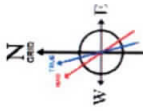


# ANTERO RESOURCES CORPORATION

Location: Ritchie County, WV  
 Field: Ritchie  
 Facility: Lettie Pad  
 Slot: Slot #09  
 Well: Christopher Unit 1H  
 Wellbore: Christopher Unit 1H PWB

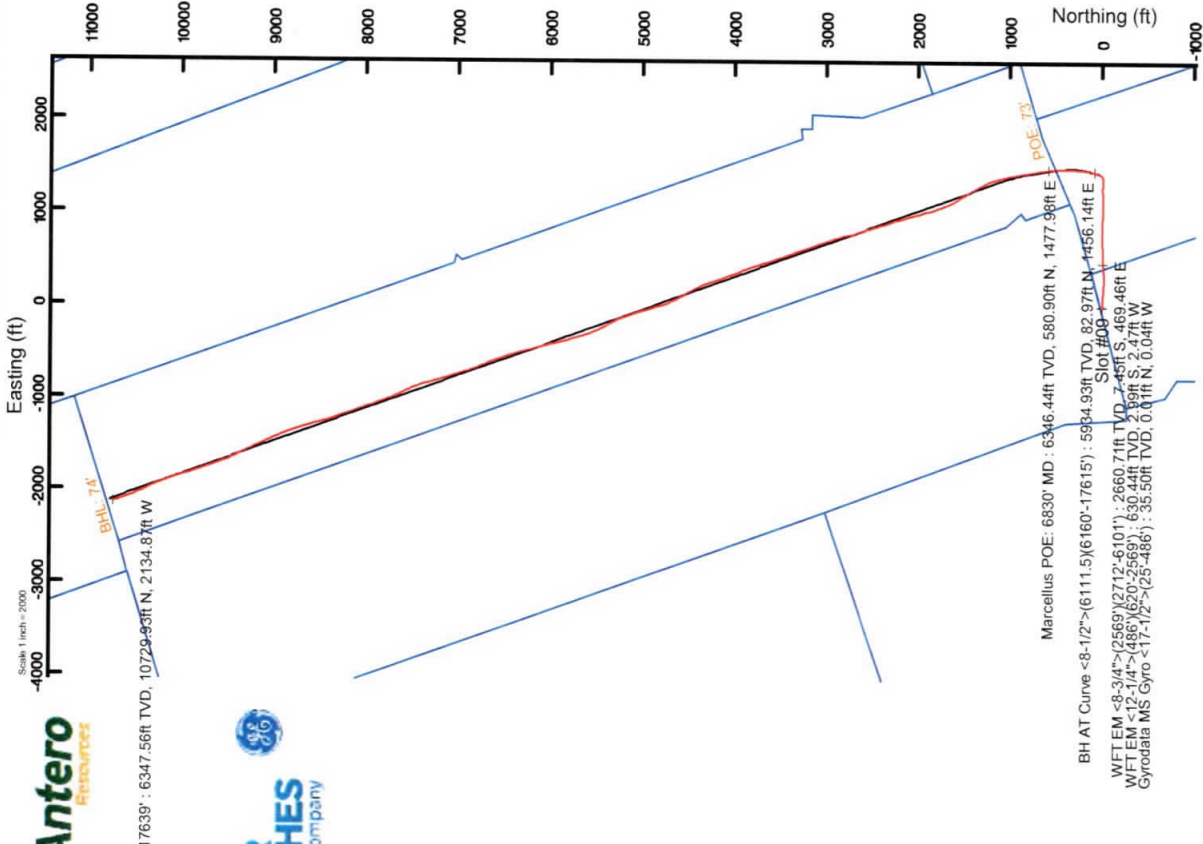
API: 47-085-10357-0000  
 BHI Job #: 109575164  
 Rig: H&P 317  
 Duration: 01/02/2019-01/05/2019



User specified (H&P) Dip: 05.40° Field: 51829.01  
 Magnetic North is 0.05 degrees East of True North (2592018)  
 To correct azimuth from True to Grid subtract 0.05 degrees  
 To correct azimuth from Magnetic to Grid subtract 7.72 degrees



Projected MD at TD: 17639' : 6347.56ft TVD, 10729.93ft N, 2134.87ft W



Phot reference wellpath is Christopher Unit 1H PWP Rev-A.0	
True vertical depths are referenced to H&P 317 (RKB)	Grid System: NAD27 / UTM Zone 17 North, US feet
Measured depths are referenced to H&P 317 (RKB)	North Reference: Grid north
H&P 317 (RKB) to Mean Sea Level: 995.5 feet	Scale: True distance
Mean Sea Level to Ground level (At Slot: Slot #09) : 970 feet	Created by: delatant on 2019-01-10
Coordinates are in feet referenced to Slot	Database: VA, MPL, EasternUS, Defn

Gyrodata MS Gyro <17-1/2>-(25-486)' : 0.53° Inc, 35.50ft MD, 35.50ft TVD, 0.03ft VS

WFT EM <12-1/4>-(486)(620-2569)' : 1.80° Inc, 630.50ft MD, 630.44ft TVD, -1.97ft VS

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Lettie Pad	1665674.089	14294790.024	80°54'38.200"W
Slot	Local E (ft)	Grid North (US ft)	Latitude
Slot #09	-4.99	69.91	39°21'53.410"N
Comment	1665743.967	14294785.036	80°54'37.400"W
Christopher Unit 1H			
H&P 317 (RKB) to Ground level (At Slot: Slot #09)		25.5ft	
Mean Sea Level to Ground level (At Slot: Slot #09)		-970ft	
H&P 317 (RKB) to Mean Sea Level		995.5ft	

WFT EM <8-3/4>-(2569)(2712-6101)' : 16.70° Inc, 2722.50ft MD, 2660.71ft TVD, -165.80ft VS

Well Profile Data						
Design Comment	MD (ft)	Inc. (°)	Az. (°)	TVD (ft)	Local E (ft)	VS (ft)
Tie On	6111.50	26.840	16.780	5892.14	61.17	1448.38
Proj. to Bottom	6185.50	29.920	16.780	5957.24	94.84	-432.68
End of 3D Arc	6379.47	40.698	9.080	6115.37	203.98	-404.43
POE	6818.69	74.990	351.000	6347.00	567.86	6.00
Landing Pt	6995.31	90.002	351.006	6370.00	740.32	8.50
End of 3D Arc	7354.54	90.000	340.229	6369.99	1087.78	207.82
End of Tangent	17633.20	90.000	340.229	6370.00	10760.50	3.00
					-2120.78	564.95
						10843.60

Well Data		
Slot	Wellbore	Wellpath
Slot #09	Christopher Unit 1H AWP	Christopher Unit 1H AWP Prof: 17639'
Slot #09	Christopher Unit 1H	Christopher Unit 1H PWP Rev-A.0

BH AT Curve <8-1/2>-(6111.5)(6160-17615)' : 29.31° Inc, 6160.00ft MD, 5934.93ft TVD, -414.46ft VS

Marcellus POE: 6830' MD : 76.32° Inc, 6830.00ft MD, 6346.44ft TVD, 46.74ft VS

Projected MD at TD: 17639' : 90.34° Inc, 17639.00ft MD, 6347.56ft TVD, 10819.60ft VS



Azimuth: 340.23° with reference 0.00 N, 0.00 E

Scale 1 inch = 1500



# Actual Wellpath Report

Christopher Unit 1H AWP Proj: 17639'

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## REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot #09
Area	Ritchie County, WV	Christopher Unit 1H
Field	Ritchie	Christopher Unit 1H AWB
Facility	Lettie Pad	

## REPORT SETUP INFORMATION

Projection System	NAD27 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.1
North Reference	Grid	User	Delaset
Scale	0.999601	Report Generated	1/10/2019 at 2:53:47 PM
Convergence at slot	0.06° East	Database/Source file	WA_MPL_EasternUS_Defn/Christopher_Unit_1H_AWP_Proj_17639_.xml

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-4.99	69.91	1665743.97	14294785.04	39°21'53.410"N	80°54'37.400"W
Facility Reference Pt			1665674.09	14294790.02	39°21'53.460"N	80°54'38.290"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.301"W

