



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

Monday, March 20, 2023
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for PEACH FORK UNIT 2H
47-095-02842-00-00

Lateral Extension

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: PEACH FORK UNIT 2H
Farm Name: EDWARD YOST ESTATE
U.S. WELL NUMBER: 47-095-02842-00-00
Horizontal 6A New Drill
Date Modification Issued: 3/20/2023

Promoting a healthy environment.

03/24/2023

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: Peach Fork Unit 2H MOD Well Pad Name: Ed Yost

3) Farm Name/Surface Owner: Edward Yost Estate Public Road Access: CR 11

4) Elevation, current ground: 1233' - As Built Elevation, proposed post-construction: _____

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: 7200' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2850#

8) Proposed Total Vertical Depth: 7200' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 27300' MD

11) Proposed Horizontal Leg Length: 18646'

12) Approximate Fresh Water Strata Depths: 70', 203'

13) Method to Determine Fresh Water Depths: 4709500165 Offset well records. Depths have been adjusted according to surface elevations.

14) Approximate Saltwater Depths: 1810'

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: _____

JMdy
3/17/23

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#	100	100	CTS, 96 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	300	300	CTS, 313 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#	27300	27300	5951 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/L	~1.18
Fresh Water	13-3/8"	17-1/2"	0.38"	2730	1000	Class A/L	~1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	1500	Class A/L	~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			
Sizes:	N/A			
Depths Set:	N/A			

Smiley
3/17/23

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.

*Antero will be air drilling the fresh water string which makes it difficult to determine when fresh water is encountered. Therefore, we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.

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): 81.82 acres

22) Area to be disturbed for well pad only, less access road (acres): 8.91 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/L cement.
Surface: Class A/L cement with 2-3% calcium chloride and 1/4 lb of flake
Intermediate: Class A/L 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

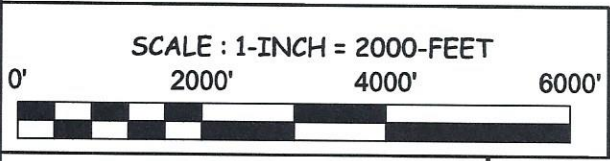
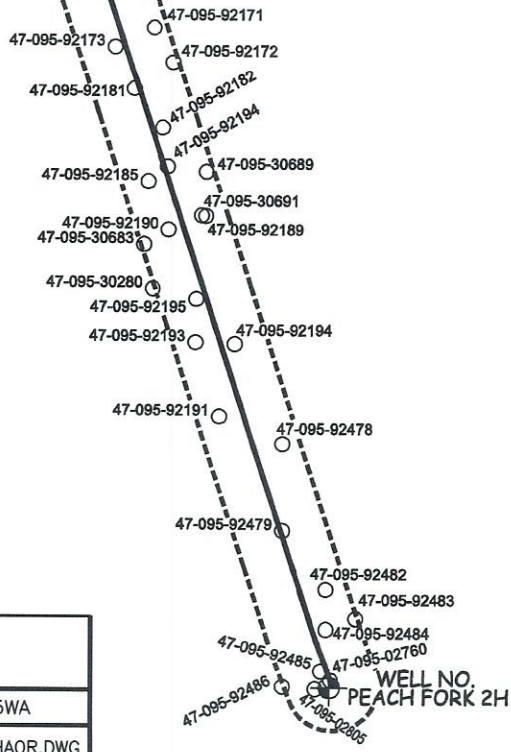
25) Proposed borehole conditioning procedures:

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.

