



Ursa Operating Company, LLC

Rockies Region

BMC D

BMC D 41B-18-07-95

Wellbore #1

Plan: Design #1

Standard Planning Report

28 November, 2016



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BMC D 41B-18-07-95
Company:	Ursa Operating Company, LLC	TVD Reference:	BMC D 41B-18-07-95 @ 5285.0usft (Est KB)
Project:	Rockies Region	MD Reference:	BMC D 41B-18-07-95 @ 5285.0usft (Est KB)
Site:	BMC D	North Reference:	True
Well:	BMC D 41B-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 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 41B-18-07-95, SHL 39.441539837 -108.040796710					
Well Position	+N/-S	-11.9 usft	Northing:	1,595,744.30 usft	Latitude:	39.441539837
	+E/-W	-16.0 usft	Easting:	2,282,524.73 usft	Longitude:	-108.040796710
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	5,268.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/23/2016	9.77	65.54	51,562

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	72.75

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	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,298.6	34.95	72.75	1,237.8	87.6	282.0	3.50	3.50	0.00	72.75	
4,378.5	34.95	72.75	3,762.2	610.7	1,967.1	0.00	0.00	0.00	0.00	
5,377.1	0.00	0.00	4,700.0	698.3	2,249.1	3.50	-3.50	0.00	180.00	
7,353.1	0.00	0.00	6,676.0	698.3	2,249.1	0.00	0.00	0.00	0.00	

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BMC D 41B-18-07-95
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Project:	Rockies Region	MD Reference:	BMC D 41B-18-07-95 @ 5285.0usft (Est KB)
Site:	BMC D	North Reference:	True
Well:	BMC D 41B-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 39.441539837 -108.040796710									
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
Start Build 3.50									
400.0	3.50	72.75	399.9	0.9	2.9	3.1	3.50	3.50	0.00
500.0	7.00	72.75	499.5	3.6	11.7	12.2	3.50	3.50	0.00
600.0	10.50	72.75	598.3	8.1	26.2	27.4	3.50	3.50	0.00
700.0	14.00	72.75	696.0	14.4	46.4	48.6	3.50	3.50	0.00
800.0	17.50	72.75	792.3	22.5	72.4	75.8	3.50	3.50	0.00
900.0	21.00	72.75	886.7	32.2	103.8	108.7	3.50	3.50	0.00
1,000.0	24.50	72.75	978.9	43.7	140.8	147.4	3.50	3.50	0.00
1,100.0	28.00	72.75	1,068.5	56.8	183.0	191.6	3.50	3.50	0.00
1,200.0	31.50	72.75	1,155.3	71.5	230.4	241.2	3.50	3.50	0.00
1,298.6	34.95	72.75	1,237.8	87.6	282.0	295.3	3.50	3.50	0.00
Start 3079.8 hold at 1298.6 MD									
1,300.0	34.95	72.75	1,239.0	87.8	282.7	296.1	0.00	0.00	0.00
1,400.0	34.95	72.75	1,320.9	104.8	337.5	353.3	0.00	0.00	0.00
1,500.0	34.95	72.75	1,402.9	121.8	392.2	410.6	0.00	0.00	0.00
1,600.0	34.95	72.75	1,484.8	138.7	446.9	467.9	0.00	0.00	0.00
1,700.0	34.95	72.75	1,566.8	155.7	501.6	525.2	0.00	0.00	0.00
1,800.0	34.95	72.75	1,648.8	172.7	556.3	582.5	0.00	0.00	0.00
1,862.5	34.95	72.75	1,700.0	183.3	590.5	618.3	0.00	0.00	0.00
Surface Casing									
1,900.0	34.95	72.75	1,730.7	189.7	611.0	639.8	0.00	0.00	0.00
2,000.0	34.95	72.75	1,812.7	206.7	665.7	697.1	0.00	0.00	0.00
2,100.0	34.95	72.75	1,894.7	223.7	720.4	754.4	0.00	0.00	0.00
2,200.0	34.95	72.75	1,976.6	240.7	775.2	811.7	0.00	0.00	0.00
2,300.0	34.95	72.75	2,058.6	257.7	829.9	868.9	0.00	0.00	0.00
2,400.0	34.95	72.75	2,140.5	274.6	884.6	926.2	0.00	0.00	0.00
2,500.0	34.95	72.75	2,222.5	291.6	939.3	983.5	0.00	0.00	0.00
2,600.0	34.95	72.75	2,304.5	308.6	994.0	1,040.8	0.00	0.00	0.00
2,700.0	34.95	72.75	2,386.4	325.6	1,048.7	1,098.1	0.00	0.00	0.00
2,800.0	34.95	72.75	2,468.4	342.6	1,103.4	1,155.4	0.00	0.00	0.00
2,900.0	34.95	72.75	2,550.4	359.6	1,158.1	1,212.7	0.00	0.00	0.00
3,000.0	34.95	72.75	2,632.3	376.6	1,212.9	1,270.0	0.00	0.00	0.00
3,100.0	34.95	72.75	2,714.3	393.6	1,267.6	1,327.3	0.00	0.00	0.00
3,200.0	34.95	72.75	2,796.3	410.5	1,322.3	1,384.6	0.00	0.00	0.00
3,300.0	34.95	72.75	2,878.2	427.5	1,377.0	1,441.8	0.00	0.00	0.00
3,400.0	34.95	72.75	2,960.2	444.5	1,431.7	1,499.1	0.00	0.00	0.00
3,500.0	34.95	72.75	3,042.1	461.5	1,486.4	1,556.4	0.00	0.00	0.00
3,600.0	34.95	72.75	3,124.1	478.5	1,541.1	1,613.7	0.00	0.00	0.00
3,700.0	34.95	72.75	3,206.1	495.5	1,595.9	1,671.0	0.00	0.00	0.00
3,800.0	34.95	72.75	3,288.0	512.5	1,650.6	1,728.3	0.00	0.00	0.00
3,898.8	34.95	72.75	3,369.0	529.2	1,704.6	1,784.9	0.00	0.00	0.00
Williams Fork									
3,900.0	34.95	72.75	3,370.0	529.5	1,705.3	1,785.6	0.00	0.00	0.00
4,000.0	34.95	72.75	3,452.0	546.4	1,760.0	1,842.9	0.00	0.00	0.00
4,100.0	34.95	72.75	3,533.9	563.4	1,814.7	1,900.2	0.00	0.00	0.00
4,200.0	34.95	72.75	3,615.9	580.4	1,869.4	1,957.5	0.00	0.00	0.00
4,300.0	34.95	72.75	3,697.8	597.4	1,924.1	2,014.7	0.00	0.00	0.00
4,378.5	34.95	72.75	3,762.2	610.7	1,967.1	2,059.7	0.00	0.00	0.00

