

REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot 7H
Area	Ohio County, WV	Well	Michael Ratcliffe OHI 7H
Field	Ohio	Wellbore	Michael Ratcliffe OHI 7H AWB
Facility	Michael Ratcliffe OHI Pad		

REPORT SETUP INFORMATION

Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.1
North Reference	Grid	User	Atenjen
Scale	0.999617	Report Generated	04/Apr/2019 at 11:54
Convergence at slot	0.28° East	Database/Source file	WA_MPL_EASTERNUS_Defn/Michael_Ratcliffe_OHI_7H_AWP_Proj_14936_.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	38.07	-92.19	1761427.12	14581069.14	40°08'54.257"N	80°34'01.057"W
Facility Reference Pt			1761519.28	14581031.09	40°08'53.876"N	80°33'59.872"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.478"W

WELLPATH DATUM

Calculation method	Minimum curvature	SDC 41 (RKB) to Facility Vertical Datum	1307.30ft
Horizontal Reference Pt	Slot	SDC 41 (RKB) to Mean Sea Level	1307.30ft
Vertical Reference Pt	SDC 41 (RKB)	SDC 41 (RKB) to Ground Level at Slot (Slot 7H)	26.00ft
MD Reference Pt	SDC 41 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	151.51°

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SEP 13 2019

WV Department of
Environmental Protection

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WELLPATH DATA (173 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	173.360	0.00	0.00	0.00	0.00	1761427.12	14581069.14	40°08'54.257"N	80°34'01.057"W	0.00	0.000	0.00	0.00	0.00
26.00	0.000	173.360	26.00	0.00	0.00	0.00	1761427.12	14581069.14	40°08'54.257"N	80°34'01.057"W	0.00	0.000	0.00	0.00	0.00
153.00	0.400	173.360	153.00	0.41	-0.44	0.05	1761427.17	14581068.70	40°08'54.252"N	80°34'01.056"W	0.44	173.360	0.31	0.31	136.50
243.00	0.420	181.320	243.00	0.99	-1.08	0.08	1761427.20	14581068.06	40°08'54.246"N	80°34'01.056"W	1.09	175.773	0.07	0.02	8.84
333.00	0.450	176.860	332.99	1.59	-1.76	0.09	1761427.21	14581067.37	40°08'54.239"N	80°34'01.056"W	1.77	177.024	0.05	0.03	-4.96
424.00	0.300	191.240	423.99	2.10	-2.36	0.06	1761427.18	14581066.78	40°08'54.233"N	80°34'01.056"W	2.36	178.422	0.19	-0.16	15.80
515.00	0.310	258.480	514.99	2.21	-2.64	-0.22	1761426.90	14581066.50	40°08'54.231"N	80°34'01.060"W	2.65	184.827	0.37	0.01	73.89
605.00	0.440	229.950	604.99	2.21	-2.91	-0.73	1761426.39	14581066.23	40°08'54.228"N	80°34'01.066"W	3.00	194.010	0.25	0.14	-31.70
628.00	0.460	234.440	627.99	2.24	-3.02	-0.87	1761426.25	14581066.12	40°08'54.227"N	80°34'01.068"W	3.14	196.047	0.18	0.09	19.52
706.00	0.670	231.870	705.98	2.35	-3.48	-1.48	1761425.64	14581065.66	40°08'54.222"N	80°34'01.076"W	3.79	203.048	0.27	0.27	-3.29
