

RKB @ 3271.10ust (Pioneer 84)

Ground Level 3248.10



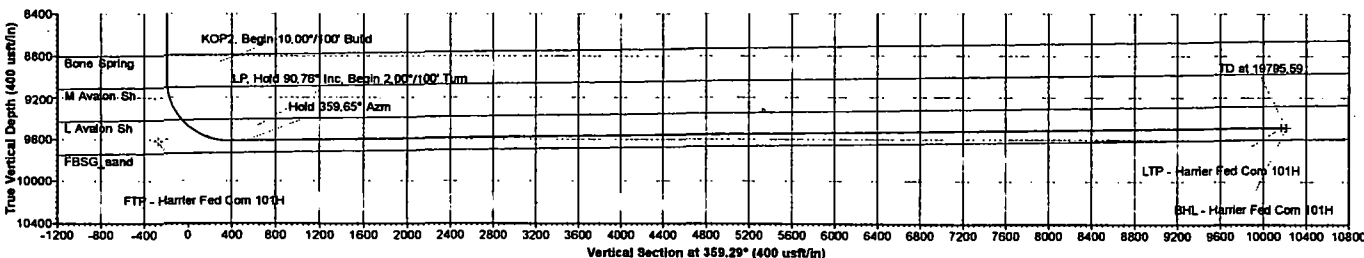
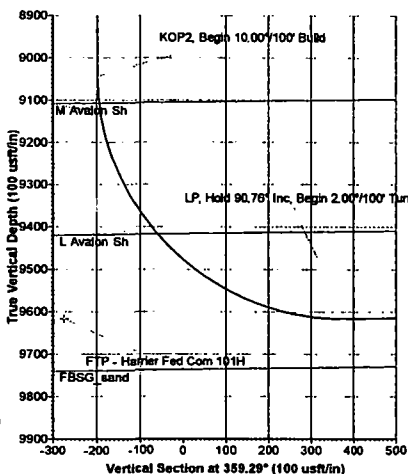
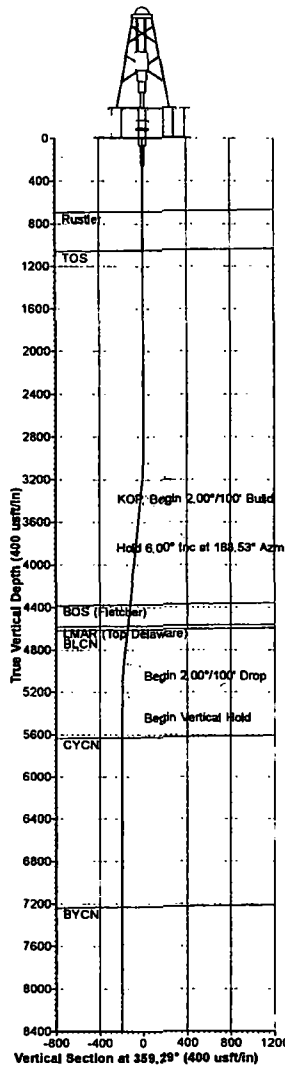
Project: Lea County, NM (NAD27 NME)
Site: Harrier Federal Com
Well: 101H
Wellbore: OH
Design: Plan 1 08-28-19
Rig: Pioneer 84



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Azimuths to Grid North
True North: -0.35°
Magnetic North: 6.25°
Magnetic Field
Strength: 47705.1anT
Dip Angle: 59.67°
Date: 10/22/2019
Model: MVHD

