



Ursa Operating Company, LLC

Rockies Region

BMC B

BMC B 32A-13-07-96

Wellbore #1

Design: Actual

End of Well Report

25 August, 2017



Company:	Ursa Operating Company, LLC	Local Co-ordinate Reference:	Well BMC B 32A-13-07-96
Project:	Rockies Region	TVD Reference:	BMC B 32A-13-07-96 @ 5117.0usft (Plan KB)
Site:	BMC B	MD Reference:	BMC B 32A-13-07-96 @ 5117.0usft (Plan KB)
Well:	BMC B 32A-13-07-96	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 32A-13-07-96, SHL: Lat 39.438864934 Long -108.046607569				
Well Position	+N/-S	0.0 usft	Northing:	1,594,816.34 usft	Latitude:	39.438864934
	+E/-W	0.0 usft	Easting:	2,280,856.97 usft	Longitude:	-108.046607569
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	8/25/2017	9.70	65.53	51,478

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	285.23

Survey Program		Date	8/25/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
113.0	7,040.0	Actual (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	
113.0	0.62	28.23	113.0	-0.1	0.5	0.3	0.55	0.55	0.00	
143.0	0.70	352.50	143.0	-0.1	0.9	0.3	1.37	0.27	-119.10	
173.0	0.83	334.09	173.0	0.1	1.2	0.2	0.92	0.43	-61.37	
204.0	1.54	304.03	204.0	0.7	1.7	-0.2	2.97	2.29	-96.97	
233.0	2.50	297.00	233.0	1.6	2.2	-1.1	3.41	3.31	-24.24	
264.0	3.56	295.86	263.9	3.2	2.9	-2.6	3.42	3.42	-3.68	
294.0	4.57	296.65	293.8	5.3	3.8	-4.5	3.37	3.37	2.63	
324.0	5.76	297.48	323.7	8.0	5.1	-6.9	3.97	3.97	2.77	
354.0	6.64	294.58	353.6	11.2	6.5	-9.8	3.11	2.93	-9.67	
384.0	7.69	295.59	383.3	14.8	8.1	-13.2	3.52	3.50	3.37	
415.0	8.61	295.95	414.0	19.2	10.0	-17.1	2.97	2.97	1.16	
444.0	9.67	295.15	442.6	23.7	12.0	-21.3	3.68	3.66	-2.76	
475.0	10.08	296.68	473.2	28.9	14.3	-26.1	1.57	1.32	4.94	
504.0	10.59	296.21	501.7	34.0	16.6	-30.7	1.78	1.76	-1.62	
535.0	10.63	296.34	532.2	39.6	19.1	-35.9	0.15	0.13	0.42	
565.0	10.97	294.24	561.6	45.2	21.5	-40.9	1.73	1.13	-7.00	
595.0	11.38	293.27	591.1	50.9	23.9	-46.3	1.50	1.37	-3.23	
626.0	11.77	291.63	621.4	57.1	26.3	-52.0	1.65	1.26	-5.29	
657.0	12.00	289.00	651.8	63.4	28.5	-58.0	1.90	0.74	-8.48	
687.0	12.13	288.34	681.1	69.7	30.5	-63.9	0.63	0.43	-2.20	
717.0	12.79	285.97	710.4	76.2	32.4	-70.1	2.78	2.20	-7.90	
747.0	13.21	284.98	739.6	82.9	34.2	-76.6	1.58	1.40	-3.30	
777.0	14.06	283.73	768.8	90.0	35.9	-83.5	3.00	2.83	-4.17	
807.0	14.99	284.75	797.8	97.5	37.8	-90.8	3.22	3.10	3.40	
838.0	16.13	284.34	827.7	105.8	39.9	-98.8	3.69	3.68	-1.32	
880.0	17.62	286.10	867.9	118.0	43.1	-110.6	3.75	3.55	4.19	

