



# **Ursa Operating Company, LLC**

**Rockies Region**

**B&V**

**B&V 11B-18-07-95**

**Wellbore #1**

**Design: Actual**

## **End of Well Report**

**13 December, 2016**



<b>Company:</b>	Ursa Operating Company, LLC	<b>Local Co-ordinate Reference:</b>	Well B&V 11B-18-07-95
<b>Project:</b>	Rockies Region	<b>TVD Reference:</b>	B&V 11B-18-07-95 TGT @ 5101.0usft (Plan KB)
<b>Site:</b>	B&V	<b>MD Reference:</b>	B&V 11B-18-07-95 TGT @ 5101.0usft (Plan KB)
<b>Well:</b>	B&V 11B-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>	B&V		
<b>Site Position:</b>		<b>Northing:</b>	1,598,935.06 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,280,801.73 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	39.450164128
		<b>Longitude:</b>	-108.047211920
		<b>Grid Convergence:</b>	-1.61 °

Well		B&V 11B-18-07-95, SHL: 39.450121262 -108.047281008				
Well Position	+N/-S	0.0 usft	Northing:	1,598,920.01 usft	Latitude:	39.450121262
	+E/-W	0.0 usft	Easting:	2,280,781.79 usft	Longitude:	-108.047281008
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,101.0 usft	Ground Level:	5,084.0 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	12/13/2016	9.77	65.55	51,561

<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	177.22

<b>Survey Program</b>	<b>Date</b>	12/13/2016		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
134.0	6,745.0	Actual (Wellbore #1)	MWD	MWD - Standard

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<b>Project:</b>	Rockies Region	<b>TVD Reference:</b>	B&V 11B-18-07-95 TGT @ 5101.0usft (Plan KB)
<b>Site:</b>	B&V	<b>MD Reference:</b>	B&V 11B-18-07-95 TGT @ 5101.0usft (Plan KB)
<b>Well:</b>	B&V 11B-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	
134.0	1.10	60.76	134.0	-0.6	0.6	1.1	0.82	0.82	0.00	
163.0	0.90	68.88	163.0	-0.8	0.8	1.6	0.84	-0.69	28.00	
193.0	0.62	146.41	193.0	-0.7	0.8	1.9	3.25	-0.93	258.43	
223.0	1.93	176.51	223.0	-0.1	0.2	2.0	4.76	4.37	100.33	
253.0	3.12	181.21	252.9	1.3	-1.2	2.0	4.02	3.97	15.67	
283.0	4.17	182.13	282.9	3.2	-3.1	2.0	3.51	3.50	3.07	
314.0	5.32	188.29	313.8	5.7	-5.6	1.7	4.05	3.71	19.87	
344.0	6.71	183.54	343.6	8.8	-8.7	1.4	4.92	4.63	-15.83	
375.0	7.99	180.63	374.4	12.8	-12.7	1.3	4.30	4.13	-9.39	
406.0	9.14	179.10	405.0	17.4	-17.3	1.3	3.78	3.71	-4.94	
436.0	10.11	178.88	434.6	22.4	-22.3	1.4	3.24	3.23	-0.73	
467.0	11.12	178.75	465.1	28.1	-28.0	1.5	3.26	3.26	-0.42	
497.0	12.08	178.44	494.4	34.1	-34.1	1.6	3.21	3.20	-1.03	
528.0	13.27	178.27	524.7	40.9	-40.9	1.8	3.84	3.84	-0.55	
558.0	14.68	178.62	553.8	48.2	-48.1	2.0	4.71	4.70	1.17	
589.0	16.04	177.63	583.7	56.4	-56.3	2.3	4.47	4.39	-3.19	
620.0	17.31	177.39	613.4	65.3	-65.2	2.7	4.10	4.10	-0.77	
650.0	18.33	176.42	641.9	74.4	-74.4	3.2	3.54	3.40	-3.23	
681.0	19.20	177.39	671.3	84.4	-84.3	3.7	2.98	2.81	3.13	
711.0	19.95	177.39	699.6	94.5	-94.4	4.2	2.50	2.50	0.00	
742.0	20.83	177.70	728.6	105.3	-105.2	4.6	2.86	2.84	1.00	
773.0	21.62	177.74	757.5	116.5	-116.4	5.1	2.55	2.55	0.13	
803.0	22.54	178.22	785.3	127.8	-127.7	5.5	3.13	3.07	1.60	
833.0	23.51	178.88	812.9	139.5	-139.4	5.8	3.35	3.23	2.20	
876.0	24.76	177.80	852.2	157.1	-157.0	6.3	3.08	2.91	-2.51	
919.0	25.58	178.35	891.1	175.4	-175.2	6.9	1.98	1.91	1.28	

