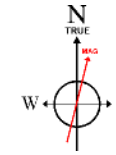


# CUB CREEK ENERGY, LLC

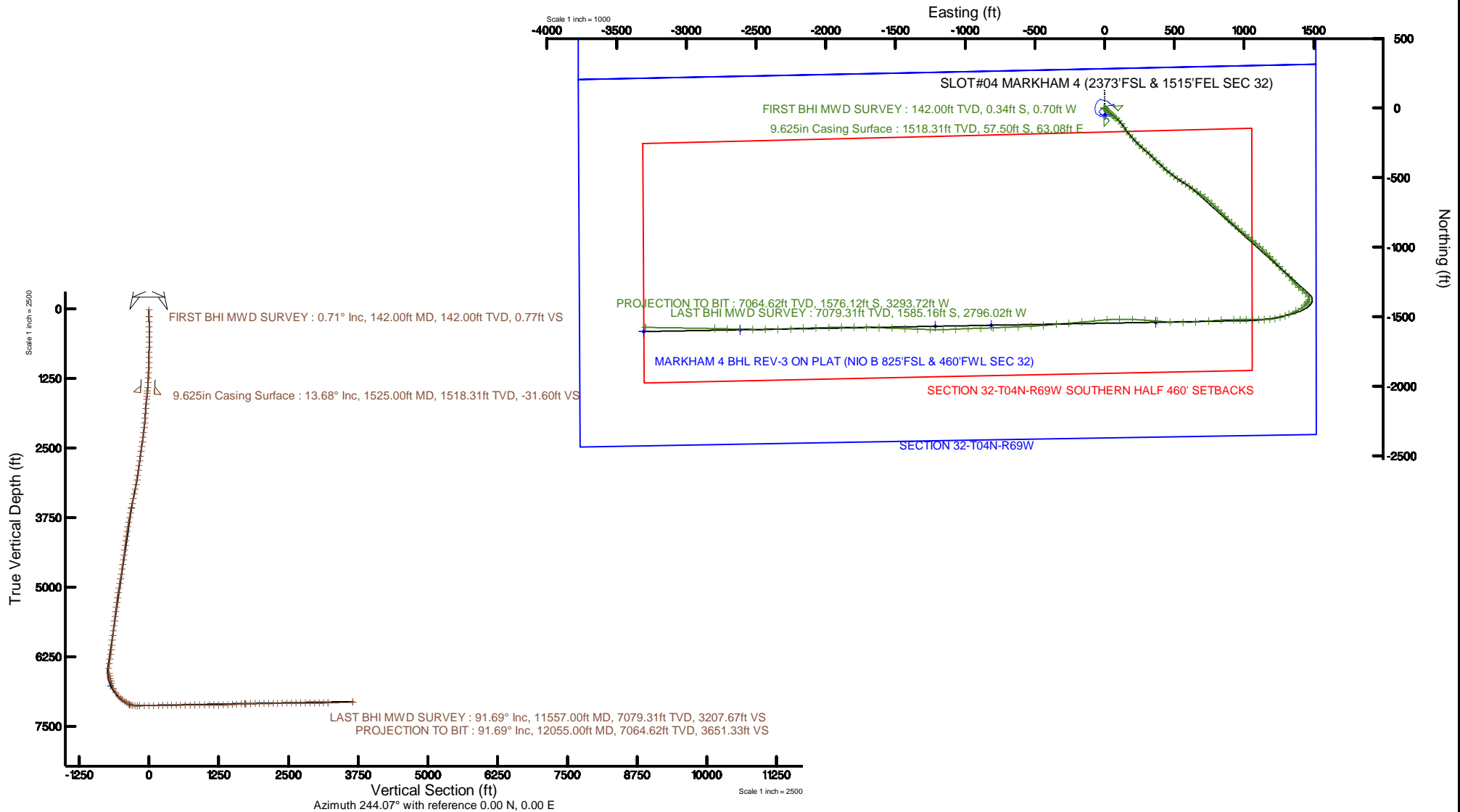
Location: COLORADO Slot: SLOT#04 MARKHAM 4 (2373'FSL & 1515'FEL SEC 32)  
Field: WELD COUNTY (NAD83, TRUE NORTH) Well: MARKHAM 4  
Facility: SEC.32-T04N-R68W Wellbore: MARKHAM 4 PWB

