

SOUTHWESTERN ENERGY

Location: Marshall County, WV
 Field: Marshall
 Facility: Columbia Gas Transmission MSH Pad
 Slot: Slot 1H
 Well: Columbia Gas Transmission MSH 1H
 Wellbore: Columbia Gas Transmission MSH 1H PWB

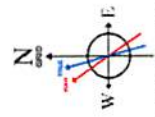
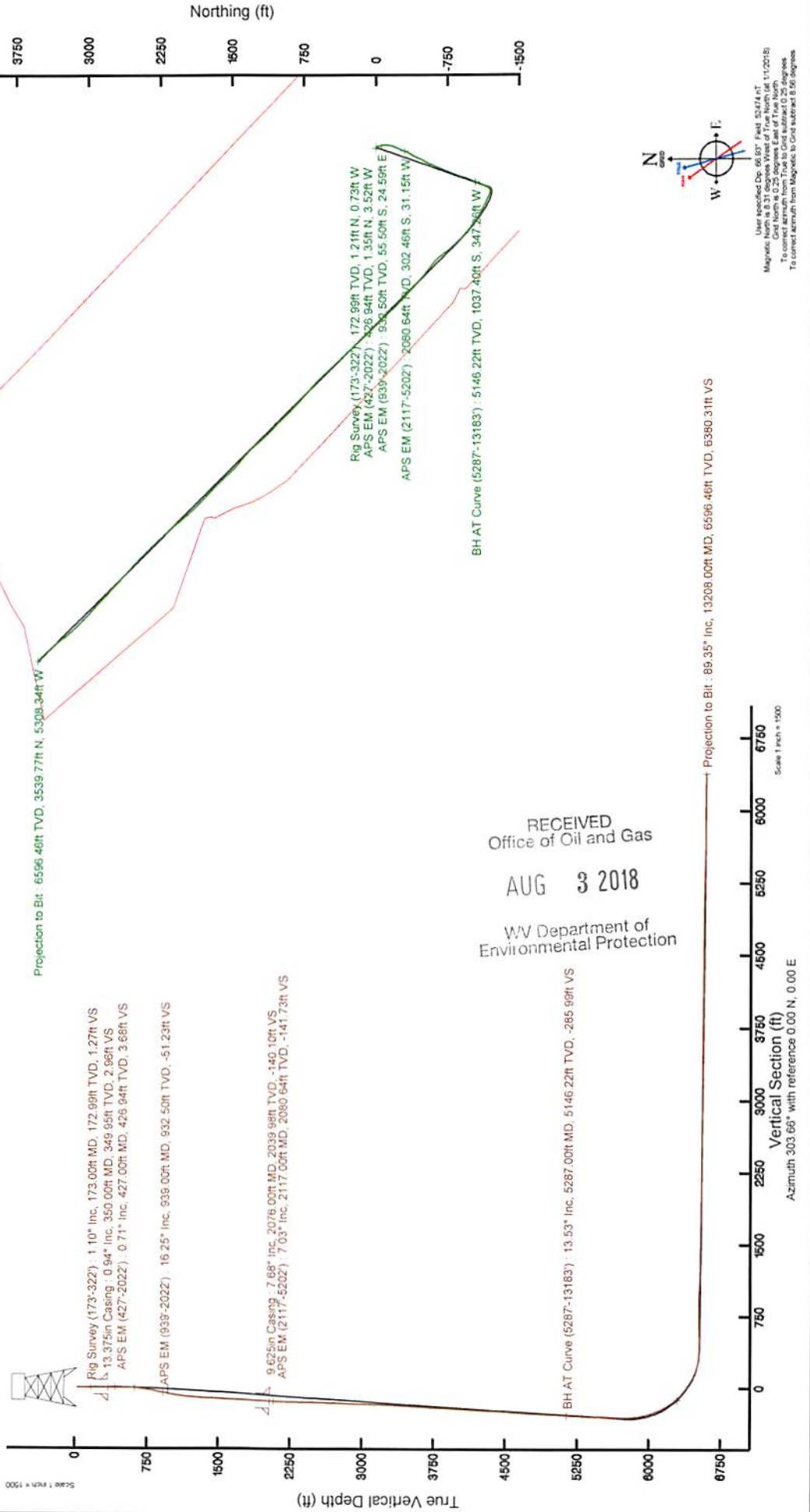
API: 47-051-01936-0000
 Job #: 8943584
 Rig: SDC 42
 Duration: 01/02/2018 - 01/24/2018



Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Columbia Gas Transmission MSH Pad	1748565 880	14437578 433	80°36'54.713" W
Slot	Local E (ft)	Local N (ft)	Latitude
Slot 1H	20 95	1748566 820	39°45'16.253" N
SDC-42 (KB) to Mud line (At Slot Slot 1H)		14437576 600	80°36'54.445" W
Mean Sea Level to Mud line (At Slot Slot 1H)		26ft	
SDC-42 (KB) to Mean Sea Level		-783.5ft	
		809.5ft	



Grid System: NAD83 / UTM Zone 17 North, US feet
 * - Wellpath was transformed from a different geoidetic datum
 Measured depths are referenced to SDC-42 (KB)
 SDC-42 (KB) to Mean Sea Level: 809.5 feet
 Mean Sea Level to Mud line (At Slot Slot 1H): -783.5 feet
 Coordinates are in feet referenced to Slot
 Database: WA, Pennsylvania
 Created by: thomazuc on 2018-01-30





Actual Wellpath Report

Columbia Gas Transmission MSH 1H AWP Proj: 13208'MD
Page 1 of 9



REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 1H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H AWB
Facility	Columbia Gas Transmission MSH Pad		

REPORT SETUP INFORMATION

Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Thomsuzc
Scale	0.999613	Report Generated	1/30/2018 at 10:57:24 AM
Convergence at slot	0.25° East	Database/Source file	WA_Pennsylvania/Columbia_Gas_Transmission_MSH_1H_AWP_Proj_13208_MD.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-1.83	20.95	1748586.82	14437576.60	39°45'16.253"N	80°36'54.445"W
Facility Reference Pt			1748565.88	14437578.43	39°45'16.272"N	80°36'54.713"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.478"W