## WELLPATH DATUM

Calculation method	Minimum curvature	H&P 317 (RKB) to Facility Vertical Datum	25.50ft
Horizontal Reference Pt	Slot	H&P 317 (RKB) to Mean Sea Level	995.50ft
Vertical Reference Pt	H&P 317 (RKB)	H&P 317 (RKB) to Ground Level at Slot (Slot #09)	25.50ft
MD Reference Pt	H&P 317 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	340.23°

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# Actual Wellpath Report

Christopher Unit 1H AWP Proj: 17639'  
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REFERENCE WELLPATH IDENTIFICATION	
Operator	ANTERO RESOURCES CORPORATION
Area	Ritchie County, WV
Field	Ritchie
Facility	Lettie Pad
Slot	Slot #09
Well	Christopher Unit 1H
Wellbore	Christopher Unit 1H AWB

WELLPATH DATA (222 stations) † = interpolated/extrapolated station																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (ft)	Grid North (ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (ft/100ft)	Build Rate (ft/100ft)	Turn Rate (ft/100ft)	Comments
0.00†	0.000	285.020	0.00	0.00	0.00	0.00	1665743.97	14294785.04	39°21'53.410"N	80°54'37.400"W	0.00	0.000	0.00	0.00	0.00	
25.50	0.000	285.020	25.50	0.00	0.00	0.00	1665743.97	14294785.04	39°21'53.410"N	80°54'37.400"W	0.00	0.000	0.00	0.00	0.00	
35.50	0.530	285.020	35.50	0.03	0.01	-0.04	1665743.92	14294785.05	39°21'53.410"N	80°54'37.401"W	0.05	285.020	5.30	5.30	-749.80	Gyrodata MS Gyro <17'-1/2">-(25'-486')
60.50	0.680	295.490	60.50	0.20	0.11	-0.29	1665743.68	14294785.14	39°21'53.411"N	80°54'37.404"W	0.31	290.026	0.74	0.60	41.88	
85.50	0.770	292.920	85.50	0.42	0.24	-0.58	1665743.39	14294785.27	39°21'53.412"N	80°54'37.407"W	0.62	292.100	0.38	0.36	-10.28	
110.50	0.920	286.490	110.49	0.65	0.36	-0.93	1665743.04	14294785.39	39°21'53.414"N	80°54'37.416"W	0.99	291.106	0.71	0.60	-25.72	
135.50	0.600	287.590	135.49	0.85	0.45	-1.24	1665742.72	14294785.49	39°21'53.414"N	80°54'37.416"W	1.32	290.059	1.28	-1.28	4.40	
160.50	0.610	279.920	160.49	0.99	0.52	-1.50	1665742.47	14294785.55	39°21'53.415"N	80°54'37.419"W	1.59	289.009	0.33	0.04	-30.68	
185.50	0.640	275.520	185.49	1.12	0.55	-1.77	1665742.20	14294785.59	39°21'53.415"N	80°54'37.423"W	1.85	287.352	0.23	0.12	-17.60	
210.50	0.800	260.010	210.49	1.21	0.54	-2.08	1665741.89	14294785.57	39°21'53.415"N	80°54'37.426"W	2.15	284.449	1.00	0.64	-62.04	
235.50	1.110	246.210	235.48	1.22	0.41	-2.47	1665741.49	14294785.44	39°21'53.414"N	80°54'37.431"W	2.51	279.367	1.54	1.24	-55.20	
260.50	0.600	249.220	260.48	1.20	0.26	-2.82	1665741.15	14294785.30	39°21'53.413"N	80°54'37.436"W	2.83	275.351	2.05	-2.04	12.04	
285.50	0.600	235.430	285.48	1.17	0.14	-3.05	1665740.92	14294785.18	39°21'53.411"N	80°54'37.439"W	3.05	272.690	0.58	0.00	-55.16	
310.50	0.530	230.580	310.48	1.09	0.00	-3.24	1665740.72	14294785.03	39°21'53.410"N	80°54'37.441"W	3.24	269.920	0.34	-0.28	-19.40	
335.50	0.430	231.820	335.48	1.02	-0.14	-3.41	1665740.56	14294784.90	39°21'53.409"N	80°54'37.443"W	3.41	267.716	0.40	-0.40	4.96	
360.50	0.610	209.100	360.48	0.91	-0.31	-3.55	1665740.42	14294784.73	39°21'53.407"N	80°54'37.445"W	3.56	265.001	1.08	0.72	-90.88	
385.50	0.540	215.520	385.47	0.75	-0.52	-3.68	1665740.29	14294784.51	39°21'53.405"N	80°54'37.447"W	3.72	261.920	0.38	-0.28	25.68	
410.50	0.520	213.790	410.47	0.62	-0.71	-3.81	1665740.16	14294784.32	39°21'53.403"N	80°54'37.449"W	3.88	259.410	0.10	-0.08	-6.92	
435.50	0.500	203.740	435.47	0.47	-0.91	-3.92	1665740.05	14294784.13	39°21'53.401"N	80°54'37.450"W	4.02	256.971	0.37	-0.08	-40.20	
460.50	0.630	196.900	460.47	0.28	-1.14	-4.00	1665739.97	14294783.90	39°21'53.399"N	80°54'37.451"W	4.16	254.126	0.58	0.52	-27.36	
496.50	0.760	202.200	496.47	-0.05	-1.55	-4.15	1665739.82	14294783.49	39°21'53.395"N	80°54'37.453"W	4.43	249.537	0.40	0.36	14.72	
630.50	1.800	106.960	630.44	-1.97	-2.99	-2.47	1665741.50	14294782.05	39°21'53.381"N	80°54'37.432"W	3.88	219.629	1.51	0.78	-71.07	WFT EM <12-1/4">-(486')(620'-2569')
724.50	3.830	96.590	724.33	-4.25	-3.78	2.06	1665746.03	14294781.26	39°21'53.373"N	80°54'37.374"W	4.30	151.399	2.22	2.16	-11.03	
816.50	5.280	90.910	816.03	-7.11	-4.20	9.34	1665753.31	14294780.84	39°21'53.368"N	80°54'37.281"W	10.24	114.183	1.65	1.58	-6.17	
911.50	5.950	87.130	910.58	-10.08	-4.02	18.63	1665762.59	14294781.02	39°21'53.370"N	80°54'37.163"W	19.06	102.172	0.81	0.71	-3.98	
1006.50	7.070	84.080	1004.96	-12.92	-3.17	29.37	1665773.32	14294781.87	39°21'53.378"N	80°54'37.026"W	29.54	96.160	1.23	1.18	-3.21	
1101.50	8.330	86.460	1099.11	-16.24	-2.14	42.05	1665786.00	14294782.90	39°21'53.388"N	80°54'36.865"W	42.10	92.916	1.37	1.33	2.51	
1196.50	10.150	89.870	1192.87	-20.98	-1.70	57.29	1665801.24	14294783.34	39°21'53.393"N	80°54'36.671"W	57.32	91.697	2.00	1.92	3.59	
1291.50	11.810	91.840	1286.13	-27.37	-1.99	75.38	1665819.32	14294783.05	39°21'53.390"N	80°54'36.440"W	75.41	91.513	1.79	1.75	2.07	
1385.50	14.490	94.540	1377.65	-35.76	-3.23	96.72	1665840.65	14294781.81	39°21'53.377"N	80°54'36.169"W	96.77	91.913	2.92	2.85	2.87	

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# Actual Wellpath Report

Christopher Unit 1H AWP Proj: 176339

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## REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot #09
Area	Ritchie County, WV	Christopher Unit 1H
Field	Ritchie	Christopher Unit 1H AWB
Facility	Lettie Pad	

