

# **Bonanza Creek Energy Inc.**

**Weld Co., CO**

**Sec.2-T5N-R62W**

**State Antelope 11-41-2HNB**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**05 May, 2015**

# **Archer**

<b>Company:</b>	Bonanza Creek Energy Inc.	<b>Local Co-ordinate Reference:</b>	Well State Antelope 11-41-2HNB
<b>Project:</b>	Weld Co., CO	<b>TVD Reference:</b>	WELL @ 4665.0usft (Original Well Elev)
<b>Site:</b>	Sec.2-T5N-R62W	<b>MD Reference:</b>	WELL @ 4665.0usft (Original Well Elev)
<b>Well:</b>	State Antelope 11-41-2HNB	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDMDBBW

<b>Project</b>	Weld Co., CO		
<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 Northern Zone		

<b>Site</b>	Sec.2-T5N-R62W				
<b>Site Position:</b>		<b>Northing:</b>	1,402,901.96 usft	<b>Latitude:</b>	40° 25' 59.318 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,334,557.68 usft	<b>Longitude:</b>	104° 17' 53.290 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16"	<b>Grid Convergence:</b>	0.78 °

<b>Well</b>	State Antelope 11-41-2HNB					
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	1,402,962.03 usft	<b>Latitude:</b>	40° 25' 59.931 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	3,334,412.37 usft	<b>Longitude:</b>	104° 17' 55.158 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	4,648.0 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>
	IGRF2010	2015/03/06	8.11	67.02	52,805

<b>Design</b>	Wellbore #1				
<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	87.85

<b>Survey Program</b>	<b>Date</b>	2015/05/05			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
504.0	10,880.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
<b>first Archer Survey</b>										
504.0	0.30	94.50	504.0	-0.1	1.3	1.3	0.06	0.06	0.00	
597.0	0.20	88.10	597.0	-0.1	1.7	1.7	0.11	-0.11	-6.88	
689.0	0.10	156.70	689.0	-0.2	1.9	1.9	0.20	-0.11	74.57	
780.0	0.10	123.10	780.0	-0.3	2.0	2.0	0.06	0.00	-36.92	
872.0	0.10	173.50	872.0	-0.4	2.1	2.1	0.09	0.00	54.78	
963.0	0.30	206.70	963.0	-0.7	2.0	2.0	0.25	0.22	36.48	
1,055.0	0.30	220.80	1,055.0	-1.1	1.7	1.7	0.08	0.00	15.33	
1,146.0	0.30	216.80	1,146.0	-1.5	1.4	1.4	0.02	0.00	-4.40	
1,238.0	0.40	195.50	1,238.0	-2.0	1.2	1.1	0.18	0.11	-23.15	
1,330.0	0.50	200.90	1,330.0	-2.7	1.0	0.9	0.12	0.11	5.87	
1,422.0	0.70	221.90	1,422.0	-3.5	0.4	0.3	0.32	0.22	22.83	

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<b>Well:</b>	State Antelope 11-41-2HNB	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDMDBBW

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
1,513.0	0.70	227.10	1,513.0	-4.3	-0.3	-0.5	0.07	0.00	5.71	
1,605.0	0.50	206.90	1,605.0	-5.0	-0.9	-1.1	0.31	-0.22	-21.96	
1,696.0	0.70	213.10	1,696.0	-5.8	-1.4	-1.6	0.23	0.22	6.81	
1,788.0	0.90	217.90	1,788.0	-6.9	-2.2	-2.4	0.23	0.22	5.22	
1,879.0	1.20	56.40	1,879.0	-6.9	-1.8	-2.1	2.28	0.33	-177.47	
1,964.0	1.90	354.60	1,963.9	-5.0	-1.2	-1.4	2.00	0.82	-72.71	
2,049.0	1.80	357.50	2,048.9	-2.3	-1.4	-1.5	0.16	-0.12	3.41	
2,133.0	3.70	349.70	2,132.8	1.7	-1.9	-1.9	2.30	2.26	-9.29	
2,218.0	3.60	332.80	2,217.6	6.8	-3.6	-3.4	1.27	-0.12	-19.88	
2,303.0	4.40	332.40	2,302.4	12.1	-6.4	-5.9	0.94	0.94	-0.47	
2,388.0	7.10	325.30	2,387.0	19.3	-10.9	-10.1	3.28	3.18	-8.35	
2,473.0	8.60	326.50	2,471.2	28.9	-17.4	-16.3	1.78	1.76	1.41	
2,558.0	10.30	324.30	2,555.0	40.4	-25.3	-23.8	2.04	2.00	-2.59	
2,643.0	12.40	327.80	2,638.3	54.3	-34.6	-32.6	2.60	2.47	4.12	
2,728.0	14.50	328.10	2,721.0	71.0	-45.1	-42.4	2.47	2.47	0.35	
2,813.0	15.80	325.20	2,803.1	89.5	-57.3	-53.9	1.77	1.53	-3.41	
2,898.0	15.50	325.60	2,884.9	108.4	-70.3	-66.2	0.38	-0.35	0.47	
2,983.0	15.40	326.40	2,966.8	127.2	-83.0	-78.2	0.28	-0.12	0.94	
3,068.0	16.50	324.50	3,048.6	146.4	-96.3	-90.7	1.43	1.29	-2.24	
3,153.0	13.10	322.10	3,130.7	163.9	-109.2	-103.0	4.06	-4.00	-2.82	
3,239.0	13.30	315.20	3,214.5	178.6	-122.2	-115.4	1.85	0.23	-8.02	
3,324.0	16.50	314.10	3,296.6	193.9	-137.7	-130.3	3.78	3.76	-1.29	
3,411.0	19.60	317.70	3,379.3	213.3	-156.4	-148.3	3.79	3.56	4.14	
3,496.0	20.50	323.80	3,459.2	235.9	-174.8	-165.8	2.68	1.06	7.18	
3,581.0	21.30	328.50	3,538.6	261.0	-191.7	-181.7	2.18	0.94	5.53	
3,666.0	19.70	329.90	3,618.2	286.6	-206.9	-196.0	1.97	-1.88	1.65	
3,751.0	18.10	330.20	3,698.6	310.5	-220.7	-208.9	1.89	-1.88	0.35	
3,836.0	16.00	332.00	3,779.9	332.3	-232.7	-220.1	2.55	-2.47	2.12	
3,923.0	15.20	333.30	3,863.7	353.0	-243.5	-230.1	1.00	-0.92	1.49	
4,010.0	13.10	334.70	3,948.0	372.1	-252.8	-238.7	2.45	-2.41	1.61	
4,095.0	12.50	336.20	4,030.9	389.3	-260.6	-245.9	0.81	-0.71	1.76	
4,185.0	13.70	334.00	4,118.6	407.8	-269.2	-253.8	1.44	1.33	-2.44	
4,270.0	14.40	331.00	4,201.0	426.0	-278.8	-262.6	1.19	0.82	-3.53	
4,357.0	12.80	334.30	4,285.6	444.2	-288.2	-271.3	2.04	-1.84	3.79	
4,444.0	13.90	328.60	4,370.2	461.8	-297.8	-280.3	1.97	1.26	-6.55	
4,529.0	12.70	332.10	4,452.9	478.8	-307.5	-289.3	1.70	-1.41	4.12	
4,613.0	11.80	325.40	4,535.0	494.0	-316.7	-298.0	2.00	-1.07	-7.98	
4,698.0	12.40	328.20	4,618.2	508.9	-326.5	-307.1	0.99	0.71	3.29	
4,782.0	10.70	329.70	4,700.4	523.3	-335.2	-315.3	2.05	-2.02	1.79	
4,868.0	9.00	334.50	4,785.2	536.3	-342.1	-321.7	2.19	-1.98	5.58	
4,954.0	6.70	324.70	4,870.4	546.4	-347.9	-327.1	3.09	-2.67	-11.40	
5,039.0	4.80	331.70	4,954.9	553.6	-352.4	-331.4	2.38	-2.24	8.24	
5,124.0	4.20	320.60	5,039.7	559.2	-356.1	-334.9	1.24	-0.71	-13.06	
5,209.0	2.80	327.50	5,124.5	563.3	-359.2	-337.8	1.72	-1.65	8.12	
5,296.0	3.10	344.90	5,211.4	567.4	-360.9	-339.4	1.08	0.34	20.00	
5,382.0	2.00	320.60	5,297.3	570.8	-362.5	-340.8	1.77	-1.28	-28.26	
5,468.0	0.10	319.60	5,383.3	572.0	-363.5	-341.8	2.21	-2.21	-1.16	
5,553.0	1.30	79.30	5,468.3	572.2	-362.6	-340.9	1.59	1.41	140.82	
5,638.0	0.70	29.20	5,553.3	572.9	-361.4	-339.6	1.18	-0.71	-58.94	
5,697.0	0.80	20.80	5,612.3	573.6	-361.1	-339.3	0.25	0.17	-14.24	
5,739.0	2.90	66.10	5,654.3	574.3	-360.0	-338.2	5.73	5.00	107.86	
5,782.0	8.10	78.90	5,697.0	575.3	-356.0	-334.2	12.35	12.09	29.77	
5,823.0	13.40	80.60	5,737.3	576.6	-348.5	-326.6	12.95	12.93	4.15	
5,866.0	16.30	82.60	5,778.9	578.2	-337.6	-315.7	6.85	6.74	4.65	

