WR-35
Rev. 8/23/13

Reviewed
5/9/18



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

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API 47 - 017 - 06783 County Doddridge District Central
Quad West Union 7.5' Pad Name Long Run Pad Field/Pool Name -----
Farm name Richard F. McCullough, et al Well Number Hugle Unit 2H
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 4350114m | Easting 511747m |
| Landing Point of Curve | Northing 4350119.4m | Easting 507452.67m |
| Bottom Hole | Northing 4347122m | Easting 512755m |

Elevation (ft) 1021' 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 10/25/2016 Date drilling commenced 12/16/2016 Date drilling ceased 4/5/2017
Date completion activities began 6/16/2017 Date completion activities ceased 11/6/2017
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 53' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 884' Void(s) encountered (Y/N) depths No
Coal depth(s) ft N/A Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

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API 47- 017 - 06783 Farm name Richard F. McCullough, et al Well number Hugle Unit 2H

| CASING STRINGS | Hole Size | Casing Size | Depth | New or Used | Grade wt/ft | Basket Depth(s) | Did cement circulate (Y/ N) * Provide details below* |
|---|---|---|---|---|---|---|---|
| Conductor | 24" | 20" | 65' | New | 94#, H-40 | N/A | Y |
| Surface | 17-1/2" | 13-3/8" | 529' | New | 48#, H-40 | N/A | Y |
| Coal | | | | | | | |
| Intermediate 1 | 12-1/4" | 9-5/8" | 2534' | New | 36#, J-55 | N/A | Y |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | 8-3/4"/8-1/2" | 5-1/2" | 17467' | New | 23#, P-110 | N/A | Y |
| Tubing | | 2-3/8" | 6340' | | 4.7#, N-80 | | |
| Packer type and depth set | | N/A | | | | | |

Comment Details

| CEMENT DATA | Class/Type of Cement | Number of Sacks | Slurry wt (ppg) | Yield ( $ft^3$/sks) | Volume ($ft^3$) | Cement Top (MD) | WOC (hrs) |
|---|---|---|---|---|---|---|---|
| Conductor | Class A | 102 sx | 15.6 | 1.18 | 120 | 0' | 8 Hrs. |
| Surface | Class A | 989 sx | 15.6 | 1.19 | 1177 | 0' | 8 Hrs. |
| Coal | | | | | | | |
| Intermediate 1 | Class A | 989 sx | 15.6 | 1.18 | 1167 | 0' | 8 Hrs. |
| Intermediate 2 | | | | | | | |
| Intermediate 3 | | | | | | | |
| Production | Class H | 745 sx (Lead) 1539 sx (Tail) | 13.50 (Lead), 15.20 (Tail) | 1.56 (Lead), 1.83 (Tail) | 3979 | ~500' into Intermediate Casing | 8 Hrs. |
| Tubing | | | | | | | |

Drillers TD (ft) 17466' MD, 6569' TVD (BHL), 6569' (Deepest Point Drilled) Loggers TD (ft) 17466' MD

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5957'

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

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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 N/A

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API 47- 017 - 06783 Farm name Richard F. McCullough, et al Well number Hugle Unit 2H

PERFORATION RECORD

| Stage No. | Perforation date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formation(s) |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

***PLEASE SEE ATTACHED EXHIBIT 1**

| | | | | | |
|---|---|---|---|---|---|
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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) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
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***PLEASE SEE ATTACHED EXHIBIT 2**

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Please insert additional pages as applicable.

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API 47- 017 - 06783 Farm name Richard F. McCullough, et al Well number Hugle Unit 2H

| PRODUCING FORMATION(S) | DEPTHS | |
|---|---|---|
| Marcellus | 6442' (TOP) TVD | 6780' (TOP) MD |
| | | |
| | | |
| | | |

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ■ Open Flow OIL TEST ■ Flow ☐ Pump

SHUT-IN PRESSURE Surface 3100 psi Bottom Hole --- psi DURATION OF TEST --- hrs

| OPEN FLOW | Gas | Oil | NGL | Water | GAS MEASURED BY |
|---|---|---|---|---|---|
| | 10165 mcfpd | 52 bpd | --- bpd | 2 bpd | ☐ Estimated ■ Orifice ☐ Pilot |

| LITHOLOGY/ FORMATION NAME | TOP DEPTH IN FT TVD | BOTTOM DEPTH IN FT TVD | TOP DEPTH IN FT MD | BOTTOM DEPTH IN FT MD | DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, $H_2S$, ETC) |
|---|---|---|---|---|---|

***PLEASE SEE ATTACHED EXHIBIT 3**

| | | | | | |
|---|---|---|---|---|---|
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Please insert additional pages as applicable.

Drilling Contractor Frontier Drilling LLC
Address 562 Spring Run Road City Pennsboro State WV Zip 26415

Logging Company Pro Oil & Gas Services LLC
Address 3035 Lynnwood Drive City Hermitage State PA Zip 16148

Cementing Company C&J Energy Services
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

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Completed by Mallory Stanton Telephone 303-357-7182
Signature _____ Title Permitting Supervisor Date 4/27/2018

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

WV Department of Environmental Protection

API 47-017-06783 Farm Name Richard F. McCullough et al Well Number Hugle Unit 2H

## EXHIBIT 1

| Stage No. | Perforation Date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formations |
|---|---|---|---|---|---|
| 1 | 9/11/2017 | 17196 | 17364 | 60 | Marcellus |
| 2 | 9/11/2017 | 16996 | 17164 | 60 | Marcellus |
| 3 | 9/12/2017 | 16796 | 16965 | 60 | Marcellus |
| 4 | 9/12/2017 | 16596 | 16765 | 60 | Marcellus |
| 5 | 9/12/2017 | 16396 | 16565 | 60 | Marcellus |
| 6 | 9/13/2017 | 16196 | 16365 | 60 | Marcellus |
| 7 | 9/13/2017 | 15996 | 16165 | 60 | Marcellus |
| 8 | 9/13/2017 | 15796 | 15965 | 60 | Marcellus |
| 9 | 9/14/2017 | 15596 | 15765 | 60 | Marcellus |
| 10 | 9/14/2017 | 15397 | 15565 | 60 | Marcellus |
| 11 | 9/14/2017 | 15197 | 15365 | 60 | Marcellus |
| 12 | 9/15/2017 | 14997 | 15165 | 60 | Marcellus |
| 13 | 9/15/2017 | 14797 | 14965 | 60 | Marcellus |
| 14 | 9/15/2017 | 14597 | 14765 | 60 | Marcellus |
| 15 | 9/15/2017 | 14397 | 14566 | 60 | Marcellus |
| 16 | 9/15/2017 | 14197 | 14366 | 60 | Marcellus |
| 17 | 9/16/2017 | 13997 | 14166 | 60 | Marcellus |
| 18 | 9/17/2017 | 13797 | 13966 | 60 | Marcellus |
| 19 | 9/17/2017 | 13597 | 13766 | 60 | Marcellus |
| 20 | 9/17/2017 | 13397 | 13566 | 60 | Marcellus |
| 21 | 9/17/2017 | 13197 | 13366 | 60 | Marcellus |
| 22 | 9/18/2017 | 12997 | 13166 | 60 | Marcellus |
| 23 | 9/18/2017 | 12798 | 12966 | 60 | Marcellus |
| 24 | 9/18/2017 | 12598 | 12766 | 60 | Marcellus |
| 25 | 9/19/2017 | 12398 | 12566 | 60 | Marcellus |
| 26 | 9/19/2017 | 12198 | 12366 | 60 | Marcellus |
| 27 | 9/19/2017 | 11998 | 12166 | 60 | Marcellus |
| 28 | 9/20/2017 | 11798 | 11967 | 60 | Marcellus |
| 29 | 9/20/2017 | 11598 | 11767 | 60 | Marcellus |
| 30 | 9/21/2017 | 11398 | 11567 | 60 | Marcellus |
| 31 | 9/21/2017 | 11198 | 11367 | 60 | Marcellus |
| 32 | 9/21/2017 | 10998 | 11167 | 60 | Marcellus |
| 33 | 9/22/2017 | 10798 | 10967 | 60 | Marcellus |
| 34 | 9/22/2017 | 10598 | 10767 | 60 | Marcellus |
| 35 | 9/22/2017 | 10399 | 10567 | 60 | Marcellus |
| 36 | 9/22/2017 | 10199 | 10367 | 60 | Marcellus |
| 37 | 9/23/2017 | 9999 | 10167 | 60 | Marcellus |
| 38 | 9/23/2017 | 9799 | 9967 | 60 | Marcellus |
| 39 | 9/23/2017 | 9599 | 9767 | 60 | Marcellus |
| 40 | 9/24/2017 | 9399 | 9568 | 60 | Marcellus |
| 41 | 9/24/2017 | 9199 | 9368 | 60 | Marcellus |
| 42 | 9/24/2017 | 8999 | 9168 | 60 | Marcellus |
| 43 | 9/24/2017 | 8799 | 8968 | 60 | Marcellus |
| 44 | 9/25/2017 | 8599 | 8768 | 60 | Marcellus |
| 45 | 9/25/2017 | 8399 | 8568 | 60 | Marcellus |
| 46 | 9/25/2017 | 8199 | 8368 | 60 | Marcellus |
| 47 | 9/25/2017 | 7999 | 8168 | 60 | Marcellus |
| 48 | 9/25/2017 | 7800 | 7968 | 60 | Marcellus |
| 49 | 9/26/2017 | 7600 | 7768 | 60 | Marcellus |
| 50 | 9/26/2017 | 7400 | 7568 | 60 | Marcellus |
| 51 | 9/26/2017 | 7200 | 7368 | 60 | Marcellus |
| 52 | 9/26/2017 | 7000 | 7168 | 60 | Marcellus |
| 53 | 9/26/2017 | 6800 | 6969 | 60 | Marcellus |

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API 47-017-06783 Farm Name Richard F. McCullough et al Well Number Hugle Unit 2H

## 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 | 9/11/2017 | 74.3 | 7668 | 5804 | 3575 | 404500 | 8744 | N/A |
| 2 | 9/11/2017 | 74.5 | 7527 | 6179 | 4039 | 404200 | 8711 | N/A |
| 3 | 9/12/2017 | 70.6 | 7232 | 7212 | 5076 | 404350 | 8689 | N/A |
| 4 | 9/12/2017 | 76.9 | 7295 | 6098 | 5364 | 404800 | 9062 | N/A |
| 5 | 9/12/2017 | 75.8 | 7554 | 5959 | 4112 | 404500 | 8628 | N/A |
| 6 | 9/13/2017 | 75.5 | 7459 | 6339 | 4085 | 404650 | 8548 | N/A |
| 7 | 9/13/2017 | 75.7 | 7345 | 7111 | 4143 | 403750 | 8795 | N/A |
| 8 | 9/13/2017 | 70 | 7482 | 6344 | 3775 | 403061 | 8779 | N/A |
| 9 | 9/14/2017 | 74.6 | 7361 | 6470 | 4071 | 404400 | 8628 | N/A |
| 10 | 9/14/2017 | 73.1 | 7593 | 6564 | 4117 | 404000 | 8826 | N/A |
| 11 | 9/14/2017 | 75.8 | 7452 | 6428 | 4187 | 405050 | 8514 | N/A |
| 12 | 9/15/2017 | 76.1 | 7334 | 6379 | 4000 | 405500 | 8432 | N/A |
| 13 | 9/15/2017 | 74.5 | 7000 | 6428 | 4378 | 404450 | 8586 | N/A |
| 14 | 9/15/2017 | 75.3 | 7360 | 6292 | 3975 | 404950 | 8424 | N/A |
| 15 | 9/15/2017 | 72.2 | 7686 | 6547 | 4044 | 406210 | 8459 | N/A |
| 16 | 9/15/2017 | 74.5 | 7149 | 6455 | 4671 | 404300 | 8467 | N/A |
| 17 | 9/16/2017 | 77.4 | 7210 | 6486 | 4155 | 405100 | 8498 | N/A |
| 18 | 9/17/2017 | 75.8 | 7366 | 6574 | 4129 | 405700 | 8995 | N/A |
| 19 | 9/17/2017 | 74.1 | 7320 | 6404 | 4236 | 404000 | 8443 | N/A |
| 20 | 9/17/2017 | 74.2 | 7213 | 6283 | 4151 | 404300 | 8434 | N/A |
| 21 | 9/17/2017 | 75.4 | 7066 | 6279 | 4235 | 405630 | 8466 | N/A |
| 22 | 9/18/2017 | 75.1 | 6842 | 6099 | 4530 | 403850 | 8306 | N/A |
| 23 | 9/18/2017 | 74.1 | 7138 | 6079 | 4382 | 403750 | 8638 | N/A |
| 24 | 9/18/2017 | 76.2 | 7173 | 5612 | 4298 | 406650 | 8347 | N/A |
| 25 | 9/19/2017 | 78.1 | 7583 | 5825 | 4259 | 404150 | 9700 | N/A |
| 26 | 9/19/2017 | 77.3 | 6793 | 6092 | 4918 | 404100 | 8420 | N/A |
| 27 | 9/19/2017 | 44.6 | 7832 | 6258 | 4972 | 185150 | 11104 | N/A |
| 28 | 9/20/2017 | 75.5 | 6929 | 5723 | 4582 | 404450 | 8234 | N/A |
| 29 | 9/20/2017 | 65 | 7433 | 5799 | 4364 | 405250 | 11061 | N/A |
| 30 | 9/21/2017 | 77.2 | 6844 | 6147 | 4254 | 405850 | 8350 | N/A |
| 31 | 9/21/2017 | 77.5 | 6834 | 5833 | 4287 | 404200 | 8257 | N/A |
| 32 | 9/21/2017 | 76.6 | 7098 | 6373 | 4055 | 404100 | 8301 | N/A |
| 33 | 9/22/2017 | 72.9 | 7509 | 5576 | 4176 | 405250 | 9949 | N/A |
| 34 | 9/22/2017 | 75.4 | 6856 | 5825 | 4305 | 405250 | 8375 | N/A |
| 35 | 9/22/2017 | 76.9 | 7004 | 5790 | 4209 | 405450 | 8381 | N/A |
| 36 | 9/22/2017 | 74.2 | 6778 | 6018 | 4320 | 406600 | 8243 | N/A |
| 37 | 9/23/2017 | 76.7 | 6857 | 6070 | 4212 | 404450 | 8280 | N/A |
| 38 | 9/23/2017 | 78.8 | 6716 | 6538 | 4357 | 405600 | 8239 | N/A |
| 39 | 9/23/2017 | 77 | 6920 | 5759 | 4243 | 406100 | 8450 | N/A |
| 40 | 9/24/2017 | 75.9 | 6600 | 6370 | 4209 | 406000 | 8330 | N/A |
| 41 | 9/24/2017 | 77.2 | 6699 | 6086 | 4187 | 404500 | 8368 | N/A |
| 42 | 9/24/2017 | 77.5 | 6688 | 6023 | 4005 | 405100 | 8169 | N/A |
| 43 | 9/24/2017 | 77.2 | 6868 | 5891 | 4209 | 405100 | 8295 | N/A |
| 44 | 9/25/2017 | 76.7 | 6559 | 5938 | 3950 | 405350 | 8207 | N/A |
| 45 | 9/25/2017 | 74.4 | 6431 | 6241 | 4049 | 404350 | 8157 | N/A |
| 46 | 9/25/2017 | 75 | 6553 | 6388 | 4178 | 404900 | 8123 | N/A |
| 47 | 9/25/2017 | 76.3 | 6368 | 6017 | 4187 | 404200 | 8139 | N/A |
| 48 | 9/25/2017 | 76.3 | 6522 | 6243 | 3988 | 405350 | 8218 | N/A |
| 49 | 9/26/2017 | 79.5 | 6407 | 6044 | 4022 | 405350 | 8171 | N/A |
| 50 | 9/26/2017 | 75.2 | 6357 | 6273 | 4032 | 404650 | 8102 | N/A |
| 51 | 9/26/2017 | 78.2 | 6553 | 6364 | 4310 | 404350 | 8115 | N/A |
| 52 | 9/26/2017 | 70.5 | 6696 | 5315 | 4000 | 406200 | 9978 | N/A |
| 53 | 9/26/2017 | 75.7 | 5863 | | 4298 | 404950 | 8125 | N/A |
| | AVG= | 73.9 | 7,287 | 6,265 | 4,294 | 12,728,901 | 279,846 | TOTAL |

