



# Ursa Operating Company, LLC

Rockies Region

B&V

B&V 21A-18-07-95

Wellbore #1

Design: Actual

## End of Well Report

27 December, 2016



<b>Company:</b> Ursa Operating Company, LLC	<b>Local Co-ordinate Reference:</b> Well B&V 21A-18-07-95
<b>Project:</b> Rockies Region	<b>TVD Reference:</b> B&V 21A-18-07-95 @ 5101.0usft (Plan KB)
<b>Site:</b> B&V	<b>MD Reference:</b> B&V 21A-18-07-95 @ 5101.0usft (Plan KB)
<b>Well:</b> B&V 21A-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	Using geodetic scale factor	
<b>Map Zone:</b> Colorado Central Zone		

<b>Site</b> B&V			
<b>Site Position:</b>	<b>Northing:</b> 1,598,935.06 usft	<b>Latitude:</b> 39.450164128	
<b>From:</b> Lat/Long	<b>Easting:</b> 2,280,801.73 usft	<b>Longitude:</b> -108.047211920	
<b>Position Uncertainty:</b> 0.0 usft	<b>Slot Radius:</b> 13-3/16 "	<b>Grid Convergence:</b> -1.61 °	

<b>Well</b> B&V 21A-18-07-95, SHL LAT: 39.450185560 LONG: -108.047177375					
<b>Well Position</b>	<b>+N/-S</b> 0.0 usft	<b>Northing:</b> 1,598,942.60 usft	<b>Latitude:</b> 39.450185560		
	<b>+E/-W</b> 0.0 usft	<b>Easting:</b> 2,280,811.70 usft	<b>Longitude:</b> -108.047177375		
<b>Position Uncertainty</b>	0.0 usft	<b>Wellhead Elevation:</b> 5,101.0 usft	<b>Ground Level:</b> 5,084.0 usft		

<b>Wellbore</b> Wellbore #1					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	12/27/2016	9.77	65.55	51,557

<b>Design</b> Actual					
<b>Audit Notes:</b>					
<b>Version:</b> 1.0	<b>Phase:</b> ACTUAL	<b>Tie On Depth:</b> 0.0			
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	147.65	

<b>Survey Program</b> Date 12/27/2016					
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
134.0	6,995.0	Surface (Wellbore #1)	MWD	MWD - Standard	

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<b>Well:</b>	B&V 21A-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	0.00
134.0	0.17	247.45	134.0	0.0	-0.1	-0.2	0.13	0.13	0.00	
163.0	0.04	108.57	163.0	0.0	-0.1	-0.2	0.70	-0.45	-478.90	
193.0	0.94	146.19	193.0	0.2	-0.3	-0.1	3.03	3.00	125.40	
222.0	1.58	152.16	222.0	0.9	-0.9	0.3	2.25	2.21	20.59	
253.0	2.23	153.03	253.0	1.9	-1.8	0.7	2.10	2.10	2.81	
283.0	2.99	149.22	282.9	3.2	-3.0	1.4	2.60	2.53	-12.70	
314.0	4.04	144.16	313.9	5.1	-4.5	2.4	3.53	3.39	-16.32	
344.0	4.79	142.54	343.8	7.4	-6.4	3.8	2.53	2.50	-5.40	
375.0	4.86	147.76	374.7	10.1	-8.5	5.3	1.43	0.23	16.84	
406.0	4.97	150.58	405.6	12.7	-10.8	6.7	0.86	0.35	9.10	
436.0	6.37	147.72	435.4	15.7	-13.4	8.2	4.76	4.67	-9.53	
467.0	8.04	147.55	466.2	19.6	-16.6	10.3	5.39	5.39	-0.55	
497.0	9.40	147.77	495.8	24.1	-20.5	12.7	4.53	4.53	0.73	
528.0	10.85	147.07	526.3	29.6	-25.1	15.6	4.69	4.68	-2.26	
558.0	12.22	147.56	555.7	35.6	-30.1	18.9	4.58	4.57	1.63	
588.0	13.27	146.54	585.0	42.2	-35.7	22.5	3.58	3.50	-3.40	
620.0	13.89	146.27	616.1	49.7	-41.9	26.6	1.95	1.94	-0.84	
650.0	14.63	146.76	645.2	57.1	-48.1	30.7	2.50	2.47	1.63	
681.0	15.45	147.53	675.1	65.1	-54.9	35.1	2.72	2.65	2.48	
711.0	16.13	147.55	704.0	73.3	-61.7	39.5	2.27	2.27	0.07	
742.0	17.18	147.99	733.7	82.2	-69.3	44.2	3.41	3.39	1.42	
773.0	18.19	148.95	763.2	91.6	-77.3	49.1	3.39	3.26	3.10	
803.0	19.29	149.09	791.6	101.2	-85.5	54.1	3.67	3.67	0.47	
833.0	20.35	147.77	819.9	111.4	-94.2	59.4	3.84	3.53	-4.40	
876.0	21.18	147.02	860.1	126.6	-107.1	67.6	2.03	1.93	-1.74	
919.0	21.71	146.63	900.1	142.3	-120.2	76.2	1.28	1.23	-0.91	