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDMDBBW

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,908.0	19.60	81.30	5,818.8	580.0	-324.8	-302.8	7.91	7.86	-3.10	
5,951.0	23.10	83.20	5,858.9	582.1	-309.3	-287.2	8.30	8.14	4.42	
5,993.0	26.20	83.80	5,897.0	584.1	-291.9	-269.8	7.40	7.38	1.43	
6,036.0	31.10	83.30	5,934.8	586.4	-271.4	-249.2	11.41	11.40	-1.16	
6,078.0	32.20	83.50	5,970.5	589.0	-249.5	-227.2	2.63	2.62	0.48	
6,121.0	37.20	87.10	6,005.9	590.9	-225.1	-202.8	12.56	11.63	8.37	
6,162.0	43.10	91.00	6,037.2	591.3	-198.7	-176.4	15.64	14.39	9.51	
6,205.0	49.20	91.40	6,067.0	590.7	-167.7	-145.4	14.20	14.19	0.93	
6,247.0	53.60	88.80	6,093.2	590.6	-134.9	-112.7	11.54	10.48	-6.19	
6,290.0	60.00	85.90	6,116.7	592.3	-99.0	-76.7	15.92	14.88	-6.74	
6,332.0	63.60	84.30	6,136.5	595.5	-62.1	-39.7	9.21	8.57	-3.81	
6,375.0	69.70	84.90	6,153.6	599.2	-22.8	-0.3	14.24	14.19	1.40	
6,416.0	73.60	85.10	6,166.5	602.6	15.9	38.5	9.52	9.51	0.49	
6,459.0	80.70	87.00	6,176.0	605.5	57.7	80.4	17.06	16.51	4.42	
6,501.0	83.50	87.70	6,181.8	607.4	99.3	122.0	6.87	6.67	1.67	
6,544.0	85.50	86.20	6,185.9	609.7	142.0	164.8	5.80	4.65	-3.49	
6,586.0	88.60	86.20	6,188.1	612.4	183.9	206.7	7.38	7.38	0.00	
<b>ICP 717' FNL &amp; 579'FWL</b>										
6,595.0	88.92	86.15	6,188.3	613.0	192.8	215.7	3.58	3.53	-0.59	
6,603.0	89.20	86.10	6,188.4	613.6	200.8	223.7	3.58	3.53	-0.59	
6,664.0	88.90	83.60	6,189.4	619.1	261.6	284.6	4.13	-0.49	-4.10	
<b>TOP 709'FNL &amp; 721' FWL</b>										
6,738.0	89.38	84.89	6,190.5	626.5	335.2	358.4	1.86	0.65	1.74	
6,756.0	89.50	85.20	6,190.7	628.0	353.1	376.4	1.86	0.65	1.74	
6,847.0	90.70	87.50	6,190.6	633.8	443.9	467.4	2.85	1.32	2.53	
6,939.0	90.10	89.10	6,189.9	636.6	535.9	559.4	1.86	-0.65	1.74	
7,030.0	90.20	89.30	6,189.7	637.8	626.9	650.3	0.25	0.11	0.22	
7,115.0	91.30	89.70	6,188.6	638.6	711.8	735.3	1.38	1.29	0.47	
7,200.0	89.50	90.30	6,188.0	638.6	796.8	820.2	2.23	-2.12	0.71	
7,285.0	91.40	91.80	6,187.3	637.0	881.8	905.1	2.85	2.24	1.76	
7,370.0	89.50	91.00	6,186.6	634.9	966.8	989.9	2.43	-2.24	-0.94	
7,456.0	88.00	90.00	6,188.5	634.2	1,052.8	1,075.8	2.10	-1.74	-1.16	
7,543.0	88.40	88.10	6,191.2	635.6	1,139.7	1,162.7	2.23	0.46	-2.18	
7,628.0	89.80	87.00	6,192.6	639.3	1,224.6	1,247.7	2.09	1.65	-1.29	
7,713.0	90.50	87.70	6,192.4	643.2	1,309.5	1,332.7	1.16	0.82	0.82	
7,798.0	91.60	88.30	6,190.8	646.2	1,394.4	1,417.7	1.47	1.29	0.71	
7,883.0	89.00	86.50	6,190.4	650.0	1,479.3	1,502.7	3.72	-3.06	-2.12	
7,968.0	87.90	85.00	6,192.7	656.3	1,564.1	1,587.6	2.19	-1.29	-1.76	
8,053.0	90.40	85.90	6,193.9	663.0	1,648.8	1,672.5	3.13	2.94	1.06	
8,138.0	92.20	86.60	6,192.0	668.6	1,733.6	1,757.4	2.27	2.12	0.82	
8,223.0	91.50	87.00	6,189.2	673.3	1,818.4	1,842.4	0.95	-0.82	0.47	
8,308.0	89.50	86.90	6,188.5	677.9	1,903.3	1,927.4	2.36	-2.35	-0.12	
8,393.0	89.50	87.10	6,189.2	682.3	1,988.2	2,012.4	0.24	0.00	0.24	
8,478.0	89.30	86.60	6,190.1	687.0	2,073.0	2,097.3	0.63	-0.24	-0.59	
8,563.0	90.80	87.60	6,190.1	691.3	2,157.9	2,182.3	2.12	1.76	1.18	
8,648.0	92.20	88.40	6,187.8	694.3	2,242.8	2,267.3	1.90	1.65	0.94	
8,733.0	90.80	88.40	6,185.6	696.6	2,327.8	2,352.3	1.65	-1.65	0.00	
8,818.0	89.80	89.20	6,185.2	698.4	2,412.7	2,437.2	1.51	-1.18	0.94	
8,903.0	88.40	89.70	6,186.5	699.2	2,497.7	2,522.2	1.75	-1.65	0.59	
8,988.0	88.50	90.00	6,188.8	699.4	2,582.7	2,607.1	0.37	0.12	0.35	
9,073.0	88.40	88.90	6,191.1	700.3	2,667.7	2,692.0	1.30	-0.12	-1.29	
9,159.0	89.50	87.70	6,192.7	702.8	2,753.6	2,778.0	1.89	1.28	-1.40	
9,244.0	90.30	88.00	6,192.8	706.0	2,838.5	2,863.0	1.01	0.94	0.35	
9,329.0	90.60	88.20	6,192.2	708.8	2,923.5	2,948.0	0.42	0.35	0.24	

