



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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Tuesday, August 11, 2020
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for FRIEND 2H
47-095-02696-00-00

Lateral length

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.

James A. Martin
Chief

Operator's Well Number: FRIEND 2H
Farm Name: RICHARD D. PYLES
U.S. WELL NUMBER: 47-095-02696-00-00
Horizontal 6A New Drill
Date Modification Issued: August 11, 2020

Promoting a healthy environment.

WW-6B
(04/15)

API NO. 47-095 - 02696
OPERATOR WELL NO. Friend Unit 2H
Well Pad Name: Pyles Pad

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

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

2) Operator's Well Number: Friend Unit 2H Well Pad Name: Pyles Pad

3) Farm Name/Surface Owner: Richard D. Pyles Public Road Access: US Route 34

4) Elevation, current ground: 1081' Elevation, proposed post-construction: ~1081'

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

Other

(b)If Gas Shallow X Deep

Horizontal X

6) Existing Pad: Yes or No No

JCB
8/5/2020

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: 24300' MD

11) Proposed Horizontal Leg Length: 15967'

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12) Approximate Fresh Water Strata Depths: 61'

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13) Method to Determine Fresh Water Depths: 47-095-01958

14) Approximate Saltwater Depths: 2200'

WV Department of
Environmental Protection

15) Approximate Coal Seam Depths: None Identified

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 X

(a) If Yes, provide Mine Info: Name:

Depth:

Seam:

Owner:

John Cragin Blevins

Digitally signed by John Cragin
Blevins
Date: 2020.08.05 11:54:48 -04'00'

WW-6B
(04/15)

API NO. 47- 095 - 02696

OPERATOR WELL NO. Friend Unit 2H

Well Pad Name: Pyles Pad

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#	80	80	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#	24300	24300	6274 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

JCB
8/5/2020

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	2500	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

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PACKERS

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

WW-6B
(10/14)

API NO. 47- 095 - 02696

OPERATOR WELL NO. Friend Unit 2H

Well Pad Name: Pyles Pad

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.

JCB
8/5/2020

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

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 23.71 acres

22) Area to be disturbed for well pad only, less access road (acres): 10.00 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

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25) Proposed borehole conditioning procedures:

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.



PERMIT MODIFICATION API # 47-095-02696

47095005230000

Friend Unit 2H

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Antero Resources Corporation

Friend Unit 2H - AOR



WELL SYMBOLS
Oil & Gas Well

April 15, 2020

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8/5/2020

UWI (APINum)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perforated
47095005230000	B F HAWKINS	1	TRIAD RESOURCES INC	PENNZOIL CO INC	1,766	Unknown	Keener	Big Injun, Berea, Alexander

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6,091' to Bottom Hole

Antero Resources
Well No. Friend 2H
BHL MOD
Antero Resources Corporation

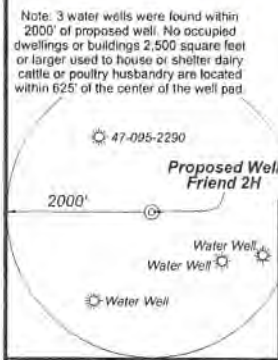


- Wellhead Layout
- Vulcan Unit 1H 47-095-02701
 - Vulcan Unit 2H 47-095-02702
 - Prosper Unit 1H 47-095-02699
 - Prosper Unit 2H 47-095-02700
 - Friend Unit 1H 47-095-02695
 - Proposed Well Friend Unit 2H 47-095-02696
 - Seagrave Unit 1H 47-095-02697
 - Seagrave Unit 2H 47-095-02698



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 prescribed by the Department of Environmental Protection.

Bradley D. Miller
Bradley D. Miller, P.S. 2167



1,122' to Top Hole
TOP HOLE LATITUDE 39 - 32 - 30.00
BTM HOLE LATITUDE 39 - 35 - 00

Notes:
West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.
Well No. Friend Unit 2H Top Hole coordinates are
N 368,409.08' Latitude: 39°30'13.64"
E 1,622,863.29' Longitude: 80°50'14.31"
Bottom Hole coordinates are
N 383,556.65' Latitude: 39°32'42.64"
E 1,617,916.03' Longitude: 80°51'17.76"
UTM Zone 17, NAD 1983
Top Hole Coordinates Bottom Hole Coordinates
N 4,372,706.344m N 4,377,296.985m
E 514,002.075m E 512,479.526m
Plat orientation and corner and well references are based upon the grid north meridian
Well location references are based upon the magnetic meridian

Notes:
Well No. Friend Unit 2H
UTM Zone 17, NAD 1927
Top Hole Coordinates
N 14,345,406.15'
E 1,686,307.70'
Point of Entry Coordinates
N 14,345,376.21'
E 1,686,512.07'
Bottom Hole Coordinates
N 14,360,467.27'
E 1,681,311.96'

Well Location References

Bearing	Dist.
L1 S 33°52' E	1,283.3'
L2 S 75°08' W	2,080.1'
L3 N 78°42' W	1,517.6'
L4 N 48°36' E	1,144.5'
L5 S 80°43' E	206.6'

LONGITUDE 80 - 50

13,797' to Top Hole
13,899' to Bottom Hole

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8/5/2020

FILE NO: 45-54-E-19
DRAWING NO: Friend Unit 2H Well Plat
SCALE: 1" = 2000'
MINIMUM DEGREE OF ACCURACY:
Submeter
PROVEN SOURCE OF ELEVATION:
WVDOT, Harrisville, WV

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE June 15 2020
OPERATOR'S WELL NO. Friend 2H
API WELL NO
47 095 02696
STATE COUNTY PERMIT

