

Gettysburg State Com #14H
Lea County, NM
Q171*** & WT-171***
Design #1

Company Name: COG Operating, LLC
Gettysburg State Com #14H
Lea County, NM
Rig: Norem 21
Created By: Shelby Petarkin
Date: 14/18, November 28 2017



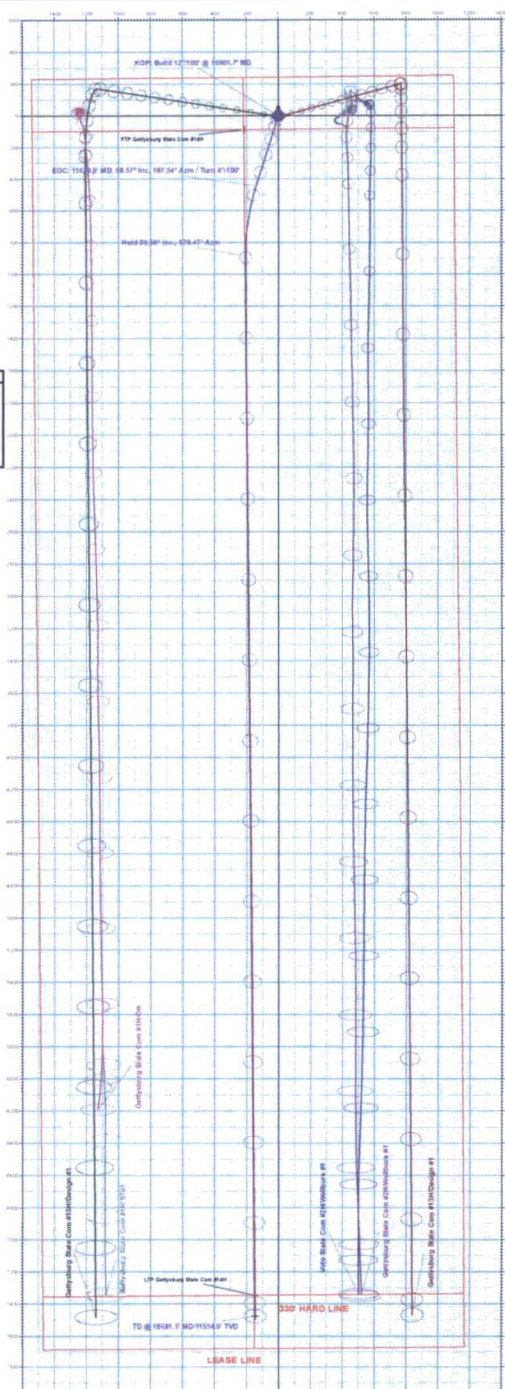
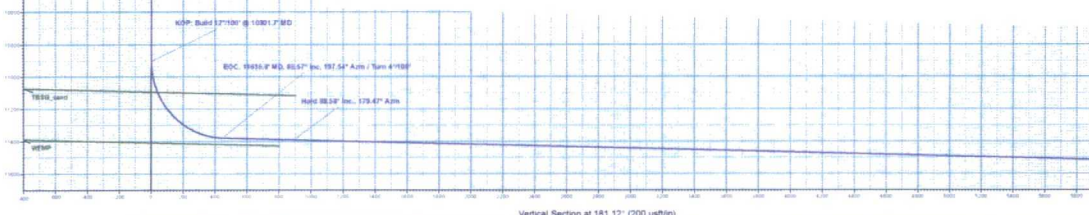
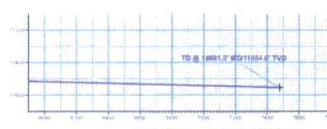
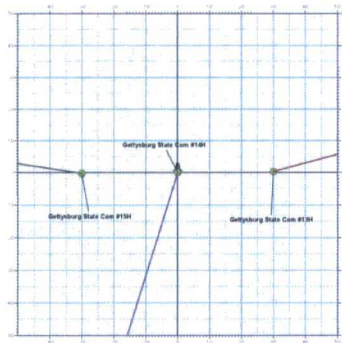
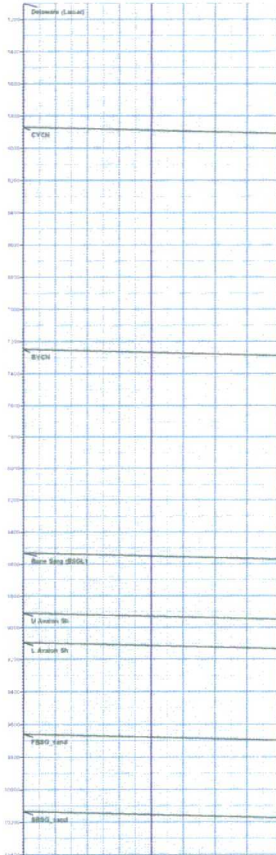
WELL DETAILS: Gettysburg State Com #14H						
NA-S	EU-W	Northings	Eastings	Ground Level	Latitude	Longitude
0.0	0.0	477942.62	764217.30	3425.0	32° 16' 39.89 N	103° 28' 41.227 W

