

Cub Creek Energy, LLC

Location	Weld County, CO	Slot	KNIGHT 9
Field	WATTENBERG	Well	W KNIGHT 9
Installation	Knight Pad	Wellbore	W KNIGHT 9 (PWB)

N

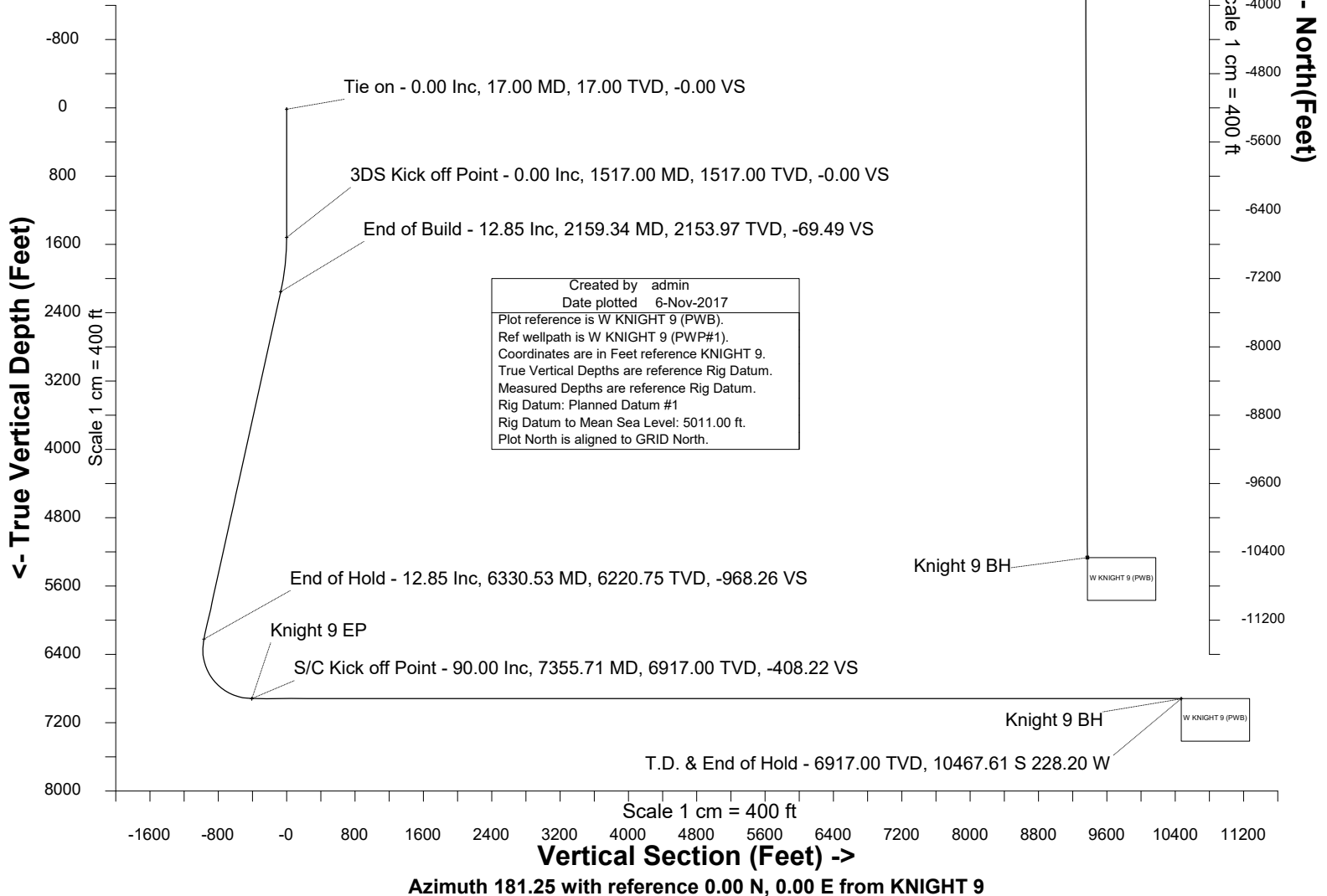
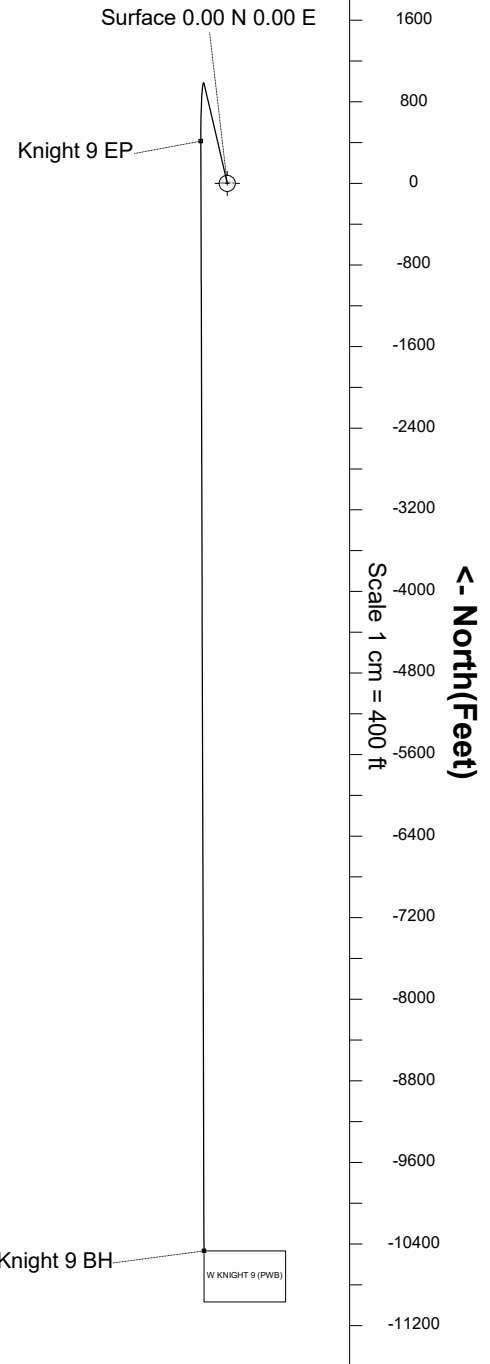
GRID

