



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC D**

**BMC D 32B-18-07-95**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**28 November, 2016**



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well BMC D 32B-18-07-95
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	BMC D 32B-18-07-95 @ 5285.0usft (Est KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 32B-18-07-95 @ 5285.0usft (Est KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 32B-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 D					
Site Position:		Northing:	1,595,755.80 usft	Latitude:	39.441572650	
From:	Lat/Long	Easting:	2,282,541.08 usft	Longitude:	-108.040739971	
Position Uncertainty:		0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.60 °

Well	BMC D 32B-18-07-95, SHL 39.441514953 -108.040706548					
Well Position	+N/-S	-21.0 usft	Northing:	1,595,734.53 usft	Latitude:	39.441514953
	+E/-W	9.4 usft	Easting:	2,282,549.93 usft	Longitude:	-108.040706548
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	5,268.0 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	11/23/2016	9.77	65.54	51,562

<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	117.82

<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	
911.8	17.91	117.82	903.5	-37.0	70.2	3.50	3.50	0.00	117.82	
3,708.3	17.91	117.82	3,564.5	-438.5	830.9	0.00	0.00	0.00	0.00	
4,220.2	0.00	0.00	4,068.0	-475.5	901.1	3.50	-3.50	0.00	180.00	32B-18-07-95 TGT
6,756.2	0.00	0.00	6,604.0	-475.5	901.1	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 D 32B-18-07-95
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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	BMC D 32B-18-07-95 @ 5285.0usft (Est KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 32B-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 39.441514953 -108.040706548</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	117.82	499.9	-1.4	2.7	3.1	3.50	3.50	0.00
600.0	7.00	117.82	599.5	-5.7	10.8	12.2	3.50	3.50	0.00
700.0	10.50	117.82	698.3	-12.8	24.2	27.4	3.50	3.50	0.00
800.0	14.00	117.82	796.0	-22.7	43.0	48.6	3.50	3.50	0.00
900.0	17.50	117.82	892.3	-35.4	67.0	75.8	3.50	3.50	0.00
911.8	17.91	117.82	903.5	-37.0	70.2	79.4	3.50	3.50	0.00
<b>Start 2796.5 hold at 911.8 MD</b>									
1,000.0	17.91	117.82	987.4	-49.7	94.2	106.5	0.00	0.00	0.00
1,100.0	17.91	117.82	1,082.6	-64.1	121.4	137.2	0.00	0.00	0.00
1,200.0	17.91	117.82	1,177.7	-78.4	148.6	168.0	0.00	0.00	0.00
1,300.0	17.91	117.82	1,272.9	-92.8	175.8	198.8	0.00	0.00	0.00
1,400.0	17.91	117.82	1,368.0	-107.1	203.0	229.5	0.00	0.00	0.00
1,500.0	17.91	117.82	1,463.2	-121.5	230.2	260.3	0.00	0.00	0.00
1,600.0	17.91	117.82	1,558.3	-135.8	257.4	291.0	0.00	0.00	0.00
1,700.0	17.91	117.82	1,653.5	-150.2	284.6	321.8	0.00	0.00	0.00
1,748.9	17.91	117.82	1,700.0	-157.2	297.9	336.8	0.00	0.00	0.00
<b>Surface Casing</b>									
1,800.0	17.91	117.82	1,748.6	-164.5	311.8	352.6	0.00	0.00	0.00
1,900.0	17.91	117.82	1,843.8	-178.9	339.0	383.3	0.00	0.00	0.00
2,000.0	17.91	117.82	1,938.9	-193.3	366.2	414.1	0.00	0.00	0.00
2,100.0	17.91	117.82	2,034.1	-207.6	393.4	444.8	0.00	0.00	0.00
2,200.0	17.91	117.82	2,129.3	-222.0	420.6	475.6	0.00	0.00	0.00
2,300.0	17.91	117.82	2,224.4	-236.3	447.8	506.3	0.00	0.00	0.00
2,400.0	17.91	117.82	2,319.6	-250.7	475.0	537.1	0.00	0.00	0.00
2,500.0	17.91	117.82	2,414.7	-265.0	502.2	567.9	0.00	0.00	0.00
2,600.0	17.91	117.82	2,509.9	-279.4	529.4	598.6	0.00	0.00	0.00
2,700.0	17.91	117.82	2,605.0	-293.7	556.6	629.4	0.00	0.00	0.00
2,800.0	17.91	117.82	2,700.2	-308.1	583.8	660.1	0.00	0.00	0.00
2,900.0	17.91	117.82	2,795.3	-322.5	611.0	690.9	0.00	0.00	0.00
3,000.0	17.91	117.82	2,890.5	-336.8	638.2	721.7	0.00	0.00	0.00
3,100.0	17.91	117.82	2,985.6	-351.2	665.4	752.4	0.00	0.00	0.00
3,200.0	17.91	117.82	3,080.8	-365.5	692.7	783.2	0.00	0.00	0.00
3,300.0	17.91	117.82	3,175.9	-379.9	719.9	813.9	0.00	0.00	0.00
3,400.0	17.91	117.82	3,271.1	-394.2	747.1	844.7	0.00	0.00	0.00
3,427.2	17.91	117.82	3,297.0	-398.1	754.5	853.1	0.00	0.00	0.00
<b>Williams Fork</b>									
3,500.0	17.91	117.82	3,366.2	-408.6	774.3	875.5	0.00	0.00	0.00
3,600.0	17.91	117.82	3,461.4	-422.9	801.5	906.2	0.00	0.00	0.00
3,708.3	17.91	117.82	3,564.5	-438.5	830.9	939.5	0.00	0.00	0.00
<b>Start Drop -3.50</b>									
3,800.0	14.71	117.82	3,652.4	-450.5	853.7	965.3	3.50	-3.50	0.00
3,900.0	11.21	117.82	3,749.9	-461.0	873.5	987.7	3.50	-3.50	0.00
4,000.0	7.71	117.82	3,848.5	-468.6	888.1	1,004.1	3.50	-3.50	0.00
4,100.0	4.21	117.82	3,947.9	-473.5	897.2	1,014.5	3.50	-3.50	0.00
4,200.0	0.71	117.82	4,047.8	-475.5	901.0	1,018.8	3.50	-3.50	0.00