WELLPATH DATUM

Calculation method	Minimum curvature	SDC 42 (KB) to Facility Vertical Datum	809.50ft
Horizontal Reference Pt	Slot	SDC 42 (KB) to Mean Sea Level	809.50ft
Vertical Reference Pt	SDC 42 (KB)	SDC 42 (KB) to Mud Line at Slot (Slot 1H)	26.00ft
MD Reference Pt	SDC 42 (KB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	303.66°

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 Environmental Protection

Actual Wellpath Report

Columbia Gas Transmission MSH 1H AWP Proj: 13208MD



Operator	SOUTHWESTERN ENERGY
Area	Marshall County, WV
Field	Marshall
Facility	Columbia Gas Transmission MSH Pad
Slot	Slot 1H
Well	Columbia Gas Transmission MSH 1H
Wellbore	Columbia Gas Transmission MSH 1H A/B

WELLPATH DATA (170 stations) † = interpolated/extrapolated station

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Dir	DLS	Build Rate	Turn Rate
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(US ft)	(US ft)	(N)	(W)	(ft)	(°)	(°/100ft)	(°/100ft)	(°/100ft)
0.00	0.00	329.030	26.00	0.00	0.00	0.00	1748586.82	14437576.60	39°45'16.253"N	80°36'54.445"W	0.00	0.00	0.00	0.00	0.00
26.00	0.00	329.030	172.99	1.27	1.21	-0.73	1748586.09	14437577.81	39°45'16.265"N	80°36'54.454"W	1.41	329.030	0.75	0.00	0.00
173.00	1.00	329.030	259.97	1.99	0.45	-2.09	1748584.73	14437577.05	39°45'16.258"N	80°36'54.471"W	2.13	282.141	3.41	1.38	-134.25
260.00	2.300	212.230	269.97	1.99	0.45	-2.09	1748584.73	14437577.05	39°45'16.258"N	80°36'54.471"W	2.13	282.141	3.41	1.38	-134.25
322.00	1.100	321.95	321.95	2.51	-0.12	-3.09	1748583.73	14437576.48	39°45'16.252"N	80°36'54.484"W	3.09	267.865	4.69	-1.94	182.10
427.00	0.710	12.850	426.94	3.68	1.35	-3.52	1748583.30	14437577.95	39°45'16.266"N	80°36'54.490"W	3.77	290.911	0.78	-0.37	45.45
519.00	1.180	101.560	518.93	3.00	1.71	-2.47	1748584.35	14437578.31	39°45'16.270"N	80°36'54.476"W	3.00	304.749	1.48	0.51	96.42
610.00	4.350	129.920	609.81	-1.30	-0.69	1.10	1748587.92	14437575.91	39°45'16.246"N	80°36'54.431"W	1.30	122.190	3.69	3.48	31.16
691.00	7.410	141.430	690.38	-9.33	-6.75	6.71	1748593.53	14437569.85	39°45'16.186"N	80°36'54.359"W	9.52	135.153	4.03	3.78	14.21
773.00	10.250	155.770	771.41	-20.55	-17.54	13.00	1748599.82	14437559.07	39°45'16.079"N	80°36'54.279"W	21.83	143.443	4.36	3.46	17.49
856.00	14.490	163.280	852.47	-34.81	-34.23	19.03	1748605.84	14437542.39	39°45'15.914"N	80°36'54.203"W	39.16	150.931	5.45	5.11	9.05
939.00	16.250	167.180	932.50	-51.23	-55.50	24.59	1748611.40	14437521.13	39°45'15.703"N	80°36'54.133"W	60.70	156.102	2.46	2.12	4.70
1020.00	16.960	1010.52	-66.68	-76.80	28.97	1748615.78	14437499.83	39°45'15.493"N	80°36'54.078"W	82.08	159.332	1.85	-1.65	3.10	
1103.00	12.830	173.680	1091.10	-80.02	-96.47	31.90	1748618.70	14437480.17	39°45'15.298"N	80°36'54.042"W	101.60	161.704	2.76	-2.51	4.81
1184.00	10.980	180.800	1170.36	-89.99	-113.12	32.78	1748619.59	14437463.52	39°45'15.134"N	80°36'54.031"W	117.78	163.840	2.91	-2.28	8.79
1268.00	10.510	189.280	1282.89	-97.49	-128.68	31.43	1748618.24	14437447.97	39°45'14.980"N	80°36'54.049"W	132.47	166.274	1.96	-0.56	10.10
1352.00	11.600	193.870	1335.33	-103.51	-144.44	28.17	1748614.98	14437432.21	39°45'14.824"N	80°36'54.092"W	147.17	168.964	1.67	1.30	5.46
1435.00	12.950	195.510	1416.43	-109.23	-161.51	23.68	1748610.50	14437415.16	39°45'14.656"N	80°36'54.150"W	163.24	171.657	1.68	1.63	1.98
1519.00	15.240	198.700	1498.08	-114.83	-180.36	17.85	1748604.67	14437396.31	39°45'14.470"N	80°36'54.226"W	181.25	174.347	1.78	1.54	3.80
1601.00	16.650	204.160	1577.31	-119.26	-200.64	10.09	1748596.91	14437376.67	39°45'14.276"N	80°36'54.326"W	200.27	177.111	2.43	1.72	6.66
1685.00	15.630	204.500	1658.20	-122.94	-220.64	0.76	1748587.58	14437356.04	39°45'14.072"N	80°36'54.447"W	220.65	179.802	0.11	-0.02	0.40
1769.00	14.390	203.650	1739.33	-126.55	-240.50	-8.12	1748578.71	14437336.19	39°45'13.877"N	80°36'54.562"W	240.64	181.933	1.50	-1.48	-1.01
1854.00	13.710	202.880	1821.79	-130.27	-259.46	-16.27	1748570.56	14437317.24	39°45'13.690"N	80°36'54.667"W	259.97	183.588	0.83	-0.80	-0.91
1938.00	11.320	200.070	1903.79	-134.07	-276.38	-22.97	1748563.86	14437300.33	39°45'13.523"N	80°36'54.754"W	277.33	184.751	2.94	-2.85	-3.35
2022.00	8.540	196.680	1986.52	-137.83	-290.10	-27.59	1748559.24	14437286.62	39°45'13.387"N	80°36'54.814"W	291.41	185.433	3.38	-3.31	-4.04
2117.00	7.030	195.270	2080.64	-141.73	-302.46	-31.15	1748555.69	14437274.25	39°45'13.265"N	80°36'54.860"W	304.06	185.879	1.60	-1.59	-1.48
2202.00	9.100	199.830	2162.82	-144.90	-313.54	-34.71	1748552.12	14437263.18	39°45'13.156"N	80°36'54.906"W	315.45	186.317	2.61	2.49	5.49
2282.00	11.690	207.930	2243.47	-147.28	-326.98	-40.80	1748546.03	14437249.75	39°45'13.023"N	80°36'54.985"W	329.52	187.113	3.62	3.16	9.88
2364.00	13.340	209.640	2323.52	-148.77	-342.54	-49.37	1748537.47	14437234.19	39°45'12.870"N	80°36'55.096"W	346.08	188.202	2.06	2.01	2.09
2449.00	13.760	210.990	2406.15	-149.93	-359.73	-59.43	1748527.42	14437217.01	39°45'12.700"N	80°36'55.225"W	364.61	189.380	0.62	0.49	1.59