WELL PROFILE DATA

Point	MD	Inc	Azi	TVD	North	East	deg/100ft	V. Sect
Tie on	17.00	0.00	0.00	17.00	S 0.00	W 0.00		-0.00
KOP	1517.00	0.00	346.96	1517.00	S 0.00	W 0.00	0.00	-0.00
End of Build	2159.34	12.85	346.96	2153.97	N 69.86	W 16.17	2.00	-69.49
End of Hold	6330.53	12.85	346.96	6220.75	N 973.40	W 225.36	0.00	-968.26
Target Knight 9 EP	7355.71	90.00	179.84	6917.00	N 413.97	W 259.14	10.00	-408.22
T.D. & Target Kni... BH	18237.34	90.00	179.84	6917.00	S 10467.61	W 228.20	0.00	10470.10

East (Feet) ->

-1600 -800 -0 800
Scale 1 cm = 400 ft



Nov-6-2017
EMMA-2015 [2000.0-2020.0] Dip: 66.59 deg Field: 52154.0 mT
Lat: N40 11 52.9440 Long: W105 2 31.0920 Elev: 4993.00 ft
Magnetic North is 8.54 deg East of True North
GRID North is 0.30 deg East of True North
To correct azimuth from True to GRID subtract 0.30 deg
To correct azimuth from Magnetic to GRID add 8.25 deg

Created by admin
Date plotted 6-Nov-2017
Plot reference is W KNIGHT 9 (PWB).
Ref wellpath is W KNIGHT 9 (PWP#1).
Coordinates are in Feet reference KNIGHT 9.
True Vertical Depths are reference Rig Datum.
Measured Depths are reference Rig Datum.
Rig Datum: Planned Datum #1
Rig Datum to Mean Sea Level: 5011.00 ft.
Plot North is aligned to GRID North.