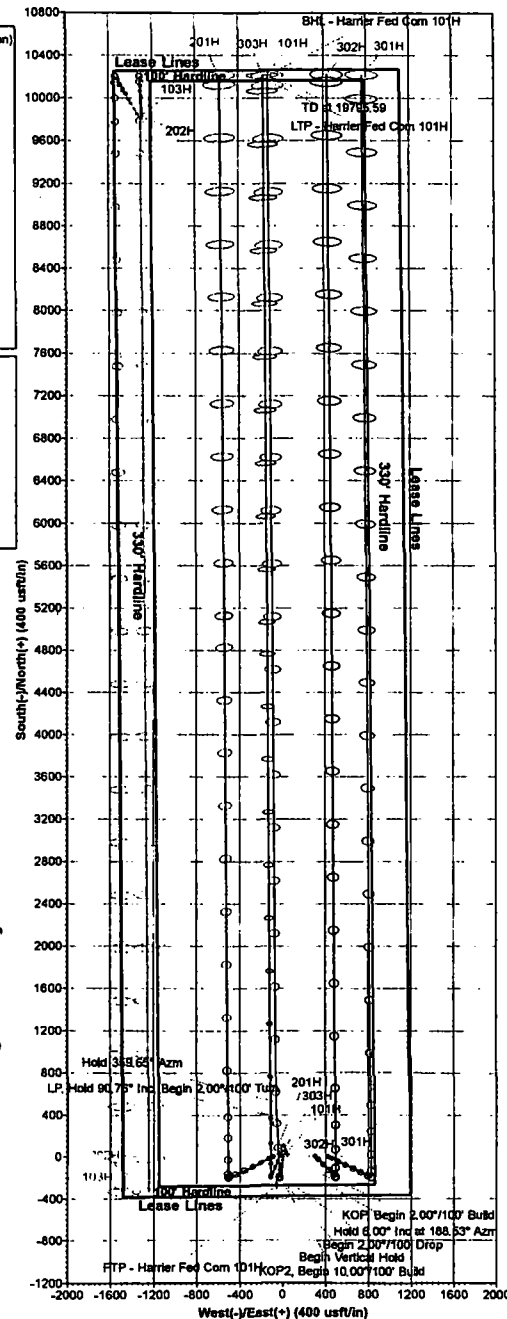
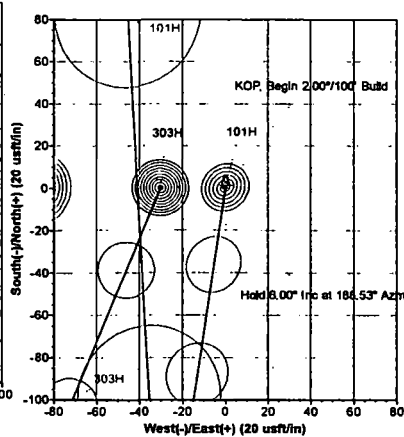


WELL DETAILS											
3248.10											
+N-S	+E-W	Northing	Easting	Latitude	Longitude						
0.00	0.00	388378.40	712001.00	32° 3' 57.291151 N	103° 38' 56.272311 W						
DESIGN TARGET DETAILS											
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude				
BHL - Harrier Fed Com 101H	9486.00	10212.40	-125.80	388588.80	711875.20	32° 5' 38.359989 N	103° 38' 56.981524 W				
LTP - Harrier Fed Com 101H	9486.87	10182.40	-125.50	388538.80	711875.50	32° 5' 37.885158 N	103° 38' 56.981724 W				
FTP - Harrier Fed Com 101H	9617.00	-275.40	-82.20	388101.00	711938.80	32° 3' 54.589715 N	103° 38' 57.015401 W				
SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Diag	TFace	VFace	Target	Annotation
1	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP: Begin 2.00°/100° Build
2	3000.00	0.00	0.00	3000.00	0.00	0.00	0.00	0.00	0.00	0.00	Hold 6.00° Inc at 188.53° Azm
3	3299.00	6.00	188.53	3299.35	-15.51	-2.33	2.00	188.53	-15.48	0.00	Begin 2.00°/100° Drop
4	4935.15	6.00	188.53	4935.65	-184.49	-27.87	0.00	0.00	-184.14	0.00	Begin Vertical Hold
5	5235.05	0.00	0.00	5235.00	-200.00	-30.00	2.00	180.00	-199.82	0.00	KOP2: Begin 10.00°/100° Build
6	9054.14	0.00	0.00	9044.09	-200.00	-30.00	0.00	0.00	-199.82	0.00	LP: Hold 90.76° Inc, Begin 2.00°/100° Turn
7	9981.74	90.76	359.65	9617.00	379.58	-61.90	10.00	358.85	350.41	0.00	Hold 359.65° Azm
8	10101.80	90.76	359.65	9615.14	519.45	-68.18	2.00	82.91	520.23	0.00	TD at 19795.59
9	19795.59	90.76	359.65	9488.00	10212.40	-125.80	0.00	0.00	0.00	0.00	BHL - Harrier Fed Com 101H