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

LOCATION: ELEVATION: As-Built 1081' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Porter Falls
DISTRICT: Ellsworth COUNTY: Tyler
SURFACE OWNER: Richard D. Pyles Sharon Rose Fair: Rose Enterprises, LLC, Darrell Sole, Allen Smith, B&C Oil and Gas Company (2), Will E. Morris Trust, Jerry Shoemaker, Haughl Family Trust, Karen J. Wolfe, ACRES: 168.5
ROYALTY OWNER: Richard D. Pyles, et ux; Joseph L. Sisko, et ux; Helen E. Boggs, BRC Appalachia Minerals I, LLC (5) LEASE NO: ACREAGE: 71.283; 13.025; 71.52; 119; 100; 52; 30; 30; 67

PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) BHL MOD
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 7,100' TVD 24,300' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road
Denver, CO 80202 Charleston, WV 25313



ID	TM/Par	Owner	DB/PG	Acres
1	16-44	Robert A. Pyles, et al	335/482	87.82
2	16-38	Rodney A. & Candis L. Nash	351/701	85.48
3	16-23.1	Bruce Winkelmann	334/195	3.30
4	16-44.1	Carl Straight	543/598	3.70
5	16-42.1	Richard D. Pyles	336/815	4.56
6	16-42	Richard D. Pyles	379/20	168.50
7	16-22	Joseph L. Jr. & Karen Sitko	286/13	81.70
8	16-23	Joseph L. Sitko	314/462	29.7
9	15-30.1	Roger D. Blizzard & Ruth E. Spencer	343/427	101.38
10	16-11	Roger Matthes	318/137	115.47
11	15-10	Antero Midstream, Inc.	617/739	34.13
12	16-1	Antero Midstream, Inc.	617/739	35.25
13	16-2	David E. Bowyer	622/775	80.75
14	16-4	Darrell J. Sole	227/376	35.00
15	15-9	Antero Midstream, LLC	586/544	132.19
16	15-8	William A. & Joyce L. Capulo	245/485	14.00
17	11-36	David W. Fiber	574/847	21.16
18	10-53	Kathy M. & Doug O. Smith	331/220	1.10
19	10-52	Darwin & Shirley Martin	306/537	5.00
20	10-72	Darwin & Shirley Martin	322/228	1.99
21	10-73	Darwin & Shirley Martin	306/537	1.90
22	10-56	Mary K. Neff	413/731	22.06
23	10-55	Charles & Shirley E. Neff	218/46	1.47
24	10-54	Michael W. & Brenda S. Schmidt	244/409	14.06
25	11-32	Darwin & Shirley Martin	348/344	60.66
26	10-70	Darwin & Shirley Martin	326/490	1.19
27	11-32.2	Bernard R. & Denise F. McDougal	636/587	0.54
28	10-51	Charles E. & Laura Lynn Friend	334/839	8.03
29	10-49	Charles E. & Laura Lynn Friend	334/836	71.52
30	10-57	Charles E. & Laura Lynn Friend	334/836	84.39
31	11-1	Gertrude L. Fugh	314/140	70.00
32	10-46	Opal Carol Tallman	282/382	114.00
33	10-10	Ronald D. & Sandra Sue Martin	378/322	58.35
34	10-8	Helen M. Young	198/126	50.50
35	10-12	Sandra K. Metz	376/458	30.50
36	10-11	J.R. Schamp	318/543	30.00
37	10-9	Brian E. & Barbara J. Courtney	344/626	52.00
38	10-5	Brian E. & Barbara J. Courtney	344/626	30.00
39	10-4	Stefan L. & Alberta B. Smolksi	356/467	56.08
40	10-13	Kevin S. & Melinda S. Goff	597/806	87.19
41	6-49	Dennis & Clista A. Heintzman	297/637	45.00
42	6-36	Dennis & Clista A. Heintzman	297/640	417.06
43	6-30.1	Larry M. & Amy B. Adams	369/344	150.34

Leases	
A	Richard D. Pyles, et ux
B	Richard D. Pyles, et ux
C	Helen E. Boggs
D	Bruce Winkelmann
E	Joseph L. Sitko, et ux
F	Joseph L. Sitko, et ux
G	BRC Appalachian Minerals I, LLC
H	Roger D. Blizzard
I	BRC Appalachian Minerals I, LLC
J	BRC Appalachian Minerals I, LLC
K	BRC Appalachian Minerals I, LLC
L	BRC Appalachian Minerals I, LLC
M	James Matthes
N	James L. Newsom Revocable Trust
O	Will E. Morris Trust
P	Jerry Shoemaker
Q	Kenneth R. Baker
R	Shirley E. Neff
S	Michael W. Schmidt, et ux
T	Haught Family Trust
U	Karen J. Wolfe
V	Darrell Sole
W	Charles Eugene Friend, et ux
X	Allen Smith
Y	Ridgetop Capital II, LP
Z	Helen M. Karcinski, et al
AA	B&C Oil and Gas Company
AB	BRC Appalachian Minerals I, LLC
AC	Sharon Rose Faini
AD	BRC Appalachian Minerals I, LLC
AE	B&C Oil and Gas Company
AF	Bounty Minerals, LLC
AG	Rose Enterprises, LLC
AH	B&C Oil and Gas Company
AI	Dennis R. & Clista A. Heintzman
AJ	BRC Appalachian Minerals I, LLC

RECEIVED
Office of Oil and Gas
AUG 10 2020
WV Department of Environmental Protection

