



# **Ursa Operating Company, LLC**

**Rockies Region**

**B&V**

**B&V 23D-07-07-95**

**Wellbore #1**

**Design: Actual**

## **End of Well Report**

**08 March, 2017**



<b>Company:</b>	Ursa Operating Company, LLC	<b>Local Co-ordinate Reference:</b>	Well B&V 23D-07-07-95
<b>Project:</b>	Rockies Region	<b>TVD Reference:</b>	B&V 23D-07-07-95 @ 5101.0usft (Plan KB)
<b>Site:</b>	B&V	<b>MD Reference:</b>	B&V 23D-07-07-95 @ 5101.0usft (Plan KB)
<b>Well:</b>	B&V 23D-07-07-95	<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

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		B&V			
Site Position:		Northing:		1,598,935.06 usft	
From:	Lat/Long	Easting:		2,280,801.73 usft	
Position Uncertainty:		Slot Radius:		13-3/16 "	
				Latitude: 39.450164128	
				Longitude: -108.047211920	
				Grid Convergence: -1.61 °	

Well		B&V 23D-07-07-95, SHL LAT: 39.450319497 LONG: -108.047088960				
Well Position	+N/-S	0.0 usft	Northing:	1,598,990.66 usft	Latitude:	39.450319497
	+E/-W	0.0 usft	Easting:	2,280,838.03 usft	Longitude:	-108.047088960
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,101.0 usft	Ground Level:	5,084.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/8/2017	9.75	65.55	51,536

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	111.61

Survey Program		Date	3/8/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
110.0	6,601.0	Actual (Wellbore #1)	MWD	MWD - Standard	

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<b>Well:</b>	B&V 23D-07-07-95	<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	
110.0	0.50	194.46	110.0	0.1	-0.5	-0.1	0.45	0.45	0.00	
139.0	0.31	188.48	139.0	0.1	-0.7	-0.2	0.67	-0.66	-20.62	
169.0	0.40	189.65	169.0	0.1	-0.8	-0.2	0.30	0.30	3.90	
199.0	0.48	172.95	199.0	0.2	-1.1	-0.2	0.50	0.27	-55.67	
229.0	0.40	191.01	229.0	0.3	-1.3	-0.2	0.53	-0.27	60.20	
260.0	0.19	220.46	260.0	0.3	-1.4	-0.3	0.81	-0.68	95.00	
291.0	0.31	121.62	291.0	0.4	-1.5	-0.2	1.25	0.39	-318.84	
321.0	0.31	95.91	321.0	0.5	-1.6	-0.1	0.46	0.00	-85.70	
352.0	0.44	81.85	352.0	0.7	-1.6	0.1	0.51	0.42	-45.35	
382.0	0.48	71.52	382.0	0.9	-1.5	0.4	0.31	0.13	-34.43	
413.0	0.53	72.71	413.0	1.1	-1.4	0.6	0.16	0.16	3.84	
443.0	0.57	74.60	443.0	1.3	-1.4	0.9	0.15	0.13	6.30	
474.0	0.53	58.08	474.0	1.5	-1.2	1.2	0.53	-0.13	-53.29	
504.0	0.53	67.96	504.0	1.7	-1.1	1.4	0.30	0.00	32.93	
535.0	0.62	66.43	535.0	2.0	-1.0	1.7	0.29	0.29	-4.94	
565.0	0.62	108.26	565.0	2.2	-1.0	2.0	1.48	0.00	139.43	
595.0	1.23	129.57	595.0	2.7	-1.2	2.4	2.30	2.03	71.03	
626.0	2.20	123.82	626.0	3.6	-1.8	3.2	3.17	3.13	-18.55	
657.0	2.68	132.83	656.9	4.9	-2.6	4.2	1.98	1.55	29.06	
718.0	4.17	125.80	717.8	8.3	-4.9	7.0	2.53	2.44	-11.52	
749.0	4.75	124.39	748.7	10.7	-6.3	9.0	1.90	1.87	-4.55	
780.0	5.41	119.34	779.6	13.4	-7.7	11.3	2.57	2.13	-16.29	
810.0	5.98	121.05	809.5	16.3	-9.2	13.9	1.98	1.90	5.70	
841.0	7.02	119.96	840.3	19.8	-11.0	16.9	3.38	3.35	-3.52	
883.0	8.53	116.08	881.9	25.4	-13.6	22.0	3.80	3.60	-9.24	
926.0	9.40	115.47	924.4	32.1	-16.5	28.0	2.04	2.02	-1.42	