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 1H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H AWB
Facility	Columbia Gas Transmission MSH Pad		

WELLPATH DATA (170 stations)																
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate	
2534.00	15.290	210.130	2488.43	-151.09	-378.09	-70.26	1748516.59	14437198.65	39°45'12.519"N	80°36'55.365"W	384.57	190.527	1.82	1.80	-1.01	
2618.00	15.990	207.890	2569.32	-152.94	-397.90	-81.23	1748505.62	14437178.86	39°45'12.324"N	80°36'55.507"W	406.11	191.538	1.10	0.83	-2.67	
2702.00	14.520	205.240	2650.36	-155.65	-417.65	-91.13	1748495.72	14437159.11	39°45'12.129"N	80°36'55.634"W	427.48	192.309	1.94	-1.75	-3.15	
2782.00	14.650	205.920	2727.79	-158.48	-435.82	-99.83	1748487.03	14437140.95	39°45'11.950"N	80°36'55.747"W	447.11	192.902	0.27	0.16	0.85	
2864.00	15.250	204.120	2807.01	-161.66	-454.99	-108.77	1748478.09	14437121.79	39°45'11.761"N	80°36'55.862"W	467.81	193.445	0.93	0.73	-2.20	
2946.00	14.910	205.740	2886.19	-164.90	-474.34	-117.76	1748469.11	14437102.45	39°45'11.570"N	80°36'55.979"W	488.74	193.943	0.66	-0.41	1.98	
3029.00	15.040	208.560	2966.37	-167.33	-493.41	-127.55	1748459.32	14437083.38	39°45'11.382"N	80°36'56.105"W	509.63	194.494	0.89	0.16	3.40	
3111.00	15.390	206.890	3045.49	-169.56	-512.46	-137.55	1748449.32	14437064.34	39°45'11.194"N	80°36'56.234"W	530.60	195.025	0.68	0.43	-2.04	
3196.00	15.600	205.680	3127.40	-172.48	-532.82	-147.61	1748439.27	14437043.98	39°45'10.994"N	80°36'56.364"W	552.89	195.484	0.45	0.25	-1.42	
3280.00	14.500	204.940	3208.52	-175.64	-552.54	-156.94	1748429.94	14437024.28	39°45'10.799"N	80°36'56.484"W	574.39	195.856	1.33	-1.31	-0.88	
3364.00	14.910	202.790	3289.77	-179.28	-572.04	-165.56	1748421.33	14437004.79	39°45'10.607"N	80°36'56.596"W	595.51	196.141	0.81	0.49	-2.56	
3449.00	16.560	205.420	3371.58	-183.07	-593.06	-174.99	1748411.89	14436983.77	39°45'10.399"N	80°36'56.718"W	618.34	196.440	2.11	1.94	3.09	
3533.00	16.680	203.250	3452.08	-186.97	-614.95	-184.89	1748402.00	14436964.89	39°45'10.184"N	80°36'56.846"W	642.14	196.734	0.75	0.14	-2.58	
3616.00	15.420	201.010	3531.84	-191.54	-636.19	-193.55	1748393.35	14436940.65	39°45'09.974"N	80°36'56.958"W	664.98	196.921	1.69	-1.52	-2.70	
3698.00	15.270	202.430	3610.92	-196.03	-656.35	-201.58	1748385.32	14436920.50	39°45'09.775"N	80°36'57.062"W	686.61	197.073	0.49	0.18	1.73	
3782.00	15.230	201.660	3691.96	-200.48	-676.83	-209.87	1748377.03	14436900.03	39°45'09.573"N	80°36'57.169"W	708.62	197.228	0.25	-0.05	-0.92	
3864.00	14.590	203.640	3771.20	-204.52	-696.30	-217.99	1748368.92	14436880.57	39°45'09.381"N	80°36'57.274"W	729.63	197.384	1.00	-0.78	2.41	
3947.00	16.290	205.970	3851.20	-207.89	-716.35	-227.28	1748359.63	14436860.53	39°45'09.183"N	80°36'57.394"W	751.54	197.603	2.18	2.05	2.81	
4030.00	16.200	204.180	3930.89	-211.36	-737.37	-237.12	1748349.79	14436839.51	39°45'08.976"N	80°36'57.521"W	774.56	197.826	0.61	-0.11	-2.16	
4114.00	15.000	202.090	4011.79	-215.47	-758.14	-246.01	1748340.91	14436818.76	39°45'08.771"N	80°36'57.636"W	797.05	197.978	1.58	-1.43	-2.49	
4195.00	13.790	197.440	4090.25	-220.27	-777.06	-252.84	1748334.08	14436799.84	39°45'08.584"N	80°36'57.725"W	817.16	198.024	2.06	-1.49	-5.74	
4280.00	13.630	199.350	4172.83	-225.58	-796.18	-259.20	1748327.72	14436780.73	39°45'08.396"N	80°36'57.807"W	837.30	198.033	0.56	-0.19	2.25	
4361.00	15.660	199.690	4251.19	-230.57	-815.47	-266.04	1748320.88	14436761.44	39°45'08.205"N	80°36'57.896"W	857.77	198.069	2.51	2.51	0.42	
4445.00	17.260	202.760	4331.75	-235.67	-837.64	-274.68	1748312.24	14436739.28	39°45'07.987"N	80°36'58.008"W	881.53	198.156	2.17	1.90	3.65	
4528.00	16.890	201.560	4411.09	-240.53	-860.21	-283.88	1748303.05	14436716.72	39°45'07.764"N	80°36'58.127"W	905.84	198.263	0.62	-0.45	-1.45	
4611.00	16.220	200.220	4490.65	-245.75	-882.30	-292.32	1748294.62	14436694.64	39°45'07.546"N	80°36'58.236"W	929.47	198.331	0.93	-0.81	-1.61	
4693.00	15.600	196.110	4569.51	-251.74	-903.64	-299.33	1748287.60	14436672.31	39°45'07.335"N	80°36'58.327"W	951.93	198.328	1.57	-0.76	-5.01	
4777.00	13.820	196.190	4650.76	-258.15	-924.13	-305.27	1748281.67	14436652.83	39°45'07.133"N	80°36'58.404"W	973.24	198.280	2.12	-2.12	0.10	
4861.00	13.580	197.320	4732.37	-263.94	-943.38	-311.00	1748275.94	14436633.79	39°45'06.945"N	80°36'58.478"W	993.13	198.249	0.43	-0.29	1.35	
4946.00	14.140	197.880	4814.89	-268.87	-962.34	-317.84	1748269.10	14436614.63	39°45'06.756"N	80°36'58.567"W	1013.47	198.277	1.44	0.66	5.36	

