



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC D**

**BMC D 31A-18-07-95**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**28 November, 2016**



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well BMC D 31A-18-07-95
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC D 31A-18-07-95 @ 5285.0usft (Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 31A-18-07-95 @ 5285.0usft (Est KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 31A-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<b>Project</b>	Rockies Region		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		Using geodetic scale factor

Site	BMC D					
Site Position:		Northing:	1,595,755.80 usft	Latitude:	39.441572650	
From:	Lat/Long	Easting:	2,282,541.08 usft	Longitude:	-108.040739971	
Position Uncertainty:		0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.60 °

Well	BMC D 31A-18-07-95, SHL 39.441474212 -108.040910187					
Well Position	+N/-S	-35.9 usft	Northing:	1,595,721.30 usft	Latitude:	39.441474212
	+E/-W	-48.1 usft	Easting:	2,282,492.03 usft	Longitude:	-108.040910187
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	5,268.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	11/23/2016	9.77	65.54	51,562

<b>Design</b>	Design #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	38.47

<b>Plan Sections</b>										
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	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,049.4	26.23	38.47	1,023.5	132.0	104.9	3.50	3.50	0.00	38.47	
3,721.5	26.23	38.47	3,420.5	1,056.6	839.6	0.00	0.00	0.00	0.00	
4,471.0	0.00	0.00	4,144.0	1,188.6	944.5	3.50	-3.50	0.00	180.00	31A-18-07-95 TGT
7,007.0	0.00	0.00	6,680.0	1,188.6	944.5	0.00	0.00	0.00	0.00	

<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well BMC D 31A-18-07-95
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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 31A-18-07-95 @ 5285.0usft (Est KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 31A-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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
0.1	0.00	0.00	0.1	0.0	0.0	0.0	0.00	0.00	0.00
<b>SHL 39.441474212 -108.040910187</b>									
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
<b>Start Build 3.50</b>									
400.0	3.50	38.47	399.9	2.4	1.9	3.1	3.50	3.50	0.00
500.0	7.00	38.47	499.5	9.6	7.6	12.2	3.50	3.50	0.00
600.0	10.50	38.47	598.3	21.5	17.1	27.4	3.50	3.50	0.00
700.0	14.00	38.47	696.0	38.1	30.3	48.6	3.50	3.50	0.00
800.0	17.50	38.47	792.3	59.3	47.1	75.8	3.50	3.50	0.00
900.0	21.00	38.47	886.7	85.1	67.6	108.7	3.50	3.50	0.00
1,000.0	24.50	38.47	978.9	115.4	91.7	147.4	3.50	3.50	0.00
1,049.4	26.23	38.47	1,023.5	132.0	104.9	168.6	3.50	3.50	0.00
<b>Start 2672.1 hold at 1049.4 MD</b>									
1,100.0	26.23	38.47	1,068.9	149.5	118.8	190.9	0.00	0.00	0.00
1,200.0	26.23	38.47	1,158.6	184.1	146.3	235.1	0.00	0.00	0.00
1,300.0	26.23	38.47	1,248.3	218.7	173.8	279.3	0.00	0.00	0.00
1,400.0	26.23	38.47	1,338.0	253.3	201.3	323.5	0.00	0.00	0.00
1,500.0	26.23	38.47	1,427.7	287.9	228.8	367.7	0.00	0.00	0.00
1,600.0	26.23	38.47	1,517.4	322.5	256.3	411.9	0.00	0.00	0.00
1,700.0	26.23	38.47	1,607.1	357.1	283.8	456.1	0.00	0.00	0.00
1,800.0	26.23	38.47	1,696.8	391.7	311.3	500.3	0.00	0.00	0.00
1,803.6	26.23	38.47	1,700.0	392.9	312.2	501.9	0.00	0.00	0.00
<b>Surface Casing</b>									
1,900.0	26.23	38.47	1,786.5	426.3	338.8	544.5	0.00	0.00	0.00
2,000.0	26.23	38.47	1,876.2	460.9	366.3	588.7	0.00	0.00	0.00
2,100.0	26.23	38.47	1,965.9	495.5	393.8	632.9	0.00	0.00	0.00
2,200.0	26.23	38.47	2,055.6	530.1	421.3	677.1	0.00	0.00	0.00
2,300.0	26.23	38.47	2,145.3	564.7	448.8	721.3	0.00	0.00	0.00
2,400.0	26.23	38.47	2,235.0	599.3	476.3	765.5	0.00	0.00	0.00
2,500.0	26.23	38.47	2,324.7	633.9	503.7	809.7	0.00	0.00	0.00
2,600.0	26.23	38.47	2,414.4	668.5	531.2	853.9	0.00	0.00	0.00
2,700.0	26.23	38.47	2,504.1	703.1	558.7	898.1	0.00	0.00	0.00
2,800.0	26.23	38.47	2,593.8	737.7	586.2	942.3	0.00	0.00	0.00
2,900.0	26.23	38.47	2,683.5	772.3	613.7	986.5	0.00	0.00	0.00
3,000.0	26.23	38.47	2,773.2	806.9	641.2	1,030.7	0.00	0.00	0.00
3,100.0	26.23	38.47	2,862.9	841.5	668.7	1,074.9	0.00	0.00	0.00
3,200.0	26.23	38.47	2,952.6	876.1	696.2	1,119.1	0.00	0.00	0.00
3,300.0	26.23	38.47	3,042.3	910.7	723.7	1,163.3	0.00	0.00	0.00
3,400.0	26.23	38.47	3,132.0	945.3	751.2	1,207.5	0.00	0.00	0.00
3,500.0	26.23	38.47	3,221.7	979.9	778.7	1,251.7	0.00	0.00	0.00
3,600.0	26.23	38.47	3,311.5	1,014.5	806.2	1,295.9	0.00	0.00	0.00
3,668.6	26.23	38.47	3,373.0	1,038.3	825.1	1,326.2	0.00	0.00	0.00
<b>Williams Fork</b>									
3,700.0	26.23	38.47	3,401.2	1,049.1	833.7	1,340.1	0.00	0.00	0.00
3,721.5	26.23	38.47	3,420.5	1,056.6	839.6	1,349.6	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
3,800.0	23.48	38.47	3,491.7	1,082.4	860.2	1,382.6	3.50	-3.50	0.00
3,900.0	19.98	38.47	3,584.5	1,111.4	883.2	1,419.6	3.50	-3.50	0.00
4,000.0	16.48	38.47	3,679.5	1,135.9	902.7	1,450.9	3.50	-3.50	0.00
4,100.0	12.98	38.47	3,776.2	1,155.8	918.5	1,476.3	3.50	-3.50	0.00

