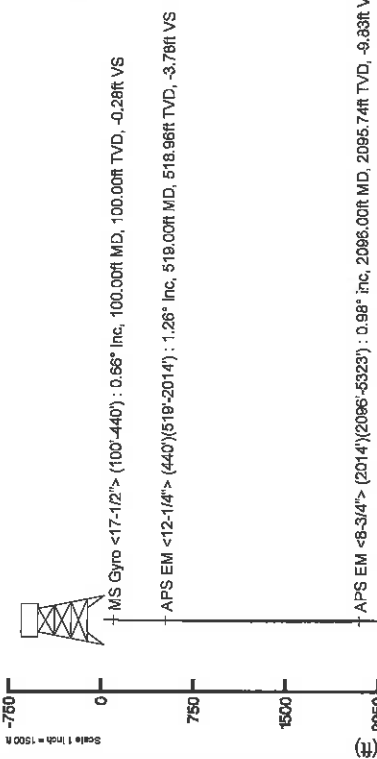


Location: Brooke County, WV
 Field: Brooke
 Facility: Linda Greathouse BRK Pad
 Slot: Slot #01
 Well: Linda Greathouse BRK 1H
 Wellbore: Linda Greathouse BRK 1H PWB

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Linda Greathouse BRK Pad	1750140.330	14601304.930	80°38'25.304"W
Slot	Local N (ft)	Local E (ft)	Longitude
Slot #01	0.08	-0.08	80°38'25.305"W
SDC 40 (RKB) to Mud Line (At Slot: Slot #01)	1750140.250	14601306.010	80°38'25.305"W
Mean Sea Level to Mud Line (At Slot: Slot #01)	268		
SDC 40 (RKB) to Mean Sea Level	-1139.2ft		
SDC 40 (RKB) to Mean Sea Level	1165.2ft		

API: 47-009-00157-0000
 BHI Job #: 7469153
 Rig: SDC 40
 Duration: 8/30/2015-9/7/2015



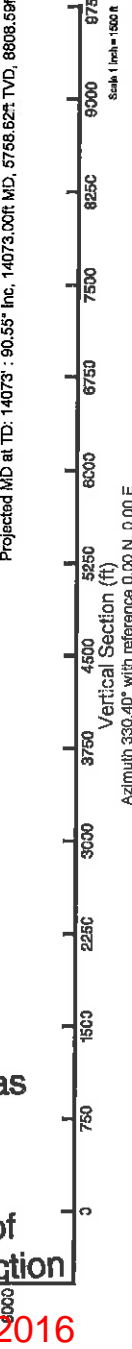
SGCN (1945.0 to 2017.0) Dr: 87.44° Field: 5289.4, IT
 Magnetic North is 8.81 degrees West of True North (44.22 Aug 2015)
 Grid North is 0.25 degrees East of True North
 To correct azimuth from True to Grid subtract 0.25 degrees
 To correct azimuth from Magnetic to Grid subtract 5.06 degrees

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (ft/100ft)	VS (ft)
Tile On	440.00	0.860	204.580	439.88	-4.11	-1.24	0.18	-2.96
Tile to Bottom	601.00	0.860	204.550	500.96	-6.30	-2.24	0.00	-4.37
End of Drop	687.00	0.000	277.792	686.95	-6.89	-2.51	1.00	-4.75
KOP 1	2150.00	0.000	277.792	2149.95	-6.89	-2.51	0.00	-4.75
Energy Build	2995.72	16.974	277.792	2996.31	10.03	-128.16	2.00	71.04
End of Arc	5427.56	16.974	277.792	5399.84	106.17	-828.70	0.00	501.64
End of Arc	5813.41	46.500	297.000	5634.57	179.11	-1013.69	8.00	656.44
End of Arc	6381.50	90.714	336.953	5844.00	566.25	-1335.25	10.00	1151.89
End of Arc	14089.88	90.714	336.953	5749.00	7659.84	-4352.70	0.00	8909.13

BHI AT Curve <8-1/2> (5323)(5410-14037) : 5293.59ft TVD, 108.65ft N, 822.06ft W
 APS EM <8-3/4> (2014)(2086-5323) : 2086.74ft TVD, 108.65ft N, 822.06ft W
 APS EM <12-1/4> (440)(518-2014) : 518.96ft TVD, 108.65ft N, 822.06ft W
 MS Gyro <17-1/2> (100-440) : 100.00ft TVD, 0.86ft N, 0.14ft W

Projected MD at TD: 14073 : 90.55° Inc, 14073.00ft MD, 5756.62ft TVD, 8908.59ft VS

Projected MD at TD: 14073 : 90.55° Inc, 14073.00ft MD, 5756.62ft TVD, 8908.59ft VS



WV Department of Environmental Protection
 APR 01 2016
 Office of Oil and Gas
 10/28/2016

REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot #01
Area	Brooke County, WV	Linda Greathouse BRK 1H
Field	Brooke	Linda Greathouse BRK 1H AWB
Facility	Linda Greathouse BRK Pad	

REPORT SETUP INFORMATION

Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect® 4.0.1
North Reference	Grid	User	jEdsaryar
Scale	0.999614	Report Generated	11/Sep/2015 at 20:16
Convergence at slot	0.25° East	Database/Source file	WellArchitectEasternDB/Linda_Greathouse_BRK_1H_AWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.08	-0.08	1750140.25	14601305.01	40°12'14.822"N	80°36'25.305"W
Facility Reference Pt			1750140.33	14601304.93	40°12'14.821"N	80°36'25.304"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.478"W

WELLPATH DATUM

Calculation method	Minimum curvature	SDC 40 (RKB) to Facility Vertical Datum	1165.20ft
Horizontal Reference Pt	Slot	SDC 40 (RKB) to Mean Sea Level	1165.20ft
Vertical Reference Pt	SDC 40 (RKB)	SDC 40 (RKB) to Mud Line at Slot (Slot #01)	26.00ft
MEP Reference Pt	SDC 40 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	330.40°