797.00	0.700	240.070	796.98	2.46	-4.09	-2.38	1761424.74	14581065.05	40°08'54.216"N	80°34'01.088"W	4.73	210.224	0.11	0.03	9.01
887.00	0.870	246.930	886.97	2.41	-4.63	-3.49	1761423.63	14581064.51	40°08'54.211"N	80°34'01.102"W	5.80	216.980	0.22	0.19	7.62
978.00	0.830	248.880	977.96	2.26	-5.14	-4.74	1761422.38	14581064.00	40°08'54.206"N	80°34'01.118"W	6.99	222.671	0.05	-0.04	2.14
1068.00	1.020	245.640	1067.95	2.12	-5.70	-6.08	1761421.05	14581063.44	40°08'54.201"N	80°34'01.135"W	8.33	226.803	0.22	0.21	-3.60
1158.00	0.450	149.810	1157.94	2.41	-6.34	-6.63	1761420.49	14581062.80	40°08'54.194"N	80°34'01.143"W	9.17	226.268	1.28	-0.63	-106.48
1249.00	1.110	109.700	1248.93	3.43	-6.95	-5.62	1761421.50	14581062.19	40°08'54.188"N	80°34'01.130"W	8.93	218.964	0.90	0.73	-44.08
1342.00	1.120	109.810	1341.92	4.78	-7.56	-3.91	1761423.21	14581061.58	40°08'54.182"N	80°34'01.108"W	8.51	207.382	0.01	0.01	0.12
1434.00	0.810	123.500	1433.90	6.02	-8.22	-2.53	1761424.59	14581060.92	40°08'54.175"N	80°34'01.090"W	8.60	197.083	0.42	-0.34	14.88
1527.00	0.700	139.040	1526.90	7.16	-9.01	-1.61	1761425.51	14581060.13	40°08'54.168"N	80°34'01.078"W	9.16	190.103	0.25	-0.12	16.71
1620.00	0.520	136.260	1619.89	8.12	-9.75	-0.94	1761426.18	14581059.39	40°08'54.160"N	80°34'01.070"W	9.79	185.520	0.20	-0.19	-2.99
1712.00	0.650	130.980	1711.89	9.01	-10.39	-0.26	1761426.86	14581058.75	40°08'54.154"N	80°34'01.061"W	10.39	181.430	0.15	0.14	-5.74
1805.00	0.460	145.940	1804.88	9.88	-11.05	0.35	1761427.47	14581058.10	40°08'54.147"N	80°34'01.053"W	11.05	178.196	0.26	-0.20	16.09
1897.00	0.260	154.430	1896.88	10.45	-11.54	0.64	1761427.76	14581057.60	40°08'54.143"N	80°34'01.049"W	11.56	176.802	0.22	-0.22	9.23
1946.00	0.320	200.590	1945.88	10.65	-11.77	0.64	1761427.76	14581057.37	40°08'54.140"N	80°34'01.049"W	11.79	176.864	0.48	0.12	94.20
2028.00	0.400	230.190	2027.88	10.86	-12.17	0.34	1761427.46	14581056.98	40°08'54.136"N	80°34'01.053"W	12.17	178.379	0.24	0.10	36.10
2096.00	0.170	25.050	2095.88	10.93	-12.29	0.26	1761427.38	14581056.85	40°08'54.135"N	80°34'01.054"W	12.30	178.791	0.82	-0.34	-228.15
2188.00	0.500	56.450	2187.82	10.71	-10.71	2.73	1761429.85	14581058.44	40°08'54.151"N	80°34'01.022"W	11.05	165.682	3.63	3.62	-20.22
2281.00	0.570	61.020	2280.51	10.42	-6.87	9.19	1761436.30	14581062.27	40°08'54.188"N	80°34'00.939"W	11.47	126.788	2.47	2.44	4.91
2373.00	0.7340	62.330	2371.90	10.47	-1.90	18.44	1761445.55	14581067.24	40°08'54.237"N	80°34'00.819"W	18.54	95.886	1.71	1.71	1.42
2466.00	0.850	50.360	2464.09	10.44	3.99	29.23	1761456.33	14581073.13	40°08'54.295"N	80°34'00.680"W	29.50	82.228	0.61	0.55	-2.01