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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY
Area	Marshall County, WV
Field	Marshall
Facility	Columbia Gas Transmission MSH Pad
Well	Columbia Gas Transmission MSH 1H
Wellbore	Columbia Gas Transmission MSH 1H AWB
Slot	Slot 1H

WELLPATH DATA (170 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]	CLS [ft/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]	
5032.00	13.790	204.430	4898.35	-272.66	-981.42	-325.99	1748260.95	14436595.56	39°45'06.568"N	80°36'58.672"W	1034.15	198.375	0.82	-0.41	2.97
5118.00	13.490	199.770	4981.93	-276.71	-1000.19	-333.63	1748253.32	14436576.80	39°45'06.383"N	80°36'58.771"W	1054.37	198.447	1.32	-0.35	-5.42
5202.00	13.610	200.240	5063.59	-281.36	-1018.69	-340.36	1748246.59	14436558.31	39°45'06.200"N	80°36'58.858"W	1074.04	198.475	0.19	0.14	0.56
5287.00	13.530	200.250	5146.22	-285.99	-1037.40	-347.26	1748239.70	14436539.60	39°45'06.015"N	80°36'58.948"W	1093.98	198.508	0.09	-0.09	0.01
5371.00	12.420	199.120	5228.07	-290.63	-1055.15	-353.62	1748233.34	14436521.86	39°45'05.840"N	80°36'59.030"W	1112.83	198.528	1.36	-1.32	-1.35
5450.00	13.320	203.530	5305.09	-294.27	-1071.52	-360.04	1748226.92	14436505.49	39°45'05.679"N	80°36'59.113"W	1130.39	198.573	1.69	1.14	5.58
5533.00	14.290	204.600	5385.69	-297.56	-1089.60	-368.12	1748218.85	14436487.42	39°45'05.500"N	80°36'59.218"W	1150.11	198.667	1.21	1.17	1.29
5615.00	14.120	205.480	5465.18	-300.58	-1107.83	-376.63	1748210.33	14436469.20	39°45'05.321"N	80°36'59.328"W	1170.11	198.777	0.34	-0.21	1.07
5697.00	14.310	204.170	5544.67	-303.67	-1126.11	-385.09	1748201.88	14436450.93	39°45'05.140"N	80°36'59.437"W	1190.13	198.879	0.46	0.23	-1.60
5777.00	14.380	201.920	5622.18	-307.33	-1144.35	-392.84	1748194.13	14436432.70	39°45'04.960"N	80°36'59.537"W	1209.90	198.947	0.70	0.09	-2.81
5860.00	14.350	199.060	5702.58	-312.02	-1163.63	-400.05	1748186.93	14436413.42	39°45'04.770"N	80°36'59.631"W	1230.48	198.973	0.86	-0.04	-3.45
5941.00	13.360	227.260	5781.32	-312.35	-1179.49	-410.21	1748176.77	14436397.47	39°45'04.614"N	80°36'59.762"W	1248.78	199.177	8.34	-1.22	34.81
6026.00	14.480	256.560	5863.92	-302.79	-1188.63	-427.78	1748159.20	14436388.43	39°45'04.424"N	80°36'59.987"W	1263.27	199.793	8.31	1.32	34.47
6110.00	14.590	267.740	5945.25	-287.07	-1191.49	-448.57	1748138.42	14436385.57	39°45'04.497"N	80°37'00.253"W	1273.13	200.630	3.34	0.13	13.31
6194.00	20.370	289.400	6025.42	-264.29	-1187.04	-472.98	1748114.03	14436390.02	39°45'04.542"N	80°37'00.566"W	1277.80	201.725	10.25	6.88	25.79
6276.00	23.920	296.600	6101.37	-233.95	-1174.85	-501.32	1748085.70	14436402.20	39°45'04.664"N	80°37'00.928"W	1277.34	203.108	5.44	4.33	8.78
6316.00	25.550	296.300	6137.70	-217.35	-1167.40	-516.30	1748070.72	14436409.65	39°45'04.738"N	80°37'01.119"W	1276.48	203.858	4.09	4.08	-0.75
6357.00	28.750	297.030	6174.18	-198.78	-1159.00	-533.02	1748054.01	14436418.05	39°45'04.822"N	80°37'01.333"W	1275.69	204.697	7.85	7.80	1.78
6398.00	32.710	297.460	6209.41	-177.96	-1149.41	-551.64	1748035.40	14436427.64	39°45'04.917"N	80°37'01.571"W	1274.93	205.638	9.67	9.66	1.05
6441.00	35.810	297.500	6244.95	-153.90	-1138.24	-573.11	1748013.93	14436438.80	39°45'05.028"N	80°37'01.845"W	1274.38	206.726	7.21	7.21	0.09
6483.00	39.830	297.310	6278.12	-128.30	-1126.39	-595.97	1747991.08	14436450.65	39°45'05.147"N	80°37'02.137"W	1274.34	207.883	9.58	9.57	-0.45
6483.00	39.830	297.310	6278.12	-128.30	-1126.39	-595.97	1747991.08	14436450.65	39°45'05.147"N	80°37'02.137"W	1274.34	207.883	9.58	9.57	-0.45
6525.00	43.290	297.250	6309.54	-100.62	-1113.62	-620.73	1747966.33	14436463.41	39°45'05.274"N	80°37'02.453"W	1274.93	209.135	8.24	8.24	-0.14
6567.00	47.210	297.790	6339.10	-70.97	-1099.84	-647.18	1747939.90	14436477.19	39°45'05.411"N	80°37'02.791"W	1276.12	210.474	9.38	9.33	1.29
6609.00	51.090	299.600	6366.57	-39.32	-1084.57	-675.03	1747912.05	14436492.45	39°45'05.563"N	80°37'03.147"W	1277.48	211.898	9.80	9.24	4.31
6650.00	55.760	303.030	6391.00	-6.44	-1067.44	-703.13	1747883.96	14436509.57	39°45'05.734"N	80°37'03.506"W	1278.21	213.373	13.22	11.39	8.37
6691.00	56.210	304.120	6413.94	27.54	-1048.65	-731.44	1747855.66	14436528.36	39°45'05.921"N	80°37'03.867"W	1278.54	214.896	2.46	1.10	2.66
6733.00	57.460	304.780	6436.91	62.70	-1028.76	-760.43	1747826.68	14436548.24	39°45'06.118"N	80°37'04.237"W	1279.30	216.471	3.25	2.98	1.57
6774.00	62.050	306.060	6457.56	98.09	-1008.23	-789.28	1747797.84	14436568.76	39°45'06.322"N	80°37'04.606"W	1280.43	218.055	11.52	11.20	3.12
6816.00	65.750	308.000	6476.04	135.73	-985.51	-819.38	1747767.76	14436591.47	39°45'06.548"N	80°37'04.990"W	1281.65	219.741	9.74	8.81	4.62
6858.00	69.970	310.010	6491.86	174.45	-961.03	-849.60	1747737.55	14436615.95	39°45'06.791"N	80°37'05.375"W	1282.73	221.478	10.98	10.05	4.79