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| API 47-017-06783 Farm Name Melody Brown et al Well Number Hugle Unit 2H | | | | |
|---|---|---|---|---|
| EXHIBIT 3 | | | | |
| LITHOLOGY/ FORMATION | TOP DEPTH (TVD) From Surface | BOTTOM DEPTH (TVD) From Surface | TOP DEPTH (MD) From Surface | BOTTOM DEPTH (MD) From Surface |
| Fresh Water | 53' | N/A | N/A | N/A |
| Sandy siltstone | 0 | 0 | 0 | 80 |
| Silty sandstone | 80 | 120 | 80 | 120 |
| Sandy siltstone | 120 | 400 | 120 | 400 |
| Silty sandstone (tr coal) | 400 | 600 | 400 | 600 |
| Sandy shale | 600 | 640 | 600 | 640 |
| Silty limestone | 640 | 720 | 640 | 720 |
| Silty shale | 720 | 800 | 720 | 800 |
| Siltstone | 800 | 880 | 800 | 880 |
| Sandstone | 880 | 960 | 880 | 960 |
| Shaly sandstone | 960 | 1,080 | 960 | 1,080 |
| Silty sandstone (tr coal) | 1,080 | 1,280 | 1,080 | 1,280 |
| Silty shale | 1,280 | 1,520 | 1,280 | 1,520 |
| Sandy shale (tr coal) | 1,520 | 1,690 | 1,520 | 1,690 |
| Shaly sandstone | 1,690 | 1,740 | 1,690 | 1,740 |
| Silty shale | 1,740 | 1,873 | 1,740 | 1,873 |
| Big Lime | 1,873 | 2,557 | 1,873 | 2,557 |
| Fifty Foot Sandstone | 2,557 | 2,640 | 2,557 | 2,640 |
| Gordon | 2,640 | 3,154 | 2,640 | 3,158 |
| Fifth Sandstone | 3,154 | 3,208 | 3,158 | 3,213 |
| Bayard | 3,208 | 3,687 | 3,213 | 3,709 |
| Speechley | 3,687 | 4,002 | 3,709 | 4,040 |
| Baltown | 4,002 | 4,488 | 4,040 | 4,549 |
| Bradford | 4,488 | 4,895 | 4,549 | 4,977 |
| Benson | 4,895 | 5,155 | 4,977 | 5,251 |
| Alexander | 5,155 | 5,765 | 5,251 | 5,880 |
| Rhinestreet | 5,765 | 6,099 | 5,880 | 6,223 |
| Sycamore | 6,099 | 6,261 | 6,223 | 6,416 |
| Middlesex | 6,261 | 6,383 | 6,416 | 6,612 |
| Burkett | 6,383 | 6,411 | 6,612 | 6,679 |
| Tully | 6,411 | 6,442 | 6,679 | 6,780 |
| Marcellus | 6,442 | NA | 6,780 | 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.

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# ANTERO RESOURCES CORPORATION

Location: Doddridge Co., WV
Field: Doddridge
Facility: Long Run Pad

Slot: Slot #08
Well: Hugle Unit 2H
Wellbore: Hugle Unit 2H PWB

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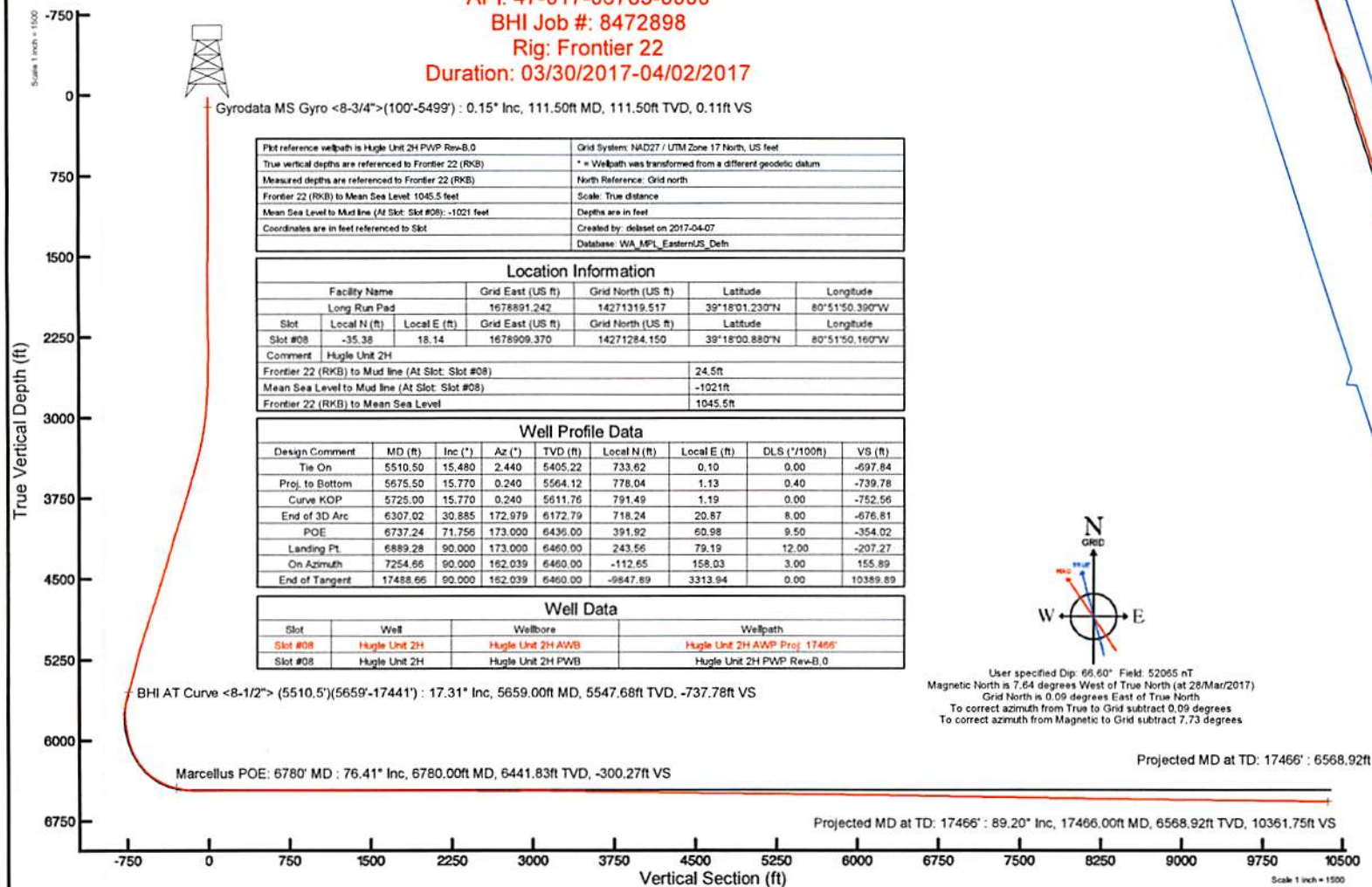
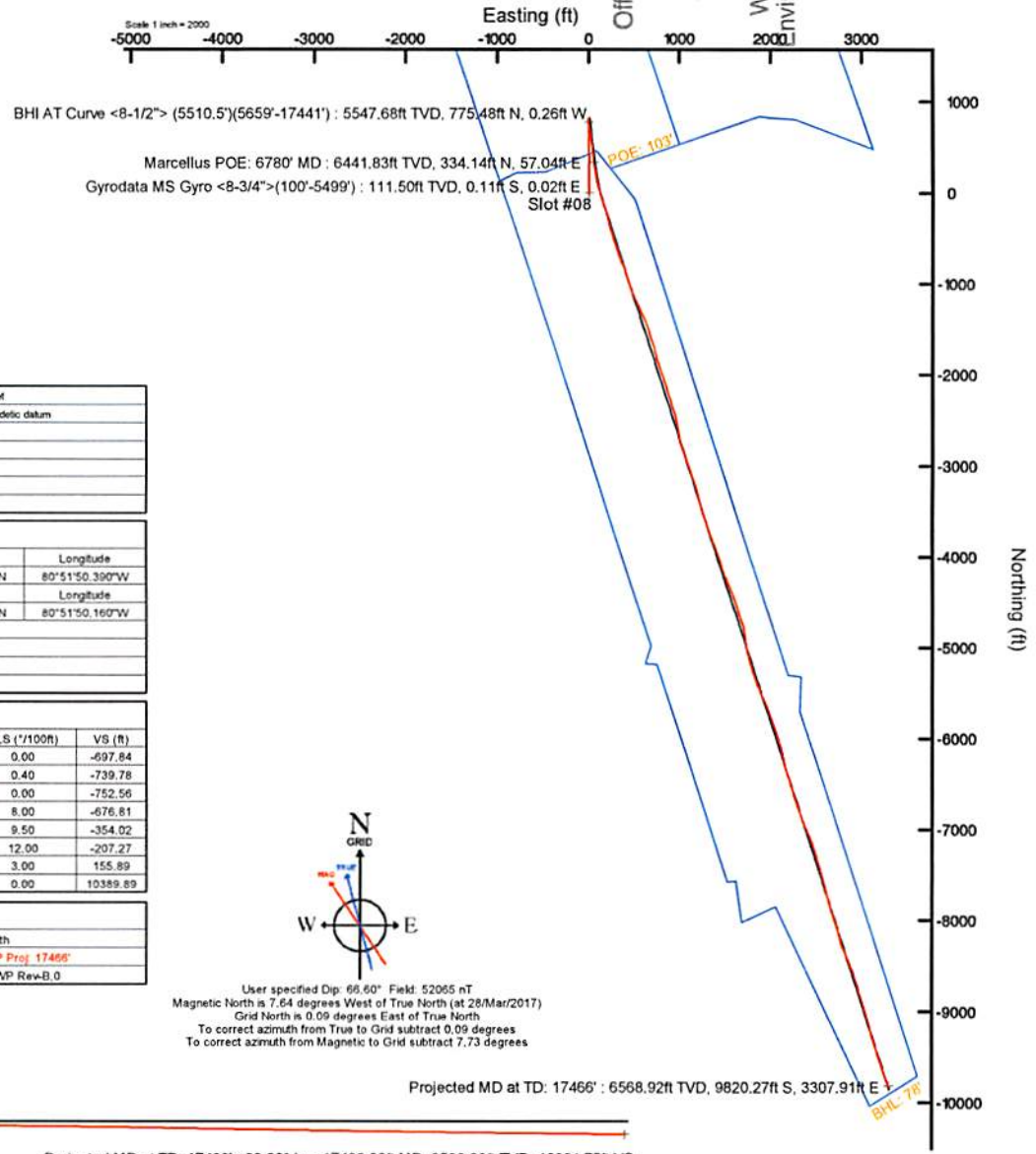
WV Department of Environmental Protection

API: 47-017-06783-0000
BHI Job #: 8472898
Rig: Frontier 22
Duration: 03/30/2017-04/02/2017




| | |
|---|---|
| Plot reference wellpath is Hugle Unit 2H PWP Rev-B.0 | Grid System: NAD27 / UTM Zone 17 North, US feet |
| True vertical depths are referenced to Frontier 22 (RKB) | * = Wellpath was transformed from a different geodetic datum |
| Measured depths are referenced to Frontier 22 (RKB) | North Reference: Grid north |
| Frontier 22 (RKB) to Mean Sea Level: 1045.5 feet | Scale: True distance |
| Mean Sea Level to Mud line (At Slot: Slot #08): -1021 feet | Depths are in feet |
| Coordinates are in feet referenced to Slot | Created by: delaset on 2017-04-07 |
| | Database: WA_MPL_EasternUS_Defn |

## Location Information

| Facility Name | | | Grid East (US ft) | Grid North (US ft) | Latitude | Longitude |
|---|---|---|---|---|---|---|
| Long Run Pad | | | 1678891.242 | 14271319.517 | 39°18'01.230"N | 80°51'50.390"W |
| Slot | Local N (ft) | Local E (ft) | Grid East (US ft) | Grid North (US ft) | Latitude | Longitude |
| Slot #08 | -35.38 | 18.14 | 1678909.370 | 14271284.150 | 39°18'00.880"N | 80°51'50.160"W |
| Comment | Hugle Unit 2H | | | | | |

| | |
|---|---|
| Frontier 22 (RKB) to Mud line (At Slot: Slot #08) | 24.5ft |
| Mean Sea Level to Mud line (At Slot: Slot #08) | -1021ft |
| Frontier 22 (RKB) to Mean Sea Level | 1045.5ft |

## Well Profile Data

| Design Comment | MD (ft) | Inc (°) | Az (°) | TVD (ft) | Local N (ft) | Local E (ft) | DLS (°/100ft) | VS (ft) |
|---|---|---|---|---|---|---|---|---|
| Tie On | 5510.50 | 15.480 | 2.440 | 5405.22 | 733.62 | 0.10 | 0.00 | -697.84 |
| Proj. to Bottom | 5675.50 | 15.770 | 0.240 | 5564.12 | 778.04 | 1.13 | 0.40 | -739.78 |
| Curve KOP | 5725.00 | 15.770 | 0.240 | 5611.76 | 791.49 | 1.19 | 0.00 | -752.56 |
| End of 3D Arc | 6307.02 | 30.885 | 172.979 | 6172.79 | 718.24 | 20.87 | 8.00 | -676.81 |
| POE | 6737.24 | 71.756 | 173.000 | 6436.00 | 391.92 | 60.98 | 9.50 | -354.02 |
| Landing Pt. | 6889.28 | 90.000 | 173.000 | 6460.00 | 243.56 | 79.19 | 12.00 | -207.27 |
| On Azimuth | 7254.66 | 90.000 | 162.039 | 6460.00 | -112.65 | 158.03 | 3.00 | 155.89 |
| End of Tangent | 17488.66 | 90.000 | 162.039 | 6460.00 | -9847.89 | 3313.94 | 0.00 | 10389.89 |

## Well Data

| Slot | Well | Wellbore | Wellpath |
|---|---|---|---|
| Slot #08 | Hugle Unit 2H | Hugle Unit 2H AWB | Hugle Unit 2H AWP Proj. 17466' |
| Slot #08 | Hugle Unit 2H | Hugle Unit 2H PWB | Hugle Unit 2H PWP Rev-B.0 |




User specified Dip: 66.60° Field: 52065 nT
Magnetic North is 7.64 degrees West of True North (at 28/Mar/2017)
Grid North is 0.09 degrees East of True North
To correct azimuth from True to Grid subtract 0.09 degrees
To correct azimuth from Magnetic to Grid subtract 7.73 degrees

