

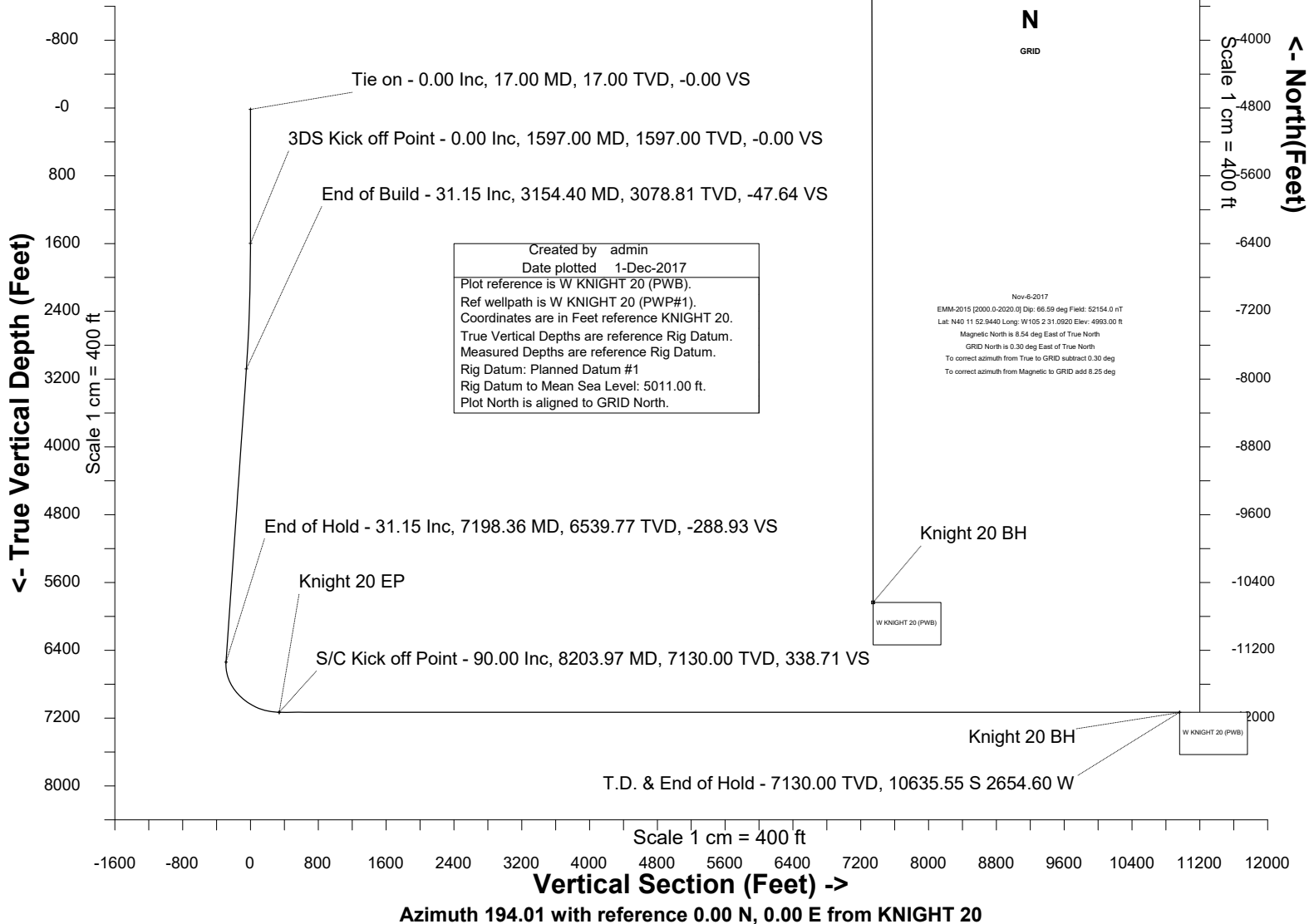
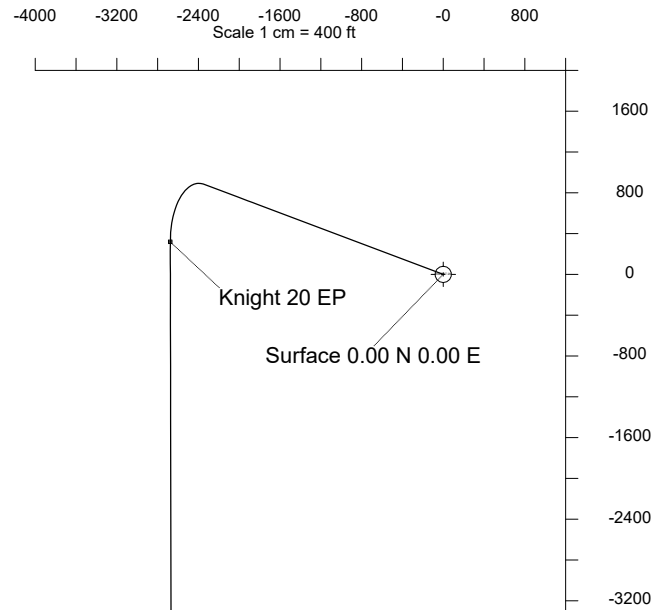
Cub Creek Energy, LLC

