



ANTERO RESOURCES CORPORATION

Location: Ritchie County, WV
Field: Ritchie
Facility: Cashew Pad

Slot: Slot J
Well: Twig Unit 2H
Wellbore: Twig Unit 2H PWB



True vertical depth is Twig Unit 2H PWB Rev-B.0
True vertical depth is referenced to H&P 519 (RFB)
Reference wellbore measured depths are referenced to H&P 519 (RFB)
H&P 519 (RFB) to Mean Sea Level: 540 feet
Mean Sea Level to Ground level (A Slot: Slot J): -1019 feet
Depth is in feet
Chadwellen MDs are referenced to each well's defined MD datum
Created by: cadwagner on 2023-11-21; Database: WVA_WPL_EASTERNAS_DASH

Location Information

Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Cashew Pad	1880970.880	14224970.270	39°10'16.9800"N	80°51'28.6900"W
Slot	Local N (ft)	Grid East (US ft)	Latitude	Longitude
Slot J	314.81	1880774.300	39°10'20.0900"N	80°51'27.3800"W

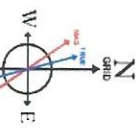
Comment: Twig Unit 2H
H&P 519 (RFB) to Ground level (A Slot: Slot J)
Mean Sea Level to Ground level (A Slot: Slot J)
H&P 519 (RFB) to Mean Sea Level

Well Profile Data

Design Comment	MD (ft)	Inc (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
The On	2835.00	15.570	104.010	2760.14	-166.06	555.11	0.29
Proj. to Bottom	2915.00	15.570	104.010	2837.21	-161.26	575.56	0.00
Drill O.A.	2995.00	15.570	104.010	2914.27	-166.45	596.78	0.00
End of 3D Arc	3043.32	14.807	106.274	2960.90	-169.75	609.00	2.00
Curve KOP	6772.05	14.807	106.274	5899.02	-263.17	1278.42	0.00
Build/oval M-SG	6231.17	30.000	0.000	6034.79	-263.32	1336.75	8.00
POE	6839.60	75.762	337.374	6395.00	-188.47	1215.66	8.00
Landing Pt.	7017.58	90.000	337.374	6417.00	-351.06	1148.19	8.00
BHL	20987.50	90.000	337.374	6417.00	-13227.31	-4218.60	0.00

Well Data

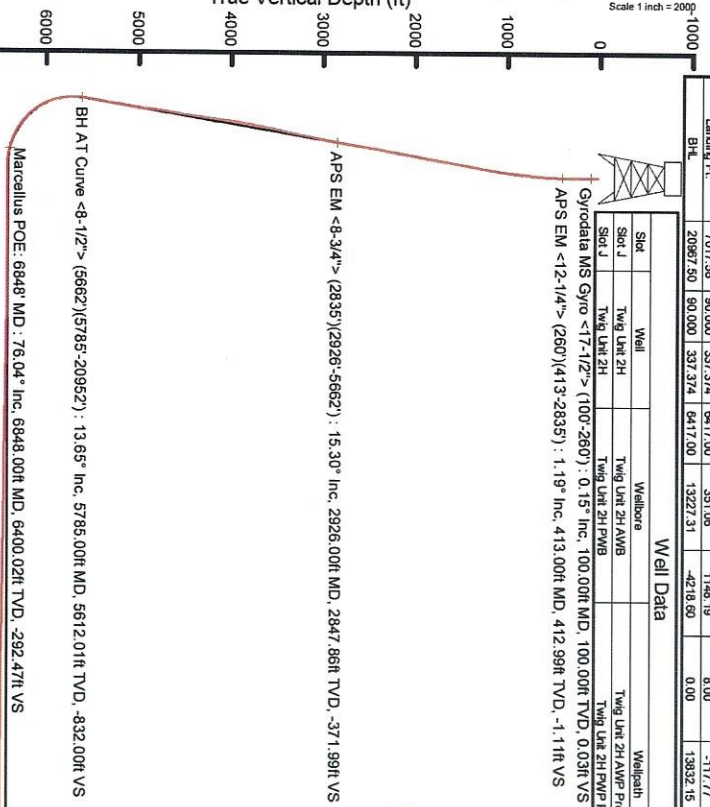
Slot	Well	Wellbore	Wellpath
Slot J	Twig Unit 2H	Twig Unit 2H AVB	Twig Unit 2H AVP Proj. 20977
Slot J	Twig Unit 2H	Twig Unit 2H PWB	Twig Unit 2H PWB Rev-B.0



User specified (HDCM) Dip: 55.73° Field: 51277 ft
Magnetic North is 7.44 degrees West of True North (at 10152023)
To correct azimuth from Magnetic to Grid subtract 7.53 degrees

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API: 47-085-10499-0000
BH Job #: 111949023
Rig: H&P 519
Duration: 10/19/2023-10/23/2023



Projected MD at TD: 20977: 90.18° Inc, 20977.00ft MD, 6513.16ft TVD, 13833.37ft VS

Vertical Section (ft)
Azimuth 337.37° with reference 0.00 N, 0.00 E

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Well	Twig Unit 2H
Field	Ritche	API	47-085-10499-0000
Facility	Cashew Pad	Wellbore	Twig Unit 2H AWB
Slot	Slot J		

REPORT SETUP INFORMATION			
Projection System	NAD27 / UTM Zone 17 North, US feet	Software System	WellArchitect® 6.0
North Reference	Grid	User	Edsaryar
Scale	0.999602	Report Generated	11/21/2023 at 12:39:17 PM
Convergence at slot	0.09° East	Database	WA_MPL_EASTERNUS_Defn

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North(ft)	East(ft)	Easting(US ft)	Northing(US ft)	Latitude	Longitude
Slot Location	314.81	103.46	1680774.30	14224684.95	39°10'20.0900"N	80°51'27.3600"W
Facility Reference Pt			1680670.88	14224370.27	39°10'16.9800"N	80°51'28.6800"W
Field Reference Pt			0.00	0.00	0°00'0.0000"	85°29'19.3013"W

WELLPATH DATUM			
Calculation method	Minimum curvature	H&P 519 (RKB) to Facility Vertical Datum	1049.00ft
Horizontal Reference Pt	Slot	H&P 519 (RKB) to Mean Sea Level	1049.00ft
Vertical Reference Pt	H&P 519 (RKB)	H&P 519 (RKB) to Ground Level at Slot (Slot J)	30.00ft
MD Reference Pt	H&P 519 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	337.37°

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REFERENCE WELLPATH IDENTIFICATION		Well	Twig Unit 2H
Operator	ANTERO RESOURCES CORPORATION	API	47-085-10499-0000
Field	Ritchie	Wellbore	Twig Unit 2H AWB
Facility	Cashew Pad		
Slot	Slot J		