# Actual Wellpath Report

Hugle Unit 2H AWP Proj: 17466'



| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | ANTERO RESOURCES CORPORATION | Slot | Slot #08 |
| Area | Doddridge Co., WV | Well | Hugle Unit 2H |
| Field | Doddridge | Wellbore | Hugle Unit 2H AWB |
| Facility | Long Run Pad | | |

| REPORT SETUP INFORMATION | | | |
|---|---|---|---|
| Projection System | NAD27 / UTM Zone 17 North, US feet | Software System | WellArchitect® 5.0 |
| North Reference | Grid | User | Delaset |
| Scale | 0.999602 | Report Generated | 07/Apr/2017 at 13:22 |
| Convergence at slot | 0.09° East | Database/Source file | WA_MPL_EasternUS_Defn/Hugle_Unit_2H_AWP_Proj__17466_.xml |

| WELLPATH LOCATION | Local coordinates | | Grid coordinates | | Geographic coordinates | |
|---|---|---|---|---|---|---|
| | North[ft] | East[ft] | Easting[US ft] | Northing[US ft] | Latitude | Longitude |
| Slot Location | -35.38 | 18.14 | 1678909.37 | 14271284.15 | 39°18'00.880"N | 80°51'50.160"W |
| Facility Reference Pt | | | 1678891.24 | 14271319.52 | 39°18'01.230"N | 80°51'50.390"W |
| Field Reference Pt | | | 0.00 | 0.00 | 0°00'00.000" | 85°29'19.301"W |

| WELLPATH DATUM | | | |
|---|---|---|---|
| Calculation method | Minimum curvature | Frontier 22 (RKB) to Facility Vertical Datum | 24.50ft |
| Horizontal Reference Pt | Slot | Frontier 22 (RKB) to Mean Sea Level | 1045.50ft |
| Vertical Reference Pt | Frontier 22 (RKB) | Frontier 22 (RKB) to Mud Line at Slot (Slot #08) | 24.50ft |
| MD Reference Pt | Frontier 22 (RKB) | Section Origin | N 0.00, E 0.00 ft |
| Field Vertical Reference | Mean Sea Level | Section Azimuth | 162.04° |

# Actual Wellpath Report

Hugle Unit 2H AWP Proj: 17466'



| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | ANTERO RESOURCES CORPORATION | Slot | Slot #08 |
| Area | Doddridge Co., WV | Well | Hugle Unit 2H |
| Field | Doddridge | Wellbore | Hugle Unit 2H AWB |
| Facility | Long Run Pad | | |

**WELLPATH DATA (201 stations)** † = interpolated/extrapolated station

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] | Build Rate [°/100ft] | Turn Rate [°/100ft] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00† | 0.000 | 170.980 | 0.00 | 0.00 | 0.00 | 0.00 | 1678909.37 | 14271284.15 | 39°18'00.880"N | 80°51'50.160"W | 0.00 | 0.000 | 0.00 | 0.00 | 0.00 | |
| 24.50 | 0.000 | 170.980 | 24.50 | 0.00 | 0.00 | 0.00 | 1678909.37 | 14271284.15 | 39°18'00.880"N | 80°51'50.160"W | 0.00 | 0.000 | 0.00 | 0.00 | 0.00 | |
| 111.50 | 0.150 | 170.980 | 111.50 | 0.11 | -0.11 | 0.02 | 1678909.39 | 14271284.04 | 39°18'00.879"N | 80°51'50.160"W | 0.11 | 170.980 | 0.17 | 0.17 | 196.53 | Gyrodata MS Gyro <8-3/4">(100'-5499') |
| 211.50 | 0.130 | 167.140 | 211.50 | 0.35 | -0.35 | 0.06 | 1678909.43 | 14271283.80 | 39°18'00.877"N | 80°51'50.159"W | 0.36 | 169.764 | 0.02 | -0.02 | -3.84 | |
| 311.50 | 0.190 | 79.670 | 311.50 | 0.49 | -0.43 | 0.25 | 1678909.62 | 14271283.72 | 39°18'00.876"N | 80°51'50.157"W | 0.50 | 149.815 | 0.23 | 0.06 | -87.47 | |
| 411.50 | 0.180 | 102.290 | 411.50 | 0.59 | -0.44 | 0.57 | 1678909.94 | 14271283.71 | 39°18'00.876"N | 80°51'50.153"W | 0.72 | 127.540 | 0.07 | -0.01 | 22.62 | |
| 511.50 | 0.210 | 110.850 | 511.50 | 0.78 | -0.54 | 0.89 | 1678910.26 | 14271283.61 | 39°18'00.875"N | 80°51'50.149"W | 1.04 | 120.945 | 0.04 | 0.03 | 8.56 | |
| 611.50 | 0.250 | 109.540 | 611.50 | 1.03 | -0.67 | 1.27 | 1678910.64 | 14271283.48 | 39°18'00.873"N | 80°51'50.144"W | 1.44 | 117.944 | 0.04 | 0.04 | -1.31 | |
| 711.50 | 0.360 | 94.130 | 711.50 | 1.28 | -0.77 | 1.79 | 1678911.16 | 14271283.38 | 39°18'00.872"N | 80°51'50.137"W | 1.95 | 113.269 | 0.14 | 0.11 | -15.41 | |
| 811.50 | 0.390 | 82.880 | 811.49 | 1.47 | -0.75 | 2.44 | 1678911.81 | 14271283.40 | 39°18'00.873"N | 80°51'50.129"W | 2.55 | 107.081 | 0.08 | 0.03 | -11.25 | |
| 911.50 | 0.440 | 80.180 | 911.49 | 1.58 | -0.64 | 3.16 | 1678912.52 | 14271283.51 | 39°18'00.874"N | 80°51'50.120"W | 3.22 | 101.500 | 0.05 | 0.05 | -2.70 | |
| 1011.50 | 0.250 | 167.970 | 1011.49 | 1.86 | -0.79 | 3.58 | 1678912.95 | 14271283.36 | 39°18'00.872"N | 80°51'50.114"W | 3.67 | 102.444 | 0.50 | -0.19 | 87.79 | |
| 1111.50 | 1.760 | 274.400 | 1111.47 | 1.49 | -0.89 | 2.09 | 1678911.46 | 14271283.26 | 39°18'00.871"N | 80°51'50.133"W | 2.27 | 112.922 | 1.85 | 1.51 | 106.43 | |
| 1211.50 | 1.140 | 264.290 | 1211.44 | 0.69 | -0.87 | -0.43 | 1678908.94 | 14271283.28 | 39°18'00.871"N | 80°51'50.165"W | 0.97 | 206.211 | 0.67 | -0.62 | -10.11 | |
| 1311.50 | 0.900 | 265.140 | 1311.43 | 0.30 | -1.03 | -2.20 | 1678907.17 | 14271283.12 | 39°18'00.870"N | 80°51'50.188"W | 2.43 | 244.854 | 0.24 | -0.24 | 0.85 | |
| 1411.50 | 0.750 | 269.710 | 1411.42 | -0.07 | -1.10 | -3.64 | 1678905.74 | 14271283.05 | 39°18'00.869"N | 80°51'50.206"W | 3.80 | 253.138 | 0.16 | -0.15 | 4.57 | |
| 1511.50 | 0.210 | 14.230 | 1511.41 | -0.43 | -0.93 | -4.25 | 1678905.13 | 14271283.22 | 39°18'00.871"N | 80°51'50.214"W | 4.35 | 257.673 | 0.83 | -0.54 | 104.52 | |
| 1611.50 | 0.510 | 61.360 | 1611.41 | -0.66 | -0.54 | -3.81 | 1678905.56 | 14271283.61 | 39°18'00.875"N | 80°51'50.208"W | 3.85 | 261.979 | 0.40 | 0.30 | 47.13 | |
| 1711.50 | 0.560 | 62.200 | 1711.41 | -0.83 | -0.10 | -2.99 | 1678906.38 | 14271284.05 | 39°18'00.879"N | 80°51'50.198"W | 2.99 | 268.167 | 0.05 | 0.05 | 0.84 | |
| 1811.50 | 0.810 | 67.630 | 1811.40 | -0.97 | 0.40 | -1.90 | 1678907.47 | 14271284.55 | 39°18'00.884"N | 80°51'50.184"W | 1.94 | 281.920 | 0.26 | 0.25 | 5.43 | |
| 1911.50 | 0.910 | 63.420 | 1911.39 | -1.14 | 1.03 | -0.54 | 1678908.83 | 14271285.18 | 39°18'00.890"N | 80°51'50.167"W | 1.16 | 332.352 | 0.12 | 0.10 | -4.21 | |
| 2011.50 | 0.240 | 71.360 | 2011.38 | -1.26 | 1.45 | 0.37 | 1678909.74 | 14271285.60 | 39°18'00.894"N | 80°51'50.155"W | 1.49 | 14.385 | 0.67 | -0.67 | 7.94 | |
| 2111.50 | 0.330 | 230.670 | 2111.38 | -1.16 | 1.33 | 0.35 | 1678909.72 | 14271285.48 | 39°18'00.893"N | 80°51'50.156"W | 1.38 | 14.600 | 0.56 | 0.09 | 159.31 | |
| 2211.50 | 0.750 | 231.910 | 2211.38 | -0.83 | 0.75 | -0.39 | 1678908.98 | 14271284.90 | 39°18'00.887"N | 80°51'50.165"W | 0.84 | 332.353 | 0.42 | 0.42 | 1.24 | |
| 2311.50 | 0.760 | 228.270 | 2311.37 | -0.34 | -0.10 | -1.40 | 1678907.97 | 14271284.05 | 39°18'00.879"N | 80°51'50.178"W | 1.40 | 265.952 | 0.05 | 0.01 | -3.64 | |
| 2411.50 | 0.240 | 284.950 | 2411.37 | -0.18 | -0.49 | -2.10 | 1678907.27 | 14271283.66 | 39°18'00.875"N | 80°51'50.187"W | 2.15 | 256.944 | 0.66 | -0.52 | 56.68 | |
| 2511.50 | 0.910 | 4.850 | 2511.36 | -1.03 | 0.36 | -2.23 | 1678907.14 | 14271284.51 | 39°18'00.884"N | 80°51'50.188"W | 2.26 | 279.125 | 0.90 | 0.67 | 79.90 | |
| 2611.50 | 0.990 | 347.910 | 2611.35 | -2.62 | 1.99 | -2.35 | 1678907.02 | 14271286.14 | 39°18'00.900"N | 80°51'50.190"W | 3.08 | 310.359 | 0.29 | 0.08 | -16.94 | |
| 2711.50 | 2.290 | 347.690 | 2711.30 | -5.47 | 4.79 | -2.95 | 1678906.42 | 14271288.94 | 39°18'00.927"N | 80°51'50.197"W | 5.63 | 328.345 | 1.30 | 1.30 | -0.22 | |
| 2811.50 | 3.930 | 357.220 | 2811.15 | -10.76 | 10.17 | -3.55 | 1678905.83 | 14271294.31 | 39°18'00.981"N | 80°51'50.205"W | 10.77 | 340.771 | 1.71 | 1.64 | 9.53 | |

# Actual Wellpath Report

Hugle Unit 2H AWP Proj: 17466'



| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | ANTERO RESOURCES CORPORATION | Slot | Slot #08 |
| Area | Doddridge Co., WV | Well | Hugle Unit 2H |
| Field | Doddridge | Wellbore | Hugle Unit 2H AWB |
| Facility | Long Run Pad | | |

**WELLPATH DATA (201 stations)**

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] | Build Rate [°/100ft] | Turn Rate [°/100ft] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2911.50 | 4.850 | 0.050 | 2910.86 | -18.09 | 17.82 | -3.71 | 1678905.66 | 14271301.96 | 39°18'01.056"N | 80°51'50.207"W | 18.20 | 348.241 | 0.94 | 0.92 | 2.83 | |
| 3011.50 | 7.020 | 3.350 | 3010.32 | -27.81 | 28.15 | -3.35 | 1678906.02 | 14271312.28 | 39°18'01.158"N | 80°51'50.202"W | 28.34 | 353.217 | 2.20 | 2.17 | 3.30 | |
| 3111.50 | 10.320 | 2.380 | 3109.16 | -41.90 | 43.20 | -2.62 | 1678906.75 | 14271327.33 | 39°18'01.307"N | 80°51'50.192"W | 43.28 | 356.531 | 3.30 | 3.30 | -0.97 | |
| 3211.50 | 12.180 | 1.620 | 3207.24 | -60.24 | 62.70 | -1.95 | 1678907.42 | 14271346.82 | 39°18'01.500"N | 80°51'50.184"W | 62.73 | 358.220 | 1.87 | 1.86 | -0.76 | |
| 3311.50 | 13.770 | 2.370 | 3304.68 | -81.34 | 85.13 | -1.16 | 1678908.21 | 14271369.25 | 39°18'01.721"N | 80°51'50.173"W | 85.14 | 359.221 | 1.60 | 1.59 | 0.75 | |
| 3411.50 | 15.630 | 1.250 | 3401.40 | -105.23 | 110.50 | -0.37 | 1678909.00 | 14271394.60 | 39°18'01.972"N | 80°51'50.163"W | 110.50 | 359.807 | 1.88 | 1.86 | -1.12 | |
| 3511.50 | 16.120 | 357.960 | 3497.59 | -131.30 | 137.84 | -0.57 | 1678908.80 | 14271421.93 | 39°18'02.242"N | 80°51'50.165"W | 137.84 | 359.762 | 1.02 | 0.49 | -3.29 | |
| 3611.50 | 16.240 | 357.270 | 3593.63 | -158.14 | 165.68 | -1.73 | 1678907.64 | 14271449.76 | 39°18'02.518"N | 80°51'50.179"W | 165.69 | 359.401 | 0.23 | 0.12 | -0.69 | |
| 3711.50 | 17.110 | 358.000 | 3689.42 | -185.78 | 194.35 | -2.91 | 1678906.46 | 14271478.42 | 39°18'02.801"N | 80°51'50.193"W | 194.37 | 359.142 | 0.89 | 0.87 | 0.73 | |
| 3811.50 | 17.660 | 3.650 | 3784.86 | -214.02 | 224.19 | -2.46 | 1678906.91 | 14271508.25 | 39°18'03.096"N | 80°51'50.187"W | 224.20 | 359.371 | 1.77 | 0.55 | 5.65 | |
| 3911.50 | 18.090 | 3.000 | 3880.03 | -242.62 | 254.83 | -0.68 | 1678908.69 | 14271538.88 | 39°18'03.399"N | 80°51'50.164"W | 254.83 | 359.847 | 0.47 | 0.43 | -0.65 | |
| 4011.50 | 18.730 | 1.290 | 3974.92 | -272.28 | 286.39 | 0.49 | 1678909.86 | 14271570.42 | 39°18'03.711"N | 80°51'50.148"W | 286.39 | 0.099 | 0.84 | 0.64 | -1.71 | |
| 4111.50 | 17.980 | 4.080 | 4069.83 | -301.75 | 317.83 | 1.95 | 1678911.32 | 14271601.86 | 39°18'04.021"N | 80°51'50.129"W | 317.84 | 0.352 | 1.15 | -0.75 | 2.79 | |
| 4211.50 | 17.000 | 2.510 | 4165.21 | -329.75 | 347.84 | 3.69 | 1678913.06 | 14271631.85 | 39°18'04.318"N | 80°51'50.106"W | 347.86 | 0.608 | 1.09 | -0.98 | -1.57 | |
| 4311.50 | 17.230 | 1.120 | 4260.78 | -357.44 | 377.25 | 4.62 | 1678913.99 | 14271661.25 | 39°18'04.609"N | 80°51'50.094"W | 377.28 | 0.702 | 0.47 | 0.23 | -1.39 | |
| 4411.50 | 16.950 | 357.390 | 4356.37 | -385.50 | 406.62 | 4.25 | 1678913.61 | 14271690.61 | 39°18'04.899"N | 80°51'50.098"W | 406.64 | 0.598 | 1.13 | -0.28 | -3.73 | |
| 4511.50 | 16.360 | 355.860 | 4452.17 | -413.23 | 435.23 | 2.57 | 1678911.93 | 14271719.20 | 39°18'05.182"N | 80°51'50.119"W | 435.23 | 0.338 | 0.74 | -0.59 | -1.53 | |
| 4611.50 | 17.390 | 358.080 | 4547.86 | -441.27 | 464.21 | 1.05 | 1678910.42 | 14271748.17 | 39°18'05.468"N | 80°51'50.138"W | 464.21 | 0.129 | 1.21 | 1.03 | 2.22 | |
| 4711.50 | 18.690 | 0.110 | 4642.95 | -470.86 | 495.17 | 0.58 | 1678909.95 | 14271779.12 | 39°18'05.774"N | 80°51'50.143"W | 495.17 | 0.067 | 1.44 | 1.30 | 2.03 | |
| 4811.50 | 19.180 | 0.160 | 4737.54 | -501.71 | 527.62 | 0.65 | 1678910.02 | 14271811.56 | 39°18'06.095"N | 80°51'50.142"W | 527.62 | 0.071 | 0.49 | 0.49 | 0.05 | |
| 4911.50 | 18.880 | 356.860 | 4832.07 | -532.96 | 560.20 | -0.19 | 1678909.18 | 14271844.13 | 39°18'06.417"N | 80°51'50.152"W | 560.20 | 359.981 | 1.12 | -0.30 | -3.30 | |
| 5011.50 | 18.250 | 0.060 | 4926.87 | -563.49 | 592.02 | -1.06 | 1678908.31 | 14271875.93 | 39°18'06.731"N | 80°51'50.162"W | 592.02 | 359.898 | 1.20 | -0.63 | 3.20 | |
| 5111.50 | 17.560 | 2.140 | 5022.03 | -592.55 | 622.75 | -0.48 | 1678908.89 | 14271906.65 | 39°18'07.035"N | 80°51'50.154"W | 622.75 | 359.956 | 0.94 | -0.69 | 2.08 | |
| 5211.50 | 17.780 | 359.950 | 5117.31 | -621.25 | 653.09 | 0.07 | 1678909.44 | 14271936.98 | 39°18'07.335"N | 80°51'50.147"W | 653.09 | 0.007 | 0.70 | 0.22 | -2.19 | |
| 5311.50 | 15.800 | 358.830 | 5213.04 | -648.81 | 681.98 | -0.22 | 1678909.15 | 14271965.85 | 39°18'07.620"N | 80°51'50.150"W | 681.98 | 359.982 | 2.01 | -1.98 | -1.12 | |
| 5411.50 | 14.450 | 0.070 | 5309.58 | -673.71 | 708.06 | -0.48 | 1678908.89 | 14271991.93 | 39°18'07.878"N | 80°51'50.153"W | 708.06 | 359.961 | 1.39 | -1.35 | 1.24 | |
| 5510.50 | 15.480 | 2.440 | 5405.22 | -697.84 | 733.62 | 0.10 | 1678909.47 | 14272017.47 | 39°18'08.131"N | 80°51'50.145"W | 733.62 | 0.008 | 1.21 | 1.04 | 2.39 | |
| 5659.00 | 17.310 | 356.880 | 5547.68 | -737.78 | 775.48 | -0.26 | 1678909.11 | 14272059.32 | 39°18'08.545"N | 80°51'50.148"W | 775.48 | 359.981 | 1.62 | 1.23 | -3.74 | BHI AT Curve <8-1/2"> (5510.5')(5659'-17441') |
| 5720.00 | 14.310 | 354.920 | 5606.37 | -753.90 | 792.06 | -1.42 | 1678907.95 | 14272075.89 | 39°18'08.709"N | 80°51'50.163"W | 792.06 | 359.897 | 4.99 | -4.92 | -3.21 | |
| 5767.00 | 9.260 | 354.810 | 5652.36 | -763.26 | 801.61 | -2.28 | 1678907.09 | 14272085.44 | 39°18'08.803"N | 80°51'50.174"W | 801.62 | 359.837 | 10.74 | -10.74 | -0.23 | |

