

State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Well Operator's Report of Well Work

RECEIVED

MAY 20 2016

WV GEOLOGICAL SURVEY  
MORGANTOWN, WV

API 47 - 085 - 10141 County Ritchie District Clay  
Quad Pullman 7.5' Pad Name Edwin Field/Pool Name ----  
Farm name Quimby, Franklin P. Well Number Moats Unit 3H  
Operator (as registered with the OOG) Antero Resources Corporation  
Address 1615 Wynkoop St. City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4342350m Easting 508388m  
Landing Point of Curve Northing 4341515.16m Easting 508655.97m  
Bottom Hole Northing 4340305m Easting 509186m

Elevation (ft) 1191' GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine

Mud Type(s) and Additive(s)  
Air- Foam & 4% KCL  
Mud- Polymer

Date permit issued 9/23/2014 Date drilling commenced 1/6/2015 Date drilling ceased 9/15/2015  
Date completion activities began 10/18/2015 Date completion activities ceased 3/3/2016  
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 49' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft None Identified Void(s) encountered (Y/N) depths No  
Coal depth(s) ft 1287' Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

Reviewed by:  
\_\_\_\_\_

API 47-085 - 10141 Farm name Quimby, Franklin P. Well number Moats Unit 3H

| CASING STRINGS            | Hole Size       | Casing Size | Depth  | New or Used | Grade wt/ft | Basket Depth(s) | Did cement circulate (Y/ N)<br>* Provide details below* |
|---------------------------|-----------------|-------------|--------|-------------|-------------|-----------------|---|
| Conductor                 | 30"             | 20"         | 40'    | New         | 94# J-55    | N/A             | Y   |
| Surface                   | 17- 1/2"        | 13- 3/8"    | 376'   | New         | 48# H-40    | N/A             | Y   |
| Coal                      |                 |             |        |             |             |                 |   |
| Intermediate 1            | 12-1/4"         | 9-5/8"      | 2548'  | New         | 36# J-55    | N/A             | Y   |
| Intermediate 2            |                 |             |        |             |             |                 |   |
| Intermediate 3            |                 |             |        |             |             |                 |   |
| Production                | 8-3/4" & 8-1/2" | 5-1/2"      | 13594' | New         | 20# P-110   | N/A             | Y   |
| Tubing                    |                 | 2-3/8"      | 6745'  |             | 4.7# N-80   | N/A             |   |
| Packer type and depth set |                 | N/A         |        |             |             |                 |   |

Comment Details \_\_\_\_\_

| CEMENT DATA    | Class/Type of Cement | Number of Sacks              | Slurry wt (ppg)     | Yield (ft <sup>3</sup> /sks) | Volume (ft <sup>3</sup> ) | Cement Top (MD)                | WOC (hrs) |
|----------------|----------------------|------------------------------|---------------------|------------------------------|---------------------------|--------------------------------|-----------|
| Conductor      | Class A              | 193 sx                       | 15.6                | 1.18                         | 38                        | 0'                             | 8 Hrs.    |
| Surface        | Class A              | 451 sx                       | 15.6                | 1.18                         | 261                       | 0'                             | 8 Hrs.    |
| Coal           |                      |                              |                     |                              |                           |                                |           |
| Intermediate 1 | Class A              | 997 sx                       | 15.6                | 1.18                         | 798                       | 0'                             | 8 Hrs.    |
| Intermediate 2 |                      |                              |                     |                              |                           |                                |           |
| Intermediate 3 |                      |                              |                     |                              |                           |                                |           |
| Production     | Class H              | 986 sx (Lead) 1030 sx (Tail) | 13.5 Lead 15.2 Tail | 1.44 Lead 1.83 Tail          | 2645                      | ~500' into Intermediate Casing | 8 Hrs.    |
| Tubing         |                      |                              |                     |                              |                           |                                |           |

Drillers TD (ft) 13594' MD, 6649' TVD (BHL), 6672' (Deepest Point Drilled) Loggers TD (ft) 13544'  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 5933'

\*\* This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Hornet Unit 1H API #47-085-10062). Please reference the wireline logs submitted with Form WR-35 for Hornet Unit 1H. A Cement Bond Log has been included with this submittal.