LEGEND	
—	301H, OH, Plan 1 08-23-19 V0
—	201H, OH, Plan 1 08-23-19 V0
—	302H, OH, Plan 1 08-23-19 V0
—	103H, OH, Plan 1 12-27-18 V0
—	202H, OH, Plan 1 12-27-18 V0
—	303H, OH, Plan 1 08-23-19 V0
—	Plan 1 08-28-19

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001
Local Origin: Well 101H, Grid North
Latitude: 32° 3' 57.291151 N
Longitude: 103° 38' 56.272311 W
Grid East: 712001.00
Grid North: 388378.40
Scale Factor: 1.000
Geomagnetic Model: MVHD
Sample Date: 22-Oct-18
Magnetic Declination: 6.62°
Dip Angle from Horizontal: 59.67°
Magnetic Field Strength: 47705.09744151nT
To convert a Magnetic Direction to a Grid Direction, Add 6.26°
To convert a Magnetic Direction to a True Direction, Add 6.62° East
To convert a True Direction to a Grid Direction, Subtract 0.36°

FORMATION TOP DETAILS				
TVDPath	MDPath	Formation	DipAngle	DipDir
688.10	688.10	Rustle	-0.76	358.29
1053.10	1053.10	TOS	-0.76	358.29
4378.78	4383.27	BOS (Fletcher)	-0.76	358.29
4577.08	4584.94	LVAR (Top Debrisure)	-0.76	358.29
4614.11	4621.90	BLCN	-0.76	358.29
5629.75	5639.78	CVCN	-0.76	358.29
7232.76	7242.78	BYCN	-0.76	358.29
8795.75	8805.79	Bone Spring	-0.76	358.29
9187.70	9117.88	M Avalon Sh	-0.76	358.29
9416.92	9460.09	L Avalon Sh	-0.76	358.29





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COG Operating LLC

**Lea County, NM (NAD27 NME)
Harrier Federal Com
101H**

OH

Plan: Plan 1 08-28-19

Standard Planning Report

28 August, 2019





Planning Report



Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Harrier Federal Com
Well: 101H
Wellbore: OH
Design: Plan 1 08-28-19

Local Co-ordinate Reference: Well 101H
TVD Reference: RKB @ 3271.10usft (Pioneer 84)
MD Reference: RKB @ 3271.10usft (Pioneer 84)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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	Harrier Federal Com			
Site Position:		Northing:	398,195.60 usft	Latitude: 32° 5' 34.543518 N
From:	Map	Easting:	710,683.50 usft	Longitude: 103° 39' 10.862860 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence: 0.36 °

Well	101H			
Well Position	+N-S	-9,819.20 usft	Northing:	388,376.40 usft
	+E-W	1,317.50 usft	Easting:	712,001.00 usft
Position Uncertainty	1.00 usft	Wellhead Elevation:		Ground Level: 3,246.10 usft

Wellbore	OH					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)	
	MVHD	10/22/2019	6.62	59.67	47,705.09744151	

Design	Plan 1 08-28-19				
Audit Notes:					
Version:		Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)	
	0.00	0.00	0.00	359.29	

Plan Survey Tool Program	Date 8/28/2019				
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	19,795.59 Plan 1 08-28-19 (OH)	MWD+HRGM		
			OWSG MWD + HRGM		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Dogleg Rate (°/100usft)	Buidl 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	
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,299.90	6.00	188.53	3,299.35	-15.51	-2.33	2.00	2.00	0.00	188.53	
4,935.15	6.00	188.53	4,925.65	-184.49	-27.67	0.00	0.00	0.00	0.00	
5,235.05	0.00	0.00	5,225.00	-200.00	-30.00	2.00	-2.00	0.00	180.00	
9,054.14	0.00	0.00	9,044.09	-200.00	-30.00	0.00	0.00	0.00	0.00	
9,961.74	90.76	356.85	9,617.00	379.68	-61.90	10.00	10.00	0.00	356.85	
10,101.60	90.76	359.65	9,615.14	519.45	-66.18	2.00	0.00	2.00	89.91	
19,795.59	90.76	359.65	9,486.00	10,212.40	-125.80	0.00	0.00	0.00	0.00	BHL - Harrier Fed C



Planning Report



Database: USA Compass
 Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Site: Harrier Federal Com
 Well: 101H
 Wellbore: OH
 Design: Plan 1 08-28-19