FILE NO: 45-54-E-19
DRAWING NO: Friend Unit 2H Well Plat
SCALE: 1" = 2000'
MINIMUM DEGREE OF ACCURACY:
Submeter
PROVEN SOURCE OF ELEVATION:
WVDOT, Harrisville, WV

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: June 15 2020
OPERATOR'S WELL NO. Friend 2H
API WELL NO
47 - 095 - 02696
STATE COUNTY PERMIT

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(IF GAS) PRODUCTION: STORAGE DEEP SHALLOW

LOCATION: ELEVATION: As-Built 1081' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Porter Falls 81 462; 45; 177;
DISTRICT: Ellsworth Sharon Rose Faini, Rose Enterprises, LLC; 102.75; 35.25; 64.65;
SURFACE OWNER: Richard D. Pyles Darrell Sole, Allen Smith; B&C Oil and Gas Company (2); 36 3625; 70.0; 134;
ROYALTY OWNER: Richard D. Pyles, et ux, Joseph L. Sitko, et ux, Helen E. Boggs; BRC Appalachian Minerals I, LLC (5) LEASE NO: _____ ACREAGE: 168.5 71.283; 13.025;
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6,091' to Bottom Hole

1,122' to Top Hole

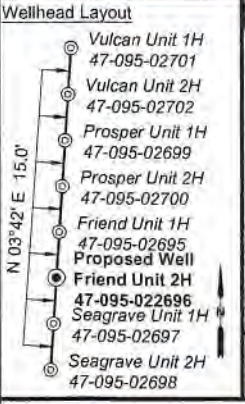
TOP HOLE LATITUDE 39 - 32 - 30.0
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LONGITUDE 80 - 50 - 50

13,797' to Top Hole

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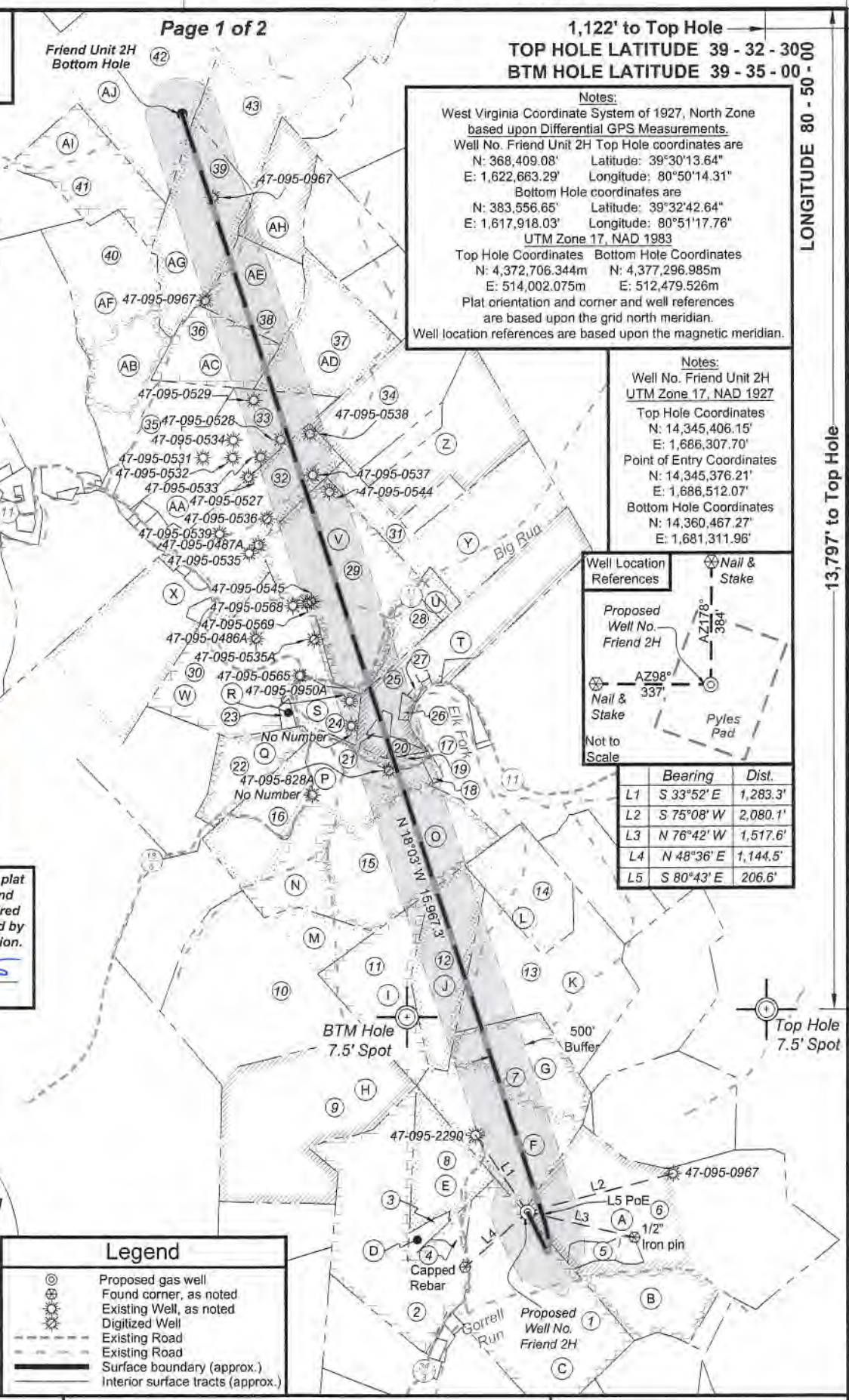
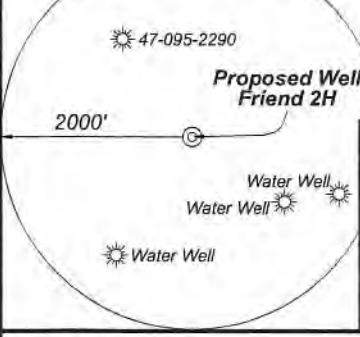
Antero Resources
Well No. Friend 2H
BHL MOD
Antero Resources Corporation



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 prescribed by the Department of Environmental Protection.