SYSDRILL
Well Design Combined Report
Wellbore: W KNIGHT 9 (PWB)



Wellhead Details

Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
KNIGHT 9	40.19771000	-105.04197000	1315198.6904	3127946.1699	120.22S	0.62E	0.00

Declination

Date	Source	Time
Nov-6-2017	EMM-2015 [2000.0-2020.0]	14:52

Installation Details

Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Knight Pad	40.19804000	-105.04197000	1315318.9022	3127945.5490	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Summary Wellpath

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Northing	Easting
17.00	0.00	0.000	17.00	0.00N	0.00E		0.00	1315198.69	3127946.17
1517.00	0.00	346.960	1517.00	0.00N	0.00E	==>	0.00	1315198.69	3127946.17
2159.34	12.85	346.960	2153.97	69.86N	16.17W	2.00	-69.49	1315268.55	3127930.00
6330.53	12.85	346.960	6220.75	973.40N	225.36W	==>	-968.26	1316172.05	3127720.82
7355.71	90.00	179.840	6917.00	413.97N	259.14W	10.00	-408.22	1315612.64	3127687.04
18237.34	90.00	179.840	6917.00	10467.61S	228.20W	==>	10470.10	1304731.55	3127717.98

Interpolated Wellpath

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	Rig Datum
17.00	0.00	0.000	17.00	0.00N	0.00E	==>	0.00	Slot Datum
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	
1500.00	0.00	0.000	1500.00	0.00N	0.00E	==>	0.00	
1600.00	1.66	346.960	1599.99	1.17N	0.27W	2.00	-1.17	
1700.00	3.66	346.960	1699.88	5.69N	1.32W	2.00	-5.66	
1800.00	5.66	346.960	1799.54	13.61N	3.15W	2.00	-13.54	
1900.00	7.66	346.960	1898.86	24.91N	5.77W	2.00	-24.77	
2000.00	9.66	346.960	1997.71	39.57N	9.16W	2.00	-39.36	
2100.00	11.66	346.960	2095.98	57.59N	13.33W	2.00	-57.29	
2200.00	12.85	346.960	2193.61	78.67N	18.21W	==>	-78.26	
2300.00	12.85	346.960	2291.11	100.33N	23.23W	==>	-99.80	
2400.00	12.85	346.960	2388.61	121.99N	28.24W	==>	-121.35	
2500.00	12.85	346.960	2486.10	143.66N	33.26W	==>	-142.90	
2600.00	12.85	346.960	2583.60	165.32N	38.27W	==>	-164.44	
2700.00	12.85	346.960	2681.10	186.98N	43.29W	==>	-185.99	
2800.00	12.85	346.960	2778.59	208.64N	48.30W	==>	-207.54	
2900.00	12.85	346.960	2876.09	230.30N	53.32W	==>	-229.08	
3000.00	12.85	346.960	2973.59	251.96N	58.33W	==>	-250.63	
3100.00	12.85	346.960	3071.08	273.62N	63.35W	==>	-272.18	

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Coordinates are from Slot MD's are from Rig (Planned Datum #1 5011.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 181.250 degrees
Bottom hole distance is 10470.10 Feet on azimuth 181.25 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 1-Dec-2017



SYSDRILL
Well Design Combined Report
Wellbore: W KNIGHT 9 (PWB)



Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3200.00	12.85	346.960	3168.58	295.29N	68.36W	==>	-293.73	
3300.00	12.85	346.960	3266.08	316.95N	73.38W	==>	-315.27	
3400.00	12.85	346.960	3363.58	338.61N	78.39W	==>	-336.82	
3500.00	12.85	346.960	3461.07	360.27N	83.41W	==>	-358.37	
3600.00	12.85	346.960	3558.57	381.93N	88.42W	==>	-379.91	
3700.00	12.85	346.960	3656.07	403.59N	93.44W	==>	-401.46	
3800.00	12.85	346.960	3753.56	425.25N	98.45W	==>	-423.01	
3900.00	12.85	346.960	3851.06	446.92N	103.47W	==>	-444.55	
4000.00	12.85	346.960	3948.56	468.58N	108.48W	==>	-466.10	
4100.00	12.85	346.960	4046.05	490.24N	113.50W	==>	-487.65	
4200.00	12.85	346.960	4143.55	511.90N	118.51W	==>	-509.20	
4300.00	12.85	346.960	4241.05	533.56N	123.53W	==>	-530.74	
4400.00	12.85	346.960	4338.54	555.22N	128.54W	==>	-552.29	
4500.00	12.85	346.960	4436.04	576.88N	133.56W	==>	-573.84	
4600.00	12.85	346.960	4533.54	598.55N	138.57W	==>	-595.38	
4700.00	12.85	346.960	4631.03	620.21N	143.59W	==>	-616.93	
4800.00	12.85	346.960	4728.53	641.87N	148.60W	==>	-638.48	
4900.00	12.85	346.960	4826.03	663.53N	153.62W	==>	-660.02	
5000.00	12.85	346.960	4923.52	685.19N	158.63W	==>	-681.57	
5100.00	12.85	346.960	5021.02	706.85N	163.65W	==>	-703.12	
5200.00	12.85	346.960	5118.52	728.51N	168.66W	==>	-724.67	
5300.00	12.85	346.960	5216.02	750.18N	173.68W	==>	-746.21	
5400.00	12.85	346.960	5313.51	771.84N	178.69W	==>	-767.76	
5500.00	12.85	346.960	5411.01	793.50N	183.71W	==>	-789.31	
5600.00	12.85	346.960	5508.51	815.16N	188.72W	==>	-810.85	
5700.00	12.85	346.960	5606.00	836.82N	193.74W	==>	-832.40	
5800.00	12.85	346.960	5703.50	858.48N	198.75W	==>	-853.95	
5900.00	12.85	346.960	5801.00	880.15N	203.77W	==>	-875.49	
6000.00	12.85	346.960	5898.49	901.81N	208.78W	==>	-897.04	
6100.00	12.85	346.960	5995.99	923.47N	213.80W	==>	-918.59	
6200.00	12.85	346.960	6093.49	945.13N	218.81W	==>	-940.14	
6300.00	12.85	346.960	6190.98	966.79N	223.83W	==>	-961.68	
6400.00	6.28	332.360	6289.22	984.31N	228.87W	10.00	-979.09	
6500.00	5.30	213.070	6388.96	985.29N	233.94W	10.00	-979.96	
6600.00	14.71	190.990	6487.36	968.92N	238.89W	10.00	-963.48	
6700.00	24.59	186.210	6581.43	935.68N	243.58W	10.00	-930.15	
6800.00	34.54	184.070	6668.30	886.60N	247.85W	10.00	-880.98	
6900.00	44.50	182.800	6745.34	823.16N	251.59W	10.00	-817.48	
7000.00	54.48	181.920	6810.22	747.28N	254.67W	10.00	-741.56	
7100.00	64.46	181.230	6860.95	661.29N	257.00W	10.00	-655.53	
7200.00	74.45	180.650	6896.00	567.78N	258.51W	10.00	-562.01	
7300.00	84.44	180.120	6914.30	469.60N	259.16W	10.00	-463.84	
7400.00	90.00	179.840	6917.00	369.68N	259.02W	==>	-363.95	
7500.00	90.00	179.840	6917.00	269.68N	258.73W	==>	-263.98	
7600.00	90.00	179.840	6917.00	169.69N	258.45W	==>	-164.01	
7700.00	90.00	179.840	6917.00	69.69N	258.16W	==>	-64.04	
7800.00	90.00	179.840	6917.00	30.31S	257.88W	==>	35.93	
7900.00	90.00	179.840	6917.00	130.31S	257.60W	==>	135.90	
8000.00	90.00	179.840	6917.00	230.31S	257.31W	==>	235.87	
8100.00	90.00	179.840	6917.00	330.31S	257.03W	==>	335.84	
8200.00	90.00	179.840	6917.00	430.31S	256.74W	==>	435.81	
8300.00	90.00	179.840	6917.00	530.31S	256.46W	==>	535.78	
8400.00	90.00	179.840	6917.00	630.31S	256.17W	==>	635.75	
8500.00	90.00	179.840	6917.00	730.31S	255.89W	==>	735.71	
8600.00	90.00	179.840	6917.00	830.31S	255.60W	==>	835.68	
8700.00	90.00	179.840	6917.00	930.31S	255.32W	==>	935.65	
8800.00	90.00	179.840	6917.00	1030.31S	255.04W	==>	1035.62	
8900.00	90.00	179.840	6917.00	1130.31S	254.75W	==>	1135.59	
9000.00	90.00	179.840	6917.00	1230.31S	254.47W	==>	1235.56	