DESIGN TARGET DETAILS						
Name	TVD	NA-S	EU-W	Northings	Eastings	Latitude
FTP Gettysburg State Com #14H	0.0	-0.0	-0.0	477942.62	764217.30	32° 16' 39.89 N
LTP Gettysburg State Com #14H	0.0	-0.0	-0.0	477942.62	764217.30	32° 16' 39.89 N
Plan, Gettysburg State Com #14H	0.0	-0.0	-0.0	477942.62	764217.30	32° 16' 39.89 N

ANNOTATIONS						
MD	Inc	Alt	TVD	NA-S	EU-W	Vsect
10901.7	0.00	0.00	10901.7	0.0	0.0	0.0
11639.8	88.58	197.54	11379.0	-444.0	-140.3	446.6
12091.4	88.58	179.47	11390.3	-888.5	-206.8	892.4
18691.5	88.58	179.47	11554.0	-7476.4	-146.2	7477.8

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

T G M Azimuths to Grid North
Magnetic North: 6.41°
Magnetic Field
Strength: 47953.7nT
Dip Angle: 60.15°
Date: 11/27/2017
Model: IGRF2015



HOBBS OCD
NOV 3 02017
RECEIVED



COG Operating, LLC

Lea County, NM

Sec 16, T23S, R34E

Gettysburg State Com #14H

Wellbore #1

Plan: Design #1

QES Well Planning Report

28 November, 2017

HOBBS OCD

NOV 30 2017

RECEIVED



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Gettysburg State Com #14H
Company:	COG Operating, LLC	TVD Reference:	KB @ 3454.0usft (Noram 21)
Project:	Lea County, NM	MD Reference:	KB @ 3454.0usft (Noram 21)
Site:	Sec 16, T23S, R34E	North Reference:	Grid
Well:	Gettysburg State Com #14H	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 #14H		
Well Position	+N/-S	-99.4 usft	Northing:
	+E/-W	-1,698.1 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	
		Latitude:	32° 18' 39.899 N
		Longitude:	103° 28' 41.227 W
		Ground Level:	3,425.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/27/2017	6.87	60.15	47,953.71610381

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	181.12

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	
10,901.7	0.00	0.00	10,901.7	0.0	0.0	0.00	0.00	0.00	0.00	
11,639.8	88.58	197.54	11,379.0	-444.0	-140.3	12.00	12.00	0.00	197.54	
12,091.4	88.58	179.47	11,390.3	-888.5	-206.8	4.00	0.00	-4.00	-90.23	
18,681.5	88.58	179.47	11,554.0	-7,476.4	-146.2	0.00	0.00	0.00	0.00	PBHL Gettysburg Sta

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Project:	Lea County, NM	MD Reference:	KB @ 3454.0usft (Noram 21)
Site:	Sec 16, T23S, R34E	North Reference:	Grid
Well:	Gettysburg State Com #14H	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)
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
Rustler									
1,229.0	0.00	0.00	1,229.0	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
TOS									
1,554.0	0.00	0.00	1,554.0	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
BOS (Castile)									

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Well:	Gettysburg State Com #14H	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)
4,719.0	0.00	0.00	4,719.0	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
Delaware (Lamar)									
4,989.0	0.00	0.00	4,989.0	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
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
CYCN									
5,889.0	0.00	0.00	5,889.0	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
BYCN									
7,269.0	0.00	0.00	7,269.0	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
Bone Sprg (BSGL)									
8,552.0	0.00	0.00	8,552.0	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
U Avalon Sh									
8,929.0	0.00	0.00	8,929.0	0.0	0.0	0.0	0.00	0.00	0.00
9,000.0	0.00	0.00	9,000.0	0.0	0.0	0.0	0.00	0.00	0.00