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<b>Well:</b>	B&V 11B-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)	
962.0	26.76	178.44	929.7	194.3	-194.2	7.4	2.75	2.74	0.21	
1,004.0	28.04	178.44	967.0	213.6	-213.5	8.0	3.05	3.05	0.00	
1,047.0	28.87	178.88	1,004.8	234.1	-234.0	8.4	1.99	1.93	1.02	
1,090.0	29.93	178.09	1,042.2	255.2	-255.1	9.0	2.62	2.47	-1.84	
1,132.0	30.63	176.95	1,078.5	276.4	-276.2	9.9	2.16	1.67	-2.71	
1,175.0	31.42	176.77	1,115.4	298.6	-298.4	11.1	1.85	1.84	-0.42	
1,218.0	32.78	176.86	1,151.8	321.4	-321.2	12.4	3.16	3.16	0.21	
1,260.0	33.88	176.33	1,186.9	344.5	-344.2	13.8	2.71	2.62	-1.26	
1,303.0	34.37	177.39	1,222.5	368.6	-368.3	15.1	1.79	1.14	2.47	
1,346.0	34.37	176.46	1,258.0	392.9	-392.6	16.4	1.22	0.00	-2.16	
1,389.0	34.72	176.33	1,293.4	417.3	-416.9	17.9	0.83	0.81	-0.30	
1,431.0	34.89	175.54	1,327.9	441.2	-440.8	19.6	1.15	0.40	-1.88	
1,474.0	35.16	175.41	1,363.1	465.9	-465.4	21.6	0.65	0.63	-0.30	
1,517.0	35.77	175.76	1,398.1	490.8	-490.3	23.5	1.50	1.42	0.81	
1,558.0	35.24	176.51	1,431.5	514.6	-514.0	25.1	1.67	-1.29	1.83	
1,602.0	35.55	176.73	1,467.3	540.1	-539.5	26.6	0.76	0.70	0.50	
1,645.0	35.91	176.91	1,502.2	565.2	-564.5	28.0	0.87	0.84	0.42	
1,687.0	35.03	177.85	1,536.5	589.6	-588.9	29.1	2.47	-2.10	2.24	
1,730.0	34.41	177.83	1,571.8	614.1	-613.4	30.0	1.44	-1.44	-0.05	
1,773.0	34.54	177.61	1,607.2	638.4	-637.7	31.0	0.42	0.30	-0.51	
1,815.0	35.24	177.21	1,641.7	662.5	-661.7	32.1	1.75	1.67	-0.95	
Last PZD Surface Survey										
1,924.0	36.01	177.03	1,730.3	726.0	-725.1	35.3	0.71	0.71	-0.17	
2,009.0	35.16	174.71	1,799.4	775.4	-774.4	38.8	1.88	-1.00	-2.73	
2,095.0	34.54	173.52	1,870.0	824.5	-823.3	43.9	1.07	-0.72	-1.38	
2,180.0	32.78	174.49	1,940.7	871.5	-870.2	48.8	2.16	-2.07	1.14	
2,266.0	32.74	176.99	2,013.1	918.0	-916.6	52.3	1.57	-0.05	2.91	

