

# SOUTHWESTERN ENERGY

Location: Brooke County, WV  
 Slot: Slot #210  
 Well: John Good Jr BRK 210H  
 Field: Brooke  
 Facility: John Good Jr BRK Pad Wellbore: John Good Jr BRK 210H PWB

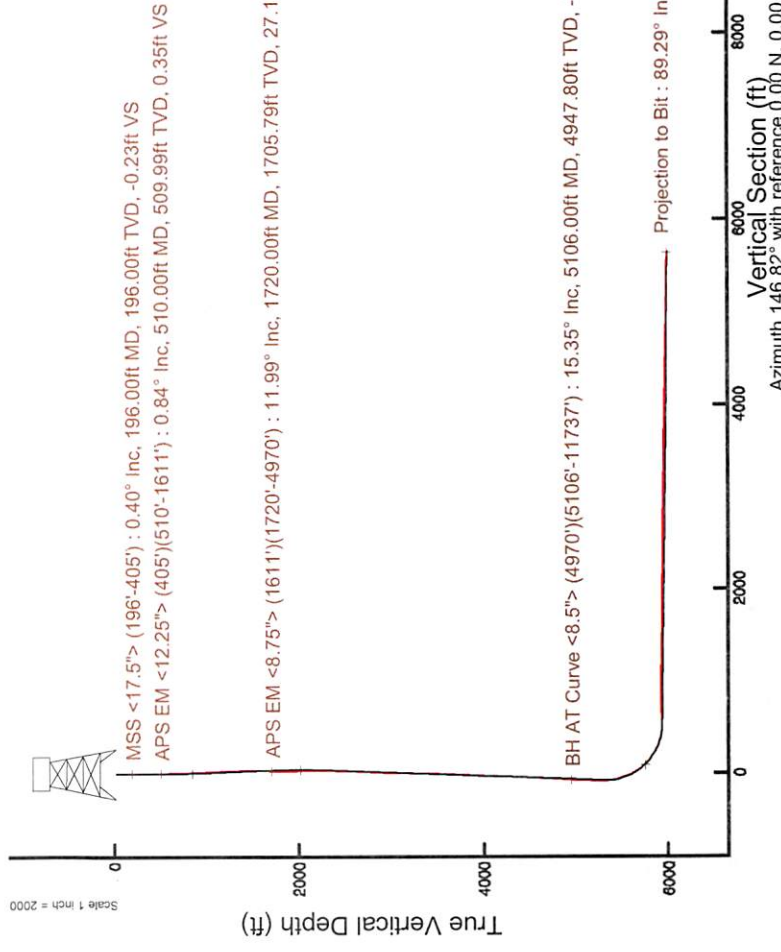
Plot reference wellpath is John Good Jr BRK 210H PWP Rev-A.0  
 Grid System: NAD83 / UTM Zone 17 North, US feet  
 True vertical depths are referenced to SDC-46 (KB)  
 Measured depths are referenced to SDC-46 (KB)  
 SDC-46 (KB) to Mean Sea Level: 1178.6 feet  
 Mean Sea Level to Ground level (At Slot: Slot #210): -1152.6 feet  
 Coordinates are in feet referenced to Slot  
 Created by: amarcar on 2017-09-12  
 Database: WA\_MPL\_EASTERUS\_Defn

## Location Information

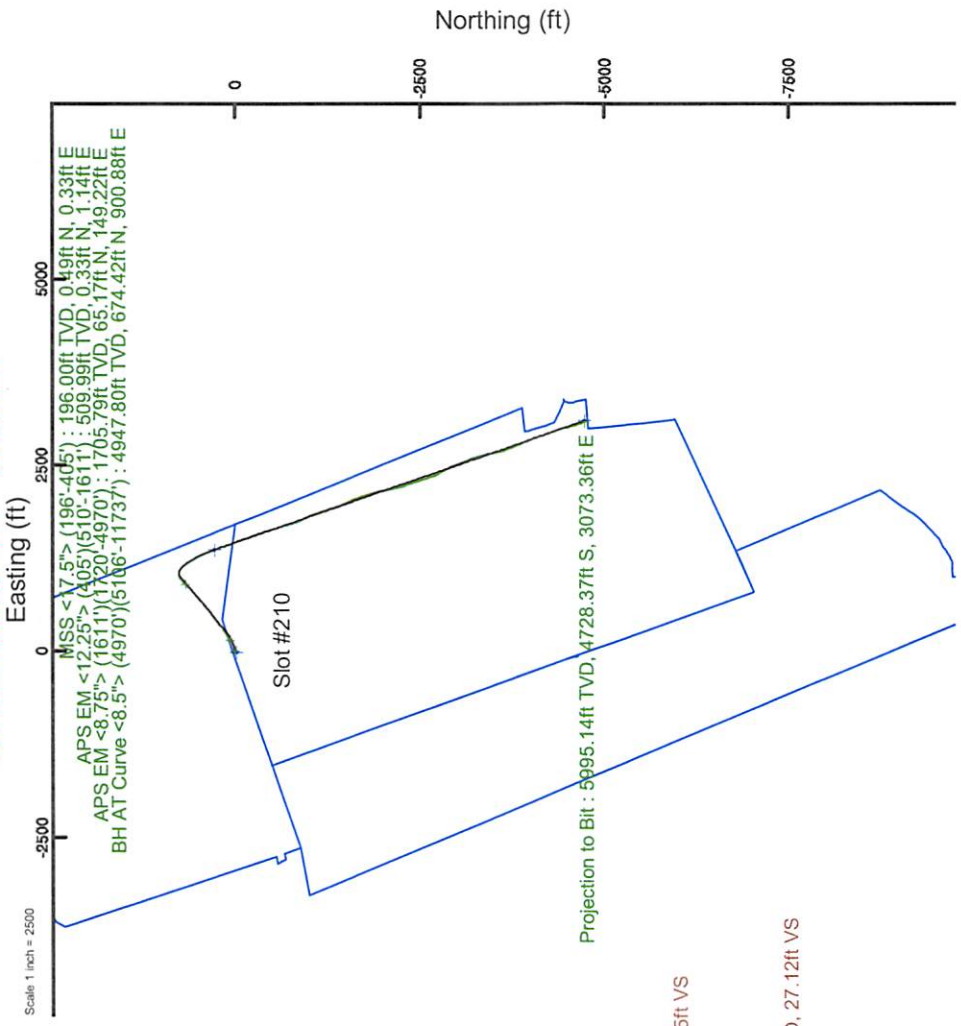
Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
John Good Jr BRK Pad	1757463.232	14608504.851	40°13'25.666"N	80°34'50.452"W
Slot #210	18.97	15.82	1757479.050	14608523.810
SDC-46 (KB) to Ground level (At Slot: Slot #210)	26ft			
Mean Sea Level to Ground level (At Slot: Slot #210)	-1152.6ft			
SDC-46 (KB) to Mean Sea Level	1178.6ft			

## Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	26.00	0.000	70.000	26.00	0.00	0.00	0.00	0.00
Start Nudge	600.00	0.000	70.000	600.00	0.00	0.00	0.00	0.00
End Nudge	1100.00	10.000	1097.47	14.89	40.90	2.00	9.92	
Start Build/Turn	1813.37	10.000	1800.00	57.25	157.30	0.00	38.17	
End Build/Turn	2270.98	17.924	50.131	2243.97	116.11	248.88	2.00	39.03
Curve KOP	5507.82	17.924	50.131	5323.71	754.69	1013.46	0.00	-77.01
Landing Point	6463.57	89.243	161.017	5933.00	282.10	1368.08	10.00	512.61
Total Depth	11761.30	89.243	161.017	6003.00	-4727.09	3091.18	0.00	5648.08



API: 47-009-00197-0000  
 Job#: 8708695  
 Rig: SDC-46  
 Duration: 09/01/17 - 09/07/17



User specified Dip: 67.72° Field: 52683 nT  
 Magnetic North is 8.30 degrees West of True North (at 27/Aug/2017)  
 Grid North is 0.27 degrees East of True North  
 To correct azimuth from True to Grid subtract 0.27 degrees  
 To correct azimuth from Magnetic to Grid subtract 8.57 degrees

Scale 1 inch = 2000

Vertical Section (ft)  
 Azimuth 146.82° with reference 0.00 N, 0.00 E

# Actual Wellpath Report

John Good Jr BRK 210H AWP Proj: 11761'

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## REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #210
Area	Brooke County, WV	Well	John Good Jr BRK 210H
Field	Brooke	Wellbore	John Good Jr BRK 210H AWB
Facility	John Good Jr BRK Pad		

## REPORT SETUP INFORMATION

Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.1
North Reference	Grid	User	Amarcar
Scale	0.999616	Report Generated	12/Sep/2017 at 15:23
Convergence at slot	0.27° East	Database/Source file	WA_MPL_EASTERNUS_Defn/John_Good_Jr_BRK_210H_AWP_Proj_11761_.xml

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	18.97	15.82	1757479.05	14608523.81	40°13'25.853"N	80°34'50.247"W
Facility Reference Pt			1757463.23	14608504.85	40°13'25.666"N	80°34'50.452"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.478"W

## WELLPATH DATUM

Calculation method	Minimum curvature	SDC-46 (KB) to Facility Vertical Datum	26.00ft
Horizontal Reference Pt	Slot	SDC-46 (KB) to Mean Sea Level	1178.60ft
Vertical Reference Pt	SDC-46 (KB)	SDC-46 (KB) to Ground Level at Slot (Slot #210)	26.00ft
MD Reference Pt	SDC-46 (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	146.82°



# Actual Wellpath Report

John Good Jr BRK 210H AWP Proj: 11761'  
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## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #210
SOUTHWESTERN ENERGY	Well	John Good Jr BRK 210H
Area	Wellbore	John Good Jr BRK 210H AWB
Field		
Facility		

## WELLPATH DATA (131 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	33.680	0.00	0.00	0.00	0.00	1757479.05	14608523.81	40°13'25.853"N	80°34'50.247"W	0.00	0.000	0.00	0.00	0.00
26.00	0.000	33.680	26.00	0.00	0.00	0.00	1757479.05	14608523.81	40°13'25.853"N	80°34'50.247"W	0.00	0.000	0.00	0.00	0.00
196.00	0.400	33.680	196.00	-0.23	0.49	0.33	1757479.38	14608524.30	40°13'25.858"N	80°34'50.243"W	0.59	33.680	0.24	0.24	19.81
288.00	0.300	62.380	288.00	-0.34	0.87	0.72	1757479.77	14608524.68	40°13'25.861"N	80°34'50.238"W	1.13	39.546	0.22	-0.11	31.20
405.00	0.400	230.280	405.00	-0.26	0.75	0.68	1757479.73	14608524.56	40°13'25.860"N	80°34'50.238"W	1.01	41.966	0.60	0.09	143.50
510.00	0.840	104.050	509.99	0.35	0.33	1.14	1757480.19	14608524.14	40°13'25.856"N	80°34'50.232"W	1.19	73.768	1.07	0.42	-120.22
603.00	1.810	93.440	602.97	1.72	0.08	3.27	1757482.32	14608523.89	40°13'25.853"N	80°34'50.205"W	3.27	88.616	1.07	1.04	-11.41
696.00	2.910	91.800	695.89	3.95	-0.08	7.10	1757486.14	14608523.73	40°13'25.852"N	80°34'50.155"W	7.10	90.672	1.18	1.18	-1.76
788.00	3.980	85.870	787.72	6.84	0.07	12.61	1757491.66	14608523.88	40°13'25.853"N	80°34'50.084"W	12.61	89.667	1.22	1.16	-6.45
881.00	5.290	82.120	880.41	10.24	0.89	20.08	1757499.12	14608524.70	40°13'25.861"N	80°34'49.988"W	20.10	87.452	1.45	1.41	-4.03
974.00	6.500	79.270	972.92	14.08	2.46	29.50	1757508.54	14608526.27	40°13'25.876"N	80°34'49.866"W	29.60	85.230	1.34	1.30	-3.06
1067.00	7.550	74.790	1065.22	17.98	5.04	40.57	1757519.60	14608528.85	40°13'25.901"N	80°34'49.724"W	40.88	82.912	1.27	1.13	-4.82
1159.00	8.680	72.490	1156.30	21.72	8.72	53.02	1757532.05	14608532.53	40°13'25.936"N	80°34'49.563"W	53.73	80.662	1.28	1.23	-2.50
1252.00	9.820	67.860	1248.09	25.13	13.82	67.06	1757546.08	14608537.62	40°13'25.986"N	80°34'49.381"W	68.47	78.356	1.46	1.27	-4.98
1345.00	11.470	64.860	1339.49	27.95	20.74	82.78	1757561.80	14608544.54	40°13'26.054"N	80°34'49.178"W	85.34	75.936	1.87	1.77	-3.23
1438.00	12.160	60.840	1430.52	29.93	29.44	99.70	1757578.71	14608553.24	40°13'26.139"N	80°34'48.960"W	103.96	73.550	1.15	0.74	-4.32
1530.00	12.730	57.170	1520.36	30.67	39.66	116.68	1757595.69	14608563.45	40°13'26.239"N	80°34'48.740"W	123.24	71.229	1.06	0.62	-3.99
1611.00	12.900	53.110	1599.34	30.14	49.92	131.41	1757610.41	14608573.71	40°13'26.340"N	80°34'48.550"W	140.58	69.199	1.13	0.21	-5.01
1720.00	11.990	45.460	1705.79	27.12	65.17	149.22	1757628.21	14608588.95	40°13'26.490"N	80°34'48.319"W	162.83	66.407	1.73	-0.83	-7.02
1812.00	11.740	54.430	1795.83	24.85	77.32	163.64	1757642.63	14608601.10	40°13'26.609"N	80°34'48.133"W	180.99	64.711	2.02	-0.27	9.75
1905.00	12.460	63.770	1886.77	25.67	87.25	180.34	1757659.32	14608611.03	40°13'26.706"N	80°34'47.917"W	200.34	64.180	2.24	0.77	10.04
1998.00	12.060	62.860	1977.65	27.90	96.12	197.98	1757676.96	14608619.89	40°13'26.793"N	80°34'47.689"W	220.08	64.103	0.48	-0.43	-0.98
2090.00	12.590	60.990	2067.53	29.64	105.37	215.31	1757694.27	14608629.14	40°13'26.884"N	80°34'47.465"W	239.71	63.923	0.72	0.58	-2.03
2183.00	13.660	58.270	2158.10	30.66	116.06	233.51	1757712.47	14608639.82	40°13'26.989"N	80°34'47.229"W	260.76	63.572	1.33	1.15	-2.92
2275.00	15.750	55.420	2247.08	30.63	128.86	253.03	1757731.99	14608652.62	40°13'27.114"N	80°34'46.977"W	283.96	63.012	2.40	2.27	-3.10
2368.00	18.520	53.800	2335.94	29.54	144.75	275.35	1757754.29	14608668.50	40°13'27.270"N	80°34'46.688"W	311.08	62.269	3.02	2.98	-1.74
2461.00	18.780	53.020	2424.06	27.77	162.48	299.23	1757778.16	14608686.23	40°13'27.444"N	80°34'46.379"W	340.49	61.498	0.39	0.28	-0.84
2553.00	18.310	51.150	2511.28	25.36	180.45	322.81	1757801.24	14608704.19	40°13'27.621"N	80°34'46.081"W	369.39	60.757	0.82	-0.51	-2.03
2646.00	18.070	50.720	2599.64	22.38	198.75	344.85	1757823.77	14608722.48	40°13'27.801"N	80°34'45.789"W	398.03	60.044	0.30	-0.26	-0.46
2739.00	17.760	49.140	2688.13	18.96	217.16	366.74	1757845.65	14608740.88	40°13'27.981"N	80°34'45.506"W	426.22	59.369	0.62	-0.33	-1.70