WELLPATH DATA (230 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 (°/100ft)	Comments
0.00†	0.000	267.410	0.00	0.00	0.00	0.00	1680774.30	14224684.95	39°10'20.0900"N	80°51'27.3600"W	0.00	0.000	0.00	0.00	0.00	
30.00	0.000	267.410	30.00	0.00	0.00	0.00	1680774.30	14224684.95	39°10'20.0900"N	80°51'27.3600"W	0.00	0.000	0.00	0.00	0.00	
100.00	0.150	267.410	100.00	0.03	0.00	-0.09	1680774.21	14224684.95	39°10'20.0899"N	80°51'27.3612"W	0.09	267.410	0.21	0.21	0.00	Gyrodala MS Gyro <17-12"> (100'-260')
200.00	0.060	189.570	200.00	0.03	-0.06	-0.23	1680774.07	14224684.89	39°10'20.0894"N	80°51'27.3630"W	0.24	255.049	0.15	-0.09	-77.84	
260.00	0.200	127.450	260.00	-0.09	-0.16	-0.15	1680774.15	14224684.79	39°10'20.0884"N	80°51'27.3620"W	0.22	224.399	0.30	0.23	-103.53	
413.00	1.190	97.430	412.99	-1.11	-0.52	1.63	1680775.93	14224684.43	39°10'20.0848"N	80°51'27.3393"W	1.72	107.782	0.67	0.65	-19.62	APS EM <12-14"> (260')(413'-2835)
593.00	6.240	100.010	592.55	-7.33	-2.47	13.13	1680787.42	14224682.48	39°10'20.0654"N	80°51'27.1934"W	13.36	100.644	2.81	2.81	1.43	
682.00	8.290	107.050	680.83	-14.04	-5.19	24.03	1680796.32	14224679.76	39°10'20.0383"N	80°51'27.0551"W	24.58	102.188	2.51	2.30	7.91	
772.00	9.510	107.220	769.75	-22.94	-9.29	37.33	1680811.62	14224675.66	39°10'19.9975"N	80°51'26.8862"W	38.47	103.979	1.36	1.36	0.19	
862.00	9.720	107.450	858.48	-32.60	-13.77	51.68	1680825.96	14224671.18	39°10'19.9530"N	80°51'26.7041"W	53.49	104.922	0.24	0.23	0.26	
951.00	11.180	105.900	946.00	-42.81	-18.39	67.15	1680841.42	14224666.57	39°10'19.9072"N	80°51'26.5078"W	69.62	105.316	1.67	1.64	-1.74	
1041.00	13.390	103.440	1033.94	-54.38	-23.20	85.68	1680859.94	14224661.76	39°10'19.8593"N	80°51'25.9905"W	88.76	105.153	2.52	2.46	-2.73	
1136.00	14.750	107.610	1126.09	-68.67	-29.42	107.91	1680882.16	14224655.54	39°10'19.7975"N	80°51'25.9905"W	111.84	105.250	1.78	1.43	4.36	
1230.00	15.090	109.880	1216.92	-84.67	-37.20	130.82	1680905.07	14224647.76	39°10'19.7202"N	80°51'25.6998"W	136.00	105.874	0.72	0.36	2.41	
1324.00	15.220	108.210	1307.65	-101.01	-45.22	154.04	1680928.28	14224639.75	39°10'19.6406"N	80°51'25.4050"W	160.54	106.604	0.48	0.14	-1.78	
1419.00	15.560	106.630	1399.25	-117.48	-53.08	178.00	1680952.23	14224631.89	39°10'19.5626"N	80°51'25.1010"W	185.74	106.604	0.36	0.36	-0.08	
1513.00	15.760	106.630	1489.76	-133.79	-60.65	202.21	1680976.43	14224624.32	39°10'19.4873"N	80°51'24.7937"W	211.11	106.697	0.48	0.21	-1.60	
1607.00	16.070	105.140	1580.15	-149.84	-67.71	227.00	1681001.21	14224617.27	39°10'19.4172"N	80°51'24.4791"W	236.89	106.608	0.55	0.33	-1.59	
1702.00	16.130	103.330	1671.43	-165.64	-74.18	252.54	1681026.74	14224610.80	39°10'19.3528"N	80°51'24.1550"W	263.21	106.370	0.53	0.06	-1.91	
1796.00	15.630	107.170	1761.84	-181.42	-80.93	277.34	1681051.53	14224604.05	39°10'19.2857"N	80°51'23.8402"W	288.91	106.268	1.24	-0.53	4.06	
1891.00	15.640	107.510	1853.33	-197.86	-88.56	301.78	1681075.96	14224596.42	39°10'19.2099"N	80°51'23.5300"W	314.51	106.355	0.10	0.01	0.36	
1985.00	15.990	106.970	1943.77	-214.28	-96.15	326.25	1681100.42	14224588.83	39°10'19.1345"N	80°51'23.2195"W	340.12	106.422	0.40	0.37	-0.57	
2080.00	16.170	107.010	2035.05	-231.06	-103.84	351.41	1681125.57	14224581.15	39°10'19.0581"N	80°51'22.9001"W	366.43	106.462	0.19	0.19	0.04	
2174.00	16.370	105.380	2125.29	-247.57	-111.19	376.70	1681150.85	14224573.81	39°10'18.9851"N	80°51'22.5792"W	392.77	106.444	0.53	0.21	-1.73	
2269.00	16.580	104.570	2216.39	-264.01	-118.15	402.73	1681176.87	14224566.85	39°10'18.9159"N	80°51'22.2489"W	419.70	106.235	0.33	0.22	-0.85	
2363.00	16.690	104.330	2306.45	-280.24	-124.86	428.79	1681202.91	14224550.14	39°10'18.8492"N	80°51'21.9181"W	446.60	106.235	0.14	0.12	-0.26	
2458.00	16.920	103.740	2397.40	-296.63	-131.52	455.43	1681229.55	14224533.48	39°10'18.7829"N	80°51'21.5799"W	474.04	106.108	0.30	0.24	-0.62	
2552.00	15.570	103.170	2487.64	-312.13	-137.64	481.00	1681255.11	14224517.36	39°10'18.7220"N	80°51'21.2554"W	500.31	105.969	1.45	-1.44	-0.61	
2646.00	15.800	105.260	2578.14	-327.37	-143.89	505.63	1681279.73	14224501.12	39°10'18.6599"N	80°51'20.9428"W	525.71	105.885	0.65	0.24	2.22	
2741.00	15.600	102.990	2669.60	-342.75	-150.16	530.56	1681304.65	14224484.85	39°10'18.5975"N	80°51'20.6264"W	551.40	105.803	0.68	-0.21	-2.39	

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Well	Twig Unit 2H
Field	Ritche	API	47-085-10499-0000
Facility	Cashew Pad	Wellbore	Twig Unit 2H AWB
Slot	Slot J		

