



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC B**

**BMC B 13A-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 13A-18-07-95
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC B 13A-18-07-95 @ 5117.0usft (PLAN KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 13A-18-07-95 @ 5117.0usft (PLAN KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 13A-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 13A-18-07-95, SHL LAT: 39.438806676 LONG: -108.046446147					
Well Position	+N/-S	-22.1 usft	Northing:	1,594,793.84 usft	Latitude:	39° 26' 19.704 N
	+E/-W	15.6 usft	Easting:	2,280,901.95 usft	Longitude:	108° 2' 47.206 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	191.68

<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	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
674.4	9.60	191.68	673.1	-22.5	-4.6	3.50	3.50	0.00	191.68	
3,555.6	9.60	191.68	3,513.9	-493.1	-101.9	0.00	0.00	0.00	0.00	
3,829.9	0.00	0.00	3,787.0	-515.6	-106.5	3.50	-3.50	0.00	180.00	13A-18-07-95 TGT
6,365.9	0.00	0.00	6,323.0	-515.6	-106.5	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 B 13A-18-07-95
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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 13A-18-07-95 @ 5117.0usft (PLAN KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 13A-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: 39.438806676 -108.046446147</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	
<b>Start Build 3.50</b>										
500.0	3.50	191.68	499.9	-3.0	-0.6	3.1	3.50	3.50	0.00	
600.0	7.00	191.68	599.5	-11.9	-2.5	12.2	3.50	3.50	0.00	
674.4	9.60	191.68	673.1	-22.5	-4.6	22.9	3.50	3.50	0.00	
<b>Start 2881.2 hold at 674.4 MD</b>										
700.0	9.60	191.68	698.4	-26.7	-5.5	27.2	0.00	0.00	0.00	
800.0	9.60	191.68	797.0	-43.0	-8.9	43.9	0.00	0.00	0.00	
900.0	9.60	191.68	895.6	-59.3	-12.3	60.6	0.00	0.00	0.00	
1,000.0	9.60	191.68	994.2	-75.7	-15.6	77.3	0.00	0.00	0.00	
1,100.0	9.60	191.68	1,092.8	-92.0	-19.0	93.9	0.00	0.00	0.00	
1,200.0	9.60	191.68	1,191.4	-108.3	-22.4	110.6	0.00	0.00	0.00	
1,300.0	9.60	191.68	1,290.0	-124.7	-25.8	127.3	0.00	0.00	0.00	
1,400.0	9.60	191.68	1,388.6	-141.0	-29.1	144.0	0.00	0.00	0.00	
1,500.0	9.60	191.68	1,487.1	-157.3	-32.5	160.7	0.00	0.00	0.00	
1,600.0	9.60	191.68	1,585.7	-173.7	-35.9	177.3	0.00	0.00	0.00	
1,700.0	9.60	191.68	1,684.3	-190.0	-39.3	194.0	0.00	0.00	0.00	
1,715.9	9.60	191.68	1,700.0	-192.6	-39.8	196.7	0.00	0.00	0.00	
<b>Surface Casing</b>										
1,800.0	9.60	191.68	1,782.9	-206.3	-42.6	210.7	0.00	0.00	0.00	
1,900.0	9.60	191.68	1,881.5	-222.7	-46.0	227.4	0.00	0.00	0.00	
2,000.0	9.60	191.68	1,980.1	-239.0	-49.4	244.1	0.00	0.00	0.00	
2,100.0	9.60	191.68	2,078.7	-255.4	-52.8	260.7	0.00	0.00	0.00	
2,200.0	9.60	191.68	2,177.3	-271.7	-56.1	277.4	0.00	0.00	0.00	
2,300.0	9.60	191.68	2,275.9	-288.0	-59.5	294.1	0.00	0.00	0.00	
2,400.0	9.60	191.68	2,374.5	-304.4	-62.9	310.8	0.00	0.00	0.00	
2,500.0	9.60	191.68	2,473.1	-320.7	-66.3	327.5	0.00	0.00	0.00	
2,600.0	9.60	191.68	2,571.7	-337.0	-69.6	344.2	0.00	0.00	0.00	
2,700.0	9.60	191.68	2,670.3	-353.4	-73.0	360.8	0.00	0.00	0.00	
2,800.0	9.60	191.68	2,768.9	-369.7	-76.4	377.5	0.00	0.00	0.00	
2,900.0	9.60	191.68	2,867.5	-386.0	-79.8	394.2	0.00	0.00	0.00	
3,000.0	9.60	191.68	2,966.1	-402.4	-83.2	410.9	0.00	0.00	0.00	
3,050.6	9.60	191.68	3,016.0	-410.6	-84.9	419.3	0.00	0.00	0.00	
<b>Williams Fork</b>										
3,100.0	9.60	191.68	3,064.7	-418.7	-86.5	427.6	0.00	0.00	0.00	
3,200.0	9.60	191.68	3,163.3	-435.0	-89.9	444.2	0.00	0.00	0.00	
3,300.0	9.60	191.68	3,261.9	-451.4	-93.3	460.9	0.00	0.00	0.00	
3,400.0	9.60	191.68	3,360.5	-467.7	-96.7	477.6	0.00	0.00	0.00	
3,500.0	9.60	191.68	3,459.1	-484.1	-100.0	494.3	0.00	0.00	0.00	
3,555.6	9.60	191.68	3,513.9	-493.1	-101.9	503.5	0.00	0.00	0.00	
<b>Start Drop -3.50</b>										
3,600.0	8.05	191.68	3,557.8	-499.8	-103.3	510.4	3.50	-3.50	0.00	
3,700.0	4.55	191.68	3,657.2	-510.5	-105.5	521.3	3.50	-3.50	0.00	
3,800.0	1.05	191.68	3,757.1	-515.3	-106.5	526.2	3.50	-3.50	0.00	
3,829.9	0.00	0.00	3,787.0	-515.6	-106.5	526.5	3.50	-3.50	0.00	
<b>Back to Vertical - Start 2536.0 hold at 3829.9 MD - Top of Gas</b>										