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 1H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H AWB
Facility	Columbia Gas Transmission MSH Pad		

WELLPATH DATA (170 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)	(ft)	(ft)	(ft)	(°/100ft)	(ft/100ft)	(°/100ft)	
6899.00	311.700	6504.22	213.22	-935.46	-879.15	1747708.01	14436641.51	39°45'07.045"N	80°37'05.752"W	1283.74	223.223	12.74	12.74	4.12	4.12	3.43
6941.00	313.140	6514.50	253.47	-907.99	-909.21	1747677.97	14436668.96	39°45'07.318"N	80°37'06.135"W	1284.95	225.038	5.37	5.37	3.48	3.48	3.69
7025.00	316.150	6529.86	334.50	-850.00	-967.95	1747619.25	14436726.93	39°45'07.894"N	80°37'06.884"W	1288.19	228.112	7.74	7.74	3.69	3.69	3.94
7110.00	318.460	6535.98	416.82	-787.73	-1025.39	1747561.83	14436789.17	39°45'08.511"N	80°37'07.616"W	1293.04	232.468	8.85	8.85	2.72	2.72	6.93
7192.00	324.140	6534.46	494.91	-723.78	-1076.62	1747510.61	14436853.10	39°45'09.146"N	80°37'08.269"W	1297.30	236.088	7.97	7.97	6.93	6.93	5.02
7276.00	319.920	6531.23	574.66	-657.63	-1128.25	1747459.00	14436919.23	39°45'09.802"N	80°37'08.926"W	1305.92	239.763	5.15	5.15	-5.02	-5.02	-13.10
7359.00	309.050	6528.91	655.93	-599.58	-1187.36	1747399.92	14436977.25	39°45'10.378"N	80°37'09.680"W	1330.16	243.208	13.09	13.09	-2.02	-2.02	4.00
7523.00	310.670	6525.56	819.25	-497.24	-1315.44	1747271.89	14437079.55	39°45'11.394"N	80°37'11.314"W	1406.28	249.293	4.40	4.40	-1.84	-1.84	1.19
7608.00	311.660	6527.23	901.52	-442.63	-1377.90	1747209.45	14437134.15	39°45'11.937"N	80°37'12.111"W	1447.25	252.191	3.16	3.16	1.19	1.19	0.76
7688.00	312.280	6531.06	982.57	-387.85	-1438.80	1747148.58	14437188.90	39°45'12.481"N	80°37'12.888"W	1490.16	254.914	1.07	1.07	0.76	0.76	-0.10
7772.00	312.200	6535.67	1065.50	-331.47	-1500.90	1747086.51	14437245.26	39°45'13.040"N	80°37'13.680"W	1537.06	257.546	0.37	0.37	-0.10	-0.10	3.55
7855.00	315.150	6540.18	1147.11	-274.24	-1560.83	1747026.59	14437302.47	39°45'13.609"N	80°37'14.444"W	1584.74	260.035	3.57	3.57	3.55	3.55	-1.10
7939.00	314.230	6544.58	1229.44	-215.25	-1620.47	1746966.98	14437361.44	39°45'14.194"N	80°37'15.204"W	1634.70	262.434	1.10	1.10	-1.10	-1.10	3.25
8022.00	316.930	6547.68	1310.59	-156.02	-1678.51	1746908.96	14437420.64	39°45'14.782"N	80°37'15.944"W	1685.75	264.690	3.92	3.92	3.25	3.25	1.14
8106.00	317.890	6549.26	1392.17	-94.19	-1735.35	1746852.15	14437482.45	39°45'15.395"N	80°37'16.669"W	1737.90	266.893	1.20	1.20	1.14	1.14	0.18
8190.00	315.720	6550.61	1473.95	-32.96	-1792.83	1746794.68	14437543.65	39°45'16.003"N	80°37'17.402"W	1793.14	268.947	2.58	2.58	0.18	0.18	-2.58
8272.00	315.870	6551.53	1554.11	25.82	-1850.00	1746737.54	14437602.41	39°45'16.586"N	80°37'18.130"W	1850.18	270.800	0.70	0.70	0.18	0.18	-0.18
8356.00	315.720	6552.16	1636.23	86.03	-1908.57	1746678.99	14437662.60	39°45'17.184"N	80°37'18.877"W	1910.51	272.581	0.23	0.23	-0.18	-0.18	1.23
8439.00	316.740	6552.33	1717.24	145.97	-1965.98	1746621.60	14437722.51	39°45'17.778"N	80°37'19.609"W	1971.39	274.246	1.52	1.52	1.23	1.23	-0.38
8520.00	316.430	6552.05	1796.19	204.81	-2021.65	1746565.95	14437781.33	39°45'18.362"N	80°37'20.318"W	2032.00	275.785	0.40	0.40	-0.38	-0.38	1.29
8600.00	317.460	6551.90	1874.05	263.26	-2076.27	1746511.36	14437839.76	39°45'18.942"N	80°37'21.015"W	2092.89	277.226	1.29	1.29	1.29	1.29	-1.47
8683.00	316.240	6551.73	1954.86	323.81	-2133.03	1746454.62	14437900.29	39°45'19.543"N	80°37'21.738"W	2157.47	278.632	1.48	1.48	-1.47	-1.47	0.16
8766.00	316.370	6551.78	2035.85	383.82	-2190.37	1746397.30	14437960.27	39°45'20.138"N	80°37'22.469"W	2223.74	279.939	0.54	0.54	0.16	0.16	0.07
8849.00	316.430	6552.16	2116.80	443.93	-2247.61	1746340.09	14438020.36	39°45'20.735"N	80°37'23.199"W	2291.03	281.173	0.08	0.08	0.07	0.07	0.50
8933.00	316.850	6552.55	2198.66	505.00	-2305.28	1746282.44	14438081.40	39°45'21.341"N	80°37'23.934"W	2359.94	282.356	0.50	0.50	0.50	0.50	0.86
9013.00	317.540	6552.79	2276.43	563.69	-2359.64	1746228.10	14438140.08	39°45'21.923"N	80°37'24.627"W	2426.03	283.436	0.89	0.89	0.86	0.86	-5.74
9097.00	312.720	6553.24	2358.73	623.21	-2418.88	1746168.88	14438199.57	39°45'22.513"N	80°37'25.382"W	2497.87	284.448	5.76	5.76	-5.74	-5.74	-3.29
9181.00	309.960	6554.04	2441.97	678.68	-2481.94	1746105.85	14438255.02	39°45'23.064"N	80°37'26.186"W	2573.06	285.294	3.29	3.29	-3.29	-3.29	

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Actual Wellpath Report

Columbia Gas Transmission MSH 1H AWP Proj: 13208'MD
Page 6 of 9



REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 1H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H AWB
Facility	Columbia Gas Transmission MSH Pad		

