



Project: Lea County, NM (NAD27 NME)
Site: Boone 16 State Com
Well: 4H
Wellbore: OH
Design: Plan 1 01-25-19
Rig: Scan Quest



Azimuths to Grid North
True North: -0.40°
Magnetic North: 6.28°
Magnetic Field
Strength: 48136.7nT
Dip Angle: 60.30°
Date: 3/24/2019
Model: MVHD

WELL DETAILS

+N-S	+E-W	Northing	Easting	Latitude	Longitude
0.00	0.00	535657.10	731276.50	32° 28' 13.43778 N	103° 35' 0.32180 W

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
BHL - Boone 16 State Com 4H	11505.00	10907.80	-90.80	546564.90	731185.70	32° 30' 1.37806 N	103° 35' 0.48665 W
LTP - Boone 16 State Com 4H	11506.08	10857.80	-90.40	546514.90	731186.10	32° 30' 0.88328 N	103° 35' 0.48608 W
FTP - Boone 16 State Com 4H	11725.00	500.00	-4.10	536157.10	731272.40	32° 28' 18.38564 N	103° 35' 0.32865 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Diag	IFace	VSeal	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	2000.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	0.00		KOP, Begin 2.00°/100' Build
3	2249.75	5.00	179.48	2249.44	-10.88	0.10	2.00	179.48	-10.88		Hold 4.99° Inc at 179.48° Azm
4	2976.44	5.00	179.48	2973.36	-74.15	0.67	0.00	0.00	-74.15		Begin 2.00°/100' Drop
5	3226.19	0.00	0.00	3222.80	-85.03	0.77	2.00	180.00	-85.03		Begin Vertical Hold
6	11155.56	0.00	0.00	11152.17	-85.03	0.77	0.00	0.00	-85.03		KOP, Begin 10.00°/100' Build
7	12067.67	91.21	359.52	11725.00	500.02	-4.10	10.00	359.52	500.03		LP, Hold 91.21° Inc at 359.52° Azm
8	22478.14	91.21	359.52	11505.00	10907.80	-90.80	0.00	0.00	10908.18	BHL - Boone 16 State Com 4H	TD at 22478.14