Check all wireline logs run  caliper  density  deviated/directional  induction  neutron  resistivity  gamma ray  temperature  sonic

Well cored  Yes  No  Conventional  Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_  
 Conductor- 0  
 Surface- 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface  
 Intermediate- 1 above float joint, 1 above float collar, 1 every 4th joint to surface  
 Production- 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_

API 47- 085 - 10141 Farm name Quimby, Franklin P. Well number Moats Unit 3H

PERFORATION RECORD

| Stage No.                             | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|---------------------------------------|------------------|------------------------|----------------------|------------------------|--------------|
| <b>*PLEASE SEE ATTACHED EXHIBIT 1</b> |                  |                        |                      |                        |              |
|                                       |                  |                        |                      |                        |              |
|                                       |                  |                        |                      |                        |              |
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|                                       |                  |                        |                      |                        |              |

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

| Stage No.                             | Stimulations Date | Ave Pump Rate (BPM) | Ave Treatment Pressure (PSI) | Max Breakdown Pressure (PSI) | ISIP (PSI) | Amount of Proppant (lbs) | Amount of Water (bbls) | Amount of Nitrogen/other (units) |
|---------------------------------------|-------------------|---------------------|------------------------------|------------------------------|------------|--------------------------|------------------------|----------------------------------|
| <b>*PLEASE SEE ATTACHED EXHIBIT 2</b> |                   |                     |                              |                              |            |                          |                        |                                  |
|                                       |                   |                     |                              |                              |            |                          |                        |                                  |
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|                                       |                   |                     |                              |                              |            |                          |                        |                                  |

Please insert additional pages as applicable.

API 47- 085 - 10141 Farm name Quimby, Franklin P. Well number Moats Unit 3H

| <u>PRODUCING FORMATION(S)</u> | <u>DEPTHS</u>          |                       |
|-------------------------------|------------------------|-----------------------|
| <u>Marcellus</u>              | <u>6573' (top)</u> TVD | <u>6898' (top)</u> MD |
| _____                         | _____                  | _____                 |
| _____                         | _____                  | _____                 |
| _____                         | _____                  | _____                 |

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump  
 SHUT-IN PRESSURE Surface 3000 psi Bottom Hole --- psi DURATION OF TEST --- hrs  
 OPEN FLOW Gas Oil NGL Water GAS MEASURED BY  
10113 mcfpd 152 bpd --- bpd 2 bpd  Estimated  Orifice  Pilot

| LITHOLOGY/<br>FORMATION | TOP<br>DEPTH IN FT<br>NAME TVD | BOTTOM<br>DEPTH IN FT<br>TVD | TOP<br>DEPTH IN FT<br>MD | BOTTOM<br>DEPTH IN FT<br>MD | DESCRIBE ROCK TYPE AND RECORD QUANTITY AND<br>TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC) |
|-------------------------|--------------------------------|------------------------------|--------------------------|-----------------------------|--|
|                         | <u>0</u>                       |                              | <u>0</u>                 |                             |  |
|                         |                                |                              |                          |                             |  |
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|                         |                                |                              |                          |                             |  |
|                         |                                |                              |                          |                             |  |

**\*PLEASE SEE ATTACHED EXHIBIT 3**

Please insert additional pages as applicable.

Drilling Contractor Precision Drilling Company, LP  
 Address 2640 Reach Rd. City Williamsport State PA Zip 17701  
 Logging Company Rush Wellsite Services  
 Address 60 Alpha Dr. City Canonsburg State PA Zip 15317  
 Cementing Company Allied Oil & Gas Services, LLC  
 Address 1036 East Main St. City Bridgeport State WV Zip 26330  
 Stimulating Company US Well Services  
 Address 533 Industrial Park Dr. City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233  
 Signature [Signature] Title Permit Representative Date 5/13/2016