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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)
9,100.0	0.00	0.00	9,100.0	0.0	0.0	0.0	0.00	0.00	0.00
L Avalon Sh									
9,114.0	0.00	0.00	9,114.0	0.0	0.0	0.0	0.00	0.00	0.00
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00
9,400.0	0.00	0.00	9,400.0	0.0	0.0	0.0	0.00	0.00	0.00
9,500.0	0.00	0.00	9,500.0	0.0	0.0	0.0	0.00	0.00	0.00
9,600.0	0.00	0.00	9,600.0	0.0	0.0	0.0	0.00	0.00	0.00
FBSG_sand									
9,679.0	0.00	0.00	9,679.0	0.0	0.0	0.0	0.00	0.00	0.00
9,700.0	0.00	0.00	9,700.0	0.0	0.0	0.0	0.00	0.00	0.00
9,800.0	0.00	0.00	9,800.0	0.0	0.0	0.0	0.00	0.00	0.00
9,900.0	0.00	0.00	9,900.0	0.0	0.0	0.0	0.00	0.00	0.00
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00
SBSG_sand									
10,154.0	0.00	0.00	10,154.0	0.0	0.0	0.0	0.00	0.00	0.00
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00
10,300.0	0.00	0.00	10,300.0	0.0	0.0	0.0	0.00	0.00	0.00
10,400.0	0.00	0.00	10,400.0	0.0	0.0	0.0	0.00	0.00	0.00
10,500.0	0.00	0.00	10,500.0	0.0	0.0	0.0	0.00	0.00	0.00
10,600.0	0.00	0.00	10,600.0	0.0	0.0	0.0	0.00	0.00	0.00
10,700.0	0.00	0.00	10,700.0	0.0	0.0	0.0	0.00	0.00	0.00
10,800.0	0.00	0.00	10,800.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP: Build 12°/100' @ 10901.7' MD									
10,901.7	0.00	0.00	10,901.7	0.0	0.0	0.0	0.00	0.00	0.00
10,925.0	2.80	197.54	10,925.0	-0.5	-0.2	0.5	12.00	12.00	0.00
10,950.0	5.80	197.54	10,949.9	-2.3	-0.7	2.3	12.00	12.00	0.00
10,975.0	8.80	197.54	10,974.7	-5.4	-1.7	5.4	12.00	12.00	0.00
11,000.0	11.80	197.54	10,999.3	-9.6	-3.0	9.7	12.00	12.00	0.00
11,025.0	14.80	197.54	11,023.6	-15.1	-4.8	15.2	12.00	12.00	0.00
11,050.0	17.80	197.54	11,047.6	-21.8	-6.9	21.9	12.00	12.00	0.00
11,075.0	20.80	197.54	11,071.2	-29.7	-9.4	29.8	12.00	12.00	0.00
11,100.0	23.80	197.54	11,094.3	-38.7	-12.2	38.9	12.00	12.00	0.00
TBSG_sand									
11,100.7	23.88	197.54	11,095.0	-39.0	-12.3	39.2	12.00	12.00	0.00
11,125.0	26.80	197.54	11,116.9	-48.9	-15.5	49.2	12.00	12.00	0.00
11,150.0	29.80	197.54	11,139.0	-60.2	-19.0	60.5	12.00	12.00	0.00
11,175.0	32.80	197.54	11,160.3	-72.6	-22.9	73.0	12.00	12.00	0.00
11,200.0	35.80	197.54	11,181.0	-86.0	-27.2	86.5	12.00	12.00	0.00
11,225.0	38.80	197.54	11,200.9	-100.4	-31.7	101.0	12.00	12.00	0.00
11,250.0	41.80	197.54	11,219.9	-115.9	-36.6	116.5	12.00	12.00	0.00
11,275.0	44.80	197.54	11,238.1	-132.2	-41.8	133.0	12.00	12.00	0.00