## WELLPATH DATA (222 stations)

MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (ft)	Grid North (ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Comments
1480.50	18.930	96.920	1468.62	-47.58	-6.03	123.88	1665867.80	14294779.01	39°21'53.349"N	80°54'35.823"W	124.03	92.787	4.73	4.67	2.51	
1574.50	18.380	96.380	1557.68	-60.96	-9.51	153.74	1665897.65	14294775.53	39°21'53.314"N	80°54'35.443"W	154.04	93.541	0.61	-0.59	-0.57	
1669.50	15.090	93.640	1648.65	-72.47	-11.96	180.98	1665924.87	14294773.08	39°21'53.290"N	80°54'35.096"W	181.37	93.782	3.56	-3.46	-2.88	
1764.50	15.910	92.010	1740.19	-82.22	-13.21	206.33	1665950.22	14294771.84	39°21'53.277"N	80°54'34.773"W	206.76	93.662	0.98	0.86	-1.72	
1859.50	17.810	93.600	1831.11	-92.81	-14.57	233.85	1665977.72	14294770.47	39°21'53.264"N	80°54'34.423"W	234.30	93.566	2.06	2.00	1.67	
1954.50	18.580	95.350	1921.36	-105.00	-16.90	263.42	1666007.28	14294768.15	39°21'53.240"N	80°54'34.046"W	263.96	93.670	0.99	0.81	1.84	
2049.50	18.080	92.920	2011.54	-117.11	-19.06	293.21	1666037.06	14294765.98	39°21'53.219"N	80°54'33.667"W	293.83	93.719	0.96	-0.53	-2.56	
2144.50	14.910	89.600	2102.62	-126.86	-19.73	320.16	1666064.00	14294765.32	39°21'53.212"N	80°54'33.324"W	320.77	93.526	3.48	-3.34	-3.49	
2239.50	12.990	84.560	2194.81	-133.55	-18.63	343.01	1666086.84	14294766.42	39°21'53.223"N	80°54'33.033"W	343.52	93.109	2.39	-2.02	-5.31	
2334.50	14.040	83.240	2287.18	-138.79	-16.26	365.09	1666108.91	14294768.78	39°21'53.246"N	80°54'32.752"W	365.45	92.550	1.15	1.11	-1.39	
2428.50	14.990	82.920	2378.18	-144.03	-13.42	388.47	1666132.29	14294771.62	39°21'53.274"N	80°54'32.454"W	388.71	91.978	1.01	1.01	-0.34	
2523.50	15.210	84.790	2469.90	-149.86	-10.77	413.08	1666156.88	14294774.27	39°21'53.299"N	80°54'32.141"W	413.22	91.494	0.56	0.23	1.97	
2579.50	16.700	86.280	2523.74	-153.93	-9.58	428.42	1666172.22	14294775.46	39°21'53.311"N	80°54'31.945"W	428.53	91.281	2.76	2.66	2.66	
2722.50	16.700	87.760	2660.71	-165.80	-7.45	469.46	1666213.24	14294777.59	39°21'53.332"N	80°54'31.423"W	469.52	90.909	0.30	0.00	1.03	WFT EM <-8-3/4">[2712'-6101']
2817.50	18.200	88.560	2751.34	-174.58	-6.54	497.93	1666241.70	14294778.50	39°21'53.340"N	80°54'31.060"W	497.97	90.753	1.60	1.58	0.84	
2912.50	18.170	88.590	2841.59	-183.91	-5.80	527.57	1666271.32	14294779.23	39°21'53.347"N	80°54'30.683"W	527.60	90.630	0.03	-0.03	0.03	
3012.50	18.310	88.140	2936.57	-193.65	-4.91	558.85	1666302.60	14294780.13	39°21'53.356"N	80°54'30.285"W	558.88	90.503	0.20	0.14	-0.45	
3107.50	18.490	88.500	3026.71	-202.96	-4.03	588.83	1666332.56	14294781.01	39°21'53.364"N	80°54'29.903"W	588.84	90.392	0.22	0.19	0.38	
3201.50	17.860	87.820	3116.02	-211.99	-3.09	618.13	1666361.85	14294781.94	39°21'53.373"N	80°54'29.530"W	618.14	90.287	0.71	-0.67	-0.72	
3296.50	17.380	86.760	3206.56	-220.43	-1.74	646.86	1666390.56	14294783.30	39°21'53.386"N	80°54'29.164"W	646.86	90.154	0.61	-0.51	-1.12	
3391.50	18.290	88.870	3297.00	-229.23	-0.64	675.93	1666419.62	14294784.40	39°21'53.397"N	80°54'28.794"W	675.93	90.054	1.17	0.96	2.22	
3486.50	18.750	90.740	3387.08	-239.35	-0.54	706.10	1666449.78	14294784.49	39°21'53.398"N	80°54'28.410"W	706.10	90.044	0.79	0.48	1.97	
3581.50	18.470	90.860	3477.11	-250.00	-0.97	736.41	1666480.08	14294784.07	39°21'53.394"N	80°54'28.024"W	736.41	90.075	0.30	-0.29	0.13	
3676.50	18.190	88.790	3567.29	-260.02	-0.88	766.28	1666509.94	14294784.16	39°21'53.393"N	80°54'27.644"W	766.29	90.066	0.75	-0.29	-2.18	
3770.50	17.730	87.210	3656.71	-268.87	0.13	795.25	1666538.90	14294785.16	39°21'53.403"N	80°54'27.275"W	795.25	89.991	0.71	-0.49	-1.68	
3865.50	17.930	89.260	3747.15	-277.86	1.02	824.32	1666567.96	14294786.06	39°21'53.412"N	80°54'26.905"W	824.32	89.929	0.69	0.21	2.16	
3960.50	18.030	92.020	3837.51	-288.09	0.69	853.64	1666597.26	14294785.73	39°21'53.408"N	80°54'26.531"W	853.64	89.954	0.90	0.11	2.91	
4055.50	17.750	90.690	3927.92	-298.61	0.00	882.81	1666626.42	14294785.03	39°21'53.401"N	80°54'26.160"W	882.81	90.000	0.52	-0.29	-1.40	
4150.50	17.350	89.950	4018.50	-308.45	-0.16	911.45	1666655.06	14294784.87	39°21'53.399"N	80°54'25.795"W	911.45	90.010	0.48	-0.42	-0.78	
4245.50	17.200	93.200	4109.21	-318.71	-0.94	939.64	1666683.23	14294784.10	39°21'53.391"N	80°54'25.436"W	939.64	90.057	1.03	-0.16	3.42	

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# Actual Wellpath Report

Christopher Unit 1H AWP Proj: 17639'

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REFERENCE WELLPATH IDENTIFICATION		Slot	Slot #09
Operator	ANTERO RESOURCES CORPORATION	Well	Christopher Unit 1H
Area	Ritchie County, WV	Wellbore	Christopher Unit 1H AWB
Field	Ritchie		
Facility	Lettie Pad		