LEGEND

Plan 1 01-25-19

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

Local Origin: Site Boone 16 State Com, Grid North

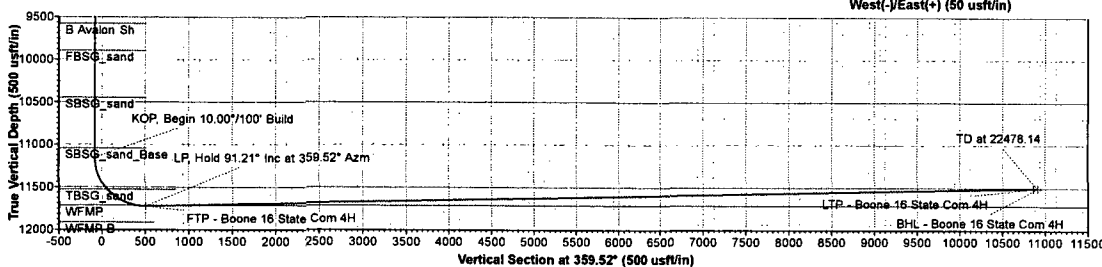
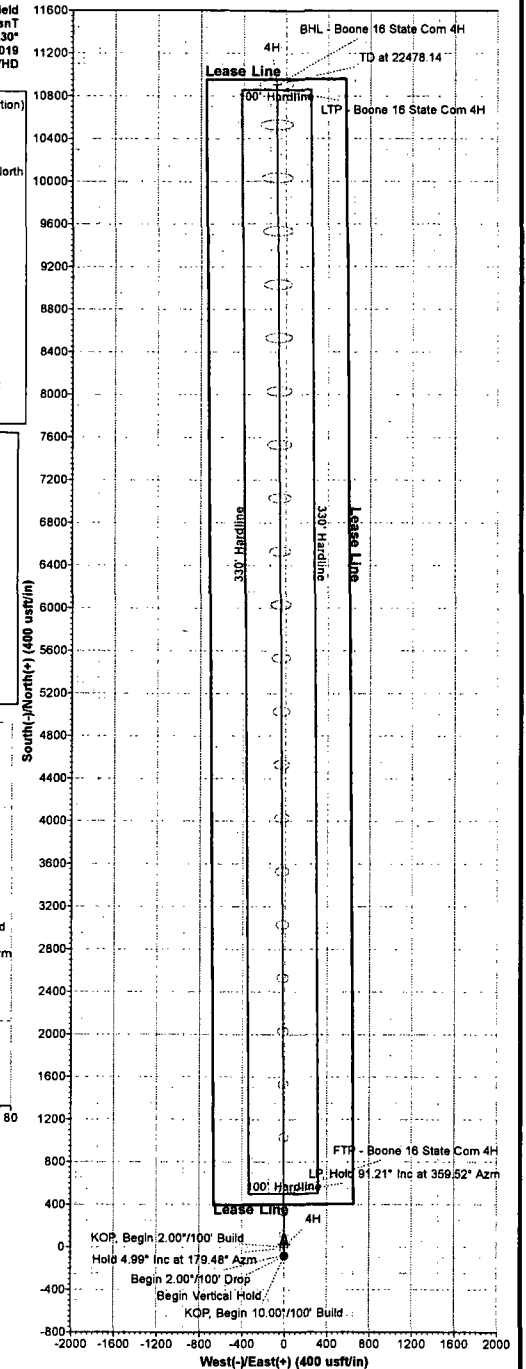
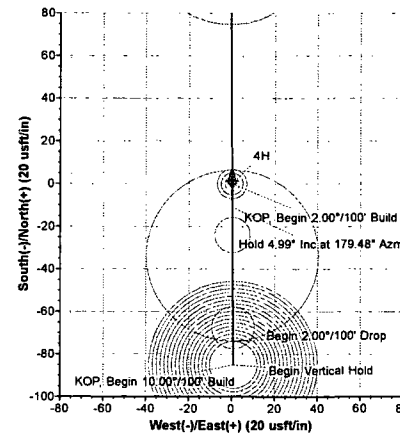
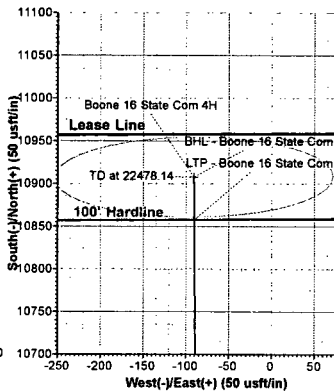
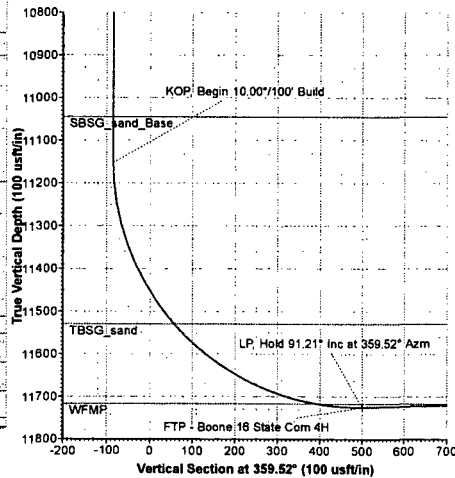
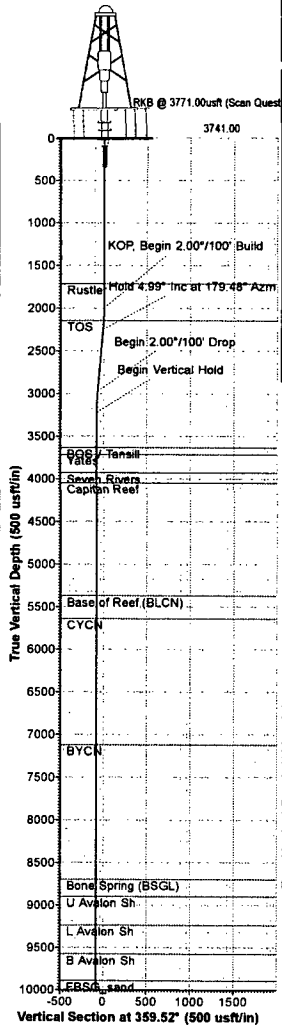
Latitude: 32° 28' 13.43778 N
Longitude: 103° 35' 0.32180 W