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<b>Site:</b> B&V	<b>MD Reference:</b> B&V 21A-18-07-95 @ 5101.0usft (Plan KB)
<b>Well:</b> B&V 21A-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	22.06	145.83	940.0	158.4	-133.5	85.1	1.07	0.81	-1.86	
1,004.0	22.54	145.31	978.8	174.3	-146.7	94.2	1.24	1.14	-1.24	
1,047.0	23.12	144.74	1,018.5	191.0	-160.3	103.7	1.44	1.35	-1.33	
1,090.0	23.47	143.86	1,058.0	207.9	-174.2	113.6	1.15	0.81	-2.05	
1,132.0	23.95	144.03	1,096.4	224.8	-187.8	123.6	1.15	1.14	0.40	
1,175.0	24.04	146.19	1,135.7	242.3	-202.2	133.6	2.05	0.21	5.02	
1,218.0	24.30	148.12	1,174.9	259.9	-216.9	143.1	1.93	0.60	4.49	
1,260.0	25.05	148.87	1,213.1	277.4	-231.9	152.3	1.94	1.79	1.79	
1,303.0	26.19	149.44	1,251.9	296.0	-247.9	161.8	2.71	2.65	1.33	
1,346.0	27.41	148.84	1,290.3	315.4	-264.5	171.8	2.91	2.84	-1.40	
1,431.0	28.78	147.07	1,365.2	355.4	-298.4	193.0	1.89	1.61	-2.08	
1,517.0	32.26	147.02	1,439.3	399.0	-335.1	216.8	4.05	4.05	-0.06	
1,602.0	35.83	148.44	1,509.7	446.6	-375.3	242.2	4.30	4.20	1.67	
1,687.0	38.58	148.65	1,577.4	498.0	-419.1	269.0	3.24	3.24	0.25	
1,773.0	40.03	148.87	1,644.0	552.5	-465.7	297.2	1.69	1.69	0.26	
1,830.0	41.26	149.17	1,687.2	589.6	-497.5	316.3	2.18	2.16	0.53	
<b>Last PZD Surface Survey</b>										
1,914.0	41.53	148.16	1,750.2	645.1	-545.0	345.2	0.86	0.32	-1.20	
1,999.0	40.43	146.76	1,814.4	700.9	-592.0	375.2	1.69	-1.29	-1.65	
2,084.0	41.12	147.51	1,878.8	756.4	-638.6	405.3	1.00	0.81	0.88	
2,170.0	39.55	146.49	1,944.3	812.0	-685.3	435.6	1.98	-1.83	-1.19	
2,255.0	40.96	146.05	2,009.2	866.9	-731.0	466.1	1.69	1.66	-0.52	
2,341.0	41.88	145.97	2,073.7	923.8	-778.1	497.9	1.07	1.07	-0.09	
2,426.0	40.91	145.09	2,137.4	980.0	-824.5	529.7	1.33	-1.14	-1.04	
2,511.0	41.98	146.72	2,201.2	1,036.2	-871.1	561.3	1.79	1.26	1.92	
2,597.0	42.28	146.27	2,264.9	1,093.9	-919.2	593.1	0.49	0.35	-0.52	
2,682.0	42.06	146.10	2,327.9	1,150.9	-966.6	624.9	0.29	-0.26	-0.20	