SMey
3/17/23

ED YOST PAD ANTERO RESOURCES CORPORATION



WILLOW LAND SURVEYING, PLLC P.O. BOX 17, PENNSBORO, WV 26415 (304) 659-1717		JOB #: 22-005WA
DATE: 02/14/23	DRAWN BY: D.L.P.	FILE: PEACHFORK2HHAOR.DWG

03/24/2023

UWI (API Num)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Productible Formation(s) not perf'd
47095027600000	AR ED YOST UNIT 5H	5H	ANTERO RESOURCES CORP	ANTERO RESOURCES CORP				
47095924850000								
47095028050000								
47095924860000								
47095924840000								
47095924820000								
47095924830000								
47095924790000								
47095924780000								
47095921910000								
47095921940000								
47095921930000								
47095921950000								
47095302800000	CLARENCE MERCER	5	RENO OIL CO	RENO OIL CO				
47095306830000								
47095921900000								
47095921890000								
47095306910000	R F RICE	5	VALLEY STEEL PROD CO	VALLEY STEEL PROD CO	2,094		Keener	Weir, Benson, Alexander
47095921850000								
47095306890000	R F RICE	2	VALLEY STEEL PROD CO	VALLEY STEEL PROD CO				
47095921850000								
47095921940000								
47095921820000								
47095921810000								
47095921720000								
47095921730000								
47095921710000								

LATITUDE 39°35'00" 904'
 LATITUDE 39°37'30"

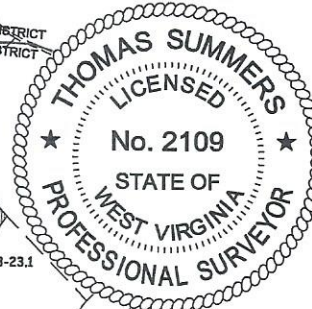
Antero Resources Corporation
Well No. Peach Fork Unit 2H

ELLSWORTH DISTRICT - TYLER COUNTY	
1-3	DANIEL WITSCHY
1-6	DANIEL WITSCHY
1-7	MICHAEL DAUGHERTY
1-8	WITSCHY REALTY INC.
1-9	WITSCHY REALTY INC.
1-10	GEREHY LAUDERMAN
1-13	JOHN STEELE
1-14	LUELLA RABEL
1-15	CRISTEL STEELE
3-1	WITSCHY REALTY INC.
3-2	JOYCE MORRIS
3-5	JOYCE MORRIS
3-6	JOYCE MORRIS
3-11	JOYCE MORRIS
3-14	CARL RUCKER
3-15	JCW INC.
3-16	JCW INC.
3-22	JCW INC.
3-23	DAVID MILLER
3-23.1	DAVID MILLER
3-30	GARY WILLEY
3-31	ROBERT MCNEMAR
3-31.1	DANNY TANLEY
3-39	PAUL STRICKLAND
4-8	PAUL STRICKLAND
6-12.1	TIMOTHY MCHENRY
6-12.2	NANCY MERCER
6-13	TIMOTHY MCHENRY
6-13.1	NANCY MERCER
6-13.2	MARY MYER
6-13.3	TIMOTHY MCHENRY
6-46	NANCY MERCER
7-17	JIMMY SAILOR
7-17.1	GAYLE HARRIS
7-18	LUCILLE GULLEY
7-18.1	LUCILLE GULLEY
7-18.2	LUCILLE GULLEY
7-18.3	LUCILLE GULLEY
7-28	EDWARD YOST
7-28.1	GEORGE YOST
7-28.2	ERNEST YOST
7-29	EDWARD YOST
7-30	FLODE YOST
7-31	EDWARD YOST
7-32	ROBERT MERCER
7-33	GARY MIDCAP

NOTES:
 WELL 2H TOP HOLE INFORMATION:
 N: 384,481ft E: 1,623,120ft
 LAT: 39°32'52.54" LON: 80°50'11.54"
 BOTTOM HOLE INFORMATION:
 N: 403,153ft E: 1,617,061ft
 LAT: 39°35'56.17" LON: 80°51'32.49"
 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: 4,377,605m E: 514,060m
 BOTTOM HOLE INFORMATION:
 N: 4,383,263m E: 512,119m

(NAD) 27 (UTM) ZONE 17 COORDS:
 WELL 2H TOP HOLE INFORMATION:
 N: 14,361,478ft E: 1,686,496ft
 POINT OF ENTRY INFORMATION:
 N: 14,362,399ft E: 1,686,150ft
 BOTTOM HOLE INFORMATION:
 N: 14,380,040ft E: 1,680,128ft