Location	Weld County, CO	Slot	KNIGHT 20
Field	WATTENBERG	Well	W KNIGHT 20
Installation	Knight Pad	Wellbore	W KNIGHT 20 (PWB)

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	1597.00	0.00	290.64	1597.00	S 0.00	W 0.00	0.00	-0.00
End of Build	3154.40	31.15	290.64	3078.81	N 145.57	W 386.50	2.00	-47.64
End of Hold	7198.36	31.15	290.64	6539.77	N 882.85	W 2344.00	0.00	-288.93
Target Knight 20 EP	8203.97	90.00	179.89	7130.00	N 318.93	W 2676.45	10.00	338.71
T.D. & Target Kni... BH	19158.48	90.00	179.89	7130.00	S 10635.55	W 2654.60	0.00	10961.84

East (Feet) ->





SYSDRILL
Well Design Combined Report
Wellbore: W KNIGHT 20 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
KNIGHT 20	40.19787700	-105.04205500	1315259.4022	3127922.1120	59.50S	23.44W	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	1315259.40	3127922.11
1597.00	0.00	290.640	1597.00	0.00N	0.00E	==>	0.00	1315259.40	3127922.11
3154.40	31.15	290.640	3078.81	145.57N	386.50W	2.00	-47.64	1315404.97	3127535.63
7198.36	31.15	290.640	6539.77	882.85N	2344.00W	==>	-288.93	1316142.21	3125578.22
8203.97	90.00	179.890	7130.00	318.93N	2676.45W	10.00	338.71	1315578.32	3125245.78
19158.48	90.00	179.890	7130.00	10635.55S	2654.60W	==>	10961.84	1304624.32	3125267.63

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	0.06	290.640	1600.00	0.00N	0.00E	2.00	0.00	
1700.00	2.06	290.640	1699.98	0.65N	1.73W	2.00	-0.21	
1800.00	4.06	290.640	1799.83	2.53N	6.73W	2.00	-0.83	
1900.00	6.06	290.640	1899.44	5.64N	14.98W	2.00	-1.85	
2000.00	8.06	290.640	1998.67	9.97N	26.48W	2.00	-3.26	
2100.00	10.06	290.640	2097.42	15.52N	41.22W	2.00	-5.08	
2200.00	12.06	290.640	2195.56	22.29N	59.17W	2.00	-7.29	
2300.00	14.06	290.640	2292.97	30.25N	80.32W	2.00	-9.90	
2400.00	16.06	290.640	2389.53	39.41N	104.63W	2.00	-12.90	
2500.00	18.06	290.640	2485.12	49.75N	132.08W	2.00	-16.28	
2600.00	20.06	290.640	2579.63	61.26N	162.64W	2.00	-20.05	
2700.00	22.06	290.640	2672.95	73.92N	196.27W	2.00	-24.19	
2800.00	24.06	290.640	2764.95	87.73N	232.92W	2.00	-28.71	
2900.00	26.06	290.640	2855.54	102.66N	272.56W	2.00	-33.60	
3000.00	28.06	290.640	2944.59	118.69N	315.13W	2.00	-38.84	
3100.00	30.06	290.640	3031.99	135.81N	360.58W	2.00	-44.45	