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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]
2559.00	8.200	66.360	2556.18	10.88	9.78	40.83	1761467.93	14581078.92	40°08'54.351"N	80°34'00.530"W	41.98	76.529	0.96	0.38	6.34
2652.00	9.940	68.310	2648.01	12.39	15.41	54.36	1761481.46	14581084.54	40°08'54.406"N	80°34'00.356"W	56.50	74.177	1.90	1.87	2.10
2744.00	10.050	66.440	2738.61	14.02	21.55	69.10	1761496.19	14581090.68	40°08'54.466"N	80°34'00.166"W	72.38	72.679	0.37	0.12	-2.03
2837.00	10.170	63.090	2830.17	14.94	28.51	83.86	1761510.95	14581097.64	40°08'54.534"N	80°33'59.975"W	88.57	71.224	0.65	0.13	-3.60
2930.00	9.440	71.290	2921.82	16.47	34.67	98.41	1761525.49	14581103.80	40°08'54.594"N	80°33'59.787"W	104.33	70.591	1.69	-0.78	8.82
3023.00	9.230	71.220	3013.59	19.02	39.52	112.69	1761539.77	14581108.64	40°08'54.642"N	80°33'59.603"W	119.42	70.675	0.23	-0.23	-0.08
3115.00	9.680	70.620	3104.34	21.49	44.46	126.97	1761554.04	14581113.58	40°08'54.690"N	80°33'59.419"W	134.53	70.701	0.50	0.49	-0.65
3208.00	10.780	74.180	3195.86	24.63	49.43	142.72	1761569.78	14581118.55	40°08'54.738"N	80°33'59.216"W	151.03	70.897	1.36	1.18	3.83
3301.00	10.820	72.010	3287.21	28.13	54.49	159.39	1761586.44	14581123.61	40°08'54.787"N	80°33'59.001"W	168.45	71.124	0.44	0.04	-2.33
3394.00	10.450	66.880	3378.61	30.51	60.50	175.45	1761602.50	14581129.62	40°08'54.846"N	80°33'58.794"W	185.59	70.973	1.09	-0.40	-5.52
3486.00	11.080	66.300	3468.99	32.03	67.33	191.21	1761618.26	14581136.44	40°08'54.913"N	80°33'58.590"W	202.72	70.601	0.69	0.68	-0.63
3579.00	11.370	71.200	3560.22	34.32	73.88	208.08	1761635.11	14581142.99	40°08'54.977"N	80°33'58.373"W	220.80	70.452	1.07	0.31	5.27
3672.00	11.150	73.510	3651.43	37.73	79.38	225.38	1761652.41	14581148.49	40°08'55.030"N	80°33'58.150"W	238.95	70.596	0.54	-0.24	2.48
3764.00	10.730	68.750	3741.76	40.66	85.01	241.89	1761668.91	14581154.12	40°08'55.085"N	80°33'57.937"W	256.39	70.635	1.08	-0.46	-5.17
3857.00	10.570	71.180	3833.16	43.19	90.90	258.03	1761685.05	14581160.01	40°08'55.142"N	80°33'57.728"W	273.57	70.593	0.51	-0.17	2.61
3949.00	10.450	71.990	3923.61	46.12	96.21	273.95	1761700.97	14581165.31	40°08'55.194"N	80°33'57.523"W	290.35	70.650	0.21	-0.13	0.88
4042.00	10.690	73.860	4015.03	49.50	101.21	290.26	1761717.27	14581170.31	40°08'55.243"N	80°33'57.313"W	307.40	70.777	0.45	0.26	2.01
4135.00	11.090	72.980	4106.36	53.12	106.23	307.10	1761734.10	14581175.32	40°08'55.292"N	80°33'57.096"W	324.95	70.919	0.47	0.43	-0.95
4227.00	11.310	72.410	4196.61	56.59	111.54	324.16	1761751.15	14581180.64	40°08'55.343"N	80°33'56.875"W	342.81	71.012	0.27	0.24	-0.62
4320.00	11.620	72.540	4287.75	60.11	117.11	341.78	1761768.77	14581186.20	40°08'55.397"N	80°33'56.648"W	361.29	71.087	0.33	0.33	0.14
4413.00	11.410	77.210	4378.88	64.39	121.96	359.69	1761786.67	14581191.05	40°08'55.444"N	80°33'56.417"W	379.80	71.270	1.03	-0.23	5.02
4505.00	10.460	74.910	4469.21	68.79	126.14	376.63	1761803.60	14581195.23	40°08'55.485"N	80°33'56.199"W	397.19	71.483	1.14	-1.03	-2.50
4598.00	10.660	71.750	4560.64	72.27	131.04	392.95	1761819.92	14581200.12	40°08'55.533"N	80°33'55.988"W	414.22	71.558	0.66	0.22	-3.40
4691.00	10.980	74.480	4651.98	75.79	136.10	409.65	1761836.61	14581205.19	40°08'55.582"N	80°33'55.773"W	431.67	71.622	0.65	0.34	2.94
4784.00	10.090	72.630	4743.42	79.35	140.90	425.96	1761852.92	14581209.99	40°08'55.628"N	80°33'55.563"W	448.66	71.697	1.02	-0.96	-1.99
4876.00	10.430	72.930	4833.94	82.55	145.75	441.61	1761868.56	14581214.83	40°08'55.676"N	80°33'55.361"W	465.04	71.735	0.37	0.37	0.33
4969.00	11.130	75.000	4925.29	86.32	150.56	458.37	1761885.31	14581219.64	40°08'55.722"N	80°33'55.145"W	482.46	71.817	0.91	0.81	2.23
5062.00	10.560	71.700	5016.63	89.93	155.57	475.17	1761902.10	14581224.64	40°08'55.771"N	80°33'54.928"W	499.99	71.872	0.94	-0.67	-3.55
5155.00	9.720	67.090	5108.17	92.20	161.30	490.49	1761917.42	14581230.37	40°08'55.827"N	80°33'54.730"W	516.33	71.797	1.26	-0.90	-4.96
5247.00	9.490	61.720	5198.89	92.99	167.91	504.32	1761931.25	14581236.99	40°08'55.892"N	80°33'54.552"W	531.54	71.585	1.01	-0.25	-5.84