Bradley D. Miller
Bradley D. Miller, P.S. 2167

Note: 3 water wells were found within 2000' of proposed well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad.



Legend

- Proposed gas well
- Found corner, as noted
- Existing Well, as noted
- Digitized Well
- Existing Road
- Existing Road
- Surface boundary (approx.)
- Interior surface tracts (approx.)

FILE NO: 45-54-E-19
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DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

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47 - 095 - 02696
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41	6-49	Dennis & Clista A. Heintzman	297/637	45.00
42	6-36	Dennis & Clista A. Heintzman	297/640	417.06
43	6-30.1	Larry M. & Amy B. Adams	369/344	150.34

Leases	
A	Richard D. Pyles, et ux
B	Richard D. Pyles, et ux
C	Helen E. Boggs
D	Bruce Winkelmann
E	Joseph L. Sitko, et ux
F	Joseph L. Sitko, et ux
G	BRC Appalachian Minerals I, LLC
H	Roger D. Blizzard
I	BRC Appalachian Minerals I, LLC
J	BRC Appalachian Minerals I, LLC
K	BRC Appalachian Minerals I, LLC
L	BRC Appalachian Minerals I, LLC
M	James Matthess
N	James L. Newsom Revocable Trust
O	Will E. Morris Trust
P	Jerry Shoemaker
Q	Kenneth R. Baker
R	Shirley E. Neff
S	Michael W. Schmidt, et ux
T	Haught Family Trust
U	Karen J. Wolfe
V	Darrell Sole
W	Charles Eugene Friend, et ux
X	Allen Smith
Y	Ridgetop Capital II, LP
Z	Helen M. Karcinski, et al
AA	B&C Oil and Gas Company
AB	BRC Appalachian Minerals I, LLC
AC	Sharon Rose Faini
AD	BRC Appalachian Minerals I, LLC
AE	B&C Oil and Gas Company
AF	Bounty Minerals, LLC
AG	Rose Enterprises, LLC
AH	B&C Oil and Gas Company
AI	Dennis R. & Clista A. Heintzman
AJ	BRC Appalachian Minerals I, LLC

FILE NO: 45-54-E-19
 DRAWING NO: Friend Unit 2H Well Plat
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY:
 Submeter
 PROVEN SOURCE OF ELEVATION:
 WVDOT, Harrisville, WV


STATE OF WEST VIRGINIA
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: June 15 2020
 OPERATOR'S WELL NO. Friend 2H
 API WELL NO Mod1
47 - 095 - 02696
 STATE COUNTY PERMIT

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

LOCATION: ELEVATION: As-Built 1081' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Porter Falls
 DISTRICT: Ellsworth COUNTY: Tyler 81.482; 45; 177;
 SURFACE OWNER: Richard D. Pyles Sharon Rose Faini; Rosa Enterprises, LLC; 102.75; 35.25; 64.65;
 ROYALTY OWNER: Richard D. Pyles, et ux; Joseph L. Sitko, et ux; Helen E. Boggs; BRC Appalachian Minerals I, LLC (5) Darrell Sole; Allen Smith; B&C Oil and Gas Company (2); 36.3625; 70.0; 134;
 LEASE NO: _____ ACREAGE: 168.5 Will E. Morris Trust; Jerry Shoemaker; Haught Family Trust; Karen J. Wolfe; 71.283; 13.025;
 ACREAGE: 30; 30; 67 71.52; 119; 100; 52;

PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) BHL MOD
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 7,100' TVD
24,300' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
 ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road
Denver, CO 80202 Charleston, WV 25313

6,091' to Bottom Hole

1,122' to Top Hole

TOP HOLE LATITUDE 39 - 32 - 30.0
BTM HOLE LATITUDE 39 - 35 - 00.0

LONGITUDE 80 - 50 - 00

13,797' to Top Hole

13,899' to Bottom Hole

Antero Resources
Well No. Friend 2H
BHL MOD
Antero Resources Corporation



- Wellhead Layout
- Vulcan Unit 1H 47-095-02701
 - Vulcan Unit 2H 47-095-02702
 - Prosper Unit 1H 47-095-02699
 - Prosper Unit 2H 47-095-02700
 - Friend Unit 1H 47-095-02695
 - Proposed Well
 - Friend Unit 2H 47-095-02696
 - Seagrave Unit 1H 47-095-02697
 - Seagrave Unit 2H 47-095-02698



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 prescribed by the Department of Environmental Protection.

Bradley D. Miller
Bradley D. Miller, P.S. 2167

Note: 3 water wells were found within 2000' of proposed well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad.



Legend

- Proposed gas well
- Found corner, as noted
- Existing Well, as noted
- Digitized Well
- Existing Road
- Existing Road
- Surface boundary (approx.)
- Interior surface tracts (approx.)

