



Ursa Operating Company, LLC

Rockies Region

B&V

B&V 23B-07-07-95

Wellbore #1

Design: Actual

End of Well Report

24 January, 2017



Company:	Ursa Operating Company, LLC	Local Co-ordinate Reference:	Well B&V 23B-07-07-95
Project:	Rockies Region	TVD Reference:	B&V 23B-07-07-95 @ 5101.0usft (Plan KB)
Site:	B&V	MD Reference:	B&V 23B-07-07-95 @ 5101.0usft (Plan KB)
Well:	B&V 23B-07-07-95	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		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 " 0.0 usft	
				Latitude: 39.450164128	
				Longitude: -108.047211920	
				Grid Convergence: -1.61 °	

Well		B&V 23B-07-07-95, SHL LAT: 39.450314156 LONG: -108.046970110				
Well Position	+N/-S	0.0 usft	Northing:	1,598,987.78 usft	Latitude:	39.450314156
	+E/-W	0.0 usft	Easting:	2,280,871.52 usft	Longitude:	-108.046970110
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	1/24/2017	9.76	65.55	51,549

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	84.86

Survey Program		Date	1/24/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
104.0	6,535.0	Surface (Wellbore #1)	MWD	MWD - Standard	

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Well:	B&V 23B-07-07-95	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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
104.0	0.70	258.10	104.0	-0.6	-0.1	-0.6	0.67	0.67	0.00	
133.0	0.88	280.09	133.0	-1.0	-0.1	-1.0	1.20	0.62	75.83	
164.0	0.51	253.59	164.0	-1.4	-0.1	-1.4	1.55	-1.19	-85.48	
194.0	0.22	222.83	194.0	-1.6	-0.2	-1.5	1.13	-0.97	-102.53	
225.0	0.18	146.05	225.0	-1.6	-0.3	-1.6	0.81	-0.13	-247.68	
255.0	0.26	153.79	255.0	-1.5	-0.4	-1.5	0.28	0.27	25.80	
286.0	0.65	138.25	286.0	-1.4	-0.6	-1.4	1.31	1.26	-50.13	
316.0	0.58	148.39	316.0	-1.2	-0.8	-1.2	0.43	-0.23	33.80	
347.0	0.66	137.70	347.0	-1.1	-1.1	-1.0	0.45	0.26	-34.48	
378.0	0.75	122.06	378.0	-0.8	-1.3	-0.7	0.68	0.29	-50.45	
408.0	1.54	101.49	408.0	-0.2	-1.5	-0.1	2.93	2.63	-68.57	
438.0	2.11	92.18	438.0	0.7	-1.6	0.8	2.14	1.90	-31.03	
468.0	2.77	87.43	467.9	2.0	-1.6	2.1	2.30	2.20	-15.83	
499.0	3.56	90.73	498.9	3.7	-1.6	3.8	2.61	2.55	10.65	
529.0	4.29	89.85	528.8	5.7	-1.6	5.9	2.44	2.43	-2.93	
560.0	5.14	86.07	559.7	8.3	-1.5	8.4	2.92	2.74	-12.19	
591.0	6.02	87.43	590.6	11.3	-1.3	11.4	2.87	2.84	4.39	
621.0	6.77	87.87	620.4	14.6	-1.2	14.8	2.51	2.50	1.47	
651.0	7.65	87.74	650.1	18.4	-1.1	18.5	2.93	2.93	-0.43	
682.0	8.57	86.99	680.8	22.7	-0.9	22.9	2.99	2.97	-2.42	
713.0	9.54	86.90	711.4	27.6	-0.6	27.8	3.13	3.13	-0.29	
743.0	10.37	85.72	741.0	32.8	-0.3	32.9	2.85	2.77	-3.93	
774.0	11.21	85.01	771.4	38.6	0.2	38.7	2.74	2.71	-2.29	
804.0	12.04	85.54	800.8	44.6	0.7	44.8	2.79	2.77	1.77	
835.0	13.14	85.23	831.1	51.4	1.2	51.5	3.56	3.55	-1.00	
878.0	14.55	84.66	872.8	61.7	2.2	61.7	3.29	3.28	-1.33	

