



# **Ursa Operating Company, LLC**

**Rockies Region**

**BMC D**

**BMC D 22A-18-07-95**

**Wellbore #1**

**Design: Actual**

## **End of Well Report**

**17 May, 2017**



<b>Company:</b>	Ursa Operating Company, LLC	<b>Local Co-ordinate Reference:</b>	Well BMC D 22A-18-07-95
<b>Project:</b>	Rockies Region	<b>TVD Reference:</b>	BMC D 22A-18-07-95 @ 5285.0usft (Plan KB)
<b>Site:</b>	BMC D	<b>MD Reference:</b>	BMC D 22A-18-07-95 @ 5285.0usft (Plan KB)
<b>Well:</b>	BMC D 22A-18-07-95	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual	<b>Database:</b>	EDM 5000.1 Single User Db

<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

<b>Site</b>	BMC D		
<b>Site Position:</b>		<b>Northing:</b>	1,595,755.80 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,282,541.08 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	39.441572650
		<b>Longitude:</b>	-108.040739971
		<b>Grid Convergence:</b>	-1.60 °

Well		BMC D 22A-18-07-95, SHL Lat: 39.441580579 Long: -108.040593070				
Well Position	+N/-S	0.0 usft	Northing:	1,595,757.53 usft	Latitude:	39.441580579
	+E/-W	0.0 usft	Easting:	2,282,582.63 usft	Longitude:	-108.040593070
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,285.0 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	5/17/2017	9.72	65.54	51,509

<b>Design</b>	Actual			
<b>Audit Notes:</b>				
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<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	232.44

<b>Survey Program</b>	<b>Date</b>	5/17/2017		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
109.0	6,310.0	Actual (Wellbore #1)	MWD	MWD - Standard

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<b>Well:</b>	BMC D 22A-18-07-95	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual	<b>Database:</b>	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	
109.0	0.48	218.00	109.0	0.4	-0.4	-0.3	0.44	0.44	0.00	
138.0	0.83	261.99	138.0	0.7	-0.5	-0.6	2.03	1.21	151.69	
167.0	0.09	1.30	167.0	0.9	-0.5	-0.8	2.93	-2.55	342.45	
198.0	0.40	105.45	198.0	0.8	-0.5	-0.7	1.39	1.00	335.97	
228.0	0.75	88.97	228.0	0.6	-0.5	-0.4	1.28	1.17	-54.93	
259.0	1.54	84.97	259.0	0.1	-0.5	0.2	2.56	2.55	-12.90	
289.0	2.07	97.94	289.0	-0.6	-0.5	1.2	2.22	1.77	43.23	
320.0	2.42	101.72	319.9	-1.4	-0.7	2.4	1.23	1.13	12.19	
350.0	2.78	117.76	349.9	-2.2	-1.2	3.6	2.69	1.20	53.47	
381.0	2.77	96.97	380.9	-3.0	-1.6	5.1	3.23	-0.03	-67.06	
411.0	2.81	101.06	410.8	-4.0	-1.9	6.5	0.68	0.13	13.63	
442.0	3.08	106.95	441.8	-5.0	-2.3	8.0	1.31	0.87	19.00	
472.0	2.94	105.80	471.8	-5.9	-2.7	9.5	0.51	-0.47	-3.83	
503.0	3.38	133.09	502.7	-6.5	-3.5	11.0	5.00	1.42	88.03	
533.0	3.52	146.89	532.7	-6.6	-4.9	12.1	2.80	0.47	46.00	
564.0	3.38	153.22	563.6	-6.4	-6.5	13.1	1.31	-0.45	20.42	
594.0	3.41	174.97	593.6	-5.7	-8.2	13.5	4.27	0.10	72.50	
625.0	2.99	192.82	624.5	-4.6	-9.9	13.4	3.47	-1.35	57.58	
655.0	3.52	211.89	654.5	-3.1	-11.5	12.8	3.99	1.77	63.57	
686.0	4.31	233.03	685.4	-1.1	-13.0	11.3	5.26	2.55	68.19	
717.0	5.22	238.41	716.3	1.5	-14.4	9.2	3.27	2.94	17.35	
747.0	6.28	242.47	746.1	4.4	-15.9	6.6	3.78	3.53	13.53	
778.0	7.30	238.82	776.9	8.1	-17.7	3.4	3.57	3.29	-11.77	
808.0	7.73	237.11	806.7	12.0	-19.8	0.1	1.62	1.43	-5.70	
839.0	8.65	235.44	837.3	16.4	-22.2	-3.6	3.07	2.97	-5.39	
881.0	9.18	231.62	878.8	22.9	-26.1	-8.8	1.89	1.26	-9.10	

