



Ursa Operating Company, LLC

Rockies Region

BMC B

BMC B 23B-18-07-95

Wellbore #1

Plan: Design #1

Standard Planning Report

22 November, 2016



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BMC B 23B-18-07-95
Company:	Ursa Operating Company, LLC	TVD Reference:	BMC B 23B-18-07-95 @ 5117.0usft (Est KB)
Project:	Rockies Region	MD Reference:	BMC B 23B-18-07-95 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 23B-18-07-95	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Rockies Region		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	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 23B-18-07-95, SHL 39.438805907 -108.046481523					
Well Position	+N/-S	-22.3 usft	Northing:	1,594,793.85 usft	Latitude:	39.438805907
	+E/-W	5.6 usft	Easting:	2,280,891.95 usft	Longitude:	-108.046481523
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,117.0 usft	Ground Level:	5,100.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/18/2016	9.78	65.54	51,563

Design	Design #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	129.14

Plan Sections										
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	
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,655.8	36.95	129.14	1,584.1	-207.6	255.1	3.50	3.50	0.00	129.14	
3,192.2	36.95	129.14	2,811.9	-790.5	971.4	0.00	0.00	0.00	0.00	
4,248.0	0.00	0.00	3,796.0	-998.1	1,226.5	3.50	-3.50	0.00	180.00	23B-18-07-95 TGT
6,784.0	0.00	0.00	6,332.0	-998.1	1,226.5	0.00	0.00	0.00	0.00	

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BMC B 23B-18-07-95
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Project:	Rockies Region	MD Reference:	BMC B 23B-18-07-95 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 23B-18-07-95	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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
SHL: 39.438805907 -108.046481523									
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
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 3.50									
700.0	3.50	129.14	699.9	-1.9	2.4	3.1	3.50	3.50	0.00
800.0	7.00	129.14	799.5	-7.7	9.5	12.2	3.50	3.50	0.00
900.0	10.50	129.14	898.3	-17.3	21.3	27.4	3.50	3.50	0.00
1,000.0	14.00	129.14	996.0	-30.7	37.7	48.6	3.50	3.50	0.00
1,100.0	17.50	129.14	1,092.3	-47.8	58.8	75.8	3.50	3.50	0.00
1,200.0	21.00	129.14	1,186.7	-68.6	84.3	108.7	3.50	3.50	0.00
1,300.0	24.50	129.14	1,278.9	-93.0	114.3	147.4	3.50	3.50	0.00
1,400.0	28.00	129.14	1,368.5	-120.9	148.6	191.6	3.50	3.50	0.00
1,500.0	31.50	129.14	1,455.3	-152.3	187.1	241.2	3.50	3.50	0.00
1,600.0	35.00	129.14	1,539.0	-186.9	229.6	296.1	3.50	3.50	0.00
1,655.8	36.95	129.14	1,584.1	-207.5	255.0	328.8	3.50	3.50	0.00
Start 1536.4 hold at 1655.8 MD									
1,700.0	36.95	129.14	1,619.4	-224.3	275.7	355.4	0.00	0.00	0.00
1,800.0	36.95	129.14	1,699.3	-262.3	322.3	415.5	0.00	0.00	0.00
1,800.8	36.95	129.14	1,700.0	-262.6	322.7	416.0	0.00	0.00	0.00
Surface Casing									
1,900.0	36.95	129.14	1,779.3	-300.2	368.9	475.6	0.00	0.00	0.00
2,000.0	36.95	129.14	1,859.2	-338.2	415.5	535.8	0.00	0.00	0.00
2,100.0	36.95	129.14	1,939.1	-376.1	462.2	595.9	0.00	0.00	0.00
2,200.0	36.95	129.14	2,019.0	-414.0	508.8	656.0	0.00	0.00	0.00
2,300.0	36.95	129.14	2,098.9	-452.0	555.4	716.1	0.00	0.00	0.00
2,400.0	36.95	129.14	2,178.8	-489.9	602.1	776.2	0.00	0.00	0.00
2,500.0	36.95	129.14	2,258.7	-527.9	648.7	836.3	0.00	0.00	0.00
2,600.0	36.95	129.14	2,338.6	-565.8	695.3	896.5	0.00	0.00	0.00
2,700.0	36.95	129.14	2,418.6	-603.8	741.9	956.6	0.00	0.00	0.00
2,800.0	36.95	129.14	2,498.5	-641.7	788.6	1,016.7	0.00	0.00	0.00
2,900.0	36.95	129.14	2,578.4	-679.7	835.2	1,076.8	0.00	0.00	0.00
3,000.0	36.95	129.14	2,658.3	-717.6	881.8	1,136.9	0.00	0.00	0.00
3,100.0	36.95	129.14	2,738.2	-755.6	928.5	1,197.0	0.00	0.00	0.00
3,192.2	36.95	129.14	2,811.9	-790.5	971.5	1,252.5	0.00	0.00	0.00
Start Drop -3.50									
3,200.0	36.68	129.14	2,818.1	-793.5	975.1	1,257.1	3.51	-3.51	0.00
3,300.0	33.18	129.14	2,900.1	-829.6	1,019.5	1,314.4	3.50	-3.50	0.00
3,400.0	29.68	129.14	2,985.4	-862.5	1,059.9	1,366.5	3.50	-3.50	0.00
3,445.2	28.10	129.14	3,025.0	-876.3	1,076.9	1,388.4	3.50	-3.50	0.00
Williams Fork									
3,500.0	26.18	129.14	3,073.8	-892.1	1,096.2	1,413.4	3.50	-3.50	0.00
3,600.0	22.68	129.14	3,164.8	-918.2	1,128.3	1,454.7	3.50	-3.50	0.00
3,700.0	19.18	129.14	3,258.2	-940.7	1,156.0	1,490.4	3.50	-3.50	0.00
3,800.0	15.68	129.14	3,353.6	-959.6	1,179.3	1,520.4	3.50	-3.50	0.00
3,900.0	12.18	129.14	3,450.6	-974.8	1,197.9	1,544.4	3.50	-3.50	0.00
4,000.0	8.68	129.14	3,548.9	-986.3	1,212.0	1,562.5	3.50	-3.50	0.00
4,100.0	5.18	129.14	3,648.2	-993.9	1,221.3	1,574.6	3.50	-3.50	0.00