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<b>Well:</b>	B&V 21A-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)		
2,768.0	41.84	146.05	2,391.9	1,208.4	-1,014.3	656.9	0.26	-0.26	-0.06		
2,853.0	40.69	145.57	2,455.8	1,264.4	-1,060.7	688.4	1.40	-1.35	-0.56		
2,938.0	39.96	145.66	2,520.6	1,319.4	-1,106.1	719.5	0.86	-0.86	0.11		
3,024.0	41.31	146.10	2,585.9	1,375.4	-1,152.4	750.9	1.60	1.57	0.51		
3,109.0	40.47	145.75	2,650.1	1,431.0	-1,198.5	782.1	1.02	-0.99	-0.41		
3,195.0	41.36	146.07	2,715.1	1,487.3	-1,245.2	813.7	1.06	1.03	0.37		
3,280.0	40.22	146.19	2,779.5	1,542.8	-1,291.3	844.6	1.34	-1.34	0.14		
3,365.0	38.94	144.78	2,845.0	1,596.9	-1,335.9	875.3	1.84	-1.51	-1.66		
3,451.0	39.77	147.15	2,911.5	1,651.4	-1,381.1	905.8	2.00	0.97	2.76		
3,536.0	39.20	147.64	2,977.1	1,705.5	-1,426.6	934.9	0.76	-0.67	0.58		
3,621.0	39.16	148.74	3,043.0	1,759.2	-1,472.2	963.2	0.82	-0.05	1.29		
3,707.0	39.68	148.21	3,109.4	1,813.8	-1,518.8	991.8	0.72	0.60	-0.62		
3,792.0	41.66	150.14	3,173.9	1,869.1	-1,566.4	1,020.1	2.76	2.33	2.27		
3,878.0	42.50	148.16	3,237.7	1,926.7	-1,615.8	1,049.7	1.83	0.98	-2.30		
3,963.0	42.10	147.37	3,300.6	1,983.9	-1,664.2	1,080.2	0.78	-0.47	-0.93		
4,048.0	40.08	146.58	3,364.6	2,039.8	-1,711.1	1,110.7	2.45	-2.38	-0.93		
4,134.0	38.28	145.40	3,431.3	2,094.1	-1,756.1	1,141.0	2.27	-2.09	-1.37		
4,219.0	36.34	144.87	3,498.9	2,145.6	-1,798.4	1,170.5	2.31	-2.28	-0.62		
4,304.0	34.50	144.08	3,568.2	2,194.8	-1,838.5	1,199.1	2.23	-2.16	-0.93		
4,390.0	32.04	143.07	3,640.1	2,241.8	-1,876.4	1,227.1	2.93	-2.86	-1.17		
4,475.0	29.79	142.49	3,713.0	2,285.3	-1,911.2	1,253.5	2.67	-2.65	-0.68		
4,561.0	26.72	144.69	3,788.7	2,325.9	-1,943.9	1,277.7	3.77	-3.57	2.56		
4,646.0	25.14	144.96	3,865.2	2,363.0	-1,974.3	1,299.1	1.86	-1.86	0.32		
4,731.0	23.47	144.21	3,942.6	2,398.0	-2,002.8	1,319.4	2.00	-1.96	-0.88		
4,817.0	21.31	147.86	4,022.1	2,430.7	-2,030.0	1,337.7	2.99	-2.51	4.24		
4,868.6	19.57	147.14	4,070.5	2,448.7	-2,045.2	1,347.4	3.41	-3.37	-1.40		
<b>B&amp;V 21A-18-07-95 TGT</b>											