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

**EXHIBIT 1**

| Stage No. | Perforation Date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formations |
|-----------|------------------|------------------------|----------------------|------------------------|------------|
| 1         | 18-Oct-15        | 13,334                 | 13,503               | 60                     | Marcellus  |
| 2         | 23-Dec-15        | 13,134                 | 13,303               | 60                     | Marcellus  |
| 3         | 28-Dec-15        | 12,934                 | 13,103               | 60                     | Marcellus  |
| 4         | 29-Dec-15        | 12,734                 | 12,903               | 60                     | Marcellus  |
| 5         | 29-Dec-15        | 12,534                 | 12,702               | 60                     | Marcellus  |
| 6         | 29-Dec-15        | 12,334                 | 12,502               | 60                     | Marcellus  |
| 7         | 29-Dec-15        | 12,133                 | 12,302               | 60                     | Marcellus  |
| 8         | 29-Dec-15        | 11,933                 | 12,102               | 60                     | Marcellus  |
| 9         | 30-Dec-15        | 11,733                 | 11,902               | 60                     | Marcellus  |
| 10        | 30-Dec-15        | 11,533                 | 11,702               | 60                     | Marcellus  |
| 11        | 30-Dec-15        | 11,333                 | 11,502               | 60                     | Marcellus  |
| 12        | 30-Dec-15        | 11,133                 | 11,302               | 60                     | Marcellus  |
| 13        | 31-Dec-15        | 10,933                 | 11,101               | 60                     | Marcellus  |
| 14        | 31-Dec-15        | 10,733                 | 10,901               | 60                     | Marcellus  |
| 15        | 31-Dec-15        | 10,532                 | 10,701               | 60                     | Marcellus  |
| 16        | 31-Dec-15        | 10,332                 | 10,501               | 60                     | Marcellus  |
| 17        | 1-Jan-16         | 10,132                 | 10,301               | 60                     | Marcellus  |
| 18        | 1-Jan-16         | 9,932                  | 10,101               | 60                     | Marcellus  |
| 19        | 1-Jan-16         | 9,732                  | 9,901                | 60                     | Marcellus  |
| 20        | 1-Jan-16         | 9,532                  | 9,701                | 60                     | Marcellus  |
| 21        | 2-Jan-16         | 9,332                  | 9,500                | 60                     | Marcellus  |
| 22        | 2-Jan-16         | 9,131                  | 9,300                | 60                     | Marcellus  |
| 23        | 2-Jan-16         | 8,931                  | 9,100                | 60                     | Marcellus  |
| 24        | 2-Jan-16         | 8,731                  | 8,900                | 60                     | Marcellus  |
| 25        | 2-Jan-16         | 8,531                  | 8,700                | 60                     | Marcellus  |
| 26        | 3-Jan-16         | 8,331                  | 8,500                | 60                     | Marcellus  |
| 27        | 3-Jan-16         | 8,131                  | 8,300                | 60                     | Marcellus  |
| 28        | 3-Jan-16         | 7,931                  | 8,099                | 60                     | Marcellus  |
| 29        | 3-Jan-16         | 7,731                  | 7,899                | 60                     | Marcellus  |
| 30        | 3-Jan-16         | 7,530                  | 7,699                | 60                     | Marcellus  |
| 31        | 4-Jan-16         | 7,330                  | 7,499                | 60                     | Marcellus  |
| 32        | 4-Jan-16         | 7,130                  | 7,299                | 60                     | Marcellus  |
| 33        | 4-Jan-16         | 6,930                  | 7,099                | 60                     | Marcellus  |