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10/28/2016

REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Brooke County, WV	Well	Linda Greathouse BRK 1H
Field	Brooke	Wellbore	Linda Greathouse BRK 1H AWB
Facility	Linda Greathouse BRK Pad		

WELLPATH DATA (167 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
0.00	0.000	198.480	0.00	0.00	0.00	0.00	1750140.25	14601305.01	40°12'14.822"N	80°36'25.305"W	0.00	0.000	0.00	0.00	0.00
26.00	0.000	198.480	26.00	0.00	0.00	0.00	1750140.25	14601305.01	40°12'14.822"N	80°36'25.305"W	0.00	0.000	0.00	0.00	0.00
100.00	0.660	198.480	100.00	-0.28	-0.40	-0.14	1750140.11	14601304.61	40°12'14.818"N	80°36'25.307"W	0.43	198.480	0.89	0.89	0.00
200.00	0.580	186.210	199.99	-1.08	-1.45	-0.37	1750139.88	14601303.56	40°12'14.808"N	80°36'25.310"W	1.50	194.369	0.15	-0.08	-12.27
300.00	0.550	200.460	299.99	-1.80	-2.41	-0.59	1750139.66	14601302.60	40°12'14.798"N	80°36'25.313"W	2.48	193.886	0.14	-0.03	14.25
400.00	0.850	199.860	399.98	-2.59	-3.55	-1.01	1750139.24	14601301.46	40°12'14.787"N	80°36'25.319"W	3.70	195.935	0.30	0.30	-0.60
440.00	0.860	204.550	439.98	-2.96	-4.11	-1.24	1750139.01	14601300.91	40°12'14.781"N	80°36'25.322"W	4.29	196.807	0.18	0.02	11.72
519.00	1.260	206.860	518.96	-3.78	-5.42	-1.88	1750138.37	14601299.59	40°12'14.769"N	80°36'25.330"W	5.74	199.120	0.51	0.51	2.92
612.00	1.340	202.350	611.94	-5.02	-7.34	-2.75	1750137.50	14601297.67	40°12'14.750"N	80°36'25.341"W	7.84	200.575	0.14	0.09	-4.85
704.00	1.250	196.840	703.91	-6.37	-9.29	-3.45	1750136.80	14601295.72	40°12'14.730"N	80°36'25.350"W	9.91	200.390	0.17	-0.10	-5.99
797.00	1.890	197.210	796.89	-7.82	-11.31	-4.07	1750136.18	14601293.70	40°12'14.710"N	80°36'25.359"W	12.02	199.801	0.11	0.11	0.40
890.00	1.890	186.350	889.85	-9.81	-13.88	-4.57	1750135.69	14601291.13	40°12'14.685"N	80°36'25.365"W	14.61	198.208	0.67	0.58	-11.68
982.00	1.220	186.520	981.82	-11.83	-16.36	-4.85	1750135.41	14601288.65	40°12'14.661"N	80°36'25.369"W	17.06	196.494	0.73	-0.73	0.18
1075.00	0.930	174.670	1074.80	-13.32	-18.10	-4.89	1750135.36	14601286.92	40°12'14.643"N	80°36'25.369"W	18.75	195.113	0.39	-0.31	-12.74
1168.00	0.430	183.640	1167.80	-14.30	-19.20	-4.84	1750135.41	14601285.82	40°12'14.633"N	80°36'25.369"W	19.80	194.149	0.55	-0.54	9.65
1261.00	0.240	224.370	1260.79	-14.65	-19.68	-5.00	1750135.25	14601285.33	40°12'14.628"N	80°36'25.371"W	20.31	194.246	0.32	-0.20	43.80
1354.00	0.410	237.310	1353.79	-14.72	-20.00	-5.41	1750134.84	14601285.01	40°12'14.625"N	80°36'25.376"W	20.72	195.144	0.20	0.18	13.91
1446.00	0.230	83.300	1445.79	-14.81	-20.16	-5.51	1750134.74	14601284.86	40°12'14.623"N	80°36'25.378"W	20.90	195.280	0.68	-0.20	-167.40
1539.00	1.020	208.140	1538.79	-14.71	-19.59	-4.71	1750135.55	14601285.43	40°12'14.629"N	80°36'25.367"W	20.14	193.510	0.91	0.85	-37.81
1632.00	0.640	206.330	1631.78	-14.40	-18.67	-3.71	1750136.54	14601286.34	40°12'14.638"N	80°36'25.354"W	19.04	191.247	0.41	-0.41	-1.95
1720.00	0.580	205.300	1723.77	-13.83	-17.87	-3.46	1750136.79	14601287.15	40°12'14.646"N	80°36'25.351"W	18.20	190.960	0.68	-0.07	-66.39
1817.00	0.650	208.000	1816.77	-12.86	-17.02	-3.93	1750136.32	14601288.00	40°12'14.654"N	80°36'25.357"W	17.47	193.002	0.31	0.08	-28.77
1910.00	0.780	204.000	1909.76	-11.77	-16.27	-4.80	1750135.45	14601288.75	40°12'14.661"N	80°36'25.368"W	16.96	196.449	0.24	0.14	-15.42
2003.00	0.700	202.000	2002.75	-10.86	-15.84	-5.89	1750134.36	14601289.18	40°12'14.666"N	80°36'25.382"W	16.90	200.402	0.37	-0.09	-28.25
2014.00	0.750	200.800	2013.75	-10.77	-15.81	-6.03	1750134.22	14601289.20	40°12'14.666"N	80°36'25.384"W	16.92	200.877	0.89	0.82	26.91
2096.00	0.280	200.600	2095.74	-9.83	-15.41	-7.22	1750133.03	14601289.60	40°12'14.670"N	80°36'25.399"W	17.02	205.110	0.35	0.23	16.80
2189.00	2.000	208.000	2188.69	-7.52	-14.39	-10.09	1750130.16	14601290.63	40°12'14.680"N	80°36'25.436"W	17.57	215.051	1.95	1.94	-7.12
2282.00	5.410	208.690	2281.44	-2.58	-12.28	-16.39	1750123.87	14601292.73	40°12'14.701"N	80°36'25.517"W	20.48	233.152	2.83	2.83	0.74
2375.00	6.530	207.700	2373.94	4.82	-8.92	-25.46	1750114.80	14601296.09	40°12'14.735"N	80°36'25.634"W	26.98	250.684	1.25	1.20	3.24
2468.00	7.710	294.600	2466.22	14.00	-4.37	-36.04	1750104.22	14601300.64	40°12'14.780"N	80°36'25.770"W	36.31	263.086	1.35	1.27	3.12