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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)	
2,351.0	33.40	178.62	2,084.3	964.4	-962.9	54.0	1.30	0.78	1.92	
2,436.0	34.19	179.19	2,154.9	1,011.6	-1,010.2	54.9	1.00	0.93	0.67	
2,521.0	33.22	179.15	2,225.7	1,058.8	-1,057.3	55.6	1.14	-1.14	-0.05	
2,607.0	34.28	177.78	2,297.2	1,106.5	-1,105.1	56.9	1.52	1.23	-1.59	
2,692.0	33.44	178.22	2,367.7	1,153.9	-1,152.4	58.6	1.03	-0.99	0.52	
2,778.0	32.33	177.45	2,440.0	1,200.6	-1,199.1	60.3	1.38	-1.29	-0.90	
2,863.0	33.35	177.83	2,511.4	1,246.7	-1,245.1	62.2	1.22	1.20	0.45	
2,948.0	33.66	178.57	2,582.3	1,293.6	-1,292.0	63.7	0.60	0.36	0.87	
3,034.0	33.84	177.91	2,653.8	1,341.4	-1,339.8	65.2	0.47	0.21	-0.77	
3,119.0	34.67	178.57	2,724.0	1,389.2	-1,387.6	66.6	1.07	0.98	0.78	
3,205.0	34.19	177.91	2,794.9	1,437.8	-1,436.2	68.1	0.71	-0.56	-0.77	
3,290.0	33.31	177.74	2,865.6	1,485.0	-1,483.4	69.9	1.04	-1.04	-0.20	
3,376.0	32.87	177.48	2,937.7	1,532.0	-1,530.3	71.9	0.54	-0.51	-0.30	
3,461.0	32.92	179.23	3,009.0	1,578.1	-1,576.4	73.2	1.12	0.06	2.06	
3,546.0	33.31	178.40	3,080.2	1,624.6	-1,622.9	74.1	0.70	0.46	-0.98	
3,631.0	34.32	177.12	3,150.9	1,671.9	-1,670.1	76.0	1.45	1.19	-1.51	
3,717.0	33.27	176.68	3,222.3	1,719.7	-1,717.9	78.6	1.25	-1.22	-0.51	
3,802.0	33.31	176.82	3,293.4	1,766.3	-1,764.5	81.2	0.10	0.05	0.16	
3,887.0	33.97	177.70	3,364.1	1,813.4	-1,811.5	83.5	0.97	0.78	1.04	
3,973.0	32.48	177.17	3,436.1	1,860.6	-1,858.6	85.6	1.77	-1.73	-0.62	
4,058.0	30.67	176.68	3,508.5	1,905.1	-1,903.0	88.0	2.15	-2.13	-0.58	
4,143.0	28.52	176.86	3,582.4	1,947.0	-1,944.9	90.3	2.53	-2.53	0.21	
4,229.0	27.29	176.99	3,658.4	1,987.3	-1,985.1	92.5	1.43	-1.43	0.15	
4,315.0	26.10	177.26	3,735.2	2,025.9	-2,023.7	94.4	1.39	-1.38	0.31	
4,400.0	25.22	177.43	3,811.9	2,062.7	-2,060.5	96.1	1.04	-1.04	0.20	
4,485.0	24.34	176.25	3,889.0	2,098.3	-2,096.1	98.1	1.19	-1.04	-1.39	
4,570.0	22.32	174.22	3,967.1	2,132.0	-2,129.6	100.9	2.56	-2.38	-2.39	