# Actual Wellpath Report

Hugle Unit 2H AWP Proj: 17466'



| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | ANTERO RESOURCES CORPORATION | Slot | Slot #08 |
| Area | Doddridge Co., WV | Well | Hugle Unit 2H |
| Field | Doddridge | Wellbore | Hugle Unit 2H AWB |
| Facility | Long Run Pad | | |

**WELLPATH DATA (201 stations)** † = interpolated/extrapolated station

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] | Build Rate [°/100ft] | Turn Rate [°/100ft] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5815.00 | 5.260 | 355.250 | 5699.97 | -769.17 | 807.66 | -2.81 | 1678906.56 | 14272091.48 | 39°18'08.863"N | 80°51'50.180"W | 807.66 | 359.801 | 8.33 | -8.33 | 0.92 | |
| 5862.00 | 0.920 | 339.200 | 5746.89 | -771.64 | 810.16 | -3.12 | 1678906.25 | 14272093.98 | 39°18'08.887"N | 80°51'50.184"W | 810.16 | 359.779 | 9.33 | -9.23 | -34.15 | |
| 5910.00 | 4.160 | 191.240 | 5794.85 | -770.51 | 808.81 | -3.60 | 1678905.77 | 14272092.63 | 39°18'08.874"N | 80°51'50.190"W | 808.82 | 359.745 | 10.34 | 6.75 | -308.25 | |
| 5957.00 | 7.420 | 191.930 | 5841.61 | -766.39 | 804.17 | -4.56 | 1678904.81 | 14272087.99 | 39°18'08.828"N | 80°51'50.203"W | 804.18 | 359.675 | 6.94 | 6.94 | 1.47 | |
| 6005.00 | 9.120 | 191.530 | 5889.11 | -760.39 | 797.41 | -5.96 | 1678903.41 | 14272081.24 | 39°18'08.761"N | 80°51'50.221"W | 797.43 | 359.572 | 3.54 | 3.54 | -0.83 | |
| 6052.00 | 11.020 | 186.800 | 5935.38 | -753.07 | 789.29 | -7.24 | 1678902.13 | 14272073.13 | 39°18'08.681"N | 80°51'50.237"W | 789.33 | 359.475 | 4.41 | 4.04 | -10.06 | |
| 6101.00 | 14.010 | 173.460 | 5983.22 | -743.00 | 778.75 | -7.12 | 1678902.26 | 14272062.59 | 39°18'08.577"N | 80°51'50.236"W | 778.78 | 359.476 | 8.45 | 6.10 | -27.22 | |
| 6148.00 | 16.900 | 168.170 | 6028.52 | -730.62 | 766.41 | -5.07 | 1678904.30 | 14272050.25 | 39°18'08.455"N | 80°51'50.210"W | 766.42 | 359.621 | 6.84 | 6.15 | -11.26 | |
| 6196.00 | 20.140 | 170.010 | 6074.03 | -715.50 | 751.43 | -2.20 | 1678907.17 | 14272035.28 | 39°18'08.307"N | 80°51'50.174"W | 751.44 | 359.832 | 6.86 | 6.75 | 3.83 | |
| 6243.00 | 24.890 | 169.160 | 6117.43 | -697.66 | 733.74 | 1.06 | 1678910.43 | 14272017.60 | 39°18'08.132"N | 80°51'50.132"W | 733.74 | 0.083 | 10.13 | 10.11 | -1.81 | |
| 6291.00 | 29.720 | 167.550 | 6160.07 | -675.78 | 712.19 | 5.53 | 1678914.90 | 14271996.05 | 39°18'07.919"N | 80°51'50.076"W | 712.21 | 0.445 | 10.18 | 10.06 | -3.35 | |
| 6338.00 | 33.760 | 168.260 | 6200.04 | -651.19 | 688.02 | 10.70 | 1678920.07 | 14271971.89 | 39°18'07.680"N | 80°51'50.011"W | 688.10 | 0.891 | 8.63 | 8.60 | 1.51 | |
| 6386.00 | 38.240 | 169.580 | 6238.86 | -623.19 | 660.33 | 16.10 | 1678925.47 | 14271944.22 | 39°18'07.406"N | 80°51'49.943"W | 660.53 | 1.397 | 9.47 | 9.33 | 2.75 | |
| 6433.00 | 42.980 | 171.400 | 6274.53 | -592.95 | 630.17 | 21.13 | 1678930.49 | 14271914.07 | 39°18'07.108"N | 80°51'49.879"W | 630.52 | 1.921 | 10.39 | 10.09 | 3.87 | |
| 6481.00 | 47.940 | 172.980 | 6308.19 | -559.28 | 596.28 | 25.76 | 1678935.12 | 14271880.20 | 39°18'06.773"N | 80°51'49.821"W | 596.84 | 2.474 | 10.60 | 10.33 | 3.29 | |
| 6528.00 | 53.180 | 173.250 | 6338.04 | -523.68 | 560.26 | 30.11 | 1678939.47 | 14271844.19 | 39°18'06.417"N | 80°51'49.766"W | 561.07 | 3.076 | 11.16 | 11.15 | 0.57 | |
| 6576.00 | 58.250 | 172.930 | 6365.07 | -484.76 | 520.90 | 34.88 | 1678944.24 | 14271804.84 | 39°18'06.028"N | 80°51'49.706"W | 522.07 | 3.831 | 10.58 | 10.56 | -0.67 | |
| 6612.00† | 62.087 | 173.046 | 6382.97 | -454.11 | 489.91 | 38.69 | 1678948.05 | 14271773.87 | 39°18'05.722"N | 80°51'49.658"W | 491.44 | 4.516 | 10.66 | 10.66 | 0.32 | Burket: 6612' MD |
| 6623.00 | 63.260 | 173.080 | 6388.02 | -444.52 | 480.21 | 39.87 | 1678949.23 | 14271764.17 | 39°18'05.626"N | 80°51'49.644"W | 481.86 | 4.746 | 10.66 | 10.66 | 0.31 | |
| 6671.00 | 66.980 | 173.570 | 6408.21 | -401.82 | 436.97 | 44.93 | 1678954.28 | 14271720.94 | 39°18'05.198"N | 80°51'49.580"W | 439.27 | 5.871 | 7.81 | 7.75 | 1.02 | |
| 6679.00† | 67.726 | 173.577 | 6411.29 | -394.59 | 429.63 | 45.76 | 1678955.11 | 14271713.61 | 39°18'05.126"N | 80°51'49.570"W | 432.06 | 6.079 | 9.32 | 9.32 | 0.09 | Tully: 6679' MD |
| 6718.00 | 71.360 | 173.610 | 6424.92 | -358.79 | 393.33 | 49.83 | 1678959.18 | 14271677.32 | 39°18'04.767"N | 80°51'49.519"W | 396.47 | 7.221 | 9.32 | 9.32 | 0.08 | |
| 6755.00† | 74.805 | 172.959 | 6435.69 | -324.08 | 358.18 | 53.97 | 1678963.32 | 14271642.18 | 39°18'04.419"N | 80°51'49.467"W | 362.22 | 8.569 | 9.46 | 9.31 | -1.76 | Hamilton: 6755' MD |
| 6766.00 | 75.830 | 172.770 | 6438.48 | -313.63 | 347.62 | 55.30 | 1678964.64 | 14271631.63 | 39°18'04.315"N | 80°51'49.450"W | 351.99 | 9.038 | 9.46 | 9.32 | -1.72 | |
| 6780.00† | 76.413 | 172.473 | 6441.83 | -300.27 | 334.14 | 57.04 | 1678966.39 | 14271618.15 | 39°18'04.182"N | 80°51'49.428"W | 338.97 | 9.688 | 4.65 | 4.17 | -2.12 | Marcellus POE: 6780' MD |
| 6813.00 | 77.790 | 171.780 | 6449.20 | -268.60 | 302.28 | 61.45 | 1678970.79 | 14271586.30 | 39°18'03.867"N | 80°51'49.373"W | 308.46 | 11.491 | 4.65 | 4.17 | -2.10 | |
| 6861.00 | 80.950 | 170.780 | 6458.05 | -222.04 | 255.65 | 68.60 | 1678977.94 | 14271539.70 | 39°18'03.406"N | 80°51'49.282"W | 264.69 | 15.021 | 6.89 | 6.58 | -2.08 | |
| 6908.00 | 85.260 | 170.690 | 6463.69 | -175.93 | 209.61 | 76.11 | 1678985.45 | 14271493.68 | 39°18'02.951"N | 80°51'49.188"W | 223.00 | 19.956 | 9.17 | 9.17 | -0.19 | |
| 6957.00 | 89.600 | 170.780 | 6465.89 | -127.55 | 161.31 | 83.99 | 1678993.33 | 14271445.40 | 39°18'02.473"N | 80°51'49.089"W | 181.87 | 27.505 | 8.86 | 8.86 | 0.18 | |
| 7052.00 | 90.830 | 166.490 | 6465.53 | -33.20 | 68.20 | 102.71 | 1679012.03 | 14271352.32 | 39°18'01.553"N | 80°51'48.852"W | 123.29 | 56.416 | 4.70 | 1.29 | -4.52 | |

# Actual Wellpath Report

Hugle Unit 2H AWP Proj: 17466'



| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | ANTERO RESOURCES CORPORATION | Slot | Slot #08 |
| Area | Doddridge Co., WV | Well | Hugle Unit 2H |
| Field | Doddridge | Wellbore | Hugle Unit 2H AWB |
| Facility | Long Run Pad | | |

