



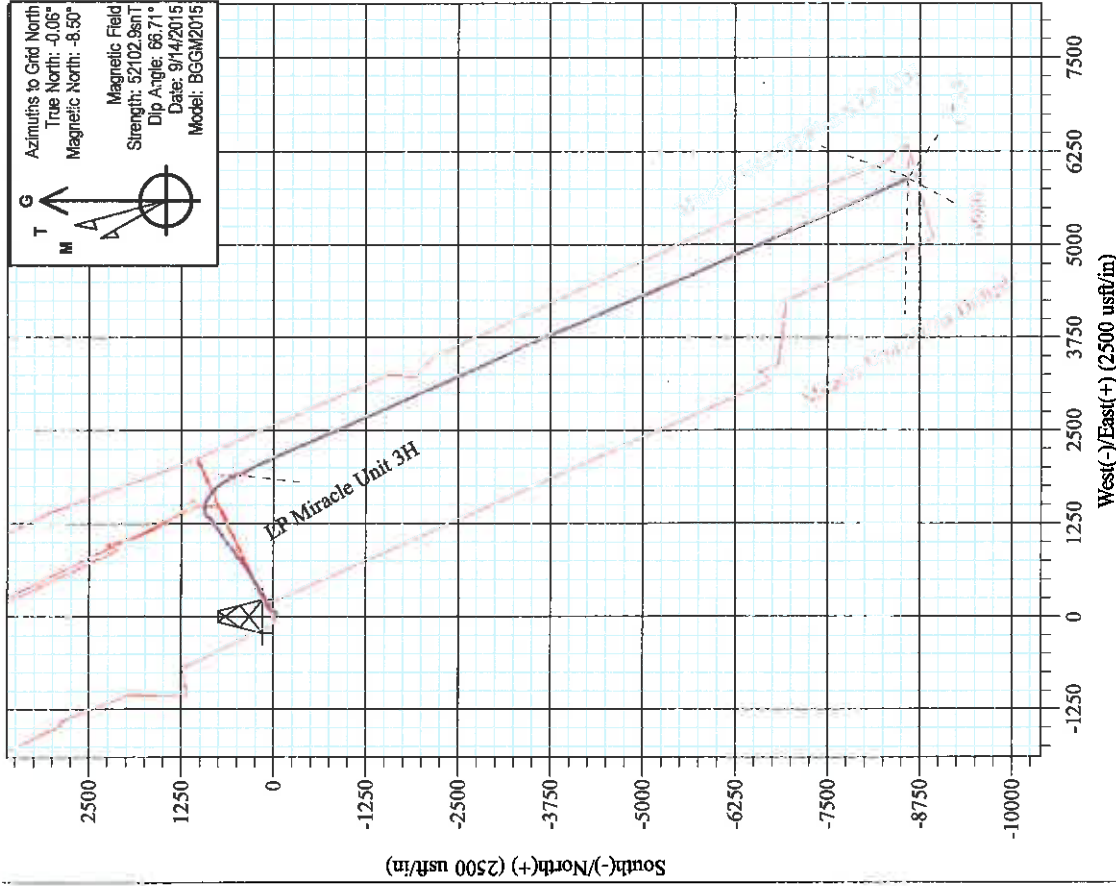
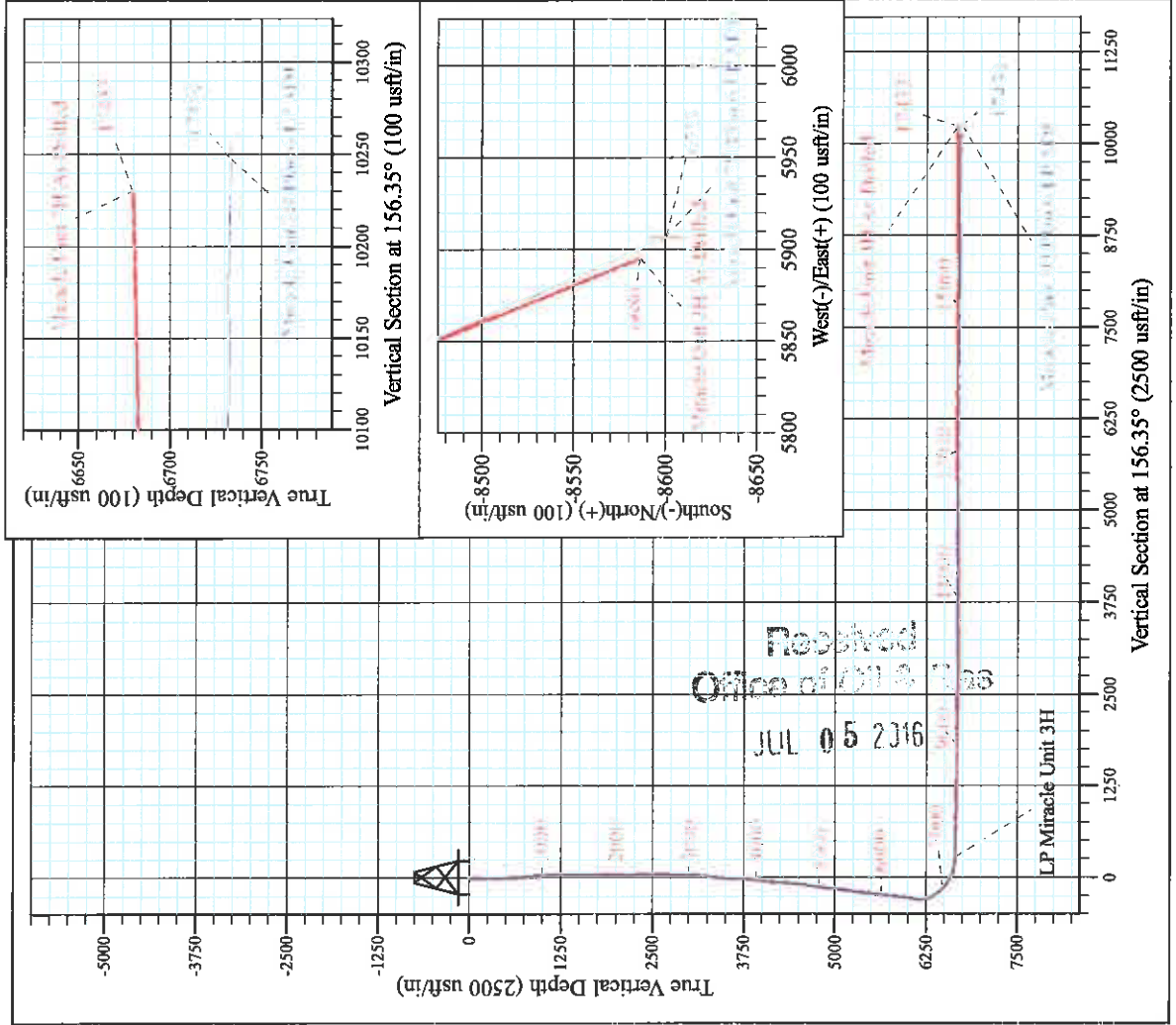
Edwin Pad: Hornet/Miracle/Moats/Myrtle
 Miracle Unit 3H
 Plan 6 LP ADJ
 Precision 522: 1191' GL + 18' KB @ 1209.0usft
 Ritchie County WV

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: Miracle Unit 3H SHL

+N/-S	+E/-W	Northing	Latitude	Longitude
0.0	0.0	14245805.54	39° 13' 49.095 N	80° 54' 10.797 W



Azimuths to Grid North
 True North: -0.06°
 Magnetic North: -8.60°

Magnetic Field
 Strength: 52102.98nT
 Dip Angle: 66.71°
 Date: 9/14/2015
 Model: BGGM2015

Shane Rhodes
 10-17, September 29 2015
 Scientific Drilling International
 124 Vista Drive
 Charleroi, PA 15022

Miracle Unit 3H
 Approx. **BHL**
 39° 12' 24.127 N 80° 52' 55.989 W



Antero Resources

Ritchie County WV

Edwin Pad: Hornet/Miracle/Moats/Myrtle

Miracle Unit 3H

Original Wellpath

Design: As Drilled

Standard Survey Report

29 September, 2015

Received
Office of Oil & Gas
JUL 05 2016





Company:	Antero Resources	Local Co-ordinate Reference:	Well Miracle Unit 3H
Project:	Ritchie County WV	TVD Reference:	Precision 522. 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad. Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522. 1191' GL + 18' KB @ 1209.0usft
Well:	Miracle Unit 3H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Antero NE

Project	Ritchie County WV, Ritchie County WV, WV North		
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	Edwin Pad. Hornet/Miracle/Moats/Myrtle				
Site Position:		Northing:	14,245,885.63 usft	Latitude:	39° 13' 49.887 N
From:	Map	Easting:	1,667,891.73 usft	Longitude:	80° 54' 10.711 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.06 °

Well	Miracle Unit 3H, Marcellus					
Well Position	+N/-S	0.0 usft	Northing:	14,245,805.54 usft	Latitude:	39° 13' 49.095 N
	+E/-W	0.0 usft	Easting:	1,667,885.07 usft	Longitude:	80° 54' 10.797 W
Position Uncertainty		2.0 usft	Wellhead Elevation:	1,209.0 usft	Ground Level:	1,191.0 usft

Wellbore	Original Wellpath				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2015	9/14/2015	-8.44	66.71	52,103

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	156.35	

Survey Program	Date	9/29/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
105.0	6,293.0	Survey #5 Def Gyro to KOP (Original Well)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
6,421.0	17,433.0	Survey #6 MWD Surveys (Original Wellpa	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1	

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	0.35	144.89	105.0	-0.3	0.2	0.3	0.33	0.00	0.00	
First SDI Gyro @ 105 MD										
130.0	0.44	144.89	130.0	-0.4	0.3	0.5	0.36	0.36	0.00	
155.0	0.43	156.05	155.0	-0.6	0.4	0.7	0.34	-0.04	44.64	
180.0	0.14	198.07	180.0	-0.7	0.4	0.8	1.36	-1.16	168.08	
205.0	0.25	167.74	205.0	-0.8	0.4	0.9	0.59	0.44	-121.32	
230.0	0.30	162.46	230.0	-0.9	0.4	1.0	0.22	0.20	-21.12	
255.0	0.20	175.94	255.0	-1.0	0.5	1.1	0.46	-0.40	53.92	
280.0	0.15	202.72	280.0	-1.1	0.5	1.2	0.38	-0.20	107.12	



Company:	Antero Resources	Local Co-ordinate Reference:	Well Miracle Unit 3H
Project:	Ritchie County WV	TVD Reference:	Precision 522 1191' GL + 18' KB @ 1209 0usft
Site:	Edwin Pad Homet/Miracle/Moats/Myrtle	MD Reference:	Precision 522 1191' GL + 18' KB @ 1209 0usft
Well:	Miracle Unit 3H	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)
305.0	0.22	150.26	305.0	-1.1	0.5	1.2	0.70	0.28	-209.84
330.0	0.20	178.94	330.0	-1.2	0.5	1.3	0.42	-0.08	114.72
355.0	0.13	163.79	355.0	-1.3	0.5	1.4	0.33	-0.28	-60.60
380.0	0.05	151.37	380.0	-1.3	0.5	1.4	0.33	-0.32	-49.68
405.0	0.20	165.28	405.0	-1.4	0.5	1.5	0.61	0.60	55.64
430.0	0.22	124.63	430.0	-1.4	0.6	1.6	0.59	0.08	-162.60
455.0	0.85	127.07	455.0	-1.6	0.8	1.8	2.52	2.52	9.76
480.0	1.25	125.99	480.0	-1.9	1.1	2.2	1.60	1.60	-4.32
505.0	1.88	127.25	505.0	-2.3	1.7	2.7	2.52	2.52	5.04
530.0	2.36	125.02	530.0	-2.8	2.4	3.5	1.95	1.92	-8.92
555.0	2.90	124.13	554.9	-3.5	3.4	4.5	2.17	2.16	-3.56
580.0	3.57	123.38	579.9	-4.2	4.5	5.7	2.89	2.88	-3.00
605.0	4.12	124.37	604.8	-5.2	5.9	7.1	2.22	2.20	3.96
630.0	4.66	124.72	629.8	-6.3	7.5	8.8	2.16	2.16	1.40
655.0	5.11	124.41	654.7	-7.5	9.3	10.6	1.80	1.80	-1.24
680.0	5.21	125.39	679.6	-8.8	11.1	12.5	0.53	0.40	3.92
705.0	5.23	124.90	704.5	-10.1	13.0	14.4	0.20	0.08	-1.96
730.0	5.45	127.96	729.4	-11.4	14.8	16.4	1.44	0.88	12.24
755.0	5.60	129.34	754.2	-13.0	16.7	18.6	0.80	0.60	5.52
780.0	5.61	129.19	779.1	-14.5	18.6	20.7	0.07	0.04	-0.60
805.0	5.65	128.81	804.0	-16.0	20.5	22.9	0.22	0.16	-1.52
830.0	5.76	129.46	828.9	-17.6	22.4	25.1	0.51	0.44	2.60
855.0	5.83	129.58	853.8	-19.2	24.4	27.4	0.28	0.28	0.48
880.0	5.79	128.69	878.6	-20.8	26.4	29.6	0.39	-0.16	-3.56
905.0	4.80	128.89	903.5	-22.3	28.2	31.7	3.96	-3.96	0.80
930.0	4.39	128.05	928.4	-23.5	29.7	33.5	1.66	-1.64	-3.36
955.0	4.00	128.46	953.4	-24.6	31.2	35.1	1.56	-1.56	1.64
980.0	3.63	128.11	978.3	-25.7	32.5	36.5	1.48	-1.48	-1.40
1,005.0	3.47	129.26	1,003.3	-26.6	33.7	37.9	0.70	-0.64	4.60
1,030.0	3.15	129.98	1,028.2	-27.6	34.8	39.2	1.29	-1.28	2.88
1,055.0	2.83	130.47	1,053.2	-28.4	35.8	40.4	1.28	-1.28	1.96
1,080.0	2.52	131.13	1,078.2	-29.2	36.7	41.4	1.25	-1.24	2.64
1,105.0	2.33	131.75	1,103.1	-29.9	37.5	42.4	0.77	-0.76	2.48
1,130.0	2.21	131.50	1,128.1	-30.5	38.2	43.3	0.48	-0.48	-1.00
1,155.0	2.07	132.00	1,153.1	-31.1	38.9	44.1	0.56	-0.56	2.00
1,180.0	1.99	131.85	1,178.1	-31.7	39.6	44.9	0.32	-0.32	-0.60
1,205.0	1.73	131.17	1,203.1	-32.3	40.2	45.7	1.04	-1.04	-2.72
1,230.0	1.51	131.23	1,228.1	-32.7	40.7	46.3	0.88	-0.88	0.24
1,255.0	1.25	129.09	1,253.1	-33.1	41.1	46.8	1.06	-1.04	-8.56
1,280.0	1.20	129.30	1,278.1	-33.5	41.6	47.3	0.20	-0.20	0.84
1,305.0	1.01	130.32	1,303.1	-33.8	41.9	47.8	0.76	-0.76	4.08
1,330.0	0.95	131.09	1,328.0	-34.0	42.3	48.1	0.25	-0.24	3.08
1,355.0	0.76	128.47	1,353.0	-34.3	42.5	48.5	0.78	-0.76	-10.48

Received
Office of Oil & Gas
JUL 15 2016



Company:	Antero Resources	Local Co-ordinate Reference:	Well Miracle Unit 3H
Project:	Ritchie County WV	TVD Reference:	Precision 522. 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522. 1191' GL + 18' KB @ 1209.0usft
Well:	Miracle Unit 3H	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)
1,380.0	0.79	131.91	1,378.0	-34.5	42.8	48.8	0.22	0.12	13.76
1,405.0	0.82	130.01	1,403.0	-34.7	43.1	49.1	0.16	0.12	-7.60
1,430.0	0.72	122.70	1,428.0	-34.9	43.3	49.4	0.56	-0.40	-29.24
1,455.0	0.54	123.96	1,453.0	-35.1	43.6	49.6	0.72	-0.72	5.04
1,480.0	0.42	122.88	1,478.0	-35.2	43.7	49.8	0.48	-0.48	-4.32
1,505.0	0.46	133.27	1,503.0	-35.3	43.9	50.0	0.36	0.16	41.56
1,530.0	0.18	118.29	1,528.0	-35.4	44.0	50.1	1.16	-1.12	-59.92
1,555.0	0.02	176.33	1,553.0	-35.4	44.0	50.1	0.68	-0.64	232.16
1,580.0	0.14	147.80	1,578.0	-35.5	44.1	50.2	0.49	0.48	-114.12
1,605.0	0.17	144.76	1,603.0	-35.5	44.1	50.2	0.12	0.12	-12.16
1,630.0	0.05	167.43	1,628.0	-35.6	44.1	50.3	0.50	-0.48	90.68
1,655.0	0.04	222.17	1,653.0	-35.6	44.1	50.3	0.17	-0.04	218.96
1,680.0	0.05	221.00	1,678.0	-35.6	44.1	50.3	0.04	0.04	-4.68
1,705.0	0.08	142.22	1,703.0	-35.6	44.1	50.3	0.34	0.12	-315.12
1,730.0	0.05	126.14	1,728.0	-35.6	44.1	50.3	0.14	-0.12	-64.32
1,755.0	0.04	201.05	1,753.0	-35.6	44.1	50.4	0.22	-0.04	299.64
1,780.0	0.04	61.21	1,778.0	-35.6	44.1	50.4	0.30	0.00	-559.36
1,805.0	0.04	244.46	1,803.0	-35.6	44.1	50.4	0.32	0.00	-707.00
1,830.0	0.09	295.84	1,828.0	-35.6	44.1	50.3	0.29	0.20	205.52
1,855.0	0.06	289.64	1,853.0	-35.6	44.1	50.3	0.12	-0.12	-24.80
1,880.0	0.10	252.42	1,878.0	-35.6	44.0	50.3	0.25	0.16	-148.88
1,905.0	0.11	207.93	1,903.0	-35.7	44.0	50.3	0.32	0.04	-177.96
1,930.0	0.12	196.64	1,928.0	-35.7	44.0	50.4	0.10	0.04	-45.16
1,955.0	0.09	196.59	1,953.0	-35.8	44.0	50.4	0.12	-0.12	-0.20
1,980.0	0.10	221.47	1,978.0	-35.8	44.0	50.4	0.17	0.04	99.52
2,005.0	0.10	221.32	2,003.0	-35.8	43.9	50.4	0.00	0.00	-0.60
2,030.0	0.07	246.60	2,028.0	-35.8	43.9	50.4	0.19	-0.12	101.12
2,055.0	0.04	201.71	2,053.0	-35.9	43.9	50.4	0.20	-0.12	-179.56
2,080.0	0.06	220.47	2,078.0	-35.9	43.9	50.5	0.10	0.08	75.04
2,105.0	0.05	168.08	2,103.0	-35.9	43.9	50.5	0.20	-0.04	-209.56
2,130.0	0.06	161.61	2,128.0	-35.9	43.9	50.5	0.05	0.04	-25.88
2,155.0	0.11	142.30	2,153.0	-35.9	43.9	50.5	0.23	0.20	-77.24
2,180.0	0.05	283.94	2,178.0	-36.0	43.9	50.6	0.61	-0.24	566.56
2,205.0	0.15	312.06	2,203.0	-35.9	43.9	50.5	0.43	0.40	112.48
2,230.0	0.03	38.38	2,228.0	-35.9	43.8	50.5	0.60	-0.48	345.28
2,255.0	0.02	204.31	2,253.0	-35.9	43.8	50.5	0.20	-0.04	663.72
2,280.0	0.11	250.55	2,278.0	-35.9	43.8	50.5	0.39	0.36	184.96
2,305.0	0.12	205.14	2,303.0	-36.0	43.8	50.5	0.36	0.04	-181.64
2,330.0	0.08	256.10	2,328.0	-36.0	43.8	50.5	0.37	-0.16	203.84
2,355.0	0.08	169.61	2,353.0	-36.0	43.7	50.5	0.44	0.00	-345.96
2,380.0	0.17	257.07	2,378.0	-36.0	43.7	50.5	0.74	0.36	349.84
2,405.0	0.19	213.12	2,403.0	-36.1	43.6	50.6	0.54	0.08	-175.80
2,430.0	0.09	163.29	2,428.0	-36.1	43.6	50.6	0.60	-0.40	-199.32

Office of Oil & Gas
301 05 2016



Company:	Antero Resources	Local Co-ordinate Reference:	Well Miracle Unit 3H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad Homet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Miracle Unit 3H	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)
2,455.0	0.10	292.18	2,453.0	-36.1	43.6	50.6	0.69	0.04	515.56
2,480.0	0.08	216.95	2,478.0	-36.1	43.6	50.6	0.44	-0.08	-300.92
2,505.0	0.11	195.65	2,503.0	-36.2	43.6	50.6	0.18	0.12	-85.20
2,530.0	0.14	243.98	2,528.0	-36.2	43.5	50.6	0.42	0.12	193.32
2,555.0	0.23	267.45	2,553.0	-36.2	43.5	50.6	0.46	0.36	93.88
2,580.0	0.11	328.36	2,578.0	-36.2	43.4	50.6	0.80	-0.48	243.64
2,605.0	0.34	299.57	2,603.0	-36.2	43.3	50.5	1.00	0.92	-115.16
2,630.0	0.34	279.00	2,628.0	-36.1	43.2	50.4	0.49	0.00	-82.28
2,655.0	0.06	33.52	2,653.0	-36.1	43.1	50.4	1.48	-1.12	458.08
2,680.0	0.22	330.15	2,678.0	-36.0	43.1	50.3	0.80	0.64	-253.48
2,705.0	0.31	289.85	2,703.0	-36.0	43.0	50.2	0.80	0.36	-161.20
2,730.0	0.17	287.36	2,728.0	-35.9	42.9	50.1	0.56	-0.56	-9.96
2,755.0	0.25	291.58	2,753.0	-35.9	42.8	50.1	0.33	0.32	16.88
2,780.0	0.28	51.81	2,778.0	-35.8	42.8	50.0	1.84	0.12	480.92
2,805.0	1.08	65.35	2,803.0	-35.7	43.1	50.0	3.24	3.20	54.16
2,830.0	2.22	64.90	2,828.0	-35.4	43.7	50.0	4.56	4.56	-1.80
2,855.0	3.19	64.40	2,853.0	-34.9	44.8	49.9	3.88	3.88	-2.00
2,880.0	4.20	63.15	2,877.9	-34.2	46.2	49.9	4.05	4.04	-5.00
2,905.0	5.43	61.16	2,902.8	-33.2	48.1	49.7	4.96	4.92	-7.96
2,930.0	6.15	58.99	2,927.7	-31.9	50.3	49.4	3.01	2.88	-8.68
2,955.0	7.02	57.40	2,952.6	-30.4	52.7	49.0	3.56	3.48	-6.36
2,980.0	7.47	50.43	2,977.4	-28.6	55.3	48.3	3.95	1.80	-27.88
3,005.0	8.14	46.63	3,002.1	-26.3	57.8	47.3	3.38	2.68	-15.20
3,030.0	9.19	46.39	3,026.8	-23.7	60.5	46.0	4.20	4.20	-0.96
3,055.0	10.17	45.44	3,051.5	-20.8	63.5	44.5	3.97	3.92	-3.80
3,080.0	11.03	45.51	3,076.1	-17.6	66.8	42.9	3.44	3.44	0.28
3,105.0	11.50	45.38	3,100.6	-14.2	70.3	41.2	1.88	1.88	-0.52
3,130.0	12.35	44.93	3,125.0	-10.5	74.0	39.3	3.42	3.40	-1.80
3,155.0	13.13	44.43	3,149.4	-6.6	77.8	37.3	3.15	3.12	-2.00
3,180.0	14.26	43.87	3,173.7	-2.3	82.0	35.0	4.55	4.52	-2.24
3,205.0	14.93	43.47	3,197.9	2.2	86.3	32.6	2.71	2.68	-1.60
3,230.0	15.39	42.99	3,222.0	7.0	90.8	30.0	1.91	1.84	-1.92
3,255.0	15.58	42.80	3,246.1	11.9	95.3	27.4	0.79	0.76	-0.76
3,280.0	16.14	42.71	3,270.2	16.9	100.0	24.6	2.24	2.24	-0.36
3,305.0	16.71	44.12	3,294.2	22.0	104.8	21.9	2.78	2.28	5.64
3,330.0	17.38	45.81	3,318.1	27.2	110.0	19.2	3.33	2.68	6.76
3,355.0	17.97	46.73	3,341.9	32.4	115.5	16.6	2.81	2.36	3.68
3,380.0	18.54	47.93	3,365.6	37.8	121.3	14.1	2.73	2.28	4.80
3,405.0	18.95	49.39	3,389.3	43.1	127.3	11.6	2.49	1.64	5.84
3,430.0	19.31	51.03	3,412.9	48.3	133.6	9.3	2.59	1.44	6.56
3,455.0	19.91	51.75	3,436.5	53.5	140.1	7.2	2.59	2.40	2.88
3,480.0	20.33	52.63	3,459.9	58.8	146.9	5.1	2.07	1.68	3.52
3,505.0	21.02	53.93	3,483.3	64.1	154.0	3.1	3.31	2.76	5.20
3,530.0	22.07	56.00	3,506.6	69.4	161.5	1.3	5.18	4.20	8.28



Company:	Antero Resources	Local Co-ordinate Reference:	Well Miracle Unit 3H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Miracle Unit 3H	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)	
3,555.0	22.83	58.28	3,529.7	74.5	169.5	-0.3	4.62	3.04	9.12	
3,580.0	23.63	59.58	3,552.7	79.6	178.0	-1.5	3.80	3.20	5.20	
3,605.0	24.58	60.32	3,575.5	84.7	186.8	-2.7	3.99	3.80	2.96	
3,630.0	25.54	60.99	3,598.1	89.9	196.1	-3.7	4.00	3.84	2.68	
3,655.0	26.31	61.93	3,620.6	95.1	205.7	-4.6	3.49	3.08	3.76	
3,680.0	27.29	62.63	3,642.9	100.4	215.6	-5.4	4.12	3.92	2.80	
3,705.0	28.06	63.31	3,665.1	105.7	226.0	-6.1	3.33	3.08	2.72	
3,730.0	28.98	63.86	3,687.0	111.0	236.7	-6.7	3.83	3.68	2.20	
3,755.0	29.40	64.05	3,708.9	116.3	247.6	-7.2	1.72	1.68	0.76	
3,780.0	30.22	63.75	3,730.5	121.8	258.8	-7.7	3.33	3.28	-1.20	
3,805.0	30.12	63.13	3,752.2	127.4	270.0	-8.4	1.31	-0.40	-2.48	
3,830.0	30.18	62.45	3,773.8	133.1	281.2	-9.2	1.39	0.24	-2.72	
3,855.0	30.35	61.14	3,795.4	139.1	292.3	-10.2	2.73	0.68	-5.24	
3,880.0	30.09	59.36	3,817.0	145.3	303.2	-11.5	3.73	-1.04	-7.12	
3,905.0	30.46	57.34	3,838.6	152.0	314.0	-13.3	4.33	1.48	-8.08	
3,930.0	30.39	56.63	3,860.1	158.9	324.6	-15.3	1.47	-0.28	-2.84	
3,955.0	30.65	56.38	3,881.7	165.9	335.2	-17.5	1.16	1.04	-1.00	
3,980.0	30.68	56.26	3,903.2	172.9	345.8	-19.7	0.27	0.12	-0.48	
4,005.0	30.39	55.64	3,924.7	180.0	356.3	-22.0	1.71	-1.16	-2.48	
4,030.0	30.06	54.76	3,946.3	187.2	366.6	-24.4	2.21	-1.32	-3.52	
4,055.0	30.28	54.59	3,967.9	194.5	376.9	-27.0	0.94	0.88	-0.68	
4,080.0	30.29	54.48	3,989.5	201.8	387.1	-29.6	0.23	0.04	-0.44	
4,105.0	30.49	54.33	4,011.1	209.2	397.4	-32.2	0.86	0.80	-0.60	
4,130.0	30.16	54.18	4,032.6	216.5	407.7	-34.8	1.35	-1.32	-0.60	
4,155.0	30.31	54.23	4,054.2	223.9	417.9	-37.5	0.61	0.60	0.20	
4,180.0	30.46	54.25	4,075.8	231.3	428.1	-40.1	0.60	0.60	0.08	
4,205.0	30.40	54.26	4,097.4	238.7	438.4	-42.8	0.24	-0.24	0.04	
4,230.0	30.03	55.01	4,119.0	246.0	448.7	-45.3	2.11	-1.48	3.00	
4,255.0	29.68	56.50	4,140.6	253.0	459.0	-47.6	3.28	-1.40	5.96	
4,280.0	29.80	57.60	4,162.4	259.7	469.4	-49.6	2.23	0.48	4.40	
4,305.0	29.93	58.04	4,184.0	266.3	479.9	-51.5	1.02	0.52	1.76	
4,330.0	29.91	58.28	4,205.7	272.9	490.5	-53.2	0.49	-0.08	0.96	
4,355.0	29.66	58.38	4,227.4	279.4	501.1	-55.0	1.02	-1.00	0.40	
4,380.0	29.86	58.34	4,249.1	286.0	511.6	-56.7	0.80	0.80	-0.16	
4,405.0	29.95	58.49	4,270.8	292.5	522.3	-58.4	0.47	0.36	0.60	
4,430.0	29.80	58.48	4,292.5	299.0	532.9	-60.1	0.60	-0.60	-0.04	
4,455.0	30.05	58.50	4,314.1	305.5	543.5	-61.8	1.00	1.00	0.08	
4,480.0	30.52	58.39	4,335.7	312.1	554.2	-63.6	1.89	1.88	-0.44	
4,505.0	31.04	58.82	4,357.2	318.8	565.2	-65.3	2.26	2.08	-1.72	
4,530.0	31.70	58.96	4,378.5	325.5	576.3	-67.0	2.66	2.64	0.56	
4,555.0	32.08	59.03	4,399.8	332.3	587.6	-68.7	1.53	1.52	0.26	
4,580.0	32.28	58.96	4,420.9	339.2	599.0	-70.4	0.81	0.80	-0.28	
4,605.0	32.30	58.57	4,442.0	346.1	610.5	-72.1	0.84	0.08	-1.56	

Official Survey Log
Gas
JUL 05 2016



Company:	Antero Resources	Local Co-ordinate Reference:	Well Miracle Unit 3H
Project:	Ritchie County WV	TVD Reference:	Precision 522. 1191' GL + 18' KB @ 1209.0usft
Srte:	Edwin Pad: Homet/Miracle/Moats/Myrtle	MD Reference:	Precision 522. 1191' GL + 18' KB @ 1209.0usft
Well:	Miracle Unit 3H	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)	
4,630.0	32.43	58.13	4,463.2	353.1	621.9	-74.0	1.08	0.52	-1.78	
4,655.0	32.00	57.38	4,484.3	360.2	633.1	-76.0	2.35	-1.72	-3.00	
4,680.0	31.75	56.73	4,505.5	367.4	644.2	-78.1	1.70	-1.00	-2.60	
4,705.0	31.47	55.90	4,526.8	374.7	655.1	-80.4	2.07	-1.12	-3.32	
4,730.0	31.54	54.79	4,548.2	382.1	665.9	-82.9	2.34	0.28	-4.44	
4,755.0	31.60	53.86	4,569.5	389.7	676.5	-85.6	1.96	0.24	-3.72	
4,780.0	31.84	53.09	4,590.7	397.5	687.0	-88.5	1.62	0.16	-3.08	
4,805.0	31.72	52.71	4,612.0	405.4	697.5	-91.6	0.86	0.32	-1.52	
4,830.0	31.56	52.18	4,633.3	413.4	707.9	-94.7	1.28	-0.64	-2.12	
4,855.0	31.53	51.59	4,654.6	421.5	718.2	-98.0	1.24	-0.12	-2.36	
4,880.0	31.37	51.57	4,675.9	429.6	728.4	-101.3	0.64	-0.64	-0.08	
4,905.0	31.36	51.33	4,697.3	437.7	738.6	-104.7	0.50	-0.04	-0.96	
4,930.0	31.07	51.10	4,718.7	445.8	748.7	-108.1	1.25	-1.16	-0.92	
4,955.0	30.97	51.14	4,740.1	453.9	758.7	-111.5	0.41	-0.40	0.16	
4,980.0	30.82	51.46	4,761.5	462.0	768.7	-114.8	0.89	-0.60	1.28	
5,005.0	30.36	52.64	4,783.1	469.8	778.8	-117.9	3.03	-1.84	4.72	
5,030.0	29.98	53.53	4,804.7	477.3	788.8	-120.8	2.35	-1.52	3.56	
5,055.0	29.61	53.96	4,826.4	484.7	798.8	-123.5	1.71	-1.48	1.72	
5,080.0	29.60	54.61	4,848.1	491.9	808.8	-126.1	1.29	-0.04	2.60	
5,105.0	29.11	54.67	4,869.9	499.0	818.8	-128.6	1.96	-1.96	0.24	
5,130.0	29.11	54.90	4,891.7	506.0	828.8	-131.0	0.45	0.00	0.92	
5,155.0	29.28	55.16	4,913.6	513.0	838.8	-133.4	0.85	0.68	1.04	
5,180.0	29.57	55.33	4,935.3	520.0	848.9	-135.8	1.21	1.16	0.68	
5,205.0	29.86	55.26	4,957.0	527.0	859.0	-138.2	1.17	1.16	-0.28	
5,230.0	29.93	55.33	4,978.7	534.1	869.3	-140.6	0.31	0.28	0.28	
5,255.0	30.09	55.15	5,000.4	541.3	879.6	-143.0	0.73	0.64	-0.72	
5,280.0	30.14	54.46	5,022.0	548.5	889.8	-145.5	1.40	0.20	-2.76	
5,305.0	30.35	53.28	5,043.6	555.9	900.0	-148.2	2.52	0.84	-4.72	
5,330.0	30.41	52.60	5,065.2	563.5	910.1	-151.1	1.40	0.24	-2.72	
5,355.0	29.88	51.42	5,086.8	571.3	920.0	-154.2	3.18	-2.12	-4.72	
5,380.0	29.45	50.42	5,108.5	579.1	929.6	-157.5	2.62	-1.72	-4.00	
5,405.0	29.03	49.89	5,130.3	586.9	938.9	-160.9	1.97	-1.68	-2.12	
5,430.0	28.74	49.35	5,152.2	594.7	948.1	-164.4	1.56	-1.16	-2.16	
5,455.0	28.17	49.49	5,174.2	602.5	957.2	-167.9	2.30	-2.28	0.56	
5,480.0	28.14	50.16	5,196.2	610.1	966.2	-171.2	1.27	-0.12	2.68	
5,505.0	27.92	50.82	5,218.3	617.5	975.3	-174.4	1.52	-0.88	2.64	
5,530.0	28.02	51.32	5,240.4	624.9	984.4	-177.5	1.02	0.40	2.00	
5,555.0	28.37	51.58	5,262.4	632.3	993.6	-180.6	1.48	1.40	1.04	
5,580.0	28.40	52.27	5,284.4	639.6	1,003.0	-183.5	1.32	0.12	5.04	
5,605.0	28.89	53.78	5,306.3	646.8	1,012.6	-186.3	3.50	1.96	5.04	
5,630.0	29.42	54.51	5,328.2	653.9	1,022.4	-188.9	2.55	2.12	2.92	
5,655.0	30.61	55.82	5,349.8	661.1	1,032.7	-191.3	5.43	4.76	5.24	
5,680.0	31.46	56.94	5,371.2	668.2	1,043.4	-193.5	4.11	3.40	4.48	

Office of Oil & Gas
JUL 27 5 2016



Company:	Antero Resources	Local Co-ordinate Reference:	Well Miracle Unit 3H
Project:	Ritchie County WV	TVD Reference:	Precision 522 1191' GL + 18' KB @ 1209.0usft
Srte:	Edwin Pad Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522 1191' GL + 18' KB @ 1209.0usft
Well:	Miracle Unit 3H	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)
5,705.0	31.71	57.14	5,392.5	675.3	1,054.4	-195.6	1.08	1.00	0.80
5,730.0	31.94	57.25	5,413.8	682.5	1,065.5	-197.7	0.95	0.92	0.44
5,755.0	32.19	57.16	5,435.0	689.7	1,076.7	-199.8	1.02	1.00	-0.36
5,780.0	32.39	57.19	5,456.1	696.9	1,087.9	-202.0	0.80	0.80	0.12
5,805.0	32.22	57.07	5,477.2	704.2	1,099.1	-204.1	0.73	-0.68	-0.48
5,830.0	31.54	56.43	5,498.5	711.4	1,110.1	-206.3	3.04	-2.72	-2.56
5,855.0	30.95	56.05	5,519.8	718.6	1,120.9	-208.6	2.49	-2.36	-1.52
5,880.0	31.33	56.06	5,541.2	725.8	1,131.6	-210.9	1.52	1.52	0.04
5,905.0	31.41	56.00	5,562.6	733.1	1,142.4	-213.2	0.34	0.32	-0.24
5,930.0	31.12	55.39	5,584.0	740.4	1,153.2	-215.6	1.72	-1.16	-2.44
5,955.0	30.47	54.65	5,605.4	747.7	1,163.6	-218.1	3.01	-2.60	-2.96
5,980.0	29.96	54.09	5,627.0	755.1	1,173.9	-220.8	2.33	-2.04	-2.24
6,005.0	29.54	53.44	5,648.7	762.4	1,183.9	-223.5	2.12	-1.68	-2.60
6,030.0	28.90	52.63	5,670.6	769.7	1,193.6	-226.3	3.01	-2.56	-3.24
6,055.0	28.70	52.54	5,692.5	777.1	1,203.2	-229.1	0.82	-0.80	-0.36
6,080.0	28.60	53.56	5,714.4	784.3	1,212.8	-231.9	2.00	-0.40	4.08
6,105.0	28.61	54.83	5,736.3	791.3	1,222.5	-234.4	2.43	0.04	5.08
6,130.0	27.98	55.64	5,758.4	798.0	1,232.2	-236.7	2.95	-2.52	3.24
6,155.0	27.83	56.00	5,780.5	804.6	1,241.9	-238.8	0.90	-0.60	1.44
6,180.0	28.47	56.68	5,802.5	811.1	1,251.7	-240.9	2.86	2.56	2.72
6,205.0	28.58	57.12	5,824.5	817.7	1,261.7	-242.8	0.95	0.44	1.76
6,230.0	27.89	56.09	5,846.5	824.2	1,271.6	-244.8	3.36	-2.76	-4.12
6,255.0	27.74	56.16	5,868.6	830.7	1,281.3	-246.9	0.62	-0.60	0.36
6,280.0	27.98	57.01	5,890.7	837.1	1,291.0	-248.9	1.82	0.96	3.32
6,293.0	28.18	56.55	5,902.2	840.4	1,296.1	-249.9	2.27	1.54	-3.54
Last SDI Gyro @ 6293 MD									
6,421.0	29.42	46.50	6,014.4	878.8	1,344.2	-265.7	3.90	0.97	-7.85
First SDI MWD @ 6421 MD									
6,451.0	29.41	43.99	6,040.5	889.1	1,354.7	-271.0	4.11	-0.03	-8.37
6,482.0	29.16	44.11	6,067.6	900.0	1,365.2	-276.8	0.83	-0.81	0.39
6,513.0	28.20	46.54	6,094.8	910.5	1,375.8	-282.1	4.87	-3.10	7.84
6,544.0	27.50	49.26	6,122.2	920.2	1,386.5	-286.7	4.68	-2.26	8.77
6,575.0	27.01	55.50	6,149.7	928.9	1,397.7	-290.2	9.35	-1.58	20.13
6,606.0	27.86	64.36	6,177.3	936.0	1,410.1	-291.7	13.44	2.74	26.58
6,636.0	29.02	73.01	6,203.7	941.2	1,423.4	-291.1	14.25	3.87	28.83
6,667.0	31.60	81.73	6,230.4	944.5	1,438.6	-288.1	16.44	8.32	28.13
6,698.0	33.83	88.89	6,256.5	945.9	1,455.3	-282.6	14.40	7.19	23.10
6,729.0	36.68	94.82	6,281.8	945.3	1,473.1	-274.9	14.08	9.19	18.48
6,745.0	37.61	97.11	6,294.6	944.3	1,482.7	-270.2	11.06	5.82	15.57
Sycamore @ 6745 MD									
6,760.0	38.53	99.35	6,306.4	943.0	1,491.9	-265.3	11.06	6.12	14.93
6,791.0	40.15	104.20	6,330.4	938.9	1,511.1	-253.9	11.21	5.23	15.85
6,821.0	41.57	108.48	6,353.1	933.4	1,529.9	-241.3	10.46	4.73	14.27
6,852.0	42.57	111.30	6,376.1	926.3	1,549.5	-227.0	6.90	3.23	9.10

Received
Office of Oil & Gas
JUL 15 2016



Company:	Antero Resources	Local Co-ordinate Reference:	Well Miracle Unit 3H
Project:	Ritchie County WV	TVD Reference:	Precision 522. 1191' GL + 18' KB @ 1209.0usft
Site:	Edwn Pad Homet/Miracle/Moats/Myrtle	MD Reference:	Precision 522. 1191' GL + 18' KB @ 1209.0usft
Well:	Miracle Unit 3H	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)
6,883.0	43.69	113.93	6,398.7	918.2	1,569.0	-211.7	6.83	3.61	8.48
6,914.0	45.15	117.39	6,420.9	908.8	1,588.6	-195.2	9.12	4.71	11.16
6,945.0	46.30	120.12	6,442.5	898.1	1,608.0	-177.6	7.32	3.71	8.81
6,966.0	47.49	122.70	6,456.9	890.1	1,621.1	-165.1	10.60	5.68	12.27
Middlesex @ 6966 MD									
6,975.0	48.02	123.77	6,462.9	886.5	1,626.7	-159.5	10.60	5.87	11.93
7,006.0	50.31	127.70	6,483.2	872.8	1,645.7	-139.3	12.10	7.39	12.68
7,037.0	52.63	131.65	6,502.5	857.2	1,664.3	-117.6	12.87	7.48	13.39
7,068.0	54.16	133.77	6,521.0	840.3	1,682.6	-94.8	7.01	4.94	6.19
7,099.0	56.40	135.45	6,538.6	822.4	1,700.7	-71.1	8.49	7.23	5.42
7,130.0	58.31	137.85	6,555.4	803.5	1,718.6	-46.6	8.97	6.16	7.74
7,153.0	59.93	139.56	6,567.2	788.6	1,731.6	-27.7	9.51	7.05	7.44
Burkett @ 7153 MD									
7,160.0	60.43	140.07	6,570.6	784.0	1,735.6	-21.9	9.51	7.11	7.28
7,191.0	63.86	141.81	6,585.1	762.7	1,752.8	4.5	12.13	11.06	5.61
7,222.0	66.80	142.11	6,598.1	740.5	1,770.2	31.8	9.52	9.48	0.97
7,229.0	67.78	141.89	6,600.8	735.4	1,774.2	38.0	14.33	14.03	-3.20
Tully @ 7229 MD									
7,253.0	71.15	141.14	6,609.2	717.8	1,788.1	59.8	14.33	14.03	-3.11
7,284.0	75.20	142.90	6,618.2	694.5	1,806.4	88.5	14.15	13.06	5.68
7,315.0	77.03	144.24	6,625.6	670.2	1,824.3	117.8	7.24	5.90	4.32
7,320.0	77.30	144.74	6,626.7	666.3	1,827.1	122.6	11.20	5.49	10.02
MRCL_HOT @ 7320 MD									
7,345.0	78.69	147.23	6,631.9	646.0	1,840.8	146.7	11.20	5.54	9.96
7,376.0	80.04	150.29	6,637.6	620.0	1,856.6	176.9	10.63	4.35	9.87
7,407.0	80.90	153.97	6,642.8	592.9	1,870.9	207.4	12.03	2.77	11.87
7,438.0	82.89	155.62	6,647.1	565.2	1,883.9	238.0	8.30	6.42	5.32
7,466.0	86.07	157.45	6,649.8	539.6	1,895.0	265.9	13.09	11.36	6.54
7,497.0	88.02	158.56	6,651.4	510.9	1,906.6	296.8	7.24	6.29	3.58
7,528.0	89.60	159.29	6,652.1	482.0	1,917.8	327.8	5.61	5.10	2.35
7,589.0	89.93	155.91	6,652.3	425.6	1,941.0	388.8	5.57	0.54	-5.54
7,682.0	88.12	153.51	6,653.9	341.5	1,980.7	481.7	3.23	-1.95	-2.58
7,775.0	88.79	152.49	6,656.4	258.7	2,022.9	574.5	1.31	0.72	-1.10
7,867.0	89.98	153.92	6,657.4	176.6	2,064.4	666.4	2.02	1.29	1.55
7,960.0	89.04	155.87	6,658.2	92.4	2,103.8	759.3	2.33	-1.01	2.10
8,053.0	88.04	155.96	6,660.6	7.5	2,141.8	852.3	1.08	-1.08	0.10
8,145.0	89.58	155.82	6,662.5	-76.4	2,179.4	944.3	1.68	1.67	-0.15
8,238.0	89.45	157.22	6,663.3	-161.7	2,216.4	1,037.3	1.51	-0.14	-1.51
8,330.0	88.37	157.80	6,665.0	-246.7	2,251.6	1,129.2	1.33	-1.17	0.63
8,423.0	89.14	157.13	6,667.0	-332.6	2,287.2	1,222.2	1.10	0.83	-0.72
8,516.0	89.31	156.97	6,668.3	-418.2	2,323.5	1,315.2	0.25	0.18	0.18
8,608.0	89.48	156.83	6,669.3	-502.9	2,359.6	1,407.2	0.24	0.18	-0.15
8,701.0	89.32	156.85	6,670.2	-588.4	2,396.2	1,500.2	0.17	-0.17	0.02
8,793.0	88.21	157.20	6,672.2	-673.0	2,432.1	1,592.1	1.27	-1.21	0.38

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Scientific Drilling International
Survey Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Miracle Unit 3H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad: Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Miracle Unit 3H	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)
8,886.0	87.98	156.95	6,675.3	-758.6	2,468.3	1,685.1	0.37	-0.25	-0.27
8,978.0	89.56	156.21	6,677.3	-843.0	2,504.8	1,777.0	1.90	1.72	-0.80
9,071.0	89.69	156.18	6,677.9	-928.1	2,542.4	1,870.0	0.14	0.14	-0.03
9,163.0	89.49	155.84	6,678.6	-1,012.2	2,579.8	1,962.0	0.43	-0.22	-0.37
9,256.0	88.69	155.42	6,680.0	-1,096.9	2,618.1	2,055.0	0.97	-0.86	-0.45
9,348.0	88.65	155.47	6,682.2	-1,180.5	2,656.3	2,147.0	0.07	-0.04	0.05
9,441.0	89.06	155.72	6,684.0	-1,265.2	2,694.8	2,239.9	0.52	0.44	0.27
9,534.0	89.89	156.72	6,684.9	-1,350.3	2,732.3	2,332.9	1.40	0.89	1.08
9,626.0	89.16	156.03	6,685.6	-1,434.6	2,769.1	2,424.9	1.09	-0.79	-0.75
9,719.0	89.26	156.60	6,686.9	-1,519.7	2,806.5	2,517.9	0.62	0.11	0.61
9,811.0	89.29	156.70	6,688.1	-1,604.2	2,842.9	2,609.9	0.11	0.03	0.11
9,904.0	89.58	155.81	6,689.0	-1,689.3	2,880.4	2,702.9	1.00	0.29	-0.96
9,996.0	90.26	156.53	6,689.2	-1,773.5	2,917.6	2,794.9	1.09	0.76	0.78
10,089.0	89.89	156.48	6,689.0	-1,858.8	2,954.6	2,887.9	0.40	-0.40	-0.05
10,182.0	89.46	155.90	6,689.6	-1,943.9	2,992.2	2,980.9	0.78	-0.46	-0.62
10,274.0	89.89	155.33	6,690.1	-2,027.6	3,030.2	3,072.9	0.78	0.47	-0.62
10,367.0	89.52	156.67	6,690.6	-2,112.6	3,068.0	3,165.9	1.49	-0.40	1.44
10,460.0	90.19	157.22	6,690.8	-2,198.2	3,104.4	3,258.9	0.93	0.72	0.59
10,553.0	90.23	157.32	6,690.5	-2,284.0	3,140.3	3,351.9	0.12	0.04	0.11
10,645.0	90.33	157.65	6,690.0	-2,368.9	3,175.6	3,443.9	0.37	0.11	0.36
10,738.0	89.93	156.09	6,689.8	-2,454.5	3,212.1	3,536.8	1.73	-0.43	-1.68
10,830.0	91.31	156.53	6,688.8	-2,538.7	3,249.1	3,628.8	1.57	1.50	0.48
10,923.0	90.60	158.90	6,687.3	-2,624.1	3,285.8	3,721.8	0.86	-0.76	0.40
11,015.0	90.83	156.24	6,686.1	-2,708.5	3,322.4	3,813.8	0.76	0.25	-0.72
11,107.0	89.62	155.94	6,685.7	-2,792.6	3,359.7	3,905.8	1.36	-1.32	-0.33
11,200.0	89.79	155.14	6,686.2	-2,877.3	3,396.2	3,998.8	0.88	0.18	-0.86
11,293.0	90.23	154.66	6,686.2	-2,961.5	3,437.6	4,091.8	0.68	0.47	-0.49
11,385.0	89.19	153.28	6,686.7	-3,044.2	3,478.0	4,183.7	1.90	-1.13	-1.52
11,478.0	89.63	153.42	6,687.6	-3,127.3	3,519.7	4,276.6	0.50	0.47	0.15
11,570.0	90.90	153.95	6,687.2	-3,209.7	3,560.5	4,368.5	1.50	1.38	0.58
11,663.0	90.77	154.94	6,685.9	-3,293.6	3,600.6	4,461.4	1.07	-0.14	1.06
11,756.0	91.07	155.13	6,684.4	-3,377.9	3,639.8	4,554.4	0.38	0.32	0.20
11,848.0	90.10	157.62	6,683.4	-3,462.2	3,676.7	4,646.3	2.90	-1.05	2.71
11,941.0	90.30	157.74	6,683.1	-3,548.2	3,712.0	4,739.3	0.25	0.22	0.13
12,033.0	90.64	157.09	6,682.3	-3,633.2	3,747.4	4,831.3	0.80	0.37	-0.71
12,126.0	89.33	156.62	6,682.4	-3,718.7	3,783.9	4,924.3	1.50	-1.41	-0.51
12,219.0	89.80	157.44	6,683.1	-3,804.3	3,820.2	5,017.3	1.02	0.51	0.88
12,311.0	91.91	159.22	6,681.7	-3,889.8	3,854.2	5,109.2	3.00	2.29	1.93
12,404.0	91.07	157.71	6,679.3	-3,976.3	3,888.3	5,202.1	1.86	-0.90	-1.62
12,495.0	90.54	156.18	6,678.0	-4,060.0	3,923.9	5,293.1	1.78	-0.58	-1.68
12,588.0	90.94	157.99	6,676.8	-4,145.7	3,960.1	5,386.1	1.99	0.43	1.95
12,680.0	91.48	158.16	6,674.9	-4,231.0	3,994.5	5,478.0	0.62	0.59	0.18
12,773.0	90.00	156.18	6,673.7	-4,316.7	4,030.6	5,571.0	2.66	-1.59	-2.13
12,866.0	90.37	156.19	6,673.4	-4,401.8	4,068.1	5,664.0	0.40	0.40	0.01

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Company:	Antero Resources	Local Co-ordinate Reference:	Well Miracle Unit 3H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad: Hornet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Miracle Unit 3H	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)
12,958.0	90.74	155.86	6,872.5	-4,485.8	4,105.5	5,756.0	0.54	0.40	-0.36
13,051.0	90.00	155.26	6,671.9	-4,570.5	4,144.0	5,849.0	1.02	-0.80	-0.65
13,143.0	90.23	154.49	6,671.7	-4,653.8	4,183.0	5,940.9	0.87	0.25	-0.84
13,236.0	90.07	156.63	6,671.4	-4,738.4	4,221.5	6,033.9	2.31	-0.17	2.30
13,328.0	89.66	158.18	6,671.7	-4,823.4	4,256.8	6,125.9	1.74	-0.45	1.68
13,421.0	89.96	157.95	6,672.0	-4,909.6	4,291.6	6,218.9	0.41	0.32	-0.25
13,513.0	89.60	158.24	6,672.3	-4,995.0	4,325.9	6,310.8	0.50	-0.39	0.32
13,606.0	89.76	158.86	6,672.8	-5,081.6	4,359.9	6,403.7	0.69	0.17	0.67
13,698.0	88.65	156.66	6,674.1	-5,166.7	4,394.7	6,495.7	2.68	-1.21	-2.39
13,791.0	88.86	156.43	6,676.1	-5,252.0	4,431.7	6,588.7	0.33	0.23	-0.25
13,883.0	88.79	156.52	6,678.0	-5,336.3	4,468.5	6,680.7	0.12	-0.08	0.10
13,976.0	89.19	155.79	6,679.7	-5,421.4	4,506.0	6,773.6	0.89	0.43	-0.78
14,068.0	90.03	157.55	6,680.3	-5,505.8	4,542.5	6,865.6	2.12	0.91	1.91
14,161.0	90.17	156.19	6,680.1	-5,591.4	4,579.0	6,958.6	1.47	0.15	-1.46
14,253.0	88.55	154.41	6,681.1	-5,674.9	4,617.4	7,050.6	2.82	-1.76	-1.93
14,346.0	89.09	155.07	6,683.1	-5,759.0	4,657.1	7,143.5	0.92	0.58	0.71
14,438.0	89.56	154.57	6,684.1	-5,842.3	4,696.3	7,235.5	0.75	0.51	-0.54
14,531.0	90.33	155.70	6,684.2	-5,926.7	4,735.4	7,328.5	1.47	0.83	1.22
14,623.0	90.00	155.77	6,684.0	-6,010.5	4,773.2	7,420.5	0.37	-0.36	0.08
14,716.0	90.37	155.57	6,683.7	-6,095.3	4,811.5	7,513.5	0.45	0.40	-0.22
14,808.0	89.86	156.91	6,683.5	-6,179.5	4,848.6	7,605.5	1.56	-0.55	1.46
14,901.0	90.37	157.39	6,683.3	-6,265.2	4,884.7	7,698.5	0.75	0.55	0.52
14,994.0	90.07	157.22	6,682.9	-6,351.0	4,920.6	7,791.4	0.37	-0.32	-0.18
15,086.0	89.13	157.24	6,683.6	-6,435.8	4,956.2	7,883.4	1.02	-1.02	0.02
15,178.0	88.86	155.36	6,685.2	-6,520.0	4,993.1	7,975.4	2.06	-0.29	-2.04
15,271.0	89.73	154.87	6,686.3	-6,604.4	5,032.3	8,068.4	1.07	0.94	-0.53
15,364.0	90.10	154.79	6,686.5	-6,688.5	5,071.8	8,161.3	0.41	0.40	-0.09
15,456.0	90.54	156.53	6,686.0	-6,772.4	5,109.7	8,253.3	1.95	0.48	1.89
15,549.0	90.07	156.10	6,685.5	-6,857.5	5,147.1	8,346.3	0.68	-0.51	-0.46
15,641.0	90.91	157.07	6,684.7	-6,941.9	5,183.6	8,438.3	1.39	0.91	1.05
15,734.0	90.54	156.05	6,683.5	-7,027.3	5,220.6	8,531.3	1.17	-0.40	-1.10
15,826.0	89.93	156.50	6,683.1	-7,111.5	5,257.7	8,623.3	0.82	-0.66	0.49
15,918.0	90.40	156.78	6,682.9	-7,196.9	5,294.5	8,716.3	0.59	0.51	0.30
16,011.0	88.49	155.11	6,683.8	-7,280.9	5,332.0	8,808.3	2.76	-2.08	-1.82
16,104.0	89.40	155.11	6,685.5	-7,365.2	5,371.2	8,901.3	0.98	0.98	0.00
16,196.0	89.97	156.32	6,686.0	-7,449.1	5,409.0	8,993.3	1.45	0.62	1.32
16,289.0	90.54	156.57	6,685.6	-7,534.3	5,446.2	9,086.2	0.67	0.61	0.27
16,381.0	89.93	157.54	6,685.2	-7,619.0	5,482.0	9,178.2	1.25	-0.66	1.05
16,474.0	90.57	157.44	6,684.8	-7,704.9	5,517.6	9,271.2	0.70	0.69	0.11
16,566.0	89.93	156.83	6,684.4	-7,789.7	5,553.4	9,363.2	0.96	-0.70	0.66
16,659.0	89.67	156.32	6,684.7	-7,875.1	5,590.3	9,456.2	0.62	-0.28	-0.55
16,751.0	90.17	156.37	6,684.8	-7,959.3	5,627.3	9,548.2	0.55	0.54	0.05
16,844.0	89.73	155.56	6,684.9	-8,044.3	5,665.1	9,641.2	0.97	-0.47	-0.85

Original Survey
05/2016



Company:	Antero Resources	Local Co-ordinate Reference:	Well Miracle Unit 3H
Project:	Ritchie County WV	TVD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Site:	Edwin Pad Homet/Miracle/Moats/Myrtle	MD Reference:	Precision 522: 1191' GL + 18' KB @ 1209.0usft
Well:	Miracle Unit 3H	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)	
16,936.0	90.40	155.68	6,684.8	-8,126.1	5,703.1	9,733.2	0.74	0.73	0.11	
17,029.0	90.30	156.36	6,684.2	-8,213.0	5,740.9	9,826.2	0.74	-0.11	0.73	
17,122.0	90.37	156.88	6,683.7	-8,298.4	5,777.8	9,919.2	0.56	0.08	0.56	
17,214.0	90.14	157.86	6,683.3	-8,383.3	5,813.2	10,011.2	1.09	-0.25	1.07	
17,307.0	90.84	157.67	6,682.5	-8,469.4	5,848.4	10,104.1	0.78	0.75	-0.20	
17,370.0	91.41	158.09	6,681.3	-8,527.7	5,872.1	10,167.1	1.12	0.90	0.67	
Last SDI MWD @ 17370 MD										
17,433.0	91.48	158.09	6,679.7	-8,586.2	5,895.6	10,230.1	0.11	0.11	0.00	
Projection To Bit @ 17433 MD / 6679 TVD										

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
6,745.0	6,294.6	Sycamore @ 6745 MD		0.00		
6,966.0	6,456.9	Middlesex @ 6966 MD		0.00		
7,153.0	6,567.2	Burkett @ 7153 MD		0.00		
7,229.0	6,600.8	Tully @ 7229 MD		0.00		
7,320.0	6,626.7	MRCL_HOT @ 7320 MD		0.00		

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
105.0	105.0	-0.3	0.2	First SDI Gyro @ 105 MD	
6,293.0	5,902.2	840.4	1,296.1	Last SDI Gyro @ 6293 MD	
6,421.0	6,014.4	878.8	1,344.2	First SDI MWD @ 6421 MD	
17,370.0	6,681.3	-8,527.7	5,872.1	Last SDI MWD @ 17370 MD	
17,433.0	6,679.7	-8,586.2	5,895.6	Projection To Bit @ 17433 MD / 6679 TVD	

Checked By: _____ Approved By: _____ Date: _____

Office
JUL 05 2016