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Site:	BMC B	MD Reference:	BMC B 32A-13-07-96 @ 5117.0usft (Plan KB)
Well:	BMC B 32A-13-07-96	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)
922.0	18.85	286.89	907.8	131.2	46.8	-123.2	2.99	2.93	1.88
964.0	20.21	286.59	947.4	145.2	50.9	-136.6	3.25	3.24	-0.71
1,007.0	21.49	286.72	987.5	160.5	55.3	-151.3	2.98	2.98	0.30
1,049.0	22.63	285.44	1,026.5	176.3	59.6	-166.4	2.95	2.71	-3.05
1,091.0	23.88	285.32	1,065.1	192.8	64.0	-182.4	2.98	2.98	-0.29
1,133.0	25.49	284.96	1,103.2	210.4	68.6	-199.4	3.85	3.83	-0.86
1,175.0	27.42	284.74	1,140.8	229.1	73.4	-217.4	4.60	4.60	-0.52
1,217.0	29.81	285.25	1,177.7	249.2	78.6	-236.9	5.72	5.69	1.21
1,259.0	31.68	285.53	1,213.8	270.7	84.3	-257.6	4.47	4.45	0.67
1,302.0	33.31	285.83	1,250.0	293.8	90.5	-279.8	3.81	3.79	0.70
1,344.0	34.54	286.01	1,284.9	317.2	97.0	-302.4	2.94	2.93	0.43
1,386.0	35.95	285.40	1,319.2	341.4	103.5	-325.7	3.46	3.36	-1.45
1,428.0	37.71	284.96	1,352.8	366.6	110.1	-350.0	4.24	4.19	-1.05
1,470.0	38.72	284.74	1,385.8	392.6	116.8	-375.1	2.43	2.40	-0.52
1,512.0	41.18	285.49	1,418.0	419.6	123.8	-401.1	5.97	5.86	1.79
1,554.0	42.45	285.57	1,449.3	447.6	131.3	-428.1	3.03	3.02	0.19
1,596.0	43.51	285.73	1,480.0	476.2	139.0	-455.7	2.54	2.52	0.38
1,639.0	44.82	284.83	1,510.9	506.2	146.9	-484.6	3.38	3.05	-2.09
1,681.0	46.14	284.17	1,540.3	536.1	154.4	-513.6	3.34	3.14	-1.57
1,723.0	47.20	284.26	1,569.2	566.6	161.9	-543.2	2.53	2.52	0.21
1,765.0	47.33	283.86	1,597.7	597.5	169.4	-573.1	0.76	0.31	-0.95
1,807.0	47.55	283.77	1,626.1	628.4	176.8	-603.2	0.55	0.52	-0.21
1,849.0	47.68	283.11	1,654.4	659.4	184.0	-633.3	1.20	0.31	-1.57
1,878.0	47.55	282.76	1,673.9	680.8	188.8	-654.2	1.00	-0.45	-1.21
Last PZD Surface Survey									
1,973.0	48.47	282.59	1,737.5	751.4	204.3	-723.1	0.98	0.97	-0.18
2,057.0	48.56	282.76	1,793.1	814.2	218.1	-784.5	0.19	0.11	0.20

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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)	
2,142.0	48.74	284.48	1,849.3	878.0	233.1	-846.5	1.53	0.21	2.02	
2,227.0	47.64	286.15	1,905.9	941.4	249.9	-907.6	1.95	-1.29	1.96	
2,312.0	46.32	286.98	1,963.9	1,003.5	267.6	-967.2	1.71	-1.55	0.98	
2,397.0	45.66	286.81	2,023.0	1,064.6	285.3	-1,025.7	0.79	-0.78	-0.20	
2,482.0	45.13	286.23	2,082.7	1,125.1	302.6	-1,083.7	0.79	-0.62	-0.68	
2,567.0	45.75	286.32	2,142.3	1,185.6	319.5	-1,141.8	0.73	0.73	0.11	
2,654.0	46.36	286.50	2,202.7	1,248.3	337.2	-1,201.9	0.72	0.70	0.21	
2,738.0	47.64	286.81	2,260.0	1,309.7	354.8	-1,260.8	1.55	1.52	0.37	
2,822.0	47.00	286.21	2,316.9	1,371.4	372.4	-1,320.0	0.93	-0.76	-0.71	
2,908.0	46.27	286.06	2,376.0	1,433.9	389.8	-1,380.0	0.86	-0.85	-0.17	
2,993.0	46.71	285.09	2,434.5	1,495.6	406.3	-1,439.4	0.98	0.52	-1.14	
3,079.0	45.62	284.30	2,494.1	1,557.6	422.0	-1,499.4	1.43	-1.27	-0.92	
3,165.0	46.54	285.31	2,553.7	1,619.6	437.9	-1,559.3	1.36	1.07	1.17	
3,250.0	47.29	285.66	2,611.8	1,681.6	454.5	-1,619.1	0.93	0.88	0.41	
3,334.0	47.15	285.67	2,668.8	1,743.3	471.1	-1,678.5	0.17	-0.17	0.01	
3,418.0	46.63	284.43	2,726.2	1,804.6	487.0	-1,737.7	1.24	-0.62	-1.48	
3,502.0	46.01	285.40	2,784.2	1,865.4	502.7	-1,796.4	1.11	-0.74	1.15	
3,587.0	46.71	285.57	2,842.9	1,926.9	519.1	-1,855.7	0.84	0.82	0.20	
3,673.0	45.89	283.94	2,902.3	1,989.0	534.9	-1,915.8	1.67	-0.95	-1.90	
3,757.0	45.64	284.92	2,960.9	2,049.2	549.9	-1,974.1	0.89	-0.30	1.17	
3,843.0	47.13	285.91	3,020.2	2,111.5	566.5	-2,034.1	1.92	1.73	1.15	
3,930.0	47.00	285.74	3,079.5	2,175.2	583.8	-2,095.4	0.21	-0.15	-0.20	
4,015.0	44.56	286.41	3,138.8	2,236.1	600.7	-2,153.9	2.93	-2.87	0.79	
4,100.0	42.32	284.87	3,200.5	2,294.5	616.5	-2,210.2	2.91	-2.64	-1.81	
4,187.0	39.95	284.21	3,266.0	2,351.7	630.8	-2,265.6	2.77	-2.72	-0.76	
4,272.0	36.69	283.73	3,332.7	2,404.4	643.6	-2,316.7	3.85	-3.84	-0.56	
4,357.0	33.71	283.11	3,402.2	2,453.4	655.0	-2,364.4	3.53	-3.51	-0.73	

