



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC B**

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

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**28 October, 2015**



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well BMC B 13D-18-07-95
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC B 13D-18-07-95 @ 5117.0usft (PLAN KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 13D-18-07-95 @ 5117.0usft (PLAN KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 13D-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		

Site		BMC B			
Site Position:		Northing:	1,594,816.33 usft	Latitude:	39° 26' 19.922 N
From:	Lat/Long	Easting:	2,280,886.96 usft	Longitude:	108° 2' 47.405 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.61 °

Well	BMC B 13D-18-07-95, SHL LAT: 39.438802062 LONG: -108.046658401					
Well Position	+N/-S	-23.7 usft	Northing:	1,594,793.84 usft	Latitude:	39° 26' 19.687 N
	+E/-W	-44.3 usft	Easting:	2,280,841.98 usft	Longitude:	108° 2' 47.970 W
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>
	IGRF2010	10/23/2015	9.81	65.56	51,780

<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	181.42	

<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	
1,002.7	24.59	181.42	981.3	-148.5	-3.7	3.50	3.50	0.00	181.42	
3,903.2	24.59	181.42	3,618.7	-1,355.2	-33.7	0.00	0.00	0.00	0.00	
4,605.9	0.00	0.00	4,300.0	-1,503.7	-37.4	3.50	-3.50	0.00	180.00	
6,610.9	0.00	0.00	6,305.0	-1,503.7	-37.4	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 13D-18-07-95
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC B 13D-18-07-95 @ 5117.0usft (PLAN KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 13D-18-07-95 @ 5117.0usft (PLAN KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 13D-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: 39.438802062 -108.046658401</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	181.42	399.9	-3.1	-0.1	3.1	3.50	3.50	0.00	
500.0	7.00	181.42	499.5	-12.2	-0.3	12.2	3.50	3.50	0.00	
600.0	10.50	181.42	598.3	-27.4	-0.7	27.4	3.50	3.50	0.00	
700.0	14.00	181.42	696.0	-48.6	-1.2	48.6	3.50	3.50	0.00	
800.0	17.50	181.42	792.3	-75.7	-1.9	75.8	3.50	3.50	0.00	
900.0	21.00	181.42	886.7	-108.7	-2.7	108.7	3.50	3.50	0.00	
1,002.7	24.59	181.42	981.3	-148.5	-3.7	148.5	3.50	3.50	0.00	
<b>Start 2900.5 hold at 1002.7 MD</b>										
1,100.0	24.59	181.42	1,069.8	-189.0	-4.7	189.0	0.00	0.00	0.00	
1,200.0	24.59	181.42	1,160.7	-230.6	-5.7	230.6	0.00	0.00	0.00	
1,300.0	24.59	181.42	1,251.6	-272.2	-6.8	272.2	0.00	0.00	0.00	
1,400.0	24.59	181.42	1,342.6	-313.8	-7.8	313.9	0.00	0.00	0.00	
1,500.0	24.59	181.42	1,433.5	-355.4	-8.8	355.5	0.00	0.00	0.00	
1,600.0	24.59	181.42	1,524.4	-397.0	-9.9	397.1	0.00	0.00	0.00	
1,700.0	24.59	181.42	1,615.4	-438.6	-10.9	438.7	0.00	0.00	0.00	
1,793.1	24.59	181.42	1,700.0	-477.3	-11.9	477.5	0.00	0.00	0.00	
<b>Surface Casing</b>										
1,800.0	24.59	181.42	1,706.3	-480.2	-11.9	480.3	0.00	0.00	0.00	
1,900.0	24.59	181.42	1,797.2	-521.8	-13.0	522.0	0.00	0.00	0.00	
2,000.0	24.59	181.42	1,888.1	-563.4	-14.0	563.6	0.00	0.00	0.00	
2,100.0	24.59	181.42	1,979.1	-605.0	-15.0	605.2	0.00	0.00	0.00	
2,200.0	24.59	181.42	2,070.0	-646.6	-16.1	646.8	0.00	0.00	0.00	
2,300.0	24.59	181.42	2,160.9	-688.2	-17.1	688.4	0.00	0.00	0.00	
2,400.0	24.59	181.42	2,251.9	-729.8	-18.1	730.0	0.00	0.00	0.00	
2,500.0	24.59	181.42	2,342.8	-771.4	-19.2	771.7	0.00	0.00	0.00	
2,600.0	24.59	181.42	2,433.7	-813.0	-20.2	813.3	0.00	0.00	0.00	
2,700.0	24.59	181.42	2,524.6	-854.6	-21.2	854.9	0.00	0.00	0.00	
2,800.0	24.59	181.42	2,615.6	-896.2	-22.3	896.5	0.00	0.00	0.00	
2,900.0	24.59	181.42	2,706.5	-937.8	-23.3	938.1	0.00	0.00	0.00	
3,000.0	24.59	181.42	2,797.4	-979.4	-24.3	979.7	0.00	0.00	0.00	
3,100.0	24.59	181.42	2,888.4	-1,021.0	-25.4	1,021.4	0.00	0.00	0.00	
3,200.0	24.59	181.42	2,979.3	-1,062.7	-26.4	1,063.0	0.00	0.00	0.00	
3,220.6	24.59	181.42	2,998.0	-1,071.2	-26.6	1,071.5	0.00	0.00	0.00	
<b>Williams Fork</b>										
3,300.0	24.59	181.42	3,070.2	-1,104.3	-27.4	1,104.6	0.00	0.00	0.00	
3,400.0	24.59	181.42	3,161.1	-1,145.9	-28.5	1,146.2	0.00	0.00	0.00	
3,500.0	24.59	181.42	3,252.1	-1,187.5	-29.5	1,187.8	0.00	0.00	0.00	
3,600.0	24.59	181.42	3,343.0	-1,229.1	-30.5	1,229.4	0.00	0.00	0.00	
3,700.0	24.59	181.42	3,433.9	-1,270.7	-31.6	1,271.1	0.00	0.00	0.00	
3,800.0	24.59	181.42	3,524.9	-1,312.3	-32.6	1,312.7	0.00	0.00	0.00	
3,903.2	24.59	181.42	3,618.7	-1,355.2	-33.7	1,355.6	0.00	0.00	0.00	
<b>Start Drop -3.50</b>										
4,000.0	21.21	181.42	3,707.9	-1,392.9	-34.6	1,393.3	3.50	-3.50	0.00	
4,065.1	18.93	181.42	3,769.0	-1,415.2	-35.2	1,415.6	3.50	-3.50	0.00	
<b>Top of Gas</b>										

