



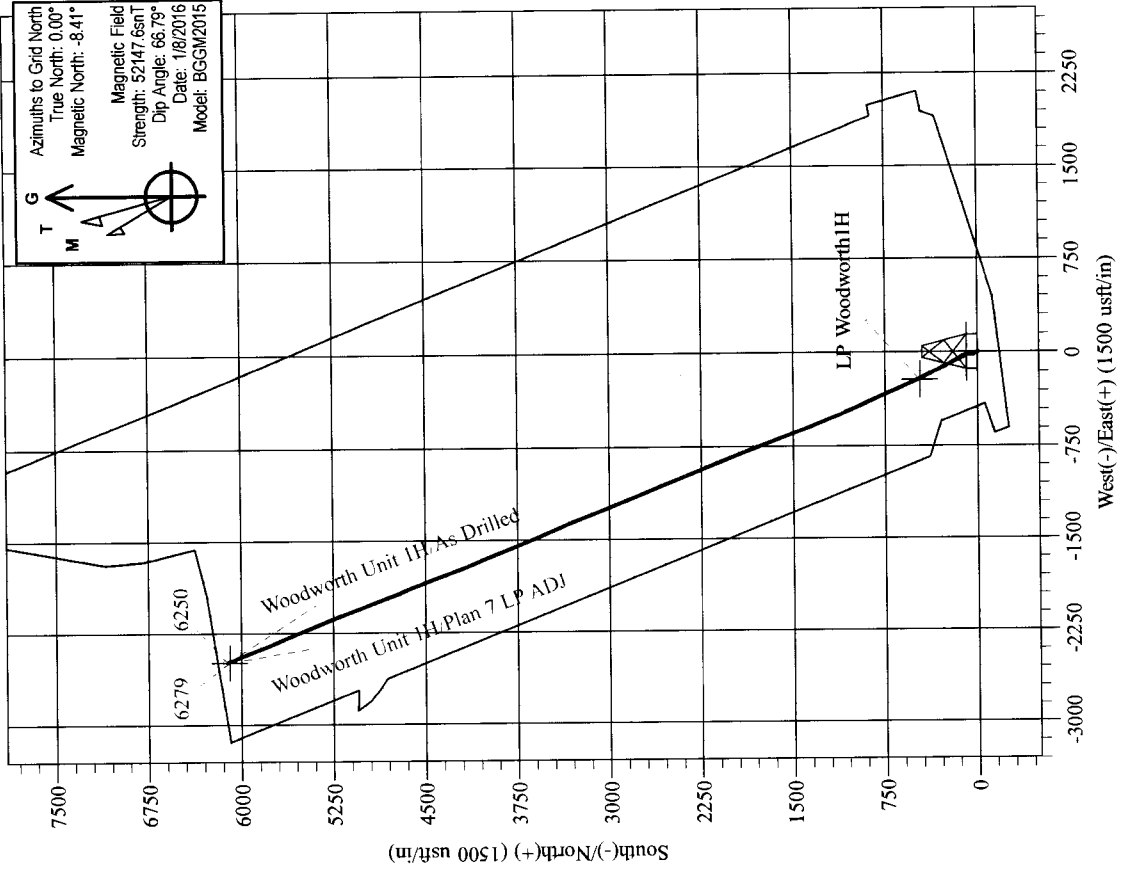
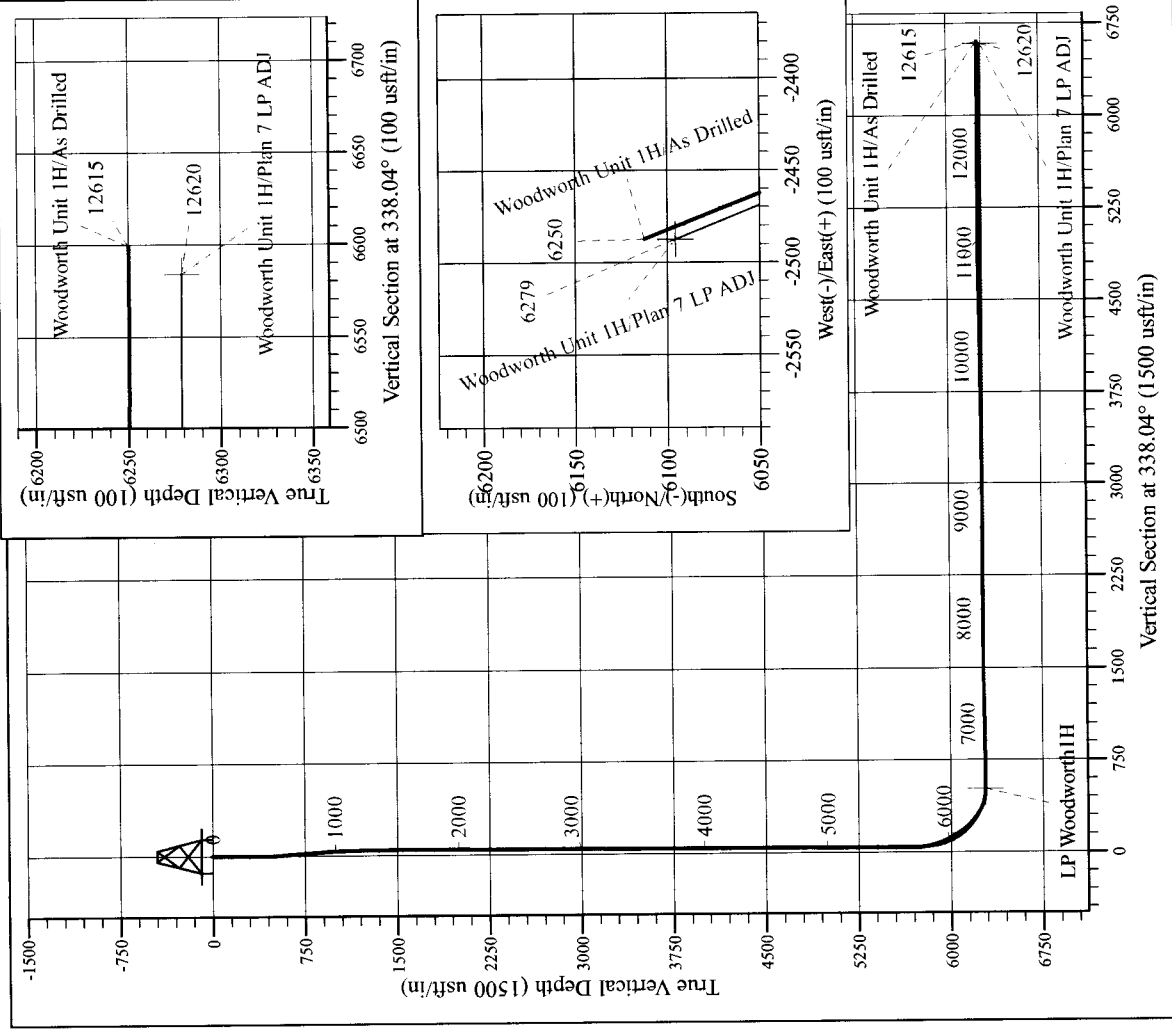
Hartley East Pad: Freeland/Plum Run/Woodworth
 Woodworth Unit 1H
 Plan 7 LP ADJ
 Precision 522: GL 1021' + KB 18' @ 1039.0usft
 Tyler County WV