Grid East: 731276.50
Grid North: 535657.10
Scale Factor: 1.000

Geomagnetic Model: MVHD
Sample Date: 24-Mar-19
Magnetic Declination: 6.68°
Dip Angle from Horizontal: 60.30°
Magnetic Field Strength: 48136.70100383nT
To convert a Magnetic Direction to a Grid Direction, Add 6.28°
To convert a Magnetic Direction to a True Direction, Add 5.68° East
To convert a True Direction to a Grid Direction, Subtract 0.40°

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
1715.00	1715.00	Rustler	0.00	
2147.00	2147.00	TOS	0.00	
3635.00	3636.39	BOS / Tansil	0.00	
3716.00	3719.39	Yates	0.00	
3831.00	3834.39	Seven Rivers	0.00	
4049.00	4052.39	Capitan Reef	0.00	
5372.00	5375.39	Base of Reef (BLCN)	0.00	
5640.00	5643.39	CYCN	0.00	
7121.00	7124.39	BYCN	0.00	
8658.00	8701.39	Bone Spring (BSGL)	0.00	
8900.00	8903.39	U Avalon Sh	0.00	
9237.00	9240.39	L Avalon Sh	0.00	
9579.00	9582.39	B Avalon Sh	0.00	
9894.00	9897.39	FBSG_sand	0.00	
10449.00	10452.39	SBSG_sand	0.00	
11045.00	11048.39	SBSG_sand_Base	0.00	
11530.00	11568.13	TBSG_sand	0.00	
11717.00	11958.94	WFMP	0.00	





PHOENIX
TECHNOLOGY SERVICES

COG Operating LLC

Lea County, NM (NAD27 NME)

Boone 16 State Com

4H

OH

Plan: Plan 1 01-25-19

Standard Planning Report

25 January, 2019



Database:	USA Compass	Local Co-ordinate Reference:	Well 4H
Company:	COG Operating LLC	TVD Reference:	RKB @ 3771.00usft (Scan Quest)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	RKB @ 3771.00usft (Scan Quest)
Site:	Boone 16 State Com	North Reference:	Grid
Well:	4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 01-25-19		

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		Boone 16 State Com				
Site Position:		Northing:	535,657.10 usft	Latitude:	32° 28' 13.43778 N	
From:	Map	Easting:	731,276.50 usft	Longitude:	103° 35' 0.32180 W	
Position Uncertainty:		0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.40

Well	4H					
Well Position	+N/-S	0.00 usft	Northing:	535,657.10 usft	Latitude:	32° 28' 13.43778 N
	+E/-W	0.00 usft	Easting:	731,276.50 usft	Longitude:	103° 35' 0.32180 W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	3,741.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	3/24/2019	6.68	60.30	48,136.70100383

Design	Plan 1 01-25-19			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	359.52

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
0.00	0.00	0.00	0.00	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	
2,249.75	5.00	179.48	2,249.44	-10.88	0.10	2.00	2.00	0.00	179.48	
2,976.44	5.00	179.48	2,973.36	-74.15	0.67	0.00	0.00	0.00	0.00	
3,226.19	0.00	0.00	3,222.80	-85.03	0.77	2.00	-2.00	0.00	180.00	
11,155.56	0.00	0.00	11,152.17	-85.03	0.77	0.00	0.00	0.00	0.00	
12,067.67	91.21	359.52	11,725.00	500.02	-4.10	10.00	10.00	-0.05	359.52	
22,478.14	91.21	359.52	11,505.00	10,907.80	-90.80	0.00	0.00	0.00	0.00	BHL - Boone 16 St