All data is in Feet unless otherwise stated
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 194.010 degrees
Bottom hole distance is 10961.84 Feet on azimuth 194.01 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 20 (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	31.15	290.640	3117.84	153.89N	408.57W	==>	-50.36	
3300.00	31.15	290.640	3203.42	172.12N	456.98W	==>	-56.33	
3400.00	31.15	290.640	3289.01	190.35N	505.38W	==>	-62.30	
3500.00	31.15	290.640	3374.59	208.58N	553.79W	==>	-68.26	
3600.00	31.15	290.640	3460.17	226.81N	602.19W	==>	-74.23	
3700.00	31.15	290.640	3545.76	245.04N	650.60W	==>	-80.20	
3800.00	31.15	290.640	3631.34	263.27N	699.01W	==>	-86.16	
3900.00	31.15	290.640	3716.92	281.51N	747.41W	==>	-92.13	
4000.00	31.15	290.640	3802.51	299.74N	795.82W	==>	-98.10	
4100.00	31.15	290.640	3888.09	317.97N	844.22W	==>	-104.06	
4200.00	31.15	290.640	3973.67	336.20N	892.63W	==>	-110.03	
4300.00	31.15	290.640	4059.26	354.43N	941.03W	==>	-116.00	
4400.00	31.15	290.640	4144.84	372.66N	989.44W	==>	-121.96	
4500.00	31.15	290.640	4230.42	390.90N	1037.84W	==>	-127.93	
4600.00	31.15	290.640	4316.01	409.13N	1086.25W	==>	-133.89	
4700.00	31.15	290.640	4401.59	427.36N	1134.66W	==>	-139.86	
4800.00	31.15	290.640	4487.17	445.59N	1183.06W	==>	-145.83	
4900.00	31.15	290.640	4572.76	463.82N	1231.47W	==>	-151.79	
5000.00	31.15	290.640	4658.34	482.05N	1279.87W	==>	-157.76	
5100.00	31.15	290.640	4743.92	500.28N	1328.28W	==>	-163.73	
5200.00	31.15	290.640	4829.51	518.52N	1376.68W	==>	-169.69	
5300.00	31.15	290.640	4915.09	536.75N	1425.09W	==>	-175.66	
5400.00	31.15	290.640	5000.67	554.98N	1473.49W	==>	-181.63	
5500.00	31.15	290.640	5086.26	573.21N	1521.90W	==>	-187.59	
5600.00	31.15	290.640	5171.84	591.44N	1570.30W	==>	-193.56	
5700.00	31.15	290.640	5257.42	609.67N	1618.71W	==>	-199.53	
5800.00	31.15	290.640	5343.01	627.91N	1667.12W	==>	-205.49	
5900.00	31.15	290.640	5428.59	646.14N	1715.52W	==>	-211.46	
6000.00	31.15	290.640	5514.17	664.37N	1763.93W	==>	-217.43	
6100.00	31.15	290.640	5599.76	682.60N	1812.33W	==>	-223.39	
6200.00	31.15	290.640	5685.34	700.83N	1860.74W	==>	-229.36	
6300.00	31.15	290.640	5770.92	719.06N	1909.14W	==>	-235.33	
6400.00	31.15	290.640	5856.51	737.30N	1957.55W	==>	-241.29	
6500.00	31.15	290.640	5942.09	755.53N	2005.95W	==>	-247.26	
6600.00	31.15	290.640	6027.67	773.76N	2054.36W	==>	-253.23	
6700.00	31.15	290.640	6113.26	791.99N	2102.77W	==>	-259.19	
6800.00	31.15	290.640	6198.84	810.22N	2151.17W	==>	-265.16	
6900.00	31.15	290.640	6284.42	828.45N	2199.58W	==>	-271.13	
7000.00	31.15	290.640	6370.01	846.68N	2247.98W	==>	-277.09	
7100.00	31.15	290.640	6455.59	864.92N	2296.39W	==>	-283.06	
7200.00	31.10	290.340	6541.18	883.15N	2344.79W	10.00	-289.03	
7300.00	29.48	270.690	6627.74	892.44N	2393.73W	10.00	-286.19	
7400.00	30.86	250.910	6714.40	884.33N	2442.70W	10.00	-266.46	
7500.00	34.90	233.990	6798.54	859.05N	2490.20W	10.00	-230.44	
7600.00	40.80	220.780	6877.60	817.38N	2534.80W	10.00	-179.21	
7700.00	47.87	210.630	6949.16	760.59N	2575.13W	10.00	-114.33	
7800.00	55.65	202.600	7011.07	690.39N	2609.98W	10.00	-37.79	
7900.00	63.86	195.990	7061.43	608.92N	2638.28W	10.00	48.11	
8000.00	72.34	190.250	7098.72	518.66N	2659.18W	10.00	140.75	
8100.00	80.96	185.040	7121.81	422.34N	2672.03W	10.00	237.31	
8200.00	89.65	180.080	7129.99	322.90N	2676.45W	10.00	334.86	
8300.00	90.00	179.890	7130.00	222.90N	2676.26W	==>	431.84	
8400.00	90.00	179.890	7130.00	122.90N	2676.06W	==>	528.81	
8500.00	90.00	179.890	7130.00	22.90N	2675.86W	==>	625.79	
8600.00	90.00	179.890	7130.00	77.10S	2675.66W	==>	722.76	
8700.00	90.00	179.890	7130.00	177.10S	2675.46W	==>	819.74	
8800.00	90.00	179.890	7130.00	277.10S	2675.26W	==>	916.71	
8900.00	90.00	179.890	7130.00	377.10S	2675.07W	==>	1013.69	
9000.00	90.00	179.890	7130.00	477.10S	2674.87W	==>	1110.66	