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<b>Well:</b>	B&V 11B-18-07-95	<b>North Reference:</b>	True
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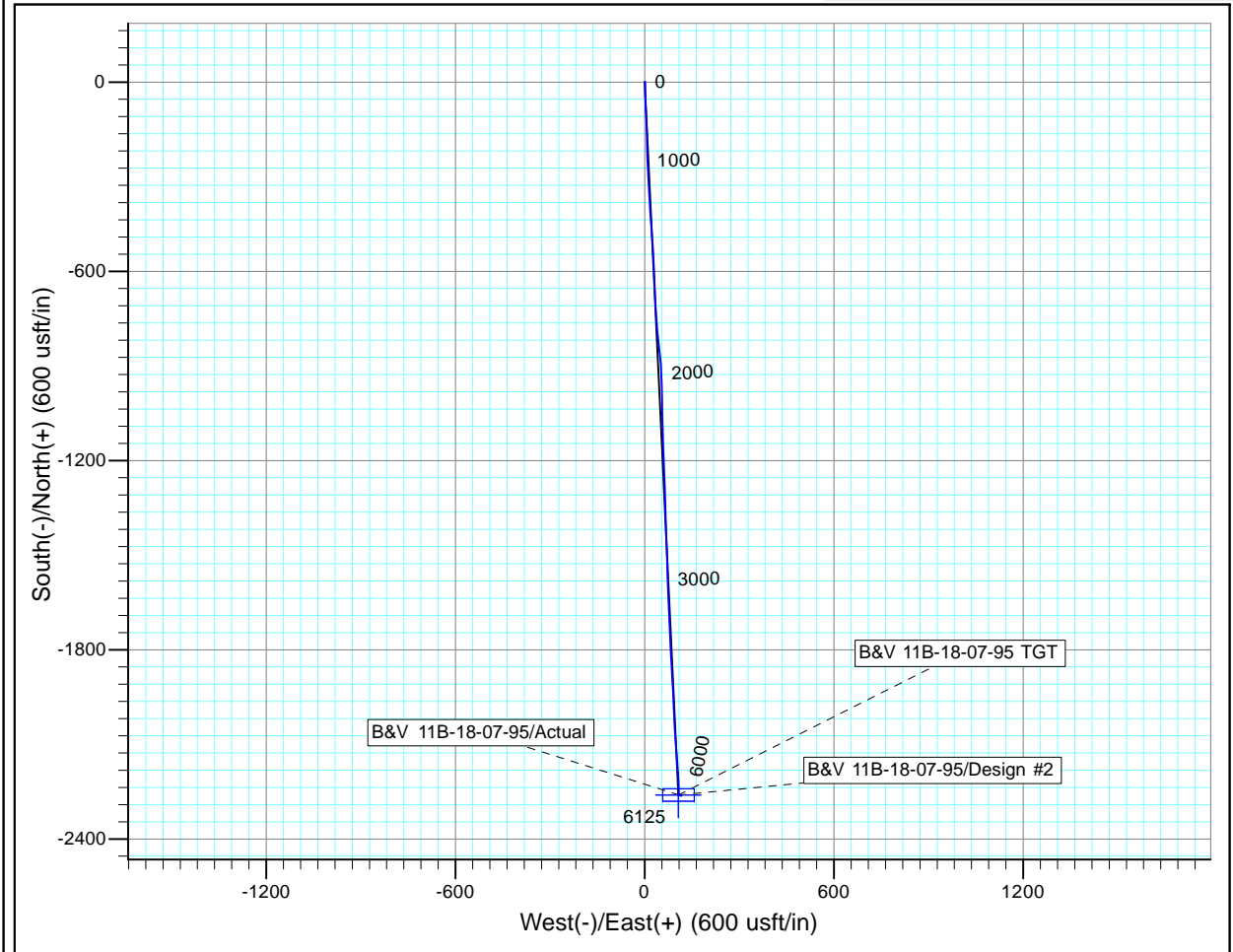
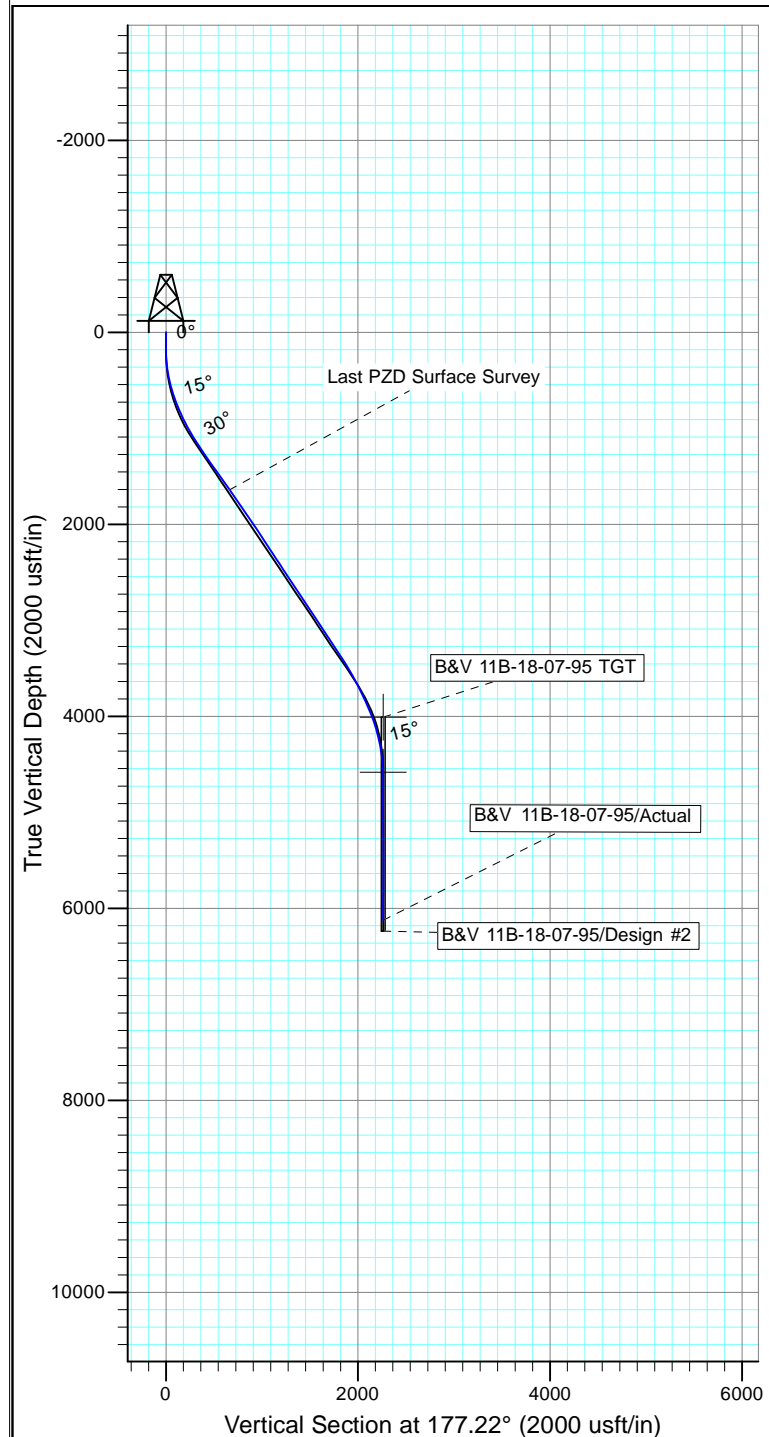
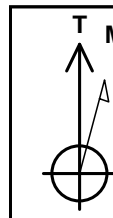
Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	
4,654.6	19.12	175.26	4,046.2	2,161.9	-2,159.4	103.6	3.80	-3.78	1.23	
B&V 11B-18-07-95 TGT										
4,656.0	19.07	175.28	4,047.5	2,162.3	-2,159.8	103.7	3.80	-3.78	1.43	
4,741.0	16.22	177.52	4,128.5	2,188.1	-2,185.6	105.3	3.45	-3.35	2.64	
4,826.0	13.45	176.07	4,210.7	2,209.8	-2,207.3	106.5	3.29	-3.26	-1.71	
4,912.0	11.24	179.72	4,294.7	2,228.2	-2,225.6	107.2	2.72	-2.57	4.24	
4,997.0	8.48	174.49	4,378.4	2,242.8	-2,240.2	107.9	3.41	-3.25	-6.15	
5,083.0	6.28	183.10	4,463.7	2,253.8	-2,251.2	108.2	2.86	-2.56	10.01	
5,168.0	3.12	179.72	4,548.4	2,260.7	-2,258.1	108.0	3.73	-3.72	-3.98	
5,202.6	1.77	179.87	4,583.0	2,262.2	-2,259.6	108.0	3.88	-3.88	0.43	