Plot reference wellpath is MARKHAM 4 REV-D.0 PWP	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
True vertical depths are referenced to XTREME 18 (17) (RKB)	* = Wellpath was transformed from a different geodetic datum
Measured depths are referenced to XTREME 18 (17) (RKB)	North Reference: True north
XTREME 18 (17) (RKB) to Mean Sea Level: 5059 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: SLOT#04 MARKHAM 4 (2373'FSL & 1515'FEL SEC 32)): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: bensjacj on 2016-10-13
	Database: WA_DEN_Denver_Defn



BGGM (1900.0 to 2018.0) Dip: 66.75° Field: 52401.7 nT  
Magnetic North is 8.57 degrees East of True North (at 10/5/2016)

To correct azimuth from Magnetic to True add 8.57 degrees



# Actual Wellpath Report

MARKHAM 4 AWP

Page 1 of 6



REFERENCE WELLPATH IDENTIFICATION			
Operator	CUB CREEK ENERGY, LLC	Slot	SLOT#04 MARKHAM 4 (2373'FSL & 1515'FEL SEC 32)
Area	COLORADO	Well	MARKHAM 4
Field	WELD COUNTY (NAD83, TRUE NORTH)	Wellbore	MARKHAM 4 AWP
Facility	SEC.32-T04N-R68W		

REPORT SETUP INFORMATION			
Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect® 5.0
North Reference	True	User	Bensjacj
Scale	0.999957	Report Generated	10/13/2016 at 12:48:12 PM
Convergence at slot	0.31° East	Database/Source file	WA_DEN_Denver_Defn/MARKHAM_4_AWP.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	47.36	-2.80	3133069.72	1341104.88	40°16'07.500"N	105°01'23.268"W
Facility Reference Pt			3133072.77	1341057.53	40°16'07.032"N	105°01'23.232"W
Field Reference Pt			3133072.77	1341057.53	40°16'07.032"N	105°01'23.232"W

WELLPATH DATUM			
Calculation method	Minimum curvature	XTREME 18 (17') (RKB) to Facility Vertical Datum	5059.00ft
Horizontal Reference Pt	Slot	XTREME 18 (17') (RKB) to Mean Sea Level	5059.00ft
Vertical Reference Pt	XTREME 18 (17') (RKB)	XTREME 18 (17') (RKB) to Mud Line at Slot (SLOT#04 MARKHAM 4 (2373'FSL & 1515'FEL SEC 32))	5059.00ft
MD Reference Pt	XTREME 18 (17') (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	244.07°

# Actual Wellpath Report

MARKHAM 4 AWP

Page 2 of 6



REFERENCE WELLPATH IDENTIFICATION			
Operator	CUB CREEK ENERGY, LLC	Slot	SLOT#04 MARKHAM 4 (2373'FSL & 1515'FEL SEC 32)
Area	COLORADO	Well	MARKHAM 4
Field	WELD COUNTY (NAD83, TRUE NORTH)	Wellbore	MARKHAM 4 AWB
Facility	SEC.32-T04N-R68W		