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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 194.010 degrees
Bottom hole distance is 10961.84 Feet on azimuth 194.01 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 1-Dec-2017



SYS DRILL
Well Design Combined Report
Wellbore: W KNIGHT 20 (PWB)



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	179.890	7130.00	577.10S	2674.67W	==>	1207.64	
9200.00	90.00	179.890	7130.00	677.10S	2674.47W	==>	1304.61	
9300.00	90.00	179.890	7130.00	777.10S	2674.27W	==>	1401.59	
9400.00	90.00	179.890	7130.00	877.10S	2674.07W	==>	1498.56	
9500.00	90.00	179.890	7130.00	977.10S	2673.87W	==>	1595.54	
9600.00	90.00	179.890	7130.00	1077.10S	2673.67W	==>	1692.51	
9700.00	90.00	179.890	7130.00	1177.10S	2673.47W	==>	1789.49	
9800.00	90.00	179.890	7130.00	1277.09S	2673.27W	==>	1886.46	
9900.00	90.00	179.890	7130.00	1377.09S	2673.07W	==>	1983.44	
10000.00	90.00	179.890	7130.00	1477.09S	2672.87W	==>	2080.41	
10100.00	90.00	179.890	7130.00	1577.09S	2672.67W	==>	2177.39	
10200.00	90.00	179.890	7130.00	1677.09S	2672.47W	==>	2274.36	
10300.00	90.00	179.890	7130.00	1777.09S	2672.27W	==>	2371.34	
10400.00	90.00	179.890	7130.00	1877.09S	2672.07W	==>	2468.31	
10500.00	90.00	179.890	7130.00	1977.09S	2671.87W	==>	2565.29	
10600.00	90.00	179.890	7130.00	2077.09S	2671.67W	==>	2662.26	
10700.00	90.00	179.890	7130.00	2177.09S	2671.47W	==>	2759.23	
10800.00	90.00	179.890	7130.00	2277.09S	2671.27W	==>	2856.21	
10900.00	90.00	179.890	7130.00	2377.09S	2671.08W	==>	2953.18	
11000.00	90.00	179.890	7130.00	2477.09S	2670.88W	==>	3050.16	
11100.00	90.00	179.890	7130.00	2577.09S	2670.68W	==>	3147.13	
11200.00	90.00	179.890	7130.00	2677.09S	2670.48W	==>	3244.11	
11300.00	90.00	179.890	7130.00	2777.09S	2670.28W	==>	3341.08	
11400.00	90.00	179.890	7130.00	2877.09S	2670.08W	==>	3438.06	
11500.00	90.00	179.890	7130.00	2977.09S	2669.88W	==>	3535.03	
11600.00	90.00	179.890	7130.00	3077.09S	2669.68W	==>	3632.01	
11700.00	90.00	179.890	7130.00	3177.09S	2669.48W	==>	3728.98	
11800.00	90.00	179.890	7130.00	3277.09S	2669.28W	==>	3825.96	
11900.00	90.00	179.890	7130.00	3377.09S	2669.08W	==>	3922.93	