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<b>Site:</b>	B&V	<b>MD Reference:</b>	B&V 23D-07-07-95 @ 5101.0usft (Plan KB)
<b>Well:</b>	B&V 23D-07-07-95	<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)
969.0	10.33	113.18	966.7	39.5	-19.6	34.7	2.35	2.16	-5.33
1,012.0	11.82	112.79	1,008.9	47.7	-22.8	42.3	3.47	3.47	-0.91
1,054.0	12.96	115.95	1,049.9	56.7	-26.5	50.5	3.16	2.71	7.52
1,097.0	14.28	115.03	1,091.7	66.8	-30.9	59.7	3.11	3.07	-2.14
1,140.0	15.22	115.07	1,133.3	77.8	-35.5	69.6	2.19	2.19	0.09
1,182.0	16.38	111.39	1,173.7	89.2	-40.0	80.1	3.65	2.76	-8.76
1,225.0	17.89	110.68	1,214.8	101.9	-44.5	91.9	3.55	3.51	-1.65
1,267.0	18.85	109.67	1,254.7	115.1	-49.1	104.3	2.41	2.29	-2.40
1,310.0	20.83	110.28	1,295.1	129.7	-54.1	118.0	4.63	4.60	1.42
1,353.0	22.32	110.06	1,335.1	145.5	-59.5	132.9	3.47	3.47	-0.51
1,395.0	23.69	111.73	1,373.8	161.9	-65.4	148.2	3.61	3.26	3.98
1,438.0	25.44	111.60	1,412.9	179.8	-72.0	164.8	4.07	4.07	-0.30
1,481.0	26.89	111.07	1,451.5	198.7	-78.9	182.5	3.42	3.37	-1.23
1,524.0	28.84	110.42	1,489.5	218.8	-86.0	201.3	4.59	4.53	-1.51
1,567.0	29.58	111.16	1,527.0	239.8	-93.5	220.9	1.91	1.72	1.72
1,609.0	29.97	109.62	1,563.5	260.7	-100.7	240.5	2.04	0.93	-3.67
1,652.0	30.10	109.40	1,600.7	282.2	-107.9	260.7	0.40	0.30	-0.51
1,695.0	30.94	108.17	1,637.7	304.0	-114.9	281.4	2.43	1.95	-2.86
1,740.0	31.09	108.23	1,676.3	327.1	-122.2	303.4	0.34	0.33	0.13
Last PZD Surface Survey									
1,803.0	31.15	107.33	1,730.2	359.6	-132.1	334.4	0.74	0.10	-1.43
1,889.0	30.98	106.99	1,803.9	403.8	-145.2	376.8	0.28	-0.20	-0.40
1,974.0	29.97	109.67	1,877.2	446.9	-158.8	417.8	1.99	-1.19	3.15
2,059.0	30.14	115.64	1,950.7	489.4	-175.1	457.0	3.52	0.20	7.02
2,145.0	30.81	117.18	2,024.9	532.8	-194.5	496.1	1.20	0.78	1.79
2,230.0	32.08	115.56	2,097.4	577.0	-214.2	535.8	1.79	1.49	-1.91
2,316.0	32.34	114.90	2,170.1	622.8	-233.8	577.3	0.51	0.30	-0.77

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<b>Well:</b>	B&V 23D-07-07-95	<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)	
2,401.0	32.04	115.03	2,242.1	668.0	-252.9	618.3	0.36	-0.35	0.15	
2,486.0	32.43	113.75	2,314.0	713.3	-271.6	659.6	0.93	0.46	-1.51	
2,572.0	31.90	112.96	2,386.8	759.0	-289.8	701.6	0.79	-0.62	-0.92	
2,657.0	31.70	112.38	2,459.0	803.8	-307.0	743.0	0.43	-0.24	-0.68	
2,742.0	31.20	111.25	2,531.5	848.2	-323.5	784.1	0.91	-0.59	-1.33	
2,827.0	31.07	111.25	2,604.3	892.1	-339.4	825.1	0.15	-0.15	0.00	
2,913.0	30.94	111.56	2,678.0	936.4	-355.6	866.3	0.24	-0.15	0.36	
2,998.0	30.28	110.72	2,751.2	979.7	-371.2	906.7	0.93	-0.78	-0.99	
3,083.0	30.15	110.02	2,824.6	1,022.4	-386.1	946.8	0.44	-0.15	-0.82	
3,169.0	29.22	108.57	2,899.3	1,065.0	-400.2	987.0	1.37	-1.08	-1.69	
3,254.0	27.82	109.18	2,974.0	1,105.5	-413.3	1,025.4	1.68	-1.65	0.72	
3,340.0	27.35	108.08	3,050.2	1,145.3	-426.0	1,063.1	0.81	-0.55	-1.28	
3,425.0	24.48	109.01	3,126.7	1,182.4	-437.8	1,098.4	3.41	-3.38	1.09	
3,510.0	23.07	110.02	3,204.5	1,216.6	-449.3	1,130.7	1.73	-1.66	1.19	
3,595.0	22.41	109.23	3,282.9	1,249.5	-460.3	1,161.6	0.86	-0.78	-0.93	
3,681.0	20.48	110.99	3,362.9	1,280.9	-471.1	1,191.1	2.37	-2.24	2.05	
3,766.0	18.24	115.25	3,443.1	1,309.0	-482.1	1,217.0	3.11	-2.64	5.01	
3,852.0	15.64	114.28	3,525.4	1,334.1	-492.6	1,239.8	3.04	-3.02	-1.13	
3,937.0	13.71	110.28	3,607.6	1,355.6	-500.8	1,259.7	2.56	-2.27	-4.71	
4,022.0	11.34	108.66	3,690.5	1,374.0	-507.0	1,277.1	2.82	-2.79	-1.91	
4,108.0	9.27	108.22	3,775.2	1,389.4	-511.8	1,291.6	2.41	-2.41	-0.51	
4,193.0	7.03	113.14	3,859.3	1,401.4	-516.0	1,302.9	2.76	-2.64	5.79	
4,278.0	5.46	113.65	3,943.8	1,410.6	-519.7	1,311.4	1.85	-1.85	0.60	
4,364.0	4.26	112.57	4,029.5	1,417.9	-522.6	1,318.1	1.40	-1.40	-1.26	
4,449.0	3.78	114.41	4,114.3	1,423.9	-524.9	1,323.6	0.58	-0.56	2.16	
4,452.6	3.75	114.62	4,117.8	1,424.1	-525.0	1,323.8	0.97	-0.89	5.78	
B&V 23D-07-07-95 TGT										

