



Company:	Antero Resources	Local Co-ordinate Reference:	Well Rollins Unit 1H
Project:	Doddridge County WV	TVD Reference:	Patterson 340: 1375' GL + 24' KB @ 1399.0usft
Site:	Revival Pad:Koch/Gains/McCue/Mt Salem Revival/Milo	MD Reference:	Patterson 340: 1375' GL + 24' KB @ 1399.0usft
Well:	Rollins Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Project	Doddridge County WV, McClellan District		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	Revival Pad:Koch/Gains/McCue/Mt Salem Revival/Milo				
Site Position:		Northing:	14,280,147.06 usft	Latitude:	39° 19' 27.317 N
From:	Map	Easting:	1,727,993.07 usft	Longitude:	80° 41' 25.164 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.20 °

Well	Rollins Unit 1H, Marcellus					
Well Position	+N/-S	0.0 usft	Northing:	14,280,061.55 usft	Latitude:	39° 19' 26.470 N
	+E/-W	0.0 usft	Easting:	1,728,021.49 usft	Longitude:	80° 41' 24.806 W
Position Uncertainty		2.0 usft	Wellhead Elevation:	1,399.0 usft	Ground Level:	1,375.0 usft

Wellbore	Original Wellpath				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2015	10/22/2015	-8.60	66.74	52,119
	BGGM2015	12/27/2015	-8.61	66.72	52,098

Design	As Drilled				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	161.55	

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Survey Program	Date	1/12/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
99.9	5,020.0	Survey #7 - Final Def Gyro (Original Wellp	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
5,061.0	15,268.0	Survey #8 - SDI MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1	

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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
99.9	0.77	191.58	99.9	-0.7	-0.1	0.6	0.77	0.77	0.00	
100.0	0.77	191.54	100.0	-0.7	-0.1	0.6	0.38	0.00	-28.57	
First Gyro @ 100										
125.0	0.51	180.03	125.0	-0.9	-0.2	0.8	1.16	-1.04	-46.04	
150.0	0.38	165.36	150.0	-1.1	-0.1	1.0	0.69	-0.52	-58.68	
175.0	0.24	173.88	175.0	-1.3	-0.1	1.2	0.59	-0.56	34.08	
200.0	0.23	171.60	200.0	-1.4	-0.1	1.3	0.05	-0.04	-9.12	



Scientific Drilling International
Survey Report



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Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
225.0	0.26	163.35	225.0	-1.5	-0.1	1.4	0.18	0.12	-33.00	
250.0	0.17	174.03	250.0	-1.6	-0.1	1.5	0.39	-0.36	42.72	
275.0	0.23	177.92	275.0	-1.6	-0.1	1.5	0.25	0.24	15.56	
300.0	0.24	160.92	300.0	-1.7	0.0	1.6	0.28	0.04	-68.00	
325.0	0.16	153.27	325.0	-1.8	0.0	1.7	0.34	-0.32	-30.60	
350.0	0.20	148.40	350.0	-1.9	0.0	1.8	0.17	0.16	-19.48	
375.0	0.19	146.82	375.0	-2.0	0.1	1.9	0.05	-0.04	-6.32	
400.0	0.16	141.34	400.0	-2.0	0.1	2.0	0.14	-0.12	-21.92	
425.0	0.17	161.17	425.0	-2.1	0.2	2.0	0.23	0.04	79.32	
450.0	0.20	144.48	450.0	-2.2	0.2	2.1	0.25	0.12	-66.76	
475.0	0.19	145.29	475.0	-2.2	0.2	2.2	0.04	-0.04	3.24	
500.0	0.23	125.48	500.0	-2.3	0.3	2.3	0.33	0.16	-79.24	
525.0	0.24	120.76	525.0	-2.3	0.4	2.4	0.09	0.04	-18.88	
550.0	0.26	117.15	550.0	-2.4	0.5	2.4	0.10	0.08	-14.44	
575.0	0.70	99.87	575.0	-2.5	0.7	2.5	1.83	1.76	-69.12	
600.0	1.26	90.48	600.0	-2.5	1.1	2.7	2.32	2.24	-37.56	
625.0	1.70	92.59	625.0	-2.5	1.8	2.9	1.77	1.76	8.44	
650.0	2.39	86.04	650.0	-2.5	2.6	3.2	2.91	2.76	-26.20	
675.0	3.47	85.41	674.9	-2.4	3.9	3.5	4.32	4.32	-2.52	
700.0	3.70	85.58	699.9	-2.3	5.5	3.9	0.92	0.92	0.68	
725.0	3.82	85.03	724.8	-2.1	7.1	4.3	0.50	0.48	-2.20	
750.0	4.07	83.94	749.8	-2.0	8.8	4.7	1.04	1.00	-4.36	
775.0	4.50	80.85	774.7	-1.7	10.7	5.0	1.95	1.72	-12.36	
800.0	5.28	78.87	799.6	-1.3	12.8	5.3	3.19	3.12	-7.92	
824.7	5.36	77.87	824.2	-0.9	15.0	5.6	0.49	0.32	-4.04	
848.8	5.43	76.78	848.2	-0.4	17.2	5.8	0.52	0.29	-4.53	
873.0	5.56	77.59	872.3	0.1	19.5	6.0	0.63	0.54	3.35	
899.7	5.77	78.62	898.8	0.7	22.1	6.3	0.87	0.79	3.88	
924.2	5.90	78.22	923.2	1.2	24.5	6.6	0.56	0.53	-1.63	
948.3	5.93	77.46	947.2	1.7	26.9	6.9	0.35	0.12	-3.15	
972.5	5.65	76.75	971.3	2.3	29.3	7.1	1.19	-1.16	-2.93	
999.1	5.01	77.02	997.8	2.8	31.7	7.4	2.41	-2.41	1.02	
1,023.4	4.05	76.06	1,022.0	3.3	33.6	7.5	3.97	-3.95	-3.95	
1,048.1	4.00	77.01	1,046.6	3.7	35.3	7.7	0.34	-0.20	3.85	
1,072.4	3.75	78.93	1,070.8	4.0	36.9	7.9	1.16	-1.03	7.91	
1,097.5	3.38	79.26	1,095.9	4.3	38.4	8.1	1.47	-1.47	1.31	
1,124.3	3.31	79.23	1,122.7	4.6	40.0	8.3	0.26	-0.26	-0.11	
1,147.8	3.12	78.41	1,146.2	4.8	41.2	8.5	0.83	-0.81	-3.49	
1,174.0	2.82	79.54	1,172.3	5.1	42.6	8.6	1.17	-1.14	4.31	
1,198.3	2.38	77.66	1,196.5	5.3	43.7	8.8	1.85	-1.82	-7.77	
1,224.5	2.23	77.86	1,222.7	5.5	44.7	8.9	0.57	-0.57	0.76	
1,248.3	2.10	79.07	1,246.5	5.7	45.6	9.0	0.58	-0.55	5.08	
1,274.4	2.15	81.41	1,272.6	5.9	46.5	9.1	0.38	0.19	8.97	