WELLPATH DATA (170 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]
9265.00	89.320	312.700	6554.97	2525.20	734.15	-2545.01	1746042.80	14438310.46	39°45'23.615"N	80°37'26.991"W	2648.78	286.091	3.26	-0.12	3.26
9348.00	89.690	312.320	6555.68	2607.21	790.23	-2606.19	1745981.64	14438366.52	39°45'24.172"N	80°37'27.771"W	2723.36	286.868	0.64	0.45	-0.46
9431.00	89.480	312.660	6556.29	2689.22	846.29	-2667.39	1745920.47	14438422.56	39°45'24.728"N	80°37'28.552"W	2798.43	287.603	0.48	-0.25	0.41
9514.00	89.450	314.890	6557.06	2770.93	903.71	-2727.32	1745860.56	14438479.96	39°45'25.298"N	80°37'29.316"W	2873.14	288.333	2.69	-0.04	2.69
9598.00	89.600	316.930	6557.76	2853.01	964.04	-2785.76	1745802.15	14438540.26	39°45'25.897"N	80°37'30.061"W	2947.85	289.089	2.44	0.18	2.43
9682.00	89.720	315.150	6558.26	2935.05	1024.50	-2844.06	1745743.86	14438600.70	39°45'26.497"N	80°37'30.805"W	3022.96	289.810	2.12	0.14	-2.12
9764.00	89.420	314.460	6558.87	3015.50	1082.28	-2902.24	1745685.71	14438658.46	39°45'27.070"N	80°37'31.546"W	3097.47	290.451	0.92	-0.37	-0.84
9847.00	89.660	315.240	6559.54	3096.92	1140.81	-2961.08	1745626.89	14438716.97	39°45'27.651"N	80°37'32.297"W	3173.24	291.070	0.98	0.29	0.94
9930.00	89.660	318.830	6560.03	3177.65	1201.54	-3017.64	1745570.35	14438777.67	39°45'28.254"N	80°37'33.018"W	3248.05	291.711	4.33	0.00	4.33
10015.00	89.510	318.330	6560.65	3259.79	1265.28	-3073.87	1745514.14	14438841.39	39°45'28.886"N	80°37'33.734"W	3324.10	292.373	0.61	-0.18	-0.59
10097.00	89.690	314.840	6561.22	3339.70	1324.83	-3130.22	1745457.82	14438900.92	39°45'29.477"N	80°37'34.453"W	3399.04	292.940	4.26	0.22	-4.26
10181.00	89.510	310.510	6561.81	3422.64	1381.75	-3191.96	1745396.10	14438957.82	39°45'30.042"N	80°37'35.240"W	3478.20	293.407	5.16	-0.21	-5.15
10263.00	89.350	308.690	6562.62	3504.19	1434.02	-3255.14	1745332.95	14439010.06	39°45'30.561"N	80°37'36.046"W	3557.01	293.775	2.23	-0.20	-2.22
10348.00	89.350	314.100	6563.59	3588.38	1490.20	-3318.87	1745269.24	14439066.22	39°45'31.119"N	80°37'36.859"W	3638.08	294.180	6.36	0.00	6.36
10431.00	89.910	318.880	6564.12	3669.28	1550.38	-3376.00	1745212.13	14439126.37	39°45'31.716"N	80°37'37.588"W	3714.97	294.666	5.80	0.67	5.76
10515.00	89.540	317.020	6564.53	3750.68	1612.75	-3432.26	1745155.90	14439188.72	39°45'32.335"N	80°37'38.305"W	3792.27	295.168	2.26	-0.44	-2.21
10598.00	89.510	314.590	6565.21	3831.81	1672.25	-3490.11	1745098.07	14439248.20	39°45'32.925"N	80°37'39.042"W	3870.05	295.601	2.93	-0.04	-2.93
10680.00	89.480	313.080	6565.94	3912.52	1729.04	-3549.26	1745038.94	14439304.97	39°45'33.489"N	80°37'39.797"W	3948.01	295.973	1.84	-0.04	-1.84
10763.00	89.450	314.790	6566.71	3994.18	1786.62	-3609.02	1744979.20	14439362.53	39°45'34.060"N	80°37'40.559"W	4027.04	296.337	2.06	-0.04	2.06
10846.00	89.380	313.980	6567.56	4075.73	1844.68	-3668.33	1744919.91	14439420.56	39°45'34.636"N	80°37'41.315"W	4106.03	296.696	0.98	-0.08	-0.98
10928.00	89.450	315.250	6568.40	4156.23	1902.26	-3726.70	1744861.57	14439478.12	39°45'35.208"N	80°37'42.060"W	4184.13	297.042	1.55	0.09	1.55
11010.00	89.450	319.060	6569.18	4235.95	1962.37	-3782.45	1744805.84	14439538.21	39°45'35.804"N	80°37'42.770"W	4261.20	297.421	4.65	0.00	4.65
11093.00	89.540	320.550	6569.92	4315.67	2025.77	-3836.01	1744752.30	14439601.58	39°45'36.433"N	80°37'43.453"W	4338.06	297.838	1.80	0.11	1.80
11176.00	89.630	319.800	6570.52	4395.24	2089.51	-3889.17	1744699.16	14439665.30	39°45'37.065"N	80°37'44.130"W	4414.94	298.248	0.91	0.11	-0.90
11260.00	89.540	318.770	6571.13	4476.13	2153.18	-3943.96	1744644.39	14439728.94	39°45'37.696"N	80°37'44.828"W	4493.44	298.632	1.23	-0.11	-1.23
11343.00	89.690	318.170	6571.68	4556.38	2215.31	-3998.99	1744589.39	14439791.05	39°45'38.313"N	80°37'45.530"W	4571.60	298.985	0.75	0.18	-0.72
11427.00	89.570	317.280	6572.23	4637.86	2277.46	-4055.49	1744532.90	14439853.18	39°45'38.929"N	80°37'46.250"W	4651.22	299.317	1.07	-0.14	-1.06
11511.00	89.570	316.380	6572.86	4719.64	2338.72	-4112.96	1744475.46	14439914.41	39°45'39.537"N	80°37'46.982"W	4731.39	299.624	1.07	0.00	-1.07
11592.00	89.510	315.480	6573.51	4798.79	2396.92	-4169.30	1744419.14	14439972.59	39°45'40.115"N	80°37'47.701"W	4809.18	299.894	1.11	-0.07	-1.11
11677.00	89.690	314.700	6574.10	4882.10	2457.41	-4229.30	1744359.16	14440032.76	39°45'40.712"N	80°37'48.466"W	4891.26	300.155	0.94	0.21	-0.92

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Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
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Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H AWB
Facility	Columbia Gas Transmission MSH Pad		

