



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC B**

**BMC B 23A-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 23A-18-07-95
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC B 23A-18-07-95 @ 5117.0usft (Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 23A-18-07-95 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 23A-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 23A-18-07-95, SHL 39.438808213 -108.046375396					
Well Position	+N/-S	-21.5 usft	Northing:	1,594,793.85 usft	Latitude:	39.438808213
	+E/-W	35.6 usft	Easting:	2,280,921.94 usft	Longitude:	-108.046375396
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	119.27

<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	
1,333.8	29.18	119.27	1,298.2	-101.6	181.3	3.50	3.50	0.00	119.27	
3,287.3	29.18	119.27	3,003.8	-567.4	1,012.2	0.00	0.00	0.00	0.00	
4,121.2	0.00	0.00	3,802.0	-669.0	1,193.4	3.50	-3.50	0.00	180.00	23A-18-07-95 TGT
6,657.2	0.00	0.00	6,338.0	-669.0	1,193.4	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 23A-18-07-95
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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 23A-18-07-95 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 23A-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: 39.438808213 -108.046375396</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	119.27	599.9	-1.5	2.7	3.1	3.50	3.50	0.00
700.0	7.00	119.27	699.5	-6.0	10.6	12.2	3.50	3.50	0.00
800.0	10.50	119.27	798.3	-13.4	23.9	27.4	3.50	3.50	0.00
900.0	14.00	119.27	896.0	-23.8	42.4	48.6	3.50	3.50	0.00
1,000.0	17.50	119.27	992.3	-37.0	66.1	75.8	3.50	3.50	0.00
1,100.0	21.00	119.27	1,086.7	-53.2	94.8	108.7	3.50	3.50	0.00
1,200.0	24.50	119.27	1,178.9	-72.1	128.6	147.4	3.50	3.50	0.00
1,300.0	28.00	119.27	1,268.5	-93.7	167.1	191.6	3.50	3.50	0.00
1,333.8	29.18	119.27	1,298.2	-101.6	181.3	207.8	3.50	3.50	0.00
<b>Start 1953.5 hold at 1333.8 MD</b>									
1,400.0	29.18	119.27	1,356.0	-117.4	209.4	240.1	0.00	0.00	0.00
1,500.0	29.18	119.27	1,443.3	-141.2	251.9	288.8	0.00	0.00	0.00
1,600.0	29.18	119.27	1,530.6	-165.1	294.5	337.6	0.00	0.00	0.00
1,700.0	29.18	119.27	1,617.9	-188.9	337.0	386.4	0.00	0.00	0.00
1,794.0	29.18	119.27	1,700.0	-211.3	377.0	432.2	0.00	0.00	0.00
<b>Surface Casing</b>									
1,800.0	29.18	119.27	1,705.2	-212.8	379.5	435.1	0.00	0.00	0.00
1,900.0	29.18	119.27	1,792.5	-236.6	422.1	483.9	0.00	0.00	0.00
2,000.0	29.18	119.27	1,879.8	-260.4	464.6	532.6	0.00	0.00	0.00
2,100.0	29.18	119.27	1,967.2	-284.3	507.2	581.4	0.00	0.00	0.00
2,200.0	29.18	119.27	2,054.5	-308.1	549.7	630.2	0.00	0.00	0.00
2,300.0	29.18	119.27	2,141.8	-332.0	592.2	678.9	0.00	0.00	0.00
2,400.0	29.18	119.27	2,229.1	-355.8	634.8	727.7	0.00	0.00	0.00
2,500.0	29.18	119.27	2,316.4	-379.7	677.3	776.4	0.00	0.00	0.00
2,600.0	29.18	119.27	2,403.7	-403.5	719.8	825.2	0.00	0.00	0.00
2,700.0	29.18	119.27	2,491.0	-427.3	762.4	874.0	0.00	0.00	0.00
2,800.0	29.18	119.27	2,578.3	-451.2	804.9	922.7	0.00	0.00	0.00
2,900.0	29.18	119.27	2,665.6	-475.0	847.4	971.5	0.00	0.00	0.00
3,000.0	29.18	119.27	2,752.9	-498.9	890.0	1,020.2	0.00	0.00	0.00
3,100.0	29.18	119.27	2,840.2	-522.7	932.5	1,069.0	0.00	0.00	0.00
3,200.0	29.18	119.27	2,927.5	-546.6	975.0	1,117.8	0.00	0.00	0.00
3,287.4	29.18	119.27	3,003.8	-567.4	1,012.2	1,160.4	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
3,300.0	28.74	119.27	3,014.9	-570.4	1,017.5	1,166.5	3.51	-3.51	0.00
3,318.4	28.10	119.27	3,031.0	-574.7	1,025.1	1,175.2	3.50	-3.50	0.00
<b>Williams Fork</b>									
3,400.0	25.24	119.27	3,103.9	-592.6	1,057.1	1,211.9	3.50	-3.50	0.00
3,500.0	21.74	119.27	3,195.6	-612.1	1,091.9	1,251.7	3.50	-3.50	0.00
3,600.0	18.24	119.27	3,289.6	-628.8	1,121.7	1,285.9	3.50	-3.50	0.00
3,700.0	14.74	119.27	3,385.5	-642.7	1,146.4	1,314.3	3.50	-3.50	0.00
3,800.0	11.24	119.27	3,482.9	-653.6	1,166.0	1,336.8	3.50	-3.50	0.00
3,900.0	7.74	119.27	3,581.5	-661.7	1,180.4	1,353.2	3.50	-3.50	0.00
4,000.0	4.24	119.27	3,681.0	-666.8	1,189.5	1,363.7	3.50	-3.50	0.00
4,100.0	0.74	119.27	3,780.8	-668.9	1,193.3	1,368.0	3.50	-3.50	0.00