11,300.0	47.80	197.54	11,255.4	-149.4	-47.2	150.3	12.00	12.00	0.00
11,325.0	50.80	197.54	11,271.7	-167.5	-52.9	168.5	12.00	12.00	0.00
11,350.0	53.80	197.54	11,287.0	-186.4	-58.9	187.5	12.00	12.00	0.00
11,375.0	56.80	197.54	11,301.2	-206.0	-65.1	207.2	12.00	12.00	0.00
11,400.0	59.80	197.54	11,314.3	-226.2	-71.5	227.6	12.00	12.00	0.00
11,425.0	62.80	197.54	11,326.3	-247.1	-78.1	248.6	12.00	12.00	0.00
11,450.0	65.80	197.54	11,337.2	-268.6	-84.9	270.2	12.00	12.00	0.00
11,475.0	68.80	197.54	11,346.8	-290.6	-91.8	292.3	12.00	12.00	0.00
11,500.0	71.80	197.54	11,355.3	-313.0	-98.9	314.9	12.00	12.00	0.00
11,525.0	74.80	197.54	11,362.5	-335.9	-106.2	337.9	12.00	12.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Gettysburg State Com #14H
Company:	COG Operating, LLC	TVD Reference:	KB @ 3454.0usft (Noram 21)
Project:	Lea County, NM	MD Reference:	KB @ 3454.0usft (Noram 21)
Site:	Sec 16, T23S, R34E	North Reference:	Grid
Well:	Gettysburg State Com #14H	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)
11,550.0	77.80	197.54	11,368.4	-359.0	-113.5	361.2	12.00	12.00	0.00
11,575.0	80.80	197.54	11,373.0	-382.4	-120.9	384.7	12.00	12.00	0.00
11,600.0	83.80	197.54	11,376.4	-406.1	-128.3	408.5	12.00	12.00	0.00
11,625.0	86.80	197.54	11,378.4	-429.8	-135.8	432.4	12.00	12.00	0.00
EOC: 11639.8' MD, 88.57° Inc, 197.54° Azm / Turn 4°/100'									
11,639.8	88.58	197.54	11,379.0	-444.0	-140.3	446.6	12.00	12.00	0.00
11,700.0	88.57	195.13	11,380.5	-501.7	-157.2	504.6	4.00	-0.01	-4.00
11,800.0	88.56	191.13	11,383.0	-599.0	-179.9	602.4	4.00	-0.01	-4.00
11,900.0	88.56	187.13	11,385.5	-697.7	-195.8	701.4	4.00	0.00	-4.00
12,000.0	88.57	183.13	11,388.0	-797.2	-204.7	801.1	4.00	0.01	-4.00
Hold 88.58° Inc., 179.47° Azm									
12,091.4	88.58	179.47	11,390.3	-888.5	-206.8	892.4	4.00	0.01	-4.00
12,100.0	88.58	179.47	11,390.5	-897.2	-206.7	901.0	0.00	0.00	0.00
12,200.0	88.58	179.47	11,393.0	-997.1	-205.8	1,001.0	0.00	0.00	0.00
12,300.0	88.58	179.47	11,395.5	-1,097.1	-204.9	1,100.9	0.00	0.00	0.00
12,400.0	88.58	179.47	11,398.0	-1,197.1	-204.0	1,200.8	0.00	0.00	0.00
12,500.0	88.58	179.47	11,400.5	-1,297.0	-203.0	1,300.7	0.00	0.00	0.00
12,600.0	88.58	179.47	11,403.0	-1,397.0	-202.1	1,400.7	0.00	0.00	0.00
12,700.0	88.58	179.47	11,405.4	-1,497.0	-201.2	1,500.6	0.00	0.00	0.00
12,800.0	88.58	179.47	11,407.9	-1,596.9	-200.3	1,600.5	0.00	0.00	0.00