WELLPATH DATA (222 stations)																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (ft)	Grid North (ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (ft/100ft)	Build Rate (ft/100ft)	Turn Rate (ft/100ft)	Comments
4340.50	16.850	93.530	4200.05	-329.64	-2.57	967.41	1666710.99	14294782.47	39°21'53.375"N	80°54'25.083"W	967.41	90.152	0.38	-0.37	0.35	
4435.50	16.540	92.380	4291.05	-340.18	-3.98	994.66	1666738.23	14294781.06	39°21'53.361"N	80°54'24.736"W	994.67	90.229	0.48	-0.33	-1.21	
4530.50	16.900	91.900	4382.03	-350.38	-5.00	1021.98	1666765.53	14294780.04	39°21'53.350"N	80°54'24.388"W	1021.99	90.280	0.41	0.38	-0.51	
4625.50	16.880	91.410	4472.93	-360.46	-5.79	1049.56	1666793.11	14294779.24	39°21'53.342"N	80°54'24.037"W	1049.58	90.316	0.15	-0.02	-0.52	
4719.50	17.150	91.000	4562.82	-370.31	-6.37	1077.06	1666820.60	14294778.67	39°21'53.336"N	80°54'23.687"W	1077.08	90.339	0.31	0.29	-0.44	
4814.50	17.180	89.670	4653.59	-379.94	-6.54	1105.10	1666848.62	14294778.50	39°21'53.334"N	80°54'23.330"W	1105.12	90.339	0.41	0.03	-1.40	
4909.50	17.020	88.570	4744.39	-388.99	-6.11	1133.03	1666876.54	14294778.93	39°21'53.338"N	80°54'22.974"W	1133.04	90.309	0.38	-0.17	-1.16	
5004.50	16.800	86.910	4835.28	-397.30	-5.02	1160.64	1666904.14	14294780.02	39°21'53.349"N	80°54'22.623"W	1160.65	90.248	0.56	-0.23	-1.75	
5099.50	17.150	85.890	4926.14	-405.03	-3.28	1188.32	1666931.81	14294781.76	39°21'53.366"N	80°54'22.270"W	1188.32	90.158	0.48	0.37	-1.07	
5194.50	17.130	89.270	5016.92	-413.37	-2.09	1216.28	1666959.76	14294782.94	39°21'53.377"N	80°54'21.914"W	1216.28	90.099	1.05	-0.02	3.56	
5289.50	17.370	88.340	5107.65	-422.34	-1.51	1244.44	1666987.91	14294783.53	39°21'53.383"N	80°54'21.556"W	1244.44	90.069	0.38	0.25	-0.98	
5384.50	17.580	90.250	5198.27	-431.66	-1.16	1272.96	1667016.42	14294783.88	39°21'53.386"N	80°54'21.192"W	1272.96	90.052	0.64	0.22	2.01	
5479.50	16.540	92.420	5289.09	-441.68	-1.79	1300.82	1667044.27	14294783.25	39°21'53.379"N	80°54'20.838"W	1300.82	90.079	1.28	-1.09	2.28	
5569.50	16.220	91.290	5471.38	-461.43	-3.53	1354.37	1667079.80	14294781.51	39°21'53.361"N	80°54'20.156"W	1354.38	90.149	0.24	-0.17	-0.59	
5763.50	17.060	91.030	5561.44	-471.05	-4.07	1381.28	1667124.70	14294780.96	39°21'53.356"N	80°54'19.813"W	1381.29	90.169	0.90	0.89	-0.28	
5827.50	14.960	82.500	5622.96	-476.14	-3.16	1398.86	1667142.27	14294781.87	39°21'53.365"N	80°54'19.590"W	1398.87	90.130	4.92	-3.28	-13.33	
5859.50	12.590	73.270	5654.04	-477.20	-1.62	1406.30	1667149.70	14294783.42	39°21'53.380"N	80°54'19.495"W	1406.30	90.066	10.08	-7.41	-28.84	
5890.50	11.520	60.710	5684.36	-476.87	0.87	1412.24	1667155.64	14294785.90	39°21'53.404"N	80°54'19.419"W	1412.24	89.965	9.12	-3.45	-40.52	
5922.50	12.550	51.900	5715.66	-475.25	4.58	1417.76	1667161.16	14294789.61	39°21'53.441"N	80°54'19.349"W	1417.77	89.815	6.57	3.22	-27.53	
5953.50	15.040	45.850	5745.77	-472.52	9.46	1423.30	1667166.70	14294794.49	39°21'53.489"N	80°54'19.278"W	1423.33	89.619	9.27	8.03	-19.52	
5985.50	18.170	39.300	5776.43	-468.25	16.21	1429.44	1667172.83	14294801.24	39°21'53.556"N	80°54'19.200"W	1429.53	89.350	11.38	9.78	-20.47	
6017.50	20.770	30.670	5806.61	-462.06	24.96	1435.50	1667178.89	14294809.98	39°21'53.642"N	80°54'19.123"W	1435.71	89.004	12.10	8.12	-26.97	
6048.50	23.750	22.820	5835.30	-453.96	35.44	1440.72	1667184.11	14294820.46	39°21'53.746"N	80°54'19.056"W	1441.16	88.591	13.56	9.61	-25.32	
6080.50	25.820	17.530	5864.35	-443.67	48.03	1445.32	1667188.71	14294833.05	39°21'53.870"N	80°54'18.997"W	1446.12	88.097	9.47	6.47	-16.53	
6111.50	26.840	16.780	5892.14	-432.68	61.17	1449.38	1667192.76	14294846.18	39°21'54.000"N	80°54'18.946"W	1450.67	87.583	3.46	3.29	-2.42	
6201.00	29.310	17.650	5934.93	-414.46	82.97	1456.14	1667199.52	14294867.97	39°21'54.215"N	80°54'18.859"W	1458.50	86.739	5.16	5.09	1.79	BH AT Curve <8-1/2">(6111.5)(6160'-17615')
6248.00	33.210	12.110	6010.14	-377.88	102.72	1462.10	1667205.48	14294887.72	39°21'54.411"N	80°54'18.783"W	1465.70	85.981	4.92	4.46	-4.10	
6296.00	34.920	8.030	6049.90	-353.76	153.46	1472.82	1667211.52	14294911.98	39°21'54.650"N	80°54'18.706"W	1473.63	85.056	6.20	4.40	-8.21	
6343.00	37.190	5.330	6087.90	-328.99	180.93	1476.02	1667219.40	14294938.43	39°21'54.912"N	80°54'18.646"W	1480.79	84.052	5.94	3.56	-8.50	
											1487.07	83.012	5.89	4.83	-5.74	

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# Actual Wellpath Report

Christopher Unit 1H AWP Proj: 17639'  
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REFERENCE WELLPATH IDENTIFICATION	
Operator	ANTERO RESOURCES CORPORATION
Area	Ritchie County, WV
Field	Ritchie
Facility	Lettie Pad
Slot	Slot #09
Well	Christopher Unit 1H
Wellbore	Christopher Unit 1H AWB