Actual Wellpath Report

Linda Greathouse BRK 1H AWP Proj: 14073'
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REFERENCE WELLPATH IDENTIFICATION

Operator	Slot #01
SOUTHWESTERN ENERGY	Linda Greathouse BRK 1H
Area	Brooke County, WV
Field	Brooke
Facility	Linda Greathouse BRK Pad
	Wellbore
	Linda Greathouse BRK 1H AWB

WELLPATH DATA (167 stations)

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate
[ft]	[°]	[°]	[ft]	[ft]	[ft]	[ft]	[US ft]	[US ft]	[°]	[°]	[ft]	[°]	[°/100ft]	[°/100ft]	[°/100ft]
2560.00	9.030	292.020	2557.24	24.67	0.91	-48.35	1750091.92	14601305.92	40°12'14.833"N	80°36'25.928"W	48.36	271.073	1.49	1.43	-2.80
2653.00	10.700	290.460	2648.86	37.01	6.66	-63.20	1750077.07	14601311.67	40°12'14.891"N	80°36'26.120"W	63.55	276.015	1.82	1.80	-1.68
2746.00	11.230	286.660	2740.16	50.17	12.27	-79.97	1750060.31	14601317.28	40°12'14.947"N	80°36'26.335"W	80.91	278.726	0.96	0.57	-4.09
2839.00	12.080	285.730	2831.24	63.64	17.51	-98.01	1750042.28	14601322.51	40°12'14.999"N	80°36'26.568"W	99.56	280.128	0.94	0.91	-1.00
2931.00	13.830	278.320	2920.90	77.24	21.71	-118.16	1750022.13	14601326.71	40°12'15.042"N	80°36'26.827"W	120.14	280.411	2.62	1.90	-8.05
3024.00	15.420	272.180	3010.89	90.59	23.79	-141.52	1749998.79	14601328.79	40°12'15.063"N	80°36'27.128"W	143.50	279.542	2.39	1.71	-6.60
3117.00	14.800	272.160	3100.68	103.35	24.71	-165.74	1749974.57	14601329.71	40°12'15.073"N	80°36'27.440"W	167.57	278.479	0.67	-0.67	-0.02
3209.00	14.580	277.240	3189.67	116.48	26.61	-188.97	1749951.35	14601331.61	40°12'15.093"N	80°36'27.739"W	190.84	278.015	1.42	-0.24	5.52
3302.00	15.590	278.930	3279.47	131.28	30.02	-212.93	1749927.40	14601335.02	40°12'15.128"N	80°36'28.048"W	215.04	278.026	1.18	1.09	1.82
3395.00	16.510	276.660	3368.84	146.88	33.50	-238.40	1749901.94	14601338.49	40°12'15.163"N	80°36'28.376"W	240.75	277.998	1.20	0.99	-2.44
3488.00	15.840	274.500	3458.16	161.82	36.03	-264.18	1749876.17	14601341.02	40°12'15.190"N	80°36'28.708"W	266.63	277.765	0.97	-0.72	-2.32
3580.00	16.330	272.400	3546.56	175.71	37.55	-289.62	1749850.74	14601342.55	40°12'15.206"N	80°36'29.036"W	292.05	277.388	0.83	0.53	-2.28
3673.00	16.780	271.600	3635.71	189.59	38.48	-316.10	1749824.27	14601343.47	40°12'15.216"N	80°36'29.377"W	318.44	276.940	0.54	0.48	-0.86
3766.00	15.300	273.570	3723.08	203.26	39.61	-341.77	1749798.61	14601344.61	40°12'15.228"N	80°36'29.708"W	344.06	276.612	1.70	-1.59	2.12
3859.00	15.000	281.660	3814.86	217.91	42.81	-365.81	1749774.58	14601347.80	40°12'15.261"N	80°36'30.017"W	368.30	276.675	2.29	-0.32	8.70
3951.00	17.250	286.110	3903.24	235.53	49.00	-390.58	1749749.82	14601353.99	40°12'15.323"N	80°36'30.336"W	393.64	277.151	2.79	2.45	4.84
4044.00	19.300	285.410	3991.54	256.27	56.91	-418.64	1749721.77	14601361.90	40°12'15.403"N	80°36'30.698"W	422.49	277.742	2.22	2.20	-0.75
4137.00	20.450	282.010	4079.01	277.93	64.38	-449.35	1749691.07	14601369.36	40°12'15.478"N	80°36'31.093"W	453.94	278.153	1.75	1.24	-3.66
4230.00	19.860	286.760	4166.32	298.09	69.62	-480.93	1749659.50	14601374.60	40°12'15.531"N	80°36'31.500"W	485.95	278.237	2.05	-0.63	-5.65
4323.00	19.430	282.090	4253.91	315.58	72.04	-512.08	1749628.37	14601377.03	40°12'15.566"N	80°36'31.901"W	517.13	278.008	1.75	0.46	-5.02
4415.00	18.560	280.300	4341.40	330.20	72.72	-540.49	1749599.97	14601377.70	40°12'15.564"N	80°36'32.267"W	545.36	277.662	3.16	-3.12	-1.73
4508.00	19.800	284.400	4431.11	343.16	73.73	-564.95	1749575.52	14601378.71	40°12'15.575"N	80°36'32.582"W	569.74	277.436	3.01	-2.77	4.41
4601.00	18.250	280.000	4521.31	356.91	76.80	-587.38	1749553.10	14601381.78	40°12'15.607"N	80°36'32.871"W	592.38	277.450	1.68	0.29	6.81
4694.00	16.440	288.900	4610.03	373.98	83.11	-610.84	1749529.64	14601388.09	40°12'15.670"N	80°36'33.173"W	616.47	277.748	3.24	2.38	8.36
4787.00	18.530	289.000	4698.73	394.93	92.19	-637.27	1749503.23	14601397.17	40°12'15.751"N	80°36'33.513"W	643.90	278.232	2.26	2.25	0.72
4879.00	19.900	286.000	4786.66	417.20	101.41	-666.11	1749474.40	14601406.38	40°12'15.853"N	80°36'33.884"W	673.79	278.657	1.49	1.03	-3.29
4972.00	19.840	283.830	4874.26	437.92	107.90	-696.65	1749443.87	14601412.87	40°12'15.919"N	80°36'34.278"W	704.95	278.804	3.06	0.38	-9.03
5065.00	18.640	289.470	4962.09	454.28	109.39	-727.14	1749413.39	14601414.36	40°12'15.935"N	80°36'34.671"W	735.32	278.556	3.89	-1.29	-11.14
5157.00	16.080	284.490	5049.89	466.18	107.52	-754.52	1749386.03	14601412.49	40°12'15.917"N	80°36'35.024"W	762.14	278.110	2.94	-2.78	-3.24
5250.00	14.500	268.850	5139.60	476.98	106.05	-778.98	1749361.57	14601411.02	40°12'15.904"N	80°36'35.339"W	786.16	277.753	2.10	-1.70	4.69

