

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

API 47 - 085 - 10180 County Ritchie District Clay  
Quad Pennsboro 7.5' Pad Name Buck Run Pad Field/Pool Name ----  
Farm name Stephen C. Jackson et al Well Number Manos Unit 1H  
Operator (as registered with the OOG) Antero Resources Corporation  
Address 1615 Wynkoop Street 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 4351845m Easting 504551m  
Landing Point of Curve Northing 4351831.35m Easting 504099.29m  
Bottom Hole Northing 4354341m Easting 503078m

Elevation (ft) 1127' 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 2/26/2015 Date drilling commenced 12/4/2015 Date drilling ceased 3/2/2016  
Date completion activities began 7/9/2016 Date completion activities ceased 10/3/2016  
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by MARCO 2017 Reviewed by N/A

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

Freshwater depth(s) ft 55', 227, 439' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1921' Void(s) encountered (Y/N) depths No  
Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

**APPROVED**  
NAME: Michael Loff 09/15/2017  
DATE: 7-13-16

API 47-085 - 10180 Farm name Stephen C. Jackson et al Well number Manos Unit 1H

| 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                 | 24"           | 20"         | 40'    | New         | 133# J-55   | N/A             | Y   |
| Surface                   | 17-1/2"       | 13-3/8"     | 591'   | New         | 48# H-40    | N/A             | Y   |
| Coal                      |               |             |        |             |             |                 |   |
| Intermediate 1            | 12-1/4"       | 9-5/8"      | 2520'  | New         | 36# J-55    | N/A             | Y   |
| Intermediate 2            |               |             |        |             |             |                 |   |
| Intermediate 3            |               |             |        |             |             |                 |   |
| Production                | 8-3/4"/8-1/2" | 5-1/2"      | 16235' | New         | 23# P-110   | N/A             | Y   |
| Tubing                    |               | 2-3/8"      | 6401'  |             | 4.7# N-80   |                 |   |
| Packer type and depth set |               | N/A         |        |             |             |                 |   |

Comment Details WVDEP Inspector Mike Goff was notified 2/22/16 at 20:00 hrs of cement squeeze from 5119' to 5000' with 96sks of Class A Cement.

| 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              | 100 sx                       | 15.6                     | 1.18                         | 38                        | 0'                             | 8 Hrs.    |
| Surface        | Class A              | 679 sx                       | 15.6                     | 1.18                         | 411                       | 0'                             | 8 Hrs.    |
| Coal           |                      |                              |                          |                              |                           |                                |           |
| Intermediate 1 | Class A              | 966 sx                       | 15.6                     | 1.18                         | 789                       | 0'                             | 8 Hrs.    |
| Intermediate 2 |                      |                              |                          |                              |                           |                                |           |
| Intermediate 3 |                      |                              |                          |                              |                           |                                |           |
| Production     | Class H              | 782 sx (Lead) 1556 sx (Tail) | 13.5 (Lead), 15.2 (Tail) | 1.44 (Lead), 1.84 (Tail)     | 3257                      | -500' into Intermediate Casing | 8 Hrs.    |
| Tubing         |                      |                              |                          |                              |                           |                                |           |

Drillers TD (ft) 16235' MD, 6403' TVD (BHL); 6438' TVD (Deepest Point Drilled) Loggers TD (ft) 16235' MD  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 6042'

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

\*\* This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Jackknife Unit 1H API #47-085-10178). Please reference the wireline logs submitted with Form WR-35 for Jackknife Unit 1H. A Cement Bond Log has been included with this submittal.

RECEIVED  
Office of Oil and Gas  
MAR 20 2017  
WV Department of Environmental Protection

API 47- 085 - 10180 Farm name Stephen C. Jackson et al Well number Manos Unit 1H

**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 - 10180 Farm name Stephen C. Jackson et al Well number Manos Unit 1H

| <u>PRODUCING FORMATION(S)</u> | <u>DEPTHS</u>      |            |                              |
|-------------------------------|--------------------|------------|------------------------------|
| <u>Marcellus</u>              | <u>6382' (TOP)</u> | <u>TVD</u> | <u>6969' (TOP)</u> <u>MD</u> |
| _____                         | _____              | _____      | _____                        |
| _____                         | _____              | _____      | _____                        |
| _____                         | _____              | _____      | _____                        |

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 14048 mcfpd Oil 186 bpd NGL --- bpd Water 360 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

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

**\*PLEASE SEE ATTACHED EXHIBIT 3**

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Please insert additional pages as applicable.