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5340.00	9.160	63.600	5290.66	93.28	174.84	517.71	1761944.63	14581243.91	40°08'55.959"N	80°33'54.379"W	546.43	71.339	0.48	-0.35	2.02
5433.00	9.210	62.650	5382.47	93.70	181.55	530.95	1761957.86	14581250.62	40°08'56.025"N	80°33'54.208"W	561.13	71.123	0.17	0.05	-1.02
5478.00	8.610	62.620	5426.92	93.84	184.75	537.14	1761964.05	14581253.82	40°08'56.056"N	80°33'54.128"W	568.02	71.019	1.33	-1.33	-0.07
5545.00	7.990	66.840	5493.22	94.37	188.89	545.87	1761972.78	14581257.96	40°08'56.097"N	80°33'54.015"W	577.63	70.913	1.30	-0.93	6.30
5638.00	9.580	65.270	5585.13	95.48	194.67	558.84	1761985.75	14581263.73	40°08'56.153"N	80°33'53.848"W	591.78	70.794	1.73	1.71	-1.69
5729.00	11.280	94.650	5674.68	100.84	197.12	574.61	1762001.50	14581266.18	40°08'56.177"N	80°33'53.645"W	607.48	71.065	6.06	1.87	32.29
5820.00	16.370	116.480	5763.08	116.23	190.67	594.98	1762021.87	14581259.74	40°08'56.112"N	80°33'53.383"W	624.79	72.231	7.92	5.59	23.99
5912.00	24.870	124.940	5849.12	144.21	173.78	622.50	1762049.38	14581242.85	40°08'55.944"N	80°33'53.030"W	646.30	74.403	9.77	9.24	9.20
5958.00	29.120	128.920	5890.10	163.20	161.20	639.15	1762066.02	14581230.27	40°08'55.819"N	80°33'52.816"W	659.16	75.845	10.03	9.24	8.65
6004.00	34.040	136.480	5929.30	185.99	144.81	656.74	1762083.61	14581213.90	40°08'55.656"N	80°33'52.591"W	672.52	77.565	13.71	10.70	16.43
6051.00	39.570	143.110	5966.93	213.54	123.28	674.81	1762101.66	14581192.37	40°08'55.442"N	80°33'52.359"W	685.97	79.647	14.47	11.77	14.11
6097.00	43.830	149.000	6001.28	243.97	97.88	691.82	1762118.67	14581166.99	40°08'55.190"N	80°33'52.142"W	698.71	81.947	12.57	9.26	12.80
6143.00	48.490	153.420	6033.14	277.12	68.80	707.74	1762134.59	14581137.92	40°08'54.902"N	80°33'51.939"W	711.08	84.447	12.27	10.13	9.61
6190.00	53.880	156.640	6062.59	313.65	35.61	723.16	1762150.00	14581104.74	40°08'54.574"N	80°33'51.742"W	724.03	87.181	12.65	11.47	6.85
6236.00	60.270	158.300	6087.58	352.03	-0.04	737.92	1762164.76	14581069.10	40°08'54.221"N	80°33'51.554"W	737.92	90.003	14.22	13.89	3.61
6283.00	66.180	159.100	6108.75	393.64	-39.12	753.15	1762179.98	14581030.03	40°08'53.834"N	80°33'51.361"W	754.17	92.973	12.67	12.57	1.70
6329.00	71.590	160.690	6125.31	436.08	-79.41	767.89	1762194.71	14580989.76	40°08'53.435"N	80°33'51.173"W	771.98	95.904	12.19	11.76	3.46
6375.00	77.220	159.880	6137.68	479.85	-121.10	782.83	1762209.65	14580948.09	40°08'53.022"N	80°33'50.984"W	792.14	98.793	12.36	12.24	-1.76
6422.00	80.040	157.130	6146.94	525.57	-163.96	799.72	1762226.53	14580905.24	40°08'52.598"N	80°33'50.769"W	816.35	101.586	8.30	6.00	-5.85
6468.00	82.380	156.430	6153.97	570.84	-205.73	817.64	1762244.44	14580863.49	40°08'52.184"N	80°33'50.541"W	843.12	104.123	5.30	5.09	-1.52
6514.00	86.150	156.130	6158.57	616.44	-247.63	836.05	1762262.84	14580821.61	40°08'51.769"N	80°33'50.306"W	871.95	106.499	8.22	8.20	-0.65
6561.00	89.380	156.610	6160.40	663.23	-290.65	854.87	1762281.66	14580778.60	40°08'51.343"N	80°33'50.067"W	902.93	108.778	6.95	6.87	1.02
6653.00	89.350	155.100	6161.42	754.96	-374.59	892.50	1762319.27	14580694.69	40°08'50.512"N	80°33'49.587"W	967.92	112.768	1.64	-0.03	-1.64
6746.00	89.110	154.370	6162.67	847.80	-458.69	932.19	1762358.95	14580610.63	40°08'49.679"N	80°33'49.082"W	1038.93	116.200	0.83	-0.26	-0.78
6838.00	89.110	154.830	6164.10	939.65	-541.78	971.64	1762398.39	14580527.56	40°08'48.856"N	80°33'48.579"W	1112.48	119.144	0.50	0.00	0.50
6931.00	89.020	155.540	6165.62	1032.45	-626.19	1010.67	1762437.40	14580443.19	40°08'48.020"N	80°33'48.082"W	1188.93	121.781	0.77	-0.10	0.76
7024.00	89.020	153.370	6167.21	1125.31	-710.08	1050.76	1762477.48	14580359.34	40°08'47.189"N	80°33'47.571"W	1268.19	124.050	2.33	0.00	-2.33
7117.00	88.950	153.210	6168.85	1218.25	-793.14	1092.56	1762519.26	14580276.30	40°08'46.366"N	80°33'47.038"W	1350.10	125.978	0.19	-0.08	-0.17
7209.00	89.020	152.900	6170.48	1310.20	-875.14	1134.24	1762560.92	14580194.34	40°08'45.554"N	80°33'46.506"W	1432.61	127.653	0.35	0.08	-0.34
7302.00	88.980	151.820	6172.11	1403.17	-957.51	1177.38	1762604.04	14580111.99	40°08'44.738"N	80°33'45.956"W	1517.58	129.120	1.16	-0.04	-1.16