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Survey Report



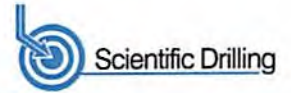
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Design:	As Drilled	Database:	Antero NE

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,298.0	1.79	79.75	1,296.2	6.0	47.3	9.3	1.54	-1.52	-7.02
1,324.7	1.46	77.09	1,322.9	6.2	48.1	9.4	1.27	-1.24	-9.96
1,347.9	1.26	75.49	1,346.0	6.3	48.6	9.4	0.88	-0.87	-6.92
1,374.5	1.14	75.81	1,372.7	6.4	49.1	9.4	0.45	-0.45	1.20
1,398.3	1.11	75.86	1,396.5	6.6	49.6	9.5	0.13	-0.13	0.21
1,424.5	1.14	75.38	1,422.7	6.7	50.1	9.5	0.12	0.11	-1.84
1,448.1	0.93	83.17	1,446.3	6.8	50.5	9.6	1.07	-0.89	32.97
1,474.4	0.68	81.82	1,472.5	6.8	50.9	9.6	0.96	-0.95	-5.14
1,497.9	0.72	85.39	1,496.1	6.8	51.2	9.7	0.25	0.17	15.15
1,524.2	0.77	82.57	1,522.3	6.9	51.5	9.8	0.24	0.19	-10.75
1,547.8	0.60	87.93	1,545.9	6.9	51.8	9.8	0.77	-0.72	22.68
1,573.9	0.58	97.51	1,572.1	6.9	52.0	9.9	0.38	-0.08	36.63
1,597.7	0.57	92.30	1,595.9	6.9	52.3	10.0	0.22	-0.04	-21.89
1,623.9	0.52	92.37	1,622.1	6.9	52.5	10.1	0.19	-0.19	0.27
1,647.5	0.47	98.19	1,645.7	6.8	52.7	10.2	0.30	-0.21	24.62
1,673.8	0.53	92.18	1,671.9	6.8	53.0	10.3	0.30	0.23	-22.91
1,699.9	0.42	116.88	1,698.1	6.8	53.2	10.4	0.88	-0.42	94.46
1,723.6	0.37	103.60	1,721.7	6.7	53.3	10.5	0.44	-0.21	-56.20
1,747.1	0.39	106.03	1,745.3	6.7	53.5	10.6	0.11	0.08	10.31
1,773.3	0.51	106.79	1,771.5	6.6	53.7	10.7	0.46	0.46	2.90
1,797.4	0.45	112.11	1,795.6	6.6	53.9	10.8	0.31	-0.25	22.08
1,823.8	0.32	117.70	1,821.9	6.5	54.0	10.9	0.51	-0.49	21.23
1,850.0	0.23	117.82	1,848.1	6.4	54.1	11.0	0.34	-0.34	0.46
1,873.5	0.31	131.11	1,871.7	6.4	54.2	11.1	0.43	0.34	56.39
1,899.9	0.22	113.82	1,898.1	6.3	54.3	11.2	0.45	-0.34	-65.52
1,923.4	0.28	109.50	1,921.6	6.3	54.4	11.3	0.27	0.26	-18.39
1,949.6	0.30	134.24	1,947.8	6.2	54.5	11.4	0.48	0.08	94.39
1,973.4	0.37	132.17	1,971.5	6.1	54.6	11.5	0.30	0.29	-8.71
1,999.3	0.41	120.61	1,997.5	6.0	54.8	11.7	0.34	0.15	-44.56
2,023.0	0.33	127.74	2,021.1	5.9	54.9	11.8	0.39	-0.34	30.11
2,048.6	0.46	109.63	2,046.8	5.8	55.1	11.9	0.70	0.51	-70.71
2,074.3	0.35	112.31	2,072.4	5.8	55.2	12.0	0.43	-0.43	10.43
2,098.0	0.27	117.90	2,096.2	5.7	55.3	12.1	0.36	-0.34	23.57
2,123.7	0.19	107.33	2,121.8	5.7	55.4	12.2	0.35	-0.31	-41.16
2,149.5	0.34	122.71	2,147.7	5.6	55.5	12.3	0.64	0.58	59.54
2,172.7	0.21	110.68	2,170.9	5.6	55.6	12.3	0.61	-0.56	-51.85
2,198.9	0.33	122.31	2,197.1	5.5	55.7	12.4	0.50	0.46	44.37
2,222.8	0.21	105.24	2,221.0	5.4	55.8	12.5	0.60	-0.50	-71.48
2,249.0	0.21	113.88	2,247.2	5.4	55.9	12.6	0.12	0.00	32.98
2,274.8	0.25	102.18	2,272.9	5.4	56.0	12.6	0.24	0.16	-45.44
2,298.4	0.23	93.99	2,296.6	5.4	56.1	12.7	0.17	-0.08	-34.63
2,324.1	0.14	126.37	2,322.2	5.4	56.2	12.7	0.52	-0.35	126.14