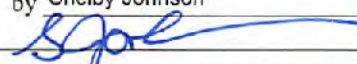
Drilling Contractor Patterson - UTI Drilling Company, LLC  
Address 207 Carlton Dr. City Eighty-Four State PA Zip 15330

Logging Company Allied Horizontal Wireline Services  
Address 381 Colonial Manor Rd City North Huntingdon State PA Zip 15642

Cementing Company BJ Services  
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 Shelby Johnson Telephone 303-357-7223  
Signature  Title Permitting Agent Date 3/13/2017

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

API 47-085-10180 Farm Name Stephen C. Jackson et al Well Number Manos Unit 1H

**EXHIBIT 1**

| Stage No. | Perforation Date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formations |
|-----------|------------------|------------------------|----------------------|------------------------|------------|
| 1         | 7/9/2016         | 15965                  | 16133                | 60                     | Marcellus  |
| 2         | 7/10/2016        | 15766                  | 15934                | 60                     | Marcellus  |
| 3         | 7/10/2016        | 15567                  | 15735                | 60                     | Marcellus  |
| 4         | 7/10/2016        | 15369                  | 15536                | 60                     | Marcellus  |
| 5         | 7/11/2016        | 15170                  | 15337                | 60                     | Marcellus  |
| 6         | 7/11/2016        | 14971                  | 15138                | 60                     | Marcellus  |
| 7         | 7/11/2016        | 14772                  | 14940                | 60                     | Marcellus  |
| 8         | 7/11/2016        | 14573                  | 14741                | 60                     | Marcellus  |
| 9         | 7/11/2016        | 14374                  | 14542                | 60                     | Marcellus  |
| 10        | 7/12/2016        | 14175                  | 14343                | 60                     | Marcellus  |
| 11        | 7/12/2016        | 13976                  | 14144                | 60                     | Marcellus  |
| 12        | 7/12/2016        | 13777                  | 13945                | 60                     | Marcellus  |
| 13        | 7/12/2016        | 13578                  | 13746                | 60                     | Marcellus  |
| 14        | 7/12/2016        | 13379                  | 13547                | 60                     | Marcellus  |
| 15        | 7/12/2016        | 13181                  | 13348                | 60                     | Marcellus  |
| 16        | 7/13/2016        | 12982                  | 13149                | 60                     | Marcellus  |
| 17        | 7/13/2016        | 12783                  | 12951                | 60                     | Marcellus  |
| 18        | 7/13/2016        | 12584                  | 12752                | 60                     | Marcellus  |
| 19        | 7/14/2016        | 12385                  | 12553                | 60                     | Marcellus  |
| 20        | 7/14/2016        | 12186                  | 12354                | 60                     | Marcellus  |
| 21        | 7/14/2016        | 11987                  | 12155                | 60                     | Marcellus  |
| 22        | 7/14/2016        | 11788                  | 11956                | 60                     | Marcellus  |
| 23        | 7/15/2016        | 11589                  | 11757                | 60                     | Marcellus  |
| 24        | 7/15/2016        | 11390                  | 11558                | 60                     | Marcellus  |
| 25        | 7/15/2016        | 11192                  | 11359                | 60                     | Marcellus  |
| 26        | 7/15/2016        | 10993                  | 11160                | 60                     | Marcellus  |
| 27        | 7/16/2016        | 10794                  | 10961                | 60                     | Marcellus  |
| 28        | 7/16/2016        | 10595                  | 10763                | 60                     | Marcellus  |
| 29        | 7/16/2016        | 10396                  | 10564                | 60                     | Marcellus  |
| 30        | 7/16/2016        | 10197                  | 10365                | 60                     | Marcellus  |
| 31        | 7/16/2016        | 9998                   | 10166                | 60                     | Marcellus  |
| 32        | 7/16/2016        | 9799                   | 9967                 | 60                     | Marcellus  |
| 33        | 7/17/2016        | 9600                   | 9768                 | 60                     | Marcellus  |
| 34        | 7/17/2016        | 9401                   | 9569                 | 60                     | Marcellus  |
| 35        | 7/17/2016        | 9202                   | 9370                 | 60                     | Marcellus  |
| 36        | 7/18/2016        | 9004                   | 9171                 | 60                     | Marcellus  |
| 37        | 7/18/2016        | 8805                   | 8972                 | 60                     | Marcellus  |
| 38        | 7/18/2016        | 8606                   | 8773                 | 60                     | Marcellus  |
| 39        | 7/18/2016        | 8407                   | 8575                 | 60                     | Marcellus  |
| 40        | 7/18/2016        | 8208                   | 8376                 | 60                     | Marcellus  |
| 41        | 7/18/2016        | 8009                   | 8177                 | 60                     | Marcellus  |
| 42        | 7/19/2016        | 7810                   | 7978                 | 60                     | Marcellus  |
| 43        | 7/19/2016        | 7611                   | 7779                 | 60                     | Marcellus  |
| 44        | 7/19/2016        | 7412                   | 7580                 | 60                     | Marcellus  |
| 45        | 7/19/2016        | 7213                   | 7381                 | 60                     | Marcellus  |
| 46        | 7/20/2016        | 7014                   | 7182                 | 60                     | Marcellus  |