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 13D-18-07-95 @ 5117.0usft (PLAN KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 13D-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)
4,100.0	17.71	181.42	3,802.1	-1,426.2	-35.4	1,426.6	3.50	-3.50	0.00
4,200.0	14.21	181.42	3,898.3	-1,453.6	-36.1	1,454.1	3.50	-3.50	0.00
4,300.0	10.71	181.42	3,995.9	-1,475.2	-36.7	1,475.6	3.50	-3.50	0.00
4,400.0	7.21	181.42	4,094.7	-1,490.8	-37.0	1,491.2	3.50	-3.50	0.00
4,500.0	3.71	181.42	4,194.2	-1,500.3	-37.3	1,500.7	3.50	-3.50	0.00
4,605.9	0.00	0.00	4,300.0	-1,503.7	-37.4	1,504.1	3.50	-3.50	0.00
<b>Back to Vertical - Start 2005.0 hold at 4605.9 MD</b>									
4,700.0	0.00	0.00	4,394.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
4,800.0	0.00	0.00	4,494.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
4,900.0	0.00	0.00	4,594.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
5,000.0	0.00	0.00	4,694.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
5,100.0	0.00	0.00	4,794.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
5,200.0	0.00	0.00	4,894.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
5,300.0	0.00	0.00	4,994.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
5,400.0	0.00	0.00	5,094.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
5,500.0	0.00	0.00	5,194.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
5,600.0	0.00	0.00	5,294.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
5,692.9	0.00	0.00	5,387.0	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
<b>Cameo</b>									
5,700.0	0.00	0.00	5,394.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
5,800.0	0.00	0.00	5,494.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
5,900.0	0.00	0.00	5,594.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
6,000.0	0.00	0.00	5,694.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
6,100.0	0.00	0.00	5,794.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
6,110.9	0.00	0.00	5,805.0	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
<b>Rollins</b>									
6,200.0	0.00	0.00	5,894.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
6,300.0	0.00	0.00	5,994.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
6,400.0	0.00	0.00	6,094.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
6,500.0	0.00	0.00	6,194.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
6,600.0	0.00	0.00	6,294.1	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
6,610.8	0.00	0.00	6,304.9	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
<b>BHL: 39.4346737 -108.0467907</b>									
6,610.9	0.00	0.00	6,305.0	-1,503.7	-37.4	1,504.1	0.00	0.00	0.00
<b>TD at 6610.9</b>									

## Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
13D-18-07-95 TGT	0.00	0.00	3,769.0	-1,503.7	-37.4	1,593,291.80	2,280,762.48	39° 26' 4.825 N	108° 2' 48.447 W
- hit/miss target									
- Shape									
- plan misses target center by 84.0usft at 4092.9usft MD (3795.4 TVD, -1424.0 N, -35.4 E) - Rectangle (sides W100.0 H40.0 D2,536.0)									

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 13D-18-07-95 @ 5117.0usft (PLAN KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 13D-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 (°)	
3,220.6	2,998.0	Williams Fork		0.00		
4,065.1	3,769.0	Top of Gas		0.00		
5,692.9	5,387.0	Cameo		0.00		
6,110.9	5,805.0	Rollins		0.00		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
0.1	0.1	0.0	0.0	SHL: 39.438802062 -108.046658401	
300.0	300.0	0.0	0.0	Start Build 3.50	
1,002.7	981.3	-148.5	-3.7	Start 2900.5 hold at 1002.7 MD	
1,793.1	1,700.0	-477.3	-11.9	Surface Casing	
3,903.2	3,618.7	-1,355.2	-33.7	Start Drop -3.50	
4,605.9	4,300.0	-1,503.7	-37.4	Back to Vertical	
4,605.9	4,300.0	-1,503.7	-37.4	Start 2005.0 hold at 4605.9 MD	
6,610.8	6,304.9	-1,503.7	-37.4	BHL: 39.4346737 -108.0467907	
6,610.9	6,305.0	-1,503.7	-37.4	TD at 6610.9	



Well Name: BMC B 13D-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 1594793.84 2280841.98 39° 26' 19.687 N 108° 2' 47.970 W  
PLAN KB BMC B 13D-18-07-95 @ 5117.0usft (PLAN KB)



Slot  
Azimuths to True North  
Magnetic North: 9.81°  
Magnetic Field  
Strength: 51780.4snT  
Dip Angle: 65.56°  
Date: 10/23/2015  
Model: IGRF2010

BMC B  
BMC B 13D-18-07-95  
Design #1  
12:07, October 28 2015

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
13D-18-07-95 TGT	3769.0	-1503.7	-37.4	1593291.80	2280762.48	39° 26' 4.825 N	108° 2' 48.447 W	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	1002.7	24.59	181.42	981.3	-148.5	-3.7	3.50	181.42	148.5	
4	3903.2	24.59	181.42	3618.7	-1355.2	-33.7	0.00	0.00	1355.6	
5	4605.9	0.00	0.00	4300.0	-1503.7	-37.4	3.50	180.00	1504.1	
6	6610.9	0.00	0.00	6305.0	-1503.7	-37.4	0.00	0.00	1504.1	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL: 39.438802062 -108.046658401
300.0	300.0	Start Build 3.50
981.3	1002.7	Start 2900.5 hold at 1002.7 MD
1700.0	1793.1	Surface Casing
3618.7	3903.2	Start Drop -3.50
4300.0	4605.9	Back to Vertical
4300.0	4605.9	Start 2005.0 hold at 4605.9 MD
6304.9	6610.8	BHL: 39.4346737 -108.0467907
6305.0	6610.9	TD at 6610.9

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
2998.0	3220.6	Williams Fork	0.00	
3769.0	4065.1	Top of Gas	0.00	
5387.0	5692.9	Cameo	0.00	
5805.0	6110.9	Rollins	0.00	