## WELLPATH DATA (136 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
17.00	0.000	244.100	17.00	0.00	0.00	0.00	40°16'07.500"N	105°01'23.268"W	0.00	
142.00	0.710	244.100	142.00	0.77	-0.34	-0.70	40°16'07.497"N	105°01'23.277"W	0.57	FIRST BHI MWD SURVEY
234.00	0.990	249.840	233.99	2.14	-0.86	-1.96	40°16'07.491"N	105°01'23.293"W	0.32	
326.00	0.630	287.980	325.98	3.29	-0.98	-3.18	40°16'07.490"N	105°01'23.309"W	0.68	
418.00	0.290	100.840	417.98	3.47	-0.87	-3.44	40°16'07.491"N	105°01'23.312"W	1.00	
510.00	0.250	309.850	509.98	3.36	-0.78	-3.36	40°16'07.492"N	105°01'23.311"W	0.57	
603.00	0.500	41.610	602.97	3.07	-0.35	-3.25	40°16'07.497"N	105°01'23.310"W	0.61	
693.00	0.460	44.540	692.97	2.37	0.20	-2.73	40°16'07.502"N	105°01'23.303"W	0.05	
783.00	0.440	74.350	782.97	1.69	0.55	-2.15	40°16'07.505"N	105°01'23.296"W	0.26	
874.00	1.830	128.450	873.95	0.72	-0.26	-0.67	40°16'07.497"N	105°01'23.277"W	1.77	
964.00	4.570	130.780	963.80	-1.32	-3.49	3.17	40°16'07.465"N	105°01'23.227"W	3.05	
1056.00	5.330	129.700	1055.46	-4.54	-8.62	9.23	40°16'07.415"N	105°01'23.149"W	0.83	
1148.00	5.990	129.190	1147.01	-8.32	-14.38	16.24	40°16'07.358"N	105°01'23.058"W	0.72	
1240.00	7.890	137.110	1238.33	-12.18	-22.04	24.26	40°16'07.282"N	105°01'22.955"W	2.31	
1329.00	9.720	135.030	1326.28	-16.42	-31.83	33.73	40°16'07.185"N	105°01'22.833"W	2.09	
1418.00	10.800	129.280	1413.86	-22.36	-42.43	45.49	40°16'07.081"N	105°01'22.681"W	1.67	
1483.00	13.080	131.200	1477.45	-27.78	-51.13	55.74	40°16'06.995"N	105°01'22.549"W	3.56	
1585.00	14.530	130.050	1576.50	-37.47	-66.96	74.22	40°16'06.838"N	105°01'22.311"W	1.45	
1631.00	14.700	131.120	1621.01	-42.10	-74.51	83.04	40°16'06.764"N	105°01'22.197"W	0.69	
1721.00	18.170	134.290	1707.32	-51.31	-91.83	101.69	40°16'06.593"N	105°01'21.956"W	3.98	
1812.00	18.600	141.340	1793.69	-59.31	-113.07	120.91	40°16'06.383"N	105°01'21.708"W	2.49	
1904.00	20.470	146.910	1880.40	-64.55	-138.01	138.87	40°16'06.136"N	105°01'21.477"W	2.87	
1995.00	21.560	144.290	1965.34	-69.37	-164.92	157.31	40°16'05.870"N	105°01'21.239"W	1.58	
2087.00	21.590	138.710	2050.91	-76.73	-191.37	178.35	40°16'05.609"N	105°01'20.967"W	2.23	
2178.00	21.770	137.560	2135.47	-85.97	-216.40	200.79	40°16'05.362"N	105°01'20.678"W	0.51	
2270.00	21.590	138.120	2220.96	-95.47	-241.59	223.60	40°16'05.113"N	105°01'20.384"W	0.30	
2362.00	21.810	134.560	2306.45	-105.83	-266.19	247.08	40°16'04.870"N	105°01'20.081"W	1.45	
2454.00	21.700	129.850	2391.90	-118.52	-289.08	272.31	40°16'04.643"N	105°01'19.755"W	1.90	
2546.00	20.900	131.090	2477.62	-131.90	-310.76	297.74	40°16'04.429"N	105°01'19.427"W	1.00	
2636.00	21.710	133.970	2561.47	-143.89	-332.87	321.82	40°16'04.211"N	105°01'19.116"W	1.47	
2728.00	21.600	134.080	2646.97	-155.53	-356.47	346.23	40°16'03.977"N	105°01'18.802"W	0.13	
2820.00	21.700	133.280	2732.48	-167.36	-379.91	370.78	40°16'03.746"N	105°01'18.485"W	0.34	
2912.00	21.630	132.410	2817.98	-179.66	-403.00	395.68	40°16'03.518"N	105°01'18.164"W	0.36	
3004.00	21.260	136.080	2903.62	-191.07	-426.46	419.77	40°16'03.286"N	105°01'17.853"W	1.51	
3096.00	21.580	128.940	2989.28	-203.41	-449.11	444.50	40°16'03.062"N	105°01'17.534"W	2.85	
3187.00	21.450	129.110	3073.94	-217.54	-470.12	470.43	40°16'02.854"N	105°01'17.199"W	0.16	
3277.00	21.010	126.970	3157.83	-231.84	-490.21	496.09	40°16'02.656"N	105°01'16.868"W	0.99	
3368.00	21.700	124.390	3242.59	-247.60	-509.52	523.01	40°16'02.465"N	105°01'16.521"W	1.28	
3460.00	21.230	122.620	3328.20	-264.72	-528.11	551.07	40°16'02.281"N	105°01'16.159"W	0.87	
3550.00	21.090	121.150	3412.14	-282.02	-545.27	578.66	40°16'02.112"N	105°01'15.803"W	0.61	
3642.00	21.260	125.870	3497.93	-298.90	-563.60	606.34	40°16'01.930"N	105°01'15.446"W	1.86	
3731.00	22.330	124.890	3580.57	-314.77	-582.73	633.28	40°16'01.741"N	105°01'15.099"W	1.27	
3823.00	22.160	122.670	3665.72	-332.34	-602.09	662.23	40°16'01.550"N	105°01'14.725"W	0.93	
3913.00	22.200	125.300	3749.07	-349.36	-621.08	690.39	40°16'01.362"N	105°01'14.362"W	1.10	
4002.00	21.950	127.690	3831.54	-364.85	-640.97	717.28	40°16'01.166"N	105°01'14.015"W	1.05	