WELLPATH DATA (222 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 (ft/100ft)	Build Rate (ft/100ft)	Turn Rate (ft/100ft)	Comments
6391.00	40.310	4.150	6125.33	-301.66	210.87	1478.49	1667221.87	14294995.82	39°21'55.479"N	80°54'18.573"W	1493.45	81.883	6.68	6.50	-2.46	
6438.00	44.300	3.990	6160.08	-272.73	242.41	1480.74	1667224.11	14295027.35	39°21'55.791"N	80°54'18.544"W	1500.45	80.702	8.49	8.49	-0.34	
6473.00H	47.275	3.812	6184.49	-249.75	267.44	1482.44	1667225.81	14295052.37	39°21'56.038"N	80°54'18.522"W	1506.37	79.774	8.51	8.50	-0.51	Middlesex: 6473' MD
6486.00	48.380	3.750	6193.22	-240.92	277.05	1483.08	1667226.45	14295061.98	39°21'56.132"N	80°54'18.514"W	1508.73	79.419	8.51	8.50	-0.48	
6533.00	53.130	3.720	6222.94	-207.55	313.36	1485.45	1667228.82	14295098.28	39°21'56.492"N	80°54'18.483"W	1518.14	78.088	10.11	10.11	-0.06	
6580.00	57.290	2.500	6249.75	-171.99	351.90	1487.53	1667230.90	14295136.79	39°21'56.873"N	80°54'18.456"W	1528.59	76.691	9.10	8.85	-2.60	
6627.00	61.530	0.410	6273.67	-134.29	392.33	1488.54	1667231.91	14295177.21	39°21'57.273"N	80°54'18.442"W	1539.38	75.234	9.80	9.02	-4.45	
6650.00H	63.446	359.229	6284.29	-115.07	412.73	1488.47	1667231.85	14295197.60	39°21'57.474"N	80°54'18.443"W	1544.64	74.502	9.49	8.33	-5.13	Burkett: 6650' MD
6675.00	65.540	357.990	6295.06	-93.66	435.28	1487.93	1667231.30	14295220.15	39°21'57.697"N	80°54'18.450"W	1550.29	73.693	9.49	8.37	-4.06	
6722.00	68.560	357.020	6313.38	-52.33	478.52	1486.04	1667229.41	14295263.36	39°21'58.124"N	80°54'18.473"W	1561.18	72.151	6.70	6.43	-2.06	
6743.00H	69.868	356.768	6320.83	-33.53	498.12	1484.97	1667228.35	14295282.96	39°21'58.318"N	80°54'18.486"W	1566.29	71.456	6.33	6.23	-1.20	Tully: 6743' MD
6770.00	71.550	356.450	6329.75	-9.08	523.56	1483.47	1667226.84	14295308.39	39°21'58.570"N	80°54'18.505"W	1573.14	70.561	6.33	6.23	-1.18	
6817.00	75.120	353.420	6343.23	34.46	568.39	1479.48	1667222.85	14295353.20	39°21'59.013"N	80°54'18.555"W	1584.91	68.984	9.79	7.60	-6.45	
6830.00H	76.316	352.860	6346.44	46.74	580.90	1477.98	1667221.35	14295365.71	39°21'59.136"N	80°54'18.574"W	1588.04	68.543	10.10	9.20	-4.31	Marcellus POE: 6830' MD
6865.00	79.540	351.380	6353.76	80.23	614.80	1473.28	1667216.66	14295399.59	39°21'59.472"N	80°54'18.634"W	1596.41	67.349	10.10	9.21	-4.23	
6912.00	84.020	350.710	6360.48	125.91	660.74	1466.04	1667209.42	14295445.51	39°21'59.926"N	80°54'18.725"W	1608.06	65.739	9.64	9.53	-1.43	
6960.00	87.010	350.460	6364.23	172.98	707.94	1458.21	1667201.60	14295492.69	39°22'00.392"N	80°54'18.824"W	1620.98	64.104	6.25	6.23	-0.52	
7007.00	88.740	351.630	6365.97	219.11	754.33	1450.90	1667194.29	14295539.07	39°22'00.851"N	80°54'18.917"W	1635.28	62.530	4.44	3.68	2.49	
7055.00	89.570	350.420	6366.68	266.25	801.74	1443.42	1667186.80	14295586.45	39°22'01.319"N	80°54'19.012"W	1651.13	60.950	3.06	1.73	-2.52	
7150.00	88.650	348.910	6368.16	359.95	895.18	1426.38	1667169.77	14295679.86	39°22'02.243"N	80°54'19.227"W	1684.01	57.888	1.86	-0.97	-1.58	
7244.00	90.030	348.700	6369.24	452.89	987.39	1408.13	1667151.53	14295772.03	39°22'03.155"N	80°54'19.458"W	1719.81	54.962	1.48	1.47	-0.22	
7339.00	90.520	347.980	6368.78	546.94	1080.42	1388.93	1667132.34	14295865.03	39°22'04.074"N	80°54'19.702"W	1759.67	52.121	0.92	0.52	-0.76	
7434.00	90.280	342.820	6368.12	641.52	1172.32	1364.99	1667108.41	14295956.89	39°22'05.857"N	80°54'20.005"W	1799.32	49.342	5.44	-0.25	-5.43	
7529.00	89.780	334.500	6368.07	736.40	1260.73	1330.45	1667073.88	14296045.26	39°22'06.695"N	80°54'20.444"W	1832.90	46.541	8.77	-0.53	-8.76	
7624.00	89.420	331.690	6368.73	830.65	1345.44	1287.47	1667030.92	14296129.93	39°22'06.990"N	80°54'20.990"W	1862.20	43.739	2.98	-0.38	-2.96	
7719.00	88.860	328.320	6370.16	924.12	1427.69	1239.99	1666983.46	14296212.16	39°22'07.508"N	80°54'21.593"W	1891.00	40.975	3.60	-0.58	-3.55	
7813.00	90.340	329.290	6370.82	1016.25	1508.10	1191.30	1666934.79	14296292.53	39°22'08.303"N	80°54'22.212"W	1921.86	38.307	1.88	1.57	1.03	
7908.00	90.220	328.860	6370.35	1109.46	1589.60	1142.50	1666886.00	14296374.00	39°22'09.109"N	80°54'22.833"W	1957.58	35.706	0.45	-0.13	-0.43	
8003.00	90.150	334.510	6370.04	1203.37	1673.20	1097.47	1666841.00	14296457.57	39°22'09.936"N	80°54'23.405"W	2001.01	33.261	5.93	-0.07	5.93	
8098.00	89.380	340.370	6370.43	1298.21	1760.90	1061.04	1666804.58	14296545.23	39°22'10.803"N	80°54'23.868"W	2055.86	31.071	6.22	-0.81	6.17	

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# Actual Wellpath Report

Christopher Unit 1H AWP Proj: 17639'

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## REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot #09
Area	Ritchie County, WV	Christopher Unit 1H
Field	Ritchie	Christopher Unit 1H AWB
Facility	Lettie Pad	

## WELLPATH DATA (222 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 (ft/100ft)	Build Rate (ft/100ft)	Turn Rate (ft/100ft)	Comments
8193.00	90.090	344.610	6370.87	1393.12	1851.47	1032.46	1666776.02	14296635.77	39°22'11.699"N	80°54'24.230"W	2119.89	29.146	4.53	0.75	4.46	
8288.00	89.510	343.690	6371.21	1487.89	1942.86	1006.52	1666750.08	14296727.11	39°22'12.602"N	80°54'24.559"W	2188.10	27.387	1.14	-0.61	-0.97	
8382.00	91.600	345.230	6370.29	1581.62	2033.41	981.34	1666724.91	14296817.63	39°22'13.498"N	80°54'24.879"W	2257.82	25.762	2.76	2.22	1.64	
8477.00	89.570	343.700	6369.32	1676.35	2124.93	955.90	1666699.48	14296909.11	39°22'14.402"N	80°54'25.202"W	2330.03	24.221	2.68	-2.14	-1.61	
8572.00	89.540	342.920	6370.06	1771.21	2215.92	928.61	1666672.21	14297000.07	39°22'15.302"N	80°54'25.548"W	2402.63	22.737	0.82	-0.03	-0.82	
8666.00	89.450	343.070	6370.89	1865.10	2305.81	901.12	1666644.73	14297089.92	39°22'16.191"N	80°54'25.897"W	2475.64	21.346	0.19	-0.10	0.16	
8761.00	89.350	342.610	6371.89	1959.99	2396.57	873.10	1666616.71	14297180.65	39°22'17.088"N	80°54'26.252"W	2550.66	20.017	0.50	-0.11	-0.48	
8856.00	90.990	343.380	6371.60	2054.88	2487.42	845.31	1666588.94	14297271.45	39°22'17.986"N	80°54'26.605"W	2627.13	18.770	1.91	1.73	0.81	
8951.00	89.540	341.780	6371.16	2149.79	2578.05	816.88	1666560.51	14297362.05	39°22'18.882"N	80°54'26.966"W	2704.37	17.581	2.27	-1.53	-1.68	
9046.00	89.850	341.650	6371.67	2244.76	2668.25	787.07	1666530.72	14297452.22	39°22'19.774"N	80°54'27.344"W	2781.92	16.435	0.35	0.33	-0.14	
9140.00	91.260	347.620	6370.76	2338.43	2758.85	762.18	1666505.84	14297542.78	39°22'20.670"N	80°54'27.660"W	2862.19	15.444	6.53	1.50	6.35	
9235.00	89.630	344.980	6370.02	2432.89	2851.13	739.68	1666483.35	14297635.02	39°22'21.562"N	80°54'27.945"W	2945.52	14.544	3.27	-1.72	-2.78	
9330.00	89.570	341.120	6370.68	2527.75	2941.98	711.99	1666455.67	14297725.84	39°22'22.480"N	80°54'28.297"W	3026.91	13.605	4.06	-0.06	-4.06	
9425.00	90.340	341.650	6370.76	2622.73	3032.01	681.66	1666425.36	14297815.83	39°22'23.370"N	80°54'28.682"W	3107.69	12.671	0.98	0.81	0.56	
9519.00	89.780	340.770	6370.66	2716.71	3121.00	651.39	1666395.09	14297904.79	39°22'24.250"N	80°54'29.066"W	3188.25	11.789	1.11	-0.60	-0.94	
9614.00	89.660	341.810	6371.13	2811.70	3210.98	620.91	1666364.63	14297994.73	39°22'25.140"N	80°54'29.453"W	3270.46	10.944	1.10	-0.13	1.09	
9709.00	90.310	340.340	6371.15	2906.68	3300.84	590.10	1666333.83	14298084.55	39°22'26.028"N	80°54'29.844"W	3353.17	10.136	1.69	0.68	-1.55	
9804.00	89.750	339.170	6371.10	3001.68	3389.97	557.23	1666300.98	14298173.65	39°22'26.910"N	80°54'30.261"W	3435.46	9.335	1.37	-0.59	-1.23	
9898.00	89.510	338.780	6371.71	3095.65	3477.71	523.51	1666267.26	14298261.35	39°22'27.777"N	80°54'30.690"W	3516.89	8.561	0.49	-0.26	-0.41	
9993.00	91.050	342.350	6371.24	3190.63	3567.28	491.90	1666235.67	14298350.88	39°22'28.663"N	80°54'31.091"W	3601.03	7.851	4.09	1.62	3.76	
10088.00	90.430	343.820	6370.02	3285.50	3658.16	464.27	1666208.05	14298441.73	39°22'29.561"N	80°54'31.442"W	3687.50	7.233	1.68	-0.65	1.55	
10182.00	89.480	341.430	6370.09	3379.41	3747.86	436.20	1666179.99	14298531.39	39°22'30.448"N	80°54'31.798"W	3773.16	6.639	2.74	-1.01	-2.54	
10277.00	89.820	339.700	6370.67	3474.41	3837.44	404.59	1666148.40	14298620.94	39°22'31.334"N	80°54'32.199"W	3858.71	6.019	1.86	0.36	-1.82	
10372.00	89.570	338.700	6371.18	3569.39	3926.25	370.86	1666114.67	14298709.71	39°22'32.212"N	80°54'32.628"W	3943.72	5.396	1.09	-0.26	-1.05	
10467.00	89.540	339.890	6371.91	3664.37	4015.11	337.27	1666081.10	14298798.53	39°22'33.090"N	80°54'33.054"W	4029.25	4.802	1.25	-0.03	1.25	
10562.00	89.880	340.070	6372.39	3759.37	4104.37	304.75	1666048.59	14298887.76	39°22'33.973"N	80°54'33.467"W	4115.66	4.246	0.40	0.36	0.19	
10657.00	90.090	340.550	6372.42	3854.37	4193.81	272.74	1666016.60	14298977.17	39°22'34.857"N	80°54'33.874"W	4202.67	3.721	0.55	0.22	0.51	
10751.00	89.970	340.810	6372.37	3948.36	4282.52	241.64	1665985.51	14299065.84	39°22'35.734"N	80°54'34.269"W	4289.33	3.229	0.30	-0.13	0.28	
10846.00	90.030	335.790	6372.37	4043.28	4370.76	206.52	1665950.41	14299154.04	39°22'36.607"N	80°54'34.715"W	4375.63	2.705	5.28	0.06	-5.28	
10941.00	90.120	331.250	6372.25	4137.60	4455.77	164.18	1665908.08	14299239.02	39°22'37.447"N	80°54'35.253"W	4458.79	2.110	4.78	0.09	-4.78	