API 47-085-10180 Farm Name Stephen C. Jackson et al Well Number Manos Unit 1H

**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           | 7/9/2016          | 71.9          | 7856                         | 5933                         | 3307         | 301600                   | 10068                  | N/A                               |
| 2           | 7/10/2016         | 71.6          | 7388                         | 6010                         | 3576         | 303300                   | 8471                   | N/A                               |
| 3           | 7/10/2016         | 74.4          | 7284                         | 6172                         | 4596         | 301570                   | 8459                   | N/A                               |
| 4           | 7/10/2016         | 71.7          | 7382                         | 5968                         | 4471         | 291320                   | 8320                   | N/A                               |
| 5           | 7/11/2016         | 70.5          | 7149                         | 6359                         | 4417         | 304380                   | 8404                   | N/A                               |
| 6           | 7/11/2016         | 70.1          | 7195                         | 6162                         | 4538         | 306100                   | 8454                   | N/A                               |
| 7           | 7/11/2016         | 71.3          | 7531                         | 5904                         | 4456         | 232500                   | 8228                   | N/A                               |
| 8           | 7/11/2016         | 77.1          | 7556                         | 5651                         | 4245         | 302300                   | 8403                   | N/A                               |
| 9           | 7/11/2016         | 80.4          | 7758                         | 5772                         | 4517         | 303200                   | 8394                   | N/A                               |
| 10          | 7/12/2016         | 80.8          | 7584                         | 5672                         | 4621         | 305400                   | 8343                   | N/A                               |
| 11          | 7/12/2016         | 77.6          | 7475                         | 5236                         | 4034         | 302600                   | 8399                   | N/A                               |
| 12          | 7/12/2016         | 78.9          | 7424                         | 5307                         | 3870         | 302500                   | 8299                   | N/A                               |
| 13          | 7/12/2016         | 69.0          | 7647                         | 5525                         | 4642         | 209500                   | 8321                   | N/A                               |
| 14          | 7/12/2016         | 71.1          | 7306                         | 5303                         | 3459         | 304600                   | 8391                   | N/A                               |
| 15          | 7/12/2016         | 70.8          | 6829                         | 5907                         | 3457         | 303300                   | 8317                   | N/A                               |
| 16          | 7/13/2016         | 71.3          | 7042                         | 5565                         | 3226         | 303500                   | 8329                   | N/A                               |
| 17          | 7/13/2016         | 74.1          | 7158                         | 5844                         | 3744         | 305400                   | 9369                   | N/A                               |
| 18          | 7/13/2016         | 71.1          | 7113                         | 6692                         | 3871         | 299200                   | 8256                   | N/A                               |
| 19          | 7/14/2016         | 71.5          | 7011                         | 5387                         | 4081         | 307810                   | 8345                   | N/A                               |
| 20          | 7/14/2016         | 71.6          | 7031                         | 5608                         | 3730         | 302600                   | 8295                   | N/A                               |
| 21          | 7/14/2016         | 70.4          | 6983                         | 5121                         | 3544         | 303300                   | 8300                   | N/A                               |
| 22          | 7/14/2016         | 71.2          | 7075                         | 5529                         | 3902         | 304700                   | 8309                   | N/A                               |
| 23          | 7/15/2016         | 71.3          | 7089                         | 5227                         | 4296         | 303300                   | 8409                   | N/A                               |
| 24          | 7/15/2016         | 72.8          | 7021                         | 5086                         | 3735         | 303800                   | 8246                   | N/A                               |
| 25          | 7/15/2016         | 72.6          | 6885                         | 4895                         | 3703         | 303800                   | 8258                   | N/A                               |
| 26          | 7/15/2016         | 73.9          | 6860                         | 5053                         | 4678         | 303900                   | 8267                   | N/A                               |
| 27          | 7/16/2016         | 73.1          | 6922                         | 5326                         | 4992         | 304210                   | 8255                   | N/A                               |
| 28          | 7/16/2016         | 72.6          | 6723                         | 5350                         | 3688         | 303500                   | 8221                   | N/A                               |
| 29          | 7/16/2016         | 72.7          | 6768                         | 5485                         | 4076         | 304400                   | 8206                   | N/A                               |
| 30          | 7/16/2016         | 73.1          | 6648                         | 5443                         | 3543         | 304310                   | 8258                   | N/A                               |
| 31          | 7/16/2016         | 71.5          | 6864                         | 5940                         | 3550         | 303300                   | 8246                   | N/A                               |
| 32          | 7/16/2016         | 70.6          | 6510                         | 5853                         | 3281         | 302200                   | 8204                   | N/A                               |
| 33          | 7/17/2016         | 72.7          | 6680                         | 5683                         | 3590         | 302500                   | 8188                   | N/A                               |
| 34          | 7/17/2016         | 72.5          | 6913                         | 5642                         | 3480         | 302100                   | 8173                   | N/A                               |
| 35          | 7/17/2016         | 70.4          | 6914                         | 5344                         | 3496         | 301300                   | 8207                   | N/A                               |
| 36          | 7/18/2016         | 72.3          | 6831                         | 5537                         | 3689         | 301700                   | 8219                   | N/A                               |
| 37          | 7/18/2016         | 72.4          | 6818                         | 5761                         | 3515         | 301700                   | 8166                   | N/A                               |
| 38          | 7/18/2016         | 72.7          | 6683                         | 5207                         | 3523         | 301600                   | 8120                   | N/A                               |
| 39          | 7/18/2016         | 72.7          | 6776                         | 5314                         | 3716         | 301700                   | 8125                   | N/A                               |
| 40          | 7/18/2016         | 70.8          | 6480                         | 4201                         | 3603         | 300500                   | 8096                   | N/A                               |
| 41          | 7/18/2016         | 70.6          | 6231                         | 4061                         | 3811         | 302640                   | 8101                   | N/A                               |
| 42          | 7/19/2016         | 71.1          | 6339                         | 5581                         | 3372         | 301350                   | 8103                   | N/A                               |
| 43          | 7/19/2016         | 72.7          | 6238                         | 4503                         | 3279         | 302500                   | 8090                   | N/A                               |
| 44          | 7/19/2016         | 72.7          | 6213                         | 5676                         | 3369         | 303200                   | 8101                   | N/A                               |
| 45          | 7/19/2016         | 69.1          | 6267                         | 6330                         | 3528         | 302230                   | 8070                   | N/A                               |
| 46          | 7/20/2016         | 70.3          | 6627                         | 6047                         | 3651         | 302440                   | 8688                   | N/A                               |
| <b>AVG=</b> |                   | <b>72.5</b>   | <b>6,980</b>                 | <b>5,547</b>                 | <b>3,858</b> | <b>13,764,860</b>        | <b>383,492</b>         | <b>TOTAL</b>                      |