Local Co-ordinate Reference: Well 101H
 TVD Reference: RKB @ 3271.10usft (Pioneer 84)
 MD Reference: RKB @ 3271.10usft (Pioneer 84)
 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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
686.10	0.00	0.00	686.10	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,053.10	0.00	0.00	1,053.10	0.00	0.00	0.00	0.00	0.00	0.00
TOS									
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 2.00°/100' Build									
3,100.00	2.00	188.53	3,099.98	-1.73	-0.26	-1.72	2.00	2.00	0.00
3,200.00	4.00	188.53	3,199.84	-6.90	-1.04	-6.89	2.00	2.00	0.00
3,299.90	6.00	188.53	3,299.35	-15.51	-2.33	-15.48	2.00	2.00	0.00
Hold 6.00° Inc at 188.53° Azm									
3,300.00	6.00	188.53	3,299.45	-15.52	-2.33	-15.49	0.00	0.00	0.00
3,400.00	6.00	188.53	3,398.90	-25.85	-3.88	-25.80	0.00	0.00	0.00
3,500.00	6.00	188.53	3,498.36	-36.19	-5.43	-36.12	0.00	0.00	0.00
3,600.00	6.00	188.53	3,597.81	-46.52	-6.98	-46.43	0.00	0.00	0.00
3,700.00	6.00	188.53	3,697.26	-56.85	-8.53	-56.75	0.00	0.00	0.00
3,800.00	6.00	188.53	3,796.71	-67.19	-10.08	-67.06	0.00	0.00	0.00
3,900.00	6.00	188.53	3,896.17	-77.52	-11.63	-77.37	0.00	0.00	0.00
4,000.00	6.00	188.53	3,995.62	-87.86	-13.18	-87.69	0.00	0.00	0.00
4,100.00	6.00	188.53	4,095.07	-98.19	-14.73	-98.00	0.00	0.00	0.00
4,200.00	6.00	188.53	4,194.53	-108.52	-16.28	-108.31	0.00	0.00	0.00
4,300.00	6.00	188.53	4,293.98	-118.86	-17.83	-118.63	0.00	0.00	0.00
4,382.10	6.00	188.53	4,375.63	-127.34	-19.10	-127.10	0.00	0.00	0.00
BOS (Fletcher)									
4,400.00	6.00	188.53	4,393.43	-129.19	-19.38	-128.94	0.00	0.00	0.00
4,500.00	6.00	188.53	4,492.88	-139.52	-20.93	-139.26	0.00	0.00	0.00
4,583.29	6.00	188.53	4,575.72	-148.13	-22.22	-147.85	0.00	0.00	0.00
LMAR (Top Delaware)									
4,600.00	6.00	188.53	4,592.34	-149.86	-22.48	-149.57	0.00	0.00	0.00
4,620.51	6.00	188.53	4,612.74	-151.98	-22.80	-151.68	0.00	0.00	0.00
BLCN									
4,700.00	6.00	188.53	4,691.79	-160.19	-24.03	-159.88	0.00	0.00	0.00
4,800.00	6.00	188.53	4,791.24	-170.52	-25.58	-170.20	0.00	0.00	0.00
4,900.00	6.00	188.53	4,890.69	-180.86	-27.13	-180.51	0.00	0.00	0.00
4,935.15	6.00	188.53	4,925.65	-184.49	-27.67	-184.14	0.00	0.00	0.00
Begin 2.00°/100' Drop									
5,000.00	4.70	188.53	4,990.22	-190.47	-28.57	-190.10	2.00	-2.00	0.00
5,100.00	2.70	188.53	5,090.00	-196.85	-29.53	-196.47	2.00	-2.00	0.00
5,200.00	0.70	188.53	5,189.95	-199.79	-29.97	-199.40	2.00	-2.00	0.00
5,235.05	0.00	0.00	5,225.00	-200.00	-30.00	-199.62	2.00	-2.00	489.26
Begin Vertical Hold									
5,637.98	0.00	0.00	5,627.94	-200.00	-30.00	-199.62	0.00	0.00	0.00
CYCN									
7,240.98	0.00	0.00	7,230.94	-200.00	-30.00	-199.62	0.00	0.00	0.00
BYCN									
8,803.98	0.00	0.00	8,793.94	-200.00	-30.00	-199.62	0.00	0.00	0.00
Bone Spring									
9,054.14	0.00	0.00	9,044.09	-200.00	-30.00	-199.62	0.00	0.00	0.00
KOP2, Begin 10.00°/100' Build									
9,100.00	4.59	356.85	9,089.90	-198.17	-30.10	-197.78	10.00	10.00	0.00
9,116.09	6.20	356.85	9,105.92	-196.66	-30.18	-196.27	10.00	10.00	0.00
M Avalon Sh									



