



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Wednesday, September 29, 2021
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET
DENVER, CO 80202

Re: Permit Modification Approval for NATIONAL UNIT 2H
47-095-02745-00-00

Lateral Extension, Updated Lease Chain

ANTERO RESOURCES CORPORATION

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

A handwritten signature in blue ink, appearing to read 'James A. Martin', is positioned above the name and title.

James A. Martin
Chief

Operator's Well Number: NATIONAL UNIT 2H
Farm Name: KAYLA LEEK
U.S. WELL NUMBER: 47-095-02745-00-00
Horizontal 6A New Drill
Date Modification Issued: 09/29/2021

Promoting a healthy environment.

10/01/2021

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Antero Resources Corporation | 494507062 | 095 - Tyler | Ellsworth | Porter Falls 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: National Unit 2H Well Pad Name: Margery Pad

3) Farm Name/Surface Owner: Kayla Leek Public Road Access: CR 11

4) Elevation, current ground: 1041' Elevation, proposed post-construction: _____

5) Well Type (a) Gas Oil _____ Underground Storage _____

Other _____

(b) If Gas Shallow Deep _____

Horizontal _____

*Dmit
9-16-21*

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale: 7100' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2850#

8) Proposed Total Vertical Depth: 7100' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 23,400' MD

11) Proposed Horizontal Leg Length: 14,147'

12) Approximate Fresh Water Strata Depths: 103'

13) Method to Determine Fresh Water Depths: Offset well records. Depths have been adjusted according to surface elevations.

14) Approximate Saltwater Depths: 1998'

15) Approximate Coal Seam Depths: None Anticipated

16) Approximate Depth to Possible Void (coal mine, karst, other): None Anticipated

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes _____ No

(a) If Yes, provide Mine Info: Name: _____
Depth: _____
Seam: _____
Owner: _____

18)

CASING AND TUBING PROGRAM

| TYPE | Size (in) | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling (ft) | INTERVALS: Left in Well (ft) | CEMENT: Fill-up (Cu. Ft.)/CTS |
|--------------|------------------|--------------------|--------------|-------------------------------|-----------------------------------|-------------------------------------|--------------------------------------|
| Conductor | 20" | New | H-40 | 94# | 90 | 90 | CTS, 77 Cu. Ft. |
| Fresh Water | 13-3/8" | New | J-55 | 54.5# | 300 | 300 | CTS, 417 Cu. Ft. |
| Coal | 9-5/8" | New | J-55 | 36# | 2500 | 2500 | CTS, 1018 Cu. Ft. |
| Intermediate | | | | | | | |
| Production | 5-1/2" | New | P-110 | 23# | 23400 | 23400 | 6042 Cu. Ft |
| Tubing | 2-3/8" | New | N-80 | 4.7# | | | |
| Liners | | | | | | | |

*DmH
9-16-21*

| TYPE | Size (in) | Wellbore Diameter (in) | Wall Thickness (in) | Burst Pressure (psi) | Anticipated Max. Internal Pressure (psi) | Cement Type | Cement Yield (cu. ft./k) |
|--------------|------------------|-------------------------------|----------------------------|-----------------------------|---|--------------------|---------------------------------|
| Conductor | 20" | 24" | 0.438" | 1530 | 50 | Class A | ~1.18 |
| Fresh Water | 13-3/8" | 17-1/2" | 0.38" | 2730 | 1000 | Class A | ~1.18 |
| Coal | 9-5/8" | 12-1/4" | 0.352" | 3520 | 1500 | Class A | ~1.18 |
| Intermediate | | | | | | | |
| Production | 5-1/2" | 8-3/4" & 8-1/2" | 0.415" | 12,630 | 9300 | Low H/POZ & Tah-H | H/POZ-1.44 & H-1.8 |
| Tubing | 2-3/8" | 4.778" | 0.19" | 11,200 | | | |
| Liners | | | | | | | |

PACKERS

| | | | | |
|-------------|-----|--|--|--|
| Kind: | N/A | | | |
| Sizes: | N/A | | | |
| Depths Set: | N/A | | | |

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Antero plans to pump Slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."