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4,442.0	30.32	284.17	3,474.2	2,498.4	665.6	-2,408.2	4.04	-3.99	1.25
4,528.0	27.07	283.20	3,549.6	2,539.7	675.3	-2,448.3	3.82	-3.78	-1.13
4,613.0	24.04	283.69	3,626.3	2,576.3	683.9	-2,483.9	3.57	-3.56	0.58
4,698.0	22.34	284.81	3,704.4	2,609.8	692.1	-2,516.4	2.07	-2.00	1.32
4,783.0	20.77	285.08	3,783.5	2,641.0	700.1	-2,546.5	1.85	-1.85	0.32
4,860.0	18.72	285.38	3,856.0	2,667.0	707.0	-2,571.6	2.66	-2.66	0.40
32A-13-07-96 TGT									
4,868.0	18.51	285.42	3,863.6	2,669.6	707.7	-2,574.1	2.66	-2.66	0.44
4,953.0	16.13	283.69	3,944.7	2,694.9	714.0	-2,598.6	2.86	-2.80	-2.04
5,038.0	13.45	288.34	4,026.9	2,716.6	719.9	-2,619.4	3.45	-3.15	5.47
5,123.0	10.90	290.32	4,110.0	2,734.4	725.8	-2,636.4	3.04	-3.00	2.33
5,209.0	8.06	293.41	4,194.8	2,748.5	731.1	-2,649.5	3.35	-3.30	3.59
5,296.0	6.33	293.18	4,281.1	2,759.3	735.4	-2,659.5	1.99	-1.99	-0.26
5,380.0	3.87	292.30	4,364.7	2,766.7	738.3	-2,666.4	2.93	-2.93	-1.05
5,389.1	3.64	292.72	4,373.8	2,767.3	738.5	-2,667.0	2.52	-2.50	4.58
32A-13-07-96									
5,465.0	1.76	300.38	4,449.6	2,770.8	740.0	-2,670.2	2.52	-2.48	10.10
5,549.0	1.36	274.15	4,533.6	2,773.0	740.7	-2,672.3	0.96	-0.48	-31.23
5,635.0	0.26	13.95	4,619.6	2,774.0	741.0	-2,673.3	1.66	-1.28	116.05
5,719.0	0.40	345.52	4,703.6	2,774.2	741.5	-2,673.3	0.25	0.17	-33.85
5,806.0	0.48	333.08	4,790.6	2,774.6	742.1	-2,673.5	0.14	0.09	-14.30
5,892.0	0.22	271.20	4,876.6	2,775.0	742.4	-2,673.9	0.49	-0.30	-71.95
5,976.0	0.57	223.83	4,960.6	2,775.3	742.1	-2,674.3	0.54	0.42	-56.39
6,060.0	1.10	223.22	5,044.6	2,775.9	741.2	-2,675.2	0.63	0.63	-0.73
6,145.0	0.31	230.60	5,129.6	2,776.4	740.5	-2,675.9	0.93	-0.93	8.68
6,228.0	0.18	16.59	5,212.6	2,776.6	740.5	-2,676.0	0.57	-0.16	175.89
6,313.0	0.22	349.74	5,297.6	2,776.6	740.8	-2,676.0	0.12	0.05	-31.59

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6,398.0	0.40	340.51	5,382.6	2,776.9	741.2	-2,676.1	0.22	0.21	-10.86
6,484.0	0.18	0.85	5,468.6	2,777.1	741.6	-2,676.2	0.28	-0.26	23.65
6,570.0	0.40	222.73	5,554.6	2,777.2	741.5	-2,676.4	0.64	0.26	-160.60
6,653.0	1.39	225.26	5,637.6	2,777.9	740.6	-2,677.4	1.19	1.19	3.05
6,737.0	1.89	234.91	5,721.5	2,779.3	739.1	-2,679.2	0.68	0.60	11.49
6,823.0	1.98	228.31	5,807.5	2,781.0	737.3	-2,681.5	0.28	0.10	-7.67
6,908.0	2.28	225.00	5,892.4	2,782.6	735.1	-2,683.8	0.38	0.35	-3.89
6,980.0	2.34	229.27	5,964.4	2,784.2	733.2	-2,685.9	0.25	0.08	5.93
Last PZD Survey									
7,040.0	2.34	229.27	6,024.3	2,785.5	731.6	-2,687.8	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)		
1,878.0	1,673.9	188.8	-654.2	Last PZD Surface Survey	
6,980.0	5,964.4	733.2	-2,685.9	Last PZD Survey	
7,040.0	6,024.3	731.6	-2,687.8	Straightline Projection to TD	

Checked By: _____ Approved By: _____ Date: _____