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDMDBBW

Survey										
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9,416.0	90.10	87.40	6,191.6	712.2	3,010.4	3,035.0	1.08	-0.57	-0.92	
9,501.0	91.00	90.10	6,190.8	714.0	3,095.4	3,120.0	3.35	1.06	3.18	
9,586.0	88.00	88.40	6,191.5	715.1	3,180.4	3,205.0	4.06	-3.53	-2.00	
9,671.0	88.00	89.10	6,194.5	717.0	3,265.3	3,289.9	0.82	0.00	0.82	
9,756.0	89.00	88.30	6,196.7	718.9	3,350.2	3,374.9	1.51	1.18	-0.94	
9,841.0	90.10	87.30	6,197.4	722.2	3,435.2	3,459.9	1.75	1.29	-1.18	
9,926.0	90.90	87.50	6,196.7	726.0	3,520.1	3,544.8	0.97	0.94	0.24	
10,013.0	88.60	86.00	6,197.0	731.0	3,606.9	3,631.8	3.16	-2.64	-1.72	
10,098.0	91.00	88.70	6,197.3	734.9	3,691.8	3,716.8	4.25	2.82	3.18	
10,183.0	92.00	89.00	6,195.1	736.6	3,776.8	3,801.8	1.23	1.18	0.35	
10,272.0	90.50	88.00	6,193.2	738.9	3,865.7	3,890.7	2.03	-1.69	-1.12	
10,359.0	89.45	86.90	6,193.2	742.8	3,952.6	3,977.7	1.75	-1.21	-1.26	
10,446.0	90.90	87.10	6,192.9	747.3	4,039.5	4,064.7	1.68	1.67	0.23	
10,531.0	91.70	87.40	6,191.0	751.4	4,124.4	4,149.7	1.01	0.94	0.35	
10,616.0	91.00	88.00	6,189.0	754.8	4,209.3	4,234.7	1.08	-0.82	0.71	
10,701.0	88.70	87.70	6,189.2	758.0	4,294.2	4,319.7	2.73	-2.71	-0.35	
10,788.0	88.80	88.00	6,191.1	761.3	4,381.2	4,406.6	0.36	0.11	0.34	
<b>Last Archer Survey</b>										
10,818.0	89.00	88.00	6,191.7	762.3	4,411.1	4,436.6	0.67	0.67	0.00	
<b>BHL 726' FNL &amp; 473' FEL - State Antelope 11-42-2HNB tgt</b>										
10,880.0	89.00	88.00	6,192.8	764.5	4,473.1	4,498.6	0.00	0.00	0.00	

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
504.0	504.0	-0.1	1.3	first Archer Survey	
6,595.0	6,188.3	613.0	192.8	ICP 717' FNL & 579'FWL	
6,738.0	6,190.5	626.5	335.2	TOP 709'FNL & 721' FWL	
10,818.0	6,191.7	762.3	4,411.1	Last Archer Survey	
10,880.0	6,192.8	764.5	4,473.1	BHL 726' FNL & 473' FEL	

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