Planning Report



Database: USA Compass
Company: COG Operating LLC
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Site: Harrier Federal Com
Well: 101H
Wellbore: OH
Design: Plan 1 08-28-19

Local Co-ordinate Reference: Well 101H
TVD Reference: RKB @ 3271.10usft (Pioneer 84)
MD Reference: RKB @ 3271.10usft (Pioneer 84)
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)
9,200.00	14.59	356.85	9,188.38	-181.56	-31.01	-181.17	10.00	10.00	0.00
9,300.00	24.59	356.85	9,282.48	-148.13	-32.85	-147.72	10.00	10.00	0.00
9,400.00	34.59	356.85	9,369.33	-98.90	-35.56	-98.45	10.00	10.00	0.00
9,459.35	40.52	356.85	9,416.36	-62.79	-37.55	-62.32	10.00	10.00	0.00
L Avalon Sh									
9,500.00	44.59	356.85	9,446.30	-35.35	-39.06	-34.86	10.00	10.00	0.00
9,600.00	54.59	356.85	9,511.04	40.58	-43.24	41.11	10.00	10.00	0.00
9,700.00	64.59	356.85	9,561.60	126.58	-47.97	127.16	10.00	10.00	0.00
9,800.00	74.59	356.85	9,596.44	220.04	-53.12	220.68	10.00	10.00	0.00
9,900.00	84.59	356.85	9,614.49	318.12	-58.51	318.81	10.00	10.00	0.00
9,961.74	90.76	356.85	9,617.00	379.68	-61.90	380.41	10.00	10.00	0.00
LP, Hold 90.76° Inc, Begin 2.00°/100° Turn									
10,000.00	90.76	357.62	9,616.49	417.90	-63.75	418.65	2.00	0.00	2.00
10,100.00	90.76	359.62	9,615.16	517.85	-66.16	518.63	2.00	0.00	2.00
10,101.60	90.76	359.65	9,615.14	519.45	-66.18	520.23	2.00	0.00	2.00
Hold 359.65° Azm									
10,200.00	90.76	359.65	9,613.83	617.84	-66.78	618.62	0.00	0.00	0.00
10,300.00	90.76	359.65	9,612.50	717.83	-67.40	718.61	0.00	0.00	0.00
10,400.00	90.76	359.65	9,611.16	817.82	-68.01	818.60	0.00	0.00	0.00
10,500.00	90.76	359.65	9,609.83	917.81	-68.63	918.58	0.00	0.00	0.00
10,600.00	90.76	359.65	9,608.50	1,017.80	-69.24	1,018.57	0.00	0.00	0.00
10,700.00	90.76	359.65	9,607.17	1,117.79	-69.86	1,118.56	0.00	0.00	0.00
10,800.00	90.76	359.65	9,605.83	1,217.78	-70.47	1,218.55	0.00	0.00	0.00
10,900.00	90.76	359.65	9,604.50	1,317.77	-71.09	1,318.54	0.00	0.00	0.00
11,000.00	90.76	359.65	9,603.17	1,417.76	-71.70	1,418.53	0.00	0.00	0.00
11,100.00	90.76	359.65	9,601.84	1,517.74	-72.32	1,518.52	0.00	0.00	0.00
11,200.00	90.76	359.65	9,600.51	1,617.73	-72.93	1,618.51	0.00	0.00	0.00
11,300.00	90.76	359.65	9,599.17	1,717.72	-73.55	1,718.50	0.00	0.00	0.00
11,400.00	90.76	359.65	9,597.84	1,817.71	-74.16	1,818.49	0.00	0.00	0.00
11,500.00	90.76	359.65	9,596.51	1,917.70	-74.78	1,918.48	0.00	0.00	0.00
11,600.00	90.76	359.65	9,595.18	2,017.69	-75.39	2,018.47	0.00	0.00	0.00
11,700.00	90.76	359.65	9,593.85	2,117.68	-76.01	2,118.46	0.00	0.00	0.00
11,800.00	90.76	359.65	9,592.51	2,217.67	-76.62	2,218.44	0.00	0.00	0.00
11,900.00	90.76	359.65	9,591.18	2,317.66	-77.24	2,318.43	0.00	0.00	0.00
12,000.00	90.76	359.65	9,589.85	2,417.65	-77.85	2,418.42	0.00	0.00	0.00
12,100.00	90.76	359.65	9,588.52	2,517.64	-78.47	2,518.41	0.00	0.00	0.00
12,200.00	90.76	359.65	9,587.18	2,617.63	-79.08	2,618.40	0.00	0.00	0.00
12,300.00	90.76	359.65	9,585.85	2,717.62	-79.70	2,718.39	0.00	0.00	0.00
12,400.00	90.76	359.65	9,584.52	2,817.60	-80.31	2,818.38	0.00	0.00	0.00
12,500.00	90.76	359.65	9,583.19	2,917.59	-80.93	2,918.37	0.00	0.00	0.00
12,600.00	90.76	359.65	9,581.86	3,017.58	-81.54	3,018.36	0.00	0.00	0.00
12,700.00	90.76	359.65	9,580.52	3,117.57	-82.16	3,118.35	0.00	0.00	0.00
12,800.00	90.76	359.65	9,579.19	3,217.56	-82.77	3,218.34	0.00	0.00	0.00
12,900.00	90.76	359.65	9,577.86	3,317.55	-83.39	3,318.33	0.00	0.00	0.00
13,000.00	90.76	359.65	9,576.53	3,417.54	-84.00	3,418.32	0.00	0.00	0.00
13,100.00	90.76	359.65	9,575.20	3,517.53	-84.62	3,518.30	0.00	0.00	0.00
13,200.00	90.76	359.65	9,573.86	3,617.52	-85.23	3,618.29	0.00	0.00	0.00
13,300.00	90.76	359.65	9,572.53	3,717.51	-85.85	3,718.28	0.00	0.00	0.00
13,400.00	90.76	359.65	9,571.20	3,817.50	-86.46	3,818.27	0.00	0.00	0.00
13,500.00	90.76	359.65	9,569.87	3,917.49	-87.08	3,918.26	0.00	0.00	0.00
13,600.00	90.76	359.65	9,568.53	4,017.48	-87.69	4,018.25	0.00	0.00	0.00
13,700.00	90.76	359.65	9,567.20	4,117.46	-88.31	4,118.24	0.00	0.00	0.00
13,800.00	90.76	359.65	9,565.87	4,217.45	-88.92	4,218.23	0.00	0.00	0.00