WV Department of
10/28/2016

Actual Wellpath Report

Linda Greathouse BRK 1H AWP Proj: 14073'
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REFERENCE WELLPATH IDENTIFICATION

Operator	Area	Field	Facility	Well	Wellbore	Slot #01	Slot #01
SOUTHWESTERN ENERGY	Brooke County, WV	Brooke	Linda Greathouse BRK Pad	Linda Greathouse BRK 1H	Linda Greathouse BRK 1H AWP		

WELLPATH DATA (167 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [%/100ft]	Build Rate [%/100ft]	Turn Rate [%/100ft]
5323.00	15.270	272.380	5210.15	486.43	106.27	-797.72	1749342.84	14601411.24	40°12'15.907"N	80°36'35.580"W	804.77	277.588	1.63	1.05	4.84
5410.00	17.460	279.310	5293.63	500.70	108.85	-822.05	1749318.52	14601413.82	40°12'15.934"N	80°36'35.894"W	829.23	277.543	3.37	2.52	7.97
5456.00	20.720	287.340	5337.10	510.98	112.40	-836.64	1749303.94	14601417.36	40°12'15.969"N	80°36'36.082"W	844.15	277.652	9.09	7.09	17.46
5502.00	24.920	293.260	5379.49	524.66	118.65	-853.32	1749287.26	14601423.62	40°12'16.032"N	80°36'36.296"W	861.53	277.916	10.40	9.13	12.87
5549.00	28.350	296.680	5421.50	541.84	127.58	-872.39	1749268.20	14601432.54	40°12'16.121"N	80°36'36.542"W	881.67	278.320	7.99	7.30	7.28
5595.00	31.150	298.790	5461.44	561.06	138.21	-892.58	1749248.01	14601443.17	40°12'16.227"N	80°36'36.801"W	903.22	278.802	6.50	6.09	4.59
5642.00	33.880	298.750	5501.07	582.57	150.37	-914.73	1749225.88	14601455.32	40°12'16.348"N	80°36'37.086"W	927.00	279.335	5.81	5.81	-0.09
5688.00	37.910	297.160	5538.32	605.31	163.00	-938.55	1749202.06	14601467.94	40°12'16.474"N	80°36'37.392"W	952.60	279.852	8.99	8.76	-3.46
5734.00	42.570	295.920	5573.43	629.97	176.25	-965.13	1749175.49	14601481.20	40°12'16.606"N	80°36'37.734"W	981.10	280.349	10.28	10.13	-2.70
5781.00	46.630	296.020	5606.89	657.19	190.70	-994.80	1749145.84	14601495.64	40°12'16.750"N	80°36'38.116"W	1012.91	280.852	8.64	8.64	0.21
5827.00	47.670	297.870	5638.17	685.32	205.99	-1024.85	1749115.79	14601510.92	40°12'16.902"N	80°36'38.502"W	1045.35	281.365	3.72	2.26	4.02
5874.00	51.030	305.010	5668.81	716.51	224.61	-1055.21	1749085.45	14601529.53	40°12'17.088"N	80°36'38.892"W	1078.85	282.017	13.56	7.15	15.19
5920.00	55.480	308.180	5696.32	750.23	246.60	-1084.77	1749055.90	14601551.51	40°12'17.306"N	80°36'39.272"W	1112.45	282.807	11.14	9.67	6.89
5966.00	59.960	309.990	5720.89	786.45	271.12	-1114.94	1749025.74	14601576.03	40°12'17.550"N	80°36'39.659"W	1147.43	283.667	10.29	9.74	3.93
6013.00	63.080	312.620	5745.80	825.49	298.39	-1145.95	1748994.74	14601603.29	40°12'17.821"N	80°36'40.058"W	1184.17	284.595	8.26	6.64	5.60
6059.00	65.260	314.950	5763.34	865.16	327.05	-1175.84	1748964.87	14601631.93	40°12'18.105"N	80°36'40.441"W	1220.47	285.543	6.58	4.74	5.07
6106.00	68.880	320.520	5781.66	907.37	359.08	-1204.91	1748935.81	14601663.95	40°12'18.423"N	80°36'40.814"W	1257.27	286.595	13.36	7.70	11.85
6152.00	71.100	325.240	5797.41	950.20	393.53	-1230.97	1748909.76	14601698.39	40°12'18.764"N	80°36'41.148"W	1292.35	287.729	10.78	4.83	10.26
6198.00	70.490	327.370	5812.54	993.53	429.67	-1255.07	1748885.67	14601734.52	40°12'19.123"N	80°36'41.456"W	1326.58	288.899	4.57	-1.33	4.63
6243.00	72.950	330.440	5827.29	1038.13	467.88	-1278.11	1748862.64	14601772.71	40°12'19.501"N	80°36'41.751"W	1361.06	290.106	8.12	5.23	6.33
6292.00	77.030	333.170	5839.20	1082.54	507.04	-1299.08	1748841.67	14601811.85	40°12'19.889"N	80°36'42.019"W	1394.53	291.321	10.56	8.87	5.93
6333.00	80.450	334.030	5848.18	1127.57	547.44	-1319.14	1748821.62	14601852.24	40°12'20.289"N	80°36'42.276"W	1428.22	292.538	7.66	7.43	1.87
6380.00	82.60	334.700	5853.21	1174.16	589.55	-1339.33	1748801.44	14601894.33	40°12'20.706"N	80°36'42.533"W	1463.34	293.758	14.56	14.49	1.49
6430.00	84.10	335.100	5858.02	1219.93	631.54	-1358.08	1748782.70	14601936.30	40°12'21.122"N	80°36'42.773"W	1497.74	294.939	9.15	7.50	5.24
6480.00	85.30	335.500	5863.20	1311.72	718.64	-1390.57	1748760.22	14602023.37	40°12'21.584"N	80°36'43.041"W	1565.29	297.330	5.19	-0.43	5.17
6522.00	86.60	335.600	5868.50	1403.55	805.64	-1423.35	1748717.45	14602110.34	40°12'22.045"N	80°36'43.304"W	1635.54	299.511	5.59	-0.27	-5.58
6570.00	88.950	335.700	5873.62	1496.10	890.60	-1461.17	1748679.64	14602195.26	40°12'23.686"N	80°36'44.087"W	1711.19	301.363	1.96	-1.09	-1.63
6610.00	89.70	335.800	5878.56	1588.69	975.36	-1499.39	1748641.44	14602280.00	40°12'24.526"N	80°36'44.575"W	1788.72	303.044	1.06	0.13	1.05
6650.00	89.750	335.880	5883.93	1680.24	1059.44	-1536.74	1748604.11	14602364.04	40°12'25.358"N	80°36'45.051"W	1866.54	304.583	0.73	0.63	-0.37
6690.00	90.950	335.950	5889.830	1772.43	1145.56	-1571.79	1748569.07	14602450.12	40°12'26.211"N	80°36'45.498"W	1944.95	306.086	4.44	1.29	4.25

Actual Wellpath Report
Linda Greathouse BRK 1H AWP Proj: 14073'
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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Brooke County, WV	Well	Linda Greathouse BRK 1H
Field	Brooke	Wellbore	Linda Greathouse BRK 1H AWB
Facility	Linda Greathouse BRK Pad		

WELLPATH DATA (167 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
7080.00	90.950	336.600	5853.82	1864.54	1231.89	-1606.29	1748534.58	14602536.42	40°12'27.065"N	80°36'45.938"W	2024.29	307.485	3.47	0.00	-3.47
7173.00	90.950	332.680	5852.28	1957.25	1315.90	-1646.11	1748494.78	14602620.40	40°12'27.897"N	80°36'46.446"W	2107.44	308.639	4.21	0.00	-4.22
7265.00	90.950	333.690	5850.75	2049.13	1398.00	-1687.61	1748453.30	14602702.47	40°12'28.710"N	80°36'46.977"W	2191.44	309.638	1.10	0.00	1.10
7358.00	90.890	333.010	5849.26	2142.00	1481.11	-1729.32	1748411.61	14602785.54	40°12'29.533"N	80°36'47.510"W	2276.89	310.579	0.73	-0.06	-0.73
7451.00	91.020	334.860	5847.71	2234.80	1564.63	-1770.17	1748370.77	14602869.04	40°12'30.360"N	80°36'48.031"W	2362.54	311.473	1.99	0.14	1.99
7544.00	91.290	341.250	5845.83	2326.91	1650.83	-1804.90	1748336.05	14602955.20	40°12'31.214"N	80°36'48.474"W	2446.00	312.447	6.88	0.29	6.87
7636.00	91.170	340.010	5843.86	2417.42	1737.60	-1835.41	1748305.55	14603041.94	40°12'32.072"N	80°36'48.863"W	2527.45	313.432	1.35	-0.13	-1.35
7729.00	91.260	337.910	5841.88	2509.36	1824.38	-1868.79	1748272.19	14603128.68	40°12'32.931"N	80°36'49.288"W	2611.65	314.311	2.26	0.10	-2.26
7822.00	90.980	335.960	5840.07	2601.73	1909.92	-1905.21	1748235.78	14603214.19	40°12'33.778"N	80°36'49.753"W	2697.71	315.071	2.12	-0.30	-2.10
7914.00	90.580	335.930	5838.81	2693.29	1993.93	-1942.71	1748198.29	14603298.16	40°12'34.610"N	80°36'50.231"W	2783.86	315.745	0.44	-0.43	-0.03
8007.00	91.080	336.200	5837.47	2785.83	2078.92	-1980.44	1748160.58	14603383.12	40°12'35.451"N	80°36'50.713"W	2871.24	316.390	0.61	0.54	0.29
8100.00	90.580	337.290	5836.12	2878.25	2164.35	-2017.15	1748123.88	14603468.52	40°12'36.297"N	80°36'51.181"W	2958.60	317.016	1.29	-0.54	1.17
8193.00	90.310	337.390	5835.40	2970.56	2250.17	-2052.98	1748088.07	14603554.31	40°12'37.147"N	80°36'51.638"W	3045.98	317.624	0.31	-0.29	0.11
8285.00	90.340	336.260	5834.88	3061.98	2334.74	-2089.18	1748051.88	14603638.85	40°12'37.984"N	80°36'52.100"W	3133.00	318.177	1.23	0.03	-1.23
8378.00	90.370	335.950	5834.30	3154.52	2419.77	-2126.85	1748014.22	14603723.84	40°12'38.826"N	80°36'52.581"W	3221.61	318.686	0.33	0.03	-0.33
8471.00	90.370	337.600	5833.70	3246.94	2505.23	-2163.53	1747977.56	14603809.27	40°12'39.672"N	80°36'53.049"W	3310.14	319.186	1.77	0.00	1.77
8563.00	90.490	340.480	5833.01	3337.88	2591.13	-2196.43	1747944.67	14603895.14	40°12'40.522"N	80°36'53.468"W	3396.80	319.713	3.13	0.13	3.13
8656.00	90.310	343.550	5832.36	3428.97	2679.57	-2225.14	1747915.97	14603983.54	40°12'41.398"N	80°36'53.833"W	3483.01	320.293	3.31	-0.19	3.30
8749.00	90.310	339.570	5831.86	3520.19	2767.78	-2254.55	1747886.57	14604071.72	40°12'42.270"N	80°36'54.207"W	3569.82	320.835	4.28	0.00	-4.28
8841.00	91.540	336.650	5830.37	3611.33	2853.13	-2288.84	1747852.30	14604157.03	40°12'43.115"N	80°36'54.645"W	3657.75	321.263	3.44	1.34	-3.17
8934.00	90.800	339.340	5828.47	3703.49	2939.32	-2323.68	1747817.47	14604243.19	40°12'43.969"N	80°36'55.089"W	3746.88	321.672	3.00	-0.80	2.89
9027.00	90.650	337.020	5827.29	3795.58	3025.77	-2357.94	1747783.23	14604329.61	40°12'44.824"N	80°36'55.526"W	3836.04	322.071	2.07	-0.16	-2.06
9119.00	90.630	335.900	5825.46	3887.01	3110.22	-2394.38	1747746.80	14604414.02	40°12'45.660"N	80°36'55.990"W	3925.12	322.409	1.97	1.07	-1.65
9212.00	90.800	337.020	5823.49	3979.63	3194.77	-2433.07	1747708.12	14604498.54	40°12'46.498"N	80°36'56.484"W	4015.76	322.708	1.38	-0.89	-1.05
9305.00	90.740	336.000	5822.24	4072.38	3278.69	-2473.13	1747668.08	14604582.43	40°12'47.329"N	80°36'56.996"W	4106.84	322.973	0.94	-0.06	-0.94
9398.00	90.090	333.000	5819.94	4164.99	3363.22	-2511.79	1747629.43	14604666.93	40°12'48.166"N	80°36'57.490"W	4197.67	323.246	3.28	1.45	2.95
9491.00	90.800	333.010	5817.62	4256.55	3447.08	-2549.54	1747591.70	14604750.76	40°12'48.996"N	80°36'57.972"W	4287.49	323.512	2.63	-1.40	-2.23
9584.00	90.740	330.800	5816.37	4349.44	3529.75	-2592.09	1747549.17	14604833.39	40°12'49.815"N	80°36'58.515"W	4379.28	323.708	4.24	-0.06	-4.24
9677.00	90.460	332.230	5815.40	4442.42	3611.49	-2636.44	1747504.84	14604915.10	40°12'50.624"N	80°36'59.083"W	4471.43	323.870	1.57	-0.30	1.54
9770.00	90.950	339.160	5814.25	4534.96	3696.19	-2674.69	1747466.60	14604999.76	40°12'51.463"N	80°36'59.571"W	4562.43	324.109	7.47	0.33	7.45

Actual Wellpath Report

Linda Greathouse BRK 1H AWP Proj: 14073'
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REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #01
SOUTHWESTERN ENERGY	Well	Linda Greathouse BRK 1H
Area	Wellbore	Linda Greathouse BRK 1H AWB
Field		
Facility		

WELLPATH DATA (167 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
9861.00	90.890	338.440	5812.78	4625.96	3781.95	-2707.95	1747433.35	14605085.49	40°12'52.312"N	80°36'59.995"W	4651.47	324.397	0.79	-0.07	-0.78
9954.00	91.140	337.690	5811.13	4718.11	3868.20	-2742.69	1747398.63	14605171.71	40°12'53.166"N	80°37'00.438"W	4741.87	324.662	0.85	0.27	-0.81
10047.00	91.230	338.480	5809.21	4810.26	3954.46	-2777.39	1747363.94	14605257.94	40°12'54.019"N	80°37'00.880"W	4832.36	324.918	0.85	0.10	0.85
10140.00	90.920	337.360	5807.46	4902.44	4040.63	-2812.34	1747329.00	14605344.07	40°12'54.872"N	80°37'01.326"W	4923.00	325.161	1.25	-0.33	-1.20
10232.00	90.990	335.980	5805.93	4993.87	4125.09	-2848.77	1747292.58	14605428.50	40°12'55.709"N	80°37'01.791"W	5013.17	325.371	1.50	0.08	-1.50
10325.00	91.050	334.610	5804.27	5086.52	4209.56	-2887.63	1747253.74	14605512.94	40°12'56.545"N	80°37'02.287"W	5104.79	325.551	1.47	0.06	-1.47
10418.00	90.770	337.250	5802.79	5179.06	4294.46	-2925.56	1747215.83	14605597.80	40°12'57.386"N	80°37'02.771"W	5196.27	325.736	2.85	-0.30	2.84
10511.00	90.890	338.920	5801.45	5271.22	4380.73	-2960.26	1747181.14	14605684.03	40°12'58.240"N	80°37'03.214"W	5287.14	325.951	1.80	0.13	1.80
10604.00	90.860	336.320	5800.03	5363.46	4466.70	-2995.66	1747145.75	14605769.98	40°12'59.091"N	80°37'03.665"W	5378.24	326.152	2.80	-0.03	-2.80
10696.00	90.800	333.520	5798.69	5455.15	4550.01	-3034.65	1747106.78	14605853.36	40°12'59.916"N	80°37'04.163"W	5469.16	326.299	3.04	-0.07	-3.04
10789.00	90.550	334.040	5797.60	5547.99	4633.44	-3075.74	1747065.71	14605936.65	40°13'00.742"N	80°37'04.688"W	5561.38	326.423	0.62	-0.27	0.56
10882.00	90.460	337.550	5796.78	5640.56	4718.24	-3113.86	1747027.60	14606021.42	40°13'01.581"N	80°37'05.175"W	5653.14	326.577	3.78	-0.10	3.77
10975.00	90.520	337.800	5795.98	5732.80	4804.27	-3149.19	1746992.29	14606107.41	40°13'02.433"N	80°37'05.626"W	5744.42	326.755	0.28	0.06	0.27
11067.00	90.580	339.100	5795.10	5823.89	4889.83	-3182.98	1746958.51	14606192.94	40°13'03.280"N	80°37'06.057"W	5834.54	326.938	1.41	0.07	1.41
11160.00	90.710	341.840	5794.05	5915.44	4977.47	-3214.06	1746927.44	14606280.55	40°13'04.147"N	80°37'06.452"W	5924.98	327.149	2.95	0.14	2.95
11253.00	90.620	338.940	5792.97	6007.02	5065.06	-3245.27	1746896.24	14606368.10	40°13'05.014"N	80°37'06.850"W	6015.53	327.352	3.12	-0.10	-3.12
11346.00	90.860	337.000	5791.77	6099.19	5151.26	-3280.15	1746861.38	14606454.27	40°13'05.867"N	80°37'07.295"W	6106.95	327.512	2.10	0.26	-2.09
11439.00	90.920	336.260	5790.33	6191.63	5236.62	-3317.03	1746824.50	14606539.59	40°13'06.713"N	80°37'07.765"W	6198.78	327.649	0.80	0.06	-0.80
11532.00	90.680	333.250	5789.03	6284.35	5320.72	-3356.69	1746784.86	14606623.66	40°13'07.545"N	80°37'08.272"W	6291.06	327.753	3.25	-0.26	-3.24
11624.00	90.590	336.170	5788.04	6376.07	5403.89	-3395.98	1746745.58	14606706.80	40°13'08.369"N	80°37'08.774"W	6382.37	327.853	3.18	-0.14	3.17
11717.00	90.830	337.740	5786.92	6468.45	5489.45	-3432.39	1746709.20	14606792.33	40°13'09.216"N	80°37'09.238"W	6474.21	327.984	1.71	0.30	1.69
11810.00	90.740	336.670	5785.65	6560.88	5574.86	-3469.16	1746672.44	14606877.71	40°13'10.061"N	80°37'09.708"W	6566.14	328.107	2.23	-0.10	-2.23
11903.00	90.680	335.530	5784.49	6653.49	5659.55	-3507.57	1746634.04	14606962.36	40°13'10.900"N	80°37'10.198"W	6658.35	328.211	0.16	-0.06	-0.15
11996.00	90.310	333.620	5783.69	6746.20	5743.70	-3547.15	1746594.48	14607046.48	40°13'11.733"N	80°37'10.704"W	6750.73	328.302	1.59	-0.40	-1.54
12089.00	90.220	331.460	5782.97	6837.92	5826.98	-3586.23	1746555.41	14607129.73	40°13'12.558"N	80°37'11.203"W	6842.13	328.390	1.66	-0.14	1.65
12182.00	90.650	333.240	5782.27	6930.29	5912.61	-3622.50	1746519.15	14607215.52	40°13'13.406"N	80°37'11.665"W	6934.08	328.505	3.05	0.04	3.05
12275.00	90.860	338.900	5781.04	7022.39	5999.04	-3656.81	1746484.85	14607301.72	40°13'14.261"N	80°37'12.103"W	7025.73	328.635	0.52	0.46	-0.24
12368.00	90.860	338.900	5781.04	7114.44	6085.61	-3690.79	1746450.89	14607388.25	40°13'15.118"N	80°37'12.537"W	7117.34	328.764	0.74	0.23	0.71
12461.00	90.490	338.070	5779.96	7205.52	6171.19	-3724.53	1746417.17	14607473.80	40°13'15.965"N	80°37'12.967"W	7208.03	328.888	0.99	-0.40	-0.90
12554.00	90.800	339.510	5778.91	7297.51	6257.88	-3758.17	1746383.54	14607560.46	40°13'16.823"N	80°37'13.396"W	7299.65	329.013	1.58	0.33	1.55

REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #01
Area	Brooke County, WV	Well	Linda Greathouse BRK 1H
Field	Brooke	Wellbore	Linda Greathouse BRK 1H AWB
Facility	Linda Greathouse BRK Pad		

WELLPATH DATA (167 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
12645.00	90.950	337.930	5777.49	7389.52	6344.53	-3791.92	1746349.80	14607647.07	40°13'17.681"N	80°37'13.826"W	7391.32	329.135	1.71	0.16	-1.70
12738.00	91.200	336.390	5775.75	7481.86	6430.22	-3828.01	1746313.73	14607732.73	40°13'18.529"N	80°37'14.286"W	7483.41	329.234	1.68	0.27	-1.66
12831.00	90.770	334.600	5774.15	7574.47	6514.82	-3866.58	1746275.17	14607817.30	40°13'19.367"N	80°37'14.779"W	7575.84	329.311	1.98	-0.46	-1.92
12923.00	90.460	334.970	5773.16	7666.20	6598.05	-3905.77	1746236.00	14607900.50	40°13'20.191"N	80°37'15.280"W	7667.42	329.376	0.52	-0.34	0.40
13016.00	90.580	337.620	5772.31	7758.69	6683.19	-3943.15	1746198.63	14607985.61	40°13'21.034"N	80°37'15.757"W	7759.74	329.459	2.85	0.13	2.85
13109.00	90.430	341.220	5771.49	7850.52	6770.24	-3975.84	1746165.96	14608072.62	40°13'21.895"N	80°37'16.173"W	7851.33	329.576	3.87	-0.16	3.87
13202.00	90.400	338.250	5770.82	7942.28	6857.47	-4008.04	1746133.76	14608159.82	40°13'22.759"N	80°37'16.584"W	7942.88	329.695	3.19	-0.03	-3.19
13294.00	90.860	338.690	5769.81	8033.36	6943.05	-4041.80	1746100.02	14608245.36	40°13'23.606"N	80°37'17.014"W	8033.81	329.795	0.69	0.50	0.48
13387.00	90.680	337.400	5768.56	8125.52	7029.29	-4076.57	1746065.26	14608331.58	40°13'24.460"N	80°37'17.458"W	8125.85	329.889	1.40	-0.19	-1.39
13480.00	90.860	335.640	5767.31	8217.98	7114.58	-4113.62	1746028.23	14608416.83	40°13'25.304"N	80°37'17.931"W	8218.22	329.964	1.90	0.19	-1.89
13573.00	90.920	334.590	5765.87	8310.66	7198.94	-4152.75	1745989.11	14608501.15	40°13'26.139"N	80°37'18.431"W	8310.84	330.021	1.13	0.06	-1.13
13666.00	90.400	334.850	5764.79	8403.38	7283.02	-4192.46	1745949.42	14608585.21	40°13'26.972"N	80°37'18.938"W	8403.52	330.073	0.63	-0.56	0.28
13758.00	91.020	336.230	5763.65	8495.00	7366.76	-4230.55	1745911.34	14608668.91	40°13'27.801"N	80°37'19.424"W	8495.10	330.132	1.64	0.67	1.50
13851.00	91.020	336.450	5762.00	8587.49	7451.93	-4267.87	1745874.04	14608754.04	40°13'28.644"N	80°37'19.901"W	8587.54	330.199	0.24	0.00	0.24
13944.00	91.080	337.240	5760.29	8679.89	7537.42	-4304.43	1745837.49	14608839.50	40°13'29.490"N	80°37'20.367"W	8679.91	330.270	0.85	0.06	0.85
14037.00	90.550	331.730	5758.97	8772.61	7621.31	-4344.47	1745797.47	14608923.36	40°13'30.321"N	80°37'20.879"W	8772.61	330.315	5.95	-0.57	-5.92
14070.00	90.550	331.730	5758.62	8808.59	7653.01	-4361.52	1745780.42	14608955.05	40°13'30.635"N	80°37'21.097"W	8808.60	330.321	0.00	0.00	0.00

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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot #01
Area	Brooke County, WV	Linda Greathouse BRK 1H
Field	Brooke	Linda Greathouse BRK 1H AWP
Facility	Linda Greathouse BRK Pad	

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Linda Greathouse BRK 1H BHL Rev-1		5749.20	7668.21	-4356.28	1745785.66	14608970.24	40°13'30.785"N	80°37'21.029"W	point
Linda Greathouse BRK 1H BHL Rev-2		5749.20	7658.95	-4352.34	1745789.60	14608960.99	40°13'30.693"N	80°37'20.978"W	point
Linda Greathouse BRK 1H LP Rev-1		5845.20	566.56	-1334.89	1748805.88	14601871.35	40°12'20.479"N	80°36'42.477"W	point

WELLPATH COMPOSITION - Ref Wellbore: Linda Greathouse BRK 1H AWP Proj: 14073'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	440.00	Generic gyro - northseeking (Standard)	01_MS Gyro <17-1/2"> (100'-440')	Linda Greathouse BRK 1H AWP
440.00	2014.00	NaviTrak (MagCorr)	02_APS EM <12-1/4"> (440')(519'-2014') Proj:2095'	Linda Greathouse BRK 1H AWP
2014.00	5323.00	NaviTrak (MagCorr)	03_APS EM <8-3/4"> (2014')(2096'-5323')	Linda Greathouse BRK 1H AWP
5323.00	14037.00	NaviTrak (MagCorr)	04_BH AT Curve <8-1/2"> (5323')(5410'-14037')	Linda Greathouse BRK 1H AWP
14037.00	14073.00	Blind Drilling (std)	Projection to bit	Linda Greathouse BRK 1H AWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	Area	Field	Facility	Well	Slot #01
SOUTHWESTERN ENERGY	Brooke County, WV	Brooke	Linda Greathouse BRK Pad	Wellbore	Linda Greathouse BRK 1H
					Linda Greathouse BRK 1H AWB

COMMENTS

Wellpath general comments
 API: 47-009-00157-0000
 BHI Job #: 7469153
 Rig: SDC 40
 Duration: 8/30/2015-9/7/2015
 MS Gyro <17-1/2"> (100'-440')
 APS EM <12-1/4"> (440')(519'-2014')
 APS EM <8-3/4"> (2014')(2096'-5323')
 BHI AT Curve <8-1/2"> (5323')(5410'-14037')
 Projected MD at TD: 14073'

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