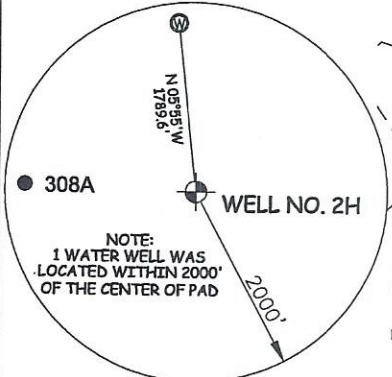
WV NORTH ZONE
 GRID NORTH

9,494' TO BOTTOM HOLE

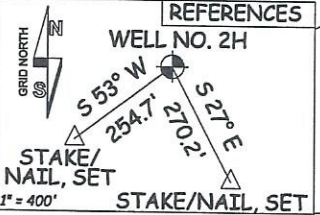
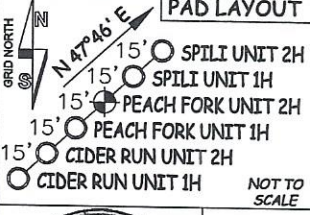
12,896'

LONGITUDE 80°50'00"

LONGITUDE 80°50'00"



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



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

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

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.

JOB # 20-011WA
 DRAWING # PEACHFORK2HR1
 SCALE 1" = 2000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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

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

THOMAS SUMMERS P.S. 2109
 DATE 02/06/23
 OPERATOR'S WELL # PEACH FORK UNIT #2H

WELL TYPE: OIL ___ GAS LIQUID INJECTION ___ WASTE DISPOSAL ___ 47 ___ 095 ___ 02842
 (IF "GAS") PRODUCTION STORAGE ___ DEEP ___ SHALLOW STATE COUNTY PERMIT
 LOCATION: ELEVATION 1,233' - AS BUILT WATERSHED OUTLET MIDDLE ISLAND CREEK 03/24/2023
 QUADRANGLE PORTER FALLS 7.5' DISTRICT ELLSWORTH COUNTY TYLER
 SURFACE OWNER EDWARD YOST ESTATE ACREAGE 109.06 ACRES +/-
 OIL & GAS ROYALTY OWNER FISHER OIL COMPANY; RIDGEWOOD DEVELOPMENT LLC; CHARLES RAY JOBS; LEASE ACREAGE 45.67 AC +/-; 17 AC +/-; 470.5 AC +/-
 RIDGETOP CAPITOL II LP; BARBARA L. DAWSON; MARK C. MERCER; EUGENE CARLTON SHANK; JAMES L. NEFF & ELAINE G. GLENDENNING; CARL E. RICE; 52 AC +/-; 14.44 AC +/-; 15.25 AC +/-; 32.1 AC +/-; 118.73 AC +/-; 24.56 AC +/-
 GARY J. WILLEY ET UX; FISHER OIL COMPANY; JCW INC.; GRASSY KNOB LLC; GRASSY KNOB LLC; GRASSY KNOB LLC; GRASSY KNOB LLC; 36 AC +/-; 69 AC +/-; 24.69 AC +/-; 50 AC +/-; 50.8 AC +/-; 18.25 AC +/-; 23.3 AC +/-; 5.6 AC +/-
 WITSCHY REALTY LLC; WITSCHY REALTY LLC; CIDER RUN MINERAL HOLDING LLC; CIDER RUN MINERAL HOLDING LLC; PEACH FORK MINERAL HOLDING LLC; 31.75 AC +/-; 22.5 AC +/-; 23.17 AC +/-; 26.21 AC +/-; 83.82 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
 TARGET FORMATION MARCELLUS PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
 WELL OPERATOR ANTERO RESOURCES CORP. ESTIMATED DEPTH 7,200' TVD 27,300' MD
 ADDRESS 1615 WYNKOOP ST. DESIGNATED AGENT KEVIN ELLIS
 DENVER, CO 80202 ADDRESS 535 WHITE OAK BLVD.
 BRIDGEPORT, WV 26330