# Actual Wellpath Report

John Good Jr BRK 210H AWP Proj: 11761'  
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## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #210
SOUTHWESTERN ENERGY	Well	John Good Jr BRK 210H
Area	Wellbore	John Good Jr BRK 210H AWB
Field		
Facility		

## WELLPATH DATA (131 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]
2835.00	17.470	48.150	2779.63	14.83	236.35	388.55	1757867.45	14608760.07	40°13'28.170"N	80°34'45.223"W	454.79	58.688	0.43	-0.30	-1.03
2927.00	17.100	46.820	2867.47	10.40	254.82	408.70	1757887.59	14608778.53	40°13'28.352"N	80°34'44.962"W	481.63	58.057	0.59	-0.40	-1.45
3020.00	16.550	51.050	2956.49	6.69	272.50	428.97	1757907.86	14608796.21	40°13'28.525"N	80°34'44.700"W	508.21	57.574	1.44	-0.59	4.55
3116.00	15.540	52.450	3048.75	4.34	288.94	449.80	1757928.68	14608812.64	40°13'28.687"N	80°34'44.430"W	534.61	57.285	1.13	-1.05	1.46
3209.00	16.530	53.390	3138.13	2.60	304.42	470.30	1757949.17	14608828.11	40°13'28.839"N	80°34'44.165"W	560.23	57.085	1.10	1.06	1.01
3301.00	16.430	54.620	3226.36	1.31	319.76	491.42	1757970.28	14608843.45	40°13'28.989"N	80°34'43.892"W	586.29	56.948	0.39	-0.11	1.34
3394.00	16.470	53.960	3315.55	0.15	335.13	512.80	1757991.65	14608858.81	40°13'29.140"N	80°34'43.615"W	612.60	56.834	0.21	0.04	-0.71
3487.00	16.900	52.320	3404.63	-1.57	351.15	534.16	1758013.00	14608874.82	40°13'29.298"N	80°34'43.339"W	639.24	56.679	0.69	0.46	-1.76
3579.00	17.710	50.540	3492.47	-4.15	368.22	555.54	1758034.38	14608891.89	40°13'29.465"N	80°34'43.062"W	666.49	56.463	1.05	0.88	-1.93
3669.00	17.060	50.680	3578.36	-7.06	385.28	576.33	1758055.15	14608908.94	40°13'29.633"N	80°34'42.793"W	693.25	56.237	0.72	-0.72	0.16
3761.00	17.790	49.580	3666.14	-10.27	402.95	597.47	1758076.29	14608926.60	40°13'29.807"N	80°34'42.520"W	720.65	56.003	0.87	0.79	-1.20
3854.00	19.120	49.540	3754.35	-13.99	422.04	619.87	1758098.68	14608945.69	40°13'29.994"N	80°34'42.230"W	749.91	55.751	1.43	1.43	-0.04
3947.00	18.100	47.820	3842.49	-18.18	441.63	642.17	1758120.97	14608965.27	40°13'30.187"N	80°34'41.941"W	779.37	55.483	1.25	-1.10	-1.85
4040.00	17.920	50.220	3930.93	-22.09	460.48	663.87	1758142.66	14608984.11	40°13'30.372"N	80°34'41.660"W	807.94	55.253	0.82	-0.19	2.58
4132.00	17.650	49.870	4018.53	-25.40	478.53	685.41	1758164.20	14609002.15	40°13'30.549"N	80°34'41.381"W	835.93	55.079	0.32	-0.29	-0.38
4225.00	16.590	47.510	4107.41	-29.26	496.58	705.98	1758184.76	14609020.20	40°13'30.727"N	80°34'41.115"W	863.14	54.878	1.36	-1.14	-2.54
4321.00	17.250	48.650	4199.26	-33.50	515.25	726.77	1758205.54	14609038.86	40°13'30.910"N	80°34'40.846"W	890.88	54.665	0.77	0.69	1.19
4414.00	17.990	49.310	4287.89	-37.33	533.72	748.01	1758226.77	14609057.32	40°13'31.092"N	80°34'40.571"W	918.90	54.492	0.82	0.80	0.71
4506.00	18.270	50.270	4375.33	-40.83	552.20	769.88	1758248.63	14609075.80	40°13'31.273"N	80°34'40.288"W	947.44	54.350	0.45	0.30	1.04
4599.00	16.890	46.680	4463.98	-44.88	570.79	790.92	1758269.66	14609094.38	40°13'31.456"N	80°34'40.016"W	975.37	54.183	1.89	-1.48	-3.86
4692.00	17.950	48.960	4552.72	-49.21	589.47	811.56	1758290.29	14609113.05	40°13'31.640"N	80°34'39.748"W	1003.04	54.008	1.36	1.14	2.45
4785.00	19.110	50.000	4640.90	-52.98	608.66	834.03	1758312.76	14609132.24	40°13'31.828"N	80°34'39.457"W	1032.51	53.879	1.30	1.25	1.12
4877.00	17.930	47.010	4728.13	-57.18	628.00	855.92	1758334.64	14609151.57	40°13'32.018"N	80°34'39.174"W	1061.60	53.732	1.65	-1.28	-3.25
4970.00	16.400	43.570	4816.99	-62.63	647.27	875.45	1758354.16	14609170.83	40°13'32.208"N	80°34'38.921"W	1088.75	53.522	1.97	-1.65	-3.70
5106.00	15.350	42.650	4947.80	-71.44	674.42	900.88	1758379.58	14609197.97	40°13'32.475"N	80°34'38.592"W	1125.36	53.180	0.79	-0.77	-0.68
5199.00	18.290	53.200	5036.83	-75.38	692.23	920.91	1758399.60	14609215.77	40°13'32.650"N	80°34'38.332"W	1152.06	53.069	4.55	3.16	11.34
5292.00	20.670	53.240	5124.50	-77.32	710.79	945.75	1758424.43	14609234.33	40°13'32.832"N	80°34'38.011"W	1183.08	53.073	2.56	2.05	0.04
5384.00	20.720	52.420	5210.57	-79.58	730.44	971.65	1758450.33	14609253.97	40°13'33.025"N	80°34'37.676"W	1215.59	53.066	0.32	0.05	-0.89
5477.00	20.360	57.570	5297.66	-80.64	749.15	998.35	1758477.01	14609272.67	40°13'33.209"N	80°34'37.330"W	1248.17	53.116	1.98	-0.39	5.54
5570.00	20.770	77.610	5384.84	-74.56	761.38	1028.15	1758506.80	14609284.89	40°13'33.328"N	80°34'36.945"W	1279.37	53.479	7.55	0.44	21.55