Actual Wellpath Report

Michael Ratcliffe OHI 7H AWP Proj: 14936'

Page 5 of 9

REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot 7H
Area	Ohio County, WV	Well	Michael Ratcliffe OHI 7H
Field	Ohio	Wellbore	Michael Ratcliffe OHI 7H AWB
Facility	Michael Ratcliffe OHI Pad		

WELLPATH DATA (173 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]
7395.00	88.950	149.540	6173.79	1496.14	-1038.58	1222.91	1762649.56	14580030.96	40°08'43.934"N	80°33'45.375"W	1604.42	130.340	2.45	-0.03	-2.45
7487.00	88.980	152.610	6175.45	1588.12	-1119.08	1267.39	1762694.02	14579950.49	40°08'43.137"N	80°33'44.807"W	1690.75	131.444	3.34	0.03	3.34
7580.00	90.120	156.570	6176.18	1680.96	-1203.06	1307.29	1762733.90	14579866.54	40°08'42.305"N	80°33'44.299"W	1776.62	132.623	4.43	1.23	4.26
7673.00	89.480	156.440	6176.50	1773.60	-1288.35	1344.36	1762770.97	14579781.28	40°08'41.460"N	80°33'43.827"W	1862.03	133.781	0.70	-0.69	-0.14
7766.00	89.380	155.860	6177.43	1866.29	-1373.41	1381.97	1762808.55	14579696.26	40°08'40.618"N	80°33'43.348"W	1948.35	134.822	0.63	-0.11	-0.62
7858.00	89.380	157.470	6178.43	1957.91	-1457.87	1418.40	1762844.98	14579611.83	40°08'39.781"N	80°33'42.884"W	2034.03	135.786	1.75	0.00	1.75
7950.00	89.450	158.380	6179.36	2049.33	-1543.12	1452.98	1762879.54	14579526.61	40°08'38.937"N	80°33'42.444"W	2119.52	136.723	0.99	0.08	0.99
8043.00	89.750	157.230	6180.01	2141.77	-1629.23	1488.11	1762914.65	14579440.54	40°08'38.085"N	80°33'41.997"W	2206.55	137.592	1.28	0.32	-1.24
8135.00	89.320	154.910	6180.76	2233.47	-1713.31	1525.42	1762951.95	14579356.49	40°08'37.252"N	80°33'41.522"W	2293.98	138.320	2.56	-0.47	-2.52
8228.00	89.020	155.730	6182.11	2326.25	-1797.81	1564.25	1762990.77	14579272.02	40°08'36.415"N	80°33'41.028"W	2383.06	138.974	0.94	-0.32	0.88
8321.00	89.170	158.470	6183.58	2418.79	-1883.46	1600.43	1763026.93	14579186.40	40°08'35.567"N	80°33'40.567"W	2471.60	139.644	2.95	0.16	2.95
8412.00	89.350	159.620	6184.75	2508.99	-1968.43	1632.97	1763059.46	14579101.46	40°08'34.725"N	80°33'40.154"W	2557.60	140.322	1.28	0.20	1.26
8505.00	90.370	161.370	6184.98	2600.85	-2056.09	1664.02	1763090.50	14579013.84	40°08'33.858"N	80°33'39.759"W	2645.08	141.016	2.18	1.10	1.88
8598.00	89.320	159.620	6185.23	2692.70	-2143.75	1695.07	1763121.54	14578926.37	40°08'32.990"N	80°33'39.365"W	2732.93	141.666	2.19	-1.13	-1.88
8691.00	89.320	158.610	6186.34	2784.87	-2230.63	1728.22	1763154.68	14578839.37	40°08'32.130"N	80°33'38.944"W	2821.78	142.233	1.09	0.00	-1.09
8783.00	89.200	159.310	6187.52	2876.09	-2316.49	1761.25	1763187.69	14578753.54	40°08'31.280"N	80°33'38.524"W	2910.00	142.754	0.77	-0.13	0.76
8876.00	88.980	155.620	6189.00	2968.56	-2402.36	1796.88	1763223.31	14578667.70	40°08'30.429"N	80°33'38.071"W	3000.02	143.205	3.97	-0.24	-3.97
8969.00	89.110	152.330	6190.55	3061.45	-2485.91	1837.67	1763264.08	14578584.19	40°08'29.602"N	80°33'37.551"W	3091.41	143.527	3.54	0.14	-3.54
9060.00	89.050	147.080	6192.01	3152.36	-2564.45	1883.56	1763309.95	14578505.68	40°08'28.823"N	80°33'36.965"W	3181.85	143.703	5.77	-0.07	-5.77
9153.00	88.920	148.390	6193.66	3245.14	-2643.07	1933.19	1763359.57	14578427.09	40°08'28.044"N	80°33'36.331"W	3274.61	143.818	1.42	-0.14	1.41
9245.00	89.080	151.150	6195.27	3337.08	-2722.54	1979.50	1763405.86	14578347.65	40°08'27.256"N	80°33'35.740"W	3366.10	143.980	3.00	0.17	3.00
9338.00	89.200	153.040	6196.66	3430.06	-2804.71	2023.02	1763449.36	14578265.51	40°08'26.442"N	80°33'35.184"W	3458.18	144.197	2.04	0.13	2.03
9430.00	89.420	156.880	6197.77	3521.87	-2888.05	2061.95	1763488.27	14578182.21	40°08'25.617"N	80°33'34.689"W	3548.58	144.475	4.18	0.24	4.17
9523.00	89.820	156.800	6198.39	3614.46	-2973.55	2098.53	1763524.84	14578096.74	40°08'24.770"N	80°33'34.223"W	3639.48	144.788	0.44	0.43	-0.09
9615.00	89.260	154.060	6199.13	3706.23	-3057.21	2136.77	1763563.07	14578013.11	40°08'23.942"N	80°33'33.736"W	3729.92	145.049	3.04	-0.61	-2.98
9708.00	89.320	150.950	6200.28	3799.20	-3139.69	2179.70	1763605.98	14577930.66	40°08'23.124"N	80°33'33.188"W	3822.14	145.230	3.34	0.06	-3.34
9801.00	89.050	150.630	6201.60	3892.18	-3220.85	2225.08	1763651.34	14577849.53	40°08'22.320"N	80°33'32.609"W	3914.70	145.362	0.45	-0.29	-0.34
9893.00	89.110	155.520	6203.08	3984.11	-3302.84	2266.72	1763692.97	14577767.57	40°08'21.508"N	80°33'32.078"W	4005.85	145.538	5.31	0.07	5.32
9985.00	89.140	161.110	6204.51	4075.41	-3388.29	2300.70	1763726.93	14577682.16	40°08'20.662"N	80°33'31.646"W	4095.57	145.823	6.08	0.00	6.08
10078.00	89.280	157.470	6205.88	4167.53	-3475.25	2333.58	1763759.80	14577595.22	40°08'19.801"N	80°33'31.229"W	4186.05	146.119	3.91	0.10	-3.91

Gas

2019

Point of Protection

REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot 7H
Area	Ohio County, WV	Well	Michael Ratcliffe OHI 7H
Field	Ohio	Wellbore	Michael Ratcliffe OHI 7H AWB
Facility	Michael Ratcliffe OHI Pad		