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# Actual Wellpath Report

Christopher Unit 1H AWP Proj: 17639  
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## REFERENCE WELLPATH IDENTIFICATION

Operator	Slot	Slot #09
ANTERO RESOURCES CORPORATION	Well	Christopher Unit 1H
Area	Wellbore	Christopher Unit 1H AWB
Field		
Facility		

## WELLPATH DATA (222 stations)

MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (ft)	Grid North (ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (ft/100ft)	Build Rate (ft/100ft)	Turn Rate (ft/100ft)	Comments
11036.00	89.630	329.710	6372.45	4231.23	4538.43	117.37	1665861.29	14299321.65	39°22'38.265"N	80°54'35.848"W	4539.95	1.481	1.70	-0.52	-1.62	
11131.00	89.970	332.830	6372.78	4325.06	4621.73	71.71	1665815.65	14299404.91	39°22'39.088"N	80°54'36.428"W	4622.28	0.889	3.30	0.36	3.28	
11226.00	89.820	338.210	6372.96	4419.70	4708.16	32.36	1665776.31	14299491.30	39°22'39.943"N	80°54'36.928"W	4709.27	0.394	5.67	-0.16	5.66	
11320.00	90.030	341.890	6373.08	4513.69	4796.50	0.29	1665744.26	14299579.61	39°22'40.817"N	80°54'37.336"W	4796.50	0.003	3.92	0.22	3.91	
11415.00	89.970	342.960	6373.08	4608.61	4877.06	-28.39	1665715.59	14299670.14	39°22'41.712"N	80°54'37.700"W	4877.15	359.667	1.13	-0.06	1.13	
11510.00	89.940	344.670	6373.16	4703.42	4978.29	-54.87	1665689.12	14299761.33	39°22'42.614"N	80°54'38.036"W	4978.60	359.368	1.80	-0.03	1.80	
11605.00	90.180	341.830	6373.06	4798.28	5069.25	-82.25	1665661.75	14299852.26	39°22'43.513"N	80°54'38.383"W	5069.92	359.070	3.00	0.25	-2.99	
11700.00	90.220	341.170	6372.73	4893.26	5159.34	-112.39	1665631.62	14299942.31	39°22'44.404"N	80°54'38.766"W	5160.57	358.752	0.70	0.04	-0.69	
11795.00	90.280	336.090	6372.31	4988.19	5247.78	-147.00	1665597.03	14300030.71	39°22'45.278"N	80°54'39.206"W	5249.84	358.395	5.35	0.06	5.35	
11889.00	90.000	332.590	6372.08	5081.68	5332.50	-187.70	1665556.35	14300115.40	39°22'46.116"N	80°54'39.723"W	5335.80	357.984	3.74	-0.30	-3.72	
11984.00	90.150	330.600	6371.96	5175.60	5416.06	-232.88	1665511.18	14300198.92	39°22'46.942"N	80°54'40.297"W	5421.06	357.538	2.10	0.16	-2.09	
12079.00	89.940	336.230	6371.88	5269.89	5500.98	-275.38	1665468.70	14300283.81	39°22'47.782"N	80°54'40.837"W	5507.87	357.134	5.93	-0.22	5.93	
12174.00	90.150	341.670	6371.81	5364.83	5589.61	-309.49	1665434.60	14300372.40	39°22'48.658"N	80°54'41.271"W	5598.17	356.831	5.73	0.22	5.73	
12269.00	90.150	343.940	6371.56	5459.73	5680.35	-337.57	1665406.53	14300463.11	39°22'49.555"N	80°54'41.627"W	5690.38	356.599	2.39	0.00	2.39	
12364.00	89.970	344.190	6371.46	5554.51	5771.70	-363.66	1665380.46	14300554.42	39°22'50.459"N	80°54'41.958"W	5783.15	356.395	0.32	-0.19	0.26	
12459.00	90.060	345.050	6371.43	5648.24	5862.34	-388.59	1665355.54	14300645.02	39°22'51.355"N	80°54'42.275"W	5875.20	356.208	0.92	0.10	0.91	
12553.00	90.090	346.880	6371.31	5742.76	5954.50	-411.62	1665332.51	14300737.14	39°22'52.266"N	80°54'42.567"W	5968.71	356.046	1.93	0.03	1.93	
12648.00	90.090	345.970	6371.16	5837.20	6046.84	-433.92	1665310.22	14300829.45	39°22'53.179"N	80°54'42.850"W	6062.39	355.895	0.96	0.00	-0.96	
12743.00	90.000	344.490	6371.09	5931.84	6138.70	-458.14	1665286.01	14300921.27	39°22'54.087"N	80°54'43.157"W	6155.77	355.732	1.56	-0.09	-1.56	
12838.00	90.030	344.790	6371.06	6026.55	6230.31	-483.31	1665260.86	14301012.84	39°22'54.992"N	80°54'43.476"W	6249.02	355.564	0.32	0.03	0.32	
12933.00	90.030	344.960	6371.01	6121.24	6322.01	-508.09	1665236.08	14301104.51	39°22'55.899"N	80°54'43.791"W	6342.40	355.405	0.18	0.00	0.18	
13028.00	90.280	343.900	6370.75	6215.99	6413.53	-533.59	1665210.59	14301195.99	39°22'56.804"N	80°54'44.114"W	6435.69	355.244	1.15	0.26	-1.12	
13123.00	90.740	341.780	6369.91	6310.88	6504.29	-561.62	1665182.57	14301286.72	39°22'57.701"N	80°54'44.470"W	6528.49	355.065	2.28	0.48	-2.23	
13217.00	89.940	339.360	6369.35	6404.87	6592.93	-592.88	1665151.32	14301375.32	39°22'58.577"N	80°54'44.867"W	6619.53	354.861	2.71	-0.85	-2.57	
13312.00	90.220	336.150	6369.22	6499.77	6680.84	-628.84	1665115.38	14301463.20	39°22'59.447"N	80°54'45.324"W	6710.37	354.623	3.39	0.29	-3.38	
13407.00	90.150	337.590	6368.91	6594.60	6768.21	-666.16	1665078.07	14301550.53	39°23'00.310"N	80°54'45.798"W	6800.91	354.379	1.52	-0.07	1.52	
13502.00	90.310	341.680	6368.53	6689.57	6857.25	-699.21	1665045.04	14301639.53	39°23'01.191"N	80°54'46.218"W	6892.80	354.178	4.31	0.17	4.31	
13596.00	90.280	341.060	6368.05	6783.55	6946.32	-729.24	1665015.02	14301728.57	39°23'02.072"N	80°54'46.600"W	6984.49	354.007	0.66	-0.03	-0.66	
13691.00	90.220	343.520	6367.63	6878.48	7036.81	-758.14	1664986.13	14301819.02	39°23'02.966"N	80°54'46.966"W	7077.53	353.851	2.59	-0.06	2.59	
13786.00	90.340	343.250	6367.17	6973.34	7127.84	-785.30	1664958.98	14301910.02	39°23'03.866"N	80°54'47.311"W	7170.97	353.713	0.31	0.13	-0.28	