12000.00	90.00	179.890	7130.00	3477.09S	2668.88W	==>	4019.91	
12100.00	90.00	179.890	7130.00	3577.09S	2668.68W	==>	4116.88	
12200.00	90.00	179.890	7130.00	3677.09S	2668.48W	==>	4213.86	
12300.00	90.00	179.890	7130.00	3777.09S	2668.28W	==>	4310.83	
12400.00	90.00	179.890	7130.00	3877.09S	2668.08W	==>	4407.81	
12500.00	90.00	179.890	7130.00	3977.09S	2667.88W	==>	4504.78	
12600.00	90.00	179.890	7130.00	4077.09S	2667.68W	==>	4601.76	
12700.00	90.00	179.890	7130.00	4177.09S	2667.48W	==>	4698.73	
12800.00	90.00	179.890	7130.00	4277.09S	2667.29W	==>	4795.71	
12900.00	90.00	179.890	7130.00	4377.09S	2667.09W	==>	4892.68	
13000.00	90.00	179.890	7130.00	4477.09S	2666.89W	==>	4989.66	
13100.00	90.00	179.890	7130.00	4577.09S	2666.69W	==>	5086.63	
13200.00	90.00	179.890	7130.00	4677.09S	2666.49W	==>	5183.61	
13300.00	90.00	179.890	7130.00	4777.09S	2666.29W	==>	5280.58	
13400.00	90.00	179.890	7130.00	4877.09S	2666.09W	==>	5377.56	
13500.00	90.00	179.890	7130.00	4977.09S	2665.89W	==>	5474.53	
13600.00	90.00	179.890	7130.00	5077.09S	2665.69W	==>	5571.51	
13700.00	90.00	179.890	7130.00	5177.09S	2665.49W	==>	5668.48	
13800.00	90.00	179.890	7130.00	5277.09S	2665.29W	==>	5765.46	
13900.00	90.00	179.890	7130.00	5377.09S	2665.09W	==>	5862.43	
14000.00	90.00	179.890	7130.00	5477.09S	2664.89W	==>	5959.41	
14100.00	90.00	179.890	7130.00	5577.09S	2664.69W	==>	6056.38	
14200.00	90.00	179.890	7130.00	5677.09S	2664.49W	==>	6153.36	
14300.00	90.00	179.890	7130.00	5777.09S	2664.29W	==>	6250.33	
14400.00	90.00	179.890	7130.00	5877.09S	2664.09W	==>	6347.31	
14500.00	90.00	179.890	7130.00	5977.09S	2663.89W	==>	6444.28	
14600.00	90.00	179.890	7130.00	6077.09S	2663.69W	==>	6541.26	
14700.00	90.00	179.890	7130.00	6177.09S	2663.49W	==>	6638.23	
14800.00	90.00	179.890	7130.00	6277.08S	2663.30W	==>	6735.21	
14900.00	90.00	179.890	7130.00	6377.08S	2663.10W	==>	6832.18	

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Vertical Section is from 0.00N 0.00E on azimuth 194.010 degrees
Bottom hole distance is 10961.84 Feet on azimuth 194.01 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Microsoft
Date Printed: 1-Dec-2017



SYS DRILL
Well Design Combined Report
Wellbore: W KNIGHT 20 (PWB)