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Site:	B&V	MD Reference:	B&V 23B-07-07-95 @ 5101.0usft (Plan KB)
Well:	B&V 23B-07-07-95	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)	
920.0	15.86	83.80	913.4	72.7	3.3	72.7	3.16	3.12	-2.05	
963.0	16.92	84.14	954.6	84.8	4.5	84.8	2.48	2.47	0.79	
1,006.0	17.80	84.71	995.7	97.7	5.8	97.5	2.08	2.05	1.33	
1,049.0	19.12	84.36	1,036.4	111.3	7.1	111.1	3.08	3.07	-0.81	
1,091.0	20.13	84.14	1,076.0	125.4	8.5	125.1	2.41	2.40	-0.52	
1,134.0	21.05	85.06	1,116.3	140.5	9.9	140.2	2.27	2.14	2.14	
1,176.0	21.75	85.44	1,155.4	155.8	11.2	155.5	1.70	1.67	0.90	
1,219.0	22.03	85.80	1,195.3	171.9	12.4	171.4	0.72	0.65	0.84	
1,262.0	22.54	84.84	1,235.0	188.2	13.7	187.7	1.46	1.19	-2.23	
1,304.0	23.18	83.80	1,273.7	204.5	15.4	203.9	1.80	1.52	-2.48	
1,347.0	23.51	83.21	1,313.2	221.5	17.3	220.9	0.94	0.77	-1.37	
1,390.0	23.77	82.73	1,352.6	238.7	19.4	238.0	0.75	0.60	-1.12	
1,433.0	24.03	82.28	1,391.9	256.2	21.7	255.2	0.74	0.60	-1.05	
1,475.0	24.30	82.95	1,430.3	273.3	23.9	272.3	0.92	0.64	1.60	
1,518.0	24.40	84.67	1,469.4	291.1	25.8	289.9	1.67	0.23	4.00	
1,560.0	24.57	84.79	1,507.6	308.5	27.4	307.2	0.42	0.40	0.29	
1,603.0	24.87	84.93	1,546.7	326.4	29.0	325.2	0.71	0.70	0.33	
1,646.0	25.18	85.19	1,585.7	344.6	30.6	343.3	0.76	0.72	0.60	
1,688.0	25.36	84.93	1,623.7	362.6	32.1	361.1	0.50	0.43	-0.62	
1,731.0	25.66	84.62	1,662.5	381.1	33.8	379.6	0.76	0.70	-0.72	
1,745.0	25.75	84.27	1,675.1	387.2	34.4	385.6	1.26	0.64	-2.50	
Last PZD Surface Survey										
1,845.0	25.05	81.98	1,765.4	430.0	39.5	428.2	1.21	-0.70	-2.29	
1,931.0	23.95	82.95	1,843.7	465.7	44.2	463.6	1.36	-1.28	1.13	
2,016.0	23.86	84.14	1,921.4	500.1	48.1	497.8	0.58	-0.11	1.40	
2,101.0	23.95	85.67	1,999.1	534.5	51.1	532.1	0.74	0.11	1.80	
2,186.0	25.40	85.45	2,076.3	570.0	53.9	567.5	1.71	1.71	-0.26	

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Well:	B&V 23B-07-07-95	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)
2,272.0	24.96	84.53		2,154.1	606.6	57.1	603.9	0.68	-0.51	-1.07
2,357.0	24.08	83.39		2,231.5	641.9	60.8	639.0	1.18	-1.04	-1.34
2,443.0	24.59	85.46		2,309.8	677.3	64.2	674.3	1.16	0.59	2.41
2,528.0	23.86	86.20		2,387.4	712.2	66.7	709.0	0.93	-0.86	0.87
2,613.0	24.17	85.76		2,465.0	746.8	69.2	743.5	0.42	0.36	-0.52
2,699.0	24.87	86.20		2,543.2	782.4	71.7	779.2	0.84	0.81	0.51
2,784.0	23.99	85.89		2,620.6	817.6	74.1	814.2	1.05	-1.04	-0.36
2,870.0	23.55	85.45		2,699.3	852.2	76.7	848.8	0.55	-0.51	-0.51
2,955.0	24.27	85.40		2,777.0	886.7	79.5	883.1	0.85	0.85	-0.06
3,040.0	24.21	85.67		2,854.5	921.6	82.2	917.9	0.15	-0.07	0.32
3,126.0	24.17	84.57		2,933.0	956.8	85.2	953.0	0.53	-0.05	-1.28
3,211.0	24.50	83.07		3,010.4	991.8	88.9	987.8	0.82	0.39	-1.76
3,296.0	24.65	83.39		3,087.7	1,027.2	93.1	1,023.0	0.24	0.18	0.38
3,382.0	23.33	82.99		3,166.3	1,062.1	97.3	1,057.7	1.55	-1.53	-0.47
3,467.0	22.15	83.04		3,244.7	1,095.0	101.3	1,090.3	1.39	-1.39	0.06
3,553.0	21.18	83.65		3,324.6	1,126.7	104.9	1,121.8	1.16	-1.13	0.71
3,638.0	20.57	84.05		3,404.1	1,157.0	108.2	1,151.9	0.74	-0.72	0.47
3,723.0	19.03	84.93		3,484.0	1,185.8	111.0	1,180.6	1.85	-1.81	1.04
3,809.0	17.53	84.36		3,565.7	1,212.8	113.5	1,207.4	1.76	-1.74	-0.66
3,894.0	16.48	83.39		3,647.0	1,237.6	116.1	1,232.2	1.28	-1.24	-1.14
3,979.0	13.93	82.95		3,729.0	1,259.9	118.8	1,254.3	3.00	-3.00	-0.52
4,065.0	10.99	82.25		3,812.9	1,278.4	121.1	1,272.7	3.42	-3.42	-0.81
4,150.0	8.83	82.07		3,896.7	1,293.0	123.1	1,287.2	2.54	-2.54	-0.21
4,235.0	6.24	85.41		3,980.9	1,304.2	124.4	1,298.3	3.09	-3.05	3.93
4,320.0	4.00	76.53		4,065.6	1,311.7	125.5	1,305.7	2.79	-2.64	-10.45
4,399.2	3.51	77.73		4,144.6	1,316.9	126.6	1,310.8	0.62	-0.62	1.52
B&V 23B-07-07-95 TGT										