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# Actual Wellpath Report

Christopher Unit 1H AWP Proj: 17639'

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## REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #09
Area	Ritchie County, WV	Well	Christopher Unit 1H
Field	Ritchie	Wellbore	Christopher Unit 1H AWB
Facility	Lettie Pad		

## WELLPATH DATA (222 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 (ft/100ft)	Build Rate (ft/100ft)	Turn Rate (ft/100ft)	Comments
13881.00	90.250	343.610	6366.68	7068.19	7218.90	-812.39	1664931.90	14302001.04	39°23'04.766"N	80°54'47.655"W	7264.46	353.579	0.39	-0.09	0.38	
13975.00	90.090	344.970	6366.40	7161.95	7309.38	-837.85	1664906.46	14302091.49	39°23'05.661"N	80°54'47.978"W	7357.25	353.461	1.46	-0.17	1.45	
14070.00	90.180	343.690	6366.18	7256.70	7400.85	-863.50	1664880.81	14302182.92	39°23'06.565"N	80°54'48.304"W	7451.05	353.345	1.35	0.09	-1.35	
14164.00	90.310	335.650	6365.77	7350.62	7488.92	-896.13	1664848.19	14302270.95	39°23'07.436"N	80°54'48.718"W	7542.35	353.176	8.55	0.14	-8.55	
14259.00	90.030	333.160	6365.49	7445.12	7574.59	-937.17	1664807.17	14302356.59	39°23'08.283"N	80°54'49.240"W	7632.35	352.947	2.64	-0.29	-2.62	
14354.00	89.970	335.830	6365.49	7539.64	7660.33	-978.07	1664766.29	14302442.29	39°23'09.131"N	80°54'49.760"W	7722.51	352.724	2.81	-0.06	2.81	
14449.00	90.000	339.030	6365.52	7634.51	7748.04	-1014.53	1664729.84	14302529.97	39°23'09.998"N	80°54'50.223"W	7814.18	352.540	3.37	0.03	3.37	
14544.00	90.120	340.490	6365.42	7729.51	7837.17	-1047.40	1664696.99	14302619.06	39°23'10.879"N	80°54'50.641"W	7906.85	352.388	1.54	0.13	1.54	
14639.00	90.180	339.940	6365.17	7824.51	7926.56	-1079.55	1664664.85	14302708.42	39°23'11.763"N	80°54'51.049"W	7999.74	352.244	0.58	0.06	-0.58	
14734.00	90.090	340.180	6364.94	7919.51	8015.87	-1111.95	1664632.46	14302797.69	39°23'12.646"N	80°54'51.461"W	8092.62	352.102	0.27	-0.09	0.25	
14829.00	90.090	339.810	6364.79	8014.51	8105.13	-1144.45	1664599.98	14302886.92	39°23'13.529"N	80°54'51.873"W	8185.53	351.963	0.39	0.00	-0.39	
14923.00	90.090	340.130	6364.65	8108.50	8193.45	-1176.65	1664567.79	14302975.20	39°23'14.402"N	80°54'52.282"W	8277.50	351.828	0.34	0.00	0.34	
15018.00	90.890	342.010	6363.83	8203.49	8283.30	-1207.46	1664536.99	14303065.01	39°23'15.290"N	80°54'52.674"W	8370.84	351.706	2.15	0.84	1.98	
15113.00	90.060	342.130	6363.05	8298.43	8373.68	-1236.71	1664507.76	14303155.36	39°23'16.184"N	80°54'53.045"W	8464.52	351.599	0.88	-0.87	0.13	
15208.00	90.800	344.990	6362.33	8393.26	8464.79	-1263.59	1664480.88	14303246.43	39°23'17.084"N	80°54'53.387"W	8558.58	351.510	3.11	0.78	3.01	
15303.00	90.550	343.990	6361.21	8487.99	8556.32	-1288.99	1664455.49	14303337.92	39°23'17.989"N	80°54'53.709"W	8652.87	351.433	1.08	-0.26	-1.05	
15398.00	90.280	343.480	6360.53	8582.81	8647.51	-1315.60	1664428.90	14303429.08	39°23'18.891"N	80°54'54.047"W	8747.02	351.350	0.61	-0.28	-0.54	
15492.00	90.520	341.470	6359.87	8676.73	8737.14	-1343.90	1664400.60	14303518.68	39°23'19.777"N	80°54'54.406"W	8839.90	351.256	2.15	0.26	-2.14	
15587.00	90.340	339.960	6359.16	8771.72	8826.81	-1375.28	1664369.24	14303608.30	39°23'20.663"N	80°54'54.805"W	8933.31	351.144	1.60	-0.19	-1.59	
15682.00	90.400	337.810	6358.54	8866.69	8915.42	-1409.50	1664335.04	14303696.88	39°23'21.540"N	80°54'55.239"W	9026.15	351.016	2.26	0.06	-2.26	
15777.00	90.430	335.230	6357.86	8961.48	9002.55	-1447.34	1664297.21	14303783.97	39°23'22.401"N	80°54'55.720"W	9118.15	350.867	2.72	0.03	-2.72	
15872.00	90.370	335.110	6357.19	9056.10	9088.76	-1487.23	1664257.33	14303870.15	39°23'23.254"N	80°54'56.228"W	9209.64	350.707	0.14	-0.06	-0.13	
15967.00	90.340	334.870	6356.60	9150.70	9174.85	-1527.40	1664217.18	14303956.21	39°23'24.105"N	80°54'56.738"W	9301.12	350.548	0.25	-0.03	-0.25	
16062.00	90.340	335.300	6356.04	9245.32	9261.01	-1567.42	1664177.18	14304042.33	39°23'24.957"N	80°54'57.247"W	9392.72	350.394	0.45	0.00	0.45	
16157.00	90.310	333.980	6355.50	9339.86	9346.85	-1608.11	1664136.51	14304128.14	39°23'25.806"N	80°54'57.764"W	9484.18	350.238	1.39	-0.03	-1.39	
16252.00	90.280	334.060	6354.94	9434.31	9432.25	-1649.72	1664094.91	14304213.50	39°23'26.650"N	80°54'58.293"W	9575.43	350.079	0.11	0.06	0.08	
16347.00	90.280	337.190	6354.40	9527.99	9517.86	-1688.51	1664056.14	14304299.08	39°23'27.496"N	80°54'58.786"W	9666.47	349.940	3.33	-0.10	3.33	
16441.00	90.340	340.280	6353.89	9622.94	9606.38	-1722.96	1664021.70	14304387.56	39°23'28.372"N	80°54'59.224"W	9759.67	349.832	3.25	0.06	3.25	
16536.00	90.400	341.070	6353.28	9717.94	9696.03	-1754.40	1663990.28	14304477.17	39°23'29.258"N	80°54'59.623"W	9853.47	349.744	0.83	0.06	0.83	
16631.00	90.340	341.620	6352.66	9812.92	9786.03	-1784.78	1663959.90	14304567.14	39°23'30.148"N	80°55'00.009"W	9947.46	349.664	0.58	-0.06	0.58	

