

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

**APPROVED**

NAME: Huffman  
DATE: 9/15/16

API 47-017-06401 County Doddridge District Grant  
Quad Smithburg 7.5' Pad Name Hamilton Field/Pool Name ---  
Farm name Kenneth E. Hamilton, et al Well Number Knight 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 4357612m Easting 522084m  
Landing Point of Curve Northing 4357626.84m Easting 521735.63m  
Bottom Hole Northing 4360400m Easting 520630m

Elevation (ft) 1157' 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

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SEP 19 2016

Date permit issued 12/10/2013 Date drilling commenced 9/5/2014 Date drilling ceased 3/9/2016  
Date completion activities began 5/10/2016 Date completion activities ceased 6/17/2016  
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 225' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 630' Void(s) encountered (Y/N) depths No  
Coal depth(s) ft 840' Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

Reviewed by:  
10/28/2016

API 47-017 - 06401 Farm name Kenneth E. Hamilton, et al Well number Knight 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                 | 30"           | 20"         | 40'    | New         | 94# J-55    | N/A             | Y   |
| Surface                   | 17-1/2"       | 13-3/8"     | 397'   | New         | 48# H-40    | N/A             | Y   |
| Coal                      |               |             |        |             |             |                 |   |
| Intermediate 1            | 12-1/4"       | 9-5/8"      | 2521'  | New         | 36# J-55    | N/A             | Y   |
| Intermediate 2            |               |             |        |             |             |                 |   |
| Intermediate 3            |               |             |        |             |             |                 |   |
| Production                | 8-3/4"/8-1/2" | 5-1/2"      | 17363' | New         | 23# P-110   | N/A             | Y   |
| Tubing                    |               | 2-3/8"      | 7244'  |             | 4.7# N-80   |                 |   |
| Packer type and depth set |               | N/A         |        |             |             |                 |   |

Comment Details Side Track @ 10652' - DEP Inspector Daniel Flack notified on 2/26/2016 at 21:00 hours by email

| 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              | 200 sx                        | 15.6                     | 1.18                         | 38                        | 0'                             | 8 Hrs.    |
| Surface        | Class A              | 464 sx                        | 15.6                     | 1.18                         | 276                       | 0'                             | 8 Hrs.    |
| Coal           |                      |                               |                          |                              |                           |                                |           |
| Intermediate 1 | Class A              | 925 sx                        | 15.6                     | 1.18                         | 790                       | 0'                             | 8 Hrs.    |
| Intermediate 2 |                      |                               |                          |                              |                           |                                |           |
| Intermediate 3 |                      |                               |                          |                              |                           |                                |           |
| Production     | Class H              | 1075 sx (Lead) 1801 sx (Tail) | 14.5 (Lead), 15.2 (Tail) | 1.33 (Lead), 1.83 (Tail)     | 3515                      | -500' into Intermediate Casing | 8 Hrs.    |
| Tubing         |                      |                               |                          |                              |                           |                                |           |

Drillers TD (ft) 17363' MD, 6933' TVD (BHL); 6972' TVD (Deepest Point Drilled) Loggers TD (ft) 17315'  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 6707'

\*\* This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Costlow Unit 1H API #47-017-06194). Please reference the wireline logs submitted with Form WR-35 for Costlow 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 \_\_\_\_\_

SEP 12 2016  
 WV Department of Environmental Protection

API 47- 017 - 06401 Farm name Kenneth E. Hamilton, et al Well number Knight 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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New York Department of  
Environmental Protection

Please insert additional pages as applicable.

API 47- 017 - 06401 Farm name Kenneth E. Hamilton, et al Well number Knight Unit 1H

| <u>PRODUCING FORMATION(S)</u> | <u>DEPTHS</u>      |            |                    |           |
|-------------------------------|--------------------|------------|--------------------|-----------|
| <u>Marcellus</u>              | <u>6911' (TOP)</u> | <u>TVD</u> | <u>7245' (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 2950 psi Bottom Hole -- psi DURATION OF TEST -- hrs

OPEN FLOW Gas 5983 mcfpd Oil 162 bpd NGL -- bpd Water 449 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

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

**\*PLEASE SEE ATTACHED EXHIBIT 3**

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Please insert additional pages as applicable.

Drilling Contractor Precision Drilling Company, LP  
Address 2640 Reach Rd. City Williamsport State PA Zip 17701

Logging Company Allied Horizontal Wireline Services  
Address 380 Bedford Rd. City North Huntingdon State PA Zip 15642

Cementing Company Nabors Completion & Production Services, Co.  
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

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 Permitting Agent Date 9/7/2016