# Actual Wellpath Report

John Good Jr BRK 210H AWP Proj: 11761'  
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## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #210
SOUTHWESTERN ENERGY	Well	John Good Jr BRK 210H
Area	Wellbore	John Good Jr BRK 210H AWB
Field		
Facility		

## WELLPATH DATA (131 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]
5663.00	20.650	107.120	5472.07	-56.04	760.08	1060.01	1758538.65	14609283.60	40°13'33.314"N	80°34'36.535"W	1304.36	54.357	11.11	-0.13	31.73
5755.00	24.640	120.880	5557.02	-26.28	745.45	1092.01	1758570.64	14609268.97	40°13'33.168"N	80°34'36.123"W	1322.19	55.681	7.18	4.34	14.96
5848.00	30.530	134.500	5639.50	14.30	718.89	1125.56	1758604.18	14609242.43	40°13'32.904"N	80°34'35.692"W	1335.55	57.434	9.24	6.33	14.65
5941.00	38.790	141.630	5715.96	66.51	679.41	1160.57	1758639.17	14609202.96	40°13'32.512"N	80°34'35.243"W	1344.81	59.655	9.88	8.88	7.67
6034.00	49.320	145.850	5782.71	130.97	627.23	1198.56	1758677.15	14609150.80	40°13'31.995"N	80°34'34.757"W	1352.76	62.376	11.75	11.32	4.54
6127.00	57.860	149.020	5837.87	205.73	564.17	1238.70	1758717.28	14609087.76	40°13'31.369"N	80°34'34.243"W	1361.13	65.513	9.58	9.18	3.41
6219.00	65.750	152.210	5881.32	286.55	493.54	1278.38	1758756.93	14609017.16	40°13'30.670"N	80°34'33.736"W	1370.34	68.890	9.10	8.58	3.47
6266.00	69.880	153.850	5899.07	329.80	454.76	1298.10	1758776.65	14608978.40	40°13'30.286"N	80°34'33.484"W	1375.45	70.693	9.32	8.74	3.49
6312.00	74.810	156.560	5913.02	373.14	414.98	1316.46	1758795.00	14608938.63	40°13'29.892"N	80°34'33.250"W	1380.32	72.504	12.14	10.76	5.89
6358.00	79.770	158.920	5923.14	417.18	373.47	1333.45	1758811.98	14608897.13	40°13'29.481"N	80°34'33.033"W	1384.76	74.354	11.89	10.78	5.13
6405.00	85.130	160.310	5929.32	462.60	329.81	1349.66	1758828.19	14608853.49	40°13'29.048"N	80°34'32.827"W	1389.38	76.268	11.77	11.40	2.96
6451.00	91.170	161.590	5930.80	507.16	286.37	1364.66	1758843.19	14608810.07	40°13'28.618"N	80°34'32.636"W	1394.39	78.149	13.42	13.13	2.78
6497.00	91.450	161.880	5929.75	551.60	242.70	1379.08	1758857.59	14608766.42	40°13'28.186"N	80°34'32.453"W	1400.27	80.019	0.88	0.61	0.63
6590.00	91.350	160.640	5927.48	641.63	154.66	1408.95	1758887.45	14608678.41	40°13'27.315"N	80°34'32.074"W	1417.41	83.736	1.34	-0.11	-1.33
6682.00	91.510	159.960	5925.18	731.07	68.07	1439.95	1758918.44	14608591.85	40°13'26.458"N	80°34'31.679"W	1441.56	87.293	0.76	0.17	-0.74
6775.00	89.940	158.580	5924.00	821.87	-18.90	1472.86	1758951.34	14608504.92	40°13'25.597"N	80°34'31.260"W	1472.98	90.735	2.25	-1.69	-1.48
6868.00	90.000	159.980	5924.05	912.68	-105.88	1505.77	1758984.23	14608417.97	40°13'24.736"N	80°34'30.842"W	1509.48	94.022	1.51	0.06	1.51
6960.00	89.480	160.380	5924.47	1002.19	-192.43	1536.96	1759015.42	14608331.46	40°13'23.879"N	80°34'30.445"W	1548.96	97.136	0.71	-0.57	0.43
7053.00	88.980	160.840	5925.72	1092.50	-280.14	1567.83	1759046.28	14608243.77	40°13'23.011"N	80°34'30.052"W	1592.66	100.131	0.73	-0.54	0.49
7146.00	88.830	160.900	5927.50	1182.70	-367.99	1598.30	1759076.74	14608155.96	40°13'22.141"N	80°34'29.665"W	1640.12	102.966	0.17	-0.16	0.06
7239.00	88.890	162.520	5929.35	1272.34	-546.52	1626.71	1759105.13	14608067.42	40°13'21.265"N	80°34'29.304"W	1689.55	105.676	2.82	0.06	2.82
7331.00	88.490	162.990	5931.45	1360.65	-544.50	1653.52	1759131.93	14607979.52	40°13'20.394"N	80°34'28.964"W	1740.86	108.227	1.10	-0.43	-1.01
7424.00	89.350	162.670	5933.20	1450.11	-633.24	1681.27	1759159.68	14607890.81	40°13'19.516"N	80°34'28.612"W	1796.58	110.639	0.93	0.92	0.09
7517.00	89.290	163.520	5934.31	1539.38	-722.22	1708.32	1759186.71	14607801.87	40°13'18.635"N	80°34'28.268"W	1854.71	112.917	0.92	-0.06	0.91
7610.00	89.350	162.540	5935.41	1628.67	-811.16	1735.46	1759213.84	14607712.96	40°13'17.755"N	80°34'27.924"W	1915.67	115.052	1.06	0.06	-1.05
7703.00	89.420	156.940	5936.41	1719.28	-898.37	1767.65	1759246.01	14607625.79	40°13'16.892"N	80°34'27.514"W	1982.84	116.941	6.02	0.08	-6.02
7796.00	89.480	153.500	5937.30	1811.26	-982.79	1806.62	1759282.97	14607541.40	40°13'16.056"N	80°34'27.017"W	2056.63	118.546	3.70	0.06	-3.70
7888.00	89.450	158.220	5938.16	1902.09	-1066.72	1844.23	1759324.57	14607457.51	40°13'15.225"N	80°34'26.538"W	2130.51	120.045	5.13	-0.03	5.13
7981.00	89.510	163.430	5939.01	1992.29	-1154.52	1874.77	1759353.09	14607369.73	40°13'14.356"N	80°34'26.149"W	2201.74	121.626	5.60	0.06	5.60
8074.00	89.380	163.070	5939.91	2081.49	-1243.57	1901.57	1759379.88	14607280.72	40°13'13.474"N	80°34'25.809"W	2272.10	123.184	0.41	-0.14	-0.39