09/15/2017

**EXHIBIT 3**

| <b>LITHOLOGY/ FORMATION</b> | <b>TOP DEPTH (TVD)<br/>From Surface</b> | <b>BOTTOM DEPTH (TVD)<br/>From Surface</b> | <b>TOP DEPTH (MD)<br/>From Surface</b> | <b>BOTTOM DEPTH (MD)<br/>From Surface</b> |
|-----------------------------|---|--|--|---|
| Fresh Water                 | 55'                                     | N/A  | 55'                                    | N/A                                       |
| Fresh Water                 | 227'                                    | N/A  | 227'                                   | N/A                                       |
| Fresh Water                 | 439'                                    | N/A  | 439'                                   | N/A                                       |
| Siltstone                   | est. 0                                  | 567  | est. 0                                 | 567                                       |
| Shale                       | est. 567                                | 627  | est. 567                               | 627                                       |
| Sandstone                   | est. 627                                | 647  | est. 627                               | 647                                       |
| Siltstone                   | est. 647                                | 867  | est. 647                               | 867                                       |
| Shale                       | est. 867                                | 987  | est. 867                               | 987                                       |
| Sandstone                   | est. 987                                | 1,067                                      | est. 987                               | 1,067                                     |
| Shale                       | est. 1067                               | 1,247                                      | est. 1067                              | 1,247                                     |
| Sandstone                   | est. 1247                               | 1,387                                      | est. 1247                              | 1,387                                     |
| Coaly Sandstone             | est. 1387                               | 1,647                                      | est. 1387                              | 1,647                                     |
| Shale                       | est. 1647                               | 1,867                                      | est. 1647                              | 1,867                                     |
| Sandstone                   | est. 1867                               | 1,907                                      | est. 1867                              | 1,907                                     |
| Shale                       | est. 1907                               | 1,989                                      | est. 1907                              | 1,991                                     |
| Big Lime                    | 1,989                                   | 2,130                                      | 1,997                                  | 2,139                                     |
| Big Injun                   | 2,130                                   | 2,502                                      | 2,139                                  | 2,510                                     |
| Gantz Sand                  | 2,502                                   | 2,882                                      | 2,510                                  | 2,887                                     |
| Fifty Foot Sandstone        | 2,882                                   | 2,981                                      | 2,887                                  | 2,987                                     |
| Gordon                      | 2,981                                   | 2,882                                      | 2,987                                  | 3,348                                     |
| Fifth Sandstone             | 2,882                                   | 3,415                                      | 3,348                                  | 3,422                                     |
| Bayard                      | 3,415                                   | 3,558                                      | 3,422                                  | 3,574                                     |
| Warren                      | 3,558                                   | 3,955                                      | 3,574                                  | 3,988                                     |
| Speechley                   | 3,955                                   | 4,224                                      | 3,988                                  | 4,266                                     |
| Baltown                     | 4,224                                   | 4,615                                      | 4,266                                  | 4,703                                     |
| Bradford                    | 4,615                                   | 5,001                                      | 4,703                                  | 5,146                                     |
| Benson                      | 5,001                                   | 5,240                                      | 5,146                                  | 5,404                                     |
| Alexander                   | 5,240                                   | 5,551                                      | 5,404                                  | 5,753                                     |
| Elk                         | 5,551                                   | 5,831                                      | 5,753                                  | 6,269                                     |
| Rhinestreet                 | 5,831                                   | 6,134                                      | 6,269                                  | 6,458                                     |
| Sycamore                    | 6,134                                   | 6,229                                      | 6,458                                  | 6,601                                     |
| Middlesex                   | 6,229                                   | 6,335                                      | 6,601                                  | 6,814                                     |
| Burkett                     | 6,335                                   | 6,363                                      | 6,814                                  | 6,898                                     |
| Tully                       | 6,363                                   | 6,383                                      | 6,898                                  | 6,969                                     |
| Marcellus                   | 6,383                                   | N/A  | 6,969                                  | N/A                                       |