Anticipated Max Pressure - 9300 lbs
Anticipated Max Rate - 80 bpm

DMH
9-16-21

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 51.65 acres

22) Area to be disturbed for well pad only, less access road (acres): 13.44 acres

23) Describe centralizer placement for each casing string:

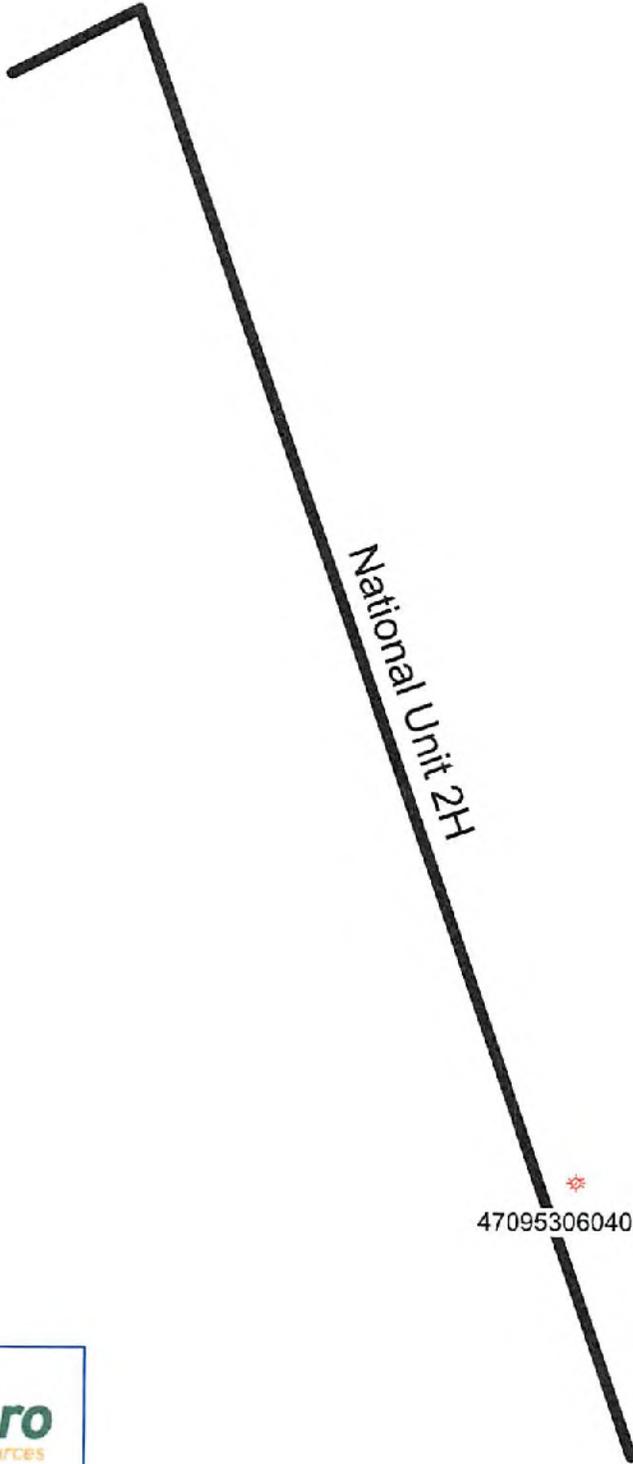
Conductor: no centralizers
Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.
Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.
Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

24) Describe all cement additives associated with each cement type:

Conductor: no additives, Class A cement.
Surface: Class A cement with 2-3% calcium chloride and 1/4 lb of flake
Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat
Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51
Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

25) Proposed borehole conditioning procedures:

*Note: Attach additional sheets as needed.



Antero Resources Corporation

National Unit 2H - AOR



WELL SYMBOLS
Plugged Gas Well

September 7, 2021

10/01/2021

LATITUDE 39°32'30"

10,550'

LATITUDE 39°32'30"

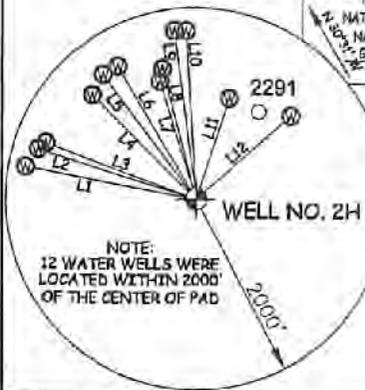
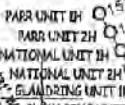
4,676' TO BOTTOM HOLE