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<b>Well:</b>	B&V 21A-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)	
4,903.0	18.41	146.58	4,103.0	2,459.9	-2,054.5	1,353.5	3.41	-3.37	-1.62	
4,988.0	16.04	145.97	4,184.2	2,485.1	-2,075.5	1,367.5	2.80	-2.79	-0.72	
5,073.0	13.10	144.18	4,266.5	2,506.4	-2,093.0	1,379.7	3.50	-3.46	-2.11	
5,158.0	9.93	143.81	4,349.7	2,523.4	-2,106.8	1,389.6	3.73	-3.73	-0.44	
5,244.0	6.02	142.06	4,434.9	2,535.3	-2,116.3	1,396.8	4.55	-4.55	-2.03	
5,329.0	2.93	140.06	4,519.6	2,541.8	-2,121.5	1,400.9	3.64	-3.64	-2.35	
5,414.0	2.46	141.35	4,604.5	2,545.8	-2,124.6	1,403.5	0.56	-0.55	1.52	
5,500.0	2.09	148.53	4,690.5	2,549.2	-2,127.4	1,405.4	0.54	-0.43	8.35	
5,585.0	2.02	154.01	4,775.4	2,552.2	-2,130.0	1,406.9	0.25	-0.08	6.45	
5,670.0	2.01	162.20	4,860.4	2,555.2	-2,132.8	1,408.0	0.34	-0.01	9.64	
5,756.0	1.85	171.41	4,946.3	2,557.9	-2,135.6	1,408.7	0.41	-0.19	10.71	
5,798.9	1.69	171.15	4,989.1	2,559.1	-2,136.9	1,408.9	0.37	-0.36	-0.61	
<b>B&amp;V 21A-18-07-95</b>										
5,841.0	1.54	170.84	5,031.3	2,560.2	-2,138.1	1,409.1	0.37	-0.36	-0.73	
5,926.0	1.54	183.14	5,116.2	2,562.2	-2,140.3	1,409.2	0.39	0.00	14.47	
6,012.0	1.89	189.16	5,202.2	2,564.2	-2,142.9	1,408.9	0.46	0.41	7.00	
6,097.0	1.23	133.71	5,287.2	2,566.1	-2,144.9	1,409.3	1.84	-0.78	-65.24	
6,183.0	2.15	54.96	5,373.1	2,567.0	-2,144.6	1,411.3	2.63	1.07	-91.57	
6,268.0	1.53	53.86	5,458.1	2,566.8	-2,143.0	1,413.6	0.73	-0.73	-1.29	
6,353.0	0.62	53.64	5,543.1	2,566.7	-2,142.1	1,414.8	1.07	-1.07	-0.26	
6,439.0	0.00	209.60	5,629.1	2,566.7	-2,141.8	1,415.2	0.72	-0.72	0.00	
6,524.0	0.66	261.15	5,714.1	2,566.5	-2,141.9	1,414.7	0.78	0.78	0.00	
6,610.0	0.83	253.32	5,800.1	2,566.1	-2,142.2	1,413.6	0.23	0.20	-9.10	
6,695.0	0.83	248.36	5,885.1	2,565.8	-2,142.6	1,412.5	0.08	0.00	-5.84	
6,780.0	0.88	236.93	5,970.1	2,565.7	-2,143.1	1,411.4	0.21	0.06	-13.45	
6,866.0	1.05	243.45	6,056.0	2,565.6	-2,143.9	1,410.1	0.24	0.20	7.58	

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6,935.0	1.05	244.32	6,125.0	2,565.5	-2,144.4	1,409.0	0.02	0.00	1.26	
<b>Last PZD Survey</b>										
6,995.0	1.05	244.32	6,185.0	2,565.4	-2,144.9	1,408.0	0.00	0.00	0.00	
<b>Straight Line Projection to TD</b>										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,830.0	1,687.2	-497.5	316.3	Last PZD Surface Survey	
6,935.0	6,125.0	-2,144.4	1,409.0	Last PZD Survey	
6,995.0	6,185.0	-2,144.9	1,408.0	Straight Line Projection to TD	