\*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:                | 7/9/2016                     |
| Job End Date:                  | 7/20/2016                    |
| State:                         | West Virginia                |
| County:                        | Ritchie                      |
| API Number:                    | 47-085-10180-00-00           |
| Operator Name:                 | Antero Resources Corporation |
| Well Name and Number:          | Manos 1H                     |
| Latitude:                      | 39.31599400                  |
| Longitude:                     | -80.94720800                 |
| Datum:                         | NAD83                        |
| Federal Well:                  | NO                           |
| Indian Well:                   | NO                           |
| True Vertical Depth:           | 6,438                        |
| Total Base Water Volume (gal): | 16,661,044                   |
| Total Base Non Water Volume:   | 0                            |



### Hydraulic Fracturing Fluid Composition:

| Trade Name             | Supplier                | Purpose          | Ingredients                                  | Chemical Abstract 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  | 90.67634   |          |
| Sand                   | U.S. Well Services, LLC | Proppant         |  |  |  |  |          |
|                        |                         |                  | Crystalline Silica, quartz                   | 14808-60-7                               | 100.00000  | 8.98251  |          |
| HCL Acid (12.6%-18.0%) | U.S. Well Services, LLC | Bulk Acid        |  |  |  |  |          |
|                        |                         |                  | Water  | 7732-18-5                                | 87.50000   | 0.12369  |          |
|                        |                         |                  | Hydrogen Chloride                            | 7647-01-0                                | 18.00000   | 0.02955  |          |
| LGC-15                 | U.S. Well Services      | Gelling Agents   |  |  |  |  |          |
|                        |                         |                  | Guar Gum                                     | 9000-30-0                                | 50.00000   | 0.04400  |          |
|                        |                         |                  | Petroleum Distillates                        | 64742-47-8                               | 60.00000   | 0.04168  |          |
|                        |                         |                  | Suspending agent (solid)                     | 14808-60-7                               | 3.00000  | 0.00673  |          |
|                        |                         |                  | Surfactant                                   | 68439-51-0                               | 3.00000  | 0.00264  |          |
| WFRA-405               | U.S. Well Services      | Friction Reducer |  |  |  |  |          |
|                        |                         |                  | Water  | 7732-18-5                                | 60.00000   | 0.03407  |          |
|                        |                         |                  | 2-Propenoic acid, polymer with 2-propenamide | 9003-06-9                                | 30.00000   | 0.01703  |          |
|                        |                         |                  | Hydrated light distillate (petroleum)        | 64742-47-8                               | 30.00000   | 0.01371  |          |