Database:	USA Compass	Local Co-ordinate Reference:	Well 4H
Company:	COG Operating LLC	TVD Reference:	RKB @ 3771.00usft (Scan Quest)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	RKB @ 3771.00usft (Scan Quest)
Site:	Boone 16 State Com	North Reference:	Grid
Well:	4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 01-25-19		

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)
0.00	0.00	0.00	0.00	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
KOP, Begin 2.00°/100' Build									
2,100.00	2.00	179.48	2,099.98	-1.75	0.02	-1.75	2.00	2.00	0.00
2,200.00	4.00	179.48	2,199.84	-6.98	0.06	-6.98	2.00	2.00	0.00
2,249.75	5.00	179.48	2,249.44	-10.88	0.10	-10.88	2.00	2.00	0.00
Hold 4.99° Inc at 179.48° Azm									
2,300.00	5.00	179.48	2,299.49	-15.25	0.14	-15.25	0.00	0.00	0.00
2,400.00	5.00	179.48	2,399.11	-23.96	0.22	-23.96	0.00	0.00	0.00
2,500.00	5.00	179.48	2,498.73	-32.67	0.30	-32.67	0.00	0.00	0.00
2,600.00	5.00	179.48	2,598.35	-41.37	0.37	-41.38	0.00	0.00	0.00
2,700.00	5.00	179.48	2,697.97	-50.08	0.45	-50.08	0.00	0.00	0.00
2,800.00	5.00	179.48	2,797.59	-58.79	0.53	-58.79	0.00	0.00	0.00
2,900.00	5.00	179.48	2,897.21	-67.49	0.61	-67.50	0.00	0.00	0.00
2,976.44	5.00	179.48	2,973.36	-74.15	0.67	-74.15	0.00	0.00	0.00
Begin 2.00°/100' Drop									
3,000.00	4.52	179.48	2,996.84	-76.10	0.69	-76.11	2.00	-2.00	0.00
3,100.00	2.52	179.48	3,096.65	-82.25	0.75	-82.25	2.00	-2.00	0.00
3,200.00	0.52	179.48	3,196.61	-84.91	0.77	-84.91	2.00	-2.00	0.00
3,226.19	0.00	0.00	3,222.80	-85.03	0.77	-85.03	2.00	-2.00	0.00
Begin Vertical Hold									
11,155.56	0.00	0.00	11,152.17	-85.03	0.77	-85.03	0.00	0.00	0.00
KOP, Begin 10.00°/100' Build									
11,200.00	4.44	359.52	11,196.56	-83.31	0.76	-83.31	10.00	10.00	0.00
11,300.00	14.44	359.52	11,295.08	-66.92	0.62	-66.92	10.00	10.00	0.00
11,400.00	24.44	359.52	11,389.26	-33.68	0.34	-33.68	10.00	10.00	0.00
11,500.00	34.44	359.52	11,476.23	15.42	-0.07	15.42	10.00	10.00	0.00
11,600.00	44.44	359.52	11,553.36	78.87	-0.60	78.87	10.00	10.00	0.00
11,700.00	54.44	359.52	11,618.30	154.74	-1.23	154.75	10.00	10.00	0.00
11,800.00	64.44	359.52	11,669.07	240.75	-1.94	240.75	10.00	10.00	0.00
11,900.00	74.44	359.52	11,704.14	334.26	-2.72	334.27	10.00	10.00	0.00
12,000.00	84.44	359.52	11,722.44	432.44	-3.54	432.45	10.00	10.00	0.00
12,067.67	91.21	359.52	11,725.00	500.02	-4.10	500.03	10.00	10.00	0.00
LP, Hold 91.21° Inc at 359.52° Azm									
12,100.00	91.21	359.52	11,724.32	532.34	-4.37	532.36	0.00	0.00	0.00
12,200.00	91.21	359.52	11,722.20	632.31	-5.21	632.33	0.00	0.00	0.00
12,300.00	91.21	359.52	11,720.09	732.29	-6.04	732.31	0.00	0.00	0.00
12,400.00	91.21	359.52	11,717.98	832.26	-6.87	832.29	0.00	0.00	0.00
12,500.00	91.21	359.52	11,715.86	932.23	-7.70	932.27	0.00	0.00	0.00
12,600.00	91.21	359.52	11,713.75	1,032.21	-8.54	1,032.24	0.00	0.00	0.00
12,700.00	91.21	359.52	11,711.64	1,132.18	-9.37	1,132.22	0.00	0.00	0.00
12,800.00	91.21	359.52	11,709.52	1,232.16	-10.20	1,232.20	0.00	0.00	0.00
12,900.00	91.21	359.52	11,707.41	1,332.13	-11.03	1,332.18	0.00	0.00	0.00
13,000.00	91.21	359.52	11,705.30	1,432.10	-11.87	1,432.15	0.00	0.00	0.00
13,100.00	91.21	359.52	11,703.18	1,532.08	-12.70	1,532.13	0.00	0.00	0.00
13,200.00	91.21	359.52	11,701.07	1,632.05	-13.53	1,632.11	0.00	0.00	0.00
13,300.00	91.21	359.52	11,698.96	1,732.03	-14.37	1,732.09	0.00	0.00	0.00
13,400.00	91.21	359.52	11,696.84	1,832.00	-15.20	1,832.06	0.00	0.00	0.00
13,500.00	91.21	359.52	11,694.73	1,931.98	-16.03	1,932.04	0.00	0.00	0.00
13,600.00	91.21	359.52	11,692.62	2,031.95	-16.86	2,032.02	0.00	0.00	0.00
13,700.00	91.21	359.52	11,690.50	2,131.92	-17.70	2,132.00	0.00	0.00	0.00
13,800.00	91.21	359.52	11,688.39	2,231.90	-18.53	2,231.98	0.00	0.00	0.00
13,900.00	91.21	359.52	11,686.28	2,331.87	-19.36	2,331.95	0.00	0.00	0.00