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<b>Well:</b>	BMC D 32B-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)
4,220.2	0.00	0.00	4,068.0	-475.5	901.1	1,018.9	3.50	-3.50	-584.04
Back to Vertical - Start 2536.0 hold at 4220.2 MD - Top of Gas - 32B-18-07-95 TGT									
4,300.0	0.00	0.00	4,147.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
4,400.0	0.00	0.00	4,247.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
4,500.0	0.00	0.00	4,347.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
4,600.0	0.00	0.00	4,447.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
4,700.0	0.00	0.00	4,547.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
4,800.0	0.00	0.00	4,647.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
4,900.0	0.00	0.00	4,747.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
5,000.0	0.00	0.00	4,847.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
5,100.0	0.00	0.00	4,947.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
5,200.0	0.00	0.00	5,047.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
5,300.0	0.00	0.00	5,147.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
5,400.0	0.00	0.00	5,247.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
5,500.0	0.00	0.00	5,347.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
5,600.0	0.00	0.00	5,447.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
5,700.0	0.00	0.00	5,547.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
5,800.0	0.00	0.00	5,647.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
5,838.2	0.00	0.00	5,686.0	-475.5	901.1	1,018.9	0.00	0.00	0.00
Cameo									
5,900.0	0.00	0.00	5,747.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
6,000.0	0.00	0.00	5,847.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
6,100.0	0.00	0.00	5,947.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
6,200.0	0.00	0.00	6,047.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
6,256.2	0.00	0.00	6,104.0	-475.5	901.1	1,018.9	0.00	0.00	0.00
Rollins									
6,300.0	0.00	0.00	6,147.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
6,400.0	0.00	0.00	6,247.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
6,500.0	0.00	0.00	6,347.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
6,600.0	0.00	0.00	6,447.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
6,700.0	0.00	0.00	6,547.8	-475.5	901.1	1,018.9	0.00	0.00	0.00
6,756.2	0.00	0.00	6,604.0	-475.5	901.1	1,018.9	0.00	0.00	0.00
TD at 6756.2 - BHL 39.4402094 -108.0375160									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
32B-18-07-95 TGT	0.00	0.00	4,068.0	-475.5	901.1	1,595,234.01	2,283,437.37	39.440209400	-108.037516000
- 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 D 32B-18-07-95 @ 5285.0usft (Est KB)
<b>Site:</b>	BMC D	<b>North Reference:</b>	True
<b>Well:</b>	BMC D 32B-18-07-95	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