|               |                    |                           |   |            |           |         |
|---------------|--------------------|---------------------------|---|------------|-----------|---------|
|               |                    |                           | Ethoxylated alcohol blend   | 68002-97-1 | 4.00000   | 0.00227 |
| SI-1100s      | U.S. Well Services | Scale Inhibitor           |   |            |           |         |
|               |                    |                           | Water   | 7732-18-5  | 80.00000  | 0.01003 |
|               |                    |                           | Copolymer of Maleic and Acrylic acid                                    | 52255-49-9 | 10.00000  | 0.00148 |
|               |                    |                           | Potassium salt of diethylene triamine penta (methylene phosphonic acid) | 15827-60-8 | 7.50000   | 0.00127 |
|               |                    |                           | Phosphino carboxylic acid polymer                                       | 71050-62-9 | 5.00000   | 0.00081 |
|               |                    |                           | Hexamethylene tramine penta (methylene phosphonic acid)                 | 34690-00-1 | 5.00000   | 0.00081 |
|               |                    |                           | Hexamethylene diamine penta (methylene phosphonic acid)                 | 23605-74-5 | 2.00000   | 0.00033 |
| BIOCLEAR 2000 | U.S. Well Services | Anti-Bacterial Agent      |   |            |           |         |
|               |                    |                           | 2,2-dibromo-3-nitrilopropionamide                                       | 10222-01-2 | 30.00000  | 0.00671 |
|               |                    |                           | Deionized Water   | 7732-18-5  | 28.00000  | 0.00255 |
| AP One        | U.S. Well Services | Gel Breakers              |   |            |           |         |
|               |                    |                           | Ammonium Persulfate   | 7727-54-0  | 100.00000 | 0.00147 |
| AI-302        | U.S. Well Services | Acid Corrosion Inhibitors |   |            |           |         |
|               |                    |                           | Water   | 7732-18-5  | 95.00000  | 0.00027 |
|               |                    |                           | 2-Propyn-1-ol compound with methyloxirane                               | 38172-91-7 | 15.00000  | 0.00004 |

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°20'00"

8,688'

1,731' TO BOTTOM HOLE

LATITUDE 39°22'30"

LONGITUDE 80°57'30"

6,346'

LONGITUDE 80°55'00"

Antero Resources Corporation  
Well No. Manos Unit 1H  
A.P.I. 47-085-10180

AS DRILLED DATA:  
WELL 1H TOP HOLE INFORMATION:  
N: 300,470ft E: 1,590,507ft  
LAT: 39°18'57.28" LON: 80°56'50.55"  
BOTTOM HOLE INFORMATION:  
N: 308,741ft E: 1,585,810ft  
LAT: 39°20'18.27" LON: 80°57'52.03"  
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 1H TOP HOLE INFORMATION:  
N: 4,351,845m E: 504,551m  
BOTTOM HOLE INFORMATION:  
N: 4,354,341m E: 503,078m

- 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.



WELL NO. 1H BOTTOM HOLE

WELL NO. 1H TOP HOLE

WV NORTH ZONE GRID NORTH



NOTE:  
4 WATER WELLS WERE LOCATED WITHIN 2000' OF THE CENTER OF PROPOSED PAD

WELL NO. 1H 47-085-10180

LEGEND

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

DATE 02/09/17

OPERATOR'S WELL# MANOS UNIT #1H

JOB # 14-009WA  
DRAWING # MANOS1HAD  
SCALE 1" = 1000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

API WELL # 47 - 085 - 10180  
STATE COUNTY PERMIT



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

WILLOW LAND SURVEYING PLLC  
P.O. BOX 17 PENNSBORO WEST VIRGINIA 26415

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

WELL TYPE: OIL \_\_\_ GAS  LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_  
(IF "GAS") PRODUCTION  STORAGE \_\_\_ DEEP \_\_\_ SHALLOW   
LOCATION: ELEVATION 1,163' ORIGINAL - 1,127' AS BUILT WATERSHED NORTH FORK HUGHES RIVER  
QUADRANGLE PENNSBORO 7.5' DISTRICT CLAY COUNTY RITCHIE

SURFACE OWNER STEPHEN C. JACKSON ET AL ACREAGE 40.835 ACRES +/-

OIL & GAS ROYALTY OWNER HARVEY WEGLE HEIRS; STEVE JACKSON; LEASE ACREAGE 51 ACRES±; 117 ACRES±; CONSTANCE K. GRIFFITH; MARY MAXINE WELCH; CLIFF WILSON ET UX; JAMES W. UTT 31 ACRES±; 163 ACRES±; 413 ACRES±; 82 ACRES±

PROPOSED WORK: DRILL \_\_\_ CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ FRACTURE OR STIMULATE \_\_\_ PLUG OFF OLD FORMATION \_\_\_ PERFORATE NEW FORMATION \_\_\_