WELLPATH DATA (173 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]
10171.00	88.980	157.990	6207.36	4259.97	-3561.31	2368.82	1763795.03	14577509.20	40°08'18.949"N	80°33'30.780"W	4277.17	146.370	0.61	-0.24	0.56
10264.00	89.230	161.040	6208.81	4352.04	-3648.40	2401.36	1763827.55	14577422.14	40°08'18.086"N	80°33'30.367"W	4367.77	146.647	3.29	0.27	3.28
10356.00	89.050	162.150	6210.19	4442.61	-3735.69	2430.40	1763856.98	14577334.89	40°08'17.223"N	80°33'29.999"W	4456.70	146.952	1.22	-0.20	1.21
10449.00	89.170	159.560	6211.64	4534.36	-3823.53	2460.90	1763887.07	14577247.09	40°08'16.353"N	80°33'29.612"W	4547.02	147.234	2.79	0.13	-2.78
10542.00	89.170	157.640	6212.99	4626.63	-3910.10	2494.82	1763920.98	14577160.54	40°08'15.496"N	80°33'29.180"W	4638.21	147.460	2.06	0.00	-2.06
10634.00	88.980	155.680	6214.47	4718.25	-3994.56	2531.27	1763957.41	14577076.12	40°08'14.659"N	80°33'28.717"W	4729.04	147.638	2.14	-0.21	-2.13
10727.00	89.080	155.710	6216.05	4810.98	-4079.30	2569.54	1763995.67	14576991.41	40°08'13.820"N	80°33'28.229"W	4821.12	147.793	0.11	0.11	0.03
10820.00	88.950	154.110	6217.64	4903.80	-4163.51	2608.97	1764035.08	14576907.23	40°08'12.986"N	80°33'27.727"W	4913.40	147.928	1.73	-0.14	-1.72
10912.00	88.950	152.580	6219.33	4995.74	-4245.72	2650.23	1764076.33	14576825.06	40°08'12.172"N	80°33'27.201"W	5004.98	148.027	1.66	0.00	-1.66
11004.00	89.050	154.770	6220.94	5087.65	-4328.16	2691.02	1764117.10	14576742.65	40°08'11.355"N	80°33'26.681"W	5096.52	148.129	2.38	0.11	2.38
11097.00	89.260	152.930	6222.31	5180.56	-4411.63	2732.00	1764158.07	14576659.21	40°08'10.528"N	80°33'26.159"W	5189.06	148.231	1.99	0.23	-1.98
11189.00	88.770	154.390	6223.89	5272.48	-4494.06	2772.82	1764198.87	14576576.81	40°08'09.711"N	80°33'25.639"W	5280.63	148.326	1.67	-0.53	1.59
11281.00	89.540	157.310	6225.25	5364.20	-4577.99	2810.45	1764236.48	14576492.91	40°08'08.880"N	80°33'25.159"W	5371.83	148.454	3.28	0.84	3.17
11374.00	89.660	157.530	6225.90	5456.70	-4663.86	2846.16	1764272.18	14576407.08	40°08'08.030"N	80°33'24.705"W	5463.72	148.606	0.27	0.13	0.24
11467.00	89.110	156.130	6226.89	5549.29	-4749.35	2882.74	1764308.75	14576321.62	40°08'07.183"N	80°33'24.240"W	5555.77	148.743	1.62	-0.59	-1.51
11559.00	89.110	153.070	6228.32	5641.14	-4832.44	2922.20	1764348.19	14576238.56	40°08'06.360"N	80°33'23.737"W	5647.27	148.838	3.33	0.00	-3.33
11652.00	89.020	153.830	6229.84	5734.07	-4915.62	2963.76	1764389.74	14576155.41	40°08'05.536"N	80°33'23.207"W	5739.96	148.913	0.82	-0.10	0.82
11745.00	89.110	156.800	6231.36	5826.84	-5000.10	3002.59	1764428.55	14576070.97	40°08'04.699"N	80°33'22.713"W	5832.37	149.015	3.19	0.10	3.19
11835.00	89.350	162.670	6232.57	5915.87	-5084.48	3033.75	1764469.70	14575986.61	40°08'03.864"N	80°33'22.317"W	5920.78	149.177	6.53	0.27	6.52
11931.00	89.200	158.700	6233.78	6010.61	-5175.05	3065.49	1764491.43	14575896.08	40°08'02.967"N	80°33'21.914"W	6014.85	149.359	4.14	-0.16	-4.14
12023.00	89.200	154.310	6235.07	6102.23	-5259.40	3102.16	1764528.08	14575811.77	40°08'02.132"N	80°33'21.448"W	6106.12	149.467	4.77	0.00	-4.77
12116.00	89.290	149.680	6236.30	6195.20	-5341.48	3145.81	1764557.71	14575729.72	40°08'01.319"N	80°33'20.891"W	6198.99	149.504	4.98	0.10	-4.98
12210.00	89.170	150.780	6237.55	6288.16	-5422.20	3191.98	1764617.87	14575649.03	40°08'00.519"N	80°33'20.302"W	6291.98	149.515	1.19	-0.13	1.18
12299.00	89.200	151.800	6238.83	6378.15	-5501.12	3235.21	1764661.08	14575570.13	40°07'59.737"N	80°33'19.750"W	6381.92	149.540	1.13	0.03	1.13
12394.00	89.350	155.210	6240.03	6473.07	-5586.13	3277.58	1764703.44	14575485.16	40°07'58.895"N	80°33'19.210"W	6476.68	149.598	3.59	0.16	3.59
12487.00	89.630	156.780	6240.86	6565.78	-5671.08	3315.41	1764741.25	14575400.25	40°07'58.053"N	80°33'18.728"W	6569.10	149.689	1.71	0.30	1.69
12579.00	89.570	158.200	6241.52	6657.28	-5756.06	3350.63	1764776.46	14575315.29	40°07'57.212"N	80°33'18.280"W	6660.25	149.796	1.55	-0.10	1.54
12669.00	89.600	156.370	6242.20	6746.81	-5839.08	3385.38	1764811.20	14575232.31	40°07'56.390"N	80°33'17.838"W	6749.49	149.896	2.03	0.07	-2.03
12761.00	89.540	156.980	6242.89	6838.44	-5923.56	3421.81	1764847.61	14575147.87	40°07'55.563"N	80°33'17.375"W	6840.85	149.987	0.67	-0.07	0.66
12854.00	89.450	161.060	6243.71	6930.62	-6010.37	3455.10	1764880.88	14575061.09	40°07'54.694"N	80°33'16.952"W	6932.69	150.107	4.39	-0.10	4.39