Planning Report



Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Harrier Federal Com
Well: 101H
Wellbore: OH
Design: Plan 1 08-28-19

Local Co-ordinate Reference: Well 101H
TVD Reference: RKB @ 3271.10usft (Pioneer 84)
MD Reference: RKB @ 3271.10usft (Pioneer 84)
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)
13,900.00	90.76	359.65	9,564.54	4,317.44	-89.54	4,318.22	0.00	0.00	0.00
14,000.00	90.76	359.65	9,563.21	4,417.43	-90.15	4,418.21	0.00	0.00	0.00
14,100.00	90.76	359.65	9,561.87	4,517.42	-90.77	4,518.20	0.00	0.00	0.00
14,200.00	90.76	359.65	9,560.54	4,617.41	-91.38	4,618.19	0.00	0.00	0.00
14,300.00	90.76	359.65	9,559.21	4,717.40	-92.00	4,718.18	0.00	0.00	0.00
14,400.00	90.76	359.65	9,557.88	4,817.39	-92.61	4,818.16	0.00	0.00	0.00
14,500.00	90.76	359.65	9,556.55	4,917.38	-93.23	4,918.15	0.00	0.00	0.00
14,600.00	90.76	359.65	9,555.21	5,017.37	-93.84	5,018.14	0.00	0.00	0.00
14,700.00	90.76	359.65	9,553.88	5,117.36	-94.46	5,118.13	0.00	0.00	0.00
14,800.00	90.76	359.65	9,552.55	5,217.35	-95.07	5,218.12	0.00	0.00	0.00
14,900.00	90.76	359.65	9,551.22	5,317.34	-95.69	5,318.11	0.00	0.00	0.00
15,000.00	90.76	359.65	9,549.88	5,417.32	-96.30	5,418.10	0.00	0.00	0.00
15,100.00	90.76	359.65	9,548.55	5,517.31	-96.92	5,518.09	0.00	0.00	0.00
15,200.00	90.76	359.65	9,547.22	5,617.30	-97.53	5,618.08	0.00	0.00	0.00
15,300.00	90.76	359.65	9,545.89	5,717.29	-98.15	5,718.07	0.00	0.00	0.00
15,400.00	90.76	359.65	9,544.56	5,817.28	-98.76	5,818.06	0.00	0.00	0.00
15,500.00	90.76	359.65	9,543.22	5,917.27	-99.38	5,918.05	0.00	0.00	0.00
15,600.00	90.76	359.65	9,541.89	6,017.26	-99.99	6,018.04	0.00	0.00	0.00
15,700.00	90.76	359.65	9,540.56	6,117.25	-100.61	6,118.02	0.00	0.00	0.00
15,800.00	90.76	359.65	9,539.23	6,217.24	-101.22	6,218.01	0.00	0.00	0.00
15,900.00	90.76	359.65	9,537.90	6,317.23	-101.84	6,318.00	0.00	0.00	0.00
16,000.00	90.76	359.65	9,536.56	6,417.22	-102.45	6,417.99	0.00	0.00	0.00
16,100.00	90.76	359.65	9,535.23	6,517.21	-103.07	6,517.98	0.00	0.00	0.00
16,200.00	90.76	359.65	9,533.90	6,617.20	-103.68	6,617.97	0.00	0.00	0.00
16,300.00	90.76	359.65	9,532.57	6,717.18	-104.30	6,717.96	0.00	0.00	0.00