OTHER PHYSICAL CHANGE IN WELL (SPECIFY) (X) AS DRILLED

PLUG & ABANDON \_\_\_ CLEAN OUT & REPLUG \_\_\_ ESTIMATED DEPTH 6,403' TVD 16,235' MD

TARGET FORMATION MARCELLUS

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER CT CORPORATION SYSTEM

ADDRESS 1615 WYNKOOP STREET DENVER, CO 80202 ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

02/09/2017

DEWEES' CO 80803

CHARGESTON, VA 22613

ADDRESS 1012 MAINCOOR STREET  
 WELL OPERATOR ANTERO RESOURCES CORP  
 TARGET FORMATION WYSCETTUS  
 FLOOR & WARDON STEAN OUT & BEGUS ESTIMATED DEPTH 8,403.1 TD 10,330. MD  
 OTHER PHYSICAL CHANGE IN WELL (SPECIFY) (X) AS DRILLED  
 STIMULATE FLOOR OFF OLD FORMATION BEFORE/NEW FORMATION  
 PROPOSED WORK DRILL COMPLET DRILL DEEPER REDUCT FRACTURE OR  
 CONSTANT K SWELLER: MAXI MAXIME MESH: STIFF MIF SON ET TX: TAMES M' TLL 31 ACRES: 103 ACRES: 413 ACRES: 85 ACRES:  
 OIL & GAS WADATY OMIER HAYLEA MEIGRE HEIRS: STELE JACKSON LEAGE ACRES: 81 ACRES: 111 ACRES:  
 SURFACE OWNER STEPHEN C JACKSON ET AL ACRES: 40,832 ACRES +1

ADDRESS 200 D BIG LAGER ROAD  
 DESIGNATED AGENCY CI CORPORATION EASTERN DIVISION STAMPER  
 ESTIMATED DEPTH 8,403.1 TD 10,330. MD  
 FRACTURE OR  
 31 ACRES: 103 ACRES: 413 ACRES: 85 ACRES:  
 LEAGE ACRES: 81 ACRES: 111 ACRES:

LOCATION: ELEVATION 1,703.0 ORIGINAL - 1,125.4 AS DRILL MATURED NORTH FORK HUGHES SHALES (IF "AS") PRODUCTION X STORAGE DEEP ZHANGOM X  
 WELL TYPE: OIL GAS X FLUID INJECTION WASTE DISPOSAL

DIVISION OF OIL AND GAS  
 DEPARTMENT OF ENERGY  
 STATE OF WEST VIRGINIA



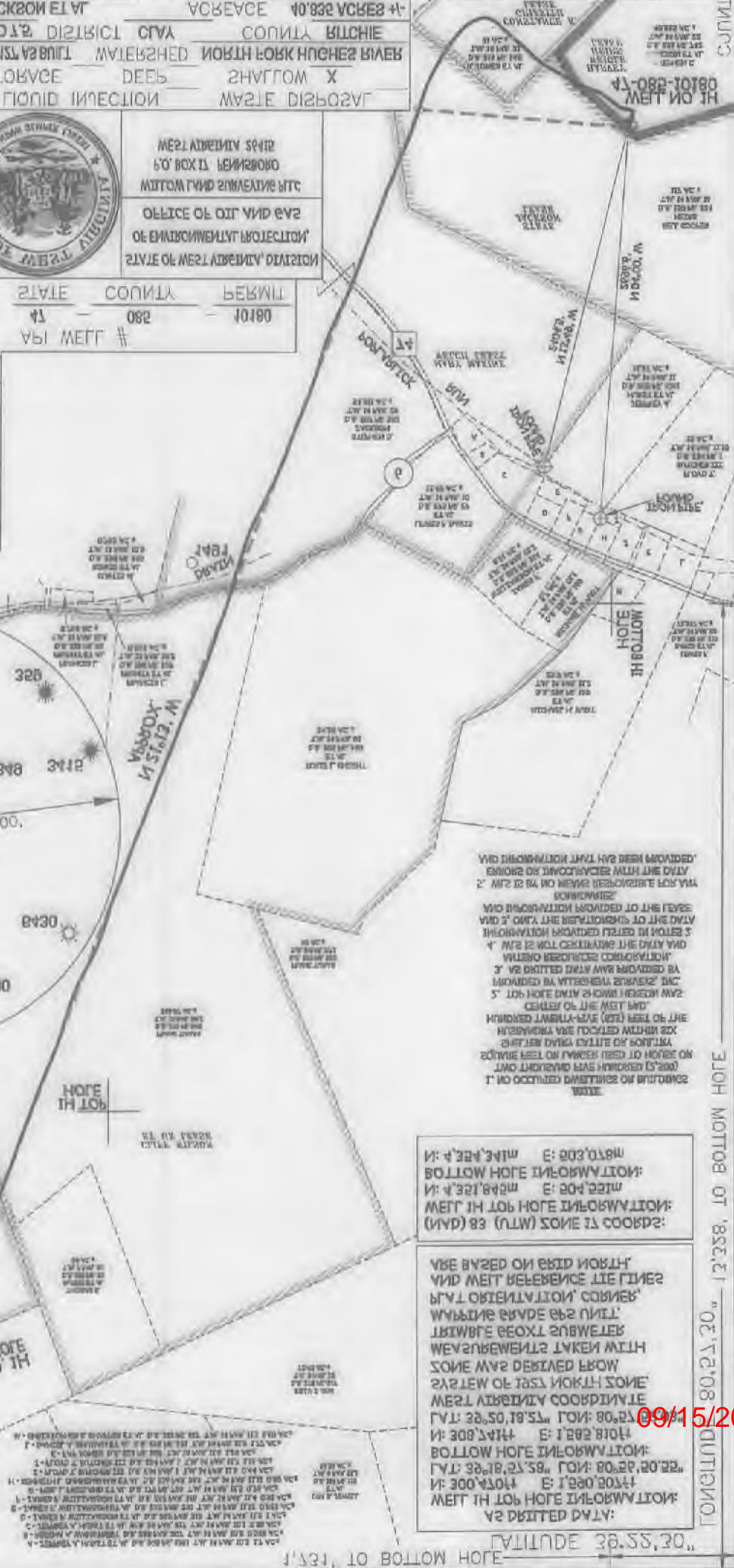
WEST VIRGINIA STATE  
 P.O. BOX 12, HERRINGBORO  
 MUTTON HIND SUBDIVISION B/C  
 OFFICE OF OIL AND GAS  
 OF ENVIRONMENTAL PROTECTION  
 STATE OF WEST VIRGINIA DIVISION