WELLPATH DATA (170 stations)																
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure	Dist	Dir	DLS	Build Rate	Turn Rate
[ft]	[°]	[°]	[ft]	[ft]	[ft]	[ft]	[US ft]	[US ft]	[ft]	[ft]	[ft]	[ft]	[°]	[%/100ft]	[%/100ft]	[%/100ft]
89.540	313.360	6574.64	4960.79	2512.71	-4286.82	1744301.67	14440088.34	39°45'41.264"N	80°37'49.200"W	4968.96	300.377	1.69	-0.19	-1.68		
89.110	312.620	6575.61	5042.69	2569.30	-4347.53	1744240.98	14440144.91	39°45'41.825"N	80°37'49.974"W	5049.98	300.582	1.03	-0.52	-0.89		
11924.00	88.830	312.920	6577.12	5125.62	2626.34	-4409.18	1744179.35	39°45'42.392"N	80°37'50.760"W	5132.11	300.780	0.49	-0.33	0.36		
12008.00	88.860	312.880	6578.82	5208.51	2683.51	-4470.70	1744117.86	39°45'42.959"N	80°37'51.545"W	5214.25	300.974	0.06	0.04	-0.05		
12091.00	88.860	313.280	6580.47	5290.37	2740.18	-4531.31	1744057.27	39°45'43.522"N	80°37'52.318"W	5295.41	301.162	0.48	0.00	0.48		
12175.00	88.890	311.960	6582.12	5373.33	2797.05	-4593.11	1743995.49	39°45'44.086"N	80°37'53.107"W	5377.75	301.340	1.57	0.04	-1.57		
12260.00	88.520	313.970	6584.04	5457.19	2854.97	-4655.29	1743933.34	39°45'44.661"N	80°37'53.900"W	5461.00	301.520	2.40	-0.44	2.36		
12342.00	88.620	314.270	6586.09	5537.80	2912.03	-4714.14	1743874.51	39°45'45.227"N	80°37'54.650"W	5541.03	301.705	0.39	0.12	0.37		
12426.00	88.580	311.550	6588.14	5620.68	2969.20	-4775.64	1743813.04	39°45'45.795"N	80°37'55.435"W	5623.42	301.871	3.24	-0.05	-3.24		
12510.00	89.380	312.360	6589.63	5703.78	3025.35	-4838.10	1743750.60	39°45'46.352"N	80°37'56.232"W	5706.13	302.018	1.36	0.95	0.96		
12594.00	89.290	314.320	6590.61	5786.58	3082.99	-4899.18	1743689.54	39°45'46.924"N	80°37'57.011"W	5788.51	302.182	2.34	-0.11	2.33		
12675.00	89.170	316.640	6591.70	5865.85	3140.74	-4955.97	1743632.78	39°45'47.497"N	80°37'57.735"W	5867.35	302.364	2.87	-0.15	2.86		
12758.00	89.200	318.640	6592.88	5946.38	3202.06	-5011.88	1743576.89	39°45'48.106"N	80°37'58.448"W	5947.45	302.574	2.41	0.04	2.41		
12843.00	89.320	323.060	6593.98	6027.56	3267.96	-5065.53	1743523.26	39°45'48.759"N	80°37'59.131"W	6028.19	302.828	5.20	0.14	5.20		
12927.00	89.690	322.330	6594.70	6106.96	3334.77	-5116.44	1743472.37	39°45'49.421"N	80°37'59.780"W	6107.26	303.095	0.97	0.44	-0.87		
13010.00	90.150	317.150	6594.82	6186.69	3398.09	-5170.06	1743418.77	39°45'50.049"N	80°38'00.463"W	6186.80	303.315	6.27	0.55	-6.24		
13095.00	89.320	315.590	6595.21	6269.60	3459.61	-5228.70	1743360.15	39°45'50.660"N	80°38'01.211"W	6269.63	303.491	2.08	-0.98	-1.84		
13177.00	89.420	314.960	6596.11	6349.91	3517.86	-5286.40	1743302.47	39°45'51.238"N	80°38'01.947"W	6349.92	303.642	0.78	0.12	-0.77		