PROJECT DETAILS:
 Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: 17N (84 W to 78 W)
 System Datum: Mean Sea Level



WELL DETAILS: Woodworth Unit 1H SHL

+N/-S	+E/-W	Northing	Latitude	Longitude
0.0	0.0	14294965.30	39° 21' 55.316 N	80° 59' 35.492 W



Woodworth Unit 1H
 Approx. BHL
 39° 22' 55.756 N 81° 0' 7.175 W

Shane Rhodes
 14:48, January 15 2016
 Scientific Drilling International
 124 Vista Drive
 Charleroi, PA 15022



Scientific Drilling International

Survey Report



Company: Antero Resources	Local Co-ordinate Reference: Well Woodworth Unit 1H
Project: Tyler County WV	TVD Reference: Precision 522: GL 1021' + KB 18' @ 1039.0usft
Site: Hartley East Pad:Freeland/Plum Run/Woodworth	MD Reference: Precision 522: GL 1021' + KB 18' @ 1039.0usft
Well: Woodworth Unit 1H	North Reference: Grid
Wellbore: Original Wellpath	Survey Calculation Method: Minimum Curvature
Design: As Drilled	Database: Antero NE

Project	Tyler County WV, Tyler Co West Virginia		
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	Hartley East Pad:Freeland/Plum Run/Woodworth		
Site Position:	Northing:	14,294,927.15 usft	Latitude: 39° 21' 54.939 N
From: Map	Easting:	1,642,331.42 usft	Longitude: 80° 59' 35.611 W
Position Uncertainty: 0.0 usft	Slot Radius: 13-3/16 "	Grid Convergence:	0.00 °

Well	Woodworth Unit 1H, Marcellus		
Well Position	+N/-S 0.0 usft	Northing: 14,294,965.30 usft	Latitude: 39° 21' 55.316 N
	+E/-W 0.0 usft	Easting: 1,642,340.77 usft	Longitude: 80° 59' 35.492 W
Position Uncertainty	2.0 usft	Wellhead Elevation: 1,039.0 usft	Ground Level: 1,021.0 usft

Wellbore	Original Wellpath				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	5/5/2015	-8.36	66.88	52,209
	BGGM2015	1/8/2016	-8.40	66.79	52,148

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	338.04

Survey Program	Date 1/15/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
105.0	5,505.4	Survey #6 Final Gyro (Original Wellpath)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
5,534.0	12,615.0	Survey #7 - SDI MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1

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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
105.0	0.40	188.34	105.0	-0.4	-0.1	-0.3	0.38	0.38	0.00	
First Gyro @ 105										
130.0	0.43	199.99	130.0	-0.5	-0.1	-0.5	0.36	0.12	46.60	
155.0	0.46	191.18	155.0	-0.7	-0.1	-0.6	0.30	0.12	-35.24	
180.0	0.38	173.24	180.0	-0.9	-0.2	-0.8	0.61	-0.32	-71.76	
205.0	0.23	170.34	205.0	-1.0	-0.1	-0.9	0.60	-0.60	-11.60	
230.0	0.24	170.79	230.0	-1.1	-0.1	-1.0	0.04	0.04	1.80	