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 23A-18-07-95 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 23A-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)	
4,121.2	0.00	0.00	3,802.0	-669.0	1,193.4	1,368.2	3.50	-3.50	0.00	
Start 2536.0 hold at 4121.2 MD - Back to Vertical - Top of Gas - 23A-18-07-95 TGT										
4,200.0	0.00	0.00	3,880.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
4,300.0	0.00	0.00	3,980.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
4,400.0	0.00	0.00	4,080.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
4,500.0	0.00	0.00	4,180.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
4,600.0	0.00	0.00	4,280.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
4,700.0	0.00	0.00	4,380.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
4,800.0	0.00	0.00	4,480.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
4,900.0	0.00	0.00	4,580.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
5,000.0	0.00	0.00	4,680.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
5,100.0	0.00	0.00	4,780.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
5,200.0	0.00	0.00	4,880.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
5,300.0	0.00	0.00	4,980.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
5,400.0	0.00	0.00	5,080.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
5,500.0	0.00	0.00	5,180.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
5,600.0	0.00	0.00	5,280.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
5,700.0	0.00	0.00	5,380.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
5,739.2	0.00	0.00	5,420.0	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
Cameo										
5,800.0	0.00	0.00	5,480.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
5,900.0	0.00	0.00	5,580.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
6,000.0	0.00	0.00	5,680.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
6,100.0	0.00	0.00	5,780.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
6,157.2	0.00	0.00	5,838.0	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
Rollins										
6,200.0	0.00	0.00	5,880.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
6,300.0	0.00	0.00	5,980.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
6,400.0	0.00	0.00	6,080.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
6,500.0	0.00	0.00	6,180.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
6,600.0	0.00	0.00	6,280.8	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
6,657.2	0.00	0.00	6,338.0	-669.0	1,193.4	1,368.2	0.00	0.00	0.00	
BHL: 39.4369715 -108.0421501 - TD at 6657.2										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
23A-18-07-95 TGT	0.00	0.00	3,802.0	-669.0	1,193.4	1,594,091.70	2,282,096.10	39.436971500	-108.042150100	
- plan hits target center										
- Rectangle (sides W100.0 H40.0 D2,536.0)										

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 23A-18-07-95 @ 5117.0usft (Est KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 23A-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 (°)
3,318.4	3,031.0	Williams Fork		0.00	
4,121.2	3,802.0	Top of Gas		0.00	
5,739.2	5,420.0	Cameo		0.00	
6,157.2	5,838.0	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: 39.438808213 -108.046375396
500.0	500.0	0.0	0.0	Start Build 3.50
1,333.8	1,298.2	-101.6	181.3	Start 1953.5 hold at 1333.8 MD
1,794.0	1,700.0	-211.3	377.0	Surface Casing
3,287.4	3,003.8	-567.4	1,012.2	Start Drop -3.50
4,121.2	3,802.0	-669.0	1,193.4	Start 2536.0 hold at 4121.2 MD
4,121.2	3,802.0	-669.0	1,193.4	Back to Vertical
6,657.2	6,338.0	-669.0	1,193.4	BHL: 39.4369715 -108.0421501
6,657.2	6,338.0	-669.0	1,193.4	TD at 6657.2



Well Name: BMC B 23A-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 2280921.94 39.438808213 -108.046375396  
Est KB BMC B 23A-18-07-95 @ 5117.0usft (Est KB)



Azimuths to True North  
Magnetic North: 9.78°  
Magnetic Field  
Strength: 51562.9nT  
Dip Angle: 65.54°  
Date: 11/18/2016  
Model: IGRF2015

BMC B  
BMC B 23A-18-07-95  
Design #1  
12:48, November 22 2016

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
23A-18-07-95 TGT	3802.0	-669.0	1193.4	1594091.71	2282096.10	39.436971500	-108.042150100	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	500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	
3	1333.8	29.18	119.27	1298.2	-101.6	181.3	3.50	119.27	207.8	
4	3287.3	29.18	119.27	3003.8	-567.4	1012.2	0.00	0.00	1160.4	
5	4121.2	0.00	0.00	3802.0	-669.0	1193.4	3.50	180.00	1368.2	23A-18-07-95 TGT
6	6657.2	0.00	0.00	6338.0	-669.0	1193.4	0.00	0.00	1368.2	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL: 39.438808213 -108.046375396
500.0	500.0	Start Build 3.50
1298.2	1333.8	Start 1953.5 hold at 1333.8 MD
1700.0	1794.0	Surface Casing
3003.8	3287.4	Start Drop -3.50
3802.0	4121.2	Start 2536.0 hold at 4121.2 MD
3802.0	4121.2	Back to Vertical
6338.0	6657.2	BHL: 39.4369715 -108.0421501
6338.0	6657.2	TD at 6657.2

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3031.0	3318.4	Williams Fork	0.00	
3802.0	4121.2	Top of Gas	0.00	
5420.0	5739.2	Cameo	0.00	
5838.0	6157.2	Rollins	0.00	