**EXHIBIT 2**

| Stage No.   | Stimulations Date | Avg Pump Rate | Avg Treatment Pressure (PSI) | Max Breakdown Pressure (PSI) | ISIP (PSI)   | Amount of Proppant (lbs) | Amount of Water (bbls) | Amount of Nitrogen/ other (units) |
|-------------|-------------------|---------------|------------------------------|------------------------------|--------------|--------------------------|------------------------|-----------------------------------|
| 1           | 23-Dec-15         | 69.6          | 6,786                        | 5,341                        | 4,526        | 237,250                  | 6,597                  | N/A                               |
| 2           | 23-Dec-15         | 69.5          | 6,726                        | 5,682                        | 4,611        | 230,500                  | 6,277                  | N/A                               |
| 3           | 28-Dec-15         | 72.0          | 6,490                        | 5,135                        | 4,647        | 251,270                  | 6,441                  | N/A                               |
| 4           | 29-Dec-15         | 72.1          | 6,499                        | 5,655                        | 4,522        | 249,260                  | 6,682                  | N/A                               |
| 5           | 29-Dec-15         | 71.7          | 6,156                        | 4,868                        | 5,081        | 251,000                  | 6,515                  | N/A                               |
| 6           | 29-Dec-15         | 72.5          | 6,301                        | 5,444                        | 4,876        | 248,600                  | 6,511                  | N/A                               |
| 7           | 29-Dec-15         | 70.5          | 6,508                        | 5,695                        | 4,755        | 250,840                  | 6,448                  | N/A                               |
| 8           | 29-Dec-15         | 72.9          | 6,406                        | 5,003                        | 4,512        | 250,600                  | 6,537                  | N/A                               |
| 9           | 30-Dec-15         | 71.6          | 6,170                        | 5,083                        | 5,584        | 249,840                  | 6,440                  | N/A                               |
| 10          | 30-Dec-15         | 69.1          | 6,629                        | 5,820                        | 4,395        | 243,270                  | 6,479                  | N/A                               |
| 11          | 30-Dec-15         | 74.5          | 6,261                        | 5,196                        | 3,366        | 250,670                  | 6,523                  | N/A                               |
| 12          | 30-Dec-15         | 71.9          | 6,491                        | 4,907                        | 4,279        | 251,220                  | 6,965                  | N/A                               |
| 13          | 31-Dec-15         | 70.2          | 6,566                        | 5,174                        | 4,823        | 245,400                  | 6,341                  | N/A                               |
| 14          | 31-Dec-15         | 72.3          | 6,478                        | 5,243                        | 3,761        | 250,840                  | 6,466                  | N/A                               |
| 15          | 31-Dec-15         | 71.6          | 6,445                        | 5,378                        | 4,102        | 252,420                  | 6,356                  | N/A                               |
| 16          | 31-Dec-15         | 70.2          | 6,442                        | 5,391                        | 3,306        | 251,400                  | 6,359                  | N/A                               |
| 17          | 1-Jan-16          | 71.6          | 6,743                        | 5,622                        | 5,100        | 250,590                  | 6,579                  | N/A                               |
| 18          | 1-Jan-16          | 70.0          | 6,721                        | 5,234                        | 5,010        | 245,520                  | 6,445                  | N/A                               |
| 19          | 1-Jan-16          | 67.5          | 6,774                        | 5,281                        | 4,318        | 224,510                  | 6,269                  | N/A                               |
| 20          | 1-Jan-16          | 72.3          | 6,614                        | 5,251                        | 3,995        | 250,840                  | 6,538                  | N/A                               |
| 21          | 2-Jan-16          | 72.9          | 6,836                        | 5,125                        | 4,653        | 181,600                  | 6,339                  | N/A                               |
| 22          | 2-Jan-16          | 56.1          | 7,851                        | 5,332                        | 4,277        | 49,400                   | 6,854                  | N/A                               |
| 23          | 2-Jan-16          | 72.4          | 6,492                        | 5,178                        | 4,321        | 239,800                  | 6,244                  | N/A                               |
| 24          | 2-Jan-16          | 72.7          | 6,471                        | 5,404                        | 4,750        | 251,000                  | 6,366                  | N/A                               |
| 25          | 2-Jan-16          | 72.9          | 6,263                        | 5,559                        | 5,138        | 251,120                  | 6,223                  | N/A                               |
| 26          | 3-Jan-16          | 72.5          | 6,281                        | 5,109                        | 4,120        | 250,500                  | 6,249                  | N/A                               |
| 27          | 3-Jan-16          | 72.5          | 6,287                        | 5,195                        | 3,318        | 253,360                  | 6,237                  | N/A                               |
| 28          | 3-Jan-16          | 73.9          | 6,254                        | 5,390                        | 4,522        | 254,280                  | 6,194                  | N/A                               |
| 29          | 3-Jan-16          | 72.6          | 6,136                        | 5,135                        | 4,799        | 251,290                  | 6,171                  | N/A                               |
| 30          | 3-Jan-16          | 72.9          | 6,206                        | 5,135                        | 4,605        | 252,440                  | 6,185                  | N/A                               |
| 31          | 4-Jan-16          | 72.5          | 6,192                        | 4,996                        | 3,799        | 250,100                  | 6,149                  | N/A                               |
| 32          | 4-Jan-16          | 69.1          | 6,018                        | 4,966                        | 4,749        | 250,570                  | 6,208                  | N/A                               |
| 33          | 4-Jan-16          | 72.0          | 5,793                        | 4,915                        | 3,361        | 253,000                  | 6,214                  | N/A                               |
| <b>AVG=</b> |                   | <b>71.2</b>   | <b>6,463</b>                 | <b>5,268</b>                 | <b>4,424</b> | <b>7,924,300</b>         | <b>6,406</b>           | <b>TOTAL</b>                      |