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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)
Start Drop -3.50									
4,400.0	34.20	72.75	3,779.9	614.4	1,978.7	2,071.9	3.50	-3.50	0.00
4,500.0	30.70	72.75	3,864.3	630.3	2,030.0	2,125.6	3.50	-3.50	0.00
4,600.0	27.20	72.75	3,951.8	644.6	2,076.2	2,174.0	3.50	-3.50	0.00
4,700.0	23.70	72.75	4,042.0	657.3	2,117.2	2,216.9	3.50	-3.50	0.00
4,800.0	20.20	72.75	4,134.8	668.4	2,152.9	2,254.3	3.50	-3.50	0.00
4,805.6	20.00	72.75	4,140.0	669.0	2,154.7	2,256.2	3.50	-3.50	0.00
Top of Gas									
4,836.7	18.92	72.75	4,169.3	672.1	2,164.6	2,266.6	3.50	-3.50	0.00
41B-18-07-95 TGT									
4,900.0	16.70	72.75	4,229.6	677.8	2,183.1	2,285.9	3.50	-3.50	0.00
5,000.0	13.20	72.75	4,326.2	685.5	2,207.8	2,311.7	3.50	-3.50	0.00
5,100.0	9.70	72.75	4,424.2	691.3	2,226.7	2,331.6	3.50	-3.50	0.00
5,200.0	6.20	72.75	4,523.2	695.4	2,239.9	2,345.4	3.50	-3.50	0.00
5,300.0	2.70	72.75	4,622.9	697.7	2,247.3	2,353.2	3.50	-3.50	0.00
5,377.1	0.00	0.00	4,700.0	698.3	2,249.1	2,355.0	3.50	-3.50	0.00
Back to Vertical - Start 1976.0 hold at 5377.1 MD									
5,400.0	0.00	0.00	4,722.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
5,500.0	0.00	0.00	4,822.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
5,600.0	0.00	0.00	4,922.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,022.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,122.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,222.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
6,000.0	0.00	0.00	5,322.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
6,100.0	0.00	0.00	5,422.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
6,200.0	0.00	0.00	5,522.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
6,300.0	0.00	0.00	5,622.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
6,400.0	0.00	0.00	5,722.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
6,435.1	0.00	0.00	5,758.0	698.3	2,249.1	2,355.0	0.00	0.00	0.00
Cameo									
6,500.0	0.00	0.00	5,822.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
6,600.0	0.00	0.00	5,922.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,022.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,122.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
6,853.1	0.00	0.00	6,176.0	698.3	2,249.1	2,355.0	0.00	0.00	0.00
Rollins									
6,900.0	0.00	0.00	6,222.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
7,000.0	0.00	0.00	6,322.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
7,100.0	0.00	0.00	6,422.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
7,200.0	0.00	0.00	6,522.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
7,300.0	0.00	0.00	6,622.9	698.3	2,249.1	2,355.0	0.00	0.00	0.00
7,353.1	0.00	0.00	6,676.0	698.3	2,249.1	2,355.0	0.00	0.00	0.00
TD at 7353.1 - BHL 39.4434566 -108.0328333									