REFERENCE WELLPATH IDENTIFICATION

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Facility	Michael Ratcliffe OHI Pad		

WELLPATH DATA (173 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]
12945.00	90.460	161.310	6243.78	7020.32	-6096.50	3484.45	1764910.22	14574974.98	40°07'53.841"N	80°33'16.580"W	7022.02	150.250	1.14	1.11	0.27
13038.00	90.710	156.520	6242.83	7112.51	-6183.25	3517.89	1764943.65	14574888.27	40°07'52.982"N	80°33'16.155"W	7113.94	150.363	5.16	0.27	-5.15
13130.00	89.690	157.370	6242.51	7204.10	-6267.90	3553.92	1764979.67	14574803.66	40°07'52.144"N	80°33'15.696"W	7205.34	150.447	1.44	-1.11	0.92
13223.00	89.350	159.560	6243.29	7296.40	-6354.40	3588.05	1765013.79	14574717.19	40°07'51.287"N	80°33'15.262"W	7297.43	150.548	2.38	-0.37	2.35
13314.00	89.820	163.760	6243.95	7385.96	-6440.75	3616.68	1765042.40	14574630.87	40°07'50.433"N	80°33'14.900"W	7386.72	150.684	4.64	0.52	4.62
13405.00	89.230	161.760	6244.70	7475.20	-6527.66	3643.65	1765069.36	14574544.00	40°07'49.573"N	80°33'14.558"W	7475.73	150.830	2.29	-0.65	-2.20
13498.00	89.170	154.890	6246.00	7567.48	-6614.02	3677.97	1765103.67	14574457.67	40°07'48.717"N	80°33'14.122"W	7567.88	150.922	7.39	-0.06	-7.39
13590.00	89.230	153.020	6247.29	7659.38	-6696.67	3718.36	1765144.05	14574375.05	40°07'47.899"N	80°33'13.607"W	7659.74	150.959	2.03	0.07	-2.03
13682.00	89.230	153.060	6248.52	7751.34	-6778.66	3760.07	1765185.74	14574293.09	40°07'47.086"N	80°33'13.075"W	7751.67	150.983	0.04	0.00	0.04
13774.00	89.480	154.280	6249.56	7843.27	-6861.11	3800.87	1765226.52	14574210.67	40°07'46.270"N	80°33'12.555"W	7843.56	151.015	1.35	0.27	1.33
13866.00	89.350	157.530	6250.50	7934.98	-6945.08	3838.42	1765264.06	14574126.74	40°07'45.438"N	80°33'12.077"W	7935.21	151.071	3.54	-0.14	3.53
13959.00	89.380	159.630	6251.53	8027.26	-7031.64	3872.38	1765298.01	14574040.20	40°07'44.581"N	80°33'11.646"W	8027.41	151.158	2.26	0.03	2.26
14052.00	89.170	155.480	6252.71	8119.72	-7117.57	3907.88	1765333.49	14573954.31	40°07'43.730"N	80°33'11.194"W	8119.81	151.231	4.47	-0.23	-4.46
14145.00	89.140	149.590	6254.08	8212.65	-7200.05	3950.75	1765376.34	14573871.87	40°07'42.913"N	80°33'10.648"W	8212.74	151.246	6.33	-0.03	-6.33
14237.00	89.020	147.460	6255.56	8304.51	-7278.50	3998.77	1765424.35	14573793.45	40°07'42.135"N	80°33'10.035"W	8304.62	151.216	2.32	-0.13	-2.32
14330.00	89.230	150.390	6256.98	8397.39	-7358.13	4046.76	1765472.32	14573713.84	40°07'41.346"N	80°33'09.422"W	8397.52	151.190	3.16	0.23	3.15
14423.00	89.290	152.310	6258.18	8490.38	-7439.73	4091.35	1765516.89	14573632.27	40°07'40.537"N	80°33'08.853"W	8490.51	151.192	2.07	0.06	2.06
14516.00	89.600	148.800	6259.08	8583.35	-7520.70	4137.06	1765562.58	14573551.33	40°07'39.735"N	80°33'08.270"W	8583.49	151.185	3.79	0.33	-3.77
14609.00	89.600	152.730	6259.73	8676.32	-7601.84	4182.47	1765607.97	14573470.23	40°07'38.931"N	80°33'07.691"W	8676.46	151.181	4.23	0.00	4.23
14701.00	89.600	152.610	6260.37	8768.30	-7683.57	4224.70	1765650.20	14573388.53	40°07'38.121"N	80°33'07.152"W	8768.43	151.196	0.13	0.00	-0.13
14794.00	89.540	150.370	6261.07	8861.29	-7765.28	4269.09	1765694.56	14573306.85	40°07'37.311"N	80°33'06.586"W	8861.42	151.199	2.41	-0.06	-2.41
14886.00	89.480	153.340	6261.86	8953.28	-7846.39	4312.48	1765737.94	14573225.77	40°07'36.508"N	80°33'06.033"W	8953.40	151.206	3.23	-0.07	3.23
14936.00	89.480	153.340	6262.31	9003.25	-7891.08	4334.91	1765760.36	14573181.10	40°07'36.065"N	80°33'05.747"W	9003.36	151.218	0.00	0.00	0.00