Notes:
West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.
Well No. Friend Unit 2H Top Hole coordinates are
N: 368,409.08' Latitude: 39°30'13.64"
E: 1,622,663.29' Longitude: 80°50'14.31"
Bottom Hole coordinates are
N: 383,556.65' Latitude: 39°32'42.64"
E: 1,617,918.03' Longitude: 80°51'17.76"
UTM Zone 17, NAD 1983
Top Hole Coordinates Bottom Hole Coordinates
N: 4,372,706.344m N: 4,377,296.985m
E: 514,002.075m E: 512,479.526m
Plat orientation and corner and well references are based upon the grid north meridian.
Well location references are based upon the magnetic meridian.

Notes:
Well No. Friend Unit 2H
UTM Zone 17, NAD 1927
Top Hole Coordinates
N: 14,345,406.15'
E: 1,686,307.70'
Point of Entry Coordinates
N: 14,345,376.21'
E: 1,686,512.07'
Bottom Hole Coordinates
N: 14,360,467.27'
E: 1,681,311.96'



	Bearing	Dist.
L1	S 33°52' E	1,283.3'
L2	S 75°08' W	2,080.1'
L3	N 76°42' W	1,517.6'
L4	N 48°36' E	1,144.5'
L5	S 80°43' E	206.6'

FILE NO: 45-54-E-19
DRAWING NO: Friend Unit 2H Well Plat
SCALE: 1" = 2000'
MINIMUM DEGREE OF ACCURACY: Submeter
PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: June 15 2020
OPERATOR'S WELL NO. Friend 2H
API WELL NO. **W401**
47 - 095 - 02696
STATE COUNTY PERMIT

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

LOCATION: ELEVATION: As-Built 1081' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Porter Falls 81,482; 45; 177;
DISTRICT: Ellsworth COUNTY: Tyler 102,75; 35,25; 64,65;
SURFACE OWNER: Richard D. Pyles Sharon Rose Faini; Rose Enterprises, LLC; Darrell Sole; Allen Smith; B&C Oil and Gas Company (2); 36,3625; 70.0; 134;
ROYALTY OWNER: Richard D. Pyles, et ux; Joseph L. Sitko, et ux; Helen E. Boggs; BRC Appalachian Minerals I, LLC (5) LEASE NO: ACREAGE: 71.283; 13,025;
PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) BHL MOD 71.52; 119; 100; 52;
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 7,100' TVD 30; 30; 67
24,300' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road
Denver, CO 80202 Charleston, WV 25313



ID	TM/Par	Owner	DB/PG	Acres
1	16-44	Robert A. Pyles, et al	335/482	87.82
2	15-38	Rodney A. & Candis L. Nash	351/701	85.48
3	16-23.1	Bruce Winkelmann	334/195	3.30
4	16-44.1	Carl Straight	543/ 598	3.70
5	16-42.1	Richard D. Pyles	336/815	4.56
6	16-42	Richard D. Pyles	379/20	168.50
7	16-22	Joesph L. Jr. & Karen Sitko	296/13	81.70
8	16-23	Joseph L. Sitko	314/462	29.7
9	15-30.1	Roger D. Blizzard & Ruth E. Spencer	343/427	101.38
10	15-11	Roger Matthess	318/137	115.47
11	15-10	Antero Midstream, Inc.	617/739	34.13
12	16-1	Antero Midstream, Inc.	617/739	35.25
13	16-2	David E. Bowyer	622/775	80.75
14	16-4	Darrell J. Sole	227/376	35.00
15	15-9	Antero Midstream, LLC	586/544	132.19
16	15-8	William A. & Joyce L. Caputo	245/485	14.00
17	11-36	David W. Fiber	574/847	21.16
18	10-53	Kathy M. & Doug O. Smith	331/220	1.10
19	10-52	Darwin & Shirley Martin	306/537	5.00
20	10-72	Darwin & Shirley Martin	322/28	1.99
21	10-73	Darwin & Shirley Martin	306/537	1.90
22	10-56	Mary K. Neff	413/731	22.06
23	10-55	Charles & Shirley E. Neff	218/46	1.47
24	10-54	Michael W. & Brenda S. Schmidt	244/409	14.06
25	11-32	Darwin & Shirley Martin	348/344	60.66
26	10-70	Darwin & Shirley Martin	326/490	1.19
27	11-32.2	Bernard R. & Denise F. McDougal	636/587	0.54
28	10-51	Charles E. & Laura Lynn Friend	334/839	8.03
29	10-49	Charles E. & Laura Lynn Friend	334/836	71.52
30	10-57	Charles E. & Laura Lynn Friend	334/836	84.39
31	11-1	Gertrude L. Pugh	314/140	70.00
32	10-46	Opal Carol Tallman	282/382	114.00
33	10-10	Ronald D. & Sandra Sue Martin	378/322	58.35
34	10-8	Helen M. Young	198/126	50.50
35	10-12	Sandra K. Melz	376/458	30.50
36	10-11	J.R. Schamp	318/543	30.00
37	10-9	Brian E. & Barbara J. Courtney	344/626	52.00
38	10-5	Brian E. & Barbara J. Courtney	344/626	30.00
39	10-4	Stefan L. & Alberta B. Smolski	356/467	56.08
40	10-13	Kevin S. & Melinda S. Goff	597/808	87.19
41	6-49	Dennis & Clista A. Heintzman	297/637	45.00
42	6-36	Dennis & Clista A. Heintzman	297/640	417.06
43	6-30.1	Larry M. & Amy B. Adams	369/344	150.34

