



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC B**

**BMC B 13C-18-07-95**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**22 November, 2016**



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well BMC B 13C-18-07-95
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC B 13C-18-07-95 @ 5117.0usft (Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 13C-18-07-95 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 13C-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 B				
Site Position:		Northing:	1,594,816.33 usft	Latitude:	39.438867241	
From:	Lat/Long	Easting:	2,280,886.96 usft	Longitude:	-108.046501442	
Position Uncertainty:		0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.61 °

Well	BMC B 13C-18-07-95, SHL 39.438805138 -108.046516899					
Well Position	+N/-S	-22.6 usft	Northing:	1,594,793.85 usft	Latitude:	39.438805138
	+E/-W	-4.4 usft	Easting:	2,280,881.96 usft	Longitude:	-108.046516899
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,117.0 usft	Ground Level:	5,100.0 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	11/18/2016	9.78	65.54	51,563

<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	183.92

<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	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,205.5	24.69	183.92	1,183.9	-149.3	-10.2	3.50	3.50	0.00	183.92	
3,308.0	24.69	183.92	3,094.1	-1,025.6	-70.2	0.00	0.00	0.00	0.00	
4,013.5	0.00	0.00	3,778.0	-1,174.9	-80.4	3.50	-3.50	0.00	180.00	13C-18-07-95 TGT
6,549.5	0.00	0.00	6,314.0	-1,174.9	-80.4	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 B 13C-18-07-95
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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 13C-18-07-95 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 13C-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: 39.438805138 -108.046516899</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
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
<b>Start Build 3.50</b>									
600.0	3.50	183.92	599.9	-3.0	-0.2	3.1	3.50	3.50	0.00
700.0	7.00	183.92	699.5	-12.2	-0.8	12.2	3.50	3.50	0.00
800.0	10.50	183.92	798.3	-27.3	-1.9	27.4	3.50	3.50	0.00
900.0	14.00	183.92	896.0	-48.5	-3.3	48.6	3.50	3.50	0.00
1,000.0	17.50	183.92	992.3	-75.6	-5.2	75.8	3.50	3.50	0.00
1,100.0	21.00	183.92	1,086.7	-108.5	-7.4	108.7	3.50	3.50	0.00
1,205.5	24.69	183.92	1,183.9	-149.4	-10.2	149.7	3.50	3.50	0.00
<b>Start 2102.5 hold at 1205.5 MD</b>									
1,300.0	24.69	183.92	1,269.7	-188.7	-12.9	189.2	0.00	0.00	0.00
1,400.0	24.69	183.92	1,360.6	-230.4	-15.8	230.9	0.00	0.00	0.00
1,500.0	24.69	183.92	1,451.4	-272.1	-18.6	272.7	0.00	0.00	0.00
1,600.0	24.69	183.92	1,542.3	-313.8	-21.5	314.5	0.00	0.00	0.00
1,700.0	24.69	183.92	1,633.1	-355.4	-24.3	356.3	0.00	0.00	0.00
1,773.6	24.69	183.92	1,700.0	-386.1	-26.4	387.0	0.00	0.00	0.00
<b>Surface Casing</b>									
1,800.0	24.69	183.92	1,724.0	-397.1	-27.2	398.0	0.00	0.00	0.00
1,900.0	24.69	183.92	1,814.9	-438.8	-30.0	439.8	0.00	0.00	0.00
2,000.0	24.69	183.92	1,905.7	-480.5	-32.9	481.6	0.00	0.00	0.00
2,100.0	24.69	183.92	1,996.6	-522.1	-35.7	523.4	0.00	0.00	0.00
2,200.0	24.69	183.92	2,087.4	-563.8	-38.6	565.1	0.00	0.00	0.00
2,300.0	24.69	183.92	2,178.3	-605.5	-41.4	606.9	0.00	0.00	0.00
2,400.0	24.69	183.92	2,269.1	-647.2	-44.3	648.7	0.00	0.00	0.00
2,500.0	24.69	183.92	2,360.0	-688.8	-47.1	690.5	0.00	0.00	0.00
2,600.0	24.69	183.92	2,450.9	-730.5	-50.0	732.2	0.00	0.00	0.00
2,700.0	24.69	183.92	2,541.7	-772.2	-52.9	774.0	0.00	0.00	0.00
2,800.0	24.69	183.92	2,632.6	-813.9	-55.7	815.8	0.00	0.00	0.00
2,900.0	24.69	183.92	2,723.4	-855.6	-58.6	857.6	0.00	0.00	0.00
3,000.0	24.69	183.92	2,814.3	-897.2	-61.4	899.3	0.00	0.00	0.00
3,100.0	24.69	183.92	2,905.1	-938.9	-64.3	941.1	0.00	0.00	0.00
3,200.0	24.69	183.92	2,996.0	-980.6	-67.1	982.9	0.00	0.00	0.00
3,212.1	24.69	183.92	3,007.0	-985.6	-67.5	987.9	0.00	0.00	0.00
<b>Williams Fork</b>									
3,308.0	24.69	183.92	3,094.1	-1,025.6	-70.2	1,028.0	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
3,400.0	21.47	183.92	3,178.7	-1,061.6	-72.7	1,064.1	3.50	-3.50	0.00
3,500.0	17.97	183.92	3,272.9	-1,095.2	-75.0	1,097.8	3.50	-3.50	0.00
3,600.0	14.47	183.92	3,368.9	-1,123.1	-76.9	1,125.7	3.50	-3.50	0.00
3,700.0	10.97	183.92	3,466.4	-1,145.1	-78.4	1,147.8	3.50	-3.50	0.00
3,800.0	7.47	183.92	3,565.1	-1,161.1	-79.5	1,163.8	3.50	-3.50	0.00
3,900.0	3.97	183.92	3,664.6	-1,171.0	-80.1	1,173.8	3.50	-3.50	0.00
4,000.0	0.47	183.92	3,764.5	-1,174.9	-80.4	1,177.6	3.50	-3.50	0.00
4,013.5	0.00	0.00	3,778.0	-1,174.9	-80.4	1,177.7	3.50	-3.50	0.00
<b>Start 2536.0 hold at 4013.5 MD - Back to Vertical - Top Of Gas - 13C-18-07-95 TGT</b>									
4,100.0	0.00	0.00	3,864.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00