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Bottom hole distance is 10470.10 Feet on azimuth 181.25 degrees from Wellhead
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Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9100.00	90.00	179.840	6917.00	1330.31S	254.18W	==>	1335.53	
9200.00	90.00	179.840	6917.00	1430.31S	253.90W	==>	1435.50	
9300.00	90.00	179.840	6917.00	1530.31S	253.61W	==>	1535.47	
9400.00	90.00	179.840	6917.00	1630.31S	253.33W	==>	1635.44	
9500.00	90.00	179.840	6917.00	1730.31S	253.05W	==>	1735.41	
9600.00	90.00	179.840	6917.00	1830.31S	252.76W	==>	1835.38	
9700.00	90.00	179.840	6917.00	1930.31S	252.48W	==>	1935.35	
9800.00	90.00	179.840	6917.00	2030.31S	252.19W	==>	2035.32	
9900.00	90.00	179.840	6917.00	2130.31S	251.91W	==>	2135.29	
10000.00	90.00	179.840	6917.00	2230.30S	251.62W	==>	2235.26	
10100.00	90.00	179.840	6917.00	2330.30S	251.34W	==>	2335.23	
10200.00	90.00	179.840	6917.00	2430.30S	251.06W	==>	2435.20	
10300.00	90.00	179.840	6917.00	2530.30S	250.77W	==>	2535.17	
10400.00	90.00	179.840	6917.00	2630.30S	250.49W	==>	2635.14	
10500.00	90.00	179.840	6917.00	2730.30S	250.20W	==>	2735.11	
10600.00	90.00	179.840	6917.00	2830.30S	249.92W	==>	2835.08	
10700.00	90.00	179.840	6917.00	2930.30S	249.63W	==>	2935.05	
10800.00	90.00	179.840	6917.00	3030.30S	249.35W	==>	3035.02	
10900.00	90.00	179.840	6917.00	3130.30S	249.07W	==>	3134.99	
11000.00	90.00	179.840	6917.00	3230.30S	248.78W	==>	3234.96	
11100.00	90.00	179.840	6917.00	3330.30S	248.50W	==>	3334.93	
11200.00	90.00	179.840	6917.00	3430.30S	248.21W	==>	3434.90	
11300.00	90.00	179.840	6917.00	3530.30S	247.93W	==>	3534.86	
11400.00	90.00	179.840	6917.00	3630.30S	247.64W	==>	3634.83	
11500.00	90.00	179.840	6917.00	3730.30S	247.36W	==>	3734.80	
11600.00	90.00	179.840	6917.00	3830.30S	247.07W	==>	3834.77	
11700.00	90.00	179.840	6917.00	3930.30S	246.79W	==>	3934.74	
11800.00	90.00	179.840	6917.00	4030.30S	246.51W	==>	4034.71	
11900.00	90.00	179.840	6917.00	4130.30S	246.22W	==>	4134.68	
12000.00	90.00	179.840	6917.00	4230.30S	245.94W	==>	4234.65	
12100.00	90.00	179.840	6917.00	4330.30S	245.65W	==>	4334.62	
12200.00	90.00	179.840	6917.00	4430.30S	245.37W	==>	4434.59	
12300.00	90.00	179.840	6917.00	4530.30S	245.08W	==>	4534.56	
12400.00	90.00	179.840	6917.00	4630.30S	244.80W	==>	4634.53	
12500.00	90.00	179.840	6917.00	4730.29S	244.52W	==>	4734.50	
12600.00	90.00	179.840	6917.00	4830.29S	244.23W	==>	4834.47	
12700.00	90.00	179.840	6917.00	4930.29S	243.95W	==>	4934.44	
12800.00	90.00	179.840	6917.00	5030.29S	243.66W	==>	5034.41	
12900.00	90.00	179.840	6917.00	5130.29S	243.38W	==>	5134.38	
13000.00	90.00	179.840	6917.00	5230.29S	243.09W	==>	5234.35	
13100.00	90.00	179.840	6917.00	5330.29S	242.81W	==>	5334.32	
13200.00	90.00	179.840	6917.00	5430.29S	242.53W	==>	5434.29	
13300.00	90.00	179.840	6917.00	5530.29S	242.24W	==>	5534.26	
13400.00	90.00	179.840	6917.00	5630.29S	241.96W	==>	5634.23	
13500.00	90.00	179.840	6917.00	5730.29S	241.67W	==>	5734.20	
13600.00	90.00	179.840	6917.00	5830.29S	241.39W	==>	5834.17	
13700.00	90.00	179.840	6917.00	5930.29S	241.10W	==>	5934.14	
13800.00	90.00	179.840	6917.00	6030.29S	240.82W	==>	6034.11	
13900.00	90.00	179.840	6917.00	6130.29S	240.53W	==>	6134.08	
14000.00	90.00	179.840	6917.00	6230.29S	240.25W	==>	6234.05	
14100.00	90.00	179.840	6917.00	6330.29S	239.97W	==>	6334.01	
14200.00	90.00	179.840	6917.00	6430.29S	239.68W	==>	6433.98	
14300.00	90.00	179.840	6917.00	6530.29S	239.40W	==>	6533.95	
14400.00	90.00	179.840	6917.00	6630.29S	239.11W	==>	6633.92	
14500.00	90.00	179.840	6917.00	6730.29S	238.83W	==>	6733.89	
14600.00	90.00	179.840	6917.00	6830.29S	238.54W	==>	6833.86	
14700.00	90.00	179.840	6917.00	6930.29S	238.26W	==>	6933.83	
14800.00	90.00	179.840	6917.00	7030.29S	237.98W	==>	7033.80	
14900.00	90.00	179.840	6917.00	7130.29S	237.69W	==>	7133.77	