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Company:	COG Operating LLC	TVD Reference:	RKB @ 3771.00usft (Scan Quest)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	RKB @ 3771.00usft (Scan Quest)
Site:	Boone 16 State Com	North Reference:	Grid
Well:	4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 01-25-19		

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)
14,000.00	91.21	359.52	11,684.17	2,431.85	-20.20	2,431.93	0.00	0.00	0.00
14,100.00	91.21	359.52	11,682.05	2,531.82	-21.03	2,531.91	0.00	0.00	0.00
14,200.00	91.21	359.52	11,679.94	2,631.80	-21.86	2,631.89	0.00	0.00	0.00
14,300.00	91.21	359.52	11,677.83	2,731.77	-22.69	2,731.86	0.00	0.00	0.00
14,400.00	91.21	359.52	11,675.71	2,831.74	-23.53	2,831.84	0.00	0.00	0.00
14,500.00	91.21	359.52	11,673.60	2,931.72	-24.36	2,931.82	0.00	0.00	0.00
14,600.00	91.21	359.52	11,671.49	3,031.69	-25.19	3,031.80	0.00	0.00	0.00
14,700.00	91.21	359.52	11,669.37	3,131.67	-26.02	3,131.77	0.00	0.00	0.00
14,800.00	91.21	359.52	11,667.26	3,231.64	-26.86	3,231.75	0.00	0.00	0.00
14,900.00	91.21	359.52	11,665.15	3,331.61	-27.69	3,331.73	0.00	0.00	0.00
15,000.00	91.21	359.52	11,663.03	3,431.59	-28.52	3,431.71	0.00	0.00	0.00
15,100.00	91.21	359.52	11,660.92	3,531.56	-29.36	3,531.69	0.00	0.00	0.00
15,200.00	91.21	359.52	11,658.81	3,631.54	-30.19	3,631.66	0.00	0.00	0.00
15,300.00	91.21	359.52	11,656.69	3,731.51	-31.02	3,731.64	0.00	0.00	0.00
15,400.00	91.21	359.52	11,654.58	3,831.49	-31.85	3,831.62	0.00	0.00	0.00
15,500.00	91.21	359.52	11,652.47	3,931.46	-32.69	3,931.60	0.00	0.00	0.00
15,600.00	91.21	359.52	11,650.35	4,031.43	-33.52	4,031.57	0.00	0.00	0.00
15,700.00	91.21	359.52	11,648.24	4,131.41	-34.35	4,131.55	0.00	0.00	0.00
15,800.00	91.21	359.52	11,646.13	4,231.38	-35.19	4,231.53	0.00	0.00	0.00
15,900.00	91.21	359.52	11,644.01	4,331.36	-36.02	4,331.51	0.00	0.00	0.00
16,000.00	91.21	359.52	11,641.90	4,431.33	-36.85	4,431.48	0.00	0.00	0.00
16,100.00	91.21	359.52	11,639.79	4,531.31	-37.68	4,531.46	0.00	0.00	0.00
16,200.00	91.21	359.52	11,637.67	4,631.28	-38.52	4,631.44	0.00	0.00	0.00
16,300.00	91.21	359.52	11,635.56	4,731.25	-39.35	4,731.42	0.00	0.00	0.00