WELLPATH DATA (230 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)	Comments
2835.00	15.570	104.010	2760.14	-357.64	-156.60	555.11	1681329.19	14224528.96	39°10'18.5388"N	80°51'20.3147"W	576.63	105.702	0.29	-0.03	1.09	
2926.00	15.300	103.400	2847.86	-371.99	-161.80	578.64	1681352.71	14224523.22	39°10'18.4817"N	80°51'20.0161"W	600.84	105.622	0.35	-0.30	-0.67	APS EM <8.3/4"> (2835)(2926-5662)
3021.00	15.990	108.240	2939.35	-387.92	-168.80	603.27	1681377.32	14224516.22	39°10'18.4122"N	80°51'19.7036"W	626.44	105.632	1.55	0.73	5.09	
3115.00	15.830	115.870	3029.75	-406.00	-178.44	627.10	1681401.15	14224506.58	39°10'18.3164"N	80°51'19.4012"W	652.00	105.884	2.23	-0.17	8.12	
3210.00	15.310	113.000	3121.27	-424.67	-189.00	650.30	1681424.34	14224496.03	39°10'18.2117"N	80°51'19.1068"W	677.21	106.205	0.98	-0.55	-3.02	
3304.00	14.650	110.050	3212.08	-441.60	-197.92	672.90	1681446.93	14224487.11	39°10'18.1232"N	80°51'18.8201"W	701.40	106.391	1.07	-0.70	-3.14	
3398.00	15.570	115.490	3302.83	-459.01	-207.43	695.45	1681469.47	14224477.60	39°10'18.0289"N	80°51'18.5339"W	725.73	106.608	1.80	0.98	5.79	
3492.00	17.680	116.640	3392.92	-479.21	-219.22	719.53	1681493.54	14224465.81	39°10'17.9119"N	80°51'18.2284"W	752.19	106.945	2.17	2.14	1.22	
3587.00	16.740	113.550	3483.69	-499.95	-231.12	744.90	1681518.90	14224453.92	39°10'17.7939"N	80°51'17.9066"W	779.93	107.238	1.30	-0.88	-3.25	
3681.00	16.050	112.200	3573.87	-518.88	-241.44	769.34	1681543.33	14224443.60	39°10'17.6915"N	80°51'17.5964"W	806.33	107.423	0.84	-0.73	-1.44	
3775.00	14.420	107.260	3664.57	-535.55	-249.83	792.55	1681566.53	14224435.22	39°10'17.6083"N	80°51'17.3019"W	830.99	107.496	2.22	-1.73	-5.26	
3870.00	16.050	106.180	3756.22	-551.37	-257.00	816.46	1681590.43	14224428.06	39°10'17.5370"N	80°51'16.9984"W	855.95	107.472	1.74	1.72	-1.14	
3963.00	17.430	104.370	3845.28	-567.81	-264.04	842.30	1681616.26	14224421.02	39°10'17.4671"N	80°51'16.6705"W	882.71	107.405	1.59	1.48	-1.95	
4058.00	16.150	100.450	3936.23	-583.58	-269.96	869.08	1681643.03	14224415.09	39°10'17.4080"N	80°51'16.3306"W	910.04	107.256	1.80	-1.35	-4.13	
4152.00	14.010	94.880	4027.00	-595.97	-273.30	893.28	1681667.22	14224411.76	39°10'17.3746"N	80°51'16.0234"W	934.15	107.012	2.75	-2.28	-5.93	
4246.00	12.920	100.990	4118.41	-607.05	-276.27	914.93	1681688.86	14224408.79	39°10'17.3449"N	80°51'15.7485"W	955.73	106.802	1.91	-1.16	6.50	
4340.00	12.710	101.210	4210.07	-618.63	-280.29	935.39	1681709.32	14224404.77	39°10'17.3049"N	80°51'15.4888"W	976.48	106.681	0.23	-0.22	0.23	
4435.00	12.750	104.640	4302.74	-630.79	-284.97	955.78	1681729.70	14224400.09	39°10'17.2583"N	80°51'15.2300"W	997.36	106.602	0.80	0.04	3.61	
4529.00	12.350	106.980	4394.49	-643.49	-290.53	975.44	1681749.34	14224394.54	39°10'17.2031"N	80°51'14.9806"W	1017.78	106.566	0.69	-0.43	2.49	
4623.00	13.530	103.620	4486.11	-656.40	-296.05	995.74	1681769.64	14224389.02	39°10'17.1482"N	80°51'14.7229"W	1038.82	106.558	1.49	1.26	-3.57	
4718.00	15.670	106.840	4578.04	-671.13	-302.39	1018.82	1681792.71	14224382.68	39°10'17.0852"N	80°51'14.4300"W	1067.75	106.531	2.41	2.25	3.39	
4812.00	15.170	106.550	4668.65	-686.97	-309.57	1042.76	1681816.64	14224375.51	39°10'17.0138"N	80°51'14.1261"W	1087.74	106.535	0.54	-0.53	-0.31	
4906.00	12.610	103.410	4759.90	-700.77	-315.45	1064.53	1681838.41	14224369.62	39°10'16.9553"N	80°51'13.8498"W	1110.29	106.506	2.84	-2.72	-3.34	
5001.00	11.240	98.210	4852.85	-711.62	-319.18	1083.79	1681857.65	14224365.90	39°10'16.9182"N	80°51'13.6054"W	1129.81	106.410	1.83	-1.44	-5.47	
5095.00	11.330	96.240	4945.03	-720.78	-321.49	1102.32	1681875.89	14224363.55	39°10'16.8950"N	80°51'13.3738"W	1147.97	106.283	0.42	0.10	-2.10	
5189.00	14.210	105.770	5036.70	-732.41	-325.63	1122.32	1681896.17	14224359.45	39°10'16.8538"N	80°51'13.1633"W	1168.61	106.180	3.79	3.06	10.14	
5284.00	14.140	110.720	5128.82	-747.62	-332.91	1144.40	1681918.24	14224352.18	39°10'16.7815"N	80°51'12.8361"W	1191.84	106.220	1.28	-0.07	5.21	
5378.00	14.050	108.130	5219.99	-762.95	-340.52	1165.98	1681939.81	14224344.57	39°10'16.7059"N	80°51'12.5622"W	1214.69	106.280	0.68	-0.10	-2.76	
5473.00	17.440	110.060	5311.41	-780.13	-348.99	1180.32	1681964.14	14224336.10	39°10'16.6218"N	80°51'12.2534"W	1240.43	106.341	3.61	3.57	2.03	
5567.00	17.480	108.320	5401.08	-798.94	-358.26	1216.95	1681990.77	14224326.83	39°10'16.5298"N	80°51'11.9154"W	1269.59	106.404	0.56	0.04	-1.85	

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REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Well	Twig Unit 2H
Field	Ritchie	API	47-085-10499-0000
Facility	Cashew Pad	Wellbore	Twig Unit 2H AWB
Slot	Slot J		

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5662.00	13.890	106.540	5492.53	-815.50	-366.00	1241.44	1682015.24	14224319.10	39°10'16.4629"N	80°51'11.6047"W	1294.26	106.426	3.81	-3.78	-1.87		
5785.00	13.650	97.010	5612.01	-832.00	-371.97	1270.00	1682043.79	14224315.13	39°10'16.3834"N	80°51'11.2421"W	1323.35	106.325	1.85	-0.20	-7.75	BH AT Curve <-8 1/2"> (5662)(5785-20952)	
5879.00	14.320	68.850	5703.33	-837.79	-369.13	1291.87	1682065.66	14224315.97	39°10'16.4212"N	80°51'10.9643"W	1343.57	105.946	7.20	0.71	-29.96		
5973.00	14.590	40.870	5794.46	-832.80	-355.96	1310.48	1682084.26	14224329.13	39°10'16.5510"N	80°51'10.7227"W	1357.97	105.196	7.37	0.29	-29.77		
6068.00	19.580	21.580	5885.31	-816.03	-332.08	1324.19	1682097.96	14224353.00	39°10'16.7668"N	80°51'10.5533"W	1365.19	104.078	7.88	5.25	-20.31		
6162.00	24.120	8.760	5972.59	-788.32	-298.41	1332.92	1682106.68	14224386.66	39°10'17.1194"N	80°51'10.4417"W	1365.91	102.619	6.98	4.83	-13.64		
6237.00†	29.926	2.049	6039.38	-758.20	-264.53	1335.92	1682109.69	14224420.52	39°10'17.4543"N	80°51'10.4029"W	1361.86	101.201	8.73	7.74	-8.95	Sycamore: 6237' MD	
6257.00	31.520	0.650	6056.58	-748.87	-254.32	1336.16	1682109.93	14224430.73	39°10'17.5552"N	80°51'10.3997"W	1360.15	100.777	8.73	7.97	-6.99		
6351.00	37.730	352.780	6133.93	-698.49	-201.14	1332.82	1682106.59	14224483.89	39°10'18.0809"N	80°51'10.4410"W	1347.91	98.582	8.13	6.61	-8.37		
6446.00	45.020	346.920	6205.20	-637.23	-139.47	1321.54	1682095.31	14224545.54	39°10'18.6906"N	80°51'10.5829"W	1328.88	96.024	8.68	7.67	-6.17		
6465.00†	46.265	346.458	6218.48	-623.83	-126.25	1318.41	1682092.19	14224558.75	39°10'18.8213"N	80°51'10.6223"W	1324.45	95.470	8.78	6.55	-2.43	Middlesex: 6465' MD	
6508.00	49.090	345.480	6247.43	-592.39	-95.41	1310.70	1682084.48	14224589.58	39°10'19.1263"N	80°51'10.7196"W	1314.17	94.163	8.78	6.57	-2.27		
6540.00	52.760	344.540	6267.60	-567.78	-71.42	1304.27	1682078.05	14224613.56	39°10'19.3635"N	80°51'10.8008"W	1306.23	93.134	11.69	11.47	-2.94		
6635.00	61.190	342.570	6319.33	-488.66	4.88	1281.68	1682055.47	14224669.83	39°10'20.1180"N	80°51'11.0860"W	1281.69	89.782	9.04	8.87	-2.07		
6658.00†	62.304	341.891	6330.22	-468.47	24.17	1275.50	1682049.29	14224709.11	39°10'20.3088"N	80°51'11.1642"W	1275.73	88.914	5.50	4.84	-2.95	Burkett: 6658' MD	
6730.00	65.810	339.850	6361.71	-403.86	85.32	1254.27	1682028.07	14224770.24	39°10'20.9135"N	80°51'11.4324"W	1257.17	86.108	5.50	4.87	-2.83		
6761.00†	68.566	339.368	6373.73	-375.31	112.11	1244.31	1682018.12	14224797.01	39°10'21.1784"N	80°51'11.5583"W	1249.35	84.852	9.00	8.89	-1.56	Tully: 6761' MD	
6824.00	74.170	338.440	6393.85	-315.66	167.78	1222.83	1681996.64	14224852.66	39°10'21.7290"N	80°51'11.8300"W	1234.28	82.188	9.00	8.90	-1.47		
6848.00†	76.041	338.244	6400.02	-292.47	189.33	1214.27	1681988.08	14224874.21	39°10'21.9422"N	80°51'11.9382"W	1228.94	81.138	7.84	7.80	-0.82	Marcellus POE: 6848' MD	
6918.00	81.500	337.690	6413.65	-223.84	252.95	1188.52	1681962.34	14224937.80	39°10'22.5714"N	80°51'12.2639"W	1215.14	77.985	7.84	7.80	-0.79		
7012.00	90.250	337.410	6420.40	-130.17	339.52	1152.75	1681928.59	14225024.33	39°10'23.4276"N	80°51'12.7163"W	1201.71	73.589	9.31	9.31	-0.30		
7107.00	90.060	337.390	6420.14	-35.18	427.22	1116.24	1681890.09	14225118.00	39°10'24.2950"N	80°51'13.1780"W	1195.20	69.056	9.20	-0.20	-0.02		
7201.00	90.250	337.410	6419.89	58.82	514.00	1080.12	1681853.98	14225198.75	39°10'25.1533"N	80°51'13.6350"W	1196.18	64.551	0.20	0.20	0.02		
7296.00	89.850	337.270	6419.81	153.82	601.67	1043.52	1681817.40	14225286.38	39°10'26.0204"N	80°51'14.0979"W	1204.55	60.033	0.45	-0.42	-0.15		
7391.00	90.220	337.070	6419.75	248.82	689.23	1006.66	1681780.55	14225373.90	39°10'26.8864"N	80°51'14.5641"W	1220.00	55.602	0.44	0.39	-0.21		
7485.00	89.970	337.450	6419.59	342.82	775.92	970.32	1681744.23	14225460.56	39°10'27.7439"N	80°51'15.0237"W	1242.41	51.352	0.48	-0.27	0.40		
7579.00	88.850	336.860	6419.74	436.82	862.55	933.83	1681707.75	14225547.15	39°10'28.6006"N	80°51'15.4854"W	1271.23	47.272	0.54	-0.13	-0.63		
7674.00	90.000	337.350	6419.87	531.82	950.06	896.87	1681670.81	14225634.63	39°10'29.4662"N	80°51'15.9529"W	1306.52	43.350	0.54	0.16	0.52		
7769.00	89.910	337.320	6419.94	626.82	1037.73	860.26	1681634.22	14225722.26	39°10'30.3333"N	80°51'16.4159"W	1347.93	39.658	0.10	-0.09	-0.03		
7863.00	89.940	337.020	6420.06	720.82	1124.36	823.79	1681597.76	14225808.86	39°10'31.1901"N	80°51'16.8737"W	1393.85	36.229	0.32	0.03	-0.32		

