491.0	-7,515.7	766.0	TD @ 18805.8' MD/11491.0' TVD