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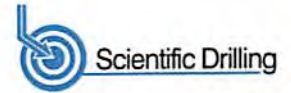
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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,349.8	0.27	100.80	2,348.0	5.3	56.3	12.8	0.61	0.50	-99.30
2,373.0	0.21	101.49	2,371.2	5.3	56.4	12.8	0.26	-0.26	2.97
2,398.7	0.33	101.38	2,396.9	5.3	56.5	12.9	0.47	0.47	-0.43
2,423.0	0.38	107.07	2,421.2	5.2	56.7	13.0	0.25	0.21	23.42
2,448.1	0.31	95.52	2,446.2	5.2	56.8	13.0	0.39	-0.28	-46.03
2,474.6	0.34	96.26	2,472.8	5.2	56.9	13.1	0.11	0.11	2.79
2,498.6	0.43	113.12	2,496.8	5.2	57.1	13.2	0.60	0.38	70.28
2,522.9	0.36	91.96	2,521.1	5.1	57.3	13.3	0.66	-0.29	-87.04
2,549.0	0.30	95.92	2,547.1	5.1	57.4	13.3	0.25	-0.23	15.21
2,573.7	0.23	89.09	2,571.9	5.1	57.5	13.4	0.31	-0.28	-27.58
2,599.8	0.26	125.10	2,598.0	5.1	57.6	13.4	0.59	0.12	138.08
2,624.5	0.20	129.90	2,622.6	5.0	57.7	13.5	0.26	-0.24	19.45
2,648.3	0.13	140.44	2,646.5	5.0	57.8	13.6	0.32	-0.29	44.19
2,674.5	0.18	207.31	2,672.6	4.9	57.8	13.6	0.67	0.19	255.72
2,699.2	0.26	189.69	2,697.4	4.8	57.7	13.7	0.42	0.32	-71.19
2,723.2	0.27	213.14	2,721.4	4.7	57.7	13.8	0.45	0.04	97.79
2,747.5	0.26	230.92	2,745.7	4.6	57.6	13.8	0.34	-0.04	73.17
2,774.1	0.30	224.90	2,772.2	4.5	57.5	13.9	0.19	0.15	-22.68
2,797.9	0.38	250.12	2,796.0	4.5	57.4	13.9	0.71	0.34	106.01
2,824.1	0.39	245.76	2,822.2	4.4	57.2	13.9	0.12	0.04	-16.62
2,848.0	0.43	244.87	2,846.1	4.3	57.1	14.0	0.17	0.17	-3.73
2,874.0	0.50	248.78	2,872.1	4.2	56.9	14.0	0.29	0.27	15.01
2,899.6	0.54	252.19	2,897.8	4.2	56.7	14.0	0.20	0.16	13.32
2,923.1	0.56	254.49	2,921.3	4.1	56.5	14.0	0.13	0.08	9.77
2,949.0	0.68	253.05	2,947.1	4.0	56.2	14.0	0.47	0.46	-5.57
2,974.7	0.68	258.55	2,972.9	3.9	55.9	13.9	0.25	0.00	21.38
2,998.2	0.52	238.73	2,996.3	3.9	55.7	13.9	1.11	-0.68	-84.45
3,024.2	0.58	229.99	3,022.3	3.7	55.5	14.0	0.40	0.23	-33.65
3,049.8	0.61	218.59	3,047.9	3.5	55.3	14.1	0.48	0.12	-44.46
3,073.3	0.60	219.29	3,071.5	3.3	55.1	14.3	0.05	-0.04	2.98
3,099.2	0.59	218.65	3,097.3	3.1	54.9	14.4	0.05	-0.04	-2.48
3,124.9	0.72	212.90	3,123.0	2.9	54.8	14.6	0.57	0.51	-22.37
3,148.3	0.64	226.86	3,146.4	2.7	54.6	14.7	0.78	-0.34	59.51
3,173.9	0.63	223.97	3,172.0	2.5	54.4	14.9	0.13	-0.04	-11.30
3,198.1	0.62	225.89	3,196.3	2.3	54.2	15.0	0.10	-0.04	7.92
3,223.7	0.64	227.94	3,221.8	2.1	54.0	15.1	0.12	0.08	8.02
3,249.2	0.60	224.16	3,247.3	1.9	53.8	15.2	0.22	-0.16	-14.82
3,273.1	0.69	232.48	3,271.3	1.7	53.6	15.3	0.54	0.38	34.77
3,298.7	0.74	233.38	3,296.8	1.5	53.4	15.4	0.20	0.20	3.52
3,324.3	0.74	227.48	3,322.4	1.3	53.1	15.5	0.30	0.00	-23.07
3,348.1	0.71	232.12	3,346.2	1.1	52.9	15.7	0.28	-0.13	19.50
3,373.7	0.54	223.47	3,371.8	0.9	52.7	15.8	0.76	-0.66	-33.78
3,400.0	0.53	225.19	3,398.1	0.8	52.5	15.9	0.07	-0.04	6.54

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Environmental Protection



Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Rollins Unit 1H
Project:	Doddridge County WW	TVD Reference:	Patterson 340: 1375' GL + 24' KB @ 1399.0usft
Site:	Revival Pad: Koch/Gains/McCue/Mt Salem Revival/Milo	MD Reference:	Patterson 340: 1375' GL + 24' KB @ 1399.0usft
Well:	Rollins Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,423.5	0.50	221.85	3,421.6	0.6	52.3	16.0	0.18	-0.13	-14.22	
3,449.0	0.38	217.28	3,447.1	0.5	52.2	16.1	0.49	-0.47	-17.94	
3,474.5	0.33	208.65	3,472.6	0.3	52.1	16.2	0.29	-0.20	-33.78	
3,498.7	0.23	187.46	3,496.8	0.2	52.1	16.3	0.59	-0.41	-87.49	
3,524.3	0.15	211.74	3,522.4	0.1	52.1	16.3	0.44	-0.31	95.07	
3,549.7	0.10	165.83	3,547.8	0.1	52.1	16.4	0.42	-0.20	-180.25	
3,573.6	0.11	169.02	3,571.7	0.1	52.1	16.4	0.05	0.04	13.38	
3,599.2	0.09	162.72	3,597.3	0.0	52.1	16.5	0.09	-0.08	-24.63	
3,624.7	0.07	125.86	3,622.8	0.0	52.1	16.5	0.21	-0.08	-144.38	
3,648.5	0.18	236.73	3,646.6	0.0	52.1	16.5	0.90	0.46	465.84	
3,674.1	0.21	221.33	3,672.2	-0.1	52.0	16.6	0.23	0.12	-60.13	
3,699.4	0.26	200.40	3,697.5	-0.2	52.0	16.6	0.39	0.20	-82.66	
3,722.8	0.30	200.90	3,720.9	-0.3	51.9	16.7	0.17	0.17	2.14	
3,749.3	0.49	191.26	3,747.4	-0.5	51.9	16.9	0.76	0.72	-36.40	
3,774.1	0.34	182.90	3,772.2	-0.7	51.8	17.0	0.65	-0.60	-33.70	
3,798.9	0.51	101.67	3,797.0	-0.7	52.0	17.2	2.29	0.68	-326.88	
3,824.8	1.77	82.29	3,822.9	-0.7	52.5	17.3	5.02	4.87	-74.91	
3,849.8	2.71	80.40	3,847.9	-0.6	53.4	17.4	3.77	3.75	-7.55	
3,874.8	2.75	78.93	3,872.9	-0.4	54.6	17.6	0.32	0.16	-5.89	
3,899.6	3.84	76.80	3,897.6	0.0	56.0	17.8	4.43	4.40	-8.60	
3,924.1	5.21	74.75	3,922.0	0.4	57.9	17.9	5.64	5.60	-8.38	
3,949.0	5.69	73.29	3,946.8	1.1	60.1	18.0	2.00	1.92	-5.85	
3,974.2	5.96	72.02	3,971.9	1.8	62.6	18.1	1.19	1.07	-5.04	
3,999.3	6.96	65.66	3,996.9	2.9	65.2	17.9	4.89	3.98	-25.32	
4,024.6	8.36	60.71	4,021.9	4.4	68.2	17.4	6.13	5.55	-19.61	
4,049.9	8.75	59.74	4,046.9	6.3	71.5	16.7	1.64	1.54	-3.83	
4,074.7	9.05	58.85	4,071.5	8.2	74.8	15.8	1.33	1.21	-3.58	
4,099.7	9.95	57.78	4,096.1	10.4	78.3	14.9	3.68	3.61	-4.29	
4,123.8	10.23	57.25	4,119.8	12.7	81.8	13.9	1.22	1.16	-2.20	
4,149.9	10.32	56.50	4,145.5	15.2	85.7	12.7	0.62	0.35	-2.88	
4,174.9	10.57	55.38	4,170.0	17.8	89.5	11.5	1.29	1.00	-4.48	
4,199.7	11.27	53.46	4,194.4	20.5	93.3	10.1	3.18	2.82	-7.03	
4,224.4	11.21	52.76	4,218.7	23.4	97.2	8.6	0.60	-0.24	-2.83	
4,249.6	11.04	50.88	4,243.4	26.4	101.0	6.9	1.59	-0.68	-7.48	
4,274.1	11.33	48.93	4,267.4	29.5	104.6	5.2	1.94	1.18	-7.94	
4,299.0	11.67	47.62	4,291.8	32.7	108.3	3.2	1.72	1.37	-5.27	
4,324.8	11.60	46.82	4,317.1	36.3	112.1	1.1	0.68	-0.27	-3.10	
4,349.2	11.30	45.36	4,341.0	39.6	115.6	-1.0	1.71	-1.23	-5.98	
4,374.9	12.54	44.54	4,366.2	43.4	119.4	-3.4	4.87	4.82	-3.19	
4,399.2	14.33	45.91	4,389.8	47.4	123.4	-5.9	7.47	7.36	5.63	
4,424.7	14.91	47.51	4,414.4	51.8	128.1	-8.6	2.78	2.28	6.29	
4,449.5	15.89	47.74	4,438.4	56.2	132.9	-11.3	3.95	3.95	0.93	

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Well:	Rollins Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,474.8	15.99	48.14	4,462.7	60.9	138.1	-14.0	0.59	0.40	1.58
4,499.8	18.15	48.13	4,486.6	65.8	143.6	-17.0	8.64	8.64	-0.04
4,524.9	18.66	48.49	4,510.4	71.0	149.5	-20.1	2.08	2.03	1.43
4,549.9	20.23	50.15	4,534.0	76.5	155.8	-23.2	6.65	6.28	6.64
4,574.1	20.46	53.47	4,556.6	81.7	162.4	-26.1	4.87	0.95	13.75
4,599.5	21.44	56.83	4,580.4	86.9	169.9	-28.6	6.09	3.85	13.20
4,624.1	21.84	59.32	4,603.3	91.7	177.6	-30.7	4.07	1.62	10.11
4,649.3	22.11	62.08	4,626.6	96.2	185.8	-32.5	4.25	1.08	10.99
4,674.7	23.94	65.04	4,650.0	100.7	194.7	-33.9	8.50	7.18	11.62
4,699.5	24.17	66.43	4,672.6	104.8	203.9	-34.9	2.47	0.93	5.62
4,725.0	24.69	66.75	4,695.8	109.0	213.6	-35.8	2.10	2.04	1.25
4,749.8	24.02	66.47	4,718.5	113.1	223.0	-36.7	2.74	-2.70	-1.13
4,774.1	24.79	66.54	4,740.6	117.1	232.2	-37.6	3.17	3.17	0.29
4,800.0	24.84	66.32	4,764.1	121.4	242.1	-38.5	0.41	0.19	-0.85
4,824.2	24.20	66.03	4,786.2	125.5	251.3	-39.5	2.68	-2.63	-1.19
4,849.3	24.86	66.22	4,808.9	129.7	260.9	-40.5	2.65	2.63	0.76
4,874.6	26.12	66.55	4,831.8	134.1	270.8	-41.5	5.02	4.99	1.31
4,899.7	26.30	66.37	4,854.3	138.5	281.0	-42.4	0.78	0.72	-0.72
4,923.9	25.50	66.19	4,876.1	142.7	290.7	-43.4	3.31	-3.30	-0.74
4,949.4	25.92	66.19	4,899.1	147.2	300.8	-44.4	1.65	1.65	0.00
4,974.1	27.26	66.59	4,921.1	151.6	310.9	-45.4	5.49	5.44	1.62
4,999.7	28.12	66.65	4,943.8	156.4	321.8	-46.5	3.35	3.35	0.23
5,020.0	27.40	66.68	4,961.8	160.1	330.5	-47.3	3.55	-3.55	0.15
Last Gyro @ 5020									
5,061.0	25.48	64.74	4,998.5	167.6	347.2	-49.1	5.14	-4.68	-4.73
First SDI MWD @ 5061									
5,155.0	25.21	64.14	5,083.4	185.0	383.5	-54.1	0.40	-0.29	-0.64
5,249.0	25.27	63.10	5,168.4	202.8	419.4	-59.6	0.48	0.06	-1.11
5,343.0	26.83	63.79	5,252.9	221.2	456.3	-65.4	1.69	1.66	0.73
5,437.0	27.66	65.13	5,336.5	239.8	495.1	-70.7	1.10	0.88	1.43
5,531.0	28.34	63.98	5,419.5	258.7	535.0	-76.1	0.92	0.72	-1.22
5,625.0	28.59	62.82	5,502.1	278.8	575.0	-82.5	0.65	0.27	-1.23
5,719.0	28.35	59.89	5,584.7	300.3	614.3	-90.4	1.51	-0.26	-3.12
5,813.0	26.70	54.88	5,668.1	323.6	650.9	-101.0	3.02	-1.76	-5.33
5,907.0	25.94	55.71	5,752.4	347.3	685.2	-112.6	0.90	-0.81	0.89
6,001.0	25.27	56.77	5,837.1	369.9	719.0	-123.4	0.86	-0.71	1.13
6,095.0	26.25	56.17	5,921.8	392.5	753.0	-134.0	1.08	1.04	-0.64
6,189.0	26.74	54.46	6,005.9	416.3	787.5	-145.7	0.96	0.52	-1.82
6,284.0	28.53	52.42	6,090.1	442.6	822.9	-159.4	2.13	1.88	-2.15
6,378.0	30.16	51.84	6,172.0	470.9	859.2	-174.8	1.76	1.73	-0.62
6,472.0	30.20	52.11	6,253.3	500.0	896.4	-190.6	0.15	0.04	0.29
6,566.0	29.55	51.73	6,334.8	528.9	933.3	-206.3	0.72	-0.69	-0.40
6,659.0	28.11	50.94	6,416.2	556.9	968.3	-221.8	1.60	-1.55	-0.85

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6,754.0	26.54	54.44	6,500.7	583.3	1,003.0	-235.9	2.36	-1.65	3.68	
6,847.0	26.85	56.83	6,583.7	606.9	1,037.5	-247.4	1.20	0.33	2.57	
6,942.0	28.06	54.67	6,668.0	631.6	1,073.6	-259.3	1.65	1.27	-2.27	
7,036.0	27.33	54.09	6,751.3	657.0	1,109.2	-272.2	0.83	-0.78	-0.62	
7,067.0	28.26	59.86	6,778.7	664.9	1,121.3	-275.8	9.18	3.00	18.61	
7,098.0	28.71	67.44	6,806.0	671.4	1,134.5	-277.9	11.74	1.45	24.45	
7,130.0	29.43	75.59	6,833.9	676.3	1,149.2	-277.9	12.57	2.25	25.47	
7,161.0	29.98	86.05	6,860.9	678.8	1,164.3	-275.4	16.80	1.77	33.74	
7,192.0	31.08	93.58	6,887.6	678.8	1,180.0	-270.4	12.83	3.55	24.29	
7,223.0	32.20	98.77	6,914.0	677.0	1,196.2	-263.7	9.49	3.61	16.74	
7,254.0	33.03	103.41	6,940.1	673.8	1,212.6	-255.4	8.50	2.68	14.97	
7,281.0	33.93	108.33	6,962.6	669.7	1,226.9	-247.0	10.58	3.34	18.21	
Middlesex @ 7281										
7,286.0	34.12	109.21	6,966.8	668.8	1,229.5	-245.3	10.58	3.76	17.68	
7,317.0	35.73	115.24	6,992.2	662.1	1,246.0	-233.8	12.28	5.19	19.45	
7,348.0	37.36	121.05	7,017.1	653.4	1,262.2	-220.4	12.33	5.26	18.74	
7,380.0	38.31	124.63	7,042.4	642.8	1,278.7	-205.0	7.48	2.97	11.19	
7,411.0	40.23	128.31	7,066.4	631.1	1,294.4	-189.0	9.74	6.19	11.87	
7,442.0	43.71	132.33	7,089.4	617.7	1,310.2	-171.3	14.18	11.23	12.97	
7,474.0	46.47	134.64	7,112.0	602.1	1,326.7	-151.3	10.03	8.63	7.22	
Burket @ 7474										
7,505.0	49.27	136.45	7,132.8	585.6	1,342.8	-130.6	10.02	9.03	5.84	
7,516.0	50.57	137.55	7,139.9	579.5	1,348.5	-122.9	14.04	11.79	9.97	
Tully @ 7516										
7,537.0	53.07	139.53	7,152.9	567.1	1,359.4	-107.7	14.04	11.92	9.45	
7,568.0	56.77	142.16	7,170.7	547.4	1,375.4	-84.0	13.81	11.94	8.48	
7,599.0	59.78	143.71	7,187.0	526.4	1,391.3	-59.0	10.60	9.71	5.00	
7,630.0	63.09	145.29	7,201.8	504.2	1,407.1	-33.0	11.58	10.66	5.10	
7,662.0	66.62	147.48	7,215.4	480.1	1,423.1	-5.0	12.65	11.03	6.84	
7,678.0	68.01	148.81	7,221.6	467.6	1,430.9	9.3	11.58	8.68	8.30	
Marcellus @ 7678										
7,693.0	69.32	150.03	7,227.0	455.5	1,438.0	23.0	11.58	8.74	8.14	
7,724.0	72.52	153.32	7,237.2	429.8	1,451.9	51.8	14.39	10.32	10.61	
7,755.0	76.21	155.18	7,245.5	402.9	1,464.9	81.4	13.23	11.90	6.00	
7,787.0	80.02	157.24	7,252.1	374.2	1,477.5	112.6	13.47	11.91	6.44	
7,818.0	83.34	158.59	7,256.6	345.8	1,489.0	143.2	11.54	10.71	4.35	
7,907.0	89.80	161.38	7,261.9	262.4	1,519.4	232.0	7.90	7.26	3.13	
8,001.0	89.73	160.77	7,262.3	173.5	1,549.9	326.0	0.65	-0.07	-0.65	
8,096.0	89.30	162.10	7,263.1	83.4	1,580.2	421.0	1.47	-0.45	-0.45	
8,190.0	89.23	161.61	7,264.3	-5.9	1,609.4	514.9	0.53	-0.07	-0.52	
8,284.0	90.03	162.16	7,264.9	-95.2	1,638.6	608.9	1.03	0.85	0.59	
8,379.0	89.50	160.73	7,265.3	-185.3	1,668.9	703.9	1.61	-0.56	-1.51	
8,473.0	90.50	162.10	7,265.3	-274.4	1,698.8	797.9	1.80	1.06	1.46	