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Well	Twig Unit 2H
Field	Ritche	API	47-085-10499-0000
Facility	Cashew Pad	Wellbore	Twig Unit 2H AWB
Slot	Slot J		

WELLPATH DATA (230 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]	Comments
7958.00	90.220	337.380	6419.93	815.82	1211.94	786.98	1681560.96	14225986.40	39°10'32.0563"N	80°51'17.3429"W	1445.03	32.998	0.48	0.29	0.38	
8052.00	89.290	337.730	6420.33	909.82	1298.82	751.09	1681525.09	14225983.25	39°10'32.9156"N	80°51'17.7969"W	1500.35	30.040	1.06	-0.99	0.37	
8147.00	89.570	337.680	6421.28	1004.81	1386.71	715.05	1681489.06	14226071.10	39°10'33.7849"N	80°51'18.2527"W	1560.21	27.278	0.30	0.29	-0.05	
8241.00	88.920	336.910	6422.52	1098.80	1473.42	678.77	1681452.80	14226157.78	39°10'34.6424"N	80°51'18.7165"W	1622.25	24.734	1.07	-0.69	-0.82	
8336.00	89.880	336.660	6423.51	1193.79	1560.72	641.32	1681415.37	14226245.04	39°10'35.5056"N	80°51'19.1853"W	1687.35	22.339	1.04	1.01	-0.26	
8431.00	89.910	337.180	6423.69	1288.79	1648.11	604.08	1681378.14	14226332.40	39°10'36.3703"N	80°51'19.6565"W	1755.33	20.129	0.55	0.03	0.55	
8526.00	89.540	337.170	6424.14	1383.78	1735.67	567.23	1681341.30	14226419.93	39°10'37.2363"N	80°51'20.1226"W	1826.01	18.098	0.39	-0.39	-0.01	
8620.00	89.510	337.470	6424.92	1477.78	1822.40	530.99	1681305.08	14226506.62	39°10'38.0941"N	80°51'20.5811"W	1898.18	16.244	0.32	-0.03	0.32	
8714.00	89.630	337.590	6425.63	1571.78	1909.26	495.06	1681269.16	14226593.45	39°10'38.9532"N	80°51'21.0356"W	1972.40	14.536	0.18	0.13	0.13	
8809.00	89.140	337.050	6426.65	1666.77	1996.91	458.43	1681232.55	14226681.06	39°10'39.8201"N	80°51'21.4989"W	2048.86	12.929	0.77	-0.52	-0.57	
8903.00	89.110	337.740	6428.08	1760.76	2083.68	422.31	1681196.44	14226767.80	39°10'40.6783"N	80°51'21.9659"W	2126.04	11.457	0.73	-0.03	0.73	
8998.00	89.050	337.370	6429.61	1855.75	2171.47	386.04	1681160.19	14226855.55	39°10'41.5466"N	80°51'22.4147"W	2205.52	10.081	0.39	-0.06	-0.39	
9092.00	89.320	337.040	6430.94	1949.74	2258.12	349.63	1681123.79	14226942.17	39°10'42.4036"N	80°51'22.8753"W	2285.03	8.801	0.45	0.29	-0.35	
9186.00	89.110	337.400	6432.23	2043.73	2344.78	313.23	1681087.41	14227028.79	39°10'43.2607"N	80°51'23.3357"W	2365.61	7.609	0.44	-0.22	0.38	
9281.00	89.020	336.580	6433.78	2138.71	2432.21	276.10	1681050.29	14227116.19	39°10'44.1254"N	80°51'23.8055"W	2447.83	6.476	0.87	-0.09	-0.86	
9375.00	89.690	336.970	6434.84	2232.70	2518.59	239.04	1681013.24	14227202.53	39°10'44.9797"N	80°51'24.2744"W	2529.90	5.422	0.82	0.71	0.41	
9470.00	89.050	337.850	6435.88	2327.69	2606.29	202.55	1680976.77	14227290.20	39°10'45.7066"N	80°51'24.7360"W	2614.15	4.444	1.15	-0.67	0.93	
9564.00	88.830	337.380	6437.62	2421.68	2693.19	166.76	1680940.99	14227377.06	39°10'46.5706"N	80°51'25.1888"W	2698.35	3.543	0.55	-0.23	-0.50	
9659.00	89.230	336.960	6439.23	2516.66	2780.74	129.90	1680904.15	14227464.57	39°10'47.5725"N	80°51'25.6550"W	2783.77	2.675	0.61	0.42	-0.44	
9753.00	88.890	336.910	6440.77	2610.65	2867.21	93.08	1680867.34	14227551.01	39°10'48.4277"N	80°51'26.1209"W	2868.72	1.859	0.37	-0.36	-0.05	
9848.00	88.710	337.350	6442.76	2705.62	2954.72	56.17	1680830.45	14227638.49	39°10'49.2933"N	80°51'26.5875"W	2955.26	1.089	0.50	-0.19	0.46	
9943.00	89.050	337.200	6444.62	2800.60	3042.33	19.48	1680793.77	14227726.06	39°10'50.1598"N	80°51'27.0521"W	3042.39	0.367	0.39	0.36	-0.16	
10037.00	89.380	337.490	6445.91	2894.60	3129.07	-16.73	1680757.58	14227812.77	39°10'51.0176"N	80°51'27.5101"W	3129.11	3.59694	0.47	0.35	0.31	
10132.00	89.540	337.200	6446.80	2989.59	3216.74	-53.32	1680721.00	14227900.40	39°10'51.8847"N	80°51'27.9730"W	3217.18	3.59050	0.35	0.17	-0.31	
10226.00	89.600	337.730	6447.51	3083.59	3303.56	-89.34	1680684.99	14227987.18	39°10'52.7434"N	80°51'28.4287"W	3304.76	3.58451	0.57	0.06	0.56	
10321.00	89.510	337.840	6448.25	3178.58	3391.50	-125.26	1680649.09	14228075.09	39°10'53.6132"N	80°51'28.8831"W	3393.81	3.57885	0.15	-0.09	0.12	
10415.00	89.230	337.500	6449.28	3272.58	3478.45	-160.97	1680613.39	14228162.00	39°10'54.4731"N	80°51'29.3343"W	3482.17	3.57350	0.47	-0.30	-0.36	
10510.00	89.480	337.340	6450.35	3367.57	3566.16	-197.45	1680576.93	14228249.68	39°10'55.3406"N	80°51'29.7965"W	3571.62	3.56831	0.31	0.26	-0.17	
10605.00	89.170	338.040	6451.47	3462.56	3654.04	-233.51	1680540.89	14228337.53	39°10'56.2099"N	80°51'30.2529"W	3661.49	3.56344	0.81	-0.33	0.74	
10699.00	88.890	337.700	6453.06	3556.54	3741.10	-268.91	1680504.49	14228424.56	39°10'57.0708"N	80°51'30.7004"W	3750.76	3.55889	0.47	-0.30	-0.36	