## EXHIBIT 3

| LITHOLOGY/ FORMATION                | TOP DEPTH (TVD) | BOTTOM DEPTH (TVD) | TOP DEPTH (MD) | BOTTOM DEPTH (MD) |
|-------------------------------------|-----------------|--------------------|----------------|-------------------|
|                                     | From Surface    | From Surface       | From Surface   | From Surface      |
| Fresh Water                         | 49'             | N/A                | 49'            | N/A               |
| Sandy Shale                         | 0               | 187                | 0              | 187               |
| Sandstone                           | est. 187        | 447                | est. 187       | 447               |
| Shale/Siltstone                     | est. 447        | 647                | est. 447       | 647               |
| Shaley Limestone                    | est. 647        | 727                | est. 647       | 727               |
| Shale/Siltstone                     | est. 727        | 1127               | est. 727       | 1127              |
| Shaley Limestone                    | est. 1127       | 1287               | est. 1127      | 1287              |
| Coal                                | est. 1287       | 1307               | est. 1287      | 1307              |
| Shaley Limestone (trace coal)       | est. 1307       | 1627               | est. 1307      | 1627              |
| Shale/Siltstone                     | est. 1627       | 1787               | est. 1627      | 1787              |
| Sandstone/Siltstone                 | est. 1787       | 1827               | est. 1787      | 1827              |
| Sandstone/Siltstone with trace coal | est. 1827       | 2007               | est. 1827      | 2007              |
| Silty Sandstone                     | est. 2007       | 2165               | est. 2007      | 2167              |
| Big Lime                            | 2165            | 2259               | 2167           | 2261              |
| Big Injun                           | 2259            | 2659               | 2261           | 2661              |
| Gantz Sand                          | 2659            | 2858               | 2661           | 2860              |
| Fifty Foot Sandstone                | 2858            | 2914               | 2860           | 2916              |
| Gordon                              | 2914            | 3063               | 2916           | 3065              |
| Fifth Sandstone                     | 3063            | 3197               | 3065           | 3199              |
| Bayard                              | 3197            | 3628               | 3199           | 3630              |
| Warren                              | 3628            | 4034               | 3630           | 4036              |
| Speechley                           | 4034            | 4286               | 4036           | 4288              |
| Baltown                             | 4286            | 4718               | 4288           | 4720              |
| Bradford                            | 4718            | 5101               | 4720           | 5103              |
| Benson                              | 5101            | 5362               | 5103           | 5364              |
| Alexander                           | 5362            | 5550               | 5364           | 5552              |
| Elk                                 | 5550            | 5950               | 5552           | 5952              |
| Rhinestreet                         | 5950            | 6249               | 5952           | 6279              |
| Sycamore                            | 6249            | 6408               | 6279           | 6489              |
| Middlesex                           | 6408            | 6518               | 6489           | 6703              |
| Burkett                             | 6518            | 6549               | 6703           | 6783              |
| Tully                               | 6549            | 6573               | 6783           | 6898              |
| Marcellus                           | 6573            | NA                 | 6898           | NA                |

\*Please note Antero determines formation tops based on mud logs that are only run on one well on a multi-well pad. The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

# Hydraulic Fracturing Fluid Product Component Information Disclosure

|                                |                              |
|--------------------------------|------------------------------|
| Job Start Date:                | 12/23/2015                   |
| Job End Date:                  | 1/4/2016                     |
| State:                         | West Virginia                |
| County:                        | Ritchie                      |
| API Number:                    | 47-085-10141-00-00           |
| Operator Name:                 | Antero Resources Corporation |
| Well Name and Number:          | Moats 3H                     |
| Longitude:                     | -80.90281700                 |
| Latitude:                      | 39.23040600                  |
| Datum:                         | NAD83                        |
| Federal/Tribal Well:           | NO                           |
| True Vertical Depth:           | 6,672                        |
| Total Base Water Volume (gal): | 9,221,604                    |
| Total Base Non Water Volume:   | 0                            |