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

10/28/2016

## EXHIBIT 1

| Stage No. | Perforation Date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formations |
|-----------|------------------|------------------------|----------------------|------------------------|------------|
| 1         | 10-May-16        | 17,098                 | 17,267               | 60                     | Marcellus  |
| 2         | 11-May-16        | 16,897                 | 17,066               | 60                     | Marcellus  |
| 3         | 12-May-16        | 16,697                 | 16,866               | 60                     | Marcellus  |
| 4         | 12-May-16        | 16,497                 | 16,666               | 60                     | Marcellus  |
| 5         | 12-May-16        | 16,297                 | 16,465               | 60                     | Marcellus  |
| 6         | 13-May-16        | 16,096                 | 16,265               | 60                     | Marcellus  |
| 7         | 13-May-16        | 15,896                 | 16,065               | 60                     | Marcellus  |
| 8         | 13-May-16        | 15,696                 | 15,865               | 60                     | Marcellus  |
| 9         | 13-May-16        | 15,495                 | 15,664               | 60                     | Marcellus  |
| 10        | 14-May-16        | 15,295                 | 15,464               | 60                     | Marcellus  |
| 11        | 14-May-16        | 15,095                 | 15,264               | 60                     | Marcellus  |
| 12        | 14-May-16        | 14,895                 | 15,064               | 60                     | Marcellus  |
| 13        | 14-May-16        | 14,694                 | 14,863               | 60                     | Marcellus  |
| 14        | 15-May-16        | 14,494                 | 14,663               | 60                     | Marcellus  |
| 15        | 15-May-16        | 14,294                 | 14,463               | 60                     | Marcellus  |
| 16        | 15-May-16        | 14,094                 | 14,262               | 60                     | Marcellus  |
| 17        | 15-May-16        | 13,893                 | 14,062               | 60                     | Marcellus  |
| 18        | 15-May-16        | 13,693                 | 13,862               | 60                     | Marcellus  |
| 19        | 16-May-16        | 13,493                 | 13,662               | 60                     | Marcellus  |
| 20        | 16-May-16        | 13,292                 | 13,461               | 60                     | Marcellus  |
| 21        | 16-May-16        | 13,092                 | 13,261               | 60                     | Marcellus  |
| 22        | 16-May-16        | 12,892                 | 13,061               | 60                     | Marcellus  |
| 23        | 17-May-16        | 12,692                 | 12,860               | 60                     | Marcellus  |
| 24        | 17-May-16        | 12,491                 | 12,660               | 60                     | Marcellus  |
| 25        | 17-May-16        | 12,291                 | 12,460               | 60                     | Marcellus  |
| 26        | 17-May-16        | 12,091                 | 12,260               | 60                     | Marcellus  |
| 27        | 17-May-16        | 11,890                 | 12,059               | 60                     | Marcellus  |
| 28        | 18-May-16        | 11,690                 | 11,859               | 60                     | Marcellus  |
| 29        | 18-May-16        | 11,490                 | 11,659               | 60                     | Marcellus  |
| 30        | 18-May-16        | 11,290                 | 11,458               | 60                     | Marcellus  |
| 31        | 18-May-16        | 11,089                 | 11,258               | 60                     | Marcellus  |
| 32        | 19-May-16        | 10,889                 | 11,058               | 60                     | Marcellus  |
| 33        | 19-May-16        | 10,689                 | 10,858               | 60                     | Marcellus  |
| 34        | 19-May-16        | 10,488                 | 10,657               | 60                     | Marcellus  |
| 35        | 19-May-16        | 10,288                 | 10,457               | 60                     | Marcellus  |
| 36        | 19-May-16        | 10,088                 | 10,257               | 60                     | Marcellus  |
| 37        | 20-May-16        | 9,888                  | 10,057               | 60                     | Marcellus  |
| 38        | 20-May-16        | 9,687                  | 9,856                | 60                     | Marcellus  |
| 39        | 20-May-16        | 9,487                  | 9,656                | 60                     | Marcellus  |
| 40        | 20-May-16        | 9,287                  | 9,456                | 60                     | Marcellus  |
| 41        | 20-May-16        | 9,087                  | 9,255                | 60                     | Marcellus  |
| 42        | 21-May-16        | 8,886                  | 9,055                | 60                     | Marcellus  |
| 43        | 21-May-16        | 8,686                  | 8,855                | 60                     | Marcellus  |
| 44        | 21-May-16        | 8,486                  | 8,655                | 60                     | Marcellus  |
| 45        | 21-May-16        | 8,285                  | 8,454                | 60                     | Marcellus  |
| 46        | 21-May-16        | 8,085                  | 8,254                | 60                     | Marcellus  |
| 47        | 22-May-16        | 7,885                  | 8,054                | 60                     | Marcellus  |
| 48        | 22-May-16        | 7,685                  | 7,853                | 60                     | Marcellus  |
| 49        | 22-May-16        | 7,484                  | 7,653                | 60                     | Marcellus  |
| 50        | 22-May-16        | 7,284                  | 7,453                | 60                     | Marcellus  |