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC B 13A-18-07-95 @ 5117.0usft (PLAN KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 13A-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)
3,900.0	0.00	0.00	3,857.1	-515.6	-106.5	526.5	0.00	0.00	0.00
4,000.0	0.00	0.00	3,957.1	-515.6	-106.5	526.5	0.00	0.00	0.00
4,100.0	0.00	0.00	4,057.1	-515.6	-106.5	526.5	0.00	0.00	0.00
4,200.0	0.00	0.00	4,157.1	-515.6	-106.5	526.5	0.00	0.00	0.00
4,300.0	0.00	0.00	4,257.1	-515.6	-106.5	526.5	0.00	0.00	0.00
4,400.0	0.00	0.00	4,357.1	-515.6	-106.5	526.5	0.00	0.00	0.00
4,500.0	0.00	0.00	4,457.1	-515.6	-106.5	526.5	0.00	0.00	0.00
4,600.0	0.00	0.00	4,557.1	-515.6	-106.5	526.5	0.00	0.00	0.00
4,700.0	0.00	0.00	4,657.1	-515.6	-106.5	526.5	0.00	0.00	0.00
4,800.0	0.00	0.00	4,757.1	-515.6	-106.5	526.5	0.00	0.00	0.00
4,900.0	0.00	0.00	4,857.1	-515.6	-106.5	526.5	0.00	0.00	0.00
5,000.0	0.00	0.00	4,957.1	-515.6	-106.5	526.5	0.00	0.00	0.00
5,100.0	0.00	0.00	5,057.1	-515.6	-106.5	526.5	0.00	0.00	0.00
5,200.0	0.00	0.00	5,157.1	-515.6	-106.5	526.5	0.00	0.00	0.00
5,300.0	0.00	0.00	5,257.1	-515.6	-106.5	526.5	0.00	0.00	0.00
5,400.0	0.00	0.00	5,357.1	-515.6	-106.5	526.5	0.00	0.00	0.00
5,447.9	0.00	0.00	5,405.0	-515.6	-106.5	526.5	0.00	0.00	0.00
Cameo									
5,500.0	0.00	0.00	5,457.1	-515.6	-106.5	526.5	0.00	0.00	0.00
5,600.0	0.00	0.00	5,557.1	-515.6	-106.5	526.5	0.00	0.00	0.00
5,700.0	0.00	0.00	5,657.1	-515.6	-106.5	526.5	0.00	0.00	0.00
5,800.0	0.00	0.00	5,757.1	-515.6	-106.5	526.5	0.00	0.00	0.00
5,865.9	0.00	0.00	5,823.0	-515.6	-106.5	526.5	0.00	0.00	0.00
Rollins									
5,900.0	0.00	0.00	5,857.1	-515.6	-106.5	526.5	0.00	0.00	0.00
6,000.0	0.00	0.00	5,957.1	-515.6	-106.5	526.5	0.00	0.00	0.00
6,100.0	0.00	0.00	6,057.1	-515.6	-106.5	526.5	0.00	0.00	0.00
6,200.0	0.00	0.00	6,157.1	-515.6	-106.5	526.5	0.00	0.00	0.00
6,300.0	0.00	0.00	6,257.1	-515.6	-106.5	526.5	0.00	0.00	0.00
6,365.8	0.00	0.00	6,322.9	-515.6	-106.5	526.5	0.00	0.00	0.00
BHL: 39.4373911 -108.0468234									
6,365.9	0.00	0.00	6,323.0	-515.6	-106.5	526.5	0.00	0.00	0.00
TD at 6365.9									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
13A-18-07-95 TGT	0.00	0.00	3,787.0	-515.6	-106.5	1,594,281.43	2,280,780.99	39° 26' 14.608 N	108° 2' 48.564 W
- hit/miss target									
- Shape									
- 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 13A-18-07-95 @ 5117.0usft (PLAN KB)
<b>Site:</b>	BMC B	<b>North Reference:</b>	True
<b>Well:</b>	BMC B 13A-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 (°)
3,050.6	3,016.0	Williams Fork		0.00	
3,829.9	3,787.0	Top of Gas		0.00	
5,447.9	5,405.0	Cameo		0.00	
5,865.9	5,823.0	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: 39.438806676 -108.046446147
400.0	400.0	0.0	0.0	Start Build 3.50
674.4	673.1	-22.5	-4.6	Start 2881.2 hold at 674.4 MD
1,715.9	1,700.0	-192.6	-39.8	Surface Casing
3,555.6	3,513.9	-493.1	-101.9	Start Drop -3.50
3,829.9	3,787.0	-515.6	-106.5	Back to Vertical
3,829.9	3,787.0	-515.6	-106.5	Start 2536.0 hold at 3829.9 MD
6,365.8	6,322.9	-515.6	-106.5	BHL: 39.4373911 -108.0468234
6,365.9	6,323.0	-515.6	-106.5	TD at 6365.9