## Hydraulic Fracturing Fluid Composition:

| Trade Name             | Supplier                | Purpose          | Ingredients                                    | Chemical Service Number (CAS #) | Maximum Ingredient Concentration in Additive (% by mass)** | Maximum Ingredient Concentration in HF Fluid (% by mass)** | Comments |
|------------------------|-------------------------|------------------|--|---------------------------------|--|--|----------|
| Water                  | Antero Resources        | Base Fluid       | Water  | 7732-18-5                       | 100.00000  | 90.31900   |          |
| Sand                   | U.S. Well Services, LLC | Proppant         |  |                                 |  |  |          |
| LGC-15                 | U.S. Well Services      | Gelling Agents   | Crystalline Silica, quartz                     | 14808-60-7                      | 100.00000  | 9.30610  |          |
|                        |                         |                  | Guar Gum                                       | 9000-30-0                       | 50.00000   | 0.07436  |          |
|                        |                         |                  | Petroleum Distillates                          | 64742-47-8                      | 60.00000   | 0.07042  |          |
|                        |                         |                  | Suspending agent (solid)                       | 14808-60-7                      | 3.00000  | 0.01137  |          |
|                        |                         |                  | Surfactant                                     | 68439-51-0                      | 3.00000  | 0.00446  |          |
| HCL Acid (12.6%-18.0%) | U.S. Well Services, LLC | Bulk Acid        |  |                                 |  |  |          |
|                        |                         |                  | Water  | 7732-18-5                       | 87.50000   | 0.08668  |          |
|                        |                         |                  | Hydrogen Chloride                              | 7647-01-0                       | 18.00000   | 0.02071  |          |
| WFRA-405               | U.S. Well Services      | Friction Reducer |  |                                 |  |  |          |
|                        |                         |                  | Water  | 7732-18-5                       | 60.00000   | 0.04011  |          |
|                        |                         |                  | 2-Propenoic acid, polymer with 2-propenamamide | 9003-06-9                       | 30.00000   | 0.02005  |          |
|                        |                         |                  | Hydrated light distillate (petroleum)          | 64742-47-8                      | 30.00000   | 0.01614  |          |
|                        |                         |                  | Ethoxylated alcohol blend                      | 68002-97-1                      | 4.00000  | 0.00267  |          |



| SI-1100  | J.S. Well Services | Scale Inhibitor           |   |            |           |         |  |  |
|--|--------------------|---------------------------|---|------------|-----------|---------|--|--|
|  |                    |                           | Water   | 7732-18-5  | 80.00000  | 0.01037 |  |  |
|  |                    |                           | Ethylene Glycol   | 107-21-1   | 25.00000  | 0.00366 |  |  |
|  |                    |                           | Copolymer of Maleic and Acrylic acid                                    | 52255-49-9 | 10.00000  | 0.00153 |  |  |
|  |                    |                           | Potassium salt of diethylene triamine penta (methylene phosphonic acid) | 15827-60-8 | 7.50000   | 0.00131 |  |  |
|  |                    |                           | Hexamethylene tramine penta (methylene phosphonic acid)                 | 34690-00-1 | 5.00000   | 0.00084 |  |  |
|  |                    |                           | Phosphino carboxylic acid polymer                                       | 71050-62-9 | 5.00000   | 0.00084 |  |  |
|  |                    |                           | Hexamethylene diamine penta (methylene phosphonic acid)                 | 23605-74-5 | 2.00000   | 0.00034 |  |  |
| K-BAC 1020   | J.S. Well Services | Anti-Bacterial Agent      |   |            |           |         |  |  |
|  |                    |                           | 2,2-dibromo-3-nitropropionamide   | 10222-01-2 | 20.00000  | 0.00428 |  |  |
|  |                    |                           | Deionized Water   | 7732-18-5  | 28.00000  | 0.00245 |  |  |
| AP One   | J.S. Well Services | Gel Breakers              |   |            |           |         |  |  |
|  |                    |                           | Ammonium Persulfate   | 7727-54-0  | 100.00000 | 0.00187 |  |  |
| AI-302   | J.S. Well Services | Acid Corrosion Inhibitors |   |            |           |         |  |  |
|  |                    |                           | Water   | 7732-18-5  | 95.00000  | 0.00036 |  |  |
|  |                    |                           | 2-Propyn-1-ol compound with methylxirane                                | 38172-91-7 | 15.00000  | 0.00006 |  |  |
| Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS. |                    |                           |   |            |           |         |  |  |

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided. Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

LATITUDE 39°15'00"

7,928'

5,317' TO BOTTOM HOLE  
LATITUDE 39°15'00"

LONGITUDE 80°52'30"

7,165'

13,880' TO BOTTOM HOLE

LONGITUDE 80°52'30"