10/28/2016

## 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         | 11-May-16         | 71.2          | 7,823                        | 6,037                        | 5,536      | 308,800                  | 8,048                  | N/A                               |
| 2         | 11-May-16         | 68.8          | 7,611                        | 5,661                        | 5,407      | 309,800                  | 8,012                  | N/A                               |
| 3         | 12-May-16         | 72.2          | 7,550                        | 5,597                        | 5,236      | 308,580                  | 7,989                  | N/A                               |
| 4         | 12-May-16         | 71.2          | 7,603                        | 5,626                        | 5,779      | 311,440                  | 7,976                  | N/A                               |
| 5         | 12-May-16         | 72.5          | 7,736                        | 5,572                        | 5,225      | 310,180                  | 7,958                  | N/A                               |
| 6         | 13-May-16         | 70.3          | 7,586                        | 5,525                        | 5,440      | 307,980                  | 9,407                  | N/A                               |
| 7         | 13-May-16         | 70.3          | 7,499                        | 5,568                        | 5,432      | 311,320                  | 8,914                  | N/A                               |
| 8         | 13-May-16         | 71.8          | 7,532                        | 5,597                        | 5,940      | 310,360                  | 7,913                  | N/A                               |
| 9         | 13-May-16         | 71.3          | 7,617                        | 5,790                        | 5,236      | 311,000                  | 7,911                  | N/A                               |
| 10        | 14-May-16         | 71.4          | 7,617                        | 5,794                        | 4,935      | 311,500                  | 7,886                  | N/A                               |
| 11        | 14-May-16         | 70.4          | 7,547                        | 5,625                        | 5,972      | 311,100                  | 7,874                  | N/A                               |
| 12        | 14-May-16         | 71.1          | 7,524                        | 5,690                        | 5,332      | 310,800                  | 7,853                  | N/A                               |
| 13        | 14-May-16         | 70.8          | 7,663                        | 5,758                        | 4,992      | 310,700                  | 7,870                  | N/A                               |
| 14        | 15-May-16         | 70.7          | 7,593                        | 5,490                        | 5,014      | 311,500                  | 7,863                  | N/A                               |
| 15        | 15-May-16         | 71.9          | 7,665                        | 5,658                        | 5,300      | 312,500                  | 7,843                  | N/A                               |
| 16        | 15-May-16         | 68.7          | 7,856                        | 5,572                        | 5,568      | 286,320                  | 8,222                  | N/A                               |
| 17        | 15-May-16         | 66.3          | 7,887                        | 5,382                        | 4,621      | 311,180                  | 8,103                  | N/A                               |
| 18        | 15-May-16         | 71.5          | 7,472                        | 5,475                        | 5,143      | 310,200                  | 7,826                  | N/A                               |
| 19        | 16-May-16         | 72.0          | 7,407                        | 5,654                        | 5,726      | 313,300                  | 7,770                  | N/A                               |
| 20        | 16-May-16         | 74.0          | 7,596                        | 5,647                        | 5,987      | 311,350                  | 7,771                  | N/A                               |
| 21        | 16-May-16         | 72.0          | 7,155                        | 5,590                        | 5,239      | 313,450                  | 7,768                  | N/A                               |
| 22        | 16-May-16         | 71.7          | 7,465                        | 5,583                        | 5,683      | 310,780                  | 7,751                  | N/A                               |
| 23        | 17-May-16         | 71.0          | 7,307                        | 5,447                        | 5,225      | 313,700                  | 7,740                  | N/A                               |
| 24        | 17-May-16         | 71.0          | 7,326                        | 5,690                        | 5,329      | 310,900                  | 7,708                  | N/A                               |
| 25        | 17-May-16         | 71.0          | 7,809                        | 5,970                        | 5,505      | 294,950                  | 7,876                  | N/A                               |
| 26        | 17-May-16         | 73.0          | 7,372                        | 5,296                        | 4,420      | 313,050                  | 7,697                  | N/A                               |
| 27        | 17-May-16         | 71.1          | 7,319                        | 5,389                        | 5,229      | 308,650                  | 7,671                  | N/A                               |
| 28        | 18-May-16         | 70.3          | 7,521                        | 5,493                        | 7,575      | 290,600                  | 7,220                  | N/A                               |
| 29        | 18-May-16         | 75.0          | 7,346                        | 5,275                        | 5,904      | 310,350                  | 7,653                  | N/A                               |
| 30        | 18-May-16         | 75.0          | 7,166                        | 5,386                        | 5,665      | 310,850                  | 7,623                  | N/A                               |
| 31        | 18-May-16         | 72.3          | 7,109                        | 5,397                        | 5,203      | 310,200                  | 7,619                  | N/A                               |
| 32        | 19-May-16         | 72.9          | 7,232                        | 5,475                        | 5,432      | 307,880                  | 8,543                  | N/A                               |
| 33        | 19-May-16         | 75.0          | 7,190                        | 5,529                        | 5,048      | 310,050                  | 7,596                  | N/A                               |
| 34        | 19-May-16         | 75.0          | 7,144                        | 5,372                        | 5,418      | 311,750                  | 7,581                  | N/A                               |
| 35        | 19-May-16         | 72.1          | 7,032                        | 5,246                        | 5,304      | 312,280                  | 7,588                  | N/A                               |
| 36        | 19-May-16         | 73.5          | 7,034                        | 5,300                        | 5,472      | 314,500                  | 7,557                  | N/A                               |
| 37        | 20-May-16         | 73.4          | 7,153                        | 5,325                        | 5,093      | 310,240                  | 7,545                  | N/A                               |
| 38        | 20-May-16         | 75.0          | 7,177                        | 5,704                        | 5,450      | 310,550                  | 7,585                  | N/A                               |
| 39        | 20-May-16         | 79.0          | 7,497                        | 5,690                        | 5,225      | 310,750                  | 8,414                  | N/A                               |
| 40        | 20-May-16         | 76.9          | 7,835                        | 5,679                        | 5,372      | 305,070                  | 8,567                  | N/A                               |
| 41        | 20-May-16         | 71.8          | 7,385                        | 5,679                        | 5,411      | 314,180                  | 7,524                  | N/A                               |
| 42        | 21-May-16         | 73.2          | 7,150                        | 5,643                        | 4,660      | 312,300                  | 7,503                  | N/A                               |
| 43        | 21-May-16         | 74.0          | 7,342                        | 5,990                        | 5,214      | 306,200                  | 7,372                  | N/A                               |
| 44        | 21-May-16         | 77.0          | 7,939                        | 5,876                        | 5,293      | 311,450                  | 7,454                  | N/A                               |
| 45        | 21-May-16         | 79.4          | 7,437                        | 5,808                        | 5,203      | 305,900                  | 8,344                  | N/A                               |
| 46        | 21-May-16         | 71.2          | 7,667                        | 5,808                        | 5,397      | 212,270                  | 7,920                  | N/A                               |
| 47        | 22-May-16         | 75.4          | 7,203                        | 5,350                        | 3,991      | 312,200                  | 7,446                  | N/A                               |
| 48        | 22-May-16         | 76.0          | 7,414                        | 5,600                        | 4,170      | 309,650                  | 8,054                  | N/A                               |
| 49        | 22-May-16         | 75.0          | 7,207                        | 6,430                        | 5,443      | 309,750                  | 7,485                  | N/A                               |
| 50        | 22-May-16         | 76.0          | 6,744                        | 5,747                        | 4,685      | 309,590                  | 7,406                  | N/A                               |
| AVG=      |                   | 72.7          | 7,441                        | 5,610                        | 5,322      | 15,373,950               | 7,856                  | TOTAL                             |

## EXHIBIT 3

| LITHOLOGY/ FORMATION      | TOP DEPTH (TVD)<br>From Surface | BOTTOM DEPTH (TVD)<br>From Surface | TOP DEPTH (MD)<br>From Surface | BOTTOM DEPTH (MD)<br>From Surface |
|---------------------------|---------------------------------|------------------------------------|--------------------------------|-----------------------------------|
| Fresh Water               | 225'                            | N/A                                | 225'                           | N/A                               |
| Shale                     | 0                               | 390                                | 0                              | 390                               |
| Sandstone/Siltstone/Shale | est. 390                        | 750                                | est. 390                       | 750                               |
| Sandstone                 | est. 750                        | 840                                | est. 750                       | 840                               |
| Coal                      | est. 840                        | 870                                | est. 840                       | 870                               |
| Sandstone                 | est. 870                        | 1080                               | est. 870                       | 1080                              |
| Siltstone                 | est. 1080                       | 1140                               | est. 1080                      | 1140                              |
| Sandstone                 | est. 1140                       | 1470                               | est. 1140                      | 1470                              |
| Shale                     | est. 1470                       | 1650                               | est. 1470                      | 1650                              |
| Sandstone                 | est. 1650                       | 1800                               | est. 1650                      | 1800                              |
| Shale                     | est. 1800                       | 1890                               | est. 1800                      | 1890                              |
| Sandstone                 | est. 1890                       | 1950                               | est. 1890                      | 1950                              |
| Shale                     | est. 1950                       | 2010                               | est. 1950                      | 2010                              |
| Sandstone                 | est. 2010                       | 2120                               | est. 2010                      | 2120                              |
| Big Lime                  | 2120                            | 2230                               | 2120                           | 2230                              |
| Big Injun                 | 2230                            | 2660                               | 2230                           | 2660                              |
| Gantz Sand                | 2660                            | 2807                               | 2660                           | 2807                              |
| Fifty Foot Sandstone      | 2807                            | 2885                               | 2807                           | 2885                              |
| Gordon                    | 2885                            | 3216                               | 2885                           | 3216                              |
| Fifth Sandstone           | 3216                            | 3236                               | 3216                           | 3236                              |
| Bayard                    | 3236                            | 3602                               | 3236                           | 3602                              |
| Warren                    | 3602                            | 3999                               | 3602                           | 3999                              |
| Speechley                 | 3999                            | 4239                               | 3999                           | 4239                              |
| Baltown                   | 4239                            | 4708                               | 4239                           | 4711                              |
| Bradford                  | 4708                            | 5181                               | 4711                           | 5204                              |
| Benson                    | 5181                            | 5442                               | 5204                           | 5490                              |
| Alexander                 | 5442                            | 5625                               | 5490                           | 5694                              |
| Elk                       | 5625                            | 6153                               | 5694                           | 6280                              |
| Rhinestreet               | 6153                            | 6522                               | 6280                           | 6689                              |
| Sycamore                  | 6522                            | 6699                               | 6689                           | 6896                              |
| Middlesex                 | 6699                            | 6831                               | 6896                           | 7081                              |
| Burkett                   | 6831                            | 6859                               | 7081                           | 7130                              |
| Tully                     | 6859                            | 6911                               | 7130                           | 7245                              |
| Marcellus                 | 6911                            | NA                                 | 7245                           | 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.