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Project:	Rockies Region	MD Reference:	BMC D 41B-18-07-95 @ 5285.0usft (Est KB)
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Well:	BMC D 41B-18-07-95	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
41B-18-07-95 TGT	0.00	0.00	4,140.0	698.3	2,249.1	1,596,379.39	2,284,792.33	39.443456600	-108.032833300
- plan misses target center by 93.1usft at 4836.7usft MD (4169.3 TVD, 672.1 N, 2164.6 E)									
- Rectangle (sides W100.0 H40.0 D2,536.0)									

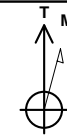
Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
3,898.8	3,369.0	Williams Fork		0.00		
4,805.6	4,140.0	Top of Gas		0.00		
6,435.1	5,758.0	Cameo		0.00		
6,853.1	6,176.0	Rollins		0.00		

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
0.1	0.1	0.0	0.0	SHL 39.441539837 -108.040796710
300.0	300.0	0.0	0.0	Start Build 3.50
1,298.6	1,237.8	87.6	282.0	Start 3079.8 hold at 1298.6 MD
1,862.5	1,700.0	183.3	590.5	Surface Casing
4,378.5	3,762.2	610.7	1,967.1	Start Drop -3.50
5,377.1	4,700.0	698.3	2,249.1	Back to Vertical
5,377.1	4,700.0	698.3	2,249.1	Start 1976.0 hold at 5377.1 MD
7,353.1	6,676.0	698.3	2,249.1	TD at 7353.1
7,353.1	6,676.0	698.3	2,249.1	BHL 39.4434566 -108.0328333



Well Name: BMC D 41B-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 1595744.31 2282524.73 39.441539837 -108.040796710
Est KB BMC D 41B-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 41B-18-07-95
Design #1
16:44, November 28 2016

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
41B-18-07-95 TGT	4140.0	698.3	2249.1	1596379.39	2284792.33	39.443456600	-108.032833300	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	1298.6	34.95	72.75	1237.8	87.6	282.0	3.50	72.75	295.3	
4	4378.5	34.95	72.75	3762.2	610.7	1967.1	0.00	0.00	2059.7	
5	5377.1	0.00	0.00	4700.0	698.3	2249.1	3.50	180.00	2355.0	
6	7353.1	0.00	0.00	6676.0	698.3	2249.1	0.00	0.00	2355.0	

ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL 39.441539837 -108.040796710
300.0	300.0	Start Build 3.50
1237.8	1298.6	Start 3079.8 hold at 1298.6 MD
1700.0	1862.5	Surface Casing
3762.2	4378.5	Start Drop -3.50
4700.0	5377.1	Back to Vertical
4700.0	5377.1	Start 1976.0 hold at 5377.1 MD
6676.0	7353.1	TD at 7353.1
6676.0	7353.1	BHL 39.4434566 -108.0328333

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3369.0	3898.8	Williams Fork	0.00	
4140.0	4805.6	Top of Gas	0.00	
5758.0	6435.1	Cameo	0.00	
6176.0	6853.1	Rollins	0.00	