16,400.00	91.21	359.52	11,633.45	4,831.23	-40.18	4,831.39	0.00	0.00	0.00
16,500.00	91.21	359.52	11,631.33	4,931.20	-41.01	4,931.37	0.00	0.00	0.00
16,600.00	91.21	359.52	11,629.22	5,031.18	-41.85	5,031.35	0.00	0.00	0.00
16,700.00	91.21	359.52	11,627.11	5,131.15	-42.68	5,131.33	0.00	0.00	0.00
16,800.00	91.21	359.52	11,624.99	5,231.12	-43.51	5,231.31	0.00	0.00	0.00
16,900.00	91.21	359.52	11,622.88	5,331.10	-44.35	5,331.28	0.00	0.00	0.00
17,000.00	91.21	359.52	11,620.77	5,431.07	-45.18	5,431.26	0.00	0.00	0.00
17,100.00	91.21	359.52	11,618.65	5,531.05	-46.01	5,531.24	0.00	0.00	0.00
17,200.00	91.21	359.52	11,616.54	5,631.02	-46.84	5,631.22	0.00	0.00	0.00
17,300.00	91.21	359.52	11,614.43	5,731.00	-47.68	5,731.19	0.00	0.00	0.00
17,400.00	91.21	359.52	11,612.31	5,830.97	-48.51	5,831.17	0.00	0.00	0.00
17,500.00	91.21	359.52	11,610.20	5,930.94	-49.34	5,931.15	0.00	0.00	0.00
17,600.00	91.21	359.52	11,608.09	6,030.92	-50.18	6,031.13	0.00	0.00	0.00
17,700.00	91.21	359.52	11,605.97	6,130.89	-51.01	6,131.10	0.00	0.00	0.00
17,800.00	91.21	359.52	11,603.86	6,230.87	-51.84	6,231.08	0.00	0.00	0.00
17,900.00	91.21	359.52	11,601.75	6,330.84	-52.67	6,331.06	0.00	0.00	0.00
18,000.00	91.21	359.52	11,599.63	6,430.82	-53.51	6,431.04	0.00	0.00	0.00
18,100.00	91.21	359.52	11,597.52	6,530.79	-54.34	6,531.02	0.00	0.00	0.00
18,200.00	91.21	359.52	11,595.41	6,630.76	-55.17	6,630.99	0.00	0.00	0.00
18,300.00	91.21	359.52	11,593.30	6,730.74	-56.01	6,730.97	0.00	0.00	0.00
18,400.00	91.21	359.52	11,591.18	6,830.71	-56.84	6,830.95	0.00	0.00	0.00
18,500.00	91.21	359.52	11,589.07	6,930.69	-57.67	6,930.93	0.00	0.00	0.00
18,600.00	91.21	359.52	11,586.96	7,030.66	-58.50	7,030.90	0.00	0.00	0.00
18,700.00	91.21	359.52	11,584.84	7,130.63	-59.34	7,130.88	0.00	0.00	0.00
18,800.00	91.21	359.52	11,582.73	7,230.61	-60.17	7,230.86	0.00	0.00	0.00
18,900.00	91.21	359.52	11,580.62	7,330.58	-61.00	7,330.84	0.00	0.00	0.00
19,000.00	91.21	359.52	11,578.50	7,430.56	-61.83	7,430.81	0.00	0.00	0.00
19,100.00	91.21	359.52	11,576.39	7,530.53	-62.67	7,530.79	0.00	0.00	0.00
19,200.00	91.21	359.52	11,574.28	7,630.51	-63.50	7,630.77	0.00	0.00	0.00
19,300.00	91.21	359.52	11,572.16	7,730.48	-64.33	7,730.75	0.00	0.00	0.00