B&V 11B-18-07-95										
5,254.0	0.22	356.73	4,634.4	2,262.9	-2,260.3	108.0	3.88	-3.03	344.42	
5,339.0	0.35	317.92	4,719.4	2,262.5	-2,260.0	107.8	0.27	0.15	-45.66	
5,424.0	0.48	284.61	4,804.4	2,262.2	-2,259.7	107.3	0.32	0.15	-39.19	
5,510.0	0.83	247.08	4,890.4	2,262.3	-2,259.8	106.4	0.62	0.41	-43.64	
5,595.0	1.19	224.32	4,975.3	2,263.1	-2,260.7	105.2	0.63	0.42	-26.78	
5,681.0	0.70	81.59	5,061.3	2,263.7	-2,261.3	105.1	2.09	-0.57	-165.97	
5,766.0	1.97	92.11	5,146.3	2,263.8	-2,261.2	107.1	1.52	1.49	12.38	
5,851.0	1.89	90.51	5,231.3	2,264.0	-2,261.3	109.9	0.11	-0.09	-1.88	
5,937.0	1.36	88.62	5,317.2	2,264.1	-2,261.3	112.4	0.62	-0.62	-2.20	
6,022.0	1.14	92.84	5,402.2	2,264.2	-2,261.3	114.2	0.28	-0.26	4.96	
6,107.0	0.88	134.98	5,487.2	2,264.8	-2,261.8	115.5	0.90	-0.31	49.58	
6,192.0	0.70	196.99	5,572.2	2,265.7	-2,262.8	115.8	0.97	-0.21	72.95	
6,278.0	0.66	221.68	5,658.2	2,266.6	-2,263.6	115.4	0.34	-0.05	28.71	
6,363.0	0.97	349.17	5,743.2	2,266.2	-2,263.3	114.9	1.73	0.36	149.99	
6,449.0	0.97	330.84	5,829.2	2,264.8	-2,262.0	114.4	0.36	0.00	-21.31	
6,534.0	1.05	293.58	5,914.2	2,263.8	-2,261.0	113.3	0.76	0.09	-43.84	

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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)
6,619.0	1.05	280.13	5,999.1	2,263.3	-2,260.6	111.9	0.29	0.00	-15.82
6,685.0	1.05	276.70	6,065.1	2,263.1	-2,260.4	110.7	0.10	0.00	-5.20
Last PZD Survey									
6,745.0	1.05	276.70	6,125.1	2,262.9	-2,260.3	109.6	0.00	0.00	0.00
Staight Line Projection to TD									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,815.0	1,641.7	-661.7	32.1	Last PZD Surface Survey	
6,685.0	6,065.1	-2,260.4	110.7	Last PZD Survey	
6,745.0	6,125.1	-2,260.3	109.6	Staight Line Projection to TD	

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



Design: Actual (B&V 11B-18-07-95/Wellbore #1)

Created By: Derek Stephens Date: 9:59, December 13 2016

THIS SURVEY IS CORRECT TO THE BEST OF  
 MY KNOWLEDGE AND IS SUPPORTED  
 BY ACTUAL FIELD DATA