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	179.890	7130.00	6477.08S	2662.90W	==>	6929.16	
15100.00	90.00	179.890	7130.00	6577.08S	2662.70W	==>	7026.13	
15200.00	90.00	179.890	7130.00	6677.08S	2662.50W	==>	7123.11	
15300.00	90.00	179.890	7130.00	6777.08S	2662.30W	==>	7220.08	
15400.00	90.00	179.890	7130.00	6877.08S	2662.10W	==>	7317.06	
15500.00	90.00	179.890	7130.00	6977.08S	2661.90W	==>	7414.03	
15600.00	90.00	179.890	7130.00	7077.08S	2661.70W	==>	7511.01	
15700.00	90.00	179.890	7130.00	7177.08S	2661.50W	==>	7607.98	
15800.00	90.00	179.890	7130.00	7277.08S	2661.30W	==>	7704.96	
15900.00	90.00	179.890	7130.00	7377.08S	2661.10W	==>	7801.93	
16000.00	90.00	179.890	7130.00	7477.08S	2660.90W	==>	7898.91	
16100.00	90.00	179.890	7130.00	7577.08S	2660.70W	==>	7995.88	
16200.00	90.00	179.890	7130.00	7677.08S	2660.50W	==>	8092.86	
16300.00	90.00	179.890	7130.00	7777.08S	2660.30W	==>	8189.83	
16400.00	90.00	179.890	7130.00	7877.08S	2660.10W	==>	8286.81	
16500.00	90.00	179.890	7130.00	7977.08S	2659.90W	==>	8383.78	
16600.00	90.00	179.890	7130.00	8077.08S	2659.70W	==>	8480.76	
16700.00	90.00	179.890	7130.00	8177.08S	2659.51W	==>	8577.73	
16800.00	90.00	179.890	7130.00	8277.08S	2659.31W	==>	8674.71	
16900.00	90.00	179.890	7130.00	8377.08S	2659.11W	==>	8771.68	
17000.00	90.00	179.890	7130.00	8477.08S	2658.91W	==>	8868.66	
17100.00	90.00	179.890	7130.00	8577.08S	2658.71W	==>	8965.63	
17200.00	90.00	179.890	7130.00	8677.08S	2658.51W	==>	9062.61	
17300.00	90.00	179.890	7130.00	8777.08S	2658.31W	==>	9159.58	
17400.00	90.00	179.890	7130.00	8877.08S	2658.11W	==>	9256.56	
17500.00	90.00	179.890	7130.00	8977.08S	2657.91W	==>	9353.53	
17600.00	90.00	179.890	7130.00	9077.08S	2657.71W	==>	9450.51	
17700.00	90.00	179.890	7130.00	9177.08S	2657.51W	==>	9547.48	
17800.00	90.00	179.890	7130.00	9277.08S	2657.31W	==>	9644.46	
17900.00	90.00	179.890	7130.00	9377.08S	2657.11W	==>	9741.43	
18000.00	90.00	179.890	7130.00	9477.08S	2656.91W	==>	9838.41	
18100.00	90.00	179.890	7130.00	9577.08S	2656.71W	==>	9935.38	
18200.00	90.00	179.890	7130.00	9677.08S	2656.51W	==>	10032.36	
18300.00	90.00	179.890	7130.00	9777.08S	2656.31W	==>	10129.33	
18400.00	90.00	179.890	7130.00	9877.08S	2656.11W	==>	10226.31	
18500.00	90.00	179.890	7130.00	9977.08S	2655.91W	==>	10323.28	
18600.00	90.00	179.890	7130.00	10077.08S	2655.71W	==>	10420.26	
18700.00	90.00	179.890	7130.00	10177.08S	2655.52W	==>	10517.23	
18800.00	90.00	179.890	7130.00	10277.08S	2655.32W	==>	10614.21	
18900.00	90.00	179.890	7130.00	10377.08S	2655.12W	==>	10711.18	
19000.00	90.00	179.890	7130.00	10477.08S	2654.92W	==>	10808.16	
19100.00	90.00	179.890	7130.00	10577.08S	2654.72W	==>	10905.13	
19158.48	90.00	179.890	7130.00	10635.55S	2654.60W	==>	10961.84	

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 194.010 degrees
Bottom hole distance is 10961.84 Feet on azimuth 194.01 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 20 EP	318.93N	2676.45W	7130.00	40.19879000	-105.05163000	1315578.32	3125245.78
Knight 20 BH	10635.55S	2654.60W	7130.00	40.16872000	-105.05175000	1304624.32	3125267.63

Notes