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 31A-18-07-95 @ 5285.0usft (Est KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 31A-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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)
4,200.0	9.48	38.47	3,874.3	1,171.0	930.6	1,495.8	3.50	-3.50	0.00
4,300.0	5.98	38.47	3,973.3	1,181.6	939.0	1,509.2	3.50	-3.50	0.00
4,400.0	2.48	38.47	4,073.1	1,187.4	943.6	1,516.6	3.50	-3.50	0.00
4,471.0	0.00	0.00	4,144.0	1,188.6	944.5	1,518.2	3.50	-3.50	0.00
Back to Vertical - Start 2536.0 hold at 4471.0 MD - Top of Gas - 31A-18-07-95 TGT									
4,500.0	0.00	0.00	4,173.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
4,600.0	0.00	0.00	4,273.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
4,700.0	0.00	0.00	4,373.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
4,800.0	0.00	0.00	4,473.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
4,900.0	0.00	0.00	4,573.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
5,000.0	0.00	0.00	4,673.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
5,100.0	0.00	0.00	4,773.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
5,200.0	0.00	0.00	4,873.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
5,300.0	0.00	0.00	4,973.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
5,400.0	0.00	0.00	5,073.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
5,500.0	0.00	0.00	5,173.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
5,600.0	0.00	0.00	5,273.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
5,700.0	0.00	0.00	5,373.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
5,800.0	0.00	0.00	5,473.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
5,900.0	0.00	0.00	5,573.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
6,000.0	0.00	0.00	5,673.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
6,089.0	0.00	0.00	5,762.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
Cameo									
6,100.0	0.00	0.00	5,773.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
6,200.0	0.00	0.00	5,873.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
6,300.0	0.00	0.00	5,973.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
6,400.0	0.00	0.00	6,073.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
6,500.0	0.00	0.00	6,173.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
6,507.0	0.00	0.00	6,180.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
Rollins									
6,600.0	0.00	0.00	6,273.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
6,700.0	0.00	0.00	6,373.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
6,800.0	0.00	0.00	6,473.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
6,900.0	0.00	0.00	6,573.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
7,007.0	0.00	0.00	6,680.0	1,188.6	944.5	1,518.2	0.00	0.00	0.00
TD at 7007.0									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
31A-18-07-95 TGT	0.00	0.00	4,144.0	1,188.6	944.5	1,596,882.94	2,283,469.37	39.444737200	-108.037565800
- hit/miss target									
- Shape									
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,536.0)									