16,400.00	90.76	359.65	9,531.23	6,817.17	-104.91	6,817.95	0.00	0.00	0.00
16,500.00	90.76	359.65	9,529.90	6,917.16	-105.53	6,917.94	0.00	0.00	0.00
16,600.00	90.76	359.65	9,528.57	7,017.15	-106.14	7,017.93	0.00	0.00	0.00
16,700.00	90.76	359.65	9,527.24	7,117.14	-106.76	7,117.92	0.00	0.00	0.00
16,800.00	90.76	359.65	9,525.91	7,217.13	-107.38	7,217.91	0.00	0.00	0.00
16,900.00	90.76	359.65	9,524.57	7,317.12	-107.99	7,317.90	0.00	0.00	0.00
17,000.00	90.76	359.65	9,523.24	7,417.11	-108.61	7,417.88	0.00	0.00	0.00
17,100.00	90.76	359.65	9,521.91	7,517.10	-109.22	7,517.87	0.00	0.00	0.00
17,200.00	90.76	359.65	9,520.58	7,617.09	-109.84	7,617.86	0.00	0.00	0.00
17,300.00	90.76	359.65	9,519.25	7,717.08	-110.45	7,717.85	0.00	0.00	0.00
17,400.00	90.76	359.65	9,517.91	7,817.07	-111.07	7,817.84	0.00	0.00	0.00
17,500.00	90.76	359.65	9,516.58	7,917.06	-111.68	7,917.83	0.00	0.00	0.00
17,600.00	90.76	359.65	9,515.25	8,017.04	-112.30	8,017.82	0.00	0.00	0.00
17,700.00	90.76	359.65	9,513.92	8,117.03	-112.91	8,117.81	0.00	0.00	0.00
17,800.00	90.76	359.65	9,512.58	8,217.02	-113.53	8,217.80	0.00	0.00	0.00
17,900.00	90.76	359.65	9,511.25	8,317.01	-114.14	8,317.79	0.00	0.00	0.00
18,000.00	90.76	359.65	9,509.92	8,417.00	-114.76	8,417.78	0.00	0.00	0.00
18,100.00	90.76	359.65	9,508.59	8,516.99	-115.37	8,517.77	0.00	0.00	0.00
18,200.00	90.76	359.65	9,507.26	8,616.98	-115.99	8,617.76	0.00	0.00	0.00
18,300.00	90.76	359.65	9,505.92	8,716.97	-116.60	8,717.74	0.00	0.00	0.00
18,400.00	90.76	359.65	9,504.59	8,816.96	-117.22	8,817.73	0.00	0.00	0.00
18,500.00	90.76	359.65	9,503.26	8,916.95	-117.83	8,917.72	0.00	0.00	0.00
18,600.00	90.76	359.65	9,501.93	9,016.94	-118.45	9,017.71	0.00	0.00	0.00
18,700.00	90.76	359.65	9,500.60	9,116.93	-119.06	9,117.70	0.00	0.00	0.00
18,800.00	90.76	359.65	9,499.26	9,216.92	-119.68	9,217.69	0.00	0.00	0.00
18,900.00	90.76	359.65	9,497.93	9,316.91	-120.29	9,317.68	0.00	0.00	0.00
19,000.00	90.76	359.65	9,496.60	9,416.89	-120.91	9,417.67	0.00	0.00	0.00
19,100.00	90.76	359.65	9,495.27	9,516.88	-121.52	9,517.66	0.00	0.00	0.00
19,200.00	90.76	359.65	9,493.93	9,616.87	-122.14	9,617.65	0.00	0.00	0.00