Leases	
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B	Richard D. Pyles, et ux
C	Helen E. Boggs
D	Bruce Winkelmann
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G	BRC Appalachian Minerals I, LLC
H	Roger D. Blizzard
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K	BRC Appalachian Minerals I, LLC
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M	James Matthess
N	James L. Newsom Revocable Trust
O	Will E. Morris Trust
P	Jerry Shoemaker
Q	Kenneth R. Baker
R	Shirley E. Neff
S	Michael W. Schmidt, et ux
T	Haught Family Trust
U	Karen J. Wolfe
V	Darrell Sole
W	Charles Eugene Friend, et ux
X	Allen Smith
Y	Ridgetop Capital II, LP
Z	Helen M. Karcinski, et al
AA	B&C Oil and Gas Company
AB	BRC Appalachian Minerals I, LLC
AC	Sharon Rose Faini
AD	BRC Appalachian Minerals I, LLC
AE	B&C Oil and Gas Company
AF	Bounty Minerals, LLC
AG	Rose Enterprises, LLC
AH	B&C Oil and Gas Company
AI	Dennis R. & Clista A. Heintzman
AJ	BRC Appalachian Minerals I, LLC

FILE NO: 45-54-E-19
DRAWING NO: Friend Unit 2H Well Plat
SCALE: 1" = 2000'
MINIMUM DEGREE OF ACCURACY:
Submeter
PROVEN SOURCE OF ELEVATION:
WVDOT, Harrisville, WV

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: June 15 20 20
OPERATOR'S WELL NO. Friend 2H
API WELL NO Mod 1
47 - 095 - 02696
STATE COUNTY PERMIT

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

LOCATION: ELEVATION: As-Built 1081' WATERSHED: Outlet Middle Island Creek QUADRANGLE: Porter Falls
DISTRICT: Ellsworth COUNTY: Tyler 81.482; 45; 177;
SURFACE OWNER: Richard D. Pyles Sharon Rose Faini; Rose Enterprises, LLC; 102.75; 35.25; 64.65;
Darrell Sole; Allen Smith; B&C Oil and Gas Company (2); 36.3625; 70.0; 134;
ROYALTY OWNER: Richard D. Pyles, et ux; Joseph L. Sitko, et ux; Helen E. Boggs; BRC Appalachian Minerals I, LLC (5) LEASE NO: _____ ACREAGE: 168.5 71.283; 13.025;
Will E. Morris Trust; Jerry Shoemaker; Haught Family Trust; Karen J. Wolfe; 81.52; 119; 100; 52;
30; 30; 67

PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) BHL MOD
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 7,100' TVD
24,300' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road
Denver, CO 80202 Charleston, WV 25313

WW-6A1

Operator's Well Number Friend Unit 2H

**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>Richard D. Pyles et ux Lease (TM 12 PCL 42)</u>			
Richard D. Pyles et ux	PetroEdge Energy LLC	1/8+	0385/0350
PetroEdge Energy LLC	Statoil USA Onshore Properties	Assignment	0406/0147
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0022/0144
<u>Helen E. Boggs Lease</u>			
Helen E. Boggs	Energy Production Inc.	1/8	0429/0656
Energy Production Inc.	Antero Resources Corporation	Assignment	0465/0312
<u>Richard D. Pyles et ux Lease (TM 12 PCL 42.1)</u>			
Richard D. Pyles et ux	PetroEdge Energy LLC	1/8+	0385/0350
PetroEdge Energy LLC	Statoil USA Onshore Properties	Assignment	0406/0147
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0022/0144
<u>Joseph L. Sitko Jr. et ux Lease (TM 16 PCL 23)</u>			
Joseph L. Sitko Jr. et ux	TNG LLC	1/8	0375/0384
TNG LLC	Statoil USA Onshore Properties	Assignment	0423/0152
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0022/0144
<u>BRC Appalachian Minerals LLC Lease (TM16 PCL 22)</u>			
BRC Appalachian Minerals 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	Assignment	0423/0152
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0022/0144
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p style="margin: 0;">RECEIVED Office of Oil and Gas AUG 10 2020 WV Department of Environmental Protection</p> </div>			
<u>BRC Appalachian Minerals LLC Lease (TM15 PCL 10)</u>			
BRC Appalachian Minerals 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	Assignment	0423/0152
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0022/0144

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

****CONTINUED ON NEXT PAGE****

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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- (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>Will E. Morris Trust Lease</u> Will E. Morris Trust	Antero Resources Corporation	1/8+	0020/0311
<u>Jerry Shoemaker Lease</u> Jerry Shoemaker	Antero Resources Corporation	1/8+	0479/0584
<u>Haught Family Trust Lease</u> Haught Family Trust Montani Energy LLC Antero Resources Appalachian Corporation	Montani Energy LLC Antero Resources Appalachian Corporation Antero Resources Corporation	1/8+ Assignment Name Change	0392/0069 0396/0759 Exhibit 1
<u>Karen J. Wolfe Lease</u> Karen J. Wolfe	Antero Resources Corporation	1/8+	0584/0043
<u>Darrell Sole Lease</u> Darrell Sole	Antero Resources Corporation	1/8+	0607/0133
<u>B&C Oil & Gas Company Lease (TM 10 PCL 10)</u> B&C Oil & Gas Company	Antero Resources Corporation	1/8+	0648/0518
<u>BRC Appalachian Minerals LLC Lease</u> BRC Appalachian Minerals LLC BRC Working Interest Company Chesapeake Appalachia LLC Statoil USA Onshore Properties EQT Production Company	BRC Working Interest Company Chesapeake Appalachia LLC Statoil USA Onshore Properties EQT Production Company Antero Resources Corporation	1/8 Assignment Assignment Assignment Assignment	0369/0300 0369/0784 0378/0764 0539/0239 0663/0001
<u>Sharon Rose Faini Lease</u> Sharon Rose Faini	Antero Resources Corporation	1/8+	0648/0518
<u>B&C Oil & Gas Company Lease (TM 10 PCL 5)</u> B&C Oil & Gas Company	Antero Resources Corporation	1/8+	0648/0518
<u>Rose Enterprises LLC Lease</u> Rose Enterprises LLC	Antero Resources Corporation	1/8+	0599/0765