SUBMETER MAPPING SCALE CBS  
 PROVEN SOURCE OF ELEV  
 ACCURACY SUBMETER  
 MINIMUM DEGREE OF  
 SCALE 4" = 1000'  
 DRAWING # MW08044  
 JOB # 14-00844

STATE COUNTY PERMIT  
 14 082 10180  
 141 WELL #

OPERATOR, 2 WELL # MW08044  
 DATE 05/08/14

LEGEND  
 - - - - - Well produced from surface  
 - - - - - Well produced from bottom hole  
 - - - - - Well produced from both  
 - - - - - Well produced from other



WHO INFORMATION THAT HAS BEEN PROVIDED  
 ERRORS OR INACCURACIES WITH THE DWL  
 2" W/2 IS BY NO MEANS RESPONSIBLE FOR ANY  
 CONSEQUENCES  
 WHO INFORMATION PROVIDED TO THE DEPT  
 AND 3" ONLY THE INFORMATION TO THE DWL  
 INFORMATION PROVIDED FILED IN WELLS 5  
 4" W/2 IS WELL CERTAINLY THE DWL WHO  
 WHO INFORMATION PROVIDED  
 3" W/2 DRILLED DWL HAS PROVIDED BY  
 PROVIDED BY WITNESSED SIGNATURE: D/C  
 5" TOP HOGUE DWL 2" CHAIN HERRING AND  
 CENTER OF THE WEST WHO  
 HERRING JARVIS-WAL (20) WELL OF THE  
 HERRINGVA WHO LOCATED WITHIN 500  
 500 FEET DWL 2" CHAIN HERRING AND  
 500 FEET ON FLOOR USED TO HOGUE ON  
 WHO INFORMATION HAS PROVIDED (500)  
 1" NO OCCUPIED DISTANCES OF DRILLING  
 WELLS

WELL NO. 14 (DWL) SOME IT COORDS:  
 N: 12,358. TO BOTTOM HOGUE  
 E: 8,448. TO BOTTOM HOGUE  
 W: 12,358. TO BOTTOM HOGUE  
 S: 8,448. TO BOTTOM HOGUE

AS DRILLED DATA:  
 WELLS INFORMATION:  
 N: 12,358. TO BOTTOM HOGUE  
 E: 8,448. TO BOTTOM HOGUE  
 W: 12,358. TO BOTTOM HOGUE  
 S: 8,448. TO BOTTOM HOGUE



Antero Resources  
 Corporation  
 1012 Maincoor Street  
 Herringboro, VA 22613  
 14-00844

PERMIT NAME

LONGITUDE 80.22,00"

LONGITUDE 80.22,30"

09/15/2017