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Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
15000.00	90.00	179.840	6917.00	7230.28S	237.41W	==>	7233.74	
15100.00	90.00	179.840	6917.00	7330.28S	237.12W	==>	7333.71	
15200.00	90.00	179.840	6917.00	7430.28S	236.84W	==>	7433.68	
15300.00	90.00	179.840	6917.00	7530.28S	236.55W	==>	7533.65	
15400.00	90.00	179.840	6917.00	7630.28S	236.27W	==>	7633.62	
15500.00	90.00	179.840	6917.00	7730.28S	235.99W	==>	7733.59	
15600.00	90.00	179.840	6917.00	7830.28S	235.70W	==>	7833.56	
15700.00	90.00	179.840	6917.00	7930.28S	235.42W	==>	7933.53	
15800.00	90.00	179.840	6917.00	8030.28S	235.13W	==>	8033.50	
15900.00	90.00	179.840	6917.00	8130.28S	234.85W	==>	8133.47	
16000.00	90.00	179.840	6917.00	8230.28S	234.56W	==>	8233.44	
16100.00	90.00	179.840	6917.00	8330.28S	234.28W	==>	8333.41	
16200.00	90.00	179.840	6917.00	8430.28S	233.99W	==>	8433.38	
16300.00	90.00	179.840	6917.00	8530.28S	233.71W	==>	8533.35	
16400.00	90.00	179.840	6917.00	8630.28S	233.43W	==>	8633.32	
16500.00	90.00	179.840	6917.00	8730.28S	233.14W	==>	8733.29	
16600.00	90.00	179.840	6917.00	8830.28S	232.86W	==>	8833.26	
16700.00	90.00	179.840	6917.00	8930.28S	232.57W	==>	8933.23	
16800.00	90.00	179.840	6917.00	9030.28S	232.29W	==>	9033.20	
16900.00	90.00	179.840	6917.00	9130.28S	232.00W	==>	9133.16	
17000.00	90.00	179.840	6917.00	9230.28S	231.72W	==>	9233.13	
17100.00	90.00	179.840	6917.00	9330.28S	231.44W	==>	9333.10	
17200.00	90.00	179.840	6917.00	9430.28S	231.15W	==>	9433.07	
17300.00	90.00	179.840	6917.00	9530.28S	230.87W	==>	9533.04	
17400.00	90.00	179.840	6917.00	9630.28S	230.58W	==>	9633.01	
17500.00	90.00	179.840	6917.00	9730.27S	230.30W	==>	9732.98	
17600.00	90.00	179.840	6917.00	9830.27S	230.01W	==>	9832.95	
17700.00	90.00	179.840	6917.00	9930.27S	229.73W	==>	9932.92	
17800.00	90.00	179.840	6917.00	10030.27S	229.45W	==>	10032.89	
17900.00	90.00	179.840	6917.00	10130.27S	229.16W	==>	10132.86	
18000.00	90.00	179.840	6917.00	10230.27S	228.88W	==>	10232.83	
18100.00	90.00	179.840	6917.00	10330.27S	228.59W	==>	10332.80	
18200.00	90.00	179.840	6917.00	10430.27S	228.31W	==>	10432.77	
18237.34	90.00	179.840	6917.00	10467.61S	228.20W	==>	10470.10	

All data is in Feet unless otherwise stated
Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5011.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 181.250 degrees
Bottom hole distance is 10470.10 Feet on azimuth 181.25 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 1-Dec-2017



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
Knight 9 EP	413.97N	259.14W	6917.00	40.19885000	-105.04289000	1315612.64	3127687.04
Knight 9 BH	10467.61S	228.20W	6917.00	40.16898000	-105.04298000	1304731.55	3127717.98

Notes