RECEIVED  
Oil and Gas

SEP 12 2016

West Virginia Department of  
Environmental Protection

10/28/2016

# Hydraulic Fracturing Fluid Product Component Information Disclosure

|                                |                              |
|--------------------------------|------------------------------|
| Job Start Date:                | 5/9/2016                     |
| Job End Date:                  | 5/22/2016                    |
| State:                         | West Virginia                |
| County:                        | Doddridge                    |
| API Number:                    | 47-017-06401-00-00           |
| Operator Name:                 | Antero Resources Corporation |
| Well Name and Number:          | Knight 1H                    |
| Latitude:                      | 39.36768900                  |
| Longitude:                     | -80.74363300                 |
| Datum:                         | NAD83                        |
| Federal Well:                  | NO                           |
| Indian Well:                   | NO                           |
| True Vertical Depth:           | 6,972                        |
| Total Base Water Volume (gal): | 16,518,122                   |
| 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  | 89.64820   |          |
| Sand                   | J.S. Well Services, LLC | Proppant         |                                       |  |  |  |          |
|                        |                         |                  | Crystalline Silica, quartz            | 14808-60-7                               | 100.00000  | 10.00461   |          |
| HCL Acid (12.6%-18.0%) | J.S. Well Services, LLC | Bulk Acid        |                                       |  |  |  |          |
|                        |                         |                  | Water                                 | 7732-18-5                                | 87.50000   | 0.13995  |          |
|                        |                         |                  | Hydrogen Chloride                     | 7647-01-0                                | 18.00000   | 0.03343  |          |
| LGC-15                 | J.S. Well Services      | Gelling Agents   |                                       |  |  |  |          |
|                        |                         |                  | Guar Gum                              | 9000-30-0                                | 50.00000   | 0.03501  |          |
|                        |                         |                  | Petroleum Distillates                 | 64742-47-8                               | 60.00000   | 0.03315  |          |
|                        |                         |                  | Suspending agent (solid)              | 14808-60-7                               | 3.00000  | 0.00535  |          |
|                        |                         |                  | Surfactant                            | 88439-51-0                               | 3.00000  | 0.00210  |          |
| WFRA-405               | J.S. Well Services      | Friction Reducer |                                       |  |  |  |          |
|                        |                         |                  | Water                                 | 7732-18-5                                | 60.00000   | 0.03741  |          |
|                        |                         |                  | 2-Propenoic acid, polymer with 2      | 8003-06-9                                | 30.00000   | 0.01871  |          |
|                        |                         |                  | propanamide                           |  |  |  |          |
|                        |                         |                  | Hydrated light distillate (petroleum) | 64742-47-8                               | 30.00000   | 0.01506  |          |



|               |                    |                           |   |            |           |         |
|---------------|--------------------|---------------------------|---|------------|-----------|---------|
| SI-1100s      | U.S. Well Services | Scale Inhibitor           | Ethoxylated alcohol blend   | 38002-97-1 | 4.00000   | 0.00249 |
|               |                    |                           | Water   | 7732-18-5  | 80.00000  | 0.01031 |
|               |                    |                           | Copolymer of Maleic and Acrylic acid                                    | 52255-49-9 | 10.00000  | 0.00152 |
|               |                    |                           | Potassium salt of diethylene triamine penta (methylene phosphonic acid) | 15827-60-8 | 7.50000   | 0.00130 |
|               |                    |                           | 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   | 0.00033 |
| X-BAC 1020    | U.S. Well Services | Anti-Bacterial Agent      |   |            |           |         |
|               |                    |                           | 2,2-dibromo-3-nitropropionamide   | 10222-01-2 | 20.00000  | 0.00396 |
|               |                    |                           | Deionized Water   | 7732-18-5  | 28.00000  | 0.00226 |
| AP One        | U.S. Well Services | Gel Breakers              |   |            |           |         |
|               |                    |                           | Ammonium Persulfate   | 7727-54-0  | 100.00000 | 0.00153 |
| BIOCLEAR 2000 | U.S. Well Services | Anti-Bacterial Agent      |   |            |           |         |
|               |                    |                           | 2,2-dibromo-3-nitropropionamide   | 10222-01-2 | 30.00000  | 0.00088 |
|               |                    |                           | Deionized Water   | 7732-18-5  | 28.00000  | 0.00034 |
| AI-302        | U.S. Well Services | Acid Corrosion Inhibitors |   |            |           |         |
|               |                    |                           | Water   | 7732-18-5  | 95.00000  | 0.00030 |
|               |                    |                           | 2-Propyn-1-ol compound with methyloxirane                               | 38172-91-7 | 15.00000  | 0.00005 |
| SI-1100       | U.S. Well Services | Scale Inhibitor           |   |            |           |         |
|               |                    |                           | Water   | 7732-18-5  | 80.00000  | 0.00003 |
|               |                    |                           | Copolymer of Maleic and Acrylic acid                                    | 52255-49-9 | 10.00000  | 0.00001 |
|               |                    |                           | Ethylene Glycol   | 107-21-1   | 25.00000  | 0.00001 |
|               |                    |                           | Potassium salt of diethylene triamine penta (methylene phosphonic acid) | 15827-60-8 | 7.50000   | 0.00000 |
|               |                    |                           | Hexamethylene tramine penta (methylene phosphonic acid)                 | 34690-00-1 | 5.00000   | 0.00000 |
|               |                    |                           | Phosphino carboxylic acid polymer                                       | 71050-62-9 | 5.00000   | 0.00000 |
|               |                    |                           | Hexamethylene diamine penta (methylene phosphonic acid)                 | 23605-74-5 | 2.00000   | 0.00000 |