# Actual Wellpath Report

MARKHAM 4 AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	CUB CREEK ENERGY, LLC	Slot	SLOT#04 MARKHAM 4 (2373'FSL & 1515'FEL SEC 32)
Area	COLORADO	Well	MARKHAM 4
Field	WELD COUNTY (NAD83, TRUE NORTH)	Wellbore	MARKHAM 4 AWB
Facility	SEC.32-T04N-R68W		

## WELLPATH DATA (136 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
4091.00	22.400	132.030	3913.97	-378.61	-662.49	743.04	40°16'00.953"N	105°01'13.683"W	1.91	
4181.00	22.200	134.550	3997.24	-390.73	-685.90	767.89	40°16'00.722"N	105°01'13.362"W	1.09	
4272.00	21.670	133.070	4081.65	-402.49	-709.44	792.42	40°16'00.489"N	105°01'13.046"W	0.84	
4362.00	21.120	132.950	4165.45	-414.29	-731.83	816.43	40°16'00.268"N	105°01'12.736"W	0.61	
4452.00	20.940	134.570	4249.45	-425.51	-754.17	839.75	40°16'00.047"N	105°01'12.435"W	0.68	
4544.00	21.150	136.120	4335.32	-436.11	-777.67	862.97	40°15'59.815"N	105°01'12.136"W	0.65	
4637.00	20.940	134.120	4422.11	-446.95	-801.33	886.53	40°15'59.581"N	105°01'11.832"W	0.80	
4729.00	21.080	133.310	4508.00	-458.43	-824.12	910.37	40°15'59.356"N	105°01'11.524"W	0.35	
4819.00	20.960	131.200	4592.01	-470.42	-845.83	934.26	40°15'59.141"N	105°01'11.216"W	0.85	
4911.00	20.820	131.230	4677.96	-483.17	-867.44	958.94	40°15'58.928"N	105°01'10.898"W	0.15	
5003.00	21.000	131.490	4763.90	-495.85	-889.14	983.58	40°15'58.713"N	105°01'10.580"W	0.22	
5093.00	20.960	127.170	4847.94	-509.32	-909.55	1008.49	40°15'58.512"N	105°01'10.259"W	1.72	
5184.00	21.590	129.000	4932.74	-523.78	-929.92	1034.47	40°15'58.310"N	105°01'09.923"W	1.01	
5276.00	21.650	129.870	5018.27	-537.92	-951.45	1060.65	40°15'58.098"N	105°01'09.586"W	0.35	
5368.00	21.640	131.400	5103.78	-551.41	-973.55	1086.40	40°15'57.879"N	105°01'09.254"W	0.61	
5460.00	21.550	132.320	5189.33	-564.21	-996.14	1111.62	40°15'57.656"N	105°01'08.928"W	0.38	
5552.00	21.630	135.100	5274.87	-575.99	-1019.53	1136.08	40°15'57.425"N	105°01'08.613"W	1.12	
5644.00	21.400	134.200	5360.46	-587.21	-1043.24	1160.08	40°15'57.191"N	105°01'08.303"W	0.44	
5734.00	21.500	136.330	5444.23	-597.82	-1066.62	1183.24	40°15'56.960"N	105°01'08.004"W	0.87	
5824.00	21.700	136.970	5527.91	-607.74	-1090.71	1205.99	40°15'56.721"N	105°01'07.711"W	0.34	
5914.00	21.770	137.360	5611.51	-617.43	-1115.15	1228.64	40°15'56.480"N	105°01'07.419"W	0.18	