# Actual Wellpath Report

John Good Jr BRK 210H AWP Proj: 11761'  
Page 5 of 8



## REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot #210
Area	Brooke County, WV	Well	John Good Jr BRK 210H
Field	Brooke	Wellbore	John Good Jr BRK 210H AWB
Facility	John Good Jr BRK Pad		

## WELLPATH DATA (131 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]
8167.00	89.420	160.770	5940.88	2171.26	-1331.97	1930.43	1759408.73	14607192.36	40°13'12.599"N	80°34'25.443"W	2345.35	124.605	2.47	0.04	-2.47
8259.00	89.630	158.690	5941.65	2260.93	-1418.26	1962.30	1759440.59	14607106.09	40°13'11.745"N	80°34'25.037"W	2421.17	125.858	2.27	0.23	-2.26
8352.00	89.450	157.220	5942.39	2352.17	-1504.46	1997.20	1759475.48	14607019.93	40°13'10.892"N	80°34'24.593"W	2500.44	126.990	1.59	-0.19	-1.58
8444.00	89.450	155.630	5943.28	2442.88	-1588.77	2033.99	1759512.26	14606935.65	40°13'10.057"N	80°34'24.124"W	2580.95	127.994	1.73	0.00	-1.73
8537.00	89.510	160.660	5944.12	2534.03	-1675.06	2068.60	1759546.85	14606849.40	40°13'09.203"N	80°34'23.683"W	2661.75	128.999	5.41	0.06	5.41
8630.00	89.600	164.110	5944.84	2623.61	-1763.68	2096.74	1759574.98	14606760.81	40°13'08.325"N	80°34'23.326"W	2739.87	130.069	3.71	0.10	3.71
8723.00	89.540	167.900	5945.54	2712.24	-1853.28	2121.67	1759599.90	14606671.25	40°13'07.439"N	80°34'23.010"W	2817.11	131.137	0.73	-0.06	0.73
8816.00	89.380	167.900	5946.42	2799.87	-1943.63	2143.62	1759621.84	14606580.93	40°13'06.545"N	80°34'22.733"W	2893.58	132.199	3.35	-0.17	3.34
8908.00	88.950	167.770	5947.76	2885.75	-2033.56	2163.00	1759641.22	14606491.04	40°13'05.655"N	80°34'22.488"W	2968.83	133.233	0.49	-0.47	-0.14
9001.00	88.980	168.420	5949.44	2972.39	-2124.54	2182.19	1759660.39	14606400.09	40°13'04.755"N	80°34'22.247"W	3045.59	134.233	0.70	0.03	0.70
9094.00	88.950	167.170	5951.12	3059.21	-2215.42	2201.84	1759680.04	14606309.24	40°13'03.856"N	80°34'21.999"W	3123.49	135.176	1.34	-0.03	-1.34
9183.00	89.230	158.530	5952.53	3144.66	-2300.37	2228.06	1759706.25	14606224.33	40°13'03.016"N	80°34'21.666"W	3202.49	135.915	9.71	0.31	-9.71
9276.00	89.320	160.590	5953.71	3235.36	-2387.51	2260.53	1759738.71	14606137.23	40°13'02.153"N	80°34'21.253"W	3287.89	136.565	2.22	0.10	2.22
9369.00	89.690	163.060	5954.51	3325.18	-2475.86	2289.54	1759767.70	14606048.91	40°13'01.279"N	80°34'20.885"W	3372.22	137.239	2.69	0.40	2.66
9461.00	89.110	163.540	5955.48	3413.39	-2563.97	2315.97	1759794.13	14605960.83	40°13'00.407"N	80°34'20.549"W	3455.09	137.909	0.82	-0.63	0.52
9554.00	89.140	160.240	5956.90	3503.17	-2652.34	2344.88	1759823.02	14605872.49	40°12'59.532"N	80°34'20.182"W	3540.25	138.521	3.55	0.03	-3.55
9647.00	89.110	152.730	5958.32	3594.78	-2737.55	2381.95	1759860.08	14605787.32	40°12'58.688"N	80°34'19.710"W	3628.75	138.973	8.07	-0.03	-8.08
9739.00	88.980	150.560	5959.85	3686.43	-2818.49	2425.64	1759903.75	14605706.41	40°12'57.886"N	80°34'19.152"W	3718.55	139.284	2.36	-0.14	-2.36
9832.00	89.050	153.350	5961.45	3779.04	-2900.55	2469.35	1759947.45	14605624.38	40°12'57.073"N	80°34'18.593"W	3809.32	139.591	3.00	0.08	3.00
9925.00	89.080	161.890	5962.97	3870.29	-2986.46	2504.72	1759982.80	14605538.17	40°12'56.223"N	80°34'18.143"W	3897.76	140.014	9.18	0.03	9.18
10017.00	89.050	157.930	5964.48	3959.87	-3072.83	2536.31	1760014.38	14605452.51	40°12'55.368"N	80°34'17.741"W	3984.36	140.464	4.30	-0.03	-4.30
10110.00	89.230	156.300	5965.87	4051.35	-3158.52	2572.41	1760050.46	14605366.51	40°12'54.519"N	80°34'17.281"W	4073.52	140.839	1.67	0.19	-1.66
10203.00	89.260	162.760	5967.10	4142.00	-3245.63	2604.84	1760082.89	14605279.44	40°12'53.657"N	80°34'16.868"W	4161.64	141.251	6.85	0.03	6.85