Ingredients shown above are subject to 29 CFR 1910.1200(a) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are from 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(l) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)



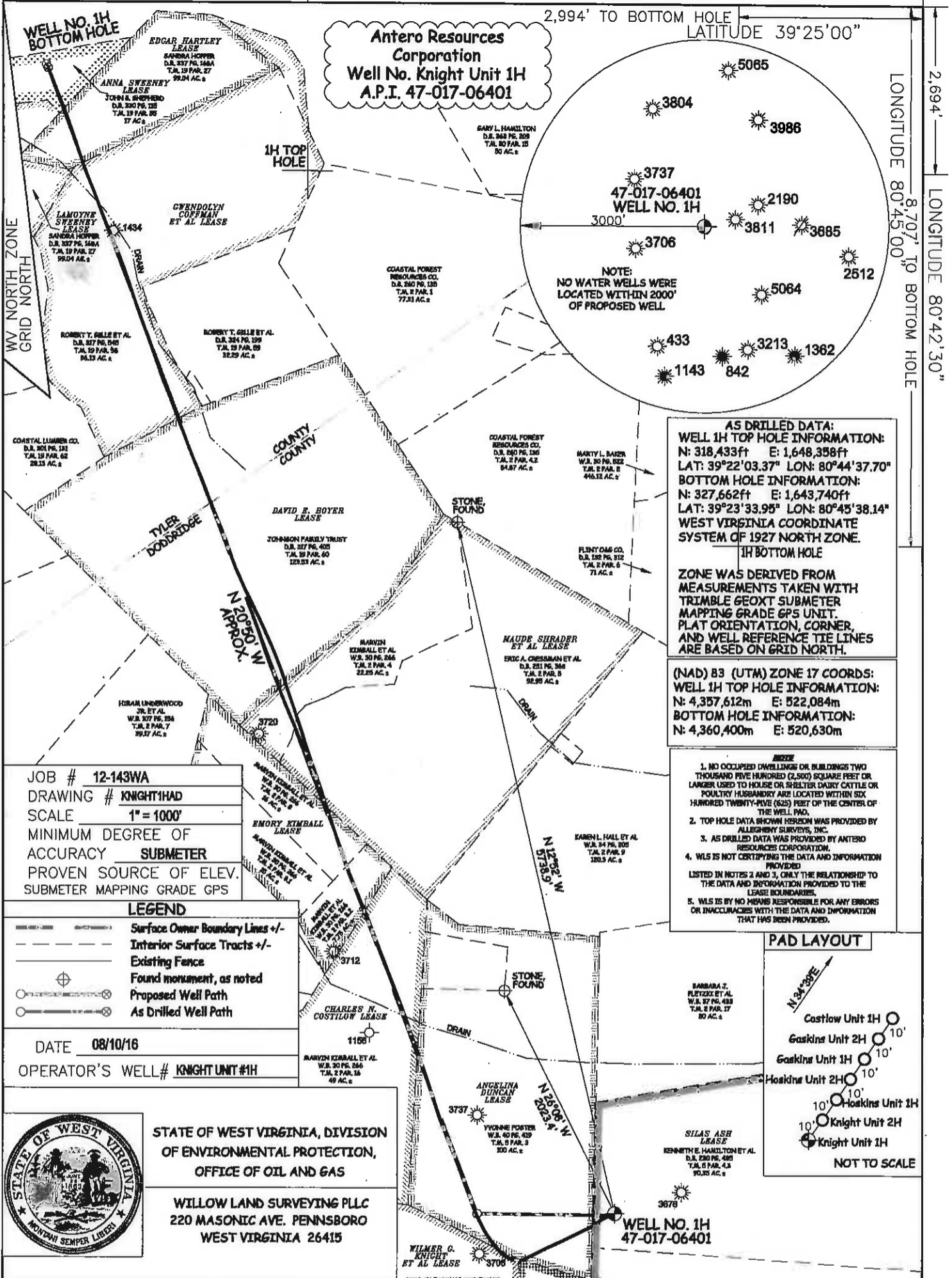
LATITUDE 39°22'30"

10,029'

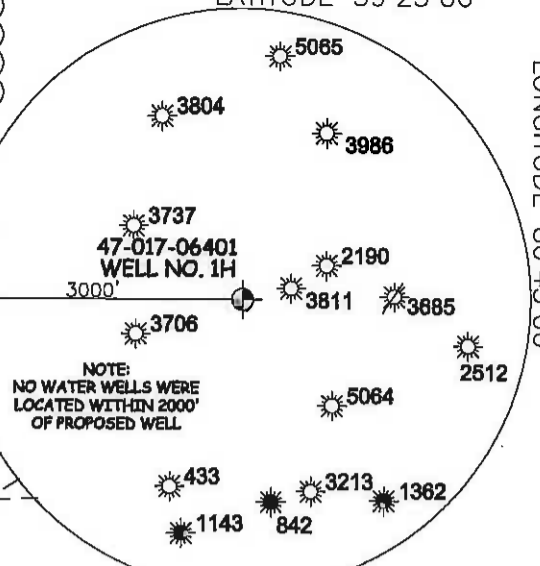
2,994' TO BOTTOM HOLE

LATITUDE 39°25'00"

LONGITUDE 80°45'00" LONGITUDE 80°42'30"



**Antero Resources Corporation**  
**Well No. Knight Unit 1H**  
**A.P.I. 47-017-06401**



**AS DRILLED DATA:**  
**WELL 1H TOP HOLE INFORMATION:**  
 N: 318,433ft E: 1,648,358ft  
 LAT: 39°22'03.37" LON: 80°44'37.70"  
**BOTTOM HOLE INFORMATION:**  
 N: 327,662ft E: 1,643,740ft  
 LAT: 39°23'33.95" LON: 80°45'38.14"  
**WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE.**  
**1H BOTTOM HOLE**

**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: 4,357,612m E: 522,084m  
**BOTTOM HOLE INFORMATION:**  
 N: 4,360,400m E: 520,630m

- 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 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.