6006.00	21.660	136.280	5696.98	-627.52	-1139.97	1251.94	40°15'56.235"N	105°01'07.118"W	0.45	
6098.00	21.580	134.740	5782.51	-638.31	-1164.15	1275.69	40°15'55.996"N	105°01'06.812"W	0.62	
6190.00	21.820	135.950	5867.99	-649.23	-1188.35	1299.59	40°15'55.757"N	105°01'06.504"W	0.55	
6283.00	21.900	139.090	5954.31	-659.10	-1213.88	1322.97	40°15'55.504"N	105°01'06.202"W	1.26	
6375.00	21.720	139.660	6039.72	-667.77	-1239.83	1345.22	40°15'55.248"N	105°01'05.915"W	0.30	
6465.00	21.740	137.210	6123.33	-676.75	-1264.75	1367.33	40°15'55.002"N	105°01'05.630"W	1.01	
6557.00	21.580	132.350	6208.84	-687.96	-1288.65	1391.41	40°15'54.765"N	105°01'05.319"W	1.96	
6647.00	21.710	130.810	6292.49	-700.66	-1310.68	1416.24	40°15'54.548"N	105°01'04.999"W	0.65	
6737.00	21.690	131.840	6376.12	-713.52	-1332.66	1441.23	40°15'54.330"N	105°01'04.677"W	0.42	
6829.00	17.290	143.030	6462.85	-722.58	-1354.94	1462.13	40°15'54.110"N	105°01'04.407"W	6.25	
6921.00	14.890	198.980	6551.75	-716.82	-1377.17	1466.54	40°15'53.891"N	105°01'04.350"W	16.40	
6967.00	16.480	216.080	6596.06	-706.88	-1388.04	1460.77	40°15'53.783"N	105°01'04.425"W	10.58	
7013.00	16.660	218.280	6640.15	-695.19	-1398.49	1452.84	40°15'53.680"N	105°01'04.527"W	1.42	
7059.00	16.650	218.180	6684.22	-683.32	-1408.84	1444.68	40°15'53.578"N	105°01'04.632"W	0.07	
7105.00	16.540	225.370	6728.30	-671.19	-1418.62	1435.95	40°15'53.481"N	105°01'04.745"W	4.47	
7197.00	24.290	238.510	6814.50	-639.89	-1437.75	1410.44	40°15'53.292"N	105°01'05.074"W	9.74	
7287.00	33.080	243.740	6893.39	-596.81	-1458.33	1372.55	40°15'53.089"N	105°01'05.563"W	10.15	
7379.00	42.970	246.900	6965.78	-540.24	-1481.80	1321.06	40°15'52.857"N	105°01'06.227"W	10.95	
7420.00	47.440	249.350	6994.67	-511.23	-1492.61	1294.06	40°15'52.750"N	105°01'06.575"W	11.70	
7469.00	52.930	252.850	7026.03	-473.91	-1504.75	1258.46	40°15'52.630"N	105°01'07.034"W	12.47	
7516.00	56.950	259.230	7053.05	-436.32	-1513.97	1221.15	40°15'52.539"N	105°01'07.516"W	14.02	
7560.00	59.290	265.950	7076.30	-400.94	-1518.76	1184.14	40°15'52.492"N	105°01'07.993"W	14.01	
7604.00	63.840	270.390	7097.26	-365.65	-1519.96	1145.49	40°15'52.480"N	105°01'08.492"W	13.62	
7648.00	70.170	270.560	7114.44	-329.39	-1519.62	1105.00	40°15'52.483"N	105°01'09.014"W	14.39	

