



Ursa Operating Company, LLC

Rockies Region

BMC B

BMC B 23C-18-07-95

Wellbore #1

Design: Actual

End of Well Report

20 June, 2017



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

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:		1,594,816.34 usft	
From:	Lat/Long	Easting:		2,280,886.96 usft	
Position Uncertainty:		Slot Radius:		13-3/16 "	
				Latitude: 39.438867241	
				Longitude: -108.046501442	
				Grid Convergence: -1.61 °	

Well		BMC B 23C-18-07-95, SHL: Lat 39.438803600 Long -108.046587650				
Well Position	+N/-S	0.0 usft	Northing:	1,594,793.85 usft	Latitude:	39.438803600
	+E/-W	0.0 usft	Easting:	2,280,861.97 usft	Longitude:	-108.046587650
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	6/20/2017	9.72	65.53	51,498

Design		Actual			
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)		+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0		0.0	0.0	136.77

Survey Program		Date	6/20/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
138.0	6,528.0	Surface (Wellbore #1)	MWD	MWD - Standard	

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 5000.1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
138.0	0.47	99.24	138.0	0.4	-0.1	0.6	0.34	0.34	0.00	
168.0	0.26	90.90	168.0	0.6	-0.1	0.7	0.72	-0.70	-27.80	
199.0	0.88	341.43	199.0	0.4	0.1	0.7	3.22	2.00	-353.13	
228.0	1.63	316.91	228.0	-0.2	0.6	0.4	3.12	2.59	-84.55	
259.0	1.93	322.97	259.0	-1.1	1.4	-0.2	1.14	0.97	19.55	
289.0	1.36	298.49	289.0	-2.0	1.9	-0.8	2.98	-1.90	-81.60	
320.0	1.54	269.62	320.0	-2.6	2.1	-1.6	2.40	0.58	-93.13	
350.0	2.15	225.59	349.9	-2.9	1.7	-2.4	4.98	2.03	-146.77	
380.0	2.81	216.84	379.9	-2.7	0.7	-3.2	2.53	2.20	-29.17	
411.0	3.03	209.55	410.9	-2.4	-0.6	-4.1	1.39	0.71	-23.52	
442.0	3.03	180.59	441.8	-1.5	-2.1	-4.5	4.89	0.00	-93.42	
472.0	3.60	175.32	471.8	-0.2	-3.9	-4.4	2.15	1.90	-17.57	
503.0	4.22	171.67	502.7	1.5	-6.0	-4.2	2.15	2.00	-11.77	
533.0	5.51	165.62	532.6	3.6	-8.4	-3.7	4.62	4.30	-20.17	
564.0	6.91	161.09	563.4	6.6	-11.6	-2.7	4.78	4.52	-14.61	
594.0	8.00	158.79	593.2	10.2	-15.3	-1.4	3.77	3.63	-7.67	
625.0	8.83	157.87	623.8	14.4	-19.5	0.3	2.71	2.68	-2.97	
655.0	10.15	151.76	653.4	19.1	-24.0	2.4	5.53	4.40	-20.37	
686.0	10.90	148.95	683.9	24.6	-28.9	5.2	2.93	2.42	-9.06	
716.0	11.87	146.18	713.3	30.5	-33.9	8.4	3.71	3.23	-9.23	
747.0	12.79	143.46	743.6	37.0	-39.3	12.2	3.51	2.97	-8.77	
789.0	13.93	140.64	784.5	46.7	-46.9	18.2	3.13	2.71	-6.71	
831.0	15.92	136.56	825.0	57.5	-55.0	25.4	5.36	4.74	-9.71	
873.0	17.18	136.29	865.3	69.4	-63.7	33.6	3.01	3.00	-0.64	
916.0	18.85	135.33	906.2	82.7	-73.2	42.9	3.94	3.88	-2.23	
958.0	20.17	133.92	945.8	96.8	-83.1	52.9	3.34	3.14	-3.36	