12,900.0	88.58	179.47	11,410.4	-1,696.9	-199.4	1,700.5	0.00	0.00	0.00
13,000.0	88.58	179.47	11,412.9	-1,796.8	-198.4	1,800.4	0.00	0.00	0.00
13,100.0	88.58	179.47	11,415.4	-1,896.8	-197.5	1,900.3	0.00	0.00	0.00
13,200.0	88.58	179.47	11,417.9	-1,996.8	-196.6	2,000.2	0.00	0.00	0.00
13,300.0	88.58	179.47	11,420.3	-2,096.7	-195.7	2,100.2	0.00	0.00	0.00
13,400.0	88.58	179.47	11,422.8	-2,196.7	-194.8	2,200.1	0.00	0.00	0.00
13,500.0	88.58	179.47	11,425.3	-2,296.7	-193.8	2,300.0	0.00	0.00	0.00
13,600.0	88.58	179.47	11,427.8	-2,396.6	-192.9	2,400.0	0.00	0.00	0.00
13,700.0	88.58	179.47	11,430.3	-2,496.6	-192.0	2,499.9	0.00	0.00	0.00
13,800.0	88.58	179.47	11,432.8	-2,596.6	-191.1	2,599.8	0.00	0.00	0.00
13,900.0	88.58	179.47	11,435.2	-2,696.5	-190.2	2,699.7	0.00	0.00	0.00
14,000.0	88.58	179.47	11,437.7	-2,796.5	-189.2	2,799.7	0.00	0.00	0.00
14,100.0	88.58	179.47	11,440.2	-2,896.5	-188.3	2,899.6	0.00	0.00	0.00
14,200.0	88.58	179.47	11,442.7	-2,996.4	-187.4	2,999.5	0.00	0.00	0.00
14,300.0	88.58	179.47	11,445.2	-3,096.4	-186.5	3,099.4	0.00	0.00	0.00
14,400.0	88.58	179.47	11,447.7	-3,196.4	-185.6	3,199.4	0.00	0.00	0.00
14,500.0	88.58	179.47	11,450.1	-3,296.3	-184.7	3,299.3	0.00	0.00	0.00
14,600.0	88.58	179.47	11,452.6	-3,396.3	-183.7	3,399.2	0.00	0.00	0.00
14,700.0	88.58	179.47	11,455.1	-3,496.3	-182.8	3,499.2	0.00	0.00	0.00
14,800.0	88.58	179.47	11,457.6	-3,596.2	-181.9	3,599.1	0.00	0.00	0.00
14,900.0	88.58	179.47	11,460.1	-3,696.2	-181.0	3,699.0	0.00	0.00	0.00
15,000.0	88.58	179.47	11,462.6	-3,796.1	-180.1	3,798.9	0.00	0.00	0.00
15,100.0	88.58	179.47	11,465.0	-3,896.1	-179.1	3,898.9	0.00	0.00	0.00
15,200.0	88.58	179.47	11,467.5	-3,996.1	-178.2	3,998.8	0.00	0.00	0.00
15,300.0	88.58	179.47	11,470.0	-4,096.0	-177.3	4,098.7	0.00	0.00	0.00
15,400.0	88.58	179.47	11,472.5	-4,196.0	-176.4	4,198.7	0.00	0.00	0.00
15,500.0	88.58	179.47	11,475.0	-4,296.0	-175.5	4,298.6	0.00	0.00	0.00
15,600.0	88.58	179.47	11,477.5	-4,395.9	-174.5	4,398.5	0.00	0.00	0.00
15,700.0	88.58	179.47	11,479.9	-4,495.9	-173.6	4,498.4	0.00	0.00	0.00
15,800.0	88.58	179.47	11,482.4	-4,595.9	-172.7	4,598.4	0.00	0.00	0.00
15,900.0	88.58	179.47	11,484.9	-4,695.8	-171.8	4,698.3	0.00	0.00	0.00
16,000.0	88.58	179.47	11,487.4	-4,795.8	-170.9	4,798.2	0.00	0.00	0.00
16,100.0	88.58	179.47	11,489.9	-4,895.8	-169.9	4,898.1	0.00	0.00	0.00
16,200.0	88.58	179.47	11,492.4	-4,995.7	-169.0	4,998.1	0.00	0.00	0.00