# Actual Wellpath Report

MARKHAM 4 AWP

Page 4 of 6



## REFERENCE WELLPATH IDENTIFICATION

Operator	CUB CREEK ENERGY, LLC	Slot	SLOT#04 MARKHAM 4 (2373'FSL & 1515'FEL SEC 32)
Area	COLORADO	Well	MARKHAM 4
Field	WELD COUNTY (NAD83, TRUE NORTH)	Wellbore	MARKHAM 4 AWB
Facility	SEC.32-T04N-R68W		

## WELLPATH DATA (136 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
7694.00	77.790	269.930	7127.12	-289.74	-1519.44	1060.82	40°15'52.485"N	105°01'09.584"W	16.62	
7740.00	85.290	269.050	7133.88	-248.67	-1519.85	1015.36	40°15'52.481"N	105°01'10.170"W	16.41	
7784.00	91.540	269.500	7135.10	-208.90	-1520.40	971.40	40°15'52.475"N	105°01'10.737"W	14.24	
7829.00	92.520	269.010	7133.51	-168.20	-1520.99	926.43	40°15'52.470"N	105°01'11.317"W	2.43	
7920.00	92.650	266.890	7129.40	-85.08	-1524.24	835.59	40°15'52.438"N	105°01'12.489"W	2.33	
8010.00	89.510	265.560	7127.70	-1.75	-1530.16	745.82	40°15'52.379"N	105°01'13.647"W	3.79	
8103.00	89.290	266.660	7128.68	84.45	-1536.47	653.04	40°15'52.317"N	105°01'14.844"W	1.21	
8195.00	91.910	268.790	7127.72	168.71	-1540.12	561.13	40°15'52.281"N	105°01'16.030"W	3.67	
8287.00	90.620	273.430	7125.68	250.61	-1538.34	469.19	40°15'52.298"N	105°01'17.216"W	5.23	
8377.00	90.620	274.940	7124.71	328.46	-1531.77	379.44	40°15'52.363"N	105°01'18.373"W	1.68	
8467.00	90.060	273.950	7124.18	406.11	-1524.80	289.72	40°15'52.432"N	105°01'19.531"W	1.26	
8559.00	91.020	272.740	7123.31	486.35	-1519.43	197.88	40°15'52.485"N	105°01'20.715"W	1.68	
8649.00	90.460	269.150	7122.15	566.61	-1517.95	107.91	40°15'52.500"N	105°01'21.876"W	4.04	
8740.00	90.950	265.190	7121.03	650.30	-1522.44	17.05	40°15'52.455"N	105°01'23.048"W	4.38	
8830.00	90.830	264.740	7119.63	734.37	-1530.34	-72.59	40°15'52.377"N	105°01'24.204"W	0.52	
8922.00	90.950	264.760	7118.20	820.43	-1538.75	-164.19	40°15'52.294"N	105°01'25.386"W	0.13	
9014.00	91.940	265.320	7115.88	906.31	-1546.70	-255.82	40°15'52.216"N	105°01'26.568"W	1.24	
9106.00	88.920	264.640	7115.19	992.24	-1554.75	-347.45	40°15'52.136"N	105°01'27.750"W	3.36	
9198.00	88.090	265.720	7117.59	1078.04	-1562.48	-439.09	40°15'52.060"N	105°01'28.932"W	1.48	
9288.00	90.030	267.120	7119.06	1161.27	-1568.10	-528.90	40°15'52.004"N	105°01'30.091"W	2.66	
9379.00	90.180	267.390	7118.90	1244.92	-1572.46	-619.80	40°15'51.961"N	105°01'31.263"W	0.34	
9471.00	91.750	267.700	7117.35	1329.29	-1576.40	-711.69	40°15'51.922"N	105°01'32.449"W	1.74	