JOB # **12-143WA**  
 DRAWING # **KNIGHT1HAD**  
 SCALE **1" = 1000'**  
 MINIMUM DEGREE OF ACCURACY **SUBMETER**  
 PROVEN SOURCE OF ELEV. **SUBMETER MAPPING GRADE GPS**

**LEGEND**

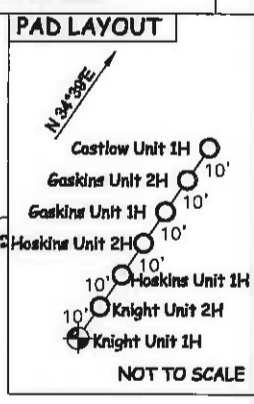
- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Existing Fence
- Found monument, as noted
- Proposed Well Path
- As Drilled Well Path

DATE **08/10/16**  
 OPERATOR'S WELL # **KNIGHT UNIT #1H**



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

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



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

API WELL # **47 - 017 - 06401**

STATE COUNTY PERMIT

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW

LOCATION: ELEVATION **ORIG 1,171' - AS BUILT 1,157'** WATERSHED **McELROY CREEK**

QUADRANGLE **SMITHBURG 7.5 (TH) SHIRLEY 7.5 (TH)** DISTRICT **GRANT** COUNTY **DODDRIDGE**

SURFACE OWNER **KENNETH E. HAMILTON ET AL** ACREAGE **90.35 ACRES +/-**

OIL & GAS ROYALTY OWNER **SILAS ASH; ANGELINA DUNCAN; MARY MAXINE WELCH; WILMER G. KNIGHT ET AL; CHARLES N. COSTILLO; EMORY KIMBALL; MAUDE SHRADER ET AL; DAVID E. BOYER; GWENDOLYN COFFMAN ET AL; EDGAR HARTLEY; ANNA SWEENEY**

WELL NO. 1H  
**47-017-06401**

DATE **10/28/2016**

COUNTY NAME **DODDRIDGE**

PERMIT

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 **6,933' TVD 17,363' MD**

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

LATITUDE 39°22'30"

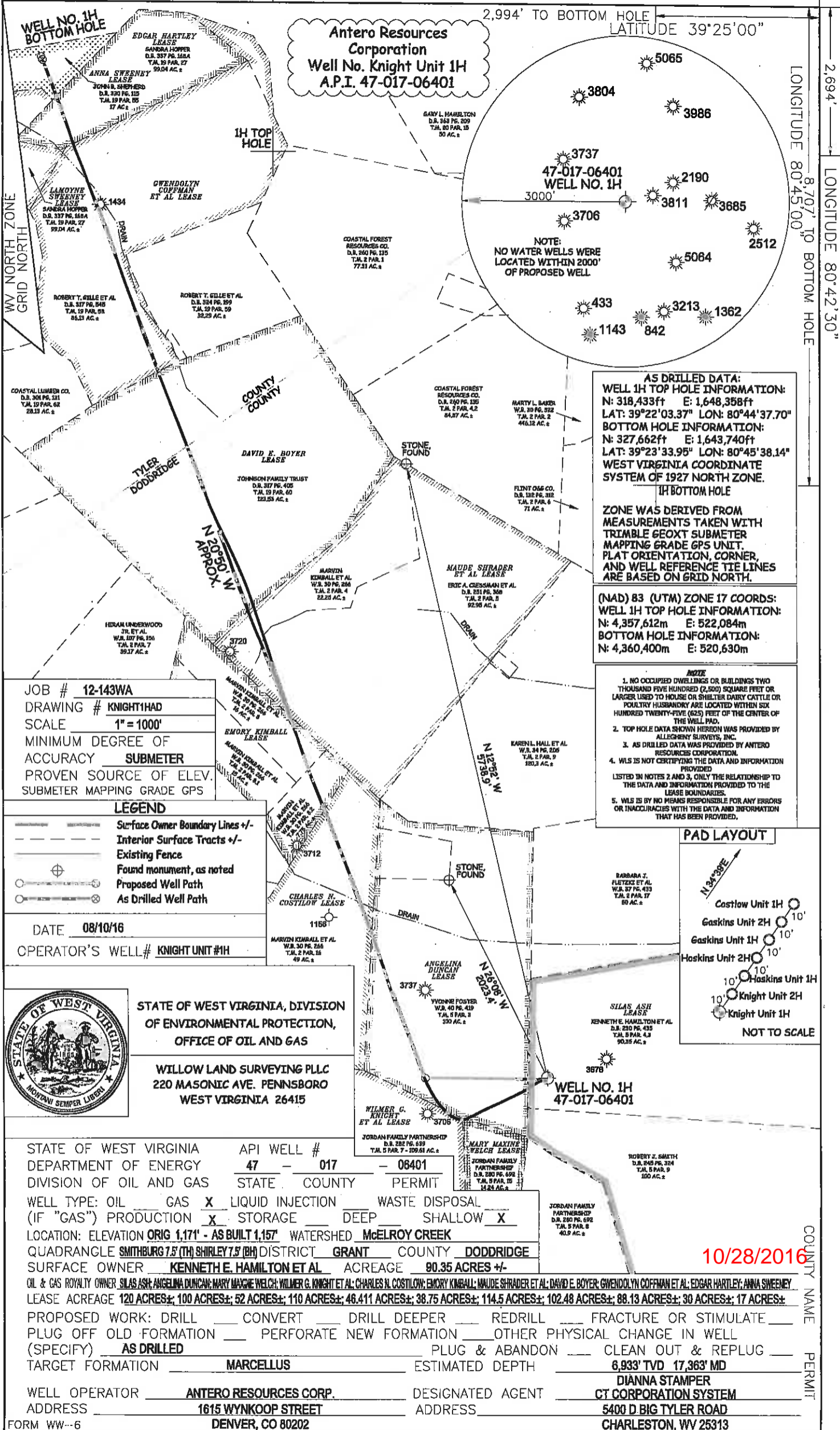
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2,994' TO BOTTOM HOLE

LATITUDE 39°25'00"

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**Well No. Knight Unit 1H**  
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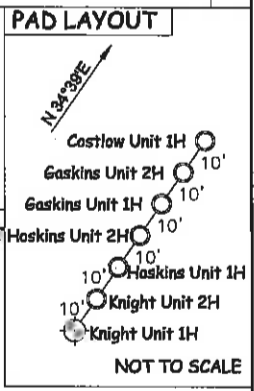
NOTE:  
 NO WATER WELLS WERE  
 LOCATED WITHIN 2000'  
 OF PROPOSED WELL