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Well	Twig Unit 2H
Field	Ritchie	API	47-085-10499-0000
Facility	Cashew Pad	Wellbore	Twig Unit 2H AWB
Slot	Slot J		

WELLPATH DATA (230 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)	Comments
10794.00	89.290	337.660	6454.57	3651.53	3828.97	-304.99	1680469.43	14228512.39	39°10'57.9399"N	80°51'31.1568"W	3841.10	355.446	0.42	0.42	-0.04	
10889.00	89.140	337.510	6455.87	3746.52	3916.79	-341.21	1680433.23	14228600.17	39°10'58.8084"N	80°51'31.6150"W	3931.62	355.021	0.22	-0.16	-0.16	
10983.00	89.080	337.900	6457.33	3840.51	4003.75	-376.87	1680367.59	14228687.10	39°10'59.6685"N	80°51'32.0661"W	4021.45	354.623	0.42	-0.06	0.41	
11078.00	88.830	338.040	6459.06	3935.49	4091.80	-412.49	1680361.97	14228775.11	39°11'0.5393"N	80°51'32.5169"W	4112.54	354.243	0.30	-0.26	0.15	
11172.00	88.920	337.540	6460.91	4029.46	4178.81	-448.02	1680326.46	14228862.09	39°11'1.3998"N	80°51'32.9663"W	4202.76	353.881	0.54	0.10	-0.53	
11267.00	90.280	338.990	6461.57	4124.45	4267.05	-483.20	1680291.30	14228950.29	39°11'2.2725"N	80°51'33.4113"W	4294.32	353.539	2.09	1.43	1.53	
11362.00	88.890	337.810	6462.26	4219.42	4355.37	-518.17	1680256.34	14229038.58	39°11'3.1460"N	80°51'33.8536"W	4386.09	353.215	1.92	-1.46	-1.24	
11456.00	89.230	338.160	6463.80	4313.41	4442.50	-553.40	1680221.13	14229125.68	39°11'4.0078"N	80°51'34.2993"W	4476.84	352.899	0.52	0.36	0.37	
11551.00	88.860	337.600	6465.39	4408.39	4530.50	-589.16	1680185.37	14229213.64	39°11'4.8781"N	80°51'34.7518"W	4568.65	352.591	0.71	-0.39	-0.39	
11646.00	89.380	338.050	6466.84	4503.37	4618.46	-625.02	1680149.53	14229301.56	39°11'5.7480"N	80°51'35.2054"W	4660.56	352.293	0.72	0.55	0.47	
11740.00	89.290	337.570	6467.94	4597.36	4705.49	-660.51	1680114.05	14229388.56	39°11'6.6088"N	80°51'35.6545"W	4751.63	352.010	0.52	-0.10	-0.51	
11835.00	89.080	337.110	6469.29	4692.35	4793.15	-697.11	1680077.47	14229476.18	39°11'6.6088"N	80°51'36.1076"W	4843.58	351.725	0.53	-0.22	-0.48	
11929.00	89.420	337.140	6470.52	4786.35	4879.75	-733.65	1680040.95	14229562.75	39°11'8.3322"N	80°51'36.5799"W	4934.59	351.450	0.36	0.36	0.03	
12024.00	87.780	337.490	6472.84	4881.31	4967.37	-770.27	1680004.33	14229650.33	39°11'9.1988"N	80°51'37.0433"W	5026.74	351.186	1.77	-1.73	0.37	
12118.00	89.200	337.870	6475.32	4975.28	5054.30	-805.96	1679968.66	14229737.22	39°11'10.0685"N	80°51'37.4948"W	5118.15	350.940	1.56	1.51	0.40	
12213.00	88.710	337.710	6477.05	5070.26	5142.23	-841.86	1679932.77	14229825.13	39°11'10.9282"N	80°51'37.9490"W	5210.69	350.702	0.54	-0.52	-0.17	
12307.00	88.400	338.210	6479.42	5164.22	5229.34	-877.13	1679897.53	14229912.19	39°11'11.7897"N	80°51'38.3952"W	5302.39	350.478	0.63	-0.33	0.53	
12402.00	89.540	337.890	6481.13	5259.20	5317.43	-912.63	1679862.04	14230000.26	39°11'12.6610"N	80°51'38.8444"W	5395.18	350.261	1.25	1.20	-0.34	
12497.00	89.480	338.010	6481.94	5354.19	5405.48	-948.29	1679826.39	14230088.27	39°11'13.5218"N	80°51'39.2956"W	5488.03	350.050	0.14	-0.06	0.13	
12591.00	89.600	337.830	6482.69	5448.18	5492.59	-983.63	1679791.07	14230175.34	39°11'14.3832"N	80°51'39.7426"W	5579.97	349.847	0.23	0.13	-0.19	
12686.00	89.510	337.820	6483.43	5543.18	5580.56	-1019.48	1679755.23	14230263.27	39°11'15.2632"N	80°51'40.1963"W	5672.91	349.647	0.10	-0.09	-0.01	
12780.00	89.570	337.800	6484.19	5637.17	5667.59	-1054.98	1679719.74	14230350.40	39°11'16.1240"N	80°51'40.6454"W	5764.94	349.455	0.07	0.06	-0.02	
12875.00	90.920	338.460	6483.78	5732.16	5755.75	-1090.37	1679684.37	14230438.40	39°11'16.9959"N	80°51'41.0931"W	5856.12	349.273	1.58	1.42	0.69	
12969.00	89.350	337.910	6483.56	5826.15	5843.02	-1125.30	1679649.45	14230525.63	39°11'17.8590"N	80°51'41.5351"W	5950.39	349.099	1.77	-1.67	-0.59	
13064.00	89.570	337.970	6484.45	5921.14	5931.06	-1160.98	1679613.79	14230613.63	39°11'18.7297"N	80°51'41.9865"W	6043.62	348.925	0.24	0.23	0.06	
13158.00	89.630	339.230	6485.11	6015.11	6018.57	-1195.27	1679579.50	14230701.11	39°11'19.5952"N	80°51'42.4204"W	6136.11	348.767	1.34	0.06	1.34	
13253.00	89.630	337.790	6485.72	6110.09	6106.96	-1230.07	1679544.72	14230789.47	39°11'20.4694"N	80°51'42.8606"W	6229.61	348.612	1.52	0.00	-1.52	
13348.00	89.820	337.700	6486.18	6205.09	6194.89	-1266.05	1679508.75	14230877.36	39°11'21.3389"N	80°51'43.3159"W	6322.94	348.449	0.22	0.20	-0.09	
13442.00	89.880	337.760	6486.43	6299.08	6281.87	-1301.68	1679473.14	14230964.31	39°11'22.1992"N	80°51'43.7666"W	6415.32	348.293	0.09	0.06	0.06	
13537.00	89.940	337.890	6486.57	6394.08	6369.85	-1337.53	1679437.30	14231052.25	39°11'23.0693"N	80°51'44.2203"W	6508.76	348.141	0.15	0.06	0.14	