9559.00	92.710	267.830	7113.92	1409.81	-1579.83	-799.56	40°15'51.888"N	105°01'33.582"W	1.10	
9650.00	92.620	268.750	7109.69	1492.71	-1582.54	-890.42	40°15'51.861"N	105°01'34.754"W	1.01	
9740.00	92.650	267.780	7105.56	1574.72	-1585.26	-980.28	40°15'51.834"N	105°01'35.913"W	1.08	
9830.00	92.680	267.310	7101.37	1657.19	-1589.11	-1070.10	40°15'51.796"N	105°01'37.072"W	0.52	
9920.00	92.460	268.800	7097.34	1739.33	-1592.16	-1159.96	40°15'51.766"N	105°01'38.231"W	1.67	
10011.00	91.540	271.460	7094.16	1821.03	-1591.96	-1250.89	40°15'51.768"N	105°01'39.404"W	3.09	
10102.00	90.060	272.040	7092.89	1901.60	-1589.18	-1341.84	40°15'51.796"N	105°01'40.577"W	1.75	
10193.00	90.060	272.270	7092.79	1981.89	-1585.76	-1432.77	40°15'51.829"N	105°01'41.750"W	0.25	
10285.00	89.880	272.080	7092.84	2063.05	-1582.27	-1524.71	40°15'51.864"N	105°01'42.936"W	0.28	
10377.00	90.180	271.860	7092.79	2144.36	-1579.10	-1616.65	40°15'51.895"N	105°01'44.122"W	0.40	
10467.00	93.080	271.640	7090.23	2224.02	-1576.36	-1706.57	40°15'51.922"N	105°01'45.282"W	3.23	
10557.00	91.760	269.930	7086.43	2304.34	-1575.12	-1796.47	40°15'51.934"N	105°01'46.442"W	2.40	
10649.00	90.770	269.260	7084.40	2387.34	-1575.77	-1888.44	40°15'51.928"N	105°01'47.628"W	1.30	
10739.00	90.370	268.560	7083.51	2469.01	-1577.49	-1978.42	40°15'51.911"N	105°01'48.789"W	0.90	
10830.00	91.290	268.550	7082.19	2551.82	-1579.78	-2069.38	40°15'51.888"N	105°01'49.962"W	1.01	
10920.00	88.920	267.760	7082.02	2633.98	-1582.68	-2159.33	40°15'51.859"N	105°01'51.122"W	2.78	
11012.00	89.540	267.970	7083.26	2718.15	-1586.11	-2251.26	40°15'51.825"N	105°01'52.308"W	0.71	
11103.00	88.800	267.830	7084.58	2801.39	-1589.44	-2342.19	40°15'51.792"N	105°01'53.481"W	0.83	
11193.00	91.690	269.270	7084.19	2883.29	-1591.72	-2432.14	40°15'51.770"N	105°01'54.642"W	3.59	
11285.00	90.680	271.550	7082.29	2965.71	-1591.06	-2524.12	40°15'51.776"N	105°01'55.828"W	2.71	
11377.00	89.690	270.580	7081.99	3047.69	-1589.35	-2616.10	40°15'51.793"N	105°01'57.014"W	1.51	
11467.00	91.020	271.860	7081.44	3127.77	-1587.43	-2706.07	40°15'51.812"N	105°01'58.175"W	2.05	
11557.00	91.690	271.040	7079.31	3207.67	-1585.16	-2796.02	40°15'51.834"N	105°01'59.335"W	1.18	LAST BHI MWD SURVEY

# Actual Wellpath Report

MARKHAM 4 AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	CUB CREEK ENERGY, LLC	Slot	SLOT#04 MARKHAM 4 (2373'FSL & 1515'FEL SEC 32)
Area	COLORADO	Well	MARKHAM 4
Field	WELD COUNTY (NAD83, TRUE NORTH)	Wellbore	MARKHAM 4 AWB
Facility	SEC.32-T04N-R68W		