**WELLPATH DATA (201 stations)**

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] | Build Rate [°/100ft] | Turn Rate [°/100ft] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7148.00 | 90.150 | 161.260 | 6464.71 | 62.71 | -23.99 | 129.36 | 1679038.68 | 14271260.17 | 39°18'00.641"N | 80°51'48.515"W | 131.56 | 100.507 | 5.49 | -0.71 | -5.45 | |
| 7243.00 | 89.420 | 160.710 | 6465.07 | 157.69 | -113.80 | 160.31 | 1679069.62 | 14271170.39 | 39°17'59.753"N | 80°51'48.123"W | 196.60 | 125.371 | 0.96 | -0.77 | -0.58 | |
| 7338.00 | 89.940 | 165.960 | 6465.60 | 252.63 | -204.78 | 187.54 | 1679096.84 | 14271079.45 | 39°17'58.853"N | 80°51'47.778"W | 277.68 | 137.516 | 5.55 | 0.55 | 5.53 | |
| 7433.00 | 90.180 | 167.830 | 6465.50 | 347.29 | -297.30 | 209.08 | 1679118.37 | 14270986.97 | 39°17'57.938"N | 80°51'47.506"W | 363.46 | 144.883 | 1.98 | 0.25 | 1.97 | |
| 7528.00 | 90.220 | 163.560 | 6465.17 | 442.07 | -389.34 | 232.55 | 1679141.83 | 14270894.97 | 39°17'57.028"N | 80°51'47.209"W | 453.50 | 149.150 | 4.49 | 0.04 | -4.49 | |
| 7623.00 | 90.220 | 160.750 | 6464.80 | 537.06 | -479.76 | 261.66 | 1679170.92 | 14270804.59 | 39°17'56.134"N | 80°51'46.841"W | 546.47 | 151.392 | 2.96 | 0.00 | -2.96 | |
| 7718.00 | 89.910 | 162.600 | 6464.70 | 632.05 | -569.93 | 291.53 | 1679200.78 | 14270714.44 | 39°17'55.243"N | 80°51'46.463"W | 640.17 | 152.910 | 1.97 | -0.33 | 1.95 | |
| 7813.00 | 89.880 | 161.960 | 6464.87 | 727.05 | -660.43 | 320.44 | 1679229.68 | 14270623.99 | 39°17'54.348"N | 80°51'46.097"W | 734.06 | 154.117 | 0.67 | -0.03 | -0.67 | |
| 7908.00 | 89.080 | 156.450 | 6465.73 | 821.90 | -749.20 | 354.15 | 1679263.38 | 14270535.25 | 39°17'53.470"N | 80°51'45.669"W | 828.69 | 154.699 | 5.86 | -0.84 | -5.80 | |
| 8004.00 | 89.720 | 159.840 | 6466.74 | 917.65 | -838.28 | 389.88 | 1679299.10 | 14270446.21 | 39°17'52.589"N | 80°51'45.217"W | 924.51 | 155.057 | 3.59 | 0.67 | 3.53 | |
| 8099.00 | 89.970 | 161.830 | 6467.00 | 1012.63 | -928.01 | 421.07 | 1679330.27 | 14270356.51 | 39°17'51.702"N | 80°51'44.822"W | 1019.07 | 155.595 | 2.11 | 0.26 | 2.09 | |
| 8193.00 | 89.880 | 162.630 | 6467.12 | 1106.63 | -1017.52 | 449.76 | 1679358.95 | 14270267.03 | 39°17'50.816"N | 80°51'44.459"W | 1112.49 | 156.154 | 0.86 | -0.10 | 0.85 | |
| 8288.00 | 89.820 | 157.610 | 6467.37 | 1201.54 | -1106.83 | 482.05 | 1679391.23 | 14270177.76 | 39°17'49.933"N | 80°51'44.050"W | 1207.25 | 156.466 | 5.28 | -0.06 | -5.28 | |
| 8383.00 | 89.970 | 152.210 | 6467.54 | 1295.77 | -1192.84 | 522.32 | 1679431.48 | 14270091.79 | 39°17'49.083"N | 80°51'43.539"W | 1302.18 | 156.352 | 5.69 | 0.16 | -5.68 | |
| 8477.00 | 89.170 | 155.720 | 6468.25 | 1388.82 | -1277.28 | 563.57 | 1679472.72 | 14270007.38 | 39°17'48.247"N | 80°51'43.016"W | 1396.09 | 156.192 | 3.83 | -0.85 | 3.73 | |
| 8572.00 | 90.250 | 156.120 | 6468.73 | 1483.28 | -1364.01 | 602.33 | 1679511.46 | 14269920.68 | 39°17'47.390"N | 80°51'42.525"W | 1491.09 | 156.174 | 1.21 | 1.14 | 0.42 | |
| 8668.00 | 90.180 | 158.930 | 6468.37 | 1578.97 | -1452.71 | 639.03 | 1679548.14 | 14269832.02 | 39°17'46.512"N | 80°51'42.060"W | 1587.05 | 156.256 | 2.93 | -0.07 | 2.93 | |
| 8762.00 | 90.340 | 165.110 | 6467.94 | 1672.92 | -1542.08 | 668.03 | 1679577.13 | 14269742.69 | 39°17'45.629"N | 80°51'41.692"W | 1680.56 | 156.578 | 6.58 | 0.17 | 6.57 | |
| 8857.00 | 90.340 | 160.630 | 6467.38 | 1767.89 | -1632.84 | 696.00 | 1679605.09 | 14269651.96 | 39°17'44.731"N | 80°51'41.338"W | 1774.99 | 156.914 | 4.72 | 0.00 | -4.72 | |
| 8952.00 | 89.820 | 165.970 | 6467.24 | 1862.83 | -1723.80 | 723.29 | 1679632.37 | 14269561.04 | 39°17'43.832"N | 80°51'40.993"W | 1869.39 | 157.238 | 5.65 | -0.55 | 5.62 | |
| 9047.00 | 89.880 | 163.800 | 6467.49 | 1957.71 | -1815.51 | 748.06 | 1679657.13 | 14269469.37 | 39°17'42.925"N | 80°51'40.680"W | 1963.58 | 157.606 | 2.29 | 0.06 | -2.28 | |
| 9141.00 | 89.750 | 161.390 | 6467.80 | 2051.70 | -1905.20 | 776.18 | 1679685.24 | 14269379.72 | 39°17'42.038"N | 80°51'40.324"W | 2057.24 | 157.834 | 2.57 | -0.14 | -2.56 | |
| 9236.00 | 89.750 | 159.810 | 6468.21 | 2146.66 | -1994.80 | 807.73 | 1679716.78 | 14269290.15 | 39°17'41.152"N | 80°51'39.924"W | 2152.13 | 157.956 | 1.66 | 0.00 | -1.66 | |
| 9331.00 | 89.780 | 162.000 | 6468.60 | 2241.64 | -2084.56 | 838.81 | 1679747.84 | 14269200.42 | 39°17'40.264"N | 80°51'39.531"W | 2247.00 | 158.081 | 2.31 | 0.03 | 2.31 | |
| 9426.00 | 89.780 | 163.510 | 6468.97 | 2336.63 | -2175.29 | 866.97 | 1679775.99 | 14269109.73 | 39°17'39.367"N | 80°51'39.174"W | 2341.69 | 158.270 | 1.59 | 0.00 | 1.59 | |
| 9521.00 | 89.720 | 162.450 | 6469.38 | 2431.61 | -2266.13 | 894.78 | 1679803.79 | 14269018.93 | 39°17'38.469"N | 80°51'38.822"W | 2436.38 | 158.454 | 1.12 | -0.06 | -1.12 | |
| 9616.00 | 89.660 | 161.310 | 6469.89 | 2526.61 | -2356.41 | 924.32 | 1679833.32 | 14268928.68 | 39°17'37.576"N | 80°51'38.448"W | 2531.22 | 158.582 | 1.20 | -0.06 | -1.20 | |
| 9711.00 | 89.690 | 164.780 | 6470.43 | 2621.58 | -2447.27 | 952.02 | 1679861.01 | 14268837.86 | 39°17'36.678"N | 80°51'38.098"W | 2625.92 | 158.743 | 3.65 | 0.03 | 3.65 | |
| 9807.00 | 89.750 | 170.030 | 6470.90 | 2717.12 | -2540.92 | 972.95 | 1679881.93 | 14268744.24 | 39°17'35.752"N | 80°51'37.834"W | 2720.83 | 159.048 | 5.47 | 0.06 | 5.47 | |
| 9902.00 | 90.370 | 171.910 | 6470.80 | 2810.97 | -2634.74 | 987.85 | 1679896.83 | 14268650.46 | 39°17'34.824"N | 80°51'37.646"W | 2813.85 | 159.447 | 2.08 | 0.65 | 1.98 | |

# Actual Wellpath Report

Hugle Unit 2H AWP Proj: 17466'



| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | ANTERO RESOURCES CORPORATION | Slot | Slot #08 |
| Area | Doddridge Co., WV | Well | Hugle Unit 2H |
| Field | Doddridge | Wellbore | Hugle Unit 2H AWB |
| Facility | Long Run Pad | | |

**WELLPATH DATA (201 stations)**

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] | Build Rate [°/100ft] | Turn Rate [°/100ft] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9997.00 | 91.820 | 166.250 | 6468.99 | 2905.19 | -2727.97 | 1005.84 | 1679914.81 | 14268557.28 | 39°17'33.902"N | 80°51'37.419"W | 2907.49 | 159.760 | 6.15 | 1.53 | -5.96 | |
| 10092.00 | 89.880 | 161.020 | 6467.58 | 3000.11 | -2819.07 | 1032.59 | 1679941.55 | 14268466.21 | 39°17'33.002"N | 80°51'37.080"W | 3002.23 | 159.883 | 5.87 | -2.04 | -5.51 | |
| 10187.00 | 89.110 | 160.760 | 6468.41 | 3095.08 | -2908.83 | 1063.69 | 1679972.64 | 14268376.48 | 39°17'32.114"N | 80°51'36.687"W | 3097.21 | 159.914 | 0.86 | -0.81 | -0.27 | |
| 10282.00 | 88.860 | 161.410 | 6470.10 | 3190.05 | -2998.69 | 1094.48 | 1680003.42 | 14268286.66 | 39°17'31.225"N | 80°51'36.297"W | 3192.18 | 159.949 | 0.73 | -0.26 | 0.68 | |
| 10378.00 | 89.140 | 159.740 | 6471.77 | 3286.00 | -3089.20 | 1126.41 | 1680035.32 | 14268196.18 | 39°17'30.330"N | 80°51'35.892"W | 3288.16 | 159.967 | 1.76 | 0.29 | -1.74 | |
| 10472.00 | 89.080 | 159.720 | 6473.23 | 3379.92 | -3177.37 | 1158.97 | 1680067.87 | 14268108.05 | 39°17'29.458"N | 80°51'35.480"W | 3382.14 | 159.960 | 0.07 | -0.06 | -0.02 | |
| 10567.00 | 89.230 | 162.560 | 6474.63 | 3474.88 | -3267.25 | 1189.67 | 1680098.56 | 14268018.20 | 39°17'28.570"N | 80°51'35.091"W | 3477.10 | 159.992 | 2.99 | 0.16 | 2.99 | |
| 10662.00 | 89.230 | 166.910 | 6475.91 | 3569.75 | -3358.87 | 1214.67 | 1680123.56 | 14267926.62 | 39°17'27.664"N | 80°51'34.775"W | 3571.76 | 160.118 | 4.58 | 0.00 | 4.58 | |
| 10756.00 | 89.110 | 162.710 | 6477.27 | 3663.61 | -3449.56 | 1239.30 | 1680148.17 | 14267835.97 | 39°17'26.767"N | 80°51'34.464"W | 3665.42 | 160.239 | 4.47 | -0.13 | -4.47 | |
| 10851.00 | 89.110 | 160.420 | 6478.75 | 3758.59 | -3539.67 | 1269.33 | 1680178.19 | 14267745.90 | 39°17'25.876"N | 80°51'34.084"W | 3760.38 | 160.272 | 2.41 | 0.00 | -2.41 | |
| 10945.00 | 89.170 | 162.380 | 6480.16 | 3852.57 | -3628.74 | 1299.31 | 1680208.16 | 14267656.86 | 39°17'24.995"N | 80°51'33.704"W | 3854.34 | 160.300 | 2.09 | 0.06 | 2.09 | |
| 11040.00 | 89.200 | 160.760 | 6481.51 | 3947.55 | -3718.86 | 1329.34 | 1680238.18 | 14267566.78 | 39°17'24.104"N | 80°51'33.324"W | 3949.31 | 160.330 | 1.71 | 0.03 | -1.71 | |
| 11136.00 | 89.200 | 158.320 | 6482.85 | 4043.44 | -3808.78 | 1362.89 | 1680271.71 | 14267476.89 | 39°17'23.215"N | 80°51'32.899"W | 4045.28 | 160.311 | 2.54 | 0.00 | -2.54 | |
| 11231.00 | 89.050 | 158.470 | 6484.30 | 4138.24 | -3897.10 | 1397.87 | 1680306.68 | 14267388.61 | 39°17'22.341"N | 80°51'32.456"W | 4140.22 | 160.267 | 0.22 | -0.16 | 0.16 | |
| 11326.00 | 89.230 | 160.950 | 6485.73 | 4233.14 | -3986.19 | 1430.80 | 1680339.60 | 14267299.56 | 39°17'21.460"N | 80°51'32.039"W | 4235.20 | 160.255 | 2.62 | 0.19 | 2.61 | |
| 11420.00 | 89.350 | 163.270 | 6486.89 | 4327.13 | -4075.63 | 1459.67 | 1680368.46 | 14267210.15 | 39°17'20.576"N | 80°51'31.673"W | 4329.13 | 160.295 | 2.47 | 0.13 | 2.47 | |
| 11515.00 | 89.290 | 160.340 | 6488.02 | 4422.11 | -4165.86 | 1489.33 | 1680398.11 | 14267119.95 | 39°17'19.683"N | 80°51'31.298"W | 4424.09 | 160.328 | 3.08 | -0.06 | -3.08 | |
| 11610.00 | 89.140 | 156.260 | 6489.32 | 4516.88 | -4254.10 | 1524.45 | 1680433.21 | 14267031.75 | 39°17'18.811"N | 80°51'30.853"W | 4519.00 | 160.285 | 4.30 | -0.16 | -4.29 | |
| 11704.00 | 89.380 | 156.340 | 6490.54 | 4610.40 | -4340.17 | 1562.23 | 1680470.97 | 14266945.72 | 39°17'17.959"N | 80°51'30.374"W | 4612.77 | 160.204 | 0.27 | 0.26 | 0.09 | |
| 11799.00 | 89.450 | 161.520 | 6491.51 | 4705.22 | -4428.78 | 1596.37 | 1680505.10 | 14266857.14 | 39°17'17.083"N | 80°51'29.942"W | 4707.71 | 160.178 | 5.45 | 0.07 | 5.45 | |
| 11894.00 | 89.230 | 162.750 | 6492.60 | 4800.21 | -4519.19 | 1625.51 | 1680534.23 | 14266766.76 | 39°17'16.189"N | 80°51'29.573"W | 4802.65 | 160.217 | 1.32 | -0.23 | 1.29 | |
| 11988.00 | 89.200 | 162.000 | 6493.89 | 4894.20 | -4608.77 | 1653.97 | 1680562.68 | 14266677.22 | 39°17'15.303"N | 80°51'29.213"W | 4896.57 | 160.258 | 0.80 | -0.03 | -0.80 | |
| 12083.00 | 89.110 | 160.670 | 6495.29 | 4989.18 | -4698.76 | 1684.37 | 1680593.06 | 14266587.27 | 39°17'14.413"N | 80°51'28.828"W | 4991.54 | 160.279 | 1.40 | -0.09 | -1.40 | |
| 12179.00 | 89.350 | 168.010 | 6496.58 | 5085.03 | -4791.13 | 1710.26 | 1680618.95 | 14266494.94 | 39°17'13.500"N | 80°51'28.501"W | 5087.23 | 160.355 | 7.65 | 0.25 | 7.65 | |
| 12273.00 | 89.420 | 172.300 | 6497.59 | 5178.06 | -4883.72 | 1726.33 | 1680635.01 | 14266402.39 | 39°17'12.585"N | 80°51'28.298"W | 5179.86 | 160.532 | 4.56 | 0.07 | 4.56 | |
| 12369.00 | 89.480 | 173.500 | 6498.51 | 5272.34 | -4978.98 | 1738.19 | 1680646.87 | 14266307.17 | 39°17'11.643"N | 80°51'28.149"W | 5273.66 | 160.756 | 1.25 | 0.06 | 1.25 | |
| 12464.00 | 89.510 | 163.960 | 6499.35 | 5366.58 | -5072.03 | 1756.74 | 1680665.40 | 14266214.15 | 39°17'10.723"N | 80°51'27.915"W | 5367.65 | 160.896 | 10.04 | 0.03 | -10.04 | |
| 12558.00 | 89.480 | 164.950 | 6500.18 | 5460.49 | -5162.59 | 1781.93 | 1680690.58 | 14266123.63 | 39°17'09.827"N | 80°51'27.596"W | 5461.47 | 160.957 | 1.05 | -0.03 | 1.05 | |
| 12653.00 | 89.540 | 162.110 | 6500.99 | 5555.44 | -5253.68 | 1808.86 | 1680717.50 | 14266032.57 | 39°17'08.927"N | 80°51'27.256"W | 5556.36 | 161.001 | 2.99 | 0.06 | -2.99 | |
| 12748.00 | 89.380 | 160.290 | 6501.89 | 5650.43 | -5343.60 | 1839.47 | 1680748.10 | 14265942.69 | 39°17'08.037"N | 80°51'26.868"W | 5651.35 | 161.005 | 1.92 | -0.17 | -1.92 | |