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Actual Wellpath Report

Twig Unit 2H AWP Proji: 20977'
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REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Well	Twig Unit 2H
Field	Ritchie	API	47-085-10499-0000
Facility	Cashew Pad	Wellbore	Twig Unit 2H AWB
Slot	Slot J		

WELLPATH DATA (230 stations)

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate	Comments
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(US ft)	(US ft)			(ft)	(°)	(%/100ft)	(%/100ft)	(%/100ft)	
13631.00	89.850	338.460	6486.75	6488.07	6457.11	-1372.48	1679402.37	14231139.48	39°11'23.9323"N	80°51'44.6625"W	6601.36	348.000	0.61	-0.10	0.61	
13726.00	90.060	338.430	6486.82	6583.05	6545.47	-1407.38	1679367.48	14231227.80	39°11'24.8061"N	80°51'45.1040"W	6695.06	347.865	0.22	0.22	-0.03	
13820.00	89.630	336.760	6487.08	6677.05	6632.37	-1443.21	1679331.67	14231314.66	39°11'25.6656"N	80°51'45.5574"W	6787.57	347.724	1.83	-0.46	-1.78	
13915.00	89.600	337.860	6487.71	6772.05	6720.01	-1479.85	1679296.04	14231402.27	39°11'26.5324"N	80°51'46.0211"W	6881.03	347.581	1.16	-0.03	1.16	
14009.00	89.940	337.810	6488.09	6866.04	6807.06	-1515.32	1679259.59	14231489.29	39°11'27.3934"N	80°51'46.4698"W	6973.69	347.450	0.37	0.36	-0.05	
14104.00	89.690	337.530	6488.40	6961.04	6894.94	-1551.41	1679223.51	14231577.13	39°11'28.2624"N	80°51'46.9266"W	7067.32	347.319	0.40	-0.26	-0.29	
14199.00	89.170	337.470	6489.34	7056.03	6982.70	-1587.76	1679187.17	14231664.86	39°11'29.1304"N	80°51'47.3866"W	7160.94	347.190	0.55	-0.55	-0.06	
14293.00	89.480	337.720	6490.45	7150.03	7069.60	-1623.59	1679151.36	14231751.72	39°11'29.9899"N	80°51'47.8400"W	7253.64	347.066	0.42	0.33	0.27	
14387.00	89.450	338.350	6491.33	7244.02	7156.77	-1658.75	1679116.22	14231838.88	39°11'30.8520"N	80°51'48.2848"W	7346.49	346.951	0.67	-0.03	0.67	
14482.00	89.450	337.960	6492.24	7339.00	7244.95	-1694.10	1679080.88	14231927.00	39°11'31.7240"N	80°51'48.7321"W	7440.38	346.839	0.41	0.00	-0.41	
14576.00	89.350	337.780	6493.22	7432.99	7332.02	-1729.50	1679045.49	14232014.03	39°11'32.5851"N	80°51'49.1801"W	7533.24	346.727	0.22	-0.11	0.00	
14670.00	89.600	337.630	6494.09	7526.99	7419.03	-1765.05	1679009.96	14232101.01	39°11'33.4457"N	80°51'49.6299"W	7626.10	346.618	0.27	0.27	0.00	
14765.00	87.140	335.630	6496.79	7621.93	7506.24	-1802.60	1678972.42	14232188.19	39°11'34.3082"N	80°51'50.1052"W	7719.65	346.496	3.44	-2.59	-2.26	
14859.00	89.350	337.360	6499.67	7715.86	7592.39	-1840.07	1678934.97	14232274.31	39°11'35.1603"N	80°51'50.5794"W	7812.19	346.377	2.99	2.35	1.84	
14954.00	89.980	337.390	6501.05	7810.85	7680.07	-1876.61	1678898.44	14232361.95	39°11'36.0275"N	80°51'51.0419"W	7906.02	346.269	0.39	-0.39	0.03	
15048.00	89.540	336.570	6502.27	7904.84	7766.58	-1913.36	1678861.70	14232448.42	39°11'36.8830"N	80°51'51.5071"W	7998.80	346.160	1.06	0.60	-0.87	
15142.00	89.380	337.030	6503.15	7998.83	7852.97	-1950.39	1678824.69	14232534.78	39°11'37.7375"N	80°51'51.9757"W	8091.55	346.052	0.52	-0.17	0.49	
15237.00	89.200	336.280	6504.33	8093.82	7940.19	-1988.03	1678787.06	14232621.96	39°11'38.6001"N	80°51'52.4522"W	8185.29	345.943	0.81	-0.19	-0.79	
15332.00	89.600	336.970	6505.32	8188.81	8027.39	-2025.72	1678749.39	14232709.13	39°11'39.4626"N	80°51'52.9292"W	8279.04	345.837	0.84	0.42	0.73	
15426.00	89.660	337.100	6505.93	8282.80	8113.94	-2062.40	1678712.73	14232795.64	39°11'40.3184"N	80°51'53.3934"W	8371.94	345.739	0.15	0.06	0.14	
15521.00	89.880	337.130	6506.31	8377.80	8201.46	-2099.34	1678675.80	14232883.13	39°11'41.1840"N	80°51'53.8610"W	8465.88	345.642	0.23	0.23	0.03	
15615.00	89.820	337.290	6506.56	8471.80	8288.12	-2135.75	1678639.40	14232969.75	39°11'42.0411"N	80°51'54.3218"W	8558.88	345.550	0.18	-0.06	0.17	
15709.00	89.510	336.770	6507.11	8566.80	8374.66	-2172.44	1678602.73	14233056.26	39°11'42.8971"N	80°51'54.7861"W	8651.85	345.458	0.64	-0.33	-0.55	
15804.00	89.570	337.040	6507.87	8660.79	8462.05	-2209.70	1678565.49	14233143.61	39°11'43.7613"N	80°51'55.2577"W	8745.80	345.365	0.29	0.06	0.28	
15898.00	89.750	336.640	6508.43	8754.78	8548.47	-2246.67	1678528.53	14233230.00	39°11'44.6160"N	80°51'55.7257"W	8838.77	345.275	0.47	0.19	-0.43	
15993.00	89.630	336.990	6508.94	8849.78	8635.80	-2284.07	1678491.14	14233317.29	39°11'45.4797"N	80°51'56.1991"W	8932.75	345.185	0.39	-0.13	0.37	
16087.00	89.290	335.650	6509.83	8943.75	8721.88	-2321.82	1678453.41	14233403.34	39°11'46.3311"N	80°51'56.6770"W	9025.63	345.093	1.47	-0.36	-1.43	
16181.00	89.690	336.720	6510.66	9037.73	8807.87	-2359.77	1678415.47	14233489.29	39°11'47.1815"N	80°51'57.1574"W	9118.50	345.002	1.22	0.43	1.14	
16275.00	89.320	336.110	6511.48	9131.71	8894.01	-2397.38	1678377.88	14233575.40	39°11'48.0356"N	80°51'57.6333"W	9211.45	344.914	0.76	-0.39	-0.65	
16370.00	89.630	336.600	6512.35	9226.69	8981.03	-2435.48	1678339.79	14233662.39	39°11'48.8942"N	80°51'58.1156"W	9305.40	344.827	0.61	0.33	0.52	

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Well	Twig Unit 2H
Field	Richie	API	47-085-10499-0000
Facility	Cashew Pad	Wellbore	Twig Unit 2H AWB
Slot	Slot J		