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# Actual Wellpath Report

Christopher Unit 1H AWP Proj: 17639  
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REFERENCE WELLPATH IDENTIFICATION	
Operator	ANTERO RESOURCES CORPORATION
Area	Ritchie County, WV
Field	Ritchie
Facility	Lettie Pad
Slot #09	Christopher Unit 1H
Well	Christopher Unit 1H AWB
Wellbore	Christopher Unit 1H AWB

WELLPATH DATA (222 stations)																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (ft)	Grid North (ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (F/100ft)	Build Rate (F/100ft)	Turn Rate (F/100ft)	Comments
16726.00	90.370	343.100	6352.07	9907.85	9876.56	-1813.57	1663931.13	14304657.63	39°23'31.043"N	80°55'00.375"W	10041.69	349.595	1.56	0.03	0.03	1.56
16821.00	90.280	342.450	6351.54	10002.75	9967.30	-1841.70	1663903.01	14304748.33	39°23'31.940"N	80°55'00.732"W	10136.02	349.531	0.69	-0.09	-0.09	-0.68
16915.00	90.220	342.540	6351.12	10096.68	10056.94	-1869.98	1663874.74	14304837.94	39°23'32.826"N	80°55'01.091"W	10229.32	349.467	0.12	-0.06	0.10	0.10
17010.00	90.220	339.900	6350.76	10191.65	10146.88	-1900.56	1663844.17	14304927.84	39°23'33.715"N	80°55'01.479"W	10323.33	349.391	2.78	0.00	0.00	-2.78
17105.00	90.180	337.890	6350.43	10286.62	10238.50	-1934.76	1663809.98	14305016.43	39°23'34.591"N	80°55'01.914"W	10416.75	349.296	2.12	-0.04	-0.04	-2.12
17200.00	90.310	335.560	6350.02	10381.44	10322.76	-1972.30	1663772.46	14305103.66	39°23'35.454"N	80°55'02.391"W	10509.49	349.183	2.46	0.14	0.14	-2.45
17294.00	90.340	333.850	6349.49	10475.00	10407.74	-2012.46	1663732.32	14305188.61	39°23'36.295"N	80°55'02.902"W	10600.53	349.056	1.82	0.03	0.03	-1.82
17389.00	90.280	337.800	6348.97	10569.70	10494.39	-2051.36	1663693.43	14305275.22	39°23'37.151"N	80°55'03.396"W	10693.01	348.940	4.16	-0.06	0.16	4.16
17484.00	90.310	339.750	6348.49	10664.66	10582.95	-2085.75	1663659.06	14305363.74	39°23'38.027"N	80°55'03.833"W	10786.52	348.851	2.05	0.03	0.03	2.05
17579.00	90.370	342.140	6347.92	10759.64	10672.73	-2116.76	1663628.06	14305453.49	39°23'38.915"N	80°55'04.227"W	10880.62	348.782	2.52	0.06	0.06	2.52
17615.00	90.340	342.550	6347.70	10795.62	10707.04	-2127.68	1663617.14	14305487.78	39°23'39.254"N	80°55'04.366"W	10916.39	348.761	1.14	-0.08	1.14	1.14
17639.00	90.340	342.550	6347.56	10819.60	10729.93	-2134.87	1663609.95	14305510.66	39°23'39.480"N	80°55'04.457"W	10940.25	348.747	0.00	0.00	0.00	Projected MD at TD: 17639'

HOLE & CASING SECTIONS - Ref Wellbore: Christopher Unit 1H AWB Ref Wellpath: Christopher Unit 1H AWP Proj: 17639'												
String/Diameter	Start MD (ft)	End MD (ft)	Interval (ft)	Start TVD (ft)	End TVD (ft)	Start N/S (ft)	End N/S (ft)	Start E/W (ft)	End E/W (ft)	End N/S (ft)	End E/W (ft)	End E/W (ft)
20in Conductor	25.50	105.50	80.00	25.50	105.49	0.00	0.33	0.00	0.33	0.33	0.33	-0.85
17.5in Open Hole	105.50	515.50	410.00	105.49	515.47	0.33	-1.78	-0.85	-1.78	-1.78	-1.78	-4.20
13.375in Casing Surface	25.50	515.50	490.00	25.50	515.47	0.00	-1.78	0.00	-1.78	-1.78	-1.78	-4.20
12.25in Open Hole	515.50	2661.50	2146.00	515.47	2602.28	-1.78	-8.23	-4.20	-8.23	-8.23	-8.23	451.95
9.625in Casing Intermediate	25.50	2661.50	2636.00	25.50	2602.28	0.00	-8.23	0.00	-8.23	-8.23	-8.23	451.95
8.75in Open Hole	2661.50	6185.50	3524.00	2602.28	5957.04	-8.23	95.11	451.95	95.11	95.11	95.11	1459.88
8.5in Open Hole	6185.50	17639.00	11453.50	5957.04	6347.56	95.11	10729.93	1459.88	10729.93	10729.93	10729.93	-2134.87
5.5in Casing Production	25.50	17639.00	17613.50	25.50	6347.56	0.00	10729.93	0.00	10729.93	10729.93	10729.93	-2134.87

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# Actual Wellpath Report

Christopher Unit 1H AWP Proj: 17639'

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### REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot #09
Area	Ritchie County, WV	Christopher Unit 1H
Field	Ritchie	Christopher Unit 1H AWB
Facility	Lettie Pad	

### TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Christopher Unit 1H BHL Rev-2	6370.00	10760.50	-2120.78	1663624.04	14305541.22	39°23'39.782"N	80°55'04.277"W	point
Christopher Unit 1H POE Rev-3	6370.00	740.32	1445.28	1667188.67	14295525.06	39°22'00.712"N	80°54'18.989"W	point

### WELLPATH COMPOSITION - Ref Wellbore: Christopher Unit 1H AWB Ref Wellpath: Christopher Unit 1H AWP Proj: 17639'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
25.50	496.50	Gyrodata standard - Drop gyro or Multi-shot	01 Gyrodata MS Gyro <17-112>-(25-486)	Christopher Unit 1H AWB
496.50	2579.50	ISCWSA MWD, Rev. 4 (Standard)	02 WFT EM <12-1/4>-(486)(620-2569)	Christopher Unit 1H AWB
2579.50	6111.50	ISCWSA MWD, Rev. 4 (Standard)	03 WFT EM <8-3/4>-(2569)(2712-6101)	Christopher Unit 1H AWB
6111.50	17615.00	BHI AutoTrak Curve (Short)	04 BH AT Curve <8-1/2>-(6111.5)(6160-17615)	Christopher Unit 1H AWB
17615.00	17639.00	Blind Drilling (std)	Projection to bit	Christopher Unit 1H AWB

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Christopher Unit 1H AWP Proj: 17639'  
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #09
Area	Ritchie County, WV	Well	Christopher Unit 1H
Field	Ritchie	Wellbore	Christopher Unit 1H AWB
Facility	Lettie Pad		

COMMENTS
<p><b>Wellpath general comments</b>            API: 47-085-10357-0000            BHI Job #: 109575164            Rig: H&amp;P 317            Duration: 01/02/2019-01/05/2019            Gyrodata MS Gyro &lt;17-1/2"&gt;(25'-486')            WFT EM &lt;12-1/4"&gt;(486')(620'-2569')            WFT EM &lt;8-3/4"&gt;(2569')(2712'-6101')            BH AT Curve &lt;8-1/2"&gt;(6111.5')(6160'-17615')            Middlesex: 6473' MD            Burkett: 6650' MD            Tully: 6743' MD            Marcellus POE: 6830' MD            Projected MD at TD: 17639'</p>

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