WM. VANCAMPEN  
ET AL LEASE  
JACK D. MACKAY ET AL  
D.B. 280 PG. 972  
T.M. 37 PAR. 3  
235.03 AC. ±

**Antero Resources Corporation**  
**Well No. Moats Unit 3H**  
**47-085-10141 (AS DRILLED)**

**WELL NO. 3H**  
**47-085-10141**

**AS DRILLED DATA:**  
**WELL 3H TOP HOLE INFORMATION:**  
N: 269,104ft E: 1,602,577ft  
LAT: 39°13'49.18" LON: 80°54'10.76"  
**BOTTOM HOLE INFORMATION:**  
N: 262,349ft E: 1,605,085ft  
LAT: 39°12'42.81" LON: 80°53'37.56"  
**WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE.**  
**ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT.**  
**PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.**

**(NAD) 83 (UTM) ZONE 17 COORDS:**  
**WELL 3H TOP HOLE INFORMATION:**  
N: 4,342,350m E: 508,388m  
**BOTTOM HOLE INFORMATION:**  
N: 4,340,305m E: 509,186m

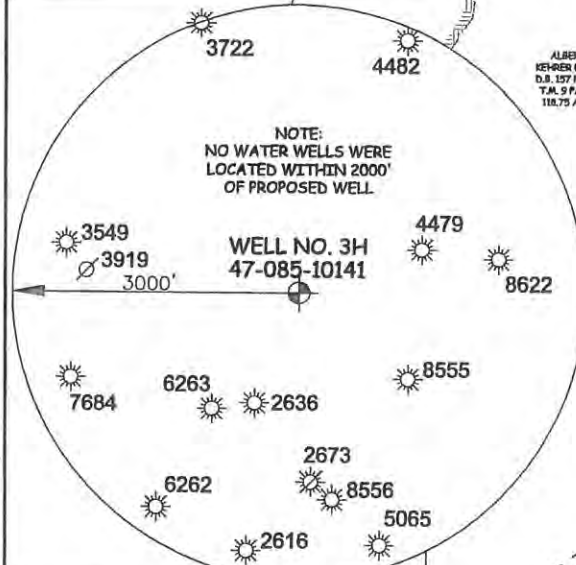
- NOTE**
1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
  2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
  3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
  4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
  5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

WV NORTH ZONE  
GRID NORTH

10  
4

**PAD LAYOUT**

- Hornet Unit 2H 10'
  - Hornet Unit 1H 10'
  - Myrtle Unit 1H 10'
  - Myrtle Unit 2H 10'
  - Miracle Unit 2H 10'
  - Miracle Unit 1H 10'
  - Moats Unit 2H 10'
  - Moats Unit 1H 10'
  - Moats Unit 3H 10'
  - Miracle Unit 3H 10'
- N 05°20' E  
NOT TO SCALE



JOB # 13-051WA  
DRAWING # MOATS3HAD  
SCALE 1" = 1000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC  
220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

**LEGEND**

- Surface Owner Boundary Lines +/-
- - - Interior Surface Tracts +/-
- X Existing Fence
- ⊕ Found monument, as noted
- Proposed Well Path
- ⊗ As Drilled Well Path

DATE 2/24/2016  
OPERATOR'S WELL# MOATS UNIT #3H

API WELL # 47 - 085 - 10141  
STATE COUNTY PERMIT

QUADRANGLE PULLMAN 7.5' DISTRICT CLAY (TH) UNION (BH) COUNTY RITCHIE ACREAGE 23 ACRES +/-

SURFACE OWNER FRANKLIN P. QUIMBY OIL & GAS ROYALTY OWNER LAWRENCE C. HEIM ET AL; C.S. HALL ET UX; MARJORIE CROOKS ET AL; JACK LANGFORD ET AL; C.W. BALL HEIRS; JACK LANGFORD ET AL; J.B. TAFT ET AL LEASE ACREAGE 53 AC±; 113 AC±; 117 AC±; 448.5 AC±; 49.27 AC±; 10 AC±; 57 AC±

PROPOSED WORK: DRILL    CONVERT    DRILL DEEPER    REDRILL    FRACTURE OR STIMULATE    PLUG OFF OLD FORMATION    PERFORATE NEW FORMATION    OTHER PHYSICAL CHANGE IN WELL (SPECIFY) (AS DRILLED) PLUG & ABANDON    CLEAN OUT & REPLUG    TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,649' TVD 13,594' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER  
ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM  
DENVER, CO 80202 5400 D BIG TYLER ROAD  
CHARLESTON, WV 25313

COUNTY NAME PERMIT