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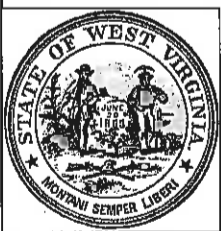
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- LEGEND**
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  - Interior Surface Tracts +/-
  - Existing Fence
  - Found monument, as noted
  - Proposed Well Path
  - As Drilled Well Path

DATE **08/10/16**  
 OPERATOR'S WELL # **KNIGHT UNIT #1H**



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

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

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API WELL # **47 - 017 - 06401**

STATE COUNTY PERMIT

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(IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW

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LEASE ACREAGE **120 ACRES±; 100 ACRES±; 52 ACRES±; 110 ACRES±; 46.411 ACRES±; 38.75 ACRES±; 114.5 ACRES±; 102.48 ACRES±; 88.13 ACRES±; 30 ACRES±; 17 ACRES±**

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

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WELL OPERATOR **ANTERO RESOURCES CORP.** DESIGNATED AGENT **DIANNA STAMPER**

ADDRESS **1615 WYNKOOP STREET** ADDRESS **CT CORPORATION SYSTEM**

**5400 D BIG TYLER ROAD**

FORM WW--6 **DENVER, CO 80202** **CHARLESTON, WV 25313**

10/28/2016

COUNTY NAME PERMIT



Antero Resources  
1615 Wynkoop Street  
Denver, CO 80202  
Office 303.357.7310  
Fax 303.357.7315

September 9, 2016

West Virginia Department of Environmental Protection  
Office of Oil and Gas  
Attn: John Kearney  
601 57<sup>th</sup> Street  
Charleston, WV 25304

Mr. Kearney:

Please find enclosed an updated WW-6A1 for the Knight Unit 1H (API #47-017-06401). When drilling, our wellbore slightly drilled into the Mary Maxine Welch Lease and Wilmer G. Knight, et al Lease. For your reference we have updated the WW-6A1 to reflect this.

If you have any questions please feel free to contact me at (303) 357-7233.

Sincerely,

A handwritten signature in blue ink that reads "Kara Quackenbush". The signature is fluid and cursive.

Kara Quackenbush  
Permitting Agent  
Antero Resources Corporation

Enclosures

Office of Oil and Gas  
SEP 12 2016  
Bureau of Land Management

10/28/2016

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE  
Chapter 22, Article 6A, Section 5(a)(5)  
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

| Lease Name or Number                 | Grantor, Lessor, etc.  | Grantee, Lessee, etc.   | Royalty   | Book/Page  |
|--------------------------------------|--|---|---|--|
| <u>Mary Maxine Welch Lease</u>       | Mary Maxine Welch<br>Antero Resources Appalachian Corp.  | Antero Resources Appalachian Corp.<br>Antero Resources Corporation  | 1/8+<br>Name Change   | 0280/0427<br>Exhibit 1   |
| <u>Wilmer G. Knight, et al Lease</u> | Wilmer G. Knight, et al<br>Allegheny Land & Mineral Co.<br>National Producers Inc.<br>Jack E. Webber & Dorthea Webber<br>Aries Petroleum Corp.<br>Chesterfield Energy Corp.<br>Dominion Reserves, Inc.<br>Antero Resources Appalachian Corp. | Allegheny Land & Mineral Co.<br>National Producers Inc.<br>Jack E. Webber & Dorthea Webber<br>Aries Petroleum Corp.<br>Chesterfield Energy Corp.<br>Dominion Reserves<br>Antero Resources Appalachian Corp.<br>Antero Resources Corporation | 1/8+<br>Assignment<br>Assignment<br>Assignment<br>Assignment<br>Assignment<br>Assignment<br>Name Change | 0068/0183<br>0084/0074<br>0089/0494<br>0122/0243<br>0134/0748<br>0159/0017<br>0230/0113<br>Exhibit 1 |

\*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

**Acknowledgement of Possible Permitting/Approval  
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Antero Resources Corporation  
By: Kevin Kilstrom  
Its: Senior Vice President - Production

FILED

JUN 10 2013

Natalie E. Tennant  
Secretary of State  
1900 Kanawha Blvd E  
Bldg 1, Suite 157-K  
Charleston, WV 25305



IN THE OFFICE OF  
PENNEY BARKER, Manager  
Corporations Division  
Tel: (304)558-8000  
Fax: (304)558-3381

Website: [www.wvns.com](http://www.wvns.com)  
E-mail: [business@wvns.com](mailto:business@wvns.com)

Office Hours: Monday - Friday  
8:30 a.m. - 5:00 p.m. ET

APPLICATION FOR  
AMENDED CERTIFICATE  
OF AUTHORITY

FILE ONE ORIGINAL  
(Two if you want a filed  
stamped copy returned to you)  
FEE: \$25.00

\*\*\*\* In accordance with the provisions of the West Virginia Code, the undersigned corporation hereby \*\*\*\*  
applies for an Amended Certificate of Authority and submits the following statements:

- Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation
- Date Certificate of Authority was issued in West Virginia: 6/25/2008
- Corporate name has been changed to: Antero Resources Corporation  
(Attach one Certified Copy of Name Change as filed in home State of incorporation.)
- Name the corporation elects to use in WV: Antero Resources Corporation  
(due to home state name not being available)
- Other amendments: \_\_\_\_\_  
(attach additional pages if necessary)
- Name and phone number of contact person. (This is optional; however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)  
Alvyn A. Schopp (305) 357-7310  
Contact Name Phone Number
- Signature Information (See below *\*Important Legal Notice Regarding Signatures\**):  
Print Name of Signer: Alvyn A. Schopp Title/Capacity: Authorized Person  
Signature: [Handwritten Signature] Date: June 10, 2013

*\*Important Legal Notice Regarding Signatures\** For West Virginia Code §31D-1-122. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.