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<b>Well:</b>	BMC D 22A-18-07-95	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Actual	<b>Database:</b>	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)
923.0	9.45	227.09	920.3	29.7	-30.5	-14.0	1.86	0.64	-10.79
965.0	9.76	226.92	961.7	36.7	-35.3	-19.1	0.74	0.74	-0.40
1,007.0	10.20	231.14	1,003.1	43.9	-40.1	-24.6	2.03	1.05	10.05
1,050.0	10.24	234.70	1,045.4	51.5	-44.7	-30.7	1.47	0.09	8.28
1,092.0	10.50	235.79	1,086.7	59.1	-49.0	-36.9	0.78	0.62	2.60
1,134.0	10.68	234.83	1,128.0	66.8	-53.4	-43.2	0.60	0.43	-2.29
1,176.0	10.72	234.30	1,169.2	74.6	-57.9	-49.6	0.25	0.10	-1.26
1,218.0	10.72	235.71	1,210.5	82.4	-62.4	-56.0	0.62	0.00	3.36
1,260.0	11.03	234.04	1,251.8	90.3	-66.9	-62.5	1.05	0.74	-3.98
1,302.0	11.16	236.01	1,293.0	98.4	-71.6	-69.1	0.95	0.31	4.69
1,344.0	11.73	233.47	1,334.1	106.7	-76.4	-75.9	1.81	1.36	-6.05
1,387.0	11.38	229.25	1,376.3	115.3	-81.7	-82.6	2.13	-0.81	-9.81
1,429.0	12.08	227.80	1,417.4	123.8	-87.4	-89.0	1.81	1.67	-3.45
1,471.0	11.91	227.70	1,458.5	132.5	-93.3	-95.5	0.41	-0.40	-0.24
1,513.0	10.99	227.53	1,499.6	140.8	-98.9	-101.6	2.19	-2.19	-0.40
1,555.0	10.94	230.35	1,540.9	148.8	-104.1	-107.6	1.28	-0.12	6.71
1,597.0	10.37	239.75	1,582.1	156.5	-108.6	-114.0	4.35	-1.36	22.38
1,629.0	9.89	240.50	1,613.6	162.1	-111.4	-118.9	1.56	-1.50	2.34
Last PZD Surface Survey									
1,702.0	10.45	246.69	1,685.5	174.7	-117.1	-130.4	1.68	0.77	8.48
1,787.0	9.80	245.86	1,769.2	189.3	-123.1	-144.1	0.78	-0.76	-0.98
1,871.0	11.21	237.46	1,851.8	204.3	-130.4	-157.5	2.47	1.68	-10.00
1,955.0	10.50	232.50	1,934.3	220.1	-139.5	-170.4	1.40	-0.85	-5.90
2,040.0	10.06	233.33	2,017.9	235.3	-148.6	-182.5	0.55	-0.52	0.98
2,124.0	11.07	235.31	2,100.5	250.7	-157.6	-195.1	1.28	1.20	2.36
2,208.0	10.68	233.77	2,183.0	266.5	-166.8	-208.0	0.58	-0.46	-1.83
2,292.0	10.06	232.50	2,265.6	281.6	-175.8	-220.1	0.79	-0.74	-1.51

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
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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)	
2,377.0	9.84	231.40	2,349.3	296.3	-184.9	-231.6	0.34	-0.26	-1.29	
2,461.0	10.81	234.08	2,432.0	311.4	-194.0	-243.6	1.29	1.15	3.19	
2,545.0	10.55	232.76	2,514.5	326.9	-203.3	-256.1	0.42	-0.31	-1.57	
2,630.0	10.06	231.27	2,598.1	342.1	-212.6	-268.1	0.66	-0.58	-1.75	
2,714.0	11.34	235.27	2,680.7	357.7	-221.9	-280.6	1.76	1.52	4.76	
2,798.0	10.85	233.77	2,763.1	373.9	-231.3	-293.8	0.68	-0.58	-1.79	
2,883.0	10.55	234.58	2,846.6	389.7	-240.5	-306.6	0.39	-0.35	0.95	
2,968.0	9.89	231.88	2,930.3	404.7	-249.6	-318.7	0.96	-0.78	-3.18	
3,052.0	10.83	234.23	3,012.9	419.8	-258.6	-330.7	1.23	1.12	2.80	
3,136.0	10.20	235.00	3,095.5	435.2	-267.5	-343.2	0.77	-0.75	0.92	
3,225.0	11.23	235.14	3,182.9	451.7	-277.0	-356.8	1.16	1.16	0.16	
3,311.0	10.68	233.38	3,267.4	468.0	-286.5	-370.1	0.75	-0.64	-2.05	
3,397.0	10.33	232.85	3,351.9	483.7	-295.9	-382.6	0.42	-0.41	-0.62	
3,485.0	9.71	229.77	3,438.6	499.0	-305.5	-394.6	0.93	-0.70	-3.50	
3,572.0	9.67	237.51	3,524.4	513.6	-314.1	-406.3	1.50	-0.05	8.90	
3,657.0	9.05	237.33	3,608.2	527.4	-321.6	-418.0	0.73	-0.73	-0.21	
3,742.0	7.95	237.51	3,692.3	539.9	-328.4	-428.6	1.29	-1.29	0.21	
3,828.0	6.42	233.60	3,777.6	550.6	-334.4	-437.5	1.87	-1.78	-4.55	
3,914.0	3.91	239.62	3,863.3	558.3	-338.7	-443.9	2.98	-2.92	7.00	
4,003.0	1.98	222.87	3,952.1	562.9	-341.4	-447.5	2.35	-2.17	-18.82	
4,091.0	2.20	218.96	4,040.1	566.0	-343.8	-449.6	0.30	0.25	-4.44	
4,111.4	2.22	218.21	4,060.5	566.8	-344.4	-450.1	0.17	0.10	-3.66	
22A-18-07-95 TGT										
4,179.0	2.29	215.84	4,128.0	569.3	-346.6	-451.7	0.17	0.10	-3.51	
4,267.0	2.64	209.38	4,215.9	572.9	-349.8	-453.7	0.51	0.40	-7.34	
4,355.0	1.27	257.11	4,303.9	575.6	-351.7	-455.7	2.29	-1.56	54.24	
4,443.0	1.67	21.25	4,391.9	575.4	-350.8	-456.2	2.96	0.45	141.07	