Antero Resources Corporation Well No. National Unit 2H

NOTES:
WELL 2H TOP HOLE INFORMATION:
 N: 373,398ft E: 1,625,064ft
BOTTOM HOLE INFORMATION:
 N: 360,257ft E: 1,630,749ft
 LAT: 39°28'34.25" LON: 80°48'29.64"
 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: 4,374,238m E: 514,708m
BOTTOM HOLE INFORMATION:
 N: 4,370,264m E: 516,507m

PAD LAYOUT NOT TO SCALE



2H TOP HOLE

| | |
|---------|---------------------------------|
| 22-16.3 | Charles Stevens |
| 22-17 | Dorothy Stevens Revocable Trust |
| 22-18 | Clara Baker |
| 22-18.1 | Dorothy Stevens Revocable Trust |
| 22-21 | Paul Baker |
| 22-22 | Paul Baker |
| 22-23 | Anthony Parr |
| 22-23.1 | Raymond Parr |
| 22-23.2 | Anthony Parr |
| 22-24 | Ruth Weekley Est. |
| 22-25 | Paul Baker |
| 22-26 | John Sole |
| 22-27 | Carol Knapp Revocable Trust |
| 22-28 | WSD Properties LLC |
| 22-29 | WSD Properties LLC |
| 22-30 | WSD Properties LLC |
| 22-31 | Richard Grodsky Et Al |
| 22-32 | Richard Grodsky Et Al |
| 22-33 | Wilma Weekley |
| 22-34 | Raymond Parr Et Al. |
| 22-38 | Bruce Parr |
| 22-40 | Ronald Webb |

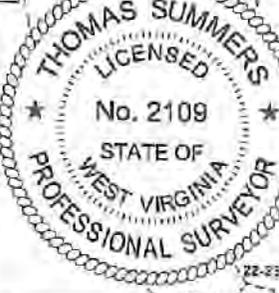
| LINE | BEARING | DIST. | LINE | BEARING | DIST. |
|------|------------|----------|------|------------|----------|
| L1 | N 79°23' W | 1820.64' | L7 | N 17°11' W | 1289.39' |
| L2 | N 72°36' W | 1737.73' | L8 | N 14°44' W | 1409.38' |
| L3 | N 69°39' W | 1680.54' | L9 | N 07°35' W | 1774.82' |
| L4 | N 45°05' W | 1540.95' | L10 | N 03°37' W | 1761.12' |
| L5 | N 36°53' W | 1627.55' | L11 | N 17°55' E | 1113.36' |
| L6 | N 30°40' W | 1612.09' | L12 | N 48°24' E | 1322.09' |

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 RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT 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



JOB # 21-007WA
 DRAWING # NATIONAL2HR
 SCALE 1" = 2000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

LEGEND
 - - - Surface Owner Boundary Lines +/-
 - - - Adjoining Surface Tracts +/-
 ⊕ Found monument, as noted

Thomas Summers
 THOMAS SUMMERS P.S. 2109

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

DATE 08/23/21
 OPERATOR'S WELL# NATIONAL UNIT #2H

WELL TYPE: OIL ___ GAS LIQUID INJECTION ___ WASTE DISPOSAL ___ API WELL # 47 - 085 - 02745
 (IF "GAS") PRODUCTION STORAGE ___ DEEP ___ SHALLOW STATE COUNTY PERMIT
 LOCATION: ELEVATION AS BUILT -1,041' WATERSHED OUTLET MIDDLE ISLAND CREEK

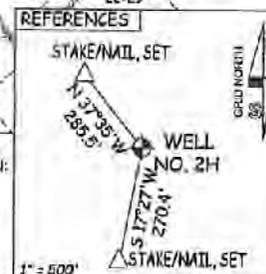
QUADRANGLE PORTER FALLS 7.5' DISTRICT ELLSWORTH COUNTY TYLER
 SURFACE OWNER KAYLA LEEK ACREAGE 69.06 ACRES +/-