LATITUDE 39°22'30"

10,029'

2,994' TO BOTTOM HOLE

LATITUDE 39°25'00"

LONGITUDE 80°45'00"  
LONGITUDE 80°42'30"

Antero Resources Corporation  
Well No. Knight Unit 1H  
A.P.I. 47-017-06401

NOTE:  
NO WATER WELLS WERE  
LOCATED WITHIN 2000'  
OF PROPOSED WELL

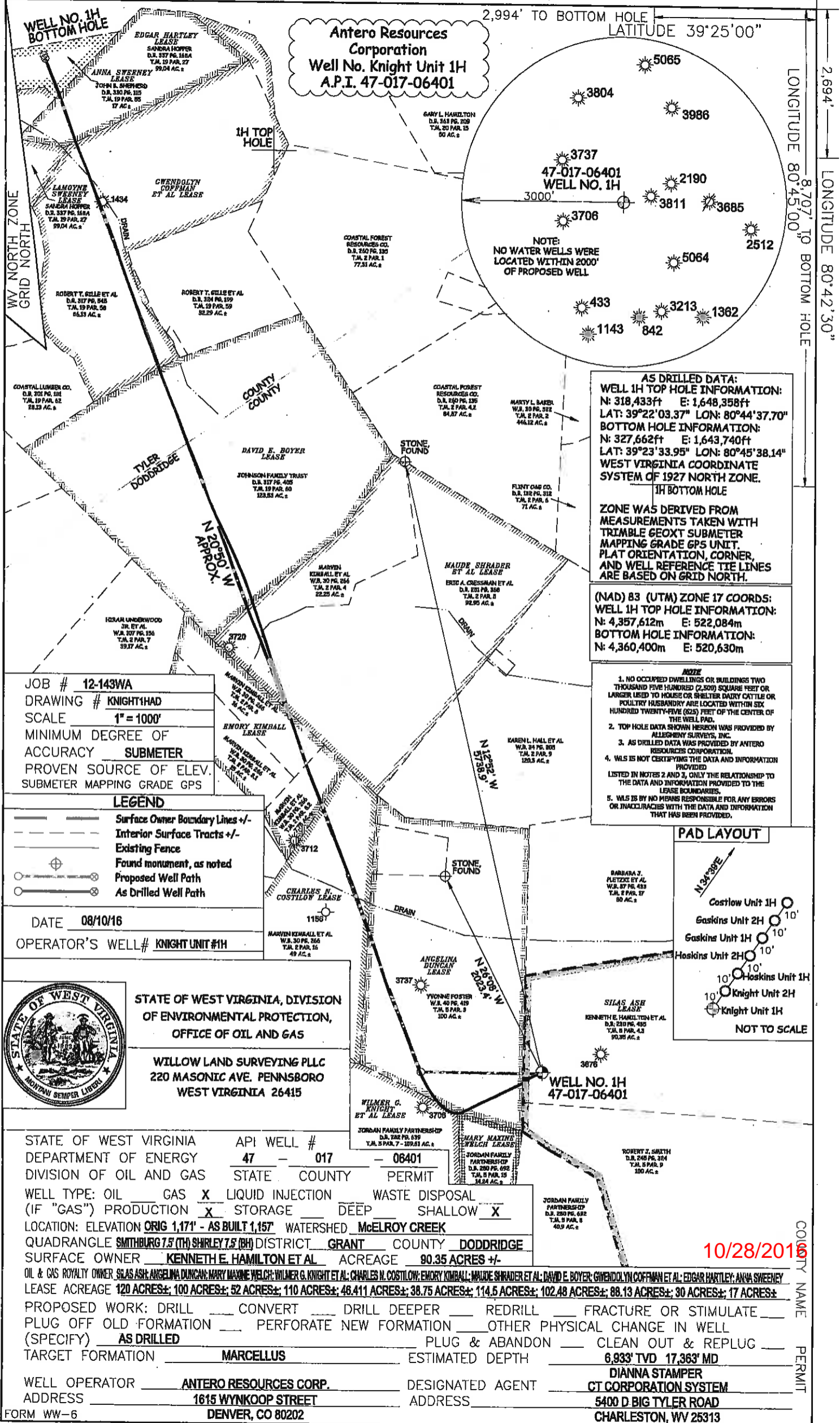
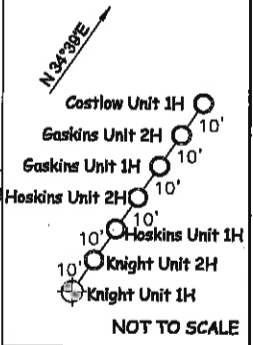
AS DRILLED DATA:  
WELL 1H TOP HOLE INFORMATION:  
N: 318,433ft E: 1,648,358ft  
LAT: 39°22'03.37" LON: 80°44'37.70"  
BOTTOM HOLE INFORMATION:  
N: 327,662ft E: 1,643,740ft  
LAT: 39°23'33.95" LON: 80°45'38.14"  
WEST VIRGINIA COORDINATE  
SYSTEM OF 1927 NORTH ZONE.

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: 4,357,612m E: 522,084m  
BOTTOM HOLE INFORMATION:  
N: 4,360,400m E: 520,630m

- NOTES**
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.

**PAD LAYOUT**



JOB # **12-143WA**  
DRAWING # **KNIGHT1HAD**  
SCALE **1" = 1000'**  
MINIMUM DEGREE OF ACCURACY **SUBMETER**  
PROVEN SOURCE OF ELEV. **SUBMETER MAPPING GRADE GPS**

**LEGEND**

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

DATE **08/10/16**  
OPERATOR'S WELL# **KNIGHT UNIT #1H**



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

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

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

API WELL # **47 - 017 - 06401**

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
(IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW

LOCATION: ELEVATION **ORIG 1,171' - AS BUILT 1,157'** WATERSHED **McELROY CREEK**

QUADRANGLE **SMITHBURG 7.5 (TH) SHIRLEY 7.5 (BH)** DISTRICT **GRANT** COUNTY **DODDRIDGE**

SURFACE OWNER **KENNETH E. HAMILTON ET AL** ACREAGE **90.35 ACRES +/-**

OIL & GAS ROYALTY OWNER **SILAS ASH; ANGELINA DUNCAN; MARY MAXINE WELCH; WILMER G. KNIGHT ET AL; CHARLES N. COSTILOV; EMORY KIMBALL; MAUDE SHRAIDER ET AL; DAVID E. BOYER; GWENDOLYN COFFMAN ET AL; EDGAR HARTLEY; ANNA SWEENEY**

LEASE ACREAGE **120 ACRES±; 100 ACRES±; 52 ACRES±; 110 ACRES±; 48.411 ACRES±; 38.75 ACRES±; 114.5 ACRES±; 102.48 ACRES±; 88.13 ACRES±; 30 ACRES±; 17 ACRES±**

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 **6,933' TVD 17,363' MD**

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

10/28/2016

COUNTY NAME PERMIT