RECEIVED
Office of Oil and Gas
AUG 10 2020
WV Department of Environmental Protection

WW-6A1
(5/13)

Operator's Well No. Friend Unit 2H

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

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

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

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
BRC Appalachian Minerals LLC Lease				
	BRC Appalachian Minerals 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

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

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

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

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

RECEIVED
Office of Oil and Gas
AUG 10 2020
WV Department of
Environmental Protection

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

Well Operator: Antero Resources Corporation
By: Tim Rady
Its: VP of Land

*Co-tenancy utilization - At least 7 mineral owners in tract. At least 75% of the royalty owners have executed a lease on the tract. The interests of the remaining co-tenants were acquired pursuant to the Co-tenancy Modernization and Majority Protection Act

Check # 220078
7/23/2020
\$5,000.00



July 29, 2020

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

West Virginia Department of Environmental Protection
Office of Oil and Gas
Attn: Ms. Laura Adkins
601 57th Street
Charleston, WV 25304

Ms. Laura Adkins:

Antero Resources Corporation (Antero) would like to submit the following permit modifications for the following expedited approved wells on the existing Pyles Pad: Friend Unit 1H (API # 47-095-02695), Friend Unit 2H (API # 47-095-02696) & Seagrave Unit 2H (API # 47-095-02698).

Attached you will find the following documents:

- REVISED Form WW-6B, which shows the updated POE & Measured Depth
- REVISED Form WW-6A1, which shows the new leases we will be drilling into
- REVISED Mylar Plat, which shows the new Lateral Length & Estimated Measured Depth
- AOR & As-Built Design

If you have any questions please feel free to contact me at (303) 357-7223.

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Megan Griffith", written over a white background.

Megan Griffith
Permitting Agent
Antero Resources Corporation

RECEIVED
Office of Oil and Gas
AUG 10 2020
WV Department of
Environmental Protection

Enclosures

WW-6B
(04/15)

API NO. 47-095 - 02696
 OPERATOR WELL NO. Friend Unit 2H
 Well Pad Name: Pyles Pad

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: Friend Unit 2H Well Pad Name: Pyles Pad

3) Farm Name/Surface Owner: Richard D. Pyles Public Road Access: US Route 34

4) Elevation, current ground: 1081' Elevation, proposed post-construction: ~1081'

5) Well Type (a) Gas Oil Underground Storage

Other _____

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No No

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: 24300' MD

11) Proposed Horizontal Leg Length: 15967'

12) Approximate Fresh Water Strata Depths: 61'

13) Method to Determine Fresh Water Depths: 47-095-01958

14) Approximate Saltwater Depths: 2200'

15) Approximate Coal Seam Depths: None Identified

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: _____

*CK# 220078
 Amt \$5000
 Date 7/23/20*

RECEIVED
 Office of Oil and Gas
 JUL 30 2020
 WV Department of
 Environmental Protection

WW-6B
(04/15)

API NO. 47- 095 - 02696
 OPERATOR WELL NO. Friend Unit 2H
 Well Pad Name: Pyles Pad

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#	80	80	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#	24300	24300	6274 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

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	2500	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

PACKERS

Kind:	N/A			RECEIVED Office of Oil and Gas JUL 30 2020
Sizes:	N/A			WV Department of Environmental Protection
Depths Set:	N/A			

WW-6B
(10/14)

API NO. 47-095 - 02696

OPERATOR WELL NO. Friend Unit 2H

Well Pad Name: Pyles Pad

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

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 23.71 acres

22) Area to be disturbed for well pad only, less access road (acres): 10.00 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

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25) Proposed borehole conditioning procedures:

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

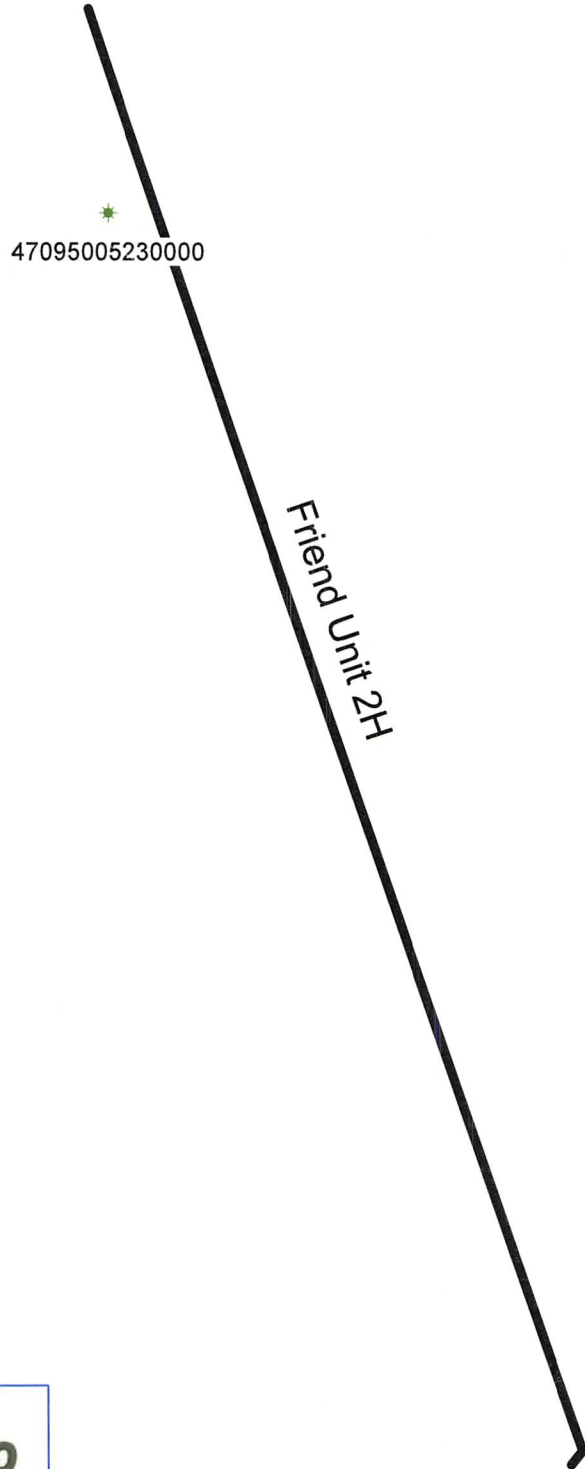
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