Database:	USA Compass	Local Co-ordinate Reference:	Well 4H
Company:	COG Operating LLC	TVD Reference:	RKB @ 3771.00usft (Scan Quest)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	RKB @ 3771.00usft (Scan Quest)
Site:	Boone 16 State Com	North Reference:	Grid
Well:	4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 01-25-19		

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)
19,400.00	91.21	359.52	11,570.05	7,830.45	-65.17	7,830.72	0.00	0.00	0.00
19,500.00	91.21	359.52	11,567.94	7,930.43	-66.00	7,930.70	0.00	0.00	0.00
19,600.00	91.21	359.52	11,565.82	8,030.40	-66.83	8,030.68	0.00	0.00	0.00
19,700.00	91.21	359.52	11,563.71	8,130.38	-67.66	8,130.66	0.00	0.00	0.00
19,800.00	91.21	359.52	11,561.60	8,230.35	-68.50	8,230.64	0.00	0.00	0.00
19,900.00	91.21	359.52	11,559.48	8,330.32	-69.33	8,330.61	0.00	0.00	0.00
20,000.00	91.21	359.52	11,557.37	8,430.30	-70.16	8,430.59	0.00	0.00	0.00
20,100.00	91.21	359.52	11,555.26	8,530.27	-71.00	8,530.57	0.00	0.00	0.00
20,200.00	91.21	359.52	11,553.14	8,630.25	-71.83	8,630.55	0.00	0.00	0.00
20,300.00	91.21	359.52	11,551.03	8,730.22	-72.66	8,730.52	0.00	0.00	0.00
20,400.00	91.21	359.52	11,548.92	8,830.20	-73.49	8,830.50	0.00	0.00	0.00
20,500.00	91.21	359.52	11,546.80	8,930.17	-74.33	8,930.48	0.00	0.00	0.00
20,600.00	91.21	359.52	11,544.69	9,030.14	-75.16	9,030.46	0.00	0.00	0.00
20,700.00	91.21	359.52	11,542.58	9,130.12	-75.99	9,130.43	0.00	0.00	0.00
20,800.00	91.21	359.52	11,540.46	9,230.09	-76.82	9,230.41	0.00	0.00	0.00
20,900.00	91.21	359.52	11,538.35	9,330.07	-77.66	9,330.39	0.00	0.00	0.00
21,000.00	91.21	359.52	11,536.24	9,430.04	-78.49	9,430.37	0.00	0.00	0.00
21,100.00	91.21	359.52	11,534.12	9,530.02	-79.32	9,530.35	0.00	0.00	0.00
21,200.00	91.21	359.52	11,532.01	9,629.99	-80.16	9,630.32	0.00	0.00	0.00
21,300.00	91.21	359.52	11,529.90	9,729.96	-80.99	9,730.30	0.00	0.00	0.00
21,400.00	91.21	359.52	11,527.78	9,829.94	-81.82	9,830.28	0.00	0.00	0.00
21,500.00	91.21	359.52	11,525.67	9,929.91	-82.65	9,930.26	0.00	0.00	0.00
21,600.00	91.21	359.52	11,523.56	10,029.89	-83.49	10,030.23	0.00	0.00	0.00
21,700.00	91.21	359.52	11,521.44	10,129.86	-84.32	10,130.21	0.00	0.00	0.00
21,800.00	91.21	359.52	11,519.33	10,229.83	-85.15	10,230.19	0.00	0.00	0.00
21,900.00	91.21	359.52	11,517.22	10,329.81	-85.99	10,330.17	0.00	0.00	0.00
22,000.00	91.21	359.52	11,515.10	10,429.78	-86.82	10,430.14	0.00	0.00	0.00
22,100.00	91.21	359.52	11,512.99	10,529.76	-87.65	10,530.12	0.00	0.00	0.00
22,200.00	91.21	359.52	11,510.88	10,629.73	-88.48	10,630.10	0.00	0.00	0.00
22,300.00	91.21	359.52	11,508.76	10,729.71	-89.32	10,730.08	0.00	0.00	0.00
22,400.00	91.21	359.52	11,506.65	10,829.68	-90.15	10,830.06	0.00	0.00	0.00
22,478.14	91.21	359.52	11,505.00	10,907.80	-90.80	10,908.18	0.00	0.00	0.00
TD at 22478.14									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BHL - Boone 16 State - hit/miss target - Shape - Point	0.00	0.00	11,505.00	10,907.80	-90.80	546,564.90	731,185.70	32° 30' 1.37806 N	103° 35' 0.48665 W
LTP - Boone 16 State - plan hits target center by 28.13usft at 22400.00usft MD (11506.65 TVD, 10829.68 N, -90.15 E) - Point	0.00	0.00	11,506.06	10,857.80	-90.40	546,514.90	731,186.10	32° 30' 0.88328 N	103° 35' 0.48608 W
FTP - Boone 16 State - plan hits target center - Point	0.00	0.00	11,725.00	500.00	-4.10	536,157.10	731,272.40	32° 28' 18.38564 N	103° 35' 0.32865 W