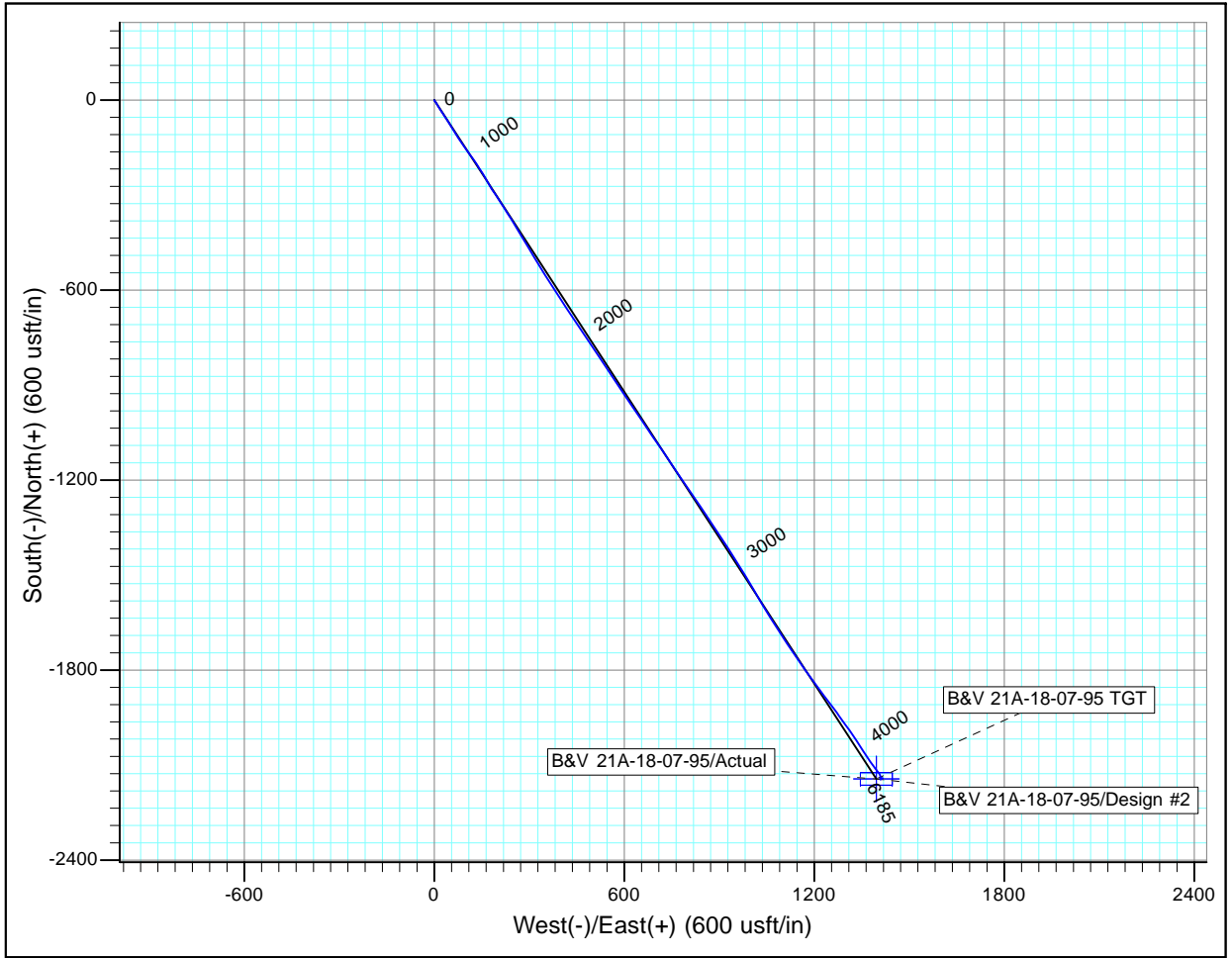
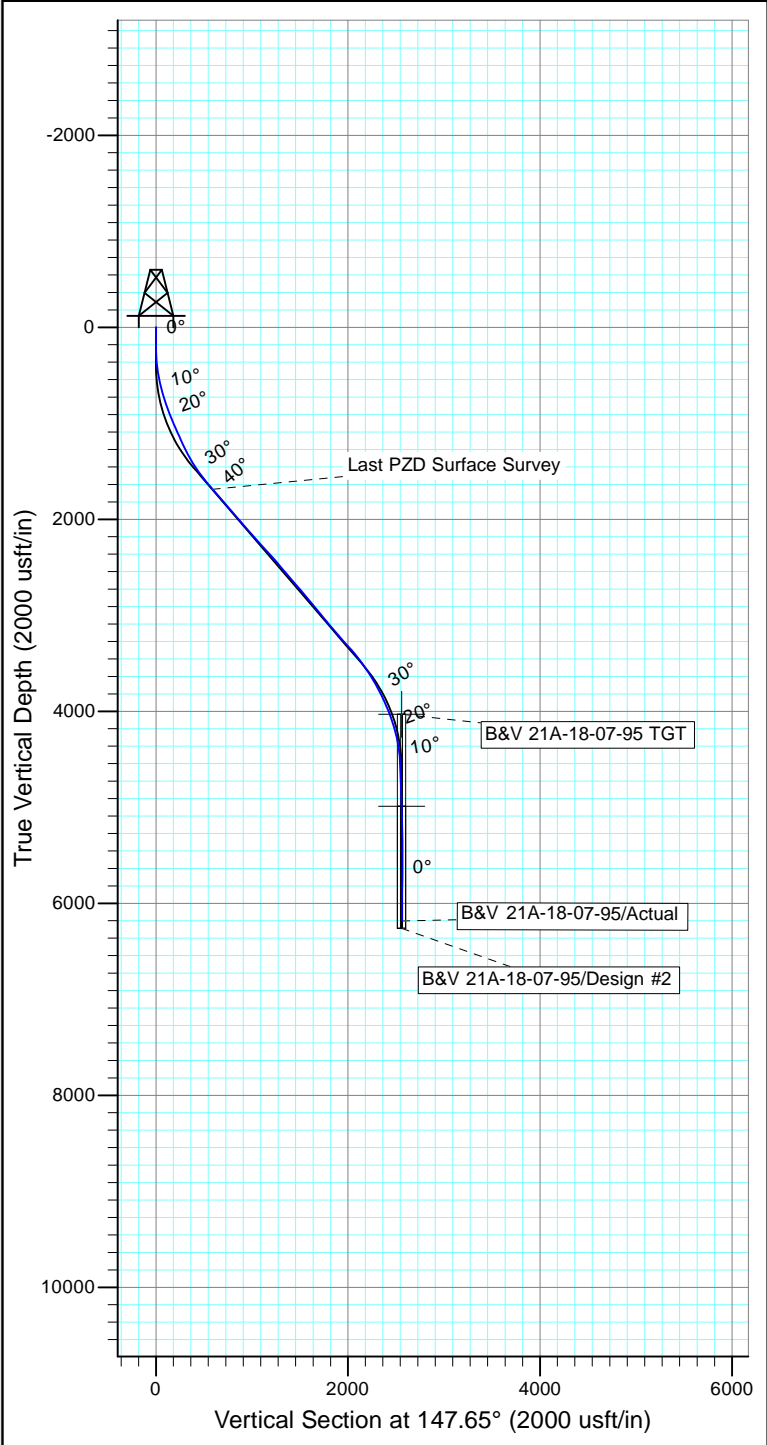
Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



Project: Rockies Region  
 Site: B&V  
 Well: B&V 21A-18-07-95  
 Wellbore: Wellbore #1  
 Design: Actual

Azimuths to True North  
 Magnetic North: 9.77°

Magnetic Field  
 Strength: 51557.2snT  
 Dip Angle: 65.55°  
 Date: 12/27/2016  
 Model: IGRF2015



Design: Actual (B&V 21A-18-07-95/Wellbore #1)

Created By: Derek Stephens    Date: 8:32, December 27 2016

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