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Well:	BMC B 23C-18-07-95	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 5000.1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)		TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
1,000.0	21.62	132.63		985.0	111.7	-93.3	63.8	3.62	3.45	-3.07
1,042.0	23.16	133.88		1,023.8	127.7	-104.3	75.4	3.84	3.67	2.98
1,084.0	24.61	136.29		1,062.2	144.7	-116.4	87.4	4.16	3.45	5.74
1,126.0	25.88	137.30		1,100.2	162.6	-129.4	99.7	3.19	3.02	2.40
1,169.0	27.44	137.38		1,138.7	181.9	-143.6	112.8	3.63	3.63	0.19
1,211.0	28.83	135.63		1,175.7	201.7	-158.0	126.4	3.85	3.31	-4.17
1,253.0	29.66	135.06		1,212.3	222.2	-172.6	140.8	2.08	1.98	-1.36
1,295.0	29.71	134.14		1,248.8	243.0	-187.2	155.6	1.09	0.12	-2.19
1,337.0	30.66	132.60		1,285.1	264.0	-201.7	171.0	2.92	2.26	-3.67
1,379.0	30.94	131.55		1,321.2	285.5	-216.1	187.0	1.44	0.67	-2.50
1,421.0	30.94	131.37		1,357.2	307.0	-230.4	203.1	0.22	0.00	-0.43
1,463.0	31.29	129.52		1,393.2	328.6	-244.4	219.7	2.42	0.83	-4.40
1,506.0	31.77	130.23		1,429.8	350.9	-258.9	236.9	1.41	1.12	1.65
1,548.0	30.67	133.30		1,465.8	372.6	-273.3	253.2	4.61	-2.62	7.31
1,590.0	31.16	134.23		1,501.8	394.1	-288.3	268.7	1.63	1.17	2.21
1,632.0	30.81	137.52		1,537.8	415.7	-303.8	283.8	4.12	-0.83	7.83
1,674.0	30.72	137.17		1,573.9	437.2	-319.6	298.3	0.48	-0.21	-0.83
1,716.0	30.59	136.56		1,610.0	458.6	-335.2	313.0	0.80	-0.31	-1.45
1,758.0	30.89	134.71		1,646.1	480.1	-350.6	328.0	2.36	0.71	-4.40
Last PZD Surface Survey										
1,841.0	30.58	132.66		1,717.5	522.4	-379.9	358.7	1.32	-0.37	-2.47
1,927.0	30.70	133.97		1,791.5	566.2	-409.9	390.5	0.79	0.14	1.52
2,012.0	31.29	132.68		1,864.3	609.9	-439.9	422.4	1.05	0.69	-1.52
2,098.0	31.64	135.18		1,937.7	654.7	-471.1	454.7	1.57	0.41	2.91
2,186.0	31.95	137.47		2,012.5	701.0	-504.6	486.7	1.42	0.35	2.60
2,273.0	31.33	137.56		2,086.6	746.7	-538.3	517.5	0.71	-0.71	0.10
2,357.0	32.22	137.91		2,158.0	790.9	-571.0	547.3	1.08	1.06	0.42

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Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	
2,441.0	31.68	136.72	2,229.2	835.4	-603.7	577.4	0.99	-0.64	-1.42	
2,525.0	32.04	137.64	2,300.6	879.7	-636.2	607.6	0.72	0.43	1.10	
2,612.0	31.82	137.51	2,374.4	925.7	-670.2	638.6	0.26	-0.25	-0.15	
2,698.0	31.11	137.86	2,447.8	970.6	-703.4	668.8	0.85	-0.83	0.41	
2,784.0	31.95	137.82	2,521.1	1,015.5	-736.7	699.0	0.98	0.98	-0.05	
2,868.0	31.51	136.94	2,592.5	1,059.7	-769.2	728.9	0.76	-0.52	-1.05	
2,954.0	30.59	135.93	2,666.2	1,104.1	-801.4	759.5	1.23	-1.07	-1.17	
3,039.0	31.33	136.41	2,739.1	1,147.8	-832.9	789.8	0.92	0.87	0.56	
3,123.0	31.16	137.25	2,810.9	1,191.4	-864.7	819.6	0.56	-0.20	1.00	
3,207.0	31.38	135.76	2,882.7	1,235.0	-896.3	849.6	0.96	0.26	-1.77	
3,291.0	30.54	135.67	2,954.7	1,278.2	-927.2	879.8	1.00	-1.00	-0.11	
3,376.0	31.38	137.25	3,027.6	1,321.9	-958.9	909.9	1.38	0.99	1.86	
3,460.0	31.77	137.12	3,099.2	1,365.9	-991.2	939.8	0.47	0.46	-0.15	
3,544.0	29.55	136.27	3,171.4	1,408.7	-1,022.4	969.1	2.69	-2.64	-1.01	
3,629.0	29.10	136.94	3,245.6	1,450.3	-1,052.6	997.7	0.66	-0.53	0.79	
3,713.0	27.07	137.47	3,319.7	1,489.9	-1,081.6	1,024.6	2.43	-2.42	0.63	
3,797.0	26.81	134.74	3,394.5	1,527.9	-1,109.1	1,051.0	1.50	-0.31	-3.25	
3,881.0	27.11	132.90	3,469.4	1,566.0	-1,135.4	1,078.5	1.06	0.36	-2.19	
3,966.0	26.06	133.65	3,545.4	1,603.9	-1,161.5	1,106.2	1.30	-1.24	0.88	
4,050.0	23.76	132.78	3,621.6	1,639.2	-1,185.7	1,131.9	2.77	-2.74	-1.04	
4,134.0	22.68	132.50	3,698.8	1,672.3	-1,208.2	1,156.3	1.29	-1.29	-0.33	
4,219.0	20.52	132.02	3,777.8	1,703.5	-1,229.2	1,179.4	2.55	-2.54	-0.56	
4,259.4	19.63	133.63	3,815.8	1,717.3	-1,238.6	1,189.6	2.60	-2.21	3.99	
23C-18-07-95 TGT										
4,303.0	18.68	135.54	3,857.0	1,731.6	-1,248.7	1,199.8	2.60	-2.17	4.37	
4,387.0	15.51	136.19	3,937.2	1,756.3	-1,266.4	1,217.0	3.78	-3.77	0.77	
4,471.0	13.89	137.91	4,018.5	1,777.6	-1,282.0	1,231.5	2.00	-1.93	2.05	