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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)	
4,530.0	1.67	17.69	4,478.8	573.3	-348.4	-455.3	0.12	0.00	-4.09	
4,617.0	1.42	12.90	4,565.8	571.4	-346.1	-454.7	0.32	-0.29	-5.51	
4,701.0	1.01	1.52	4,649.8	570.2	-344.4	-454.4	0.56	-0.49	-13.55	
4,785.0	1.05	339.73	4,733.8	569.5	-342.9	-454.7	0.47	0.05	-25.94	
4,872.0	0.88	328.04	4,820.8	569.2	-341.6	-455.3	0.30	-0.20	-13.44	
4,962.0	0.92	307.12	4,910.7	569.3	-340.6	-456.3	0.37	0.04	-23.24	
5,050.0	1.10	283.78	4,998.7	570.0	-339.9	-457.6	0.51	0.20	-26.52	
5,134.0	1.58	265.99	5,082.7	571.5	-339.8	-459.6	0.75	0.57	-21.18	
5,218.0	1.93	251.26	5,166.7	573.8	-340.4	-462.1	0.68	0.42	-17.54	
5,303.0	2.38	254.03	5,251.6	576.8	-341.3	-465.1	0.54	0.53	3.26	
5,387.0	2.50	247.79	5,335.5	580.2	-342.5	-468.5	0.35	0.14	-7.43	
5,471.0	2.42	238.83	5,419.5	583.7	-344.1	-471.7	0.47	-0.10	-10.67	
5,556.0	1.67	190.93	5,504.4	586.4	-346.2	-473.5	2.11	-0.88	-56.35	
5,640.0	1.74	185.29	5,588.4	588.2	-348.7	-473.8	0.22	0.08	-6.71	
5,724.0	1.63	198.84	5,672.3	590.0	-351.1	-474.3	0.49	-0.13	16.13	
5,809.0	2.15	213.91	5,757.3	592.6	-353.6	-475.6	0.84	0.61	17.73	
5,894.0	2.42	204.11	5,842.2	595.7	-356.5	-477.2	0.56	0.32	-11.53	
5,978.0	2.64	205.43	5,926.1	598.9	-359.9	-478.8	0.27	0.26	1.57	
6,062.0	2.90	205.56	6,010.0	602.6	-363.6	-480.5	0.31	0.31	0.15	
6,147.0	2.86	214.66	6,094.9	606.5	-367.2	-482.7	0.54	-0.05	10.71	
6,231.0	2.77	207.98	6,178.8	610.3	-370.8	-484.8	0.40	-0.11	-7.95	
Last PZD Survey										
6,310.0	2.77	207.98	6,257.7	613.8	-374.1	-486.6	0.00	0.00	0.00	
Straight Line Projection to TD										

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<b>Well:</b>	BMC D 22A-18-07-95	<b>North Reference:</b>	True
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<b>Design:</b>	Actual	<b>Database:</b>	EDM 5000.1 Single User Db

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,629.0	1,613.6	-111.4	-118.9	Last PZD Surface Survey
6,231.0	6,178.8	-370.8	-484.8	Last PZD Survey
6,310.0	6,257.7	-374.1	-486.6	Straight Line Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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