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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)
19,300.00	90.76	359.65	9,492.60	9,716.86	-122.75	9,717.64	0.00	0.00	0.00
19,400.00	90.76	359.65	9,491.27	9,816.85	-123.37	9,817.63	0.00	0.00	0.00
19,500.00	90.76	359.65	9,489.94	9,916.84	-123.98	9,917.62	0.00	0.00	0.00
19,600.00	90.76	359.65	9,488.61	10,016.83	-124.60	10,017.60	0.00	0.00	0.00
19,700.00	90.76	359.65	9,487.27	10,116.82	-125.21	10,117.59	0.00	0.00	0.00
19,795.59	90.76	359.65	9,486.00	10,212.40	-125.80	10,213.18	0.00	0.00	0.00
TD at 19795.59									

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
BHL - Harrier Fed Cor - plan hits target center - Point	0.00	0.00	9,486.00	10,212.40	-125.80	398,588.80	711,875.20	32° 5' 38.359969 N	3° 38' 56.981524 W
LTP - Harrier Fed Con - plan misses target center by 45.59usft at 19700.00usft MD (9487.27 TVD, 10116.82 N, -125.21 E) - Point	0.00	0.00	9,486.67	10,162.40	-125.50	398,538.80	711,875.50	32° 5' 37.865156 N	3° 38' 56.981725 W
FTP - Harrier Fed Cor - plan misses target center by 293.17usft at 9464.50usft MD (9420.26 TVD, -59.43 N, -37.74 E) - Point	0.00	0.00	9,617.00	-275.40	-62.20	388,101.00	711,938.80	32° 3' 54.569715 N	3° 38' 57.015401 W

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
686.10	686.10	Rustler		-0.24	359.29
1,053.10	1,053.10	TOS		-0.24	359.29
4,382.10	4,375.63	BOS (Fletcher)		-0.24	359.29
4,583.29	4,575.72	LMAR (Top Delaware)		-0.24	359.29
4,620.51	4,612.74	BLCN		-0.24	359.29
5,637.98	5,627.94	CYCN		-0.24	359.29
7,240.98	7,230.94	BYCN		-0.24	359.29
8,803.98	8,793.94	Bone Spring		-0.24	359.29
9,116.09	9,105.92	MAvalon Sh		-0.24	359.29
9,459.35	9,416.36	LAvalon Sh		-0.24	359.29



Planning Report



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Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,000.00	3,000.00	0.00	0.00	KOP, Begin 2.00°/100' Build
3,299.90	3,299.35	-15.51	-2.33	Hold 6.00° Inc at 188.53° Azm
4,935.15	4,925.65	-184.49	-27.67	Begin 2.00°/100' Drop
5,235.05	5,225.00	-200.00	-30.00	Begin Vertical Hold
9,054.14	9,044.09	-200.00	-30.00	KOP2, Begin 10.00°/100' Build
9,961.74	9,617.00	379.68	-61.90	LP, Hold 90.76° Inc, Begin 2.00°/100' Turn
10,101.60	9,615.14	519.45	-66.18	Hold 359.65° Azm
19,795.59	9,486.00	10,212.40	-125.80	TD at 19795.59