# Actual Wellpath Report

Hugle Unit 2H AWP Proj: 17466'



| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | ANTERO RESOURCES CORPORATION | Slot | Slot #08 |
| Area | Doddridge Co., WV | Well | Hugle Unit 2H |
| Field | Doddridge | Wellbore | Hugle Unit 2H AWB |
| Facility | Long Run Pad | | |

**WELLPATH DATA (201 stations)**

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] | Build Rate [°/100ft] | Turn Rate [°/100ft] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12844.00 | 89.320 | 158.240 | 6502.98 | 5746.30 | -5433.37 | 1873.45 | 1680782.07 | 14265852.95 | 39°17'07.150"N | 80°51'26.438"W | 5747.29 | 160.976 | 2.14 | -0.06 | -2.14 | |
| 12938.00 | 89.380 | 156.310 | 6504.05 | 5839.97 | -5520.07 | 1909.76 | 1680818.37 | 14265766.29 | 39°17'06.292"N | 80°51'25.978"W | 5841.09 | 160.916 | 2.05 | 0.06 | -2.05 | |
| 13034.00 | 89.320 | 156.400 | 6505.13 | 5935.49 | -5608.00 | 1948.26 | 1680856.85 | 14265678.39 | 39°17'05.422"N | 80°51'25.490"W | 5936.79 | 160.842 | 0.11 | -0.06 | 0.09 | |
| 13129.00 | 89.350 | 158.750 | 6506.24 | 6030.19 | -5695.81 | 1984.50 | 1680893.07 | 14265590.62 | 39°17'04.554"N | 80°51'25.031"W | 6031.62 | 160.791 | 2.47 | 0.03 | 2.47 | |
| 13224.00 | 89.380 | 159.740 | 6507.29 | 6125.07 | -5784.64 | 2018.16 | 1680926.72 | 14265501.83 | 39°17'03.676"N | 80°51'24.605"W | 6126.58 | 160.767 | 1.04 | 0.03 | 1.04 | |
| 13319.00 | 89.260 | 161.940 | 6508.42 | 6220.03 | -5874.36 | 2049.34 | 1680957.89 | 14265412.14 | 39°17'02.788"N | 80°51'24.210"W | 6221.57 | 160.768 | 2.32 | -0.13 | 2.32 | |
| 13413.00 | 88.950 | 162.610 | 6509.89 | 6314.02 | -5963.89 | 2077.95 | 1680986.49 | 14265322.65 | 39°17'01.903"N | 80°51'23.848"W | 6315.52 | 160.791 | 0.79 | -0.33 | 0.71 | |
| 13507.00 | 89.290 | 163.720 | 6511.33 | 6407.99 | -6053.85 | 2105.17 | 1681013.70 | 14265232.73 | 39°17'01.013"N | 80°51'23.503"W | 6409.43 | 160.825 | 1.23 | 0.36 | 1.18 | |
| 13602.00 | 88.740 | 166.950 | 6512.96 | 6502.81 | -6145.73 | 2129.22 | 1681037.73 | 14265140.89 | 39°17'00.105"N | 80°51'23.200"W | 6504.11 | 160.891 | 3.45 | -0.58 | 3.40 | |
| 13697.00 | 88.830 | 167.740 | 6514.98 | 6597.38 | -6238.40 | 2150.02 | 1681058.53 | 14265048.25 | 39°16'59.189"N | 80°51'22.937"W | 6598.50 | 160.984 | 0.84 | 0.09 | 0.83 | |
| 13793.00 | 88.950 | 163.780 | 6516.84 | 6693.14 | -6331.41 | 2173.63 | 1681082.13 | 14264955.27 | 39°16'58.269"N | 80°51'22.638"W | 6694.13 | 161.052 | 4.13 | 0.12 | -4.12 | |
| 13888.00 | 89.080 | 160.970 | 6518.47 | 6788.11 | -6421.93 | 2202.39 | 1681110.87 | 14264864.79 | 39°16'57.374"N | 80°51'22.275"W | 6789.08 | 161.071 | 2.96 | 0.14 | -2.96 | |
| 13983.00 | 88.950 | 163.700 | 6520.10 | 6883.09 | -6512.43 | 2231.21 | 1681139.68 | 14264774.33 | 39°16'56.479"N | 80°51'21.910"W | 6884.04 | 161.088 | 2.88 | -0.14 | 2.87 | |
| 14078.00 | 89.050 | 164.040 | 6521.76 | 6978.03 | -6603.67 | 2257.60 | 1681166.06 | 14264683.12 | 39°16'55.577"N | 80°51'21.576"W | 6978.91 | 161.126 | 0.37 | 0.11 | 0.36 | |
| 14173.00 | 89.110 | 159.720 | 6523.29 | 7072.99 | -6693.93 | 2287.13 | 1681195.58 | 14264592.90 | 39°16'54.684"N | 80°51'21.202"W | 7073.87 | 161.136 | 4.55 | 0.06 | -4.55 | |
| 14268.00 | 89.020 | 161.920 | 6524.84 | 7167.95 | -6783.64 | 2318.34 | 1681226.78 | 14264503.23 | 39°16'53.797"N | 80°51'20.807"W | 7168.85 | 161.132 | 2.32 | -0.09 | 2.32 | |
| 14363.00 | 89.140 | 159.970 | 6526.36 | 7262.92 | -6873.42 | 2349.35 | 1681257.77 | 14264413.49 | 39°16'52.909"N | 80°51'20.415"W | 7263.83 | 161.129 | 2.06 | 0.13 | -2.05 | |
| 14458.00 | 89.140 | 157.680 | 6527.79 | 7357.75 | -6961.99 | 2383.65 | 1681292.07 | 14264324.95 | 39°16'52.033"N | 80°51'19.980"W | 7358.74 | 161.100 | 2.41 | 0.00 | -2.41 | |
| 14553.00 | 89.010 | 154.470 | 6529.32 | 7452.21 | -7048.80 | 2422.17 | 1681330.57 | 14264238.17 | 39°16'51.175"N | 80°51'19.492"W | 7453.36 | 161.036 | 3.38 | -0.14 | -3.38 | |
| 14648.00 | 89.050 | 159.290 | 6530.93 | 7546.78 | -7136.13 | 2459.46 | 1681367.84 | 14264150.87 | 39°16'50.311"N | 80°51'19.020"W | 7548.07 | 160.984 | 5.07 | 0.04 | 5.07 | |
| 14743.00 | 89.050 | 163.190 | 6532.51 | 7641.74 | -7226.06 | 2490.00 | 1681398.37 | 14264060.99 | 39°16'49.422"N | 80°51'18.633"W | 7643.03 | 160.987 | 4.10 | 0.00 | 4.11 | |
| 14839.00 | 89.080 | 163.930 | 6534.08 | 7737.70 | -7318.12 | 2517.16 | 1681425.53 | 14263968.96 | 39°16'48.511"N | 80°51'18.290"W | 7738.93 | 161.019 | 0.77 | 0.03 | 0.77 | |
| 14934.00 | 88.980 | 163.410 | 6535.68 | 7832.64 | -7409.27 | 2543.87 | 1681452.22 | 14263877.84 | 39°16'47.610"N | 80°51'17.952"W | 7833.81 | 161.051 | 0.56 | -0.11 | -0.55 | |
| 15028.00 | 89.080 | 163.880 | 6537.28 | 7926.59 | -7499.46 | 2570.34 | 1681478.68 | 14263787.70 | 39°16'46.718"N | 80°51'17.617"W | 7927.70 | 161.082 | 0.51 | 0.11 | 0.50 | |
| 15123.00 | 89.230 | 165.410 | 6538.68 | 8021.48 | -7591.05 | 2595.49 | 1681503.82 | 14263696.14 | 39°16'45.812"N | 80°51'17.299"W | 8022.51 | 161.124 | 1.62 | 0.16 | 1.61 | |
| 15218.00 | 89.420 | 165.760 | 6539.80 | 8116.29 | -7683.05 | 2619.14 | 1681527.46 | 14263604.17 | 39°16'44.903"N | 80°51'17.000"W | 8117.22 | 161.176 | 0.42 | 0.20 | 0.37 | |
| 15312.00 | 89.290 | 165.960 | 6540.85 | 8210.08 | -7774.20 | 2642.10 | 1681550.41 | 14263513.06 | 39°16'44.001"N | 80°51'16.710"W | 8210.90 | 161.229 | 0.25 | -0.14 | 0.21 | |
| 15407.00 | 89.350 | 165.170 | 6541.98 | 8304.89 | -7866.19 | 2665.78 | 1681574.08 | 14263421.10 | 39°16'43.092"N | 80°51'16.411"W | 8305.62 | 161.279 | 0.83 | 0.06 | -0.83 | |
| 15501.00 | 89.230 | 159.760 | 6543.15 | 8398.85 | -7955.79 | 2694.09 | 1681602.38 | 14263331.55 | 39°16'42.206"N | 80°51'16.053"W | 8399.56 | 161.292 | 5.76 | -0.13 | -5.76 | |
| 15595.00 | 89.320 | 159.360 | 6544.34 | 8492.75 | -8043.86 | 2726.91 | 1681635.19 | 14263243.51 | 39°16'41.335"N | 80°51'15.637"W | 8493.51 | 161.273 | 0.44 | 0.10 | -0.43 | |

# Actual Wellpath Report

Hugle Unit 2H AWP Proj: 17466'



| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | ANTERO RESOURCES CORPORATION | Slot | Slot #08 |
| Area | Doddridge Co., WV | Well | Hugle Unit 2H |
| Field | Doddridge | Wellbore | Hugle Unit 2H AWB |
| Facility | Long Run Pad | | |

**WELLPATH DATA (201 stations)**

| MD [ft] | Inclination [°] | Azimuth [°] | TVD [ft] | Vert Sect [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Closure Dist [ft] | Closure Dir [°] | DLS [°/100ft] | Build Rate [°/100ft] | Turn Rate [°/100ft] | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15689.00 | 89.200 | 167.030 | 6545.55 | 8586.65 | -8133.77 | 2754.07 | 1681662.33 | 14263153.63 | 39°16'40.446"N | 80°51'15.294"W | 8587.38 | 161.294 | 8.16 | -0.13 | 8.16 | |
| 15784.00 | 89.350 | 162.940 | 6546.76 | 8681.50 | -8225.50 | 2778.67 | 1681686.93 | 14263061.94 | 39°16'39.539"N | 80°51'14.983"W | 8682.16 | 161.334 | 4.31 | 0.16 | -4.31 | |
| 15879.00 | 89.140 | 158.500 | 6548.01 | 8776.44 | -8315.14 | 2810.03 | 1681718.27 | 14262972.34 | 39°16'38.652"N | 80°51'14.586"W | 8777.12 | 161.328 | 4.68 | -0.22 | -4.67 | |
| 15973.00 | 89.260 | 154.940 | 6549.32 | 8870.01 | -8401.47 | 2847.17 | 1681755.40 | 14262886.05 | 39°16'37.798"N | 80°51'14.115"W | 8870.80 | 161.279 | 3.79 | 0.13 | -3.79 | |
| 16067.00 | 89.260 | 157.930 | 6550.53 | 8963.55 | -8487.61 | 2884.74 | 1681792.96 | 14262799.94 | 39°16'36.946"N | 80°51'13.639"W | 8964.45 | 161.228 | 3.18 | 0.00 | 3.18 | |
| 16162.00 | 89.140 | 160.960 | 6551.86 | 9058.43 | -8576.54 | 2918.09 | 1681826.29 | 14262711.04 | 39°16'36.067"N | 80°51'13.217"W | 9059.38 | 161.210 | 3.19 | -0.13 | 3.19 | |
| 16257.00 | 89.260 | 163.760 | 6553.19 | 9153.41 | -8667.06 | 2946.87 | 1681855.06 | 14262620.56 | 39°16'35.172"N | 80°51'12.853"W | 9154.34 | 161.222 | 2.95 | 0.13 | 2.95 | |
| 16351.00 | 89.420 | 162.710 | 6554.27 | 9247.38 | -8757.06 | 2973.99 | 1681882.16 | 14262530.60 | 39°16'34.282"N | 80°51'12.510"W | 9248.28 | 161.242 | 1.13 | 0.17 | -1.12 | |
| 16446.00 | 89.200 | 162.530 | 6555.41 | 9342.37 | -8847.71 | 3002.36 | 1681910.53 | 14262439.98 | 39°16'33.385"N | 80°51'12.151"W | 9343.24 | 161.256 | 0.30 | -0.23 | -0.19 | |
| 16540.00 | 89.290 | 161.830 | 6556.65 | 9436.36 | -8937.19 | 3031.12 | 1681939.28 | 14262350.53 | 39°16'32.501"N | 80°51'11.787"W | 9437.22 | 161.265 | 0.75 | 0.10 | -0.74 | |
| 16635.00 | 89.230 | 162.960 | 6557.88 | 9531.35 | -9027.74 | 3059.85 | 1681968.00 | 14262260.03 | 39°16'31.605"N | 80°51'11.424"W | 9532.19 | 161.276 | 1.19 | -0.06 | 1.19 | |
| 16730.00 | 89.350 | 165.780 | 6559.06 | 9626.25 | -9119.21 | 3085.45 | 1681993.58 | 14262168.59 | 39°16'30.701"N | 80°51'11.100"W | 9627.04 | 161.307 | 2.97 | 0.13 | 2.97 | |
| 16824.00 | 89.320 | 166.100 | 6560.15 | 9720.03 | -9210.38 | 3108.28 | 1682016.41 | 14262077.45 | 39°16'29.799"N | 80°51'10.812"W | 9720.73 | 161.352 | 0.34 | -0.03 | 0.34 | |
| 16919.00 | 89.350 | 163.000 | 6561.25 | 9814.92 | -9301.93 | 3133.58 | 1682041.70 | 14261985.94 | 39°16'28.894"N | 80°51'10.492"W | 9815.57 | 161.383 | 3.26 | 0.03 | -3.26 | |
| 17014.00 | 89.290 | 161.580 | 6562.38 | 9909.91 | -9392.42 | 3162.48 | 1682070.58 | 14261895.49 | 39°16'27.999"N | 80°51'10.126"W | 9910.54 | 161.391 | 1.50 | -0.06 | -1.49 | |
| 17109.00 | 89.260 | 162.010 | 6563.58 | 10004.90 | -9482.66 | 3192.16 | 1682100.25 | 14261805.29 | 39°16'27.107"N | 80°51'09.751"W | 10005.53 | 161.395 | 0.45 | -0.03 | 0.45 | |
| 17204.00 | 89.320 | 160.990 | 6564.76 | 10099.89 | -9572.74 | 3222.30 | 1682130.38 | 14261715.24 | 39°16'26.216"N | 80°51'09.369"W | 10100.53 | 161.396 | 1.08 | 0.06 | -1.07 | |
| 17298.00 | 88.770 | 159.200 | 6566.33 | 10193.82 | -9661.11 | 3254.29 | 1682162.36 | 14261626.91 | 39°16'25.342"N | 80°51'08.964"W | 10194.48 | 161.384 | 1.99 | -0.59 | -1.90 | |
| 17393.00 | 89.290 | 162.000 | 6567.93 | 10288.76 | -9750.70 | 3285.84 | 1682193.90 | 14261537.36 | 39°16'24.456"N | 80°51'08.565"W | 10289.45 | 161.377 | 3.00 | 0.55 | 2.95 | |
| 17441.00 | 89.200 | 162.600 | 6568.57 | 10336.76 | -9796.42 | 3300.43 | 1682208.48 | 14261491.65 | 39°16'24.004"N | 80°51'08.381"W | 10337.44 | 161.381 | 1.26 | -0.19 | 1.25 | |
| 17466.00 | 89.200 | 162.600 | 6568.92 | 10361.75 | -9820.27 | 3307.91 | 1682215.96 | 14261467.81 | 39°16'23.768"N | 80°51'08.286"W | 10362.43 | 161.384 | 0.00 | 0.00 | 0.00 | Projected MD at TD: 17466' |