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4,557.0	11.32	135.93	4,102.4	1,796.3	-1,295.7	1,244.3	3.03	-2.99	-2.30
4,642.0	8.70	139.45	4,186.1	1,811.1	-1,306.6	1,254.3	3.16	-3.08	4.14
4,726.0	5.67	150.96	4,269.4	1,821.5	-1,315.0	1,260.5	3.98	-3.61	13.70
4,793.2	3.47	157.19	4,336.4	1,826.6	-1,319.8	1,262.9	3.35	-3.27	9.27
23C-18-07-95									
4,811.0	2.90	160.41	4,354.2	1,827.5	-1,320.7	1,263.2	3.35	-3.20	18.08
4,895.0	1.14	206.90	4,438.1	1,829.7	-1,323.5	1,263.6	2.70	-2.10	55.35
4,981.0	0.92	19.30	4,524.1	1,829.7	-1,323.6	1,263.4	2.39	-0.26	200.47
5,068.0	1.10	359.57	4,611.1	1,828.8	-1,322.1	1,263.6	0.45	0.21	-22.68
5,154.0	0.70	316.55	4,697.1	1,827.7	-1,320.9	1,263.3	0.88	-0.47	-50.02
5,239.0	1.01	274.62	4,782.1	1,826.6	-1,320.5	1,262.2	0.80	0.36	-49.33
5,327.0	1.49	264.34	4,870.1	1,825.3	-1,320.5	1,260.2	0.60	0.55	-11.68
5,414.0	0.62	267.02	4,957.1	1,824.3	-1,320.6	1,258.6	1.00	-1.00	3.08
5,498.0	1.14	67.20	5,041.1	1,824.3	-1,320.3	1,259.0	2.07	0.62	190.69
5,582.0	1.36	59.95	5,125.1	1,824.8	-1,319.5	1,260.6	0.32	0.26	-8.63
5,666.0	0.70	32.13	5,209.0	1,824.9	-1,318.6	1,261.7	0.96	-0.79	-33.12
5,751.0	0.22	183.57	5,294.0	1,824.9	-1,318.3	1,262.0	1.06	-0.56	178.16
5,835.0	0.62	211.96	5,378.0	1,825.1	-1,318.9	1,261.7	0.52	0.48	33.80
5,919.0	0.75	216.57	5,462.0	1,825.3	-1,319.7	1,261.2	0.17	0.15	5.49
6,004.0	1.19	247.97	5,547.0	1,825.1	-1,320.5	1,260.0	0.79	0.52	36.94
6,088.0	2.02	251.20	5,631.0	1,824.2	-1,321.3	1,257.8	0.99	0.99	3.85
6,172.0	1.98	246.15	5,714.9	1,823.1	-1,322.3	1,255.1	0.22	-0.05	-6.01
6,257.0	1.58	233.93	5,799.9	1,822.5	-1,323.6	1,252.8	0.65	-0.47	-14.38
6,341.0	1.39	236.48	5,883.9	1,822.2	-1,324.9	1,251.0	0.24	-0.23	3.04
6,425.0	1.32	233.67	5,967.8	1,821.9	-1,326.0	1,249.4	0.11	-0.08	-3.35
6,468.0	1.45	230.90	6,010.8	1,821.8	-1,326.6	1,248.6	0.34	0.30	-6.44
Last PZD Survey									

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6,528.0	1.45	230.90	6,070.8	1,821.7	-1,327.6	1,247.4	0.00	0.00	0.00	
Straightline Projection to TD										

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,758.0	1,646.1	-350.6	328.0	Last PZD Surface Survey
6,468.0	6,010.8	-1,326.6	1,248.6	Last PZD Survey
6,528.0	6,070.8	-1,327.6	1,247.4	Straightline Projection to TD

Checked By: _____ Approved By: _____ Date: _____