OIL & GAS ROYALTY OWNER RIDGETOP CAPITAL LP; BRC APPALACHIAN MINERALS I LLC; LEASE ACREAGE 69.06 AC.±; 373.47 AC.±;
 BRC APPALACHIAN MINERALS I LLC; BOUNTY MINERALS LLC; S.A. SMITH & C.B. MORRIS HEIRS TRUST; 55.13 AC.±; 92.25 AC.±; 31.5 AC.±;
 BRC APPALACHIAN MINERALS I LLC; DAVID E. BOWYER; DAVID E. BOWYER; 35 AC.±; 80 AC.±; 75 AC.±;
 BRENDA CUCI; BETTY MOREHEAD ET VIR; PAUL RICHARD BAKER 114 AC.±; 68.88 AC.±; 39.86 AC.±;

PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER REDRILL ___ FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE IN WELL ___
 (SPECIFY) MOD-BHL PLUG & ABANDON CLEAN OUT & REPLUG
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,100' TVD 23,400' MD
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM
 ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD
 FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

| Ellsworth District - Tyler County | |
|-----------------------------------|--|
| 11-51 | Bear Knob Holdings LLC |
| 16-5 | David Leek |
| 16-5.1 | Richard Ferrell |
| 16-6 | Kayla Leek |
| 16-7 | John Thomas |
| 16-7.1 | Lianne Wilson |
| 16-8 | Jean Neal Et Al |
| 16-9 | Bear Knob Holdings LLC |
| 16-10 | Jean Neal Et Al |
| 16-11 | Jean Neal Et Al |
| 16-15 | Harvey Miller Et Al |
| 16-16 | Harvey Miller Et Al |
| 16-16.1 | Barbara Kirtle |
| 16-17 | Alfred Steele |
| 16-18 | Alfred Steele |
| 16-19 | Jean Neal Et Al |
| 16-20 | Jean Neal Et Al |
| 16-21 | Kayla Leek |
| 16-24 | Jones Eastham |
| 16-25 | Nancy Fowler |
| 16-26 | Barbara Kirtle |
| 16-27 | Gilbert Eddy |
| 16-28 | Kenneth Tomblin Et Al |
| 16-36 | George Korabetis |
| 16-37 | Rossie Warner |
| 16-38 | EQT Production Company |
| 16-39 | Richard Pylee |
| 16-39.1 | Lee Wilzer |
| 16-40 | Gary Weekley |
| 16-42 | Richard Pylee |
| 16-42.3 | Richard Pylee |
| 16-50 | American Energy Marcellus Minerals LLC |
| 22-6 | EQT Production Company |
| 22-7 | Kaverth Baker |
| 22-8 | EQT Production Company |
| 22-9 | Steven Wright |
| 22-10 | Leslie Henderson |
| 22-13 | Debra Dieke |
| 22-14 | Leslie Weekley |
| 22-15 | Lornie Wade Et Al |
| 22-16 | Darlene Stephens |
| 22-16.1 | Joann McSwain |
| 22-16.2 | Sarah Bassett |

NOTE
 NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER CATTLE, HORSES OR POULTRY. HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.



6,553' TO BOTTOM HOLE

8,773'

LONGITUDE 80°47'30"

LONGITUDE 80°47'30"

COUNTY TYLER

PERMIT

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:

| Grantor, lessor, etc. | Grantee, lessee, etc. | Royalty | Book/Page |
|---|-------------------------------------|------------|-----------|
| <u>Ridgetop Capital LP Lease</u> | | | |
| Ridgetop Capital LP | Petroedge Energy LLC | 1/8 | 0420/0643 |
| Petroedge Energy LLC | Statoil USA Onshore Properties Inc. | Assignment | 0436/0001 |
| Statoil USA Onshore Properties Inc. | EQT Production Company | Assignment | 0539/0239 |
| EQT Production Company | Antero Resources Corporation | Assignment | 0663/0001 |
| | | | |
| <u>BRC Appalachian Minerals I, LLC Lease</u> | | | |
| BRC Appalachian Minerals I, LLC | BRC Working Interest Company, LLC | 1/8 | 0369/0300 |
| BRC Working Interest Company, LLC | Chesapeake Appalachia, LLC | Assignment | 0369/0784 |
| Chesapeake Appalachia, LLC | Statoil USA Onshore Properties Inc | Assignment | 0378/0764 |
| Statoil USA Onshore Properties Inc | EQT Production Company | Assignment | 0539/0239 |
| EQT Production Company | Antero Resources Corporation | Assignment | 0663/0001 |
| | | | |
| <u>BRC Appalachian Minerals I, LLC Lease</u> | | | |
| BRC Appalachian Minerals I, LLC | BRC Working Interest Company, LLC | 1/8 | 0369/0300 |
| BRC Working Interest Company, LLC | Chesapeake Appalachia, LLC | Assignment | 0369/0784 |
| Chesapeake Appalachia, LLC | Statoil USA Onshore Properties Inc | Assignment | 0378/0764 |
| Statoil USA Onshore Properties Inc | EQT Production Company | Assignment | 0539/0239 |
| EQT Production Company | Antero Resources Corporation | Assignment | 0663/0001 |
| | | | |
| <u>Bounty Minerals, LLC Lease</u> | | | |
| Bounty Minerals, LLC | Antero Resources Corporation | 1/8+ | 0555/0337 |
| | | | |
| <u>BRC Appalachian Minerals I, LLC Lease</u> | | | |
| BRC Appalachian Minerals I, LLC | BRC Working Interest Company, LLC | 1/8 | 0369/0300 |
| BRC Working Interest Company, LLC | Chesapeake Appalachia, LLC | Assignment | 0369/0784 |
| Chesapeake Appalachia, LLC | Statoil USA Onshore Properties Inc | Assignment | 0378/0764 |
| Statoil USA Onshore Properties Inc | EQT Production Company | Assignment | 0539/0239 |
| EQT Production Company | Antero Resources Corporation | Assignment | 0663/0001 |
| | | | |
| <u>David E. Bowyer Lease</u> | | | |
| David E. Bowyer | Antero Resources Corporation | 1/8+ | 0078/0318 |
| | | | |
| <u>David E. Bowyer Lease</u> | | | |
| David E. Bowyer | Antero Resources Corporation | 1/8+ | 0101/0738 |
| | | | |
| <u>Betty Morehead et vir Lease</u> | | | |
| Betty Morehead et vir | Antero Resources Corporation | 1/8+ | 0498/0111 |
| | | | |
| <u>Brenda Cuic Lease</u> | | | |
| Brenda Cuic | JB Exploration I, LLC | 1/8 | 0124/0431 |

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)

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- (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:

| Grantor, lessor, etc. | Grantee, lessee, etc. | Royalty | Book/Page |
|--|--------------------------------|------------|-----------|
| JB Exploration I, LLC | Statoil USA Onshore Properties | Assignment | 0509/0746 |
| Statoil USA Onshore Properties, LLC | EQT Production Company | Assignment | 0563/0016 |
| EQT Production Company | Antero Resources Corporation | Assignment | 0663/0001 |
| <u>Paul Richard Baker Lease</u> | | | |
| Paul Richard Baker | Antero Resources Corporation | 1/8+ | 0101/0763 |



Stansberry, Wade A <wade.a.stansberry@wv.gov>

Expedited Modifications H6A Horizontal Well Work Permits Margery Pad

1 message

Stansberry, Wade A <wade.a.stansberry@wv.gov>

Wed, Sep 29, 2021 at 12:07 PM

To: Dani DeVito <ddevito@shalepro.com>, mhamsher@anteroresources.com, Derek Haught <derek.m.haught@wv.gov>, ljackson@wvassessor.com

I have attached permit copies for the Margery Pad for the following wells

95-02742
95-02743
95-02744
95-02745
95-02746

Thank you,

Wade A. Stansberry

Environmental Resource Specialist 3

West Virginia Department of Environmental Protection

Office of Oil & Gas

601 57th St. SE

Charleston, WV 25304

(304) 926-0499 ext. 41115

(304) 926-0452 fax

Wade.A.Stansberry@wv.gov

5 attachments

 **47-095-02744 - mod.pdf**
631K

 **47-095-02745 - mod.pdf**
634K

 **47-095-02746 - Copy.pdf**
649K

 **47-095-02743 - mod.pdf**
660K

 **47-095-02742 - mod.pdf**
728K

10/01/2021