10296.00	88.950	166.440	5968.55	4230.53	-3335.26	2629.53	1760107.57	14605189.84	40°12'52.770"N	80°34'16.556"W	4247.16	141.748	3.97	-0.33	3.96
10388.00	88.980	169.170	5970.21	4316.41	-3425.16	2648.96	1760126.99	14605099.97	40°12'51.881"N	80°34'16.311"W	4329.98	142.282	2.97	0.03	2.97
10481.00	88.950	167.690	5971.89	4402.85	-3516.25	2667.61	1760145.63	14605008.92	40°12'50.980"N	80°34'16.076"W	4413.64	142.814	1.59	-0.03	-1.59
10574.00	88.950	164.710	5973.60	4490.56	-3606.52	2689.79	1760167.80	14604918.66	40°12'50.086"N	80°34'15.796"W	4499.12	143.284	3.20	0.00	-3.20
10667.00	88.980	160.340	5975.28	4580.05	-3695.22	2717.70	1760195.70	14604830.02	40°12'49.209"N	80°34'15.441"W	4587.00	143.667	4.70	0.03	-4.70
10759.00	88.950	156.900	5976.94	4670.08	-3780.86	2751.23	1760229.22	14604744.41	40°12'48.361"N	80°34'15.015"W	4675.91	143.958	3.74	-0.03	-3.74
10852.00	88.950	156.980	5978.65	4761.62	-3866.41	2787.65	1760255.63	14604658.89	40°12'47.514"N	80°34'14.550"W	4766.57	144.209	0.09	0.00	0.09

### REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #210
SOUTHWESTERN ENERGY	Well	John Good Jr BRK 210H
Area	Wellbore	John Good Jr BRK 210H AWB
Field		
Facility		

### WELLPATH DATA (131 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]
10945.00	88.770	158.150	5980.50	4852.97	-3952.35	2823.14	1760301.10	14604572.98	40°12'46.663"N	80°34'14.098"W	4857.08	144.462	1.27	-0.19	1.26
11038.00	88.740	159.580	5982.52	4943.89	-4039.08	2856.66	1760334.61	14604486.29	40°12'45.804"N	80°34'13.672"W	4947.19	144.730	1.54	-0.03	1.54
11130.00	88.680	162.050	5984.59	5033.13	-4125.94	2886.88	1760364.82	14604399.47	40°12'44.944"N	80°34'13.288"W	5035.62	145.020	2.68	-0.07	2.68
11223.00	88.650	162.540	5986.75	5122.74	-4214.51	2915.16	1760393.08	14604310.93	40°12'44.068"N	80°34'12.929"W	5124.47	145.329	0.53	-0.03	0.53
11316.00	88.740	161.020	5988.87	5212.56	-4302.82	2944.23	1760422.14	14604222.65	40°12'43.194"N	80°34'12.560"W	5213.71	145.618	1.64	0.10	-1.63
11409.00	89.080	162.010	5990.64	5302.50	-4391.00	2973.71	1760451.61	14604134.50	40°12'42.321"N	80°34'12.185"W	5303.19	145.893	1.13	0.37	1.06
11501.00	89.380	165.660	5991.88	5390.45	-4479.34	2999.32	1760477.21	14604046.20	40°12'41.447"N	80°34'11.861"W	5390.77	146.194	3.98	0.33	3.97
11594.00	89.290	165.470	5992.96	5478.51	-4569.40	3022.50	1760500.38	14603956.17	40°12'40.556"N	80°34'11.567"W	5478.59	146.517	0.23	-0.10	-0.20
11687.00	89.200	161.760	5994.18	5567.52	-4658.60	3048.72	1760526.60	14603867.01	40°12'39.673"N	80°34'11.235"W	5567.52	146.798	3.99	-0.10	-3.99
11737.00	89.290	159.930	5994.84	5616.02	-4705.83	3065.13	1760542.99	14603819.80	40°12'39.205"N	80°34'11.026"W	5616.03	146.922	3.66	0.18	-3.66
11761.00	89.290	159.930	5995.14	5639.40	-4728.37	3073.36	1760551.23	14603797.27	40°12'38.982"N	80°34'10.922"W	5639.42	146.977	0.00	0.00	0.00

### HOLE & CASING SECTIONS - Ref Wellbore: John Good Jr BRK 210H AWB Ref Wellpath: John Good Jr BRK 210H AWP Proj: 11761'

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]
17.5in Open Hole	26.00	435.00	409.00	26.00	435.00	0.00	0.00	0.62	0.60
13.375in Casing Surface	26.00	415.00	389.00	26.00	415.00	0.00	0.00	0.71	0.63
12.25in Open Hole	435.00	1687.00	1252.00	435.00	1673.52	0.62	0.60	60.42	144.18
9.625in Casing Intermediate	26.00	1668.00	1642.00	26.00	1654.96	0.00	0.00	57.74	141.14
8.75in Open Hole	1687.00	5044.00	3357.00	1673.52	4888.08	60.42	144.18	662.21	889.54
8.5in Open Hole	5044.00	11761.00	6717.00	4888.08	5995.14	662.21	889.54	-4728.37	3073.36

### REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #210
SOUTHWESTERN ENERGY	Well	John Good Jr BRK 210H
Area	Wellbore	John Good Jr BRK 210H AWB
Field		
Facility		

### TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
John Good Jr N LL	5897.00	-19.01	-15.80	1757463.26	14608504.81	40°13'25.666"N	80°34'50.452"W	polygon
John Good Jr S LL	5897.00	-19.01	-15.80	1757463.26	14608504.81	40°13'25.666"N	80°34'50.452"W	polygon
John Good Jr SW LL	5897.00	-19.01	-15.80	1757463.26	14608504.81	40°13'25.666"N	80°34'50.452"W	polygon
John Good Jr BRK 210H LP Rev-2	5933.00	282.10	1368.08	1758846.60	14608805.80	40°13'28.576"N	80°34'32.593"W	point
John Good Jr BRK 210H BHL Rev-2	6003.00	-4727.09	3091.18	1760569.04	14603798.55	40°12'38.994"N	80°34'10.692"W	point

### WELLPATH COMPOSITION - Ref Wellbore: John Good Jr BRK 210H AWB Ref Wellpath: John Good Jr BRK 210H AWP Proj: 11761'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	405.00	LOWSG EMS rev2 - Standard	01 MSS <17.5"> (196'-405')	John Good Jr BRK 210H AWB
405.00	1611.00	BHI NaviTrak (Axial)	02 APS EM <12.25"> (405')(510'-1611')	John Good Jr BRK 210H AWB
1611.00	4970.00	BHI NaviTrak (Axial)	03 APS EM <8.75"> (1611')(1720-4970')	John Good Jr BRK 210H AWB
4970.00	11737.00	BHI AutoTrak Curve (Short)	04 BH AT Curve <8.5"> (4970')(5106'-11737')	John Good Jr BRK 210H AWB
11737.00	11761.00	Blind Drilling (std)	Projection to bit	John Good Jr BRK 210H AWB



**REFERENCE WELLPATH IDENTIFICATION**

Operator	Slot	Slot #210
SOUTHWESTERN ENERGY	Well	John Good Jr BRK 210H
Brooke County, WV	Wellbore	John Good Jr BRK 210H AWB
Brooke		
John Good Jr BRK Pad		

**WELLPATH COMMENTS**

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
196.00	0.400	33.680	196.00	MSS <17.5"> (196'-405')
510.00	0.840	104.050	509.99	APS EM <12.25"> (405')(510'-1611')
1720.00	11.990	45.460	1705.79	APS EM <8.75"> (1611')(1720'-4970')
5106.00	15.350	42.650	4947.80	BH AT Curve <8.5"> (4970')(5106'-11737')
11761.00	89.290	159.930	5995.14	Projection to Bit

**COMMENTS**

Wellpath general comments  
API: 47-009-00197-0000  
Job#: 8708695  
Rig: SDC-46  
Duration: 09/01/17 - 09/07/17

Top Hole Latitude: 40°15'00"

10,937'

7,887'

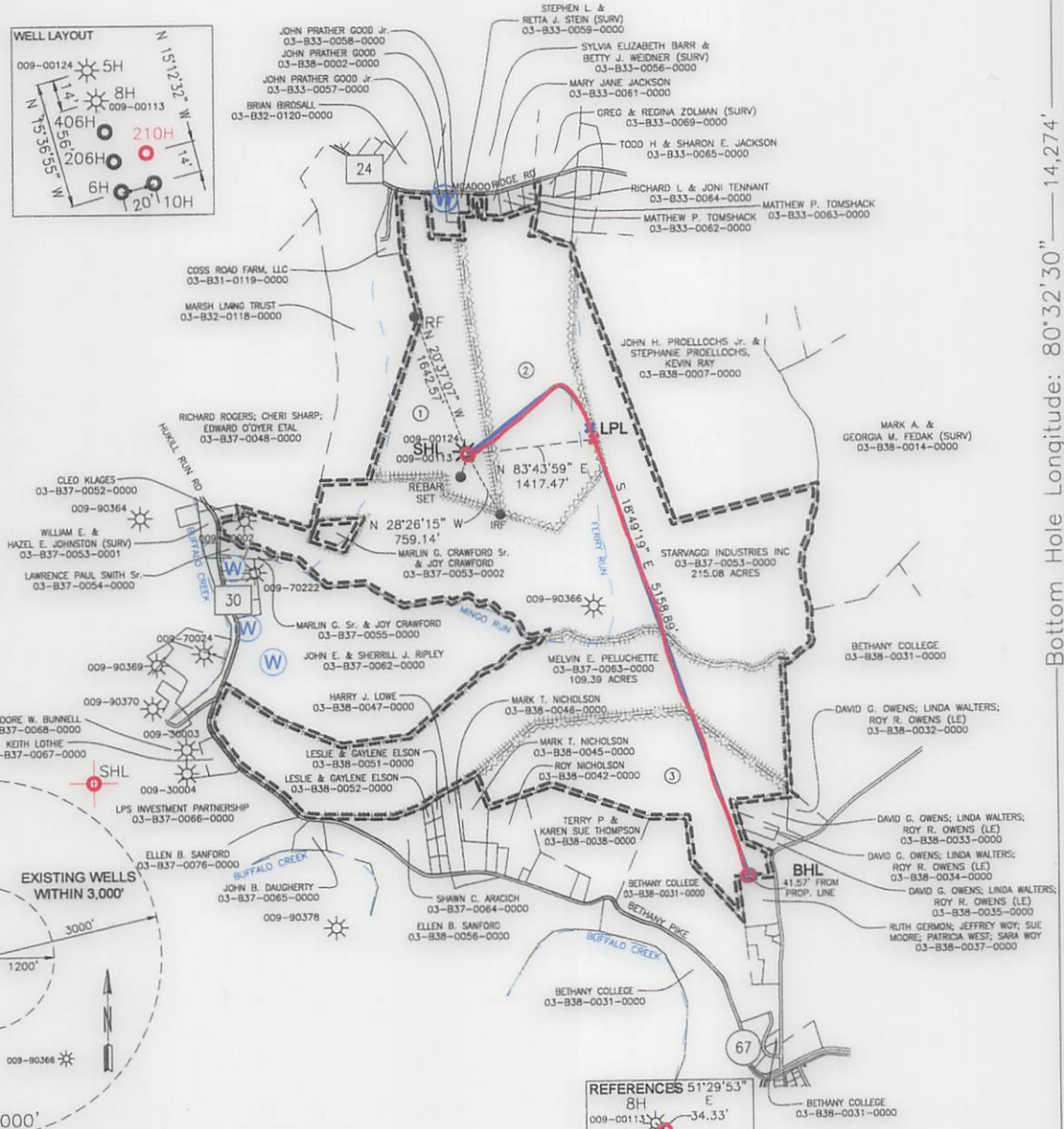
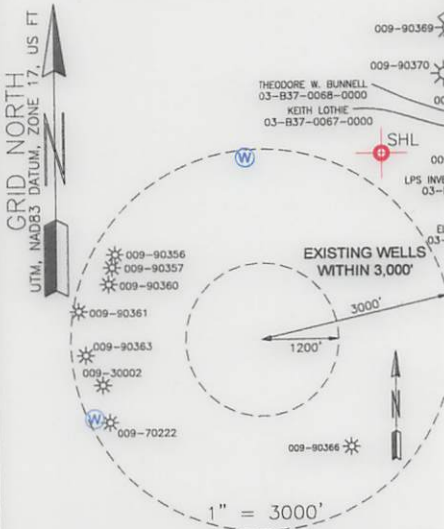
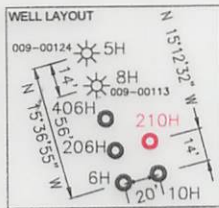
Bottom Hole Latitude: 40°15'00"