WW-6A1

Operator's Well Number Peach Fork Unit 2H MOD

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>Linda K Loehr Lease</u> Linda K. Loehr	Antero Resources Corporation	1/8+	494/518
<u>Fisher Oil Company Lease</u> Fisher Oil Company	Antero Resources Corporation	1/8+	19/535
<u>Ridgewood Development LLC Lease</u> Ridgewood Development LLC	Antero Resources Corporation	1/8+	185/337
<u>Charles Ray Jobes Lease</u> Charles Ray Jobes EOG Resources Inc PC Exploration Inc Phillips Exploration Inc Chesapeake Appalachia LLC Statoil USA Onshore Properties Inc SWN Exchange Titleholder LLC SWN Production Company LLC Antero Exchange Properties LLC	EOG Resources Inc PC Exploration Inc Phillips Exploration Inc Chesapeake Appalachia LLC Statoil USA Onshore Properties Inc SWN Exchange Titleholder LLC SWN Production Company LLC Antero Exchange Properties LLC Antero Resources Corporation	1/8 Assignment Merge Assignment Assignment Assignment Merge Assignment Merge	353/284 357/210 PA SOS 375/312 423/165 470/668 9/404 544/242 552/315
<u>Ridgetop Capitol II, LP Lease</u> Ridgetop Capitol II, LP	Antero Resources Corporation	1/8+	148/192
<u>Barbara L. Dawson Lease</u> Barbara L. Dawson	Antero Resources Corporation	1/8+	190/419
<u>Mark C. Mercer Lease</u> Mark C. Mercer	Antero Resources Corporation	1/8+	189/507
<u>Cheryl A. Sullivan Lease</u> Cheryl A. Sullivan	Antero Resources Corporation	1/8+	167/7
<u>Eugene Carlton Shank Lease</u> Eugene Carlton Shank	Antero Resources Corporation	1/8+	21/656
<u>James L. Neff & Elaine G. Glendenning Lease</u> James L. Neff & Elaine G. Glendenning	Antero Resources Corporation	1/8+	591/427
<u>Carl E. Rice Lease</u> Carl E. Rice	Antero Resources Corporation	1/8+	208/557
<u>Gary J. Willey et ux Lease</u> Gary J. Willey et ux	Antero Resources Corporation	1/8+	197/239
<u>Fisher Oil Company Lease</u> Fisher Oil Company	Antero Resources Corporation	1/8+	667/682
<u>JCW, Inc. Lease</u> JCW, Inc.	Antero Resources Corporation	1/8+	208/547

03/24/2023

WW-6A1

Operator's Well Number Peach Fork Unit 2H MOD

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>JCW, Inc. Lease</u> JCW, Inc.	Antero Resources Corporation	1/8+	208/547
<u>Grassy Knob LLC Lease</u> Grassy Knob LLC	Antero Resources Corporation	1/8+	177/207
<u>Grassy Knob LLC Lease</u> Grassy Knob LLC	Antero Resources Corporation	1/8+	177/207
<u>Grassy Knob LLC Lease</u> Grassy Knob LLC	Antero Resources Corporation	1/8+	177/207
<u>Donald Enlow Lease</u> Donald Enlow	Antero Resources Corporation	1/8+	232/102
<u>Witschey Realty LLC Lease</u> Witschey Realty LLC	Antero Resources Corporation	1/8+	177/193
<u>Witschey Realty LLC Lease</u> Witschey Realty LLC	Antero Resources Corporation	1/8+	177/193
<u>Cider Run Mineral Holdings, LLC Lease</u> Cider Run Mineral Holdings, LLC	Antero Resources Corporation	1/8+	177/165
<u>Cider Run Mineral Holdings, LLC Lease</u> Cider Run Mineral Holdings, