



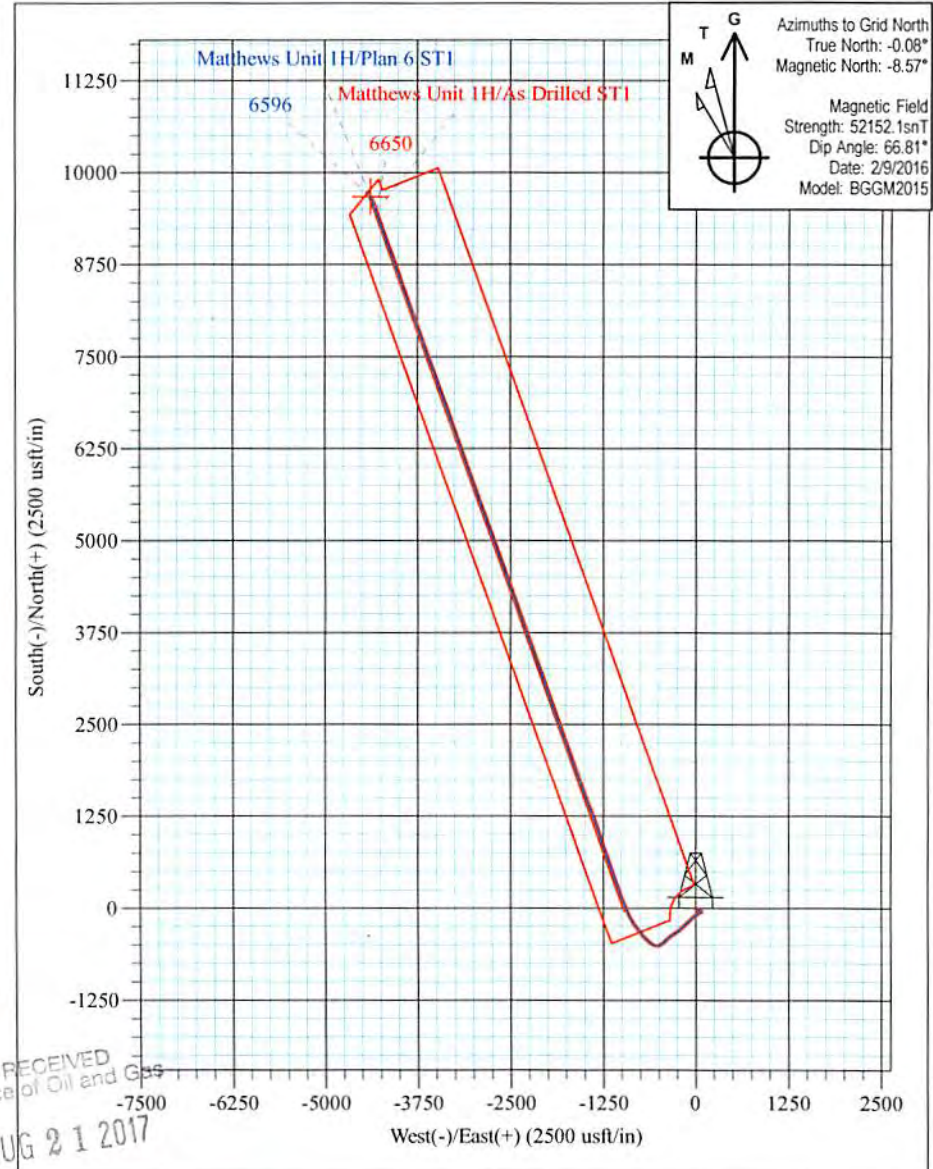
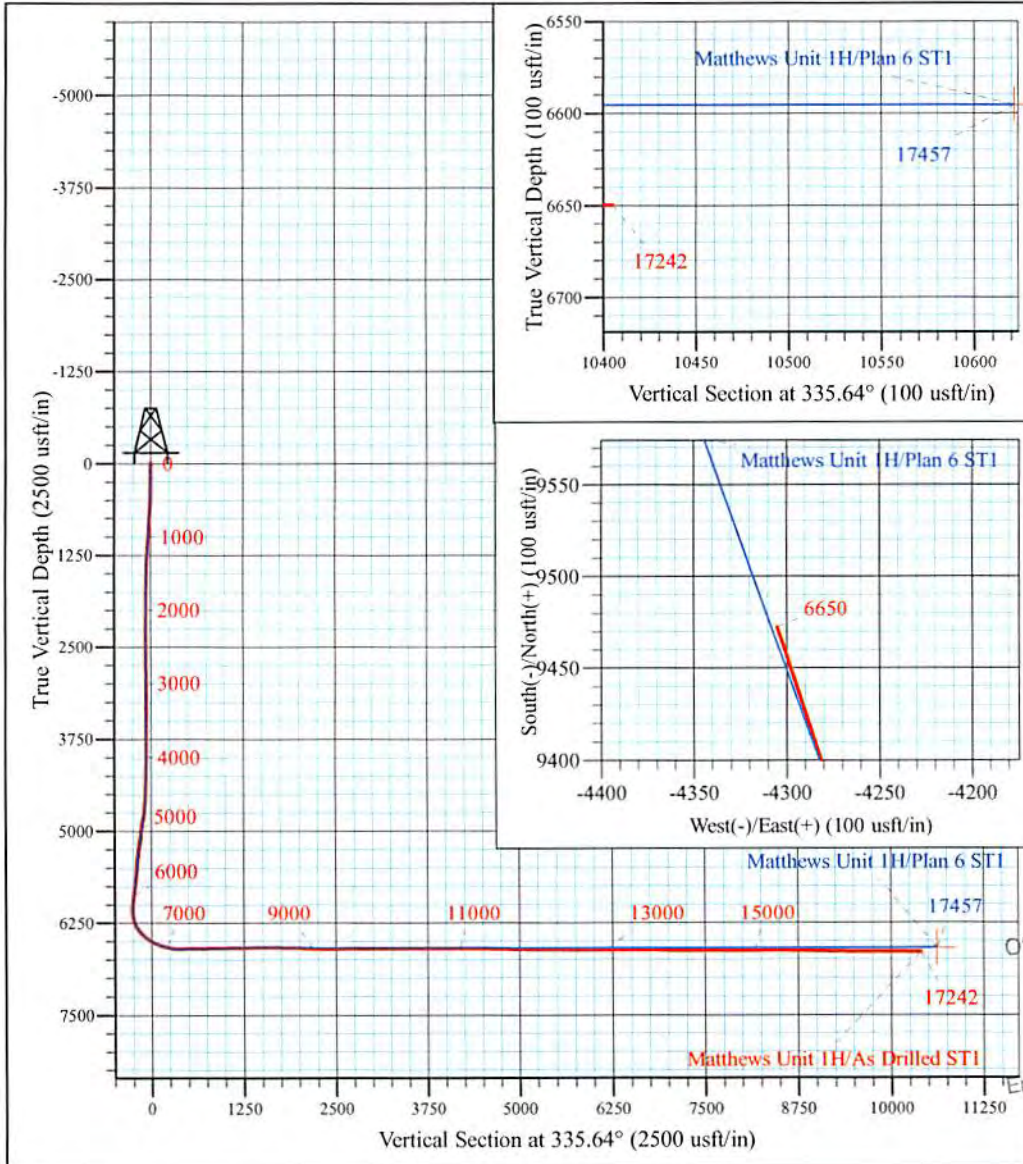
Estlack Pad: Hare/Jujubee/Lucy/Matthews/Melvin
 Matthews Unit 1H
 Plan 6 ST1
 Frontier 32: 1141' GL + 32' KB @ 1173.0usft
 Tyler County WV

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: **Matthews Unit 1H SHL**

| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|-------|-------|-------------|------------|------------------|------------------|
| 0.0 | 0.0 | 14312823.74 | 1674809.76 | 39° 24' 51.663 N | 80° 52' 41.617 W |



Azimuths to Grid North
 True North: -0.08°
 Magnetic North: -8.57°
 Magnetic Field
 Strength: 52152.1snT
 Dip Angle: 66.81°
 Date: 2/9/2016
 Model: BGGM2015

Matthews Unit 1H
Approx. BHL
 39° 26' 25.375 N 80° 53' 36.348 W

Shane Rhodes
 15:12, February 22 2016
 Scientific Drilling International
 124 Vista Drive
 Charleroi, PA 15022



Scientific Drilling International
Survey Report



| | | | |
|------------------|---|-------------------------------------|---|
| Company: | Antero Resources | Local Co-ordinate Reference: | Well Matthews Unit 1H |
| Project: | Tyler County WV | TVD Reference: | Frontier 32: 1141' GL + 32' KB @ 1173.0usft |
| Site: | Estlack Pad: Hare/Jujubee/Lucy/Matthews/Melvin | MD Reference: | Frontier 32: 1141' GL + 32' KB @ 1173.0usft |
| Well: | Matthews Unit 1H | North Reference: | Grid |
| Wellbore: | ST1 | Survey Calculation Method: | Minimum Curvature |
| Design: | As Drilled ST1 | Database: | Antero NE |

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| | | | |
|--------------------|--|----------------------|----------------|
| 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 | Estlack Pad: Hare/Jujubee/Lucy/Matthews/Melvin, Site Center: Hare Unit 1H | | | | |
| Site Position: | | Northing: | 14,312,832.65 usft | Latitude: | 39° 24' 51.751 N |
| From: | Map | Easting: | 1,674,804.62 usft | Longitude: | 80° 52' 41.682 W |
| Position Uncertainty: | 0.0 usft | Slot Radius: | 13-3/16 " | Grid Convergence: | 0.08 ° |

| | | | | | | |
|-----------------------------|-----------------------------|----------|----------------------------|--------------------|----------------------|------------------|
| Well | Matthews Unit 1H, Marcellus | | | | | |
| Well Position | +N/-S | 0.0 usft | Northing: | 14,312,823.74 usft | Latitude: | 39° 24' 51.663 N |
| | +E/-W | 0.0 usft | Easting: | 1,674,809.76 usft | Longitude: | 80° 52' 41.617 W |
| Position Uncertainty | | 2.0 usft | Wellhead Elevation: | 1,173.0 usft | Ground Level: | 1,141.0 usft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | ST1 | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | BGGM2015 | 2/9/2016 | -8.49 | 66.81 | 52,152 |

| | | | | | |
|--------------------------|--------------------------------|---------------------|---------------------|----------------------|---------|
| Design | As Drilled ST1 | | | | |
| Audit Notes: | | | | | |
| Version: | 1.0 | Phase: | ACTUAL | Tie On Depth: | 8,719.0 |
| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) | |
| | 0.0 | 0.0 | 0.0 | 335.56 | |

| | | | | | |
|-----------------------|------------------|--|---------------------|--|--|
| Survey Program | Date | 2/24/2016 | | | |
| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description | |
| 25.0 | 5,782.0 | Survey #4 - Final Gyro (Original Wellpath) | Standard Keeper 104 | Standard Wireline Keeper ver 1.0.4 | |
| 5,816.0 | 8,719.0 | Survey #5 - SDI MWD (Original Wellpath) | SDI MWD | Scientific Drilling Intl. MWD - Standard ver 1.0.1 | |
| 8,814.0 | 17,242.0 | Survey #6 - MWD ST01 (ST1) | 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 | |
| 25.0 | 0.08 | 97.46 | 25.0 | 0.0 | 0.0 | 0.0 | 0.32 | 0.32 | 0.00 | |
| 50.0 | 0.15 | 97.46 | 50.0 | 0.0 | 0.1 | 0.0 | 0.28 | 0.28 | 0.00 | |
| 75.0 | 0.23 | 97.46 | 75.0 | 0.0 | 0.1 | -0.1 | 0.32 | 0.32 | 0.00 | |
| 100.0 | 0.31 | 97.46 | 100.0 | 0.0 | 0.3 | -0.1 | 0.32 | 0.32 | 0.00 | |
| 125.0 | 0.50 | 79.39 | 125.0 | 0.0 | 0.4 | -0.2 | 0.91 | 0.76 | -72.28 | |
| 150.0 | 0.43 | 85.46 | 150.0 | 0.0 | 0.6 | -0.3 | 0.34 | -0.28 | 24.28 | |
| 175.0 | 0.40 | 93.52 | 175.0 | 0.0 | 0.8 | -0.3 | 0.26 | -0.12 | 32.24 | |



Scientific Drilling International
Survey Report



| | | | |
|------------------|---|-------------------------------------|---|
| Company: | Antero Resources | Local Co-ordinate Reference: | Well Matthews Unit 1H |
| Project: | Tyler County WV | TVD Reference: | Frontier 32: 1141' GL + 32' KB @ 1173.0usft |
| Site: | Estlack Pad: Hare/Jujubee/Lucy/Matthews/Melvin | MD Reference: | Frontier 32: 1141' GL + 32' KB @ 1173.0usft |
| Well: | Matthews Unit 1H | North Reference: | Grid |
| Wellbore: | ST1 | Survey Calculation Method: | Minimum Curvature |
| Design: | As Drilled ST1 | 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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 200.0 | 0.37 | 102.42 | 200.0 | 0.0 | 1.0 | -0.4 | 0.27 | -0.12 | 35.60 |
| 225.0 | 0.37 | 97.42 | 225.0 | 0.0 | 1.1 | -0.5 | 0.13 | 0.00 | -20.00 |
| 250.0 | 0.37 | 110.18 | 250.0 | -0.1 | 1.3 | -0.6 | 0.33 | 0.00 | 51.04 |
| 275.0 | 0.34 | 101.70 | 275.0 | -0.1 | 1.5 | -0.7 | 0.24 | -0.12 | -33.92 |
| 300.0 | 0.30 | 95.18 | 300.0 | -0.1 | 1.6 | -0.8 | 0.22 | -0.16 | -26.08 |
| 325.0 | 0.31 | 92.71 | 325.0 | -0.2 | 1.7 | -0.9 | 0.07 | 0.04 | -9.88 |
| 350.0 | 0.38 | 83.01 | 350.0 | -0.1 | 1.9 | -0.9 | 0.36 | 0.28 | -38.80 |
| 375.0 | 0.36 | 73.34 | 375.0 | -0.1 | 2.0 | -0.9 | 0.26 | -0.08 | -38.68 |
| 400.0 | 0.34 | 85.55 | 400.0 | -0.1 | 2.2 | -1.0 | 0.31 | -0.08 | 48.84 |
| 425.0 | 0.40 | 84.31 | 425.0 | -0.1 | 2.3 | -1.0 | 0.24 | 0.24 | -4.96 |
| 450.0 | 0.40 | 82.71 | 450.0 | -0.1 | 2.5 | -1.1 | 0.04 | 0.00 | -6.40 |
| 475.0 | 1.27 | 100.19 | 475.0 | -0.1 | 2.9 | -1.3 | 3.59 | 3.48 | 69.92 |
| 500.0 | 2.40 | 101.82 | 500.0 | -0.2 | 3.7 | -1.7 | 4.52 | 4.52 | 6.52 |
| 525.0 | 3.47 | 100.94 | 524.9 | -0.5 | 4.9 | -2.5 | 4.28 | 4.28 | -3.52 |
| 550.0 | 4.00 | 105.23 | 549.9 | -0.9 | 6.5 | -3.5 | 2.40 | 2.12 | 17.16 |
| 575.0 | 4.11 | 105.58 | 574.8 | -1.3 | 8.2 | -4.6 | 0.45 | 0.44 | 1.40 |
| 600.0 | 4.28 | 107.42 | 599.8 | -1.9 | 10.0 | -5.8 | 0.87 | 0.68 | 7.36 |
| 625.0 | 4.48 | 106.62 | 624.7 | -2.4 | 11.8 | -7.1 | 0.84 | 0.80 | -3.20 |
| 650.0 | 4.56 | 107.01 | 649.6 | -3.0 | 13.7 | -8.4 | 0.34 | 0.32 | 1.56 |
| 675.0 | 4.59 | 109.78 | 674.5 | -3.6 | 15.6 | -9.7 | 0.89 | 0.12 | 11.08 |
| 700.0 | 4.65 | 114.02 | 699.4 | -4.4 | 17.4 | -11.2 | 1.39 | 0.24 | 16.96 |
| 725.0 | 4.62 | 114.32 | 724.4 | -5.2 | 19.3 | -12.7 | 0.15 | -0.12 | 1.20 |
| 750.0 | 4.76 | 115.03 | 749.3 | -6.1 | 21.1 | -14.2 | 0.61 | 0.56 | 2.84 |
| 775.0 | 4.91 | 118.25 | 774.2 | -7.0 | 23.0 | -15.9 | 1.24 | 0.60 | 12.88 |
| 800.0 | 4.90 | 118.56 | 799.1 | -8.0 | 24.9 | -17.6 | 0.11 | -0.04 | 1.24 |
| 825.0 | 4.94 | 119.22 | 824.0 | -9.0 | 26.8 | -19.3 | 0.28 | 0.16 | 2.64 |
| 850.0 | 4.93 | 120.14 | 848.9 | -10.1 | 28.6 | -21.1 | 0.32 | -0.04 | 3.68 |
| 875.0 | 4.92 | 119.39 | 873.8 | -11.2 | 30.5 | -22.8 | 0.26 | -0.04 | -3.00 |
| 900.0 | 5.04 | 121.46 | 898.7 | -12.3 | 32.4 | -24.6 | 0.86 | 0.48 | 8.28 |
| 925.0 | 4.97 | 121.63 | 923.6 | -13.4 | 34.2 | -26.4 | 0.29 | -0.28 | 0.68 |
| 950.0 | 4.92 | 121.26 | 948.5 | -14.5 | 36.1 | -28.2 | 0.24 | -0.20 | -1.48 |
| 975.0 | 4.95 | 121.81 | 973.5 | -15.7 | 37.9 | -29.9 | 0.22 | 0.12 | 2.20 |
| 1,000.0 | 4.93 | 123.05 | 998.4 | -16.8 | 39.7 | -31.7 | 0.43 | -0.08 | 4.96 |
| 1,025.0 | 4.99 | 122.94 | 1,023.3 | -18.0 | 41.5 | -33.6 | 0.24 | 0.24 | -0.44 |
| 1,050.0 | 4.99 | 122.89 | 1,048.2 | -19.2 | 43.4 | -35.4 | 0.02 | 0.00 | -0.20 |
| 1,075.0 | 5.01 | 122.38 | 1,073.1 | -20.4 | 45.2 | -37.2 | 0.19 | 0.08 | -2.04 |
| 1,100.0 | 5.08 | 122.27 | 1,098.0 | -21.5 | 47.0 | -39.1 | 0.28 | 0.28 | -0.44 |
| 1,125.0 | 5.16 | 122.14 | 1,122.9 | -22.7 | 48.9 | -40.9 | 0.32 | 0.32 | -0.52 |
| 1,150.0 | 5.20 | 122.36 | 1,147.8 | -23.9 | 50.8 | -42.8 | 0.18 | 0.16 | 0.88 |
| 1,175.0 | 5.19 | 122.87 | 1,172.7 | -25.1 | 52.7 | -44.7 | 0.19 | -0.04 | 2.04 |
| 1,200.0 | 5.19 | 123.23 | 1,197.6 | -26.4 | 54.6 | -46.6 | 0.13 | 0.00 | 1.44 |
| 1,225.0 | 4.66 | 121.96 | 1,222.5 | -27.5 | 56.5 | -48.4 | 2.16 | -2.12 | -5.08 |

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Scientific Drilling International
Survey Report



Company: Antero Resources
Project: Tyler County WV
Site: Estlack Pad:
 Hare/Jujubee/Lucy/Matthews/Melvin
Well: Matthews Unit 1H
Wellbore: ST1
Design: As Drilled ST1

Local Co-ordinate Reference: Well Matthews Unit 1H
TVD Reference: Frontier 32: 1141' GL + 32' KB @ 1173.0usft
MD Reference: Frontier 32: 1141' GL + 32' KB @ 1173.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Antero NE

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WV Department of Environmental Protection

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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 1,250.0 | 4.13 | 119.33 | 1,247.4 | -28.5 | 58.1 | -50.0 | 2.27 | -2.12 | -10.52 |
| 1,275.0 | 4.12 | 118.45 | 1,272.3 | -29.4 | 59.7 | -51.4 | 0.26 | -0.04 | -3.52 |
| 1,300.0 | 3.76 | 119.47 | 1,297.3 | -30.2 | 61.2 | -52.8 | 1.47 | -1.44 | 4.08 |
| 1,325.0 | 3.31 | 120.31 | 1,322.2 | -31.0 | 62.5 | -54.1 | 1.81 | -1.80 | 3.36 |
| 1,350.0 | 2.87 | 118.89 | 1,347.2 | -31.6 | 63.7 | -55.2 | 1.79 | -1.76 | -5.68 |
| 1,375.0 | 2.78 | 120.77 | 1,372.2 | -32.3 | 64.8 | -56.2 | 0.52 | -0.36 | 7.52 |
| 1,400.0 | 2.58 | 120.68 | 1,397.1 | -32.9 | 65.8 | -57.1 | 0.80 | -0.80 | -0.36 |
| 1,425.0 | 2.30 | 121.54 | 1,422.1 | -33.4 | 66.7 | -58.0 | 1.13 | -1.12 | 3.44 |
| 1,450.0 | 2.19 | 118.78 | 1,447.1 | -33.9 | 67.5 | -58.8 | 0.62 | -0.44 | -11.04 |
| 1,475.0 | 1.92 | 121.02 | 1,472.1 | -34.3 | 68.3 | -59.5 | 1.13 | -1.08 | 8.96 |
| 1,500.0 | 1.81 | 117.38 | 1,497.1 | -34.7 | 69.0 | -60.2 | 0.65 | -0.44 | -14.56 |
| 1,525.0 | 1.52 | 115.22 | 1,522.1 | -35.1 | 69.7 | -60.7 | 1.19 | -1.16 | -8.64 |
| 1,550.0 | 1.29 | 118.05 | 1,547.0 | -35.3 | 70.2 | -61.2 | 0.96 | -0.92 | 11.32 |
| 1,575.0 | 1.33 | 118.33 | 1,572.0 | -35.6 | 70.7 | -61.7 | 0.16 | 0.16 | 1.12 |
| 1,600.0 | 1.33 | 116.72 | 1,597.0 | -35.9 | 71.2 | -62.1 | 0.15 | 0.00 | -6.44 |
| 1,625.0 | 1.30 | 117.42 | 1,622.0 | -36.1 | 71.7 | -62.6 | 0.14 | -0.12 | 2.80 |
| 1,650.0 | 1.20 | 116.15 | 1,647.0 | -36.4 | 72.2 | -63.0 | 0.42 | -0.40 | -5.08 |
| 1,675.0 | 1.28 | 116.06 | 1,672.0 | -36.6 | 72.7 | -63.4 | 0.32 | 0.32 | -0.36 |
| 1,700.0 | 1.23 | 113.54 | 1,697.0 | -36.9 | 73.2 | -63.8 | 0.30 | -0.20 | -10.08 |
| 1,725.0 | 1.22 | 111.37 | 1,722.0 | -37.1 | 73.7 | -64.2 | 0.19 | -0.04 | -8.68 |
| 1,750.0 | 1.21 | 109.47 | 1,747.0 | -37.2 | 74.2 | -64.6 | 0.17 | -0.04 | -7.60 |
| 1,775.0 | 1.09 | 109.94 | 1,772.0 | -37.4 | 74.7 | -65.0 | 0.48 | -0.48 | 1.88 |
| 1,800.0 | 1.10 | 114.28 | 1,797.0 | -37.6 | 75.1 | -65.3 | 0.33 | 0.04 | 17.36 |
| 1,825.0 | 1.06 | 117.45 | 1,822.0 | -37.8 | 75.5 | -65.7 | 0.29 | -0.16 | 12.68 |
| 1,850.0 | 1.08 | 110.98 | 1,847.0 | -38.0 | 76.0 | -66.0 | 0.49 | 0.08 | -25.88 |
| 1,875.0 | 1.10 | 111.49 | 1,872.0 | -38.2 | 76.4 | -66.3 | 0.09 | 0.08 | 2.04 |
| 1,900.0 | 1.01 | 108.58 | 1,897.0 | -38.3 | 76.8 | -66.7 | 0.42 | -0.36 | -11.64 |
| 1,925.0 | 0.83 | 103.03 | 1,922.0 | -38.4 | 77.2 | -66.9 | 0.80 | -0.72 | -22.20 |
| 1,950.0 | 0.78 | 109.70 | 1,947.0 | -38.5 | 77.5 | -67.2 | 0.42 | -0.20 | 26.68 |
| 1,975.0 | 0.74 | 116.01 | 1,972.0 | -38.7 | 77.9 | -67.4 | 0.37 | -0.16 | 25.24 |
| 2,000.0 | 0.70 | 111.53 | 1,997.0 | -38.8 | 78.1 | -67.6 | 0.28 | -0.16 | -17.92 |
| 2,025.0 | 0.63 | 120.89 | 2,022.0 | -38.9 | 78.4 | -67.9 | 0.52 | -0.28 | 37.44 |
| 2,050.0 | 0.54 | 113.80 | 2,047.0 | -39.0 | 78.6 | -68.1 | 0.46 | -0.36 | -28.36 |
| 2,075.0 | 0.39 | 104.00 | 2,072.0 | -39.1 | 78.8 | -68.2 | 0.68 | -0.60 | -39.20 |
| 2,100.0 | 0.33 | 131.05 | 2,097.0 | -39.2 | 79.0 | -68.3 | 0.71 | -0.24 | 108.20 |
| 2,125.0 | 0.38 | 130.09 | 2,122.0 | -39.3 | 79.1 | -68.5 | 0.20 | 0.20 | -3.84 |
| 2,150.0 | 0.45 | 125.89 | 2,147.0 | -39.4 | 79.2 | -68.6 | 0.31 | 0.28 | -16.80 |
| 2,175.0 | 0.47 | 118.83 | 2,172.0 | -39.5 | 79.4 | -68.8 | 0.24 | 0.08 | -28.24 |
| 2,200.0 | 0.54 | 111.45 | 2,197.0 | -39.6 | 79.6 | -69.0 | 0.38 | 0.28 | -29.52 |
| 2,225.0 | 0.48 | 107.84 | 2,222.0 | -39.6 | 79.8 | -69.1 | 0.27 | -0.24 | -14.44 |
| 2,250.0 | 0.31 | 102.25 | 2,247.0 | -39.7 | 80.0 | -69.2 | 0.70 | -0.68 | -22.36 |
| 2,275.0 | 0.22 | 121.51 | 2,272.0 | -39.7 | 80.1 | -69.3 | 0.50 | -0.36 | 77.04 |
| 2,300.0 | 0.32 | 135.18 | 2,297.0 | -39.8 | 80.2 | -69.4 | 0.47 | 0.40 | 54.68 |



Scientific Drilling International
Survey Report



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Project: Tyler County WV
Site: Estlack Pad:
 Hare/Jujubee/Lucy/Mathews/Melvin
Well: Mathews Unit 1H
Wellbore: ST1
Design: As Drilled ST1

Local Co-ordinate Reference: Well Mathews Unit 1H
TVD Reference: Frontier 32: 1141' GL + 32' KB @ 1173.0usft
MD Reference: Frontier 32: 1141' GL + 32' KB @ 1173.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Antero NE

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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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 2,325.0 | 0.33 | 129.56 | 2,322.0 | -39.9 | 80.3 | -69.5 | 0.13 | 0.04 | -22.48 |
| 2,350.0 | 0.28 | 129.33 | 2,347.0 | -40.0 | 80.4 | -69.7 | 0.20 | -0.20 | -0.92 |
| 2,375.0 | 0.30 | 132.49 | 2,372.0 | -40.1 | 80.5 | -69.8 | 0.10 | 0.08 | 12.64 |
| 2,400.0 | 0.29 | 111.08 | 2,397.0 | -40.1 | 80.6 | -69.9 | 0.44 | -0.04 | -85.64 |
| 2,425.0 | 0.21 | 103.15 | 2,422.0 | -40.2 | 80.7 | -70.0 | 0.35 | -0.32 | -31.72 |
| 2,450.0 | 0.13 | 103.38 | 2,447.0 | -40.2 | 80.7 | -70.0 | 0.32 | -0.32 | 0.92 |
| 2,475.0 | 0.06 | 105.21 | 2,472.0 | -40.2 | 80.8 | -70.0 | 0.28 | -0.28 | 7.32 |
| 2,500.0 | 0.02 | 272.28 | 2,497.0 | -40.2 | 80.8 | -70.0 | 0.32 | -0.16 | 668.28 |
| 2,525.0 | 0.02 | 307.65 | 2,522.0 | -40.2 | 80.8 | -70.0 | 0.05 | 0.00 | 141.48 |
| 2,550.0 | 0.07 | 256.88 | 2,547.0 | -40.2 | 80.8 | -70.0 | 0.24 | 0.20 | -203.08 |
| 2,575.0 | 0.15 | 189.78 | 2,572.0 | -40.2 | 80.7 | -70.0 | 0.55 | 0.32 | -268.40 |
| 2,600.0 | 0.13 | 247.08 | 2,597.0 | -40.3 | 80.7 | -70.1 | 0.54 | -0.08 | 229.20 |
| 2,625.0 | 0.17 | 237.48 | 2,622.0 | -40.3 | 80.7 | -70.1 | 0.19 | 0.16 | -38.40 |
| 2,650.0 | 0.15 | 249.99 | 2,647.0 | -40.3 | 80.6 | -70.1 | 0.16 | -0.08 | 50.04 |
| 2,675.0 | 0.15 | 259.56 | 2,672.0 | -40.4 | 80.5 | -70.1 | 0.10 | 0.00 | 38.28 |
| 2,700.0 | 0.27 | 279.77 | 2,697.0 | -40.4 | 80.4 | -70.0 | 0.56 | 0.48 | 80.84 |
| 2,725.0 | 0.24 | 285.42 | 2,722.0 | -40.3 | 80.3 | -70.0 | 0.16 | -0.12 | 22.60 |
| 2,750.0 | 0.33 | 276.96 | 2,747.0 | -40.3 | 80.2 | -69.9 | 0.40 | 0.36 | -33.84 |
| 2,775.0 | 0.38 | 281.28 | 2,772.0 | -40.3 | 80.1 | -69.8 | 0.23 | 0.20 | 17.28 |
| 2,800.0 | 0.45 | 289.82 | 2,796.9 | -40.2 | 79.9 | -69.7 | 0.37 | 0.28 | 34.16 |
| 2,825.0 | 0.57 | 285.11 | 2,821.9 | -40.2 | 79.7 | -69.5 | 0.51 | 0.48 | -18.84 |
| 2,850.0 | 0.61 | 281.48 | 2,846.9 | -40.1 | 79.4 | -69.4 | 0.22 | 0.16 | -14.52 |
| 2,875.0 | 0.50 | 275.66 | 2,871.9 | -40.1 | 79.2 | -69.2 | 0.49 | -0.44 | -23.28 |
| 2,900.0 | 0.61 | 279.97 | 2,896.9 | -40.0 | 78.9 | -69.1 | 0.47 | 0.44 | 17.24 |
| 2,925.0 | 0.68 | 280.01 | 2,921.9 | -40.0 | 78.7 | -69.0 | 0.28 | 0.28 | 0.16 |
| 2,950.0 | 0.66 | 275.90 | 2,946.9 | -39.9 | 78.4 | -68.8 | 0.21 | -0.08 | -16.44 |
| 2,975.0 | 0.63 | 275.69 | 2,971.9 | -39.9 | 78.1 | -68.7 | 0.12 | -0.12 | -0.84 |
| 3,000.0 | 0.66 | 276.49 | 2,996.9 | -39.9 | 77.8 | -68.5 | 0.13 | 0.12 | 3.20 |
| 3,025.0 | 0.73 | 287.30 | 3,021.9 | -39.8 | 77.5 | -68.3 | 0.59 | 0.28 | 43.24 |
| 3,050.0 | 0.77 | 283.91 | 3,046.9 | -39.7 | 77.2 | -68.1 | 0.24 | 0.16 | -13.56 |
| 3,075.0 | 0.81 | 275.51 | 3,071.9 | -39.7 | 76.9 | -67.9 | 0.49 | 0.16 | -33.60 |
| 3,100.0 | 0.77 | 274.48 | 3,096.9 | -39.7 | 76.5 | -67.8 | 0.17 | -0.16 | -4.12 |
| 3,125.0 | 0.70 | 272.69 | 3,121.9 | -39.6 | 76.2 | -67.6 | 0.29 | -0.28 | -7.16 |
| 3,150.0 | 0.68 | 276.22 | 3,146.9 | -39.6 | 75.9 | -67.5 | 0.19 | -0.08 | 14.12 |
| 3,175.0 | 0.68 | 280.79 | 3,171.9 | -39.6 | 75.6 | -67.3 | 0.22 | 0.00 | 18.28 |
| 3,200.0 | 0.66 | 281.96 | 3,196.9 | -39.5 | 75.3 | -67.1 | 0.10 | -0.08 | 4.68 |
| 3,225.0 | 0.76 | 259.76 | 3,221.9 | -39.5 | 75.0 | -67.0 | 1.16 | 0.40 | -88.80 |
| 3,250.0 | 0.87 | 251.86 | 3,246.9 | -39.6 | 74.7 | -66.9 | 0.63 | 0.44 | -31.60 |
| 3,275.0 | 0.85 | 252.70 | 3,271.9 | -39.7 | 74.3 | -66.9 | 0.09 | -0.08 | 3.36 |
| 3,300.0 | 0.93 | 254.03 | 3,296.9 | -39.8 | 73.9 | -66.8 | 0.33 | 0.32 | 5.32 |
| 3,325.0 | 0.78 | 250.70 | 3,321.9 | -39.9 | 73.6 | -66.8 | 0.63 | -0.60 | -13.32 |
| 3,350.0 | 0.69 | 253.83 | 3,346.9 | -40.0 | 73.3 | -66.8 | 0.39 | -0.36 | 12.52 |



Scientific Drilling International
Survey Report



Company: Antero Resources
Project: Tyler County WV
Site: Estlack Pad:
Hare/Jubee/Lucy/Matthews/Melvin
Well: Matthews Unit 1H
Wellbore: ST1
Design: As Drilled ST1

Local Co-ordinate Reference: Well Matthews Unit 1H
TVD Reference: Frontier 32: 1141' GL + 32' KB @ 1173.0usft
MD Reference: Frontier 32: 1141' GL + 32' KB @ 1173.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Antero NE

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Environmental Protection

| 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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 3,375.0 | 0.69 | 259.37 | 3,371.9 | -40.1 | 73.0 | -66.7 | 0.27 | 0.00 | 22.16 |
| 3,400.0 | 0.59 | 266.39 | 3,396.9 | -40.1 | 72.7 | -66.6 | 0.51 | -0.40 | 28.08 |
| 3,425.0 | 0.62 | 251.57 | 3,421.9 | -40.2 | 72.5 | -66.6 | 0.64 | 0.12 | -59.28 |
| 3,450.0 | 0.50 | 269.35 | 3,446.9 | -40.2 | 72.2 | -66.5 | 0.84 | -0.48 | 71.12 |
| 3,475.0 | 0.49 | 259.84 | 3,471.9 | -40.3 | 72.0 | -66.4 | 0.33 | -0.04 | -38.04 |
| 3,500.0 | 0.49 | 256.23 | 3,496.9 | -40.3 | 71.8 | -66.4 | 0.12 | 0.00 | -14.44 |
| 3,525.0 | 0.39 | 261.36 | 3,521.9 | -40.3 | 71.6 | -66.3 | 0.43 | -0.40 | 20.52 |
| 3,550.0 | 0.42 | 256.17 | 3,546.9 | -40.4 | 71.4 | -66.3 | 0.19 | 0.12 | -20.76 |
| 3,575.0 | 0.44 | 247.08 | 3,571.9 | -40.4 | 71.3 | -66.3 | 0.28 | 0.08 | -36.36 |
| 3,600.0 | 0.35 | 267.22 | 3,596.9 | -40.5 | 71.1 | -66.3 | 0.66 | -0.36 | 80.56 |
| 3,625.0 | 0.39 | 274.15 | 3,621.9 | -40.5 | 70.9 | -66.2 | 0.24 | 0.16 | 27.72 |
| 3,650.0 | 0.46 | 255.57 | 3,646.9 | -40.5 | 70.8 | -66.1 | 0.61 | 0.28 | -74.32 |
| 3,675.0 | 0.35 | 282.18 | 3,671.9 | -40.5 | 70.6 | -66.1 | 0.86 | -0.44 | 106.44 |
| 3,700.0 | 0.36 | 286.14 | 3,696.9 | -40.5 | 70.4 | -66.0 | 0.11 | 0.04 | 15.84 |
| 3,725.0 | 0.38 | 284.62 | 3,721.9 | -40.4 | 70.3 | -65.9 | 0.09 | 0.08 | -6.08 |
| 3,750.0 | 0.46 | 285.77 | 3,746.9 | -40.4 | 70.1 | -65.8 | 0.32 | 0.32 | 4.60 |
| 3,775.0 | 0.41 | 285.76 | 3,771.9 | -40.3 | 69.9 | -65.6 | 0.20 | -0.20 | -0.04 |
| 3,800.0 | 0.45 | 275.12 | 3,796.9 | -40.3 | 69.7 | -65.5 | 0.36 | 0.16 | -42.56 |
| 3,825.0 | 0.39 | 290.51 | 3,821.9 | -40.2 | 69.6 | -65.4 | 0.51 | -0.24 | 61.56 |
| 3,850.0 | 0.47 | 281.79 | 3,846.9 | -40.2 | 69.4 | -65.3 | 0.41 | 0.32 | -34.88 |
| 3,875.0 | 0.72 | 244.71 | 3,871.9 | -40.2 | 69.1 | -65.2 | 1.79 | 1.00 | -148.32 |
| 3,900.0 | 1.66 | 231.44 | 3,896.9 | -40.5 | 68.7 | -65.3 | 3.89 | 3.76 | -53.08 |
| 3,925.0 | 1.84 | 228.63 | 3,921.9 | -41.0 | 68.1 | -65.5 | 0.80 | 0.72 | -11.24 |
| 3,950.0 | 1.77 | 229.21 | 3,946.9 | -41.5 | 67.5 | -65.8 | 0.29 | -0.28 | 2.32 |
| 3,975.0 | 2.75 | 227.84 | 3,971.8 | -42.2 | 66.8 | -66.0 | 3.93 | 3.92 | -5.48 |
| 4,000.0 | 4.26 | 229.10 | 3,996.8 | -43.2 | 65.6 | -66.5 | 6.05 | 6.04 | 5.04 |
| 4,025.0 | 4.37 | 228.53 | 4,021.7 | -44.4 | 64.2 | -67.0 | 0.47 | 0.44 | -2.28 |
| 4,050.0 | 4.23 | 227.13 | 4,046.7 | -45.7 | 62.8 | -67.6 | 0.70 | -0.56 | -5.60 |
| 4,075.0 | 3.97 | 225.08 | 4,071.6 | -46.9 | 61.6 | -68.2 | 1.19 | -1.04 | -8.20 |
| 4,100.0 | 3.80 | 221.87 | 4,096.5 | -48.2 | 60.4 | -68.8 | 1.10 | -0.68 | -12.84 |
| 4,125.0 | 3.74 | 221.46 | 4,121.5 | -49.4 | 59.3 | -69.5 | 0.26 | -0.24 | -1.64 |
| 4,150.0 | 3.54 | 220.67 | 4,146.4 | -50.6 | 58.3 | -70.2 | 0.82 | -0.80 | -3.16 |
| 4,175.0 | 5.15 | 230.30 | 4,171.4 | -51.9 | 56.9 | -70.8 | 7.05 | 6.44 | 38.52 |
| 4,200.0 | 6.24 | 232.07 | 4,196.2 | -53.4 | 54.9 | -71.4 | 4.42 | 4.36 | 7.08 |
| 4,225.0 | 6.43 | 231.91 | 4,221.1 | -55.1 | 52.8 | -72.0 | 0.76 | 0.76 | -0.64 |
| 4,250.0 | 6.57 | 232.45 | 4,245.9 | -56.9 | 50.5 | -72.7 | 0.61 | 0.56 | 2.16 |
| 4,275.0 | 7.25 | 232.33 | 4,270.7 | -58.7 | 48.2 | -73.4 | 2.72 | 2.72 | -0.48 |
| 4,300.0 | 7.34 | 231.57 | 4,295.5 | -60.7 | 45.7 | -74.1 | 0.53 | 0.36 | -3.04 |
| 4,325.0 | 6.84 | 229.53 | 4,320.3 | -62.6 | 43.3 | -74.9 | 2.24 | -2.00 | -8.16 |
| 4,350.0 | 7.18 | 229.86 | 4,345.2 | -64.6 | 40.9 | -75.6 | 1.37 | 1.36 | 1.32 |
| 4,375.0 | 8.30 | 230.94 | 4,369.9 | -66.7 | 38.4 | -76.6 | 4.52 | 4.48 | 4.32 |
| 4,400.0 | 8.77 | 230.53 | 4,394.6 | -69.1 | 35.5 | -77.6 | 1.90 | 1.88 | -1.64 |
| 4,425.0 | 8.57 | 228.34 | 4,419.4 | -71.5 | 32.6 | -78.6 | 1.54 | -0.80 | -8.76 |



Scientific Drilling International
Survey Report



WV Department of Environmental Protection

| | | | |
|------------------|---|-------------------------------------|---|
| Company: | Antero Resources | Local Co-ordinate Reference: | Well Matthews Unit 1H |
| Project: | Tyler County WV | TVD Reference: | Frontier 32: 1141' GL + 32' KB @ 1173.0usft |
| Site: | Estlack Pad: Hare/Jujubee/Lucy/Matthews/Melvin | MD Reference: | Frontier 32: 1141' GL + 32' KB @ 1173.0usft |
| Well: | Matthews Unit 1H | North Reference: | Grid |
| Wellbore: | ST1 | Survey Calculation Method: | Minimum Curvature |
| Design: | As Drilled ST1 | Database: | Antero NE |

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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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 4,450.0 | 9.39 | 229.04 | 4,444.1 | -74.1 | 29.7 | -79.8 | 3.31 | 3.28 | 2.80 |
| 4,475.0 | 10.94 | 231.35 | 4,468.7 | -76.9 | 26.3 | -80.9 | 6.41 | 6.20 | 9.24 |
| 4,500.0 | 12.58 | 232.73 | 4,493.1 | -80.1 | 22.3 | -82.1 | 6.66 | 6.56 | 5.52 |
| 4,525.0 | 12.68 | 232.70 | 4,517.5 | -83.4 | 17.9 | -83.3 | 0.40 | 0.40 | -0.12 |
| 4,550.0 | 13.53 | 233.43 | 4,541.9 | -86.8 | 13.4 | -84.6 | 3.46 | 3.40 | 2.92 |
| 4,575.0 | 15.05 | 234.21 | 4,566.1 | -90.4 | 8.4 | -85.8 | 6.13 | 6.08 | 3.12 |
| 4,600.0 | 16.00 | 234.49 | 4,590.2 | -94.3 | 3.0 | -87.1 | 3.81 | 3.80 | 1.12 |
| 4,625.0 | 16.09 | 233.74 | 4,614.2 | -98.4 | -2.6 | -88.5 | 0.90 | 0.36 | -3.00 |
| 4,650.0 | 17.03 | 233.64 | 4,638.2 | -102.6 | -8.4 | -89.9 | 3.76 | 3.76 | -0.40 |
| 4,675.0 | 18.75 | 233.84 | 4,662.0 | -107.1 | -14.6 | -91.5 | 6.88 | 6.88 | 0.80 |
| 4,700.0 | 19.34 | 233.22 | 4,685.6 | -112.0 | -21.1 | -93.2 | 2.49 | 2.36 | -2.48 |
| 4,725.0 | 19.17 | 232.09 | 4,709.2 | -117.0 | -27.7 | -95.1 | 1.64 | -0.68 | -4.52 |
| 4,750.0 | 20.02 | 229.97 | 4,732.8 | -122.3 | -34.2 | -97.2 | 4.43 | 3.40 | -8.48 |
| 4,775.0 | 22.06 | 226.04 | 4,756.1 | -128.3 | -40.8 | -99.9 | 9.92 | 8.16 | -15.72 |
| 4,800.0 | 22.39 | 223.20 | 4,779.2 | -135.0 | -47.5 | -103.3 | 4.49 | 1.32 | -11.36 |
| 4,825.0 | 22.58 | 221.18 | 4,802.3 | -142.1 | -53.9 | -107.1 | 3.18 | 0.76 | -8.08 |
| 4,850.0 | 23.83 | 220.61 | 4,825.3 | -149.5 | -60.4 | -111.2 | 5.08 | 5.00 | -2.28 |
| 4,875.0 | 25.36 | 220.67 | 4,848.0 | -157.4 | -67.1 | -115.5 | 6.12 | 6.12 | 0.24 |
| 4,900.0 | 26.33 | 220.63 | 4,870.5 | -165.7 | -74.2 | -120.1 | 3.88 | 3.88 | -0.16 |
| 4,925.0 | 26.16 | 221.74 | 4,893.0 | -174.0 | -81.5 | -124.7 | 2.08 | -0.68 | 4.44 |
| 4,950.0 | 24.77 | 225.56 | 4,915.5 | -181.8 | -88.9 | -128.7 | 8.60 | -5.56 | 15.28 |
| 4,975.0 | 23.82 | 225.72 | 4,938.3 | -189.0 | -96.3 | -132.2 | 3.81 | -3.80 | 0.64 |
| 5,000.0 | 22.67 | 224.69 | 4,961.3 | -195.9 | -103.3 | -135.7 | 4.88 | -4.60 | -4.12 |
| 5,025.0 | 22.37 | 226.25 | 4,984.4 | -202.7 | -110.1 | -138.9 | 2.67 | -1.20 | 6.24 |
| 5,050.0 | 21.67 | 230.03 | 5,007.6 | -208.9 | -117.1 | -141.8 | 6.32 | -2.80 | 15.12 |
| 5,075.0 | 21.26 | 229.65 | 5,030.8 | -214.8 | -124.1 | -144.2 | 1.73 | -1.64 | -1.52 |
| 5,100.0 | 20.89 | 228.02 | 5,054.2 | -220.7 | -130.8 | -146.8 | 2.77 | -1.48 | -6.52 |
| 5,125.0 | 20.93 | 227.83 | 5,077.5 | -226.7 | -137.5 | -149.5 | 0.31 | 0.16 | -0.76 |
| 5,150.0 | 24.32 | 227.92 | 5,100.6 | -233.2 | -144.6 | -152.4 | 13.56 | 13.56 | 0.36 |
| 5,175.0 | 24.22 | 227.47 | 5,123.4 | -240.1 | -152.2 | -155.6 | 0.84 | -0.40 | -1.80 |
| 5,200.0 | 24.06 | 227.04 | 5,146.2 | -247.0 | -159.7 | -158.8 | 0.95 | -0.64 | -1.72 |
| 5,225.0 | 25.37 | 227.94 | 5,168.9 | -254.1 | -167.4 | -162.0 | 5.45 | 5.24 | 3.60 |
| 5,250.0 | 27.09 | 228.29 | 5,191.3 | -261.4 | -175.6 | -165.4 | 6.91 | 6.88 | 1.40 |
| 5,275.0 | 27.32 | 227.40 | 5,213.6 | -269.1 | -184.1 | -168.8 | 1.87 | 0.92 | -3.56 |
| 5,300.0 | 25.40 | 227.57 | 5,236.0 | -276.6 | -192.3 | -172.3 | 7.69 | -7.68 | 0.68 |
| 5,325.0 | 25.86 | 229.66 | 5,258.5 | -283.8 | -200.4 | -175.4 | 4.06 | 1.84 | 8.36 |
| 5,350.0 | 24.75 | 229.60 | 5,281.1 | -290.7 | -208.5 | -178.4 | 4.44 | -4.44 | -0.24 |
| 5,375.0 | 23.93 | 228.54 | 5,303.9 | -297.4 | -216.3 | -181.3 | 3.72 | -3.28 | -4.24 |
| 5,400.0 | 23.35 | 228.57 | 5,326.8 | -304.1 | -223.8 | -184.2 | 2.32 | -2.32 | 0.12 |
| 5,425.0 | 25.03 | 230.63 | 5,349.6 | -310.7 | -231.6 | -187.0 | 7.52 | 6.72 | 8.24 |
| 5,450.0 | 24.91 | 232.49 | 5,372.2 | -317.3 | -239.9 | -189.6 | 3.18 | -0.48 | 7.44 |
| 5,475.0 | 24.10 | 233.18 | 5,395.0 | -323.5 | -248.2 | -191.9 | 3.44 | -3.24 | 2.76 |



Scientific Drilling International
Survey Report



Company: Antero Resources
Project: Tyler County WV
Site: Estlack Pad:
Hare/Jujubee/Lucy/Matthews/Melvin
Well: Matthews Unit 1H
Wellbore: ST1
Design: As Drilled ST1

Local Co-ordinate Reference: Well Matthews Unit 1H
TVD Reference: Frontier 32: 1141' GL + 32' KB @ 1173.0usft
MD Reference: Frontier 32: 1141' GL + 32' KB @ 1173.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Antero NE

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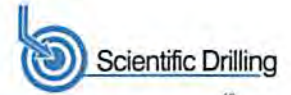
WV Department of
Environmental Protection

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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 5,500.0 | 24.24 | 234.55 | 5,417.8 | -329.6 | -256.4 | -193.9 | 2.31 | 0.56 | 5.48 |
| 5,525.0 | 25.35 | 237.90 | 5,440.5 | -335.4 | -265.1 | -195.6 | 7.16 | 4.44 | 13.40 |
| 5,550.0 | 25.50 | 238.44 | 5,463.1 | -341.0 | -274.3 | -197.0 | 1.10 | 0.60 | 2.16 |
| 5,575.0 | 24.65 | 237.31 | 5,485.7 | -346.7 | -283.2 | -198.4 | 3.90 | -3.40 | -4.52 |
| 5,600.0 | 25.34 | 236.79 | 5,508.4 | -352.4 | -292.1 | -200.0 | 2.90 | 2.76 | -2.08 |
| 5,625.0 | 25.84 | 236.21 | 5,530.9 | -358.4 | -301.1 | -201.7 | 2.24 | 2.00 | -2.32 |
| 5,650.0 | 26.08 | 234.76 | 5,553.4 | -364.6 | -310.1 | -203.6 | 2.71 | 0.96 | -5.80 |
| 5,675.0 | 24.98 | 233.69 | 5,576.0 | -370.9 | -318.9 | -205.7 | 4.77 | -4.40 | -4.28 |
| 5,700.0 | 24.82 | 233.31 | 5,598.6 | -377.1 | -327.3 | -207.9 | 0.91 | -0.64 | -1.52 |
| 5,725.0 | 24.77 | 232.65 | 5,621.3 | -383.5 | -335.7 | -210.2 | 1.13 | -0.20 | -2.64 |
| 5,750.0 | 23.71 | 231.14 | 5,644.1 | -389.8 | -343.8 | -212.6 | 4.91 | -4.24 | -6.04 |
| 5,782.0 | 22.50 | 230.61 | 5,673.6 | -397.7 | -353.5 | -215.8 | 3.84 | -3.78 | -1.66 |
| 5,816.0 | 23.88 | 234.33 | 5,704.8 | -405.9 | -364.1 | -218.8 | 5.92 | 4.06 | 10.94 |
| 5,847.0 | 24.06 | 232.62 | 5,733.1 | -413.4 | -374.3 | -221.5 | 2.31 | 0.58 | -5.52 |
| 5,879.0 | 23.72 | 230.54 | 5,762.4 | -421.4 | -384.4 | -224.6 | 2.84 | -1.06 | -6.50 |
| 5,910.0 | 25.11 | 229.17 | 5,790.6 | -429.7 | -394.2 | -228.1 | 4.84 | 4.48 | -4.42 |
| 5,942.0 | 25.39 | 227.14 | 5,819.6 | -438.8 | -404.4 | -232.1 | 2.84 | 0.88 | -6.34 |
| 5,974.0 | 24.27 | 223.88 | 5,848.6 | -448.2 | -414.0 | -236.7 | 5.53 | -3.50 | -10.19 |
| 6,006.0 | 23.17 | 226.43 | 5,877.9 | -457.3 | -423.1 | -241.2 | 4.70 | -3.44 | 7.97 |
| 6,038.0 | 22.15 | 228.99 | 5,907.4 | -465.6 | -432.2 | -245.0 | 4.43 | -3.19 | 8.00 |
| 6,069.0 | 21.00 | 230.62 | 5,936.3 | -472.9 | -440.9 | -248.1 | 4.18 | -3.71 | 5.26 |
| 6,101.0 | 20.07 | 229.60 | 5,966.2 | -480.1 | -449.5 | -251.1 | 3.11 | -2.91 | -3.19 |
| 6,132.0 | 19.93 | 231.27 | 5,995.4 | -486.9 | -457.7 | -253.9 | 1.90 | -0.45 | 5.39 |
| 6,164.0 | 19.82 | 238.51 | 6,025.5 | -493.1 | -466.6 | -255.9 | 7.69 | -0.34 | 22.63 |
| 6,196.0 | 20.92 | 240.90 | 6,055.5 | -498.7 | -476.2 | -257.0 | 4.31 | 3.44 | 7.47 |
| 6,227.0 | 21.50 | 243.73 | 6,084.4 | -503.9 | -486.1 | -257.6 | 3.80 | 1.87 | 9.13 |
| 6,259.0 | 21.15 | 250.35 | 6,114.2 | -508.5 | -496.8 | -257.3 | 7.60 | -1.09 | 20.69 |
| 6,291.0 | 21.39 | 258.98 | 6,144.0 | -511.5 | -508.0 | -255.5 | 9.80 | 0.75 | 26.97 |
| 6,323.0 | 22.17 | 267.91 | 6,173.7 | -512.9 | -519.7 | -251.9 | 10.63 | 2.44 | 27.91 |
| 6,355.0 | 24.42 | 276.60 | 6,203.1 | -512.3 | -532.4 | -246.1 | 12.82 | 7.03 | 27.16 |
| 6,387.0 | 26.25 | 284.85 | 6,232.1 | -509.7 | -545.8 | -238.3 | 12.41 | 5.72 | 25.78 |
| 6,411.0 | 27.70 | 289.41 | 6,253.5 | -506.5 | -556.2 | -231.0 | 10.53 | 6.06 | 19.00 |
| SCMR @ 6411 | | | | | | | | | |
| 6,419.0 | 28.22 | 290.83 | 6,260.5 | -505.2 | -559.7 | -228.4 | 10.53 | 6.45 | 17.76 |
| 6,450.0 | 31.12 | 297.50 | 6,287.5 | -498.9 | -573.6 | -216.9 | 14.16 | 9.35 | 21.52 |
| 6,482.0 | 34.25 | 302.10 | 6,314.4 | -490.3 | -588.6 | -202.8 | 12.48 | 9.78 | 14.38 |
| 6,513.0 | 37.42 | 304.86 | 6,339.5 | -480.3 | -603.7 | -187.5 | 11.48 | 10.23 | 8.90 |
| 6,545.0 | 41.00 | 308.38 | 6,364.3 | -468.2 | -620.0 | -169.8 | 13.17 | 11.19 | 11.00 |
| 6,576.0 | 44.28 | 310.68 | 6,387.1 | -454.9 | -636.1 | -150.9 | 11.71 | 10.58 | 7.42 |
| 6,608.0 | 47.27 | 312.94 | 6,409.4 | -439.6 | -653.2 | -129.9 | 10.63 | 9.34 | 7.06 |
| 6,624.0 | 48.54 | 314.10 | 6,420.2 | -431.4 | -661.8 | -118.9 | 9.62 | 7.97 | 7.26 |
| MDLX @ 6624 | | | | | | | | | |
| 6,639.0 | 49.75 | 315.15 | 6,430.0 | -423.4 | -669.9 | -108.3 | 9.62 | 8.04 | 6.99 |



Scientific Drilling International
Survey Report



Company: Antero Resources
Project: Tyler County WV
Site: Estlack Pad:
 Hare/Jujubee/Lucy/Matthews/Melvin
Well: Matthews Unit 1H
Wellbore: ST1
Design: As Drilled ST1

Local Co-ordinate Reference: Well Matthews Unit 1H
TVD Reference: Frontier 32: 1141' GL + 32' KB @ 1173.0usft
MD Reference: Frontier 32: 1141' GL + 32' KB @ 1173.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Antero NE

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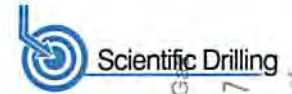
WV Department of
Environmental Protection

| 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) | |
|------------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|--|
| 6,671.0 | 52.40 | 316.76 | 6,450.1 | -405.5 | -687.2 | -84.8 | 9.16 | 8.28 | 5.03 | |
| 6,702.0 | 55.71 | 317.93 | 6,468.3 | -387.1 | -704.2 | -61.0 | 11.11 | 10.68 | 3.77 | |
| 6,734.0 | 58.50 | 319.35 | 6,485.7 | -366.9 | -721.9 | -35.3 | 9.48 | 8.72 | 4.44 | |
| 6,766.0 | 60.76 | 320.81 | 6,501.8 | -345.7 | -739.7 | -8.7 | 8.09 | 7.06 | 4.56 | |
| 6,798.0 | 63.73 | 322.00 | 6,516.7 | -323.6 | -757.3 | 18.8 | 9.85 | 9.28 | 3.72 | |
| 6,805.0 | 64.18 | 322.20 | 6,519.8 | -318.6 | -761.2 | 24.9 | 6.98 | 6.49 | 2.85 | |
| BRKT @ 6805 | | | | | | | | | | |
| 6,830.0 | 65.81 | 322.90 | 6,530.4 | -300.6 | -775.0 | 46.9 | 6.98 | 6.50 | 2.80 | |
| 6,862.0 | 68.08 | 323.89 | 6,542.9 | -277.0 | -792.5 | 75.7 | 7.64 | 7.09 | 3.09 | |
| 6,876.0 | 69.07 | 324.23 | 6,548.0 | -266.4 | -800.2 | 88.5 | 7.45 | 7.09 | 2.46 | |
| TLLY @ 6876 | | | | | | | | | | |
| 6,894.0 | 70.35 | 324.67 | 6,554.3 | -252.7 | -810.0 | 105.1 | 7.45 | 7.10 | 2.42 | |
| 6,926.0 | 72.53 | 325.81 | 6,564.4 | -227.8 | -827.3 | 134.9 | 7.60 | 6.81 | 3.56 | |
| 6,957.0 | 74.70 | 327.31 | 6,573.2 | -203.0 | -843.7 | 164.3 | 8.40 | 7.00 | 4.84 | |
| 6,975.0 | 75.50 | 328.03 | 6,577.8 | -188.3 | -853.0 | 181.5 | 5.91 | 4.46 | 4.01 | |
| MRCL_Hot @ 6975 | | | | | | | | | | |
| 6,989.0 | 76.13 | 328.59 | 6,581.2 | -176.7 | -860.1 | 195.0 | 5.91 | 4.47 | 3.99 | |
| 7,021.0 | 76.99 | 330.93 | 6,588.7 | -149.8 | -875.8 | 225.9 | 7.60 | 2.69 | 7.31 | |
| 7,052.0 | 78.51 | 332.73 | 6,595.3 | -123.1 | -890.1 | 256.2 | 7.50 | 4.90 | 5.81 | |
| 7,084.0 | 81.71 | 335.69 | 6,600.8 | -94.8 | -903.8 | 287.7 | 13.53 | 10.00 | 9.25 | |
| 7,116.0 | 85.63 | 338.07 | 6,604.3 | -65.5 | -916.2 | 319.5 | 14.31 | 12.25 | 7.44 | |
| 7,142.0 | 87.62 | 338.86 | 6,605.8 | -41.4 | -925.8 | 345.4 | 8.23 | 7.65 | 3.04 | |
| 7,174.0 | 90.40 | 338.90 | 6,606.4 | -11.5 | -937.3 | 377.3 | 8.69 | 8.69 | 0.13 | |
| 7,205.0 | 90.77 | 338.50 | 6,606.1 | 17.4 | -948.6 | 408.3 | 1.76 | 1.19 | -1.29 | |
| 7,237.0 | 90.67 | 337.90 | 6,605.7 | 47.1 | -960.4 | 440.2 | 1.90 | -0.31 | -1.88 | |
| 7,300.0 | 90.04 | 337.15 | 6,605.3 | 105.3 | -984.5 | 503.2 | 1.55 | -1.00 | -1.19 | |
| 7,395.0 | 90.74 | 338.48 | 6,604.6 | 193.2 | -1,020.4 | 598.1 | 1.58 | 0.74 | 1.40 | |
| 7,489.0 | 91.59 | 341.10 | 6,602.7 | 281.4 | -1,052.9 | 691.8 | 2.93 | 0.90 | 2.79 | |
| 7,583.0 | 91.76 | 341.19 | 6,600.0 | 370.3 | -1,083.2 | 785.3 | 0.20 | 0.18 | 0.10 | |
| 7,677.0 | 90.98 | 341.96 | 6,597.7 | 459.5 | -1,112.9 | 878.8 | 1.17 | -0.83 | 0.82 | |
| 7,771.0 | 89.87 | 341.13 | 6,597.0 | 548.7 | -1,142.7 | 972.3 | 1.47 | -1.18 | -0.88 | |
| 7,866.0 | 90.57 | 340.67 | 6,596.6 | 638.4 | -1,173.8 | 1,066.9 | 0.88 | 0.74 | -0.48 | |
| 7,961.0 | 90.20 | 339.93 | 6,596.0 | 727.9 | -1,205.8 | 1,161.5 | 0.87 | -0.39 | -0.78 | |
| 8,056.0 | 90.74 | 339.95 | 6,595.2 | 817.1 | -1,238.4 | 1,256.3 | 0.57 | 0.57 | 0.02 | |
| 8,150.0 | 91.07 | 342.96 | 6,593.7 | 906.2 | -1,268.3 | 1,349.7 | 3.22 | 0.35 | 3.20 | |
| 8,245.0 | 91.14 | 342.76 | 6,591.9 | 997.0 | -1,296.3 | 1,444.0 | 0.22 | 0.07 | -0.21 | |
| 8,339.0 | 89.86 | 341.13 | 6,591.1 | 1,086.3 | -1,325.4 | 1,537.4 | 2.20 | -1.36 | -1.73 | |
| 8,434.0 | 89.76 | 339.07 | 6,591.4 | 1,175.6 | -1,357.7 | 1,632.1 | 2.17 | -0.11 | -2.17 | |
| 8,530.0 | 90.40 | 338.88 | 6,591.3 | 1,265.3 | -1,392.2 | 1,727.9 | 0.70 | 0.67 | -0.20 | |
| 8,624.0 | 90.66 | 339.08 | 6,590.4 | 1,353.0 | -1,425.9 | 1,821.7 | 0.35 | 0.28 | 0.21 | |
| 8,719.0 | 89.25 | 339.03 | 6,590.5 | 1,441.7 | -1,459.8 | 1,916.5 | 1.49 | -1.48 | -0.05 | |
| 8,814.0 | 86.30 | 337.00 | 6,594.2 | 1,529.7 | -1,495.4 | 2,011.4 | 3.77 | -3.11 | -2.14 | |
| 8,829.0 | 86.51 | 336.67 | 6,595.1 | 1,543.5 | -1,501.3 | 2,026.3 | 2.60 | 1.40 | -2.20 | |



Scientific Drilling International

Survey Report



Environmental Protection
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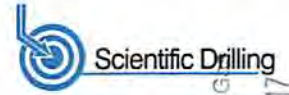
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| | | | |
|------------------|---|-------------------------------------|---|
| Company: | Antero Resources | Local Co-ordinate Reference: | Well Matthews Unit 1H |
| Project: | Tyler County WV | TVD Reference: | Frontier 32: 1141' GL + 32' KB @ 1173.0usft |
| Site: | Estlack Pad: Hare/Jujubee/Lucy/Matthews/Melvin | MD Reference: | Frontier 32: 1141' GL + 32' KB @ 1173.0usft |
| Well: | Matthews Unit 1H | North Reference: | Grid |
| Wellbore: | ST1 | Survey Calculation Method: | Minimum Curvature |
| Design: | As Drilled ST1 | 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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 8,845.0 | 86.51 | 336.21 | 6,596.1 | 1,558.1 | -1,507.6 | 2,042.3 | 2.87 | 0.00 | -2.88 |
| 8,860.0 | 86.67 | 336.39 | 6,597.0 | 1,571.8 | -1,513.7 | 2,057.3 | 1.60 | 1.07 | 1.20 |
| 8,908.0 | 87.18 | 335.94 | 6,599.5 | 1,615.7 | -1,533.0 | 2,105.2 | 1.42 | 1.06 | -0.94 |
| 9,003.0 | 88.76 | 338.26 | 6,602.9 | 1,703.1 | -1,570.0 | 2,200.1 | 2.95 | 1.66 | 2.44 |
| 9,098.0 | 90.00 | 341.12 | 6,603.9 | 1,792.2 | -1,602.9 | 2,294.8 | 3.28 | 1.31 | 3.01 |
| 9,192.0 | 90.92 | 341.52 | 6,603.2 | 1,881.3 | -1,633.0 | 2,388.4 | 1.07 | 0.98 | 0.43 |
| 9,287.0 | 90.03 | 341.88 | 6,602.4 | 1,971.4 | -1,662.9 | 2,482.8 | 1.01 | -0.94 | 0.38 |
| 9,383.0 | 90.06 | 341.34 | 6,602.3 | 2,062.5 | -1,693.2 | 2,578.3 | 0.56 | 0.03 | -0.56 |
| 9,478.0 | 90.68 | 340.91 | 6,601.7 | 2,152.4 | -1,723.9 | 2,672.8 | 0.79 | 0.65 | -0.45 |
| 9,573.0 | 90.30 | 342.51 | 6,600.9 | 2,242.6 | -1,753.7 | 2,767.3 | 1.73 | -0.40 | 1.68 |
| 9,668.0 | 90.50 | 342.71 | 6,600.2 | 2,333.3 | -1,782.1 | 2,861.5 | 0.30 | 0.21 | 0.21 |
| 9,763.0 | 89.22 | 339.61 | 6,600.5 | 2,423.2 | -1,812.8 | 2,956.1 | 3.53 | -1.35 | -3.26 |
| 9,858.0 | 89.85 | 339.11 | 6,601.2 | 2,512.1 | -1,846.3 | 3,050.9 | 0.85 | 0.66 | -0.53 |
| 9,954.0 | 90.45 | 340.56 | 6,601.0 | 2,602.2 | -1,879.3 | 3,146.6 | 1.63 | 0.63 | 1.51 |
| 10,049.0 | 90.45 | 340.39 | 6,600.2 | 2,691.7 | -1,911.1 | 3,241.2 | 0.18 | 0.00 | -0.18 |
| 10,143.0 | 89.87 | 342.33 | 6,600.0 | 2,780.8 | -1,941.1 | 3,334.8 | 2.15 | -0.62 | 2.06 |
| 10,238.0 | 90.54 | 342.46 | 6,599.6 | 2,871.3 | -1,969.9 | 3,429.1 | 0.72 | 0.71 | 0.14 |
| 10,334.0 | 89.47 | 341.12 | 6,599.6 | 2,962.5 | -1,999.9 | 3,524.5 | 1.79 | -1.11 | -1.40 |
| 10,430.0 | 88.63 | 340.06 | 6,601.2 | 3,053.1 | -2,031.8 | 3,620.1 | 1.41 | -0.88 | -1.10 |
| 10,524.0 | 90.34 | 339.98 | 6,602.1 | 3,141.4 | -2,063.9 | 3,713.8 | 1.82 | 1.82 | -0.09 |
| 10,618.0 | 91.28 | 340.59 | 6,600.7 | 3,229.9 | -2,095.6 | 3,807.5 | 1.19 | 1.00 | 0.65 |
| 10,713.0 | 90.37 | 337.88 | 6,599.4 | 3,318.7 | -2,129.3 | 3,902.3 | 3.01 | -0.96 | -2.85 |
| 10,809.0 | 89.83 | 340.48 | 6,599.2 | 3,408.4 | -2,163.4 | 3,998.1 | 2.77 | -0.56 | 2.71 |
| 10,903.0 | 88.92 | 340.78 | 6,600.2 | 3,497.1 | -2,194.6 | 4,091.7 | 1.02 | -0.97 | 0.32 |
| 10,998.0 | 90.33 | 340.91 | 6,600.8 | 3,586.8 | -2,225.7 | 4,186.3 | 1.49 | 1.48 | 0.14 |
| 11,092.0 | 89.36 | 341.47 | 6,601.1 | 3,675.8 | -2,256.0 | 4,279.8 | 1.19 | -1.03 | 0.60 |
| 11,186.0 | 89.69 | 341.08 | 6,601.9 | 3,764.8 | -2,286.2 | 4,373.4 | 0.54 | 0.35 | -0.41 |
| 11,282.0 | 89.25 | 340.81 | 6,602.8 | 3,855.5 | -2,317.6 | 4,468.9 | 0.54 | -0.46 | -0.28 |
| 11,376.0 | 90.23 | 341.51 | 6,603.2 | 3,944.5 | -2,347.9 | 4,562.5 | 1.28 | 1.04 | 0.74 |
| 11,471.0 | 89.66 | 339.98 | 6,603.3 | 4,034.2 | -2,379.2 | 4,657.1 | 1.72 | -0.60 | -1.61 |
| 11,564.0 | 88.35 | 339.01 | 6,604.9 | 4,121.3 | -2,411.8 | 4,749.9 | 1.75 | -1.41 | -1.04 |
| 11,659.0 | 88.98 | 338.90 | 6,607.1 | 4,209.9 | -2,445.9 | 4,844.7 | 0.67 | 0.66 | -0.12 |
| 11,753.0 | 89.75 | 339.15 | 6,608.2 | 4,297.7 | -2,479.6 | 4,938.5 | 0.86 | 0.82 | 0.27 |
| 11,848.0 | 89.32 | 341.12 | 6,608.9 | 4,387.0 | -2,511.8 | 5,033.2 | 2.12 | -0.45 | 2.07 |
| 11,943.0 | 88.61 | 340.42 | 6,610.6 | 4,476.7 | -2,543.1 | 5,127.8 | 1.05 | -0.75 | -0.74 |
| 12,038.0 | 89.32 | 340.48 | 6,612.4 | 4,566.2 | -2,574.9 | 5,222.4 | 0.75 | 0.75 | 0.06 |
| 12,132.0 | 89.25 | 342.19 | 6,613.5 | 4,655.3 | -2,605.0 | 5,315.9 | 1.82 | -0.07 | 1.82 |
| 12,227.0 | 90.05 | 342.47 | 6,614.1 | 4,745.8 | -2,633.8 | 5,410.3 | 0.89 | 0.84 | 0.29 |
| 12,322.0 | 89.95 | 341.83 | 6,614.1 | 4,836.2 | -2,662.9 | 5,504.6 | 0.68 | -0.11 | -0.67 |
| 12,416.0 | 88.94 | 339.09 | 6,615.0 | 4,924.8 | -2,694.4 | 5,598.3 | 3.11 | -1.07 | -2.91 |
| 12,511.0 | 89.65 | 339.61 | 6,616.2 | 5,013.7 | -2,727.9 | 5,693.1 | 0.93 | 0.75 | 0.55 |
| 12,604.0 | 90.49 | 339.80 | 6,616.1 | 5,100.9 | -2,760.1 | 5,785.8 | 0.93 | 0.90 | 0.20 |
| 12,700.0 | 89.91 | 339.34 | 6,615.7 | 5,190.9 | -2,793.6 | 5,881.6 | 0.77 | -0.60 | -0.48 |



Scientific Drilling International
Survey Report



Company: Antero Resources
Project: Tyler County WV
Site: Estlack Pad:
 Hare/Jujubee/Lucy/Matthews/Melvin
Well: Matthews Unit 1H
Wellbore: ST1
Design: As Drilled ST1

Local Co-ordinate Reference: Well Matthews Unit 1H
TVD Reference: Frontier 32: 1141' GL + 32' KB @ 1173.0usft
MD Reference: Frontier 32: 1141' GL + 32' KB @ 1173.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Antero NE

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Environmental Protection

| 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) |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 12,796.0 | 88.67 | 338.91 | 6,616.9 | 5,280.5 | -2,827.8 | 5,977.4 | 1.37 | -1.29 | -0.45 |
| 12,889.0 | 89.44 | 338.57 | 6,618.5 | 5,367.2 | -2,861.6 | 6,070.2 | 0.91 | 0.83 | -0.37 |
| 12,983.0 | 89.98 | 341.01 | 6,618.9 | 5,455.4 | -2,894.0 | 6,164.0 | 2.66 | 0.57 | 2.60 |
| 13,077.0 | 89.07 | 341.38 | 6,619.7 | 5,544.4 | -2,924.3 | 6,257.5 | 1.05 | -0.97 | 0.39 |
| 13,173.0 | 89.85 | 341.56 | 6,620.6 | 5,635.4 | -2,954.8 | 6,353.0 | 0.83 | 0.81 | 0.19 |
| 13,268.0 | 90.45 | 341.15 | 6,620.4 | 5,725.4 | -2,985.2 | 6,447.5 | 0.76 | 0.63 | -0.43 |
| 13,362.0 | 89.14 | 339.64 | 6,620.7 | 5,814.0 | -3,016.7 | 6,541.2 | 2.13 | -1.39 | -1.61 |
| 13,456.0 | 89.54 | 339.63 | 6,621.8 | 5,902.1 | -3,049.5 | 6,634.9 | 0.43 | 0.43 | -0.01 |
| 13,551.0 | 89.98 | 340.31 | 6,622.2 | 5,991.3 | -3,082.0 | 6,729.6 | 0.85 | 0.46 | 0.72 |
| 13,645.0 | 89.85 | 342.81 | 6,622.3 | 6,080.5 | -3,111.7 | 6,823.1 | 2.66 | -0.14 | 2.66 |
| 13,739.0 | 88.60 | 342.70 | 6,623.6 | 6,170.3 | -3,139.6 | 6,916.4 | 1.33 | -1.33 | -0.12 |
| 13,834.0 | 89.04 | 341.91 | 6,625.6 | 6,260.7 | -3,168.5 | 7,010.7 | 0.95 | 0.46 | -0.83 |
| 13,928.0 | 90.01 | 342.38 | 6,626.3 | 6,350.2 | -3,197.3 | 7,104.1 | 1.15 | 1.03 | 0.50 |
| 14,022.0 | 89.00 | 340.55 | 6,627.2 | 6,439.3 | -3,227.2 | 7,197.5 | 2.22 | -1.07 | -1.95 |
| 14,117.0 | 90.14 | 340.47 | 6,627.9 | 6,528.9 | -3,258.8 | 7,292.2 | 1.20 | 1.20 | -0.08 |
| 14,211.0 | 89.27 | 339.73 | 6,628.4 | 6,617.3 | -3,290.8 | 7,385.9 | 1.22 | -0.93 | -0.79 |
| 14,306.0 | 90.35 | 340.61 | 6,628.7 | 6,706.6 | -3,323.1 | 7,480.6 | 1.47 | 1.14 | 0.93 |
| 14,400.0 | 89.14 | 340.39 | 6,629.1 | 6,795.2 | -3,354.4 | 7,574.2 | 1.31 | -1.29 | -0.23 |
| 14,494.0 | 90.04 | 341.32 | 6,629.8 | 6,884.0 | -3,385.3 | 7,667.8 | 1.38 | 0.96 | 0.99 |
| 14,590.0 | 89.17 | 339.88 | 6,630.4 | 6,974.6 | -3,417.2 | 7,763.4 | 1.75 | -0.91 | -1.50 |
| 14,685.0 | 90.21 | 341.37 | 6,630.9 | 7,064.2 | -3,448.7 | 7,858.1 | 1.91 | 1.09 | 1.57 |
| 14,781.0 | 89.74 | 339.37 | 6,631.0 | 7,154.6 | -3,480.9 | 7,953.7 | 2.14 | -0.49 | -2.08 |
| 14,876.0 | 88.63 | 338.98 | 6,632.3 | 7,243.4 | -3,514.7 | 8,048.5 | 1.24 | -1.17 | -0.41 |
| 14,971.0 | 89.67 | 339.83 | 6,633.7 | 7,332.3 | -3,548.1 | 8,143.3 | 1.41 | 1.09 | 0.89 |
| 15,066.0 | 90.95 | 340.41 | 6,633.2 | 7,421.6 | -3,580.4 | 8,238.0 | 1.48 | 1.35 | 0.61 |
| 15,161.0 | 90.81 | 339.22 | 6,631.8 | 7,510.8 | -3,613.2 | 8,332.7 | 1.26 | -0.15 | -1.25 |
| 15,257.0 | 91.42 | 338.74 | 6,629.9 | 7,600.4 | -3,647.6 | 8,428.5 | 0.81 | 0.64 | -0.50 |
| 15,352.0 | 90.04 | 340.24 | 6,628.7 | 7,689.4 | -3,680.9 | 8,523.3 | 2.15 | -1.45 | 1.58 |
| 15,448.0 | 88.46 | 340.06 | 6,629.9 | 7,779.6 | -3,713.5 | 8,619.0 | 1.66 | -1.65 | -0.19 |
| 15,543.0 | 89.03 | 339.93 | 6,632.0 | 7,868.9 | -3,746.0 | 8,713.7 | 0.62 | 0.60 | -0.14 |
| 15,638.0 | 88.87 | 339.11 | 6,633.8 | 7,957.9 | -3,779.2 | 8,808.4 | 0.88 | -0.17 | -0.86 |
| 15,733.0 | 89.50 | 341.01 | 6,635.1 | 8,047.2 | -3,811.6 | 8,903.1 | 2.11 | 0.66 | 2.00 |
| 15,828.0 | 89.40 | 341.82 | 6,636.0 | 8,137.2 | -3,841.9 | 8,997.6 | 0.86 | -0.11 | 0.85 |
| 15,923.0 | 87.79 | 341.78 | 6,638.4 | 8,227.4 | -3,871.5 | 9,092.0 | 1.70 | -1.69 | -0.04 |
| 16,017.0 | 88.93 | 342.39 | 6,641.0 | 8,316.8 | -3,900.4 | 9,185.4 | 1.38 | 1.21 | 0.65 |
| 16,112.0 | 89.87 | 341.73 | 6,642.0 | 8,407.2 | -3,929.7 | 9,279.8 | 1.21 | 0.99 | -0.69 |
| 16,208.0 | 88.90 | 342.61 | 6,643.1 | 8,498.6 | -3,959.1 | 9,375.1 | 1.36 | -1.01 | 0.92 |
| 16,303.0 | 89.60 | 342.70 | 6,644.3 | 8,589.3 | -3,987.4 | 9,469.4 | 0.74 | 0.74 | 0.09 |
| 16,397.0 | 89.54 | 341.21 | 6,645.0 | 8,678.6 | -4,016.5 | 9,562.8 | 1.59 | -0.06 | -1.59 |
| 16,492.0 | 89.47 | 339.62 | 6,645.8 | 8,768.1 | -4,048.4 | 9,657.4 | 1.68 | -0.07 | -1.67 |
| 16,586.0 | 90.51 | 339.69 | 6,645.9 | 8,856.3 | -4,081.1 | 9,751.2 | 1.11 | 1.11 | 0.07 |
| 16,683.0 | 89.50 | 338.81 | 6,645.8 | 8,947.0 | -4,115.4 | 9,848.0 | 1.38 | -1.04 | -0.91 |



Scientific Drilling International
Survey Report



| | | | |
|------------------|---|-------------------------------------|---|
| Company: | Antero Resources | Local Co-ordinate Reference: | Well Matthews Unit 1H |
| Project: | Tyler County WV | TVD Reference: | Frontier 32: 1141' GL + 32' KB @ 1173.0usft |
| Site: | Estlack Pad: Hare/Jujubee/Lucy/Matthews/Melvin | MD Reference: | Frontier 32: 1141' GL + 32' KB @ 1173.0usft |
| Well: | Matthews Unit 1H | North Reference: | Grid |
| Wellbore: | ST1 | Survey Calculation Method: | Minimum Curvature |
| Design: | As Drilled ST1 | Database: | Antero NE |

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 Environmental Protection

| 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) |
|--|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|-------------------------|------------------------|-----------------------|
| 16,778.0 | 90.28 | 336.51 | 6,646.0 | 9,034.8 | -4,151.5 | 9,942.9 | 2.56 | 0.82 | -2.42 |
| 16,873.0 | 89.37 | 339.23 | 6,646.3 | 9,122.8 | -4,187.3 | 10,037.8 | 3.02 | -0.96 | 2.86 |
| 16,967.0 | 89.84 | 340.47 | 6,647.0 | 9,211.1 | -4,219.7 | 10,131.6 | 1.41 | 0.50 | 1.32 |
| 17,061.0 | 89.57 | 342.44 | 6,647.5 | 9,300.2 | -4,249.6 | 10,225.1 | 2.12 | -0.29 | 2.10 |
| 17,157.0 | 89.17 | 342.05 | 6,648.5 | 9,391.6 | -4,278.9 | 10,320.4 | 0.56 | -0.42 | -0.41 |
| Last SDI MWD @ 17157 | | | | | | | | | |
| 17,242.0 | 89.17 | 342.05 | 6,649.7 | 9,472.4 | -4,305.1 | 10,404.8 | 0.00 | 0.00 | 0.00 |
| Projection To Bit @ 17242 MD / 6649 TVD | | | | | | | | | |

| Measured Depth (usft) | Vertical Depth (usft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|-----------------------|-----------------------|-----------------|-----------|---------|-------------------|
| 6,411.0 | 6,253.5 | SCMR @ 6411 | | 0.00 | |
| 6,624.0 | 6,420.2 | MDLX @ 6624 | | 0.00 | |
| 6,805.0 | 6,519.8 | BRKT @ 6805 | | 0.00 | |
| 6,876.0 | 6,548.0 | TLLY @ 6876 | | 0.00 | |
| 6,975.0 | 6,577.8 | MRCL_Hot @ 6975 | | 0.00 | |

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment |
|-----------------------|-----------------------|-------------------|--------------|---|
| | | +N/-S (usft) | +E/-W (usft) | |
| 17,157.0 | 6,648.5 | 9,391.6 | -4,278.9 | Last SDI MWD @ 17157 |
| 17,242.0 | 6,649.7 | 9,472.4 | -4,305.1 | Projection To Bit @ 17242 MD / 6649 TVD |

Checked By: _____ Approved By: _____ Date: _____