# THRASHER

THE THRASHER GROUP, INC.  
600 WHITE OAKS BLVD.  
BRIDGEPORT, WV 26330  
PHONE 304-624-4108

### NOTES ON SURVEY

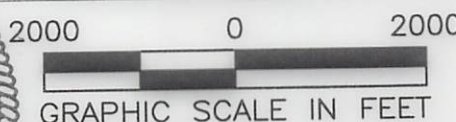
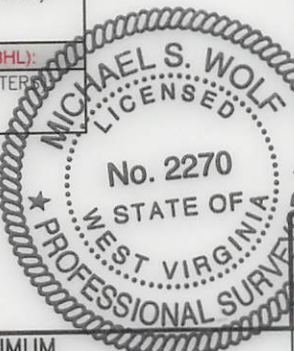
- COORDINATES SYSTEM IS UTM, NAD 83 DATUM, ZONE 17, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.
- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND FIELD LOCATIONS.
- THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED OF CENTER OF PAD.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
- NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
- NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.



Bottom Hole Longitude: 80°32'30" Top Hole Longitude: 80°32'30"

<b>SURFACE HOLE LOCATION (SHL):</b> UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,687.216 EASTING: 535,680.908	<b>SURFACE HOLE LOCATION (SHL):</b> UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,687.216 EASTING: 535,680.908
<b>LANDING POINT LOCATION (LPL):</b> UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,772.913 EASTING: 536,097.516	<b>LANDING POINT LOCATION (LPL):</b> UTM (NAD83, ZONE 17, METERS): NORTHING: 4,452,734.124 EASTING: 536,110.150
<b>BOTTOM HOLE LOCATION (BHL):</b> UTM (NAD83, ZONE 17, METERS): NORTHING: 4,451,246.701 EASTING: 536,622.517	<b>BOTTOM HOLE LOCATION (BHL):</b> UTM (NAD83, ZONE 17, METERS): NORTHING: 4,451,245.777 EASTING: 536,617.463

TRACT	SURFACE OWNER	TAX PARCEL	ACRES
1	JOHN PRATHER GOOD III, TRUSTEE OF THE JOHN P. GOOD JR. IRREVOCABLE TRUST	03-B38-0001-0000	66.57
2	MARY JANE JACKSON	03-B33-0060-0000	89.784
3	ALLEN SCOTT JOHNSON, WARREN RAY JOHNSON, DEBORAH SUE CRAIG, VICTORIA LYNN OWENS, CHARLES LAWRENCE JOHNSON	03-B38-0034-0000	84.00



I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 2270



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS  
WVDEP  
OFFICE OF OIL & GAS  
601 57TH STREET  
CHARLESTON, WV 25034

MINIMUM DEGREE OF ACCURACY: 1/200  
PROVEN SOURCE OF SURVEY GRADE GPS ELEVATION: (NAVD 88, US FT)

COMPANY: SWN Production Company, LLC  
OPERATOR'S WELL #: JOHN GOOD JR BRK 210H  
API WELL #: 47 STATE COUNTY PERMIT

WELL TYPE: OIL  WASTE DISPOSAL  PRODUCTION  DEEP  GAS  LIQUID INJECTION  STORAGE  SHALLOW

WATERSHED: BUFFALO CREEK ELEVATION: 1152.6'

DISTRICT: BUFFALO COUNTY: BROOKE QUADRANGLE: BETHANY

SURFACE OWNER: JOHN P. GOOD III, TRUSTEE OF THE JOHN P GOOD JR IRREVOCABLE TRUST ACREAGE: 66.57

OIL & GAS ROYALTY OWNER: JOHN P GOOD JR ACREAGE: 66.57

DRILL  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION

CONVERT  PLUG & ABANDON  CLEAN OUT & REPLUG  OTHER CHANGE  (SPECIFY) AS-DRILLED

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 5,995 TVD 11,761 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC DESIGNATED AGENT: DEE SOUTHALL  
ADDRESS: P.O. BOX 1300 ADDRESS: P.O. BOX 1300  
CITY: JANE LEW STATE: WV ZIP CODE: 26378 CITY: JANE LEW STATE: WV ZIP CODE: 26378

<b>LEGEND:</b>	<ul style="list-style-type: none"> <li>○ PROPOSED SURFACE HOLE / BOTTOM HOLE</li> <li>⊙ EXISTING / PRODUCING WELLHEAD</li> <li>LPL* LANDING POINT LOCATION</li> <li>⊕ EXISTING WATER WELL</li> <li>⊙ EXISTING SPRING</li> <li>— SURVEYED BOUNDARY</li> <li>— DRILLING UNIT</li> <li>— LEASE BOUNDARY</li> <li>— PROPOSED PATH</li> <li>— AS-DRILLED PATH</li> </ul>	<b>REVISIONS:</b>  <b>DATE:</b> 01-08-2018  <b>DRAWN BY:</b> R.DOERR <b>SCALE:</b> 1" = 2000' <b>DRAWING NO:</b> 050-5700 <b>WELL LOCATION PLAT</b>
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