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REFERENCE WELLPATH IDENTIFICATION

Operator	SOUTHWESTERN ENERGY	Slot	Slot 7H
Area	Ohio County, WV	Well	Michael Ratcliffe OHI 7H
Field	Ohio	Wellbore	Michael Ratcliffe OHI 7H AWB
Facility	Michael Ratcliffe OHI Pad		

HOLE & CASING SECTIONS - Ref Wellbore: Michael Ratcliffe OHI 7H AWB Ref Wellpath: Michael Ratcliffe OHI 7H AWP Proj: 14936'

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]
20in Conductor	26.00	100.00	74.00	26.00	100.00	0.00	0.00	-0.15	0.02
17.5in Open Hole	100.00	685.00	585.00	100.00	684.99	-0.15	0.02	-3.34	-1.30
13.375in Casing Surface	26.00	685.00	659.00	26.00	684.99	0.00	0.00	-3.34	-1.30
12.25in Open Hole	685.00	2013.00	1328.00	684.99	2012.88	-3.34	-1.30	-12.10	0.42
9.625in Casing Intermediate	26.00	2013.00	1987.00	26.00	2012.88	0.00	0.00	-12.10	0.42
8.75in Open Hole	2013.00	5478.00	3465.00	2012.88	5426.92	-12.10	0.42	184.75	537.14
8.5in Open Hole	5478.00	14936.00	9458.00	5426.92	6262.31	184.75	537.14	-7891.08	4334.91
5.5in Casing Production	26.00	14936.00	14910.00	26.00	6262.31	0.00	0.00	-7891.08	4334.91

TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Michael Ratcliffe OHI 7H LP Rev-2	6156.00	-266.78	871.80	1762298.59	14580802.46	40°08'51.578"N	80°33'49.847"W	point
Michael Ratcliffe OHI 7H BHL Rev-2	6242.00	-7913.18	4294.73	1765720.19	14573159.01	40°07'35.848"N	80°33'06.266"W	point

WELLPATH COMPOSITION - Ref Wellbore: Michael Ratcliffe OHI 7H AWB Ref Wellpath: Michael Ratcliffe OHI 7H AWP Proj: 14936'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	628.00	OWSG MWD rev2 + HRGM	01 Premier MWD <17-1/2"> (153-628)	Michael Ratcliffe OHI 7H AWB
628.00	1946.00	OWSG MWD rev2 + HRGM	02 Premier MWD <12-1/4"> (628)(706-1946)	Michael Ratcliffe OHI 7H AWB
1946.00	5478.00	OWSG MWD rev2 + HRGM	03 Premier MWD <8-3/4"> (1946)(2028-5478) Proj: 5550'	Michael Ratcliffe OHI 7H AWB
5478.00	14936.00	BHI AutoTrak Curve (Short)	04 BH AT Curve <8-1/2"> (5478)(5545-14886)	Michael Ratcliffe OHI 7H AWB
14936.00	14936.00	Blind Drilling (std)	Projection to bit	Michael Ratcliffe OHI 7H AWB

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REFERENCE WELLPATH IDENTIFICATION			
Operator	SOUTHWESTERN ENERGY	Slot	Slot 7H
Area	Ohio County, WV	Well	Michael Ratcliffe OHI 7H
Field	Ohio	Wellbore	Michael Ratcliffe OHI 7H AWB
Facility	Michael Ratcliffe OHI Pad		

COMMENTS
<p>Wellpath general comments API: 47-069-00289-0000 BH Job #: 109668350 Rig: SDC 41 Duration: 03/31/2019 - 04/01/2019</p>

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Well Name: Michael Ratcliffe UD OHI 7H 47069002890000

LITHOLOGY/FORMATION	TOP DEPTH, MD (FT)	TOP DEPTH, TVD (FT)	BOTTOM DEPTH, MD (FT)	BOTTOM DEPTH, TVD (FT)	QUANTITY AND TYPE OF FLUID
Base of Fresh Water	0.00	0.00	402.00	402.00	
Top of Salt Water	755.00	755.00	NA	NA	
Pittsburgh Coal	611.00	611.00	616.00	616.00	
Pottsville (ss)	749.00	749.00	831.00	831.00	
Raven Cliff (ss)	1360.00	1360.00	1792.00	1792.00	
Big Injun (ss)	1792.00	1792.00	1935.00	1935.00	
Rhinestreet (shale)	5801.00	5744.00	6126.00	6021.00	
Cashaqua (shale)	6126.00	6021.00	6216.00	6077.00	
Middlesex (shale)	6216.00	6077.00	6489.00	6156.00	
Burket (shale)	6489.00	6156.00	NA	NA	GAS

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