WELLPATH DATA (230 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
16464.00	90.180	337.130	6512.50	9320.69	9067.47	-2472.41	1678302.88	142933748.79	39°1'49.7491"N	80°51'58.5833"W	9398.50	344.748	0.81	0.59	0.56	
16558.00	89.480	335.980	6512.78	9414.68	9153.71	-2509.81	1678265.49	14293835.00	39°1'50.6020"N	80°51'59.0567"W	9491.55	344.667	1.43	-0.74	-1.22	
16652.00	89.820	336.450	6513.36	9508.66	9239.72	-2547.72	1678227.60	14293920.98	39°1'51.4527"N	80°51'59.5366"W	9584.54	344.585	0.62	0.36	0.50	
16747.00	89.600	336.680	6513.84	9603.64	9326.89	-2585.50	1678189.83	14294008.10	39°1'52.3147"N	80°52'0.0149"W	9678.62	344.506	0.34	-0.23	0.24	
16841.00	90.030	336.980	6514.14	9697.64	9413.30	-2622.49	1678152.86	14294094.49	39°1'53.1694"N	80°52'0.4830"W	9771.78	344.432	0.56	0.46	0.32	
16936.00	89.600	336.760	6514.45	9792.64	9500.67	-2659.81	1678115.56	14294181.81	39°1'54.0334"N	80°52'0.9554"W	9865.96	344.360	0.51	-0.45	-0.23	
17030.00	89.510	337.080	6515.18	9886.63	9587.14	-2696.65	1678078.72	14294268.25	39°1'54.8887"N	80°52'1.4219"W	9959.18	344.290	0.35	-0.10	0.34	
17124.00	89.480	336.280	6516.01	9980.62	9673.45	-2733.88	1678041.51	14294354.53	39°1'55.7423"N	80°52'1.8931"W	10052.35	344.219	0.87	-0.03	-0.87	
17219.00	90.280	336.510	6516.20	10075.60	9760.49	-2771.93	1677996.12	14294441.54	39°1'56.6032"N	80°52'2.3749"W	10146.47	344.146	0.88	0.84	0.26	
17313.00	89.780	336.640	6516.16	10169.59	9846.74	-2809.30	1677966.12	14294527.75	39°1'57.4562"N	80°52'2.8479"W	10239.66	344.076	0.55	-0.53	0.14	
17407.00	90.180	336.630	6516.19	10263.59	9933.04	-2846.58	1677928.86	14294614.01	39°1'58.3096"N	80°52'3.3198"W	10332.87	344.009	0.43	0.43	-0.01	
17502.00	90.120	336.540	6515.94	10358.58	10020.21	-2884.34	1677891.12	14294701.15	39°1'59.1718"N	80°52'3.7978"W	10427.08	343.941	0.11	-0.06	-0.09	
17596.00	90.180	336.740	6515.69	10452.57	10106.51	-2921.61	1677853.86	14294787.41	39°1'20.0253"N	80°52'4.2696"W	10520.33	343.876	0.22	0.06	0.21	
17691.00	90.090	336.880	6515.47	10547.56	10193.83	-2959.02	1677816.47	14294874.70	39°1'20.8889"N	80°52'4.7432"W	10614.61	343.813	0.18	-0.09	0.15	
17785.00	90.060	336.820	6515.35	10641.56	10280.26	-2995.97	1677779.53	14294961.10	39°1'21.7437"N	80°52'5.2110"W	10707.92	343.752	0.07	-0.03	-0.06	
17879.00	89.820	336.660	6515.45	10735.55	10366.62	-3033.09	1677742.42	14295047.42	39°1'22.5978"N	80°52'5.6809"W	10801.23	343.691	0.31	0.26	-0.17	
17973.00	90.280	336.760	6515.36	10829.55	10452.96	-3070.26	1677705.27	14295133.73	39°1'23.4517"N	80°52'6.1514"W	10894.54	343.631	0.50	0.49	0.11	
18067.00	90.150	336.700	6515.01	10923.54	10539.32	-3107.39	1677668.15	14295220.05	39°1'24.3058"N	80°52'6.6215"W	10987.86	343.572	0.15	-0.14	-0.06	
18162.00	89.970	336.830	6514.91	11018.52	10626.28	-3145.63	1677629.93	14295306.98	39°1'25.1659"N	80°52'7.1057"W	11082.09	343.510	0.94	-0.19	-0.92	
18256.00	90.090	336.960	6514.86	11112.51	10712.41	-3183.27	1677592.30	14295393.08	39°1'26.0177"N	80°52'7.5822"W	11175.37	343.450	1.21	0.13	1.20	
18350.00	90.150	336.810	6514.66	11206.50	10798.87	-3220.17	1677555.42	14295479.49	39°1'26.8728"N	80°52'8.0494"W	11268.76	343.396	0.17	0.06	-0.16	
18444.00	90.030	336.700	6514.52	11300.50	10885.24	-3257.27	1677518.33	14295565.83	39°1'27.7269"N	80°52'8.5190"W	11362.14	343.341	0.17	-0.13	-0.12	
18539.00	89.880	336.780	6514.59	11395.49	10972.51	-3294.43	1677480.83	14295653.07	39°1'28.5901"N	80°52'8.9940"W	11456.51	343.286	0.18	0.00	0.08	
18634.00	89.880	336.530	6514.79	11490.48	11059.74	-3332.43	1677443.20	14295740.26	39°1'29.4528"N	80°52'9.4706"W	11550.88	343.232	0.26	0.00	-0.26	
18728.00	90.310	337.290	6514.63	11584.48	11146.21	-3369.30	1677406.35	14295826.70	39°1'30.3079"N	80°52'9.9373"W	11644.31	343.181	0.93	0.46	0.81	
18822.00	89.540	336.360	6514.76	11678.47	11232.62	-3406.29	1677369.37	14295913.07	39°1'31.1628"N	80°52'10.4056"W	11737.74	343.130	1.28	-0.82	-0.99	
18916.00	90.060	336.840	6515.09	11772.46	11318.89	-3443.62	1677332.06	14295999.31	39°1'32.0158"N	80°52'10.8782"W	11831.13	343.078	0.75	0.55	0.51	
19011.00	90.280	336.790	6514.80	11867.46	11406.21	-3481.02	1677294.67	14296086.60	39°1'32.8794"N	80°52'11.3518"W	11925.57	343.029	0.24	0.23	-0.05	
19105.00	90.460	338.280	6514.20	11961.45	11493.08	-3516.94	1677258.77	14296173.43	39°1'33.7385"N	80°52'11.8064"W	12019.14	342.986	1.60	0.19	1.59	
19199.00	89.780	337.780	6514.00	12055.45	11580.25	-3552.11	1677223.61	14296260.56	39°1'34.6006"N	80°52'12.2516"W	12112.79	342.947	0.90	-0.72	-0.53	

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REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Well	Twig Unit 2H
Field	Ritche	API	47-085-10499-0000
Facility	Cashew Pad	Wellbore	Twig Unit 2H AWB
Slot	Slot J		