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4,406.0	3.47	77.85	4,151.4	1,317.3	126.7	1,311.2	0.62	-0.62	1.75	
4,491.0	3.09	83.73	4,236.3	1,322.1	127.5	1,316.0	0.60	-0.45	6.92	
4,576.0	2.55	87.78	4,321.2	1,326.3	127.8	1,320.2	0.68	-0.64	4.76	
4,662.0	1.49	59.44	4,407.1	1,329.2	128.5	1,323.0	1.66	-1.23	-32.95	
4,747.0	1.23	47.18	4,492.1	1,330.9	129.6	1,324.7	0.46	-0.31	-14.42	
4,832.0	0.97	58.16	4,577.1	1,332.3	130.6	1,325.9	0.39	-0.31	12.92	
4,918.0	0.52	69.91	4,663.1	1,333.3	131.2	1,326.9	0.55	-0.52	13.66	
5,003.0	0.62	167.72	4,748.1	1,333.8	130.8	1,327.4	1.01	0.12	115.07	
5,089.0	0.60	143.02	4,834.1	1,334.1	130.0	1,327.8	0.30	-0.02	-28.72	
5,174.0	0.88	169.04	4,919.1	1,334.4	129.0	1,328.1	0.51	0.33	30.61	
5,259.0	0.79	183.36	5,004.0	1,334.3	127.8	1,328.2	0.27	-0.11	16.85	
5,345.0	0.92	173.30	5,090.0	1,334.3	126.5	1,328.3	0.23	0.15	-11.70	
5,430.0	0.79	61.24	5,175.0	1,334.8	126.1	1,328.9	1.67	-0.15	-131.84	
5,515.0	0.04	45.90	5,260.0	1,335.4	126.4	1,329.4	0.88	-0.88	-18.05	
5,601.0	0.39	270.02	5,346.0	1,335.1	126.5	1,329.1	0.49	0.41	-158.00	
5,686.0	0.88	262.20	5,431.0	1,334.2	126.4	1,328.2	0.58	0.58	-9.20	
5,772.0	1.05	252.36	5,517.0	1,332.8	126.0	1,326.8	0.28	0.20	-11.44	
5,857.0	1.45	233.99	5,602.0	1,331.1	125.2	1,325.2	0.66	0.47	-21.61	
5,942.0	1.58	249.90	5,687.0	1,329.0	124.1	1,323.2	0.52	0.15	18.72	
6,028.0	0.62	296.35	5,772.9	1,327.5	123.9	1,321.7	1.44	-1.12	54.01	
6,113.0	0.73	276.62	5,857.9	1,326.6	124.2	1,320.7	0.30	0.13	-23.21	
6,199.0	0.83	233.07	5,943.9	1,325.5	123.9	1,319.7	0.68	0.12	-50.64	
6,284.0	1.18	234.76	6,028.9	1,324.2	123.0	1,318.5	0.41	0.41	1.99	
6,369.0	1.54	236.49	6,113.9	1,322.4	121.9	1,316.8	0.43	0.42	2.04	
6,455.0	1.45	239.48	6,199.9	1,320.4	120.7	1,314.9	0.14	-0.10	3.48	
6,475.0	1.39	230.26	6,219.9	1,320.0	120.4	1,314.5	1.18	-0.30	-46.10	
Last PZD Survey										

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6,535.0	1.39	230.26	6,279.8	1,318.8	119.5	1,313.4	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)	
1,745.0	1,675.1	34.4	385.6	Last PZD Surface Survey
6,475.0	6,219.9	120.4	1,314.5	Last PZD Survey
6,535.0	6,279.8	119.5	1,313.4	Straightline Projection to TD

Checked By: _____ Approved By: _____ Date: _____