Scientific Drilling International

Survey Report



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Project: Tyler County WV
Site: Hartley East Pad:Freeland/Plum Run/Woodworth
Well: Woodworth Unit 1H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Woodworth Unit 1H
TVD Reference: Precision 522: GL 1021' + KB 18' @ 1039.0usft
MD Reference: Precision 522: GL 1021' + KB 18' @ 1039.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
255.0	0.32	172.25	255.0	-1.3	-0.1	-1.1	0.32	0.32	5.84
280.0	0.33	162.69	280.0	-1.4	-0.1	-1.3	0.22	0.04	-38.24
305.0	0.29	168.82	305.0	-1.5	0.0	-1.4	0.21	-0.16	24.52
330.0	0.27	191.56	330.0	-1.6	0.0	-1.5	0.45	-0.08	90.96
355.0	0.06	298.03	355.0	-1.7	-0.1	-1.6	1.17	-0.84	425.88
380.0	0.30	319.04	380.0	-1.6	-0.1	-1.5	0.98	0.96	84.04
405.0	0.71	320.64	405.0	-1.5	-0.3	-1.3	1.64	1.64	6.40
430.0	1.24	323.37	430.0	-1.1	-0.5	-0.9	2.13	2.12	10.92
455.0	1.61	325.80	455.0	-0.6	-0.9	-0.3	1.50	1.48	9.72
480.0	1.69	327.09	480.0	0.0	-1.3	0.5	0.35	0.32	5.16
505.0	2.30	331.01	505.0	0.7	-1.7	1.3	2.50	2.44	15.68
530.0	2.84	336.67	529.9	1.7	-2.2	2.4	2.38	2.16	22.64
555.0	3.29	337.61	554.9	3.0	-2.7	3.8	1.81	1.80	3.76
580.0	4.06	337.64	579.8	4.4	-3.3	5.4	3.08	3.08	0.12
605.0	4.15	336.94	604.8	6.1	-4.0	7.2	0.41	0.36	-2.80
630.0	4.44	338.44	629.7	7.8	-4.7	9.0	1.24	1.16	6.00
655.0	4.84	340.81	654.6	9.7	-5.4	11.0	1.77	1.60	9.48
680.0	4.88	341.33	679.5	11.7	-6.1	13.2	0.24	0.16	2.08
705.0	4.94	340.78	704.4	13.7	-6.8	15.3	0.31	0.24	-2.20
730.0	5.06	340.83	729.4	15.8	-7.5	17.5	0.48	0.48	0.20
755.0	5.08	341.62	754.3	17.9	-8.2	19.7	0.29	0.08	3.16
780.0	5.13	341.25	779.2	20.0	-9.0	21.9	0.24	0.20	-1.48
805.0	5.12	341.83	804.1	22.1	-9.7	24.1	0.21	-0.04	2.32
830.0	4.86	342.16	829.0	24.2	-10.3	26.3	1.05	-1.04	1.32
855.0	4.64	341.99	853.9	26.2	-11.0	28.4	0.88	-0.88	-0.68
880.0	4.35	341.43	878.8	28.0	-11.6	30.3	1.17	-1.16	-2.24
905.0	4.01	341.49	903.7	29.7	-12.2	32.1	1.36	-1.36	0.24
930.0	3.67	341.92	928.7	31.3	-12.7	33.8	1.36	-1.36	1.72
955.0	3.40	341.97	953.6	32.8	-13.2	35.3	1.08	-1.08	0.20
980.0	3.04	340.21	978.6	34.1	-13.6	36.8	1.49	-1.44	-7.04
1,005.0	2.75	339.45	1,003.6	35.3	-14.1	38.0	1.17	-1.16	-3.04
1,030.0	2.47	340.19	1,028.5	36.4	-14.5	39.2	1.13	-1.12	2.96
1,055.0	2.17	338.76	1,053.5	37.3	-14.8	40.2	1.22	-1.20	-5.72
1,080.0	2.05	339.04	1,078.5	38.2	-15.1	41.1	0.48	-0.48	1.12
1,105.0	1.77	337.59	1,103.5	39.0	-15.4	41.9	1.14	-1.12	-5.80
1,130.0	1.55	337.36	1,128.5	39.6	-15.7	42.6	0.88	-0.88	-0.92
1,155.0	1.43	338.81	1,153.5	40.2	-16.0	43.3	0.50	-0.48	5.80
1,180.0	1.14	336.79	1,178.5	40.8	-16.2	43.9	1.17	-1.16	-8.08
1,205.0	0.96	341.71	1,203.4	41.2	-16.3	44.3	0.80	-0.72	19.68
1,230.0	0.90	335.44	1,228.4	41.6	-16.5	44.7	0.47	-0.24	-25.08
1,255.0	0.64	338.24	1,253.4	41.9	-16.6	45.0	1.05	-1.04	11.20
1,280.0	0.52	333.72	1,278.4	42.1	-16.7	45.3	0.51	-0.48	-18.08
1,305.0	0.36	352.72	1,303.4	42.3	-16.8	45.5	0.86	-0.64	76.00



Scientific Drilling International

Survey Report



Company: Antero Resources
Project: Tyler County WV
Site: Hartley East Pad:Freeland/Plum Run/Woodworth
Well: Woodworth Unit 1H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Woodworth Unit 1H
TVD Reference: Precision 522: GL 1021' + KB 18' @ 1039.0usft
MD Reference: Precision 522: GL 1021' + KB 18' @ 1039.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
1,330.0	0.21	349.63	1,328.4	42.4	-16.8	45.6	0.60	-0.60	-12.36
1,355.0	0.19	319.13	1,353.4	42.5	-16.8	45.7	0.43	-0.08	-122.00
1,380.0	0.22	310.73	1,378.4	42.5	-16.9	45.8	0.17	0.12	-33.60
1,405.0	0.23	329.02	1,403.4	42.6	-17.0	45.9	0.29	0.04	73.16
1,430.0	0.25	331.74	1,428.4	42.7	-17.0	46.0	0.09	0.08	10.88
1,455.0	0.23	330.20	1,453.4	42.8	-17.1	46.1	0.08	-0.08	-6.16
1,480.0	0.16	347.71	1,478.4	42.9	-17.1	46.2	0.36	-0.28	70.04
1,505.0	0.10	328.36	1,503.4	42.9	-17.1	46.2	0.29	-0.24	-77.40
1,530.0	0.16	331.45	1,528.4	43.0	-17.1	46.3	0.24	0.24	12.36
1,555.0	0.11	308.30	1,553.4	43.0	-17.2	46.3	0.29	-0.20	-92.60
1,580.0	0.09	339.55	1,578.4	43.1	-17.2	46.4	0.23	-0.08	125.00
1,605.0	0.14	323.11	1,603.4	43.1	-17.2	46.4	0.24	0.20	-65.76
1,630.0	0.11	300.17	1,628.4	43.1	-17.3	46.5	0.23	-0.12	-91.76
1,655.0	0.08	44.93	1,653.4	43.2	-17.3	46.5	0.61	-0.12	419.04
1,680.0	0.08	126.68	1,678.4	43.2	-17.3	46.5	0.42	0.00	327.00
1,705.0	0.14	142.09	1,703.4	43.1	-17.2	46.4	0.27	0.24	61.64
1,730.0	0.10	163.34	1,728.4	43.1	-17.2	46.4	0.24	-0.16	85.00
1,755.0	0.14	186.86	1,753.4	43.0	-17.2	46.3	0.25	0.16	94.08
1,780.0	0.11	202.83	1,778.4	43.0	-17.2	46.3	0.18	-0.12	63.88
1,805.0	0.11	206.12	1,803.4	42.9	-17.2	46.3	0.03	0.00	13.16
1,830.0	0.04	203.42	1,828.4	42.9	-17.2	46.2	0.28	-0.28	-10.80
1,855.0	0.10	233.17	1,853.4	42.9	-17.3	46.2	0.27	0.24	119.00
1,880.0	0.01	109.00	1,878.4	42.9	-17.3	46.2	0.42	-0.36	-496.68
1,905.0	0.04	81.21	1,903.4	42.9	-17.3	46.2	0.13	0.12	-111.16
1,930.0	0.08	145.96	1,928.4	42.9	-17.2	46.2	0.29	0.16	259.00
1,955.0	0.10	205.25	1,953.4	42.8	-17.2	46.2	0.36	0.08	237.16
1,980.0	0.18	175.18	1,978.4	42.8	-17.3	46.1	0.42	0.32	-120.28
2,005.0	0.12	226.58	2,003.4	42.7	-17.3	46.1	0.56	-0.24	205.60
2,030.0	0.08	231.17	2,028.4	42.7	-17.3	46.1	0.16	-0.16	18.36
2,055.0	0.12	189.17	2,053.4	42.6	-17.3	46.0	0.32	0.16	-168.00
2,080.0	0.04	241.39	2,078.4	42.6	-17.3	46.0	0.40	-0.32	208.88
2,105.0	0.04	198.99	2,103.4	42.6	-17.3	46.0	0.12	0.00	-169.60
2,130.0	0.13	158.77	2,128.4	42.6	-17.3	46.0	0.41	0.36	-160.88
2,155.0	0.27	155.48	2,153.4	42.5	-17.3	45.9	0.56	0.56	-13.16
2,180.0	0.22	88.22	2,178.4	42.4	-17.2	45.8	1.10	-0.20	-269.04
2,205.0	0.05	137.04	2,203.4	42.4	-17.2	45.8	0.76	-0.68	195.28
2,230.0	0.19	140.59	2,228.4	42.4	-17.1	45.7	0.56	0.56	14.20
2,255.0	0.08	115.24	2,253.4	42.4	-17.1	45.7	0.49	-0.44	-101.40
2,280.0	0.24	156.21	2,278.4	42.3	-17.1	45.6	0.75	0.64	163.88
2,305.0	0.19	122.78	2,303.4	42.2	-17.0	45.5	0.53	-0.20	-133.72
2,330.0	0.25	114.50	2,328.4	42.2	-16.9	45.4	0.27	0.24	-33.12
2,355.0	0.23	134.62	2,353.4	42.1	-16.8	45.4	0.34	-0.08	80.48



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Survey Report



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Site: Hartley East Pad:Freeland/Plum Run/Woodworth
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Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Woodworth Unit 1H
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MD Reference: Precision 522: GL 1021' + KB 18' @ 1039.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
2,380.0	0.30	125.05	2,378.4	42.0	-16.7	45.3	0.33	0.28	-38.28
2,405.0	0.10	196.92	2,403.4	42.0	-16.7	45.2	1.14	-0.80	287.48
2,430.0	0.26	142.64	2,428.4	41.9	-16.7	45.1	0.87	0.64	-217.12
2,455.0	0.24	155.69	2,453.4	41.8	-16.6	45.0	0.24	-0.08	52.20
2,480.0	0.24	168.89	2,478.4	41.7	-16.6	44.9	0.22	0.00	52.80
2,505.0	0.21	161.23	2,503.4	41.6	-16.6	44.8	0.17	-0.12	-30.64
2,530.0	0.22	146.05	2,528.4	41.6	-16.5	44.7	0.23	0.04	-60.72
2,555.0	0.28	149.99	2,553.4	41.5	-16.5	44.6	0.25	0.24	15.76
2,580.0	0.31	165.97	2,578.4	41.3	-16.4	44.5	0.35	0.12	63.92
2,605.0	0.25	169.26	2,603.4	41.2	-16.4	44.4	0.25	-0.24	13.16
2,630.0	0.32	178.82	2,628.4	41.1	-16.4	44.2	0.34	0.28	38.24
2,655.0	0.26	202.25	2,653.4	41.0	-16.4	44.1	0.53	-0.24	93.72
2,680.0	0.20	216.30	2,678.4	40.9	-16.4	44.1	0.33	-0.24	56.20
2,705.0	0.25	205.60	2,703.4	40.8	-16.5	44.0	0.26	0.20	-42.80
2,730.0	0.17	184.88	2,728.4	40.7	-16.5	43.9	0.44	-0.32	-82.88
2,755.0	0.26	200.13	2,753.4	40.6	-16.5	43.9	0.42	0.36	61.00
2,780.0	0.34	201.27	2,778.4	40.5	-16.6	43.8	0.32	0.32	4.56
2,805.0	0.27	218.69	2,803.4	40.4	-16.6	43.7	0.46	-0.28	69.68
2,830.0	0.26	213.59	2,828.4	40.3	-16.7	43.6	0.10	-0.04	-20.40
2,855.0	0.21	197.76	2,853.4	40.2	-16.8	43.6	0.33	-0.20	-63.32
2,880.0	0.26	205.11	2,878.4	40.1	-16.8	43.5	0.23	0.20	29.40
2,905.0	0.24	208.85	2,903.4	40.0	-16.8	43.4	0.10	-0.08	14.96
2,930.0	0.26	227.70	2,928.4	39.9	-16.9	43.4	0.34	0.08	75.40
2,955.0	0.28	213.37	2,953.4	39.8	-17.0	43.3	0.28	0.08	-57.32
2,980.0	0.22	211.13	2,978.4	39.8	-17.0	43.2	0.24	-0.24	-8.96
3,005.0	0.11	220.33	3,003.4	39.7	-17.1	43.2	0.45	-0.44	36.80
3,030.0	0.23	198.18	3,028.4	39.6	-17.1	43.2	0.54	0.48	-88.60
3,055.0	0.22	214.58	3,053.4	39.5	-17.2	43.1	0.26	-0.04	65.60
3,080.0	0.18	221.55	3,078.4	39.5	-17.2	43.0	0.19	-0.16	27.88
3,105.0	0.20	231.87	3,103.4	39.4	-17.3	43.0	0.16	0.08	41.28
3,130.0	0.17	214.43	3,128.4	39.4	-17.3	43.0	0.25	-0.12	-69.76
3,155.0	0.09	183.70	3,153.4	39.3	-17.4	42.9	0.41	-0.32	-122.92
3,180.0	0.17	191.85	3,178.4	39.3	-17.4	42.9	0.33	0.32	32.60
3,205.0	0.21	201.43	3,203.4	39.2	-17.4	42.8	0.20	0.16	38.32
3,230.0	0.22	210.34	3,228.4	39.1	-17.4	42.8	0.14	0.04	35.64
3,255.0	0.12	230.01	3,253.4	39.0	-17.5	42.7	0.46	-0.40	78.68
3,280.0	0.01	232.46	3,278.4	39.0	-17.5	42.7	0.44	-0.44	9.80
3,305.0	0.03	208.43	3,303.4	39.0	-17.5	42.7	0.09	0.08	-96.12
3,330.0	0.08	170.69	3,328.4	39.0	-17.5	42.7	0.24	0.20	-150.96
3,355.0	0.09	159.04	3,353.4	38.9	-17.5	42.7	0.08	0.04	-46.60
3,380.0	0.10	153.40	3,378.4	38.9	-17.5	42.6	0.05	0.04	-22.56
3,405.0	0.09	154.96	3,403.4	38.9	-17.5	42.6	0.04	-0.04	6.24
3,430.0	0.08	149.12	3,428.4	38.8	-17.4	42.5	0.05	-0.04	-23.36



