



Ursa Operating Company, LLC

Rockies Region

BMC B

BMC B 43A-13-07-96

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 43A-13-07-96
Company:	Ursa Operating Company, LLC	TVD Reference:	BMC B 43A-13-07-96 @ 5117.0usft (Est KB)
Project:	Rockies Region	MD Reference:	BMC B 43A-13-07-96 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 43A-13-07-96	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 43A-13-07-96, SHL 39.438806676 -108.046446147					
Well Position	+N/-S	-22.1 usft	Northing:	1,594,793.85 usft	Latitude:	39.438806676
	+E/-W	15.6 usft	Easting:	2,280,901.95 usft	Longitude:	-108.046446147
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	243.53

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	
700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,783.1	37.91	243.53	1,705.8	-154.0	-309.2	3.50	3.50	0.00	243.53	
3,104.3	37.91	243.53	2,748.2	-515.8	-1,035.8	0.00	0.00	0.00	0.00	
4,187.4	0.00	0.00	3,754.0	-669.8	-1,345.0	3.50	-3.50	0.00	180.00	43A-13-07-96 TGT
6,723.4	0.00	0.00	6,290.0	-669.8	-1,345.0	0.00	0.00	0.00	0.00	

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well BMC B 43A-13-07-96
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Project:	Rockies Region	MD Reference:	BMC B 43A-13-07-96 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 43A-13-07-96	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 39.438806676 -108.046446147									
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
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 3.50									
800.0	3.50	243.53	799.9	-1.4	-2.7	3.1	3.50	3.50	0.00
900.0	7.00	243.53	899.5	-5.4	-10.9	12.2	3.50	3.50	0.00
1,000.0	10.50	243.53	998.3	-12.2	-24.5	27.4	3.50	3.50	0.00
1,100.0	14.00	243.53	1,096.0	-21.7	-43.5	48.6	3.50	3.50	0.00
1,200.0	17.50	243.53	1,192.3	-33.8	-67.8	75.8	3.50	3.50	0.00
1,300.0	21.00	243.53	1,286.7	-48.5	-97.3	108.7	3.50	3.50	0.00
1,400.0	24.50	243.53	1,378.9	-65.7	-131.9	147.4	3.50	3.50	0.00
1,500.0	28.00	243.53	1,468.5	-85.4	-171.5	191.6	3.50	3.50	0.00
1,600.0	31.50	243.53	1,555.3	-107.5	-215.9	241.2	3.50	3.50	0.00
1,700.0	35.00	243.53	1,639.0	-132.0	-265.0	296.1	3.50	3.50	0.00
1,775.8	37.65	243.53	1,700.0	-152.0	-305.2	340.9	3.50	3.50	0.00
Surface Casing									
1,783.1	37.91	243.53	1,705.8	-154.0	-309.2	345.4	3.49	3.49	0.00
Start 1321.2 hold at 1783.1 MD									
1,800.0	37.91	243.53	1,719.1	-158.6	-318.5	355.8	0.00	0.00	0.00
1,900.0	37.91	243.53	1,798.0	-186.0	-373.5	417.2	0.00	0.00	0.00
2,000.0	37.91	243.53	1,876.9	-213.4	-428.5	478.7	0.00	0.00	0.00
2,100.0	37.91	243.53	1,955.8	-240.8	-483.5	540.1	0.00	0.00	0.00
2,200.0	37.91	243.53	2,034.7	-268.2	-538.5	601.6	0.00	0.00	0.00
2,300.0	37.91	243.53	2,113.6	-295.5	-593.5	663.0	0.00	0.00	0.00
2,400.0	37.91	243.53	2,192.5	-322.9	-648.5	724.4	0.00	0.00	0.00
2,500.0	37.91	243.53	2,271.4	-350.3	-703.5	785.9	0.00	0.00	0.00
2,600.0	37.91	243.53	2,350.3	-377.7	-758.5	847.3	0.00	0.00	0.00
2,700.0	37.91	243.53	2,429.2	-405.1	-813.5	908.8	0.00	0.00	0.00
2,800.0	37.91	243.53	2,508.1	-432.5	-868.5	970.2	0.00	0.00	0.00
2,900.0	37.91	243.53	2,587.0	-459.9	-923.5	1,031.6	0.00	0.00	0.00
3,000.0	37.91	243.53	2,665.9	-487.3	-978.5	1,093.1	0.00	0.00	0.00
3,104.3	37.91	243.53	2,748.2	-515.8	-1,035.8	1,157.2	0.00	0.00	0.00
Start Drop -3.50									
3,200.0	34.56	243.53	2,825.4	-541.0	-1,086.5	1,213.7	3.50	-3.50	0.00
3,300.0	31.06	243.53	2,909.4	-565.2	-1,135.0	1,267.9	3.50	-3.50	0.00
3,384.6	28.10	243.53	2,983.0	-583.8	-1,172.3	1,309.7	3.50	-3.50	0.00
Williams Fork									
3,400.0	27.56	243.53	2,996.6	-587.0	-1,178.8	1,316.8	3.50	-3.50	0.00
3,500.0	24.06	243.53	3,086.6	-606.4	-1,217.7	1,360.4	3.50	-3.50	0.00
3,600.0	20.56	243.53	3,179.1	-623.3	-1,251.7	1,398.3	3.50	-3.50	0.00
3,700.0	17.06	243.53	3,273.8	-637.7	-1,280.6	1,430.6	3.50	-3.50	0.00
3,800.0	13.56	243.53	3,370.2	-649.5	-1,304.2	1,457.0	3.50	-3.50	0.00
3,900.0	10.06	243.53	3,468.1	-658.6	-1,322.5	1,477.4	3.50	-3.50	0.00
4,000.0	6.56	243.53	3,567.0	-665.0	-1,335.5	1,491.9	3.50	-3.50	0.00
4,100.0	3.06	243.53	3,666.6	-668.8	-1,343.0	1,500.3	3.50	-3.50	0.00
4,187.4	0.00	0.00	3,754.0	-669.8	-1,345.0	1,502.6	3.50	-3.50	0.00