Well Name: BMC B 13A-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 2280901.95 39° 26' 19.704 N 108° 2' 47.206 W  
PLAN KB BMC B 13A-18-07-95 @ 5117.0usft (PLAN KB)



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

BMC B  
BMC B 13A-18-07-95  
Design #1  
12:17, October 28 2015

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
13A-18-07-95 TGT	3787.0	-515.6	-106.5	1594281.44	2280780.99	39° 26' 14.608 N	108° 2' 48.564 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	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	
3	674.4	9.60	191.68	673.1	-22.5	-4.6	3.50	191.68	22.9	
4	3555.6	9.60	191.68	3513.9	-493.1	-101.9	0.00	0.00	503.5	
5	3829.9	0.00	0.00	3787.0	-515.6	-106.5	3.50	180.00	526.5	13A-18-07-95 TGT
6	6365.9	0.00	0.00	6323.0	-515.6	-106.5	0.00	0.00	526.5	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL: 39.438806676 -108.046446147
400.0	400.0	Start Build 3.50
673.1	674.4	Start 2881.2 hold at 674.4 MD
1700.0	1715.9	Surface Casing
3513.9	3555.6	Start Drop -3.50
3787.0	3829.9	Back to Vertical
3787.0	3829.9	Start 2536.0 hold at 3829.9 MD
6322.9	6365.8	BHL: 39.4373911 -108.0468234
6323.0	6365.9	TD at 6365.9

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3016.0	3050.6	Williams Fork	0.00	
3787.0	3829.9	Top of Gas	0.00	
5405.0	5447.9	Cameo	0.00	
5823.0	5865.9	Rollins	0.00	