# Actual Wellpath Report

Hugle Unit 2H AWP Proj: 17466'



## REFERENCE WELLPATH IDENTIFICATION

| | | | |
|---|---|---|---|
| Operator | ANTERO RESOURCES CORPORATION | Slot | Slot #08 |
| Area | Doddridge Co., WV | Well | Hugle Unit 2H |
| Field | Doddridge | Wellbore | Hugle Unit 2H AWB |
| Facility | Long Run Pad | | |

## HOLE & CASING SECTIONS - Ref Wellbore: Hugle Unit 2H AWB Ref Wellpath: Hugle Unit 2H AWP Proj: 17466'

| String/Diameter | Start MD [ft] | End MD [ft] | Interval [ft] | Start TVD [ft] | End TVD [ft] | Start N/S [ft] | Start E/W [ft] | End N/S [ft] | End E/W [ft] |
|---|---|---|---|---|---|---|---|---|---|
| 20in Conductor | 24.50 | 64.50 | 40.00 | 24.50 | 64.50 | 0.00 | 0.00 | -0.02 | 0.00 |
| 17.5in Open Hole | 64.50 | 529.00 | 464.50 | 64.50 | 529.00 | -0.02 | 0.00 | -0.56 | 0.95 |
| 13.375in Casing Surface | 24.50 | 529.00 | 504.50 | 24.50 | 529.00 | 0.00 | 0.00 | -0.56 | 0.95 |
| 12.25in Open Hole | 529.00 | 2533.50 | 2004.50 | 529.00 | 2533.36 | -0.56 | 0.95 | 0.71 | -2.22 |
| 9.625in Casing Intermediate | 24.50 | 2533.50 | 2509.00 | 24.50 | 2533.36 | 0.00 | 0.00 | 0.71 | -2.22 |
| 8.75in Open Hole | 2533.50 | 5675.50 | 3142.00 | 2533.36 | 5563.47 | 0.71 | -2.22 | 780.27 | -0.54 |
| 8.5in Open Hole | 5675.50 | 17466.00 | 11790.50 | 5563.47 | 6568.92 | 780.27 | -0.54 | -9820.27 | 3307.91 |
| 5.5in Casing Production | 24.50 | 17466.00 | 17441.50 | 24.50 | 6568.92 | 0.00 | 0.00 | -9820.27 | 3307.91 |

## TARGETS

| Name | TVD [ft] | North [ft] | East [ft] | Grid East [US ft] | Grid North [US ft] | Latitude | Longitude | Shape |
|---|---|---|---|---|---|---|---|---|
| Hugle Unit 2H POE Rev-3 | 6436.00 | 391.92 | 60.98 | **1678970.33** | **14271675.91** | 39°18'04.753"N | 80°51'49.377"W | point |
| Hugle Unit 2H BHL Rev-3 | 6460.00 | -9847.89 | 3313.94 | 1682221.98 | 14261440.20 | 39°16'23.495"N | 80°51'08.210"W | point |
| Hugle Unit 2H LP Rev-3 | 6460.00 | 243.56 | 79.19 | 1678988.53 | 14271527.61 | 39°18'03.286"N | 80°51'49.148"W | point |

## WELLPATH COMPOSITION - Ref Wellbore: Hugle Unit 2H AWB Ref Wellpath: Hugle Unit 2H AWP Proj: 17466'

| Start MD [ft] | End MD [ft] | Positional Uncertainty Model | Log Name/Comment | Wellbore |
|---|---|---|---|---|
| 24.50 | 5510.50 | Gyrodata standard - Drop gyro or Multi-shot | 04_Gyrodata MS Gyro <8-3/4"> (100'-5499') | Hugle Unit 2H AWB |
| 5510.50 | 17441.00 | BHI AutoTrak Curve (Short) | 05_BHI AT Curve <8-1/2"> (5510.5')(5659'-17441') | Hugle Unit 2H AWB |
| 17441.00 | 17466.00 | Blind Drilling (std) | Projection to bit | Hugle Unit 2H AWB |

# Actual Wellpath Report

Hugle Unit 2H AWP Proj: 17466'



| REFERENCE WELLPATH IDENTIFICATION | | | |
|---|---|---|---|
| Operator | ANTERO RESOURCES CORPORATION | Slot | Slot #08 |
| Area | Doddridge Co., WV | Well | Hugle Unit 2H |
| Field | Doddridge | Wellbore | Hugle Unit 2H AWB |
| Facility | Long Run Pad | | |

## COMMENTS

**Wellpath general comments**

API: 47-017-06783-0000
BHI Job #: 8472898
Rig: Frontier 22
Duration: 03/30/2017-04/02/2017
Gyrodata MS Gyro <8-3/4">(100'-5499')
BHI AT Curve <8-1/2"> (5510.5')(5659'-17441')
Burket: 6612' MD
Tully: 6679' MD
Hamilton: 6755' MD
Marcellus POE: 6780' MD
Projected MD at TD: 17466'

# Hydraulic Fracturing Fluid Product Component Information Disclosure

| | |
|---|---|
| Job Start Date: | 9/11/2017 |
| Job End Date: | 9/26/2017 |
| State: | West Virginia |
| County: | Doddridge |
| API Number: | 47-017-06783-00-00 |
| Operator Name: | Antero Resources Corporation |
| Well Name and Number: | Hugle Unit 2H |
| Latitude: | 39.30032800 |
| Longitude: | -80.86376400 |
| Datum: | NAD83 |
| Federal Well: | NO |
| Indian Well: | NO |
| True Vertical Depth: | 6,566 |
| Total Base Water Volume (gal): | 19,906,251 |
| 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 | Supplied by Operator | Base Fluid | | | | | |
| | | | Water | 7732-18-5 | 70.00000 | 88.30257 | |
| DAP-103 | CWS | Iron Control | | | | | |
| | | | | Listed Below | | | |

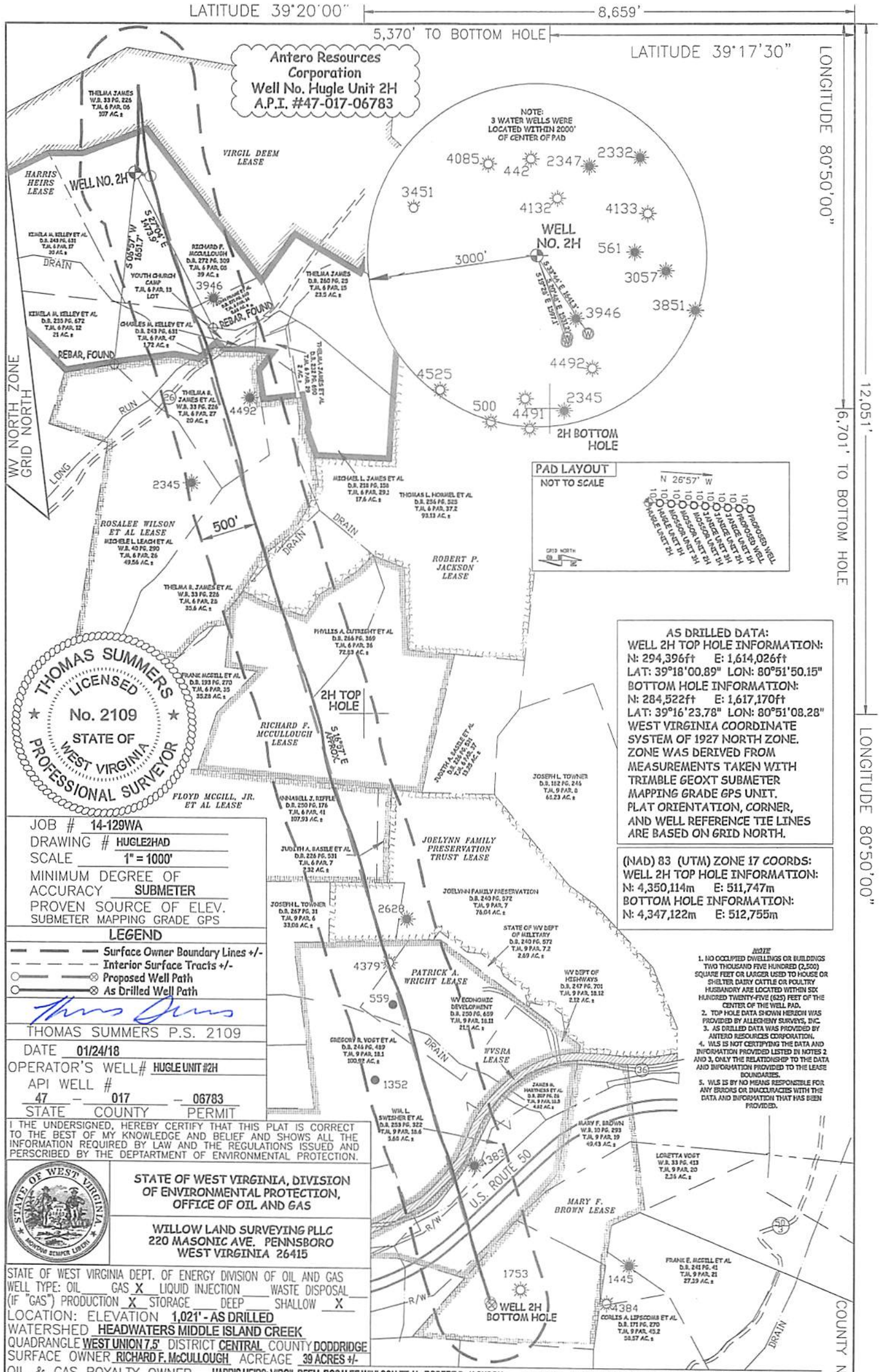
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DWP-111 | CWS | Gel Slurry | | | | | |
| | | | | Listed Below | | | |
| DAP-902 | CWS | Scale Inhibitor | | | | | |
| | | | | Listed Below | | | |
| SANIFRAC 8844 | CWS | Biocide | | | | | |
| | | | | Listed Below | | | |
| Sand (Proppant) | CWS | Propping Agent | | | | | |
| | | | | Listed Below | | | |
| Hydrochloric Acid | CWS | Clean Perforations | | | | | |
| | | | | Listed Below | | | |
| Calbreak 5501 | CWS | Breaker | | | | | |
| | | | | Listed Below | | | |
| CI-9100G | CWS | Corrosion Inhibitor | | | | | |
| | | | | Listed Below | | | |
| DWP-641 | CWS | Friction Reducer | | | | | |
| | | | | Listed Below | | | |
| Other Chemical (s) | Listed Above | See Trade Name (s) List | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | Listed Below | | | |
| Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients. | | | | | | | |
| | | | Crystalline silica (Quartz) | 14808-60-7 | 100.00000 | 11.30024 | |
| | | | Calcite | 471-34-1 | 1.00000 | 0.08702 | |
| | | | Hydrochloric acid | 7647-01-0 | 37.00000 | 0.05512 | |
| | | | Distillates (petroleum), hydrotreated middle | 64742-46-7 | 60.00000 | 0.04911 | |
| | | | Guar gum | 9000-30-0 | 60.00000 | 0.04911 | |
| | | | Polymer | 26100-47-0 | 45.00000 | 0.02615 | |
| | | | Illite | 12173-60-3 | 1.00000 | 0.02594 | |
| | | | Distillates (petroleum), hydrotreated light | 64742-47-8 | 30.00000 | 0.01743 | |
| | | | Ammonium Persulfate | 64742-47-8 | 100.00000 | 0.01301 | |
| | | | Goethite | 1310-14-1 | 0.10000 | 0.01130 | |
| | | | Apatite | 64476-38-6 | 0.10000 | 0.01130 | |
| | | | Biotite | 1302-27-8 | 0.10000 | 0.01130 | |
| | | | Ammonium chloride | 12125-02-9 | 11.00000 | 0.00639 | |
| | | | Polyethylene glycol mixture | 25322-68-3 | 54.50000 | 0.00621 | |
| | | | 2-Propenoic acid, homopolymer, sodium salt | 9003-04-7 | 40.00000 | 0.00597 | |
| | | | Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite | 68953-58-2 | 5.00000 | 0.00409 | |
| | | | Vinylidene chloride-methyl acrylate copolymer | 69418-26-4 | 20.00000 | 0.00260 | |
| | | | Ilmenite | 98072-94-7 | 0.10000 | 0.00259 | |
| | | | Sorbitan monooleate | 1338-43-8 | 4.00000 | 0.00232 | |
| | | | 2,2-Dibromo-3-Nitrilopropionamide | 10222-01-2 | 20.00000 | 0.00228 | |
| | | | Polyethylene glycol monooleate | 9004-96-0 | 3.00000 | 0.00174 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1,2-Propanediol | 57-55-6 | 10.00000 | 0.00149 | |
| | | | Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether | 37251-67-5 | 1.50000 | 0.00123 | |
| | | | Sorbitol tetraoleate | 61723-83-9 | 2.00000 | 0.00116 | |
| | | | Amines, tallow alkyl, ethoxylated | 61791-26-2 | 1.00000 | 0.00058 | |
| | | | Citric acid | 77-92-9 | 60.00000 | 0.00050 | |
| | | | Sodium bromide | 7647-15-6 | 4.00000 | 0.00046 | |
| | | | Dibromoacetonitrile | 3252-43-5 | 3.00000 | 0.00034 | |
| | | | Alkyloxypolyethyleneoxy ethanol | 84133-50-6 | 0.50000 | 0.00029 | |
| | | | Acrylamide | 79-06-1 | 0.10000 | 0.00006 | |
| | | | Ethylene glycol | 107-21-1 | 40.00000 | 0.00003 | |
| | | | Diethylene glycol (mono) methyl ether | 34590-94-8 | 20.00000 | 0.00002 | |
| | | | Isopropanol | 67-63-0 | 5.00000 | 0.00001 | |
| | | | Cinnamaldehyde | 104-55-2 | 10.00000 | 0.00001 | |
| | | | Tar bases, quinolone derivs | 68513-87-1 | 1.00000 | 0.00001 | |
| | | | Diethylene glycol | 111-46-6 | 1.00000 | 0.00001 | |
| | | | Ethoxylated alcohols | Proprietary | 10.00000 | 0.00001 | Proprietary CAS |
| | | | Formic Acid | 64-18-6 | 10.00000 | 0.00001 | |
| | | | Tar bases, quinolone derivs, benzyl chloride-quatenized | 72480-70-7 | 10.00000 | 0.00001 | |

* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%
*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

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)




AS DRILLED DATA:
WELL 2H TOP HOLE INFORMATION:
N: 294,396ft E: 1,614,026ft
LAT: 39°18'00.89" LON: 80°51'50.15"
BOTTOM HOLE INFORMATION:
N: 284,522ft E: 1,617,170ft
LAT: 39°16'23.78" LON: 80°51'08.28"
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 2H TOP HOLE INFORMATION:
N: 4,350,114m E: 511,747m
BOTTOM HOLE INFORMATION:
N: 4,347,122m E: 512,755m