13183.00	89.350	314.960	6596.18	6355.80	3522.10	-5290.65	1743298.23	39°45'51.280"N	80°38'02.001"W	6355.80	303.653	1.17	-1.17	0.00		
13208.00	89.350	314.960	6596.46	6380.31	3539.77	-5308.34	1743280.54	39°45'51.455"N	80°38'02.226"W	6380.31	303.697	0.00	0.00	0.00		

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 1H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H AWB
Facility	Columbia Gas Transmission MSH Pad		

HOLE & CASING SECTIONS										
- Ref Wellbore: Columbia Gas Transmission MSH 1H AWB				Ref Wellpath: Columbia Gas Transmission MSH 1H AWP Proj: 13208'MD						
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	126.00	370.00	244.00	126.00	369.94	0.56	-0.34	0.60	-3.47	
13.375in Casing	26.00	350.00	324.00	26.00	349.95	0.00	0.00	0.31	-3.35	
12.25in Open Hole	370.00	2094.00	1724.00	369.94	2057.82	0.60	-3.47	-299.68	-30.38	
9.625in Casing	26.00	2076.00	2050.00	26.00	2039.98	0.00	0.00	-297.41	-29.73	
8.75in Open Hole	2094.00	5354.00	3260.00	2057.82	5211.48	-299.68	-30.38	-1051.67	-352.40	
8.5in Open Hole	5354.00	13208.00	7854.00	5211.48	6596.46	-1051.67	-352.40	3539.77	-5308.34	

TARGETS									
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape	
Columbia Gas Transmission MSH 1H LP Rev-1	6534.00	-802.64	-1022.89	1747564.33	14436774.27	39°45'08.364"N	80°37'07.585"W	point	
Columbia Gas Transmission MSH 1H BHL Rev-1	6596.00	3536.82	-5310.92	1743277.96	14441112.05	39°45'51.426"N	80°38'02.260"W	point	

WELLPATH COMPOSITION - Ref Wellbore: Columbia Gas Transmission MSH 1H AWB						Ref Wellpath: Columbia Gas Transmission MSH 1H AWP Proj: 13208'MD
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore		
26.00	322.00	OWSG MWD rev2 + HRGM	01 Rig Survey <17.5">(173'-322')	Columbia Gas Transmission MSH 1H AWB		
322.00	2022.00	BHI NaviTrak (Axial)	02 APS EM <12.25"> (260')(427'-2022')	Columbia Gas Transmission MSH 1H AWB		
2022.00	5202.00	BHI NaviTrak (Axial)	03 APS EM <8.75"> (2022')(2117'-5202')	Columbia Gas Transmission MSH 1H AWB		
5202.00	13183.00	BHI AutoTrak Curve (Short)	04 BH AT Curve <8.5"> (5202')(5287'-13183')	Columbia Gas Transmission MSH 1H AWB		
13183.00	13208.00	Blind Drilling (std)	Projection to bit	Columbia Gas Transmission MSH 1H AWB		

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Actual Wellpath Report

Columbia Gas Transmission MSH 1H AWP Proj: 13208'MD
Page 9 of 9



REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 1H
Area	Marshall County, WV	Well	Columbia Gas Transmission MSH 1H
Field	Marshall	Wellbore	Columbia Gas Transmission MSH 1H AWB
Facility	Columbia Gas Transmission MSH Pad		

COMMENTS
Wellpath general comments API: 47-051-01936-0000 Job #: 8943584 Rig: SDC 42 Duration: 01/02/2018 - 01/24/2018

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