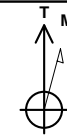
Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,427.2	3,297.0	Williams Fork		0.00	
4,220.2	4,068.0	Top of Gas		0.00	
5,838.2	5,686.0	Cameo		0.00	
6,256.2	6,104.0	Rollins		0.00	

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 39.441514953 -108.040706548
400.0	400.0	0.0	0.0	Start Build 3.50
911.8	903.5	-37.0	70.2	Start 2796.5 hold at 911.8 MD
1,748.9	1,700.0	-157.2	297.9	Surface Casing
3,708.3	3,564.5	-438.5	830.9	Start Drop -3.50
4,220.2	4,068.0	-475.5	901.1	Back to Vertical
4,220.2	4,068.0	-475.5	901.1	Start 2536.0 hold at 4220.2 MD
6,756.2	6,604.0	-475.5	901.1	TD at 6756.2
6,756.2	6,604.0	-475.5	901.1	BHL 39.4402094 -108.0375160



Well Name: BMC D 32B-18-07-95  
Surface Location: BMC D  
North American Datum 1983, US State Plane 1983, Colorado Central Zone  
Ground Elevation: 5268.0  
+N/-S +E/-W Northing Easting Latitude Longitude  
0.0 0.0 1595734.53 2282549.93 39.441514953 -108.040706548  
Est KB BMC D 32B-18-07-95 @ 5285.0usft (Est KB)

Slot



Azimuths to True North  
Magnetic North: 9.77°  
Magnetic Field  
Strength: 51562.2snT  
Dip Angle: 65.54°  
Date: 11/23/2016  
Model: IGRF2015

BMC D  
BMC D 32B-18-07-95  
Design #1  
15:25, November 28 2016

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
32B-18-07-95 TGT	4068.0	-475.5	901.1	1595234.01	2283437.37	39.440209400	-108.037516000	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	911.8	17.91	117.82	903.5	-37.0	70.2	3.50	117.82	79.4	
4	3708.3	17.91	117.82	3564.5	-438.5	830.9	0.00	0.00	939.5	
5	4220.2	0.00	0.00	4068.0	-475.5	901.1	3.50	180.00	1018.9	32B-18-07-95 TGT
6	6756.2	0.00	0.00	6604.0	-475.5	901.1	0.00	0.00	1018.9	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL 39.441514953 -108.040706548
400.0	400.0	Start Build 3.50
903.5	911.8	Start 2796.5 hold at 911.8 MD
1700.0	1748.9	Surface Casing
3564.5	3708.3	Start Drop -3.50
4068.0	4220.2	Back to Vertical
4068.0	4220.2	Start 2536.0 hold at 4220.2 MD
6604.0	6756.2	TD at 6756.2
6604.0	6756.2	BHL 39.4402094 -108.0375160

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3297.0	3427.2	Williams Fork	0.00	
4068.0	4220.2	Top of Gas	0.00	
5686.0	5838.2	Cameo	0.00	
6104.0	6256.2	Rollins	0.00	