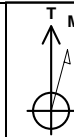
<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well BMC D 31A-18-07-95
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC D 31A-18-07-95 @ 5285.0usft (Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 31A-18-07-95 @ 5285.0usft (Est KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 31A-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,668.6	3,373.0	Williams Fork		0.00	
4,471.0	4,144.0	Top of Gas		0.00	
6,089.0	5,762.0	Cameo		0.00	
6,507.0	6,180.0	Rollins		0.00	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.1	0.1	0.0	0.0	SHL 39.441474212 -108.040910187
300.0	300.0	0.0	0.0	Start Build 3.50
1,049.4	1,023.5	132.0	104.9	Start 2672.1 hold at 1049.4 MD
1,803.6	1,700.0	392.9	312.2	Surface Casing
3,721.5	3,420.5	1,056.6	839.6	Start Drop -3.50
4,471.0	4,144.0	1,188.6	944.5	Back to Vertical
4,471.0	4,144.0	1,188.6	944.5	Start 2536.0 hold at 4471.0 MD
7,007.0	6,680.0	1,188.6	944.5	TD at 7007.0
7,007.0	6,680.0	1,188.6	944.5	BHL 39.4447372 -108.0375658



Well Name: BMC D 31A-18-07-95  
Surface Location: BMC D  
North American Datum 1983, US State Plane 1983, Colorado Central Zone  
Ground Elevation: 5268.0  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1595721.31 2282492.03 39.441474212 -108.040910187  
Est KB BMC D 31A-18-07-95 @ 5285.0usft (Est KB)



Azimuths to True North  
Magnetic North: 9.77°  
Magnetic Field  
Strength: 51562.1nT  
Dip Angle: 65.54°  
Date: 11/23/2016  
Model: IGRF2015

BMC D  
BMC D 31A-18-07-95  
Design #1  
14:37, November 28 2016

#### WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
31A-18-07-95 TGT	4144.0	1188.6	944.5	1596882.94	2283469.37	39.444737200	-108.037565800	Rectangle (Sides: L40.0 W100.0)

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSEct	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0	
3	1049.4	26.23	38.47	1023.5	132.0	104.9	3.50	38.47	168.6	
4	3721.5	26.23	38.47	3420.5	1056.6	839.6	0.00	0.00	1349.6	
5	4471.0	0.00	0.00	4144.0	1188.6	944.5	3.50	180.00	1518.2	31A-18-07-95 TGT
6	7007.0	0.00	0.00	6680.0	1188.6	944.5	0.00	0.00	1518.2	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL 39.441474212 -108.040910187
300.0	300.0	Start Build 3.50
1023.5	1049.4	Start 2672.1 hold at 1049.4 MD
1700.0	1803.6	Surface Casing
3420.5	3721.5	Start Drop -3.50
4144.0	4471.0	Start 2536.0 hold at 4471.0 MD
4144.0	4471.0	Back to Vertical
6680.0	7007.0	TD at 7007.0
6680.0	7007.0	BHL 39.4447372 -108.0375658

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3373.0	3668.6	Williams Fork	0.00	
4144.0	4471.0	Top of Gas	0.00	
5762.0	6089.0	Cameo	0.00	
6180.0	6507.0	Rollins	0.00	