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Site:	BMC B	North Reference:	True
Well:	BMC B 23B-18-07-95	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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	1.68	129.14	3,748.0	-997.6	1,226.0	1,580.6	3.50	-3.50	0.00
4,248.0	0.00	0.00	3,796.0	-998.1	1,226.5	1,581.3	3.50	-3.50	0.00
Back to Vertical - Start 2536.0 hold at 4248.0 MD - Top of Gas - 23B-18-07-95 TGT									
4,300.0	0.00	0.00	3,848.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
4,400.0	0.00	0.00	3,948.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
4,500.0	0.00	0.00	4,048.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
4,600.0	0.00	0.00	4,148.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
4,700.0	0.00	0.00	4,248.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
4,800.0	0.00	0.00	4,348.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
4,900.0	0.00	0.00	4,448.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
5,000.0	0.00	0.00	4,548.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
5,100.0	0.00	0.00	4,648.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
5,200.0	0.00	0.00	4,748.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
5,300.0	0.00	0.00	4,848.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
5,400.0	0.00	0.00	4,948.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
5,500.0	0.00	0.00	5,048.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
5,600.0	0.00	0.00	5,148.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
5,700.0	0.00	0.00	5,248.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
5,800.0	0.00	0.00	5,348.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
5,866.0	0.00	0.00	5,414.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
Cameo									
5,900.0	0.00	0.00	5,448.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
6,000.0	0.00	0.00	5,548.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
6,100.0	0.00	0.00	5,648.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
6,200.0	0.00	0.00	5,748.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
6,284.0	0.00	0.00	5,832.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
Rollins									
6,300.0	0.00	0.00	5,848.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
6,400.0	0.00	0.00	5,948.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
6,500.0	0.00	0.00	6,048.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
6,600.0	0.00	0.00	6,148.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
6,700.0	0.00	0.00	6,248.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
6,784.0	0.00	0.00	6,332.0	-998.1	1,226.5	1,581.3	0.00	0.00	0.00
BHL: 39.4360657 -108.0421392 - TD at 6784.0									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
23B-18-07-95 TGT	0.00	0.00	3,796.0	-998.1	1,226.5	1,593,761.82	2,282,089.95	39.436065700	-108.042139200
- hit/miss target									
- Shape									
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,536.0)									

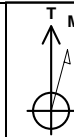
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Project:	Rockies Region	MD Reference:	BMC B 23B-18-07-95 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 23B-18-07-95	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,445.2	3,025.0	Williams Fork		0.00	
4,248.0	3,796.0	Top of Gas		0.00	
5,866.0	5,414.0	Cameo		0.00	
6,284.0	5,832.0	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: 39.438805907 -108.046481523
600.0	600.0	0.0	0.0	Start Build 3.50
1,655.8	1,584.1	-207.5	255.0	Start 1536.4 hold at 1655.8 MD
1,800.8	1,700.0	-262.6	322.7	Surface Casing
3,192.2	2,811.9	-790.5	971.5	Start Drop -3.50
4,248.0	3,796.0	-998.1	1,226.5	Back to Vertical
4,248.0	3,796.0	-998.1	1,226.5	Start 2536.0 hold at 4248.0 MD
6,784.0	6,332.0	-998.1	1,226.5	BHL: 39.4360657 -108.0421392
6,784.0	6,332.0	-998.1	1,226.5	TD at 6784.0



Well Name: BMC B 23B-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 2280891.95 39.438805907 -108.046481523
Est KB BMC B 23B-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 23B-18-07-95
Design #1
13:00, November 22 2016

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
23B-18-07-95 TGT	3796.0	-998.1	1226.5	1593761.83	2282089.95	39.436065700	-108.042139200	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	600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.0	
3	1655.8	36.95	129.14	1584.1	-207.6	255.1	3.50	129.14	328.8	
4	3192.2	36.95	129.14	2811.9	-790.5	971.4	0.00	0.00	1252.5	
5	4248.0	0.00	0.00	3796.0	-998.1	1226.5	3.50	180.00	1581.3	23B-18-07-95 TGT
6	6784.0	0.00	0.00	6332.0	-998.1	1226.5	0.00	0.00	1581.3	

ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL: 39.438805907 -108.046481523
600.0	600.0	Start Build 3.50
1584.1	1655.8	Start 1536.4 hold at 1655.8 MD
1700.0	1800.8	Surface Casing
2811.9	3192.2	Start Drop -3.50
3796.0	4248.0	Back to Vertical
3796.0	4248.0	Start 2536.0 hold at 4248.0 MD
6332.0	6784.0	BHL: 39.4360657 -108.0421392
6332.0	6784.0	TD at 6784.0

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3025.0	3445.2	Williams Fork	0.00	
3796.0	4248.0	Top of Gas	0.00	
5414.0	5866.0	Cameo	0.00	
5832.0	6284.0	Rollins	0.00	