Scientific Drilling International

Survey Report



Company: Antero Resources
Project: Tyler County WV
Site: Hartley East Pad:Freeland/Plum Run/Woodworth
Well: Woodworth Unit 1H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Woodworth Unit 1H
TVD Reference: Precision 522: GL 1021' + KB 18' @ 1039.0usft
MD Reference: Precision 522: GL 1021' + KB 18' @ 1039.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
3,455.0	0.16	137.65	3,453.4	38.8	-17.4	42.5	0.33	0.32	-45.88
3,480.0	0.13	133.08	3,478.4	38.8	-17.4	42.4	0.13	-0.12	-18.28
3,505.0	0.08	129.89	3,503.4	38.7	-17.3	42.4	0.20	-0.20	-12.76
3,530.0	0.08	185.44	3,528.4	38.7	-17.3	42.4	0.30	0.00	222.20
3,555.0	0.13	189.71	3,553.4	38.6	-17.3	42.3	0.20	0.20	17.08
3,580.0	0.09	177.36	3,578.4	38.6	-17.3	42.3	0.19	-0.16	-49.40
3,605.0	0.08	174.66	3,603.4	38.6	-17.3	42.2	0.04	-0.04	-10.80
3,630.0	0.04	95.09	3,628.4	38.5	-17.3	42.2	0.33	-0.16	-318.28
3,655.0	0.06	154.24	3,653.4	38.5	-17.3	42.2	0.21	0.08	236.60
3,680.0	0.06	140.88	3,678.4	38.5	-17.3	42.2	0.06	0.00	-53.44
3,705.0	0.06	113.05	3,703.4	38.5	-17.3	42.2	0.12	0.00	-111.32
3,730.0	0.08	126.10	3,728.4	38.5	-17.2	42.1	0.10	0.08	52.20
3,755.0	0.04	48.63	3,753.4	38.5	-17.2	42.1	0.33	-0.16	-309.88
3,780.0	0.11	82.16	3,778.4	38.5	-17.2	42.1	0.32	0.28	134.12
3,805.0	0.11	61.67	3,803.4	38.5	-17.1	42.1	0.16	0.00	-81.96
3,830.0	0.12	94.47	3,828.4	38.5	-17.1	42.1	0.26	0.04	131.20
3,855.0	0.21	53.05	3,853.4	38.5	-17.0	42.1	0.58	0.36	-165.68
3,880.0	0.27	69.45	3,878.4	38.6	-16.9	42.1	0.36	0.24	65.60
3,905.0	0.15	70.33	3,903.4	38.6	-16.9	42.1	0.48	-0.48	3.52
3,930.0	0.13	84.87	3,928.4	38.6	-16.8	42.1	0.16	-0.08	58.16
3,955.0	0.06	47.27	3,953.4	38.6	-16.8	42.1	0.36	-0.28	-150.40
3,980.0	0.14	39.83	3,978.4	38.7	-16.7	42.1	0.32	0.32	-29.76
4,005.0	0.26	41.22	4,003.4	38.7	-16.7	42.2	0.48	0.48	5.56
4,030.0	0.24	55.25	4,028.4	38.8	-16.6	42.2	0.26	-0.08	56.12
4,055.0	0.21	71.21	4,053.4	38.9	-16.5	42.2	0.28	-0.12	63.84
4,080.0	0.20	78.69	4,078.4	38.9	-16.4	42.2	0.11	-0.04	29.92
4,105.0	0.18	74.14	4,103.4	38.9	-16.3	42.2	0.10	-0.08	-18.20
4,130.0	0.11	52.16	4,128.4	38.9	-16.3	42.2	0.35	-0.28	-87.92
4,155.0	0.18	65.73	4,153.4	39.0	-16.2	42.2	0.31	0.28	54.28
4,180.0	0.21	69.46	4,178.4	39.0	-16.1	42.2	0.13	0.12	14.92
4,205.0	0.21	84.45	4,203.4	39.0	-16.1	42.2	0.22	0.00	59.96
4,230.0	0.21	113.86	4,228.4	39.0	-16.0	42.1	0.43	0.00	117.64
4,255.0	0.20	111.40	4,253.4	39.0	-15.9	42.1	0.05	-0.04	-9.84
4,280.0	0.13	79.98	4,278.4	38.9	-15.8	42.0	0.45	-0.28	-125.68
4,305.0	0.18	71.21	4,303.4	39.0	-15.8	42.0	0.22	0.20	-35.08
4,330.0	0.21	75.79	4,328.4	39.0	-15.7	42.0	0.14	0.12	18.32
4,355.0	0.25	101.57	4,353.4	39.0	-15.6	42.0	0.44	0.16	103.12
4,380.0	0.25	76.30	4,378.4	39.0	-15.5	41.9	0.44	0.00	-101.08
4,405.0	0.24	87.34	4,403.4	39.0	-15.4	41.9	0.19	-0.04	44.16
4,430.0	0.18	74.33	4,428.4	39.0	-15.3	41.9	0.31	-0.24	-52.04
4,455.0	0.19	74.13	4,453.4	39.0	-15.2	41.9	0.04	0.04	-0.80
4,480.0	0.25	62.78	4,478.4	39.1	-15.1	41.9	0.30	0.24	-45.40