NOTE
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JOB # 14-129WA
DRAWING # HUGLE2HAD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

LEGEND
Surface Owner Boundary Lines +/-
Interior Surface Tracts +/-
Proposed Well Path
As Drilled Well Path

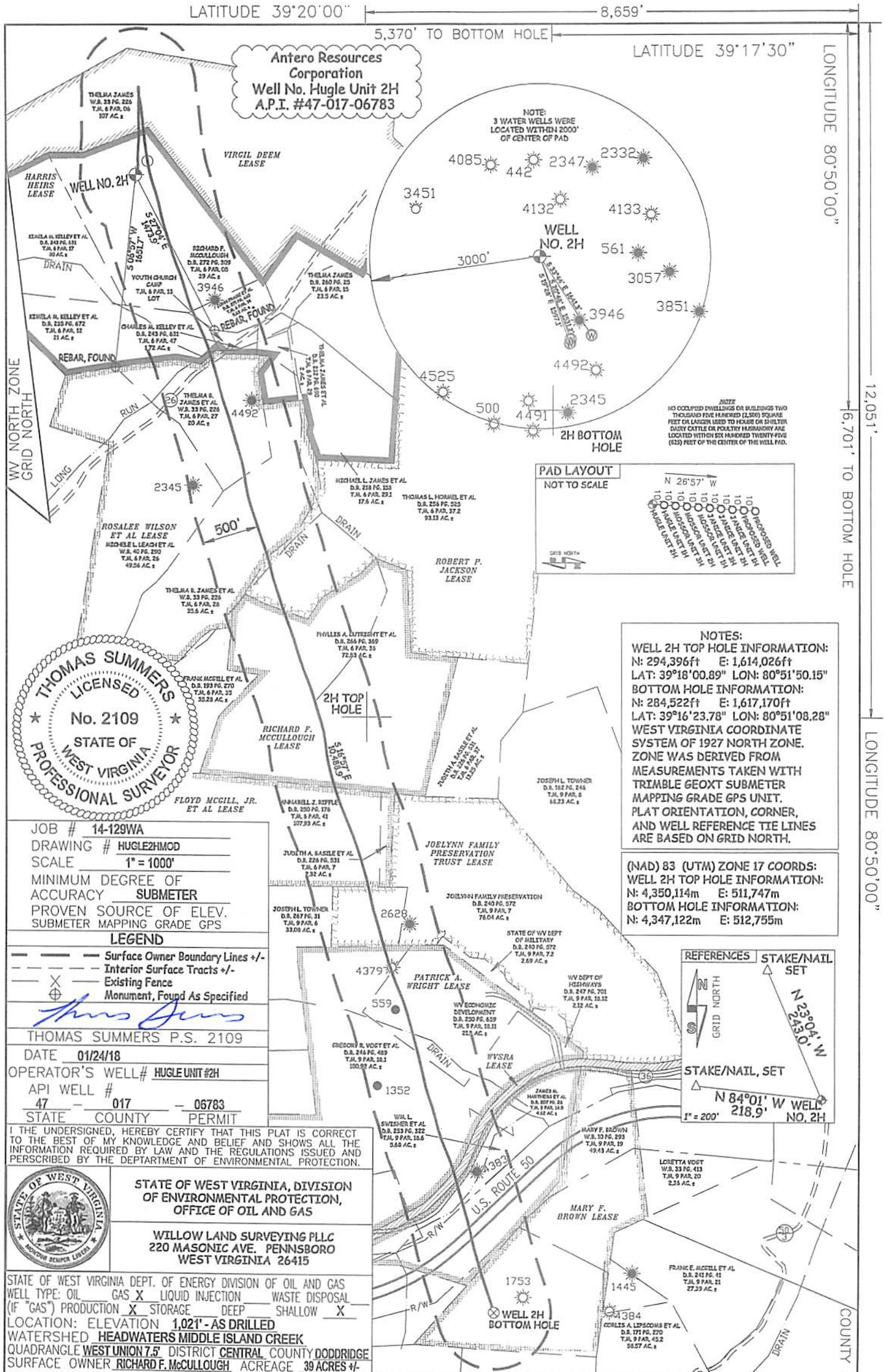
THOMAS SUMMERS P.S. 2109
DATE 01/24/18
OPERATOR'S WELL# HUGLE UNIT #2H
API WELL # 47 – 017 – 06783
STATE COUNTY PERMIT

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PERSCRIBED BY THE DEPTARTMENT OF ENVIRONMENTAL PROTECTION.

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 DEPT. OF ENERGY DIVISION OF OIL AND GAS
WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,021' - AS DRILLED
WATERSHED HEADWATERS MIDDLE ISLAND CREEK
QUADRANGLE WEST UNION 7.5' DISTRICT CENTRAL COUNTY DODDRIDGE
SURFACE OWNER RICHARD F. McCULLOUGH ACREAGE 39 ACRES +/-
OIL & GAS ROYALTY OWNER HARRIS HEIRS; VIRGIL DEEM; ROSALEE WINLSON ET AL; ROBERT P. JACKSON; RICHARD F. MCCULLOIGH; FLOYD McGILL, JR. ET AL; JOELYNN FAMILY PRESERVATION TRUST; PATRICK A WRIGHT; WVSRA; MARY F. BROWN LEASE ACREAGE 217 AC±; 107 AC±; 100 AC±; 94 AC.±; 72.83 AC±; 107 AC±; 76.04 AC±; 222 AC±; 301.19 AC±; 55.65 AC±
PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE ___
PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) AS DRILLED ___ PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,569' TVD 17,466' MD
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER-CT CORPORATION SYSTEM
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313




JOB # 14-129WA
DRAWING # HUGLE2HMOD
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
- Monument, Found As Specified

THOMAS SUMMERS P.S. 2109

DATE 01/24/18

OPERATOR'S WELL# HUGLE UNIT #2H

API WELL # 47 – 017 – 06783
STATE COUNTY PERMIT

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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 DEPT. OF ENERGY DIVISION OF OIL AND GAS
WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,021' - AS DRILLED
WATERSHED HEADWATERS MIDDLE ISLAND CREEK
QUADRANGLE WEST UNION 7.5' DISTRICT CENTRAL COUNTY DODDRIDGE
SURFACE OWNER RICHARD F. McCULLOUGH ACREAGE 39 ACRES +/-
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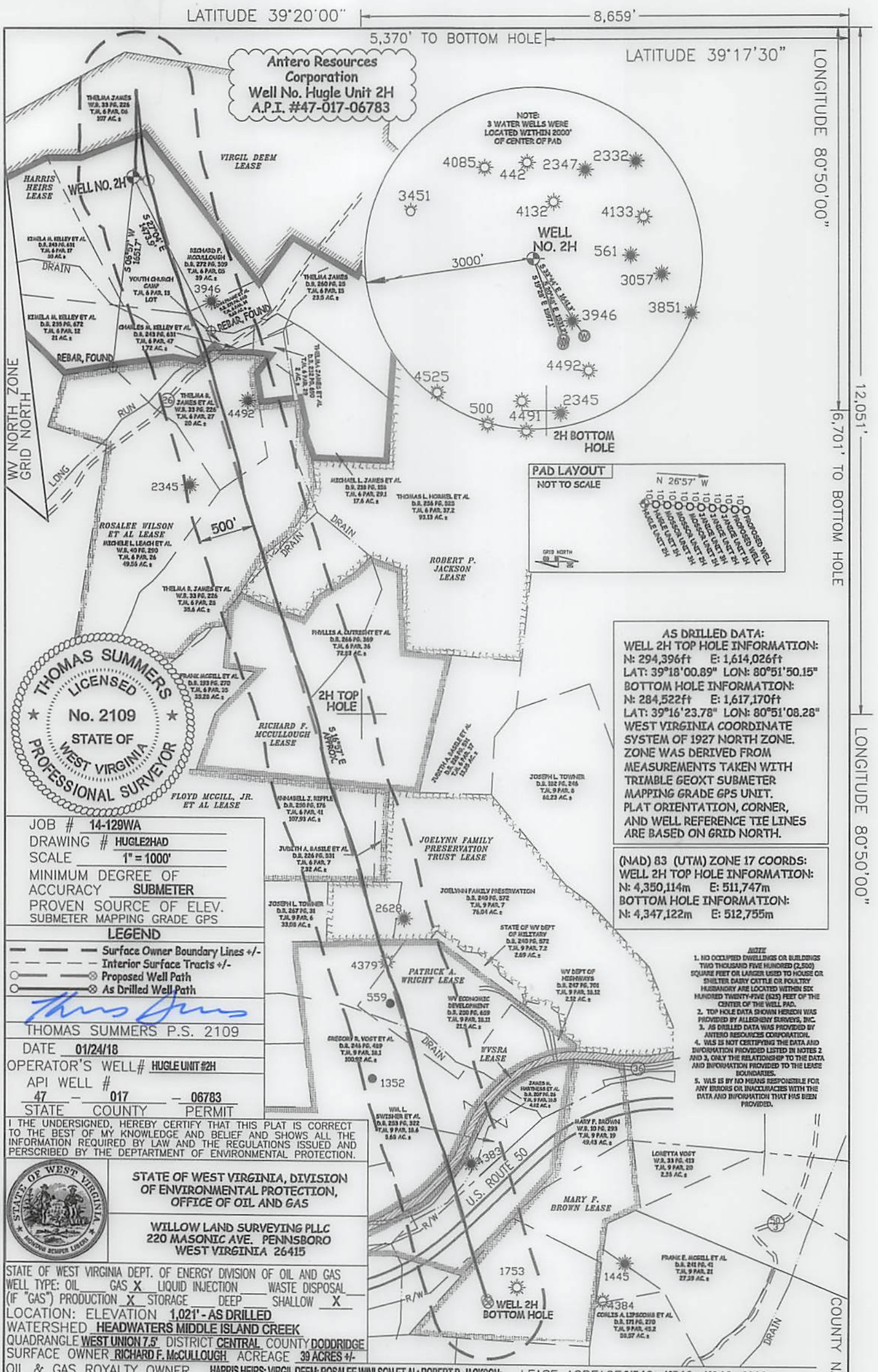
PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE ___
PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) MOD POE ___ PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,569' TVD 17,466' MD
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER-CT CORPORATION SYSTEM
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
DENVER, CO 80202 CHARLESTON, WV 25313

FORM WW-6




AS DRILLED DATA:
WELL 2H TOP HOLE INFORMATION:
N: 294,396ft E: 1,614,026ft
LAT: 39°18'00.89" LON: 80°51'50.15"
BOTTOM HOLE INFORMATION:
N: 284,522ft E: 1,617,170ft
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(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 2H TOP HOLE INFORMATION:
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BOTTOM HOLE INFORMATION:
N: 4,347,122m E: 512,755m

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DRAWING # HUGLE2HAD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

LEGEND
- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Proposed Well Path
- As Drilled Well Path

THOMAS SUMMERS P.S. 2109
DATE 01/24/18
OPERATOR'S WELL# HUGLE UNIT #2H
API WELL # 47 – 017 – 06783
STATE COUNTY PERMIT

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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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WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
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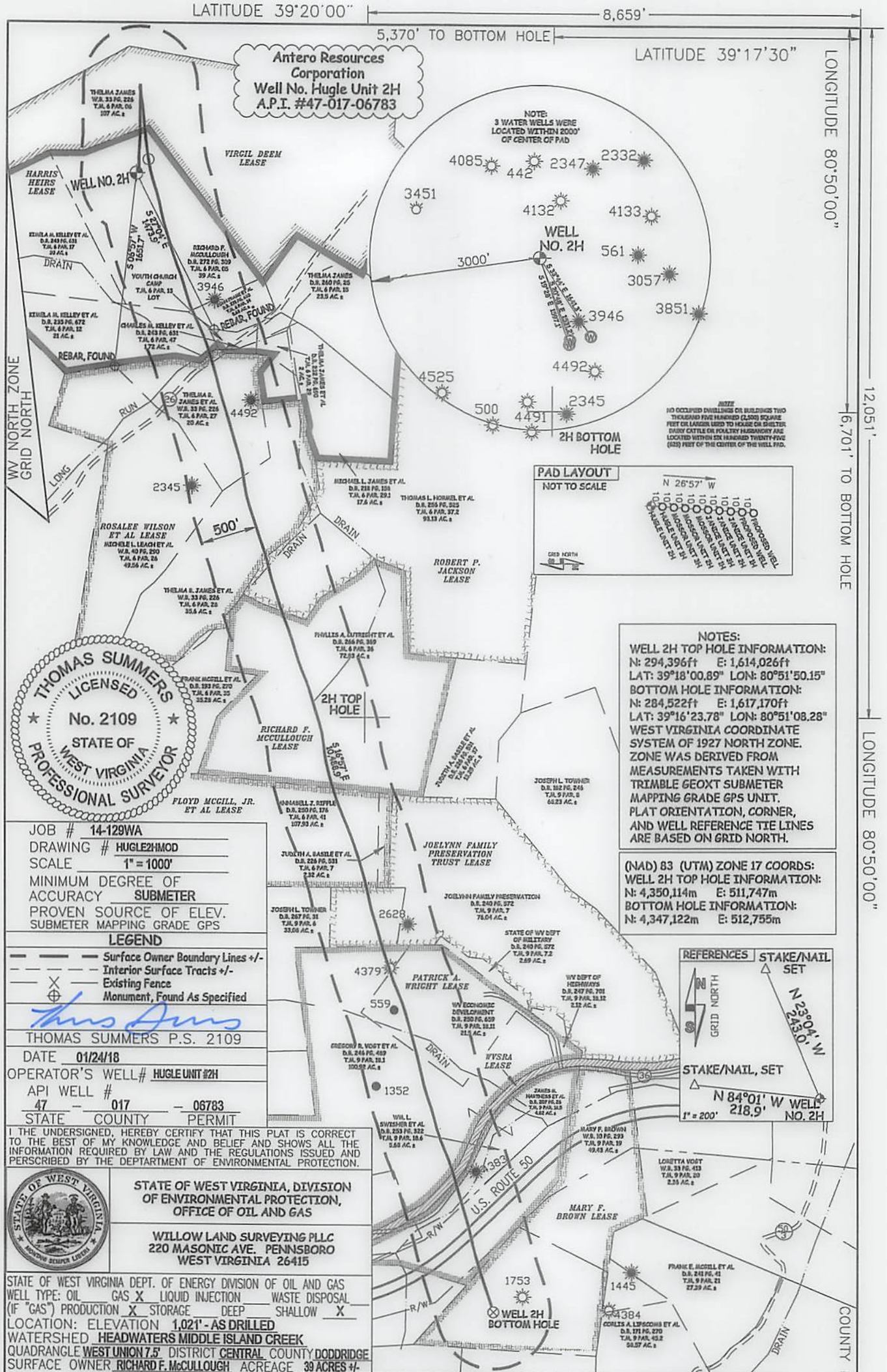
PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) AS DRILLED
PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
TARGET FORMATION MARCELLUS
ESTIMATED DEPTH 6,569' TVD 17,466' MD
WELL OPERATOR ANTERO RESOURCES CORP.
DESIGNATED AGENT DIANNA STAMPER-CT CORPORATION SYSTEM
ADDRESS 1615 WYNKOOP STREET DENVER, CO 80202
ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313
FORM WW-6

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- Monument, Found As Specified

THOMAS SUMMERS P.S. 2109

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