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<b>Well:</b>	B&V 23D-07-07-95	<b>North Reference:</b>	True
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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)	
4,535.0	3.03	120.57	4,200.1	1,429.0	-527.3	1,328.1	0.97	-0.87	7.22	
4,620.0	3.21	119.29	4,285.0	1,433.5	-529.6	1,332.1	0.23	0.21	-1.51	
4,706.0	2.86	127.86	4,370.9	1,438.0	-532.1	1,335.9	0.67	-0.41	9.97	
4,791.0	2.37	134.32	4,455.8	1,441.6	-534.6	1,338.9	0.67	-0.58	7.60	
4,877.0	2.11	134.89	4,541.7	1,444.7	-537.0	1,341.3	0.30	-0.30	0.66	
4,962.0	1.58	140.52	4,626.7	1,447.2	-539.0	1,343.1	0.66	-0.62	6.62	
5,048.0	1.49	138.20	4,712.6	1,449.2	-540.7	1,344.6	0.13	-0.10	-2.70	
5,133.0	1.54	159.94	4,797.6	1,451.0	-542.6	1,345.7	0.67	0.06	25.58	
5,218.0	1.19	104.92	4,882.6	1,452.6	-543.9	1,347.0	1.53	-0.41	-64.73	
5,304.0	1.06	129.54	4,968.6	1,454.3	-544.6	1,348.5	0.58	-0.15	28.63	
5,389.0	1.53	61.81	5,053.6	1,455.7	-544.6	1,350.1	1.76	0.55	-79.68	
5,474.0	1.01	50.74	5,138.5	1,456.8	-543.6	1,351.6	0.67	-0.61	-13.02	
5,560.0	0.92	94.86	5,224.5	1,457.9	-543.2	1,352.9	0.85	-0.10	51.30	
5,645.0	0.44	108.74	5,309.5	1,458.8	-543.3	1,353.9	0.59	-0.56	16.33	
5,730.0	0.48	212.28	5,394.5	1,459.1	-543.7	1,354.0	0.85	0.05	121.81	
5,816.0	1.01	19.89	5,480.5	1,459.0	-543.3	1,354.1	1.72	0.62	194.90	
5,901.0	0.92	351.63	5,565.5	1,458.7	-542.0	1,354.2	0.56	-0.11	-33.25	
5,986.0	1.23	324.34	5,650.5	1,457.5	-540.5	1,353.6	0.69	0.36	-32.11	
6,072.0	1.41	311.20	5,736.5	1,455.8	-539.1	1,352.3	0.41	0.21	-15.28	
6,157.0	1.49	277.85	5,821.4	1,453.7	-538.3	1,350.4	0.98	0.09	-39.24	
6,243.0	1.41	251.70	5,907.4	1,451.8	-538.4	1,348.3	0.77	-0.09	-30.41	
6,328.0	1.63	249.68	5,992.4	1,450.1	-539.2	1,346.2	0.27	0.26	-2.38	
6,413.0	1.41	231.22	6,077.4	1,448.7	-540.3	1,344.2	0.63	-0.26	-21.72	
6,499.0	1.41	232.71	6,163.3	1,447.6	-541.6	1,342.5	0.04	0.00	1.73	
6,541.0	1.85	239.61	6,205.3	1,446.9	-542.2	1,341.5	1.15	1.05	16.43	
Last PZD Survey										

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6,601.0	1.85	239.61	6,265.3	1,445.8	-543.2	1,339.9	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)	
1,740.0	1,676.3	-122.2	303.4	Last PZD Surface Survey
6,541.0	6,205.3	-542.2	1,341.5	Last PZD Survey
6,601.0	6,265.3	-543.2	1,339.9	Straightline Projection to TD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