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<b>Well:</b>	BMC B 13C-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	0.00	0.00	3,964.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
4,300.0	0.00	0.00	4,064.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
4,400.0	0.00	0.00	4,164.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
4,500.0	0.00	0.00	4,264.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
4,600.0	0.00	0.00	4,364.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
4,700.0	0.00	0.00	4,464.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
4,800.0	0.00	0.00	4,564.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
4,900.0	0.00	0.00	4,664.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
5,000.0	0.00	0.00	4,764.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
5,100.0	0.00	0.00	4,864.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
5,200.0	0.00	0.00	4,964.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
5,300.0	0.00	0.00	5,064.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
5,400.0	0.00	0.00	5,164.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
5,500.0	0.00	0.00	5,264.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
5,600.0	0.00	0.00	5,364.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
5,631.5	0.00	0.00	5,396.0	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
Cameo									
5,700.0	0.00	0.00	5,464.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
5,800.0	0.00	0.00	5,564.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
5,900.0	0.00	0.00	5,664.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
6,000.0	0.00	0.00	5,764.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
6,049.5	0.00	0.00	5,814.0	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
Rollins									
6,100.0	0.00	0.00	5,864.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
6,200.0	0.00	0.00	5,964.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
6,300.0	0.00	0.00	6,064.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
6,400.0	0.00	0.00	6,164.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
6,500.0	0.00	0.00	6,264.5	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
6,549.5	0.00	0.00	6,314.0	-1,174.9	-80.4	1,177.7	0.00	0.00	0.00
TD at 6549.5 MD - BHL: 39.4355795 -108.0468016									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
13C-18-07-95 TGT	0.00	0.00	3,778.0	-1,174.9	-80.4	1,593,621.68	2,280,768.65	39.435579500	-108.046801600
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,536.0)									

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,212.1	3,007.0	Williams Fork		0.00	
4,013.5	3,778.0	Top Of Gas		0.00	
5,631.5	5,396.0	Cameo		0.00	
6,049.5	5,814.0	Rollins		0.00	

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 13C-18-07-95 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 13C-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

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: 39.438805138 -108.046516899
500.0	500.0	0.0	0.0	Start Build 3.50
1,205.5	1,183.9	-149.4	-10.2	Start 2102.5 hold at 1205.5 MD
1,773.6	1,700.0	-386.1	-26.4	Surface Casing
3,308.0	3,094.1	-1,025.6	-70.2	Start Drop -3.50
4,013.5	3,778.0	-1,174.9	-80.4	Start 2536.0 hold at 4013.5 MD
4,013.5	3,778.0	-1,174.9	-80.4	Back to Vertical
6,549.5	6,314.0	-1,174.9	-80.4	TD at 6549.5 MD
6,549.5	6,314.0	-1,174.9	-80.4	BHL: 39.4355795 -108.0468016



Well Name: BMC B 13C-18-07-95  
Surface Location: BMC B  
North American Datum 1983, US State Plane 1983, Colorado Central Zone  
Ground Elevation: 5100.0  
+N/-S +E/-W Northing Easting Latitude Longitude  
0.0 0.0 1594793.85 2280881.96 39.438805138 -108.046516899  
Est KB BMC B 13C-18-07-95 @ 5117.0usft (Est KB)



Azimuths to True North  
Magnetic North: 9.78°  
Magnetic Field  
Strength: 51562.8nT  
Dip Angle: 65.54°  
Date: 11/18/2016  
Model: IGRF2015

BMC B  
BMC B 13C-18-07-95  
Design #1  
11:58, November 22 2016

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
13C-18-07-95 TGT	3778.0	-1174.9	-80.4	1593621.68	2280768.65	39.435579500	-108.046801600	Rectangle (Sides: L40.0 W100.0)

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	
3	1205.5	24.69	183.92	1183.9	-149.3	-10.2	3.50	183.92	149.7	
4	3308.0	24.69	183.92	3094.1	-1025.6	-70.2	0.00	0.00	1028.0	
5	4013.5	0.00	0.00	3778.0	-1174.9	-80.4	3.50	180.00	1177.7	13C-18-07-95 TGT
6	6549.5	0.00	0.00	6314.0	-1174.9	-80.4	0.00	0.00	1177.7	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL: 39.438805138 -108.046516899
500.0	500.0	Start Build 3.50
1183.9	1205.5	Start 2102.5 hold at 1205.5 MD
1700.0	1773.6	Surface Casing
3094.1	3308.0	Start Drop -3.50
3778.0	4013.5	Start 2536.0 hold at 4013.5 MD
3778.0	4013.5	Back to Vertical
6314.0	6549.5	TD at 6549.5 MD
6314.0	6549.5	BHL: 39.4355795 -108.0468016

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3007.0	3212.1	Williams Fork	0.00	
3778.0	4013.5	Top Of Gas	0.00	
5396.0	5631.5	Cameo	0.00	
5814.0	6049.5	Rollins	0.00	