WELLPATH DATA (230 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)	Comments
19294.00	90.120	337.420	6514.08	12150.45	11668.08	-3588.31	1677187.43	14236348.36	39°12'15.4692"N	80°52'12.7098"W	12207.38	342.906	0.52	0.36	-0.38	
19388.00	90.430	338.030	6513.63	12244.44	11755.06	-3623.94	1677151.81	14236435.31	39°12'16.3294"N	80°52'13.1609"W	12300.99	342.866	0.73	0.33	0.65	
19482.00	90.490	338.430	6512.88	12338.43	11842.36	-3658.80	1677116.96	14236522.57	39°12'17.1927"N	80°52'13.6021"W	12394.69	342.831	0.43	0.06	0.43	
19576.00	89.970	338.480	6512.50	12432.41	11929.79	-3693.32	1677082.46	14236609.96	39°12'18.0574"N	80°52'14.0391"W	12488.41	342.798	0.56	-0.55	0.05	
19671.00	89.720	337.920	6512.76	12527.40	12017.99	-3728.60	1677047.19	14236698.13	39°12'18.9297"N	80°52'14.4856"W	12583.11	342.763	0.65	-0.26	-0.59	
19765.00	90.150	337.460	6512.86	12621.40	12104.96	-3764.28	1677011.52	14236785.06	39°12'19.7897"N	80°52'14.9374"W	12676.74	342.726	0.67	0.46	-0.49	
19860.00	90.340	337.950	6512.46	12716.39	12192.85	-3800.32	1676975.50	14236872.92	39°12'20.6590"N	80°52'15.3936"W	12771.38	342.689	0.55	0.20	0.52	
19954.00	90.060	337.470	6512.13	12810.39	12279.83	-3835.98	1676939.86	14236959.86	39°12'21.5191"N	80°52'15.8449"W	12865.03	342.652	0.59	-0.30	-0.51	
20049.00	89.940	337.940	6512.13	12905.39	12367.73	-3872.02	1676903.83	14237047.73	39°12'22.3884"N	80°52'16.3012"W	12959.67	342.616	0.51	-0.13	0.49	
20144.00	89.450	337.720	6512.64	13000.39	12455.70	-3907.87	1676868.00	14237135.67	39°12'23.2584"N	80°52'16.7550"W	13054.34	342.581	0.57	-0.52	-0.23	
20238.00	90.220	337.640	6512.91	13094.38	12542.66	-3943.56	1676832.31	14237222.59	39°12'24.1184"N	80°52'17.2069"W	13148.00	342.546	0.82	-0.46	-0.09	
20333.00	89.780	337.730	6512.91	13189.38	12630.54	-3979.64	1676796.26	14237310.44	39°12'25.9875"N	80°52'17.6636"W	13242.66	342.511	0.47	0.20	0.04	
20427.00	89.970	337.770	6513.11	13283.38	12717.54	-4015.23	1676760.68	14237397.40	39°12'26.8479"N	80°52'18.1142"W	13336.34	342.478	0.21	0.22	0.20	
20521.00	90.180	337.960	6512.99	13377.38	12804.61	-4050.65	1676725.27	14237484.44	39°12'27.6990"N	80°52'18.5625"W	13430.04	342.446	0.30	0.22	0.20	
20615.00	90.030	337.560	6512.82	13471.37	12891.62	-4086.22	1676689.71	14237571.41	39°12'28.5695"N	80°52'19.0130"W	13523.72	342.413	0.45	-0.16	-0.43	
20709.00	89.910	337.720	6512.86	13565.37	12978.55	-4121.98	1676653.97	14237658.31	39°12'29.4292"N	80°52'19.4657"W	13617.40	342.380	0.21	-0.13	0.17	
20803.00	89.720	337.380	6513.17	13659.37	13065.43	-4157.88	1676618.08	14237745.15	39°12'29.2884"N	80°52'19.9201"W	13711.07	342.347	0.41	-0.20	-0.36	
20897.00	90.060	337.760	6513.35	13753.37	13152.32	-4193.75	1676582.23	14237832.00	39°12'30.1477"N	80°52'20.3742"W	13804.74	342.315	0.54	0.36	0.40	
20952.00	90.180	337.460	6513.23	13808.37	13203.17	-4224.70	1676561.29	14237882.84	39°12'30.6506"N	80°52'20.6394"W	13859.56	342.296	0.59	0.22	-0.55	
20977.00#	90.180	337.460	6513.16	13833.37	13226.26	-4224.28	1676551.71	14237905.92	39°12'30.8790"N	80°52'20.7608"W	13884.47	342.287	0.00	0.00	0.00	Projected MD at TD: 20977'

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Actual Wellpath Report
 Twig Unit 2H AWP Proj: 20977'
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Well	Twig Unit 2H
Field	Ritchie	API	47-085-10499-0000
Facility	Cashew Pad	Wellbore	Twig Unit 2H AWB
Slot	Slot J		

String/Diameter	Ref Wellbore: Twig Unit 2H AWB		Ref Wellpath: Twig Unit 2H AWP Proj: 20977'		Start N/S [ft]	Start EW [ft]	End N/S [ft]	End EW [ft]
	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]				
20in Open Hole	30.00	130.00	100.00	30.00	0.00	0.00	-0.01	-0.16
17.5in Open Hole	130.00	371.00	241.00	130.00	-0.01	-0.16	-0.41	0.87
13.375in Casing Surface	30.00	363.00	333.00	30.00	0.00	0.00	-0.39	0.75
12.25in Open Hole	371.00	2915.00	2544.00	370.99	-0.41	0.87	-161.12	575.82
9.625in Casing Intermediate	30.00	2885.00	2855.00	30.00	0.00	0.00	-159.25	568.09
8.75in Open Hole	2915.00	5740.00	2825.00	2837.25	-161.12	575.82	-370.35	1259.49
8.5in Open Hole	5740.00	20977.00	15237.00	5568.28	-370.35	1259.49	13226.26	4224.28
5.5in Casing Production	30.00	20957.00	20927.00	30.00	0.00	0.00	13207.79	-4216.61

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Twig Unit 2H AWP Proj: 20977'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Well	Twig Unit 2H
Field	Ritchie	API	47-085-10499-0000
Facility	Cashew Pad	Wellbore	Twig Unit 2H AWB
Slot	Slot J		

TARGETS									
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape	
Twig Unit 2H POE Rev-3	6395.00	188.47	1215.96	1681989.77	14224873.34	39°10'21.9336"N	80°51'11.9168"W	point	
Twig Unit 2H BHL Rev-3	6417.00	13271.23	-4236.91	1676539.09	14237950.87	39°12'31.3236"N	80°52'20.9204"W	point	
Twig Unit 2H BHL Rev-4	6417.00	13227.31	-4218.60	1676557.39	14237906.97	39°12'30.8893"N	80°52'20.6886"W	point	
Twig Unit 2H LP Rev-3	6417.00	351.06	1148.19	1681922.03	14225035.87	39°10'23.5417"N	80°51'12.7739"W	point	
Twig Unit 2H 50' L/R Hard Line Rev-2	7000.00	6707.89	-1501.32	1679273.58	14231390.15	39°11'26.4129"N	80°51'46.2940"W	rectangle	2D Rectangle 14126.1 x 100.

WELLPATH COMPOSITION - Ref Wellbore: Twig Unit 2H AWB Ref Wellpath: Twig Unit 2H AWP Proj: 20977'									
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore	Survey Date				
30.00	260.00		Gyrodatta 2015 - GC+WIR+DPIPE	01 Gyrodatta MS Gyro <17'-12"> (100'-260')	Twig Unit 2H AWB 9/13/2023				
260.00	2835.00		BH NavITrak (2019) (Axial Cor+HRGM)	02 APS EM <12'-1/4"> (260)'(413'-2835')	Twig Unit 2H AWB 9/13/2023				
2835.00	5662.00		BH NavITrak (2019) (Axial Cor+HRGM)	03 APS EM <8-3/4"> (2835)'(2926'-5662')	Twig Unit 2H AWB 10/15/2023				
5662.00	20977.00		BH AutoTrak CurveXpress (2019) (HRGM, Short spacing)	04 BH AT Curve <8-1/2"> (5662)'(5785'-20952')	Twig Unit 2H AWB 10/15/2023				

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Actual Wellpath Report
 Twig Unit 2H AWP Proj: 20977'
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Well	Twig Unit 2H
Field	Ritchie	API	47-085-10499-0000
Facility	Cashew Pad	Wellbore	Twig Unit 2H AWB
Slot	Slot J		

COMMENTS	
Wellpath general comments	
API: 47-085-10499-0000	
BH Job #: 111949023	
Rig: H&P 519	
Duration: 10/19/2023-10/23/2023	
Gyrodatta MS Gyro <17'-1/2"> (100'-260')	
APS EM <12-1/4"> (260')(413'-2835')	
APS EM <8-3/4"> (2835')(2926'-5662')	
BH AT Curve <8-1/2"> (5662')(5785'-20952')	
Sycamore: 6237' MD	
Middlesex: 6465' MD	
Burkett: 6658' MD	
Tully: 6761' MD	
Marcellus POE: 6848' MD	
Projected MD at TD: 20977'	

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