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*Note: Attach additional sheets as needed.



PERMIT MODIFICATION API # 47-095-02696



Antero Resources Corporation

Friend Unit 2H - AOR



WELL SYMBOLS
Oil & Gas Well

April 15, 2020

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UWI (API Num)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
47095005230000	B F HAWKINS	1	TRIAD RESOURCES INC	PENNZOIL CO INC	1,766	Unknown	Keener	Big Injun, Berea, Alexander

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WW-6A1

Operator's Well Number Friend Unit 2H

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>Richard D. Pyles et ux Lease (TM 12 PCL 42)</u>			
Richard D. Pyles et ux	PetroEdge Energy LLC	1/8+	0385/0350
PetroEdge Energy LLC	Statoil USA Onshore Properties	Assignment	0406/0147
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0022/0144
<u>Helen E. Boggs Lease</u>			
Helen E. Boggs	Energy Production Inc.	1/8	0429/0656
Energy Production Inc.	Antero Resources Corporation	Assignment	0465/0312
<u>Richard D. Pyles et ux Lease (TM 12 PCL 42.1)</u>			
Richard D. Pyles et ux	PetroEdge Energy LLC	1/8+	0385/0350
PetroEdge Energy LLC	Statoil USA Onshore Properties	Assignment	0406/0147
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0022/0144
<u>Joseph L. Sitko Jr. et ux Lease (TM 16 PCL 23)</u>			
Joseph L. Sitko Jr. et ux	TNG LLC	1/8	0375/0384
TNG LLC	Statoil USA Onshore Properties	Assignment	0423/0152
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0022/0144
<u>BRC Appalachian Minerals LLC Lease (TM16 PCL 22)</u>			
BRC Appalachian Minerals 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	Assignment	0423/0152
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0022/0144
<u>BRC Appalachian Minerals LLC Lease (TM15 PCL 10)</u>			
BRC Appalachian Minerals 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	Assignment	0423/0152
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0022/0144

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

CONTINUED ON NEXT PAGE

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Will E. Morris Trust Lease</u> Will E. Morris Trust	Antero Resources Corporation	1/8+	0020/0311
<u>Jerry Shoemaker Lease</u> Jerry Shoemaker	Antero Resources Corporation	1/8+	0479/0584
<u>Haught Family Trust Lease</u> Haught Family Trust Montani Energy LLC Antero Resources Appalachian Corporation	Montani Energy LLC Antero Resources Appalachian Corporation Antero Resources Corporation	1/8+ Assignment Name Change	0392/0069 0396/0759 Exhibit 1
<u>Karen J. Wolfe Lease</u> Karen J. Wolfe	Antero Resources Corporation	1/8+	0584/0043
<u>Darrell Sole Lease</u> Darrell Sole	Antero Resources Corporation	1/8+	0607/0133
<u>B&C Oil & Gas Company Lease (TM 10 PCL 10)</u> B&C Oil & Gas Company	Antero Resources Corporation	1/8+	0648/0518
<u>BRC Appalachian Minerals LLC Lease</u> BRC Appalachian Minerals LLC BRC Working Interest Company Chesapeake Appalachia LLC Statoil USA Onshore Properties EQT Production Company	BRC Working Interest Company Chesapeake Appalachia LLC Statoil USA Onshore Properties EQT Production Company Antero Resources Corporation	1/8 Assignment Assignment Assignment Assignment	0369/0300 0369/0784 0378/0764 0539/0239 0663/0001
<u>Sharon Rose Faini Lease</u> Sharon Rose Faini	Antero Resources Corporation	1/8+	0648/0518
<u>B&C Oil & Gas Company Lease (TM 10 PCL 5)</u> B&C Oil & Gas Company	Antero Resources Corporation	1/8+	0648/0518
<u>Rose Enterprises LLC Lease</u> Rose Enterprises LLC	Antero Resources Corporation	1/8+	0599/0765

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WW-6A1
(5/13)

Operator's Well No. Friend Unit 2H

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	BRC Appalachian Minerals 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

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

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

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

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

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Well Operator: Antero Resources Corporation
By: Tim Rady
Its: VP of Land

***Co-tenancy utilization – At least 7 mineral owners in tract. At least 75% of the royalty owners have executed a lease on the tract. The interests of the remaining co-tenants were acquired pursuant to the Co-tenancy Modernization and Majority Protection Act**