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Site:	BMC B	North Reference:	True
Well:	BMC B 43A-13-07-96	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)
Start 2536.0 hold at 4187.4 MD - Back to Vertical - Top of Gas - 43A-13-07-96 TGT									
4,200.0	0.00	0.00	3,766.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
4,300.0	0.00	0.00	3,866.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
4,400.0	0.00	0.00	3,966.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
4,500.0	0.00	0.00	4,066.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
4,600.0	0.00	0.00	4,166.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
4,700.0	0.00	0.00	4,266.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
4,800.0	0.00	0.00	4,366.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
4,900.0	0.00	0.00	4,466.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
5,000.0	0.00	0.00	4,566.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
5,100.0	0.00	0.00	4,666.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
5,200.0	0.00	0.00	4,766.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
5,300.0	0.00	0.00	4,866.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
5,400.0	0.00	0.00	4,966.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
5,500.0	0.00	0.00	5,066.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
5,600.0	0.00	0.00	5,166.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
5,700.0	0.00	0.00	5,266.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
5,800.0	0.00	0.00	5,366.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
5,805.4	0.00	0.00	5,372.0	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
Cameo									
5,900.0	0.00	0.00	5,466.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,566.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
6,100.0	0.00	0.00	5,666.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
6,200.0	0.00	0.00	5,766.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
6,223.4	0.00	0.00	5,790.0	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
Rollins									
6,300.0	0.00	0.00	5,866.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
6,400.0	0.00	0.00	5,966.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
6,500.0	0.00	0.00	6,066.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,166.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
6,700.0	0.00	0.00	6,266.6	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
6,723.4	0.00	0.00	6,290.0	-669.8	-1,345.0	1,502.6	0.00	0.00	0.00
BHL 39.4369677 -108.0512082 - TD at 6723.4									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
43A-13-07-96 TGT	0.00	0.00	3,754.0	-669.8	-1,345.0	1,594,162.03	2,279,538.72	39.436967700	-108.051208200
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,536.0)									

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Project:	Rockies Region	MD Reference:	BMC B 43A-13-07-96 @ 5117.0usft (Est KB)
Site:	BMC B	North Reference:	True
Well:	BMC B 43A-13-07-96	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

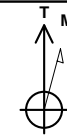
Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,384.6	2,983.0	Williams Fork		0.00	
4,187.4	3,754.0	Top of Gas		0.00	
5,805.4	5,372.0	Cameo		0.00	
6,223.4	5,790.0	Rollins		0.00	

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
700.0	700.0	0.0	0.0	Start Build 3.50
1,775.8	1,700.0	-152.0	-305.2	Surface Casing
1,783.1	1,705.8	-154.0	-309.2	Start 1321.2 hold at 1783.1 MD
3,104.3	2,748.2	-515.8	-1,035.8	Start Drop -3.50
4,187.4	3,754.0	-669.8	-1,345.0	Start 2536.0 hold at 4187.4 MD
4,187.4	3,754.0	-669.8	-1,345.0	Back to Vertical
6,723.4	6,290.0	-669.8	-1,345.0	BHL 39.4369677 -108.0512082
6,723.4	6,290.0	-669.8	-1,345.0	TD at 6723.4



Well Name: BMC B 43A-13-07-96
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 2280901.95 39.438806676 -108.046446147
Est KB BMC B 43A-13-07-96 @ 5117.0usft (Est KB)

Slot



Azinuths 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 43A-13-07-96
Design #1
15:32, November 22 2016

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
43A-13-07-96 TGT	3754.0	-669.8	-1345.0	1594162.03	2279538.72	39.436967700	-108.051208200	Rectangle (Sides: L40.0 W100.0)

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.0	
3	1783.1	37.91	243.53	1705.8	-154.0	-309.2	3.50	243.53	345.4	
4	3104.3	37.91	243.53	2748.2	-515.8	-1035.8	0.00	0.00	1157.2	
5	4187.4	0.00	0.00	3754.0	-669.8	-1345.0	3.50	180.00	1502.6	43A-13-07-96 TGT
6	6723.4	0.00	0.00	6290.0	-669.8	-1345.0	0.00	0.00	1502.6	

ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL 39.438806676 -108.046446147
700.0	700.0	Start Build 3.50
1700.0	1775.8	Surface Casing
1705.8	1783.1	Start 1321.2 hold at 1783.1 MD
2748.2	3104.3	Start Drop -3.50
3754.0	4187.4	Start 2536.0 hold at 4187.4 MD
3754.0	4187.4	Back to Vertical
6290.0	6723.4	BHL 39.4369677 -108.0512082
6290.0	6723.4	TD at 6723.4

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
2983.0	3384.6	Williams Fork	0.00	
3754.0	4187.4	Top of Gas	0.00	
5372.0	5805.4	Cameo	0.00	
5790.0	6223.4	Rollins	0.00	