Database: EDM 5000.1 Single User Db
Company: COG Operating, LLC
Project: Lea County, NM
Site: Sec 16, T23S, R34E
Well: Gettysburg State Com #14H
Wellbore: Wellbore #1
Design: Design #1

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

Well Gettysburg State Com #14H
KB @ 3454.0usft (Noram 21)
KB @ 3454.0usft (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)
16,300.0	88.58	179.47	11,494.9	-5,095.7	-168.1	5,098.0	0.00	0.00	0.00
16,400.0	88.58	179.47	11,497.3	-5,195.7	-167.2	5,197.9	0.00	0.00	0.00
16,500.0	88.58	179.47	11,499.8	-5,295.6	-166.3	5,297.9	0.00	0.00	0.00
16,600.0	88.58	179.47	11,502.3	-5,395.6	-165.3	5,397.8	0.00	0.00	0.00
16,700.0	88.58	179.47	11,504.8	-5,495.6	-164.4	5,497.7	0.00	0.00	0.00
16,800.0	88.58	179.47	11,507.3	-5,595.5	-163.5	5,597.6	0.00	0.00	0.00
16,900.0	88.58	179.47	11,509.8	-5,695.5	-162.6	5,697.6	0.00	0.00	0.00
17,000.0	88.58	179.47	11,512.2	-5,795.4	-161.7	5,797.5	0.00	0.00	0.00
17,100.0	88.58	179.47	11,514.7	-5,895.4	-160.7	5,897.4	0.00	0.00	0.00
17,200.0	88.58	179.47	11,517.2	-5,995.4	-159.8	5,997.4	0.00	0.00	0.00
17,300.0	88.58	179.47	11,519.7	-6,095.3	-158.9	6,097.3	0.00	0.00	0.00
17,400.0	88.58	179.47	11,522.2	-6,195.3	-158.0	6,197.2	0.00	0.00	0.00
17,500.0	88.58	179.47	11,524.7	-6,295.3	-157.1	6,297.1	0.00	0.00	0.00
17,600.0	88.58	179.47	11,527.1	-6,395.2	-156.1	6,397.1	0.00	0.00	0.00
17,700.0	88.58	179.47	11,529.6	-6,495.2	-155.2	6,497.0	0.00	0.00	0.00
17,800.0	88.58	179.47	11,532.1	-6,595.2	-154.3	6,596.9	0.00	0.00	0.00
17,900.0	88.58	179.47	11,534.6	-6,695.1	-153.4	6,696.8	0.00	0.00	0.00
18,000.0	88.58	179.47	11,537.1	-6,795.1	-152.5	6,796.8	0.00	0.00	0.00
18,100.0	88.58	179.47	11,539.6	-6,895.1	-151.5	6,896.7	0.00	0.00	0.00
18,200.0	88.58	179.47	11,542.0	-6,995.0	-150.6	6,996.6	0.00	0.00	0.00
18,300.0	88.58	179.47	11,544.5	-7,095.0	-149.7	7,096.6	0.00	0.00	0.00
18,400.0	88.58	179.47	11,547.0	-7,195.0	-148.8	7,196.5	0.00	0.00	0.00
18,500.0	88.58	179.47	11,549.5	-7,294.9	-147.9	7,296.4	0.00	0.00	0.00
18,600.0	88.58	179.47	11,552.0	-7,394.9	-146.9	7,396.3	0.00	0.00	0.00
TD @ 18681.5' MD/11554.0' TVD									
18,681.5	88.58	179.47	11,554.0	-7,476.4	-146.2	7,477.8	0.00	0.00	0.00

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LTP Gettysburg State Cr - hit/miss target - Shape	0.00	0.00	0.0	-7,346.6	-147.4	470,596.04	764,069.95	32° 17' 27.215 N	103° 28' 43.626 W
- plan misses target center by 7348.0usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Point									
FTP Gettysburg State Cr - hit/miss target - Shape	0.00	0.00	0.0	-87.9	-214.2	477,854.69	764,003.13	32° 18' 39.046 N	103° 28' 43.730 W
- plan misses target center by 231.5usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Point									
PBHL Gettysburg State Cr - hit/miss target - Shape	0.00	0.00	11,554.0	-7,476.4	-146.2	470,466.20	764,071.10	32° 17' 25.930 N	103° 28' 43.625 W
- plan hits target center									
- Point									

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Gettysburg State Com #14H
Company:	COG Operating, LLC	TVD Reference:	KB @ 3454.0usft (Noram 21)
Project:	Lea County, NM	MD Reference:	KB @ 3454.0usft (Noram 21)
Site:	Sec 16, T23S, R34E	North Reference:	Grid
Well:	Gettysburg State Com #14H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,229.0	1,229.0	Rustler		1.42	181.12	
1,554.0	1,554.0	TOS		1.42	181.12	
4,719.0	4,719.0	BOS (Castile)		1.42	181.12	
4,989.0	4,989.0	Delaware (Lamar)		1.42	181.12	
5,889.0	5,889.0	CYCN		1.42	181.12	
7,269.0	7,269.0	BYCN		1.42	181.12	
8,552.0	8,552.0	Bone Sprg (BSGL)		1.42	181.12	
8,929.0	8,929.0	U Avalon Sh		1.42	181.12	
9,114.0	9,114.0	L Avalon Sh		1.42	181.12	
9,679.0	9,679.0	FBSG_sand		1.42	181.12	
10,154.0	10,154.0	SBSG_sand		1.42	181.12	
11,100.7	11,095.0	TBSG_sand		1.42	181.12	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
10,901.7	10,901.7	0.0	0.0	KOP: Build 12°/100' @ 10901.7' MD	
11,639.8	11,379.0	-444.0	-140.3	EOC: 11639.8' MD, 88.57° Inc, 197.54° Azm / Turn 4°/100'	
12,091.4	11,390.3	-888.5	-206.8	Hold 88.58° Inc., 179.47° Azm	
18,681.5	11,554.0	-7,476.4	-146.2	TD @ 18681.5' MD/11554.0' TVD	