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Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,566.0	90.77	163.82	7,264.3	-363.3	1,726.1	890.9	1.87	0.29	1.85
8,660.0	90.03	162.68	7,263.6	-453.3	1,753.2	984.8	1.45	-0.79	-1.21
8,754.0	90.84	162.41	7,262.9	-543.0	1,781.4	1,078.8	0.91	0.86	-0.29
8,849.0	90.94	160.99	7,261.4	-633.2	1,811.2	1,173.8	1.50	0.11	-1.49
8,943.0	90.67	160.96	7,260.1	-722.0	1,841.8	1,267.8	0.29	-0.29	-0.03
9,037.0	90.77	161.23	7,258.9	-810.9	1,872.3	1,361.8	0.31	0.11	0.29
9,131.0	90.03	160.49	7,258.3	-899.7	1,903.1	1,455.8	1.11	-0.79	-0.79
9,225.0	91.14	161.33	7,257.3	-988.6	1,933.8	1,549.8	1.48	1.18	0.89
9,320.0	90.34	160.78	7,256.1	-1,078.4	1,964.7	1,644.8	1.02	-0.84	-0.58
9,414.0	90.10	157.74	7,255.7	-1,166.3	1,998.0	1,738.7	3.24	-0.26	-3.23
9,508.0	90.03	160.51	7,255.6	-1,254.1	2,031.5	1,832.6	2.95	-0.07	2.95
9,602.0	90.37	163.22	7,255.3	-1,343.4	2,060.7	1,926.6	2.91	0.36	2.88
9,696.0	89.87	161.74	7,255.1	-1,433.1	2,089.0	2,020.5	1.66	-0.53	-1.57
9,791.0	90.57	162.79	7,254.7	-1,523.6	2,118.0	2,115.5	1.33	0.74	1.11
9,885.0	90.60	162.33	7,253.8	-1,613.2	2,146.1	2,209.5	0.49	0.03	-0.49
9,979.0	90.94	159.88	7,252.5	-1,702.2	2,176.6	2,303.5	2.63	0.36	-2.61
10,073.0	90.40	159.67	7,251.4	-1,790.4	2,209.1	2,397.4	0.62	-0.57	-0.22
10,167.0	90.54	161.31	7,250.7	-1,879.0	2,240.4	2,491.4	1.75	0.15	1.74
10,261.0	89.77	162.76	7,250.4	-1,968.4	2,269.4	2,585.4	1.75	-0.82	1.54
10,355.0	90.94	165.79	7,249.8	-2,058.8	2,294.9	2,679.3	3.46	1.24	3.22
10,449.0	91.01	164.87	7,248.2	-2,149.8	2,318.7	2,773.1	0.98	0.07	-0.98
10,543.0	91.61	163.03	7,246.1	-2,240.1	2,344.7	2,867.0	2.06	0.64	-1.96
10,637.0	89.87	164.10	7,244.9	-2,330.2	2,371.3	2,960.9	2.17	-1.85	1.14
10,730.0	91.04	164.48	7,244.1	-2,419.7	2,396.5	3,053.8	1.32	1.26	0.41
10,825.0	91.04	164.20	7,242.4	-2,511.2	2,422.1	3,148.7	0.29	0.00	-0.29
10,919.0	89.80	160.15	7,241.7	-2,600.7	2,450.9	3,242.6	4.51	-1.32	-4.31
11,013.0	89.97	161.44	7,241.9	-2,689.4	2,481.8	3,336.6	1.38	0.18	1.37
11,107.0	91.44	162.11	7,240.7	-2,778.7	2,511.2	3,430.6	1.72	1.56	0.71
11,200.0	90.30	160.58	7,239.3	-2,866.8	2,540.9	3,523.6	2.05	-1.23	-1.65
11,294.0	90.13	160.90	7,239.0	-2,955.5	2,571.9	3,617.6	0.39	-0.18	0.34
11,389.0	90.34	160.77	7,238.6	-3,045.3	2,603.1	3,712.6	0.26	0.22	-0.14
11,483.0	90.30	161.36	7,238.1	-3,134.2	2,633.6	3,806.6	0.63	-0.04	0.63
11,577.0	89.76	162.80	7,238.0	-3,223.6	2,662.5	3,900.6	1.64	-0.57	1.53
11,671.0	90.37	159.14	7,237.9	-3,312.5	2,693.2	3,994.5	3.95	0.65	-3.89
11,766.0	90.40	154.68	7,237.3	-3,399.8	2,730.4	4,089.2	4.69	0.03	-4.69
11,860.0	91.34	155.54	7,235.8	-3,485.1	2,770.0	4,182.6	1.36	1.00	0.91
11,954.0	91.78	158.25	7,233.3	-3,571.5	2,806.9	4,276.2	2.92	0.47	2.88
12,048.0	90.40	161.92	7,231.5	-3,659.9	2,838.9	4,370.2	4.17	-1.47	3.90
12,142.0	90.50	162.29	7,230.7	-3,749.3	2,867.8	4,464.2	0.41	0.11	0.39
12,236.0	90.03	162.32	7,230.3	-3,838.9	2,896.3	4,558.2	0.50	-0.50	0.03
12,330.0	90.71	163.56	7,229.7	-3,928.7	2,923.9	4,652.1	1.50	0.72	1.32
12,424.0	90.94	164.84	7,228.3	-4,019.2	2,949.5	4,746.0	1.38	0.24	1.36
12,518.0	90.50	165.71	7,227.2	-4,110.1	2,973.4	4,839.8	1.04	-0.47	0.93

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Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Rollins Unit 1H
Project:	Doddridge County WV	TVD Reference:	Patterson 340: 1375' GL + 24' KB @ 1399.0usft
Site:	Revival Pad.Koch/Gains/McCue/Mt Salem Revival/Milo	MD Reference:	Patterson 340: 1375' GL + 24' KB @ 1399.0usft
Well:	Rollins Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,612.0	90.03	166.65	7,226.7	-4,201.3	2,995.8	4,933.5	1.12	-0.50	1.00
12,706.0	90.27	164.38	7,226.5	-4,292.3	3,019.3	5,027.3	2.43	0.26	-2.41
12,800.0	89.87	163.51	7,226.4	-4,382.7	3,045.3	5,121.2	1.02	-0.43	-0.93
12,894.0	90.23	162.69	7,226.3	-4,472.6	3,072.7	5,215.1	0.95	0.38	-0.87
12,989.0	89.23	161.75	7,226.7	-4,563.1	3,101.7	5,310.1	1.44	-1.05	-0.99
13,083.0	90.77	161.80	7,226.7	-4,652.4	3,131.1	5,404.1	1.64	1.64	0.05
13,177.0	90.47	161.58	7,225.7	-4,741.6	3,160.6	5,498.1	0.40	-0.32	-0.23
13,271.0	90.64	158.92	7,224.8	-4,830.0	3,192.4	5,592.1	2.84	0.18	-2.83
13,364.0	90.81	158.17	7,223.6	-4,916.6	3,226.4	5,685.0	0.83	0.18	-0.81
13,459.0	89.80	159.08	7,223.1	-5,005.1	3,261.0	5,779.8	1.43	-1.06	0.96
13,552.0	89.60	158.07	7,223.6	-5,091.6	3,295.0	5,872.7	1.11	-0.22	-1.09
13,646.0	89.73	158.89	7,224.2	-5,179.1	3,329.4	5,966.6	0.88	0.14	0.87
13,740.0	89.97	160.92	7,224.4	-5,267.3	3,361.7	6,060.5	2.17	0.26	2.16
13,834.0	89.60	159.15	7,224.8	-5,355.7	3,393.8	6,154.5	1.92	-0.39	-1.88
13,928.0	90.30	160.67	7,224.8	-5,444.0	3,426.1	6,248.4	1.78	0.74	1.62
14,022.0	90.17	161.43	7,224.5	-5,532.9	3,456.7	6,342.4	0.82	-0.14	0.81
14,117.0	91.24	162.13	7,223.3	-5,623.1	3,486.4	6,437.4	1.35	1.13	0.74
14,211.0	91.14	162.60	7,221.3	-5,712.7	3,514.8	6,531.4	0.51	-0.11	0.50
14,305.0	90.67	160.57	7,219.9	-5,801.8	3,544.5	6,625.4	2.22	-0.50	-2.16
14,399.0	91.71	163.39	7,217.9	-5,891.2	3,573.6	6,719.3	3.20	1.11	3.00
14,493.0	91.78	162.38	7,215.0	-5,981.0	3,601.2	6,813.3	1.08	0.07	-1.07
14,587.0	89.87	163.64	7,213.7	-6,070.9	3,628.7	6,907.2	2.43	-2.03	1.34
14,681.0	89.19	163.43	7,214.5	-6,161.0	3,655.3	7,001.2	0.76	-0.72	-0.22
14,775.0	90.40	164.67	7,214.8	-6,251.4	3,681.2	7,095.1	1.84	1.29	1.32
14,869.0	89.83	163.95	7,214.6	-6,341.9	3,706.6	7,189.0	0.98	-0.61	-0.77
14,963.0	91.58	162.98	7,213.4	-6,432.0	3,733.3	7,282.9	2.13	1.86	-1.03
15,056.0	91.24	159.28	7,211.2	-6,519.9	3,763.4	7,375.9	3.99	-0.37	-3.98
15,150.0	90.30	161.41	7,209.9	-6,608.5	3,795.0	7,469.8	2.48	-1.00	2.27
15,203.0	90.13	161.41	7,209.7	-6,658.7	3,811.9	7,522.8	0.32	-0.32	0.00
Last SDI MWD @ 15203									
15,268.0	90.13	161.41	7,209.5	-6,720.3	3,832.6	7,587.8	0.00	0.00	0.00
Projection To Bit @ 15268 MD / 7209 TVD									

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,281.0	6,962.6	Middlesex @ 7281		0.00	
7,474.0	7,112.0	Burket @ 7474		0.00	
7,516.0	7,139.9	Tully @ 7516		0.00	
7,678.0	7,221.6	Marcellus @ 7678		0.00	

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Site:	Revival Pad:Koch/Gains/McCue/Mt Salem Revival/Milo	MD Reference:	Patterson 340: 1375' GL + 24' KB @ 1399.0usft
Well:	Rollins Unit 1H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,020.0	4,961.8	160.1	330.5	Last Gyro @ 5020
5,061.0	4,998.5	167.6	347.2	First SDI MWD @ 5061
15,203.0	7,209.7	-6,658.7	3,811.9	Last SDI MWD @ 15203
15,268.0	7,209.5	-6,720.3	3,832.6	Projection To Bit @ 15268 MD / 7209 TVD

Checked By: _____ Approved By: _____ Date: _____

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