Scientific Drilling International

Survey Report



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Design: As Drilled

Local Co-ordinate Reference: Well Woodworth Unit 1H
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MD Reference: Precision 522: GL 1021' + KB 18' @ 1039.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
4,505.0	0.22	88.03	4,503.4	39.1	-15.0	41.9	0.43	-0.12	101.00
4,530.0	0.27	96.84	4,528.4	39.1	-14.9	41.8	0.25	0.20	35.24
4,555.0	0.21	98.36	4,553.4	39.1	-14.8	41.8	0.24	-0.24	6.08
4,580.0	0.21	83.21	4,578.4	39.1	-14.7	41.7	0.22	0.00	-60.60
4,605.0	0.21	76.60	4,603.4	39.1	-14.6	41.7	0.10	0.00	-26.44
4,630.0	0.24	87.22	4,628.4	39.1	-14.5	41.7	0.21	0.12	42.48
4,655.0	0.28	82.14	4,653.4	39.1	-14.4	41.7	0.18	0.16	-20.32
4,680.0	0.23	102.84	4,678.4	39.1	-14.3	41.6	0.42	-0.20	82.80
4,705.0	0.15	78.51	4,703.4	39.1	-14.2	41.6	0.45	-0.32	-97.32
4,730.0	0.23	83.53	4,728.4	39.1	-14.1	41.6	0.33	0.32	20.08
4,755.0	0.22	103.82	4,753.4	39.1	-14.0	41.5	0.32	-0.04	81.16
4,780.0	0.22	86.56	4,778.4	39.1	-13.9	41.5	0.26	0.00	-69.04
4,805.0	0.38	75.87	4,803.4	39.1	-13.8	41.5	0.68	0.64	-42.76
4,830.0	0.31	79.79	4,828.4	39.2	-13.7	41.4	0.30	-0.28	15.68
4,855.0	0.24	67.81	4,853.4	39.2	-13.6	41.4	0.36	-0.28	-47.92
4,880.0	0.18	103.82	4,878.4	39.2	-13.5	41.4	0.57	-0.24	144.04
4,905.0	0.23	63.12	4,903.4	39.2	-13.4	41.4	0.60	0.20	-162.80
4,930.0	0.28	72.33	4,928.4	39.3	-13.3	41.4	0.26	0.20	36.84
4,955.0	0.27	81.42	4,953.4	39.3	-13.2	41.4	0.18	-0.04	36.36
4,980.0	0.32	85.67	4,978.4	39.3	-13.0	41.3	0.22	0.20	17.00
5,005.0	0.16	71.64	5,003.4	39.3	-12.9	41.3	0.68	-0.64	-56.12
5,030.0	0.18	105.36	5,028.4	39.3	-12.9	41.3	0.40	0.08	134.88
5,055.0	0.16	96.23	5,053.4	39.3	-12.8	41.2	0.13	-0.08	-36.52
5,080.0	0.21	63.95	5,078.4	39.3	-12.7	41.2	0.45	0.20	-129.12
5,105.0	0.22	59.34	5,103.4	39.4	-12.6	41.2	0.08	0.04	-18.44
5,130.0	0.26	74.34	5,128.4	39.4	-12.5	41.2	0.30	0.16	60.00
5,155.0	0.20	74.01	5,153.4	39.4	-12.4	41.2	0.24	-0.24	-1.32
5,180.0	0.21	59.11	5,178.4	39.5	-12.4	41.2	0.22	0.04	-59.60
5,205.0	0.21	69.19	5,203.4	39.5	-12.3	41.2	0.15	0.00	40.32
5,230.0	0.19	71.52	5,228.4	39.5	-12.2	41.2	0.09	-0.08	9.32
5,255.0	0.16	85.56	5,253.4	39.6	-12.1	41.2	0.21	-0.12	56.16
5,280.0	0.13	88.60	5,278.4	39.6	-12.1	41.2	0.12	-0.12	12.16
5,305.0	0.10	109.74	5,303.4	39.6	-12.0	41.2	0.21	-0.12	84.56
5,330.0	0.20	50.59	5,328.4	39.6	-12.0	41.2	0.69	0.40	-236.60
5,355.0	0.10	78.73	5,353.4	39.6	-11.9	41.2	0.49	-0.40	112.56
5,380.0	0.21	55.60	5,378.4	39.6	-11.8	41.2	0.50	0.44	-92.52
5,405.0	0.23	83.96	5,403.4	39.7	-11.8	41.2	0.44	0.08	113.44
5,430.0	0.18	66.89	5,428.4	39.7	-11.7	41.2	0.31	-0.20	-68.28
5,455.0	0.21	73.28	5,453.4	39.7	-11.6	41.2	0.15	0.12	25.56
5,480.0	0.29	91.45	5,478.4	39.7	-11.5	41.1	0.45	0.32	72.68
5,505.0	0.23	103.49	5,503.4	39.7	-11.4	41.1	0.32	-0.24	48.16
Last Gyro @ 5505									
5,505.4	0.23	110.04	5,503.8	39.7	-11.4	41.1	6.41	0.00	1,597.56



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Survey Report



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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)
5,534.0	0.30	106.94	5,532.4	39.7	-11.2	41.0	0.25	0.24	-10.84
First SDI MWD @ 5534									
5,627.0	0.34	139.66	5,625.4	39.4	-10.8	40.6	0.20	0.04	35.18
5,719.0	0.18	188.37	5,717.4	39.0	-10.7	40.2	0.28	-0.17	52.95
5,750.0	1.95	327.95	5,748.4	39.4	-11.0	40.7	6.74	5.71	450.26
5,781.0	6.87	333.09	5,779.3	41.5	-12.1	43.0	15.91	15.87	16.58
5,812.0	10.97	342.59	5,809.9	46.0	-13.8	47.8	14.01	13.23	30.65
5,843.0	14.48	355.40	5,840.2	52.7	-15.0	54.5	14.46	11.32	41.32
5,874.0	16.62	351.85	5,870.0	60.9	-15.9	62.5	7.55	6.90	-11.45
5,905.0	19.28	350.59	5,899.5	70.4	-17.4	71.8	8.67	8.58	-4.06
5,936.0	21.73	349.81	5,928.6	81.1	-19.3	82.4	7.95	7.90	-2.52
5,966.0	25.16	345.70	5,956.1	92.7	-21.8	94.2	12.66	11.43	-13.70
5,997.0	28.34	342.36	5,983.8	106.1	-25.7	108.0	11.34	10.26	-10.77
6,028.0	29.39	335.33	6,010.9	120.1	-31.1	123.0	11.45	3.39	-22.68
6,059.0	30.36	332.78	6,037.8	133.9	-37.8	138.4	5.15	3.13	-8.23
6,090.0	32.33	330.89	6,064.3	148.2	-45.5	154.4	7.10	6.35	-6.10
6,121.0	35.80	329.84	6,089.9	163.2	-54.0	171.6	11.35	11.19	-3.39
6,152.0	39.50	329.45	6,114.5	179.6	-63.6	190.3	11.96	11.94	-1.26
6,171.0	42.00	329.10	6,128.9	190.2	-70.0	202.6	13.19	13.13	-1.85
Middlesex @ 6171									
6,182.0	43.44	328.91	6,137.0	196.6	-73.8	210.0	13.19	13.14	-1.71
6,213.0	46.79	333.56	6,158.8	215.9	-84.3	231.8	15.15	10.81	15.00
6,244.0	50.38	334.00	6,179.3	236.7	-94.6	254.9	11.63	11.58	1.42
6,275.0	53.34	334.12	6,198.5	258.7	-105.3	279.3	9.55	9.55	0.39
6,306.0	56.32	334.52	6,216.3	281.5	-116.2	304.5	9.67	9.61	1.29
6,307.0	56.43	334.48	6,216.9	282.2	-116.6	305.4	11.87	11.30	-4.35
Burket @ 6307									
6,330.0	59.04	333.51	6,229.2	299.7	-125.1	324.8	11.87	11.32	-4.22
Tully @ 6330									
6,337.0	59.83	333.22	6,232.7	305.1	-127.8	330.8	11.87	11.34	-4.07
6,344.0	60.88	333.36	6,236.2	310.5	-130.6	336.8	15.04	14.93	2.07
Marcellus @ 6344									
6,367.0	64.31	333.82	6,246.8	328.8	-139.6	357.2	15.04	14.93	1.98
6,398.0	70.07	333.80	6,258.8	354.5	-152.3	385.7	18.58	18.58	-0.06
6,429.0	76.11	334.84	6,267.8	381.2	-165.1	415.3	19.75	19.48	3.35
6,463.0	83.36	335.38	6,273.9	411.5	-179.2	448.7	21.38	21.32	1.59
6,494.0	87.57	335.86	6,276.3	439.7	-191.9	479.5	13.67	13.58	1.55
6,524.0	87.87	335.42	6,277.5	467.0	-204.3	509.5	1.77	1.00	-1.47
6,617.0	89.96	336.47	6,279.3	551.9	-242.2	602.4	2.51	2.25	1.13
6,709.0	89.62	336.02	6,279.6	636.1	-279.2	694.3	0.61	-0.37	-0.49
6,802.0	90.80	335.87	6,279.3	721.0	-317.2	787.3	1.28	1.27	-0.16
6,894.0	90.51	337.45	6,278.2	805.5	-353.6	879.2	1.75	-0.32	1.72
6,986.0	89.93	335.87	6,277.9	889.9	-390.0	971.2	1.83	-0.63	-1.72



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Survey Report



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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)
7,079.0	90.87	336.62	6,277.2	975.0	-427.5	1,064.2	1.29	1.01	0.81
7,171.0	90.98	337.08	6,275.7	1,059.6	-463.7	1,156.1	0.51	0.12	0.50
7,264.0	89.90	336.13	6,275.0	1,145.0	-500.6	1,249.1	1.55	-1.16	-1.02
7,356.0	89.70	338.25	6,275.3	1,229.8	-536.3	1,341.1	2.31	-0.22	2.30
7,449.0	90.74	338.77	6,275.0	1,316.3	-570.3	1,434.1	1.25	1.12	0.56
7,541.0	90.64	338.74	6,273.9	1,402.0	-603.7	1,526.1	0.11	-0.11	-0.03
7,634.0	90.40	338.49	6,273.0	1,488.6	-637.6	1,619.1	0.37	-0.26	-0.27
7,727.0	90.53	339.18	6,272.3	1,575.4	-671.1	1,712.0	0.75	0.14	0.74
7,819.0	90.19	339.43	6,271.7	1,661.4	-703.7	1,804.0	0.46	-0.37	0.27
7,912.0	90.80	338.93	6,270.9	1,748.3	-736.7	1,897.0	0.85	0.66	-0.54
8,005.0	90.83	338.81	6,269.6	1,835.1	-770.2	1,990.0	0.13	0.03	-0.13
8,097.0	90.39	338.95	6,268.6	1,920.9	-803.4	2,082.0	0.50	-0.48	0.15
8,190.0	90.09	338.99	6,268.2	2,007.7	-836.8	2,174.9	0.33	-0.32	0.04
8,282.0	90.25	338.71	6,267.9	2,093.5	-869.9	2,266.9	0.35	0.17	-0.30
8,375.0	89.81	337.47	6,267.9	2,179.8	-904.7	2,359.9	1.41	-0.47	-1.33
8,467.0	90.48	338.00	6,267.6	2,264.9	-939.5	2,451.9	0.93	0.73	0.58
8,560.0	89.74	337.58	6,267.5	2,351.0	-974.7	2,544.9	0.91	-0.80	-0.45
8,653.0	90.45	337.76	6,267.3	2,437.0	-1,010.0	2,637.9	0.79	0.76	0.19
8,745.0	90.58	338.09	6,266.5	2,522.3	-1,044.6	2,729.9	0.39	0.14	0.36
8,838.0	89.57	338.27	6,266.4	2,608.6	-1,079.1	2,822.9	1.10	-1.09	0.19
8,930.0	89.64	337.70	6,267.0	2,693.9	-1,113.6	2,914.9	0.62	0.08	-0.62
9,023.0	89.34	336.42	6,267.8	2,779.6	-1,149.9	3,007.9	1.41	-0.32	-1.38
9,115.0	90.21	337.55	6,268.2	2,864.2	-1,185.8	3,099.9	1.55	0.95	1.23
9,208.0	90.82	337.45	6,267.3	2,950.2	-1,221.4	3,192.9	0.66	0.66	-0.11
9,301.0	90.35	338.60	6,266.4	3,036.4	-1,256.2	3,285.9	1.34	-0.51	1.24
9,393.0	89.88	338.82	6,266.2	3,122.1	-1,289.6	3,377.9	0.56	-0.51	0.24
9,486.0	90.14	338.58	6,266.2	3,208.8	-1,323.4	3,470.9	0.38	0.28	-0.26
9,578.0	90.04	338.08	6,266.0	3,294.3	-1,357.4	3,562.9	0.55	-0.11	-0.54
9,671.0	90.28	337.05	6,265.8	3,380.2	-1,392.9	3,655.8	1.14	0.26	-1.11
9,763.0	90.58	336.32	6,265.1	3,464.7	-1,429.3	3,747.8	0.86	0.33	-0.79
9,856.0	90.55	337.37	6,264.2	3,550.2	-1,465.9	3,840.8	1.13	-0.03	1.13
9,949.0	89.94	337.92	6,263.8	3,636.2	-1,501.2	3,933.8	0.88	-0.66	0.59
10,041.0	91.08	337.67	6,263.0	3,721.4	-1,536.0	4,025.8	1.27	1.24	-0.27
10,133.0	91.76	338.61	6,260.7	3,806.7	-1,570.2	4,117.8	1.26	0.74	1.02
10,226.0	90.61	338.25	6,258.8	3,893.2	-1,604.4	4,210.7	1.30	-1.24	-0.39
10,319.0	90.41	337.51	6,257.9	3,979.4	-1,639.4	4,303.7	0.82	-0.22	-0.80
10,411.0	90.58	336.54	6,257.1	4,064.1	-1,675.3	4,395.7	1.07	0.18	-1.05
10,504.0	91.42	337.25	6,255.5	4,149.6	-1,711.8	4,488.7	1.18	0.90	0.76
10,596.0	91.96	338.48	6,252.8	4,234.8	-1,746.5	4,580.6	1.46	0.59	1.34
10,689.0	91.45	339.30	6,250.0	4,321.5	-1,780.0	4,673.6	1.04	-0.55	0.88
10,781.0	90.45	340.10	6,248.5	4,407.8	-1,811.9	4,765.5	1.39	-1.09	0.87
10,874.0	89.27	339.25	6,248.7	4,495.0	-1,844.2	4,858.5	1.56	-1.27	-0.91
10,966.0	89.40	338.23	6,249.8	4,580.7	-1,877.5	4,950.5	1.12	0.14	-1.11



Scientific Drilling International

Survey Report



Company: Antero Resources
Project: Tyler County WV
Site: Hartley East Pad:Freeland/Plum Run/Woodworth
Well: Woodworth Unit 1H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Woodworth Unit 1H
TVD Reference: Precision 522: GL 1021' + KB 18' @ 1039.0usft
MD Reference: Precision 522: GL 1021' + KB 18' @ 1039.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
11,059.0	90.65	337.64	6,249.8	4,666.9	-1,912.5	5,043.5	1.49	1.34	-0.63
11,152.0	89.74	339.04	6,249.4	4,753.3	-1,946.8	5,136.5	1.80	-0.98	1.51
11,244.0	89.74	339.03	6,249.9	4,839.2	-1,979.7	5,228.4	0.01	0.00	-0.01
11,337.0	90.04	338.66	6,250.0	4,926.0	-2,013.3	5,321.4	0.51	0.32	-0.40
11,429.0	90.31	338.86	6,249.8	5,011.7	-2,046.6	5,413.4	0.37	0.29	0.22
11,522.0	90.58	339.36	6,249.0	5,098.6	-2,079.8	5,506.4	0.61	0.29	0.54
11,615.0	89.81	338.99	6,248.7	5,185.5	-2,112.8	5,599.4	0.92	-0.83	-0.40
11,707.0	89.20	338.38	6,249.5	5,271.2	-2,146.3	5,691.4	0.94	-0.66	-0.66
11,800.0	89.03	337.81	6,251.0	5,357.5	-2,181.0	5,784.4	0.64	-0.18	-0.61
11,892.0	89.03	337.21	6,252.5	5,442.5	-2,216.1	5,876.3	0.65	0.00	-0.65
11,985.0	90.68	337.97	6,252.7	5,528.5	-2,251.6	5,969.3	1.95	1.77	0.82
12,078.0	91.38	338.03	6,251.1	5,614.7	-2,286.4	6,062.3	0.76	0.75	0.06
12,170.0	90.17	337.51	6,249.8	5,699.8	-2,321.2	6,154.3	1.43	-1.32	-0.57
12,263.0	90.41	337.51	6,249.4	5,785.7	-2,356.8	6,247.3	0.26	0.26	0.00
12,355.0	89.60	337.73	6,249.4	5,870.8	-2,391.8	6,339.3	0.91	-0.88	0.24
12,448.0	89.64	338.69	6,250.0	5,957.1	-2,426.3	6,432.3	1.03	0.04	1.03
12,540.0	89.87	338.66	6,250.4	6,042.8	-2,459.8	6,524.3	0.25	0.25	-0.03
12,550.0	90.07	338.52	6,250.4	6,052.2	-2,463.5	6,534.3	2.44	1.99	-1.40
Last SDI MWD @ 12550									
12,615.0	90.07	338.52	6,250.3	6,112.7	-2,487.3	6,599.3	0.00	0.00	0.00
Projection To Bit @ 12615 MD / 6250 TVD									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,171.0	6,128.9	Middlesex @ 6171		0.00	
6,307.0	6,216.9	Burket @ 6307		0.00	
6,330.0	6,229.2	Tully @ 6330		0.00	
6,344.0	6,236.2	Marcellus @ 6344		0.00	

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
105.0	105.0	-0.4	-0.1	First Gyro @ 105
5,505.0	5,503.4	39.7	-11.4	Last Gyro @ 5505
5,534.0	5,532.4	39.7	-11.2	First SDI MWD @ 5534
12,550.0	6,250.4	6,052.2	-2,463.5	Last SDI MWD @ 12550
12,615.0	6,250.3	6,112.7	-2,487.3	Projection To Bit @ 12615 MD / 6250 TVD

Checked By: _____ Approved By: _____ Date: _____