WELLPATH DATA (136 stations)										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
12055.00	91.690	271.040	7064.62	3651.33	-1576.12	-3293.72	40°15'51.923"N	105°02'05.755"W	0.00	PROJECTION TO BIT

HOLE & CASING SECTIONS - Ref Wellbore: MARKHAM 4 AWB Ref Wellpath: MARKHAM 4 AWP									
String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
13.5in Open Hole	17.00	1535.00	1518.00	17.00	1528.02	0.00	0.00	-59.04	64.89
9.625in Casing Surface	17.00	1525.00	1508.00	17.00	1518.31	0.00	0.00	-57.50	63.08
8.75in Open Hole	1535.00	12055.00	10520.00	1528.02	7064.62	-59.04	64.89	-1576.12	-3293.72

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
SECTION 32-T04N-R69W	-8.00	-47.36	2.79	3133072.76	1341057.53	40°16'07.032"N	105°01'23.232"W	polygon
MARKHAM 4 BHL REV-2 ON PLAT (NIO B 825'FSL & 460'FWL SEC 32)	7056.00	-1606.36	-3304.31	3129774.24	1339480.84	40°15'51.624"N	105°02'05.892"W	point
MARKHAM 4 BHL REV-3 ON PLAT (NIO B 825'FSL & 460'FWL SEC 32)	7056.84	-1606.36	-3304.31	3129774.24	1339480.84	40°15'51.624"N	105°02'05.892"W	point
SECTION 32-T04N-R69W SOUTHERN HALF 460' SETBACKS	7060.30	-47.36	2.79	3133072.76	1341057.53	40°16'07.032"N	105°01'23.232"W	polygon
MARKHAM 4 BHL REV-1 ON PLAT (NIO B 825'FSL & 460'FWL SEC 32)	7062.00	-1606.36	-3304.31	3129774.24	1339480.84	40°15'51.624"N	105°02'05.892"W	point
MARKHAM 4 WP 4	7073.30	-1593.70	-2613.10	3130465.35	1339497.22	40°15'51.750"N	105°01'56.976"W	point
MARKHAM 4 WP 3	7085.30	-1568.00	-1213.60	3131864.62	1339530.44	40°15'52.005"N	105°01'38.923"W	point
MARKHAM 4 WP 2	7100.80	-1560.70	-813.60	3132264.56	1339539.89	40°15'52.077"N	105°01'33.763"W	point
MARKHAM 4 WP 1	7126.70	-1539.10	365.90	3133443.87	1339567.84	40°15'52.291"N	105°01'18.548"W	point

WELLPATH COMPOSITION - Ref Wellbore: MARKHAM 4 AWB Ref Wellpath: MARKHAM 4 AWP				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
17.00	1483.00	Custom BHI NaviTrak (Standard Rotating) (Rockies 0.03Gt model)	BHI NAVITRAK MWD STD ROTATING ROCKIES GT <142-1483>	MARKHAM 4 AWB
1483.00	11557.00	Custom BHI AutoTrak Curve (Short) (Rockies 0.03Gt model)	BHI AUTOTRAK CURVE MWD, SHORT, ROCKIES GT <1585-11557>	MARKHAM 4 AWB
11557.00	12055.00	Blind Drilling (std)	Projection to bit	MARKHAM 4 AWB

# Actual Wellpath Report

MARKHAM 4 AWP

Page 6 of 6



REFERENCE WELLPATH IDENTIFICATION			
Operator	CUB CREEK ENERGY, LLC	Slot	SLOT#04 MARKHAM 4 (2373'FSL & 1515'FEL SEC 32)
Area	COLORADO	Well	MARKHAM 4
Field	WELD COUNTY (NAD83, TRUE NORTH)	Wellbore	MARKHAM 4 AWB
Facility	SEC.32-T04N-R68W		

WELLPATH COMMENTS				
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
142.00	0.710	244.100	142.00	FIRST BHI MWD SURVEY
11557.00	91.690	271.040	7079.31	LAST BHI MWD SURVEY
12055.00	91.690	271.040	7064.62	PROJECTION TO BIT