Database:	USA Compass	Local Co-ordinate Reference:	Well 4H
Company:	COG Operating LLC	TVD Reference:	RKB @ 3771.00usft (Scan Quest)
Project:	Lea County, NM (NAD27 NME)	MD Reference:	RKB @ 3771.00usft (Scan Quest)
Site:	Boone 16 State Com	North Reference:	Grid
Well:	4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 01-25-19		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,715.00	1,715.00	Rustler		0.00		
2,147.06	2,147.00	TOS		0.00		
3,638.39	3,635.00	BOS / Tansill		0.00		
3,719.39	3,716.00	Yates		0.00		
3,934.39	3,931.00	Seven Rivers		0.00		
4,052.39	4,049.00	Capitan Reef		0.00		
5,375.39	5,372.00	Base of Reef (BLCN)		0.00		
5,643.39	5,640.00	CYCN		0.00		
7,124.39	7,121.00	BYCN		0.00		
8,701.39	8,698.00	Bone Spring (BSGL)		0.00		
8,903.39	8,900.00	U Avalon Sh		0.00		
9,240.39	9,237.00	L Avalon Sh		0.00		
9,582.39	9,579.00	B Avalon Sh		0.00		
9,897.39	9,894.00	FBSG_sand		0.00		
10,452.39	10,449.00	SBSG_sand		0.00		
11,048.39	11,045.00	SBSG_sand_Base		0.00		
11,568.13	11,530.00	TBSG_sand		0.00		
11,958.94	11,717.00	WFMP		0.00		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
2,000.00	2,000.00	0.00	0.00	KOP, Begin 2.00°/100' Build	
2,249.75	2,249.44	-10.88	0.10	Hold 4.99° Inc at 179.48° Azm	
2,976.44	2,973.36	-74.15	0.67	Begin 2.00°/100' Drop	
3,226.19	3,222.80	-85.03	0.77	Begin Vertical Hold	
11,155.56	11,152.17	-85.03	0.77	KOP, Begin 10.00°/100' Build	
12,067.67	11,725.00	500.02	-4.10	LP, Hold 91.21° Inc at 359.52° Azm	
22,478.14	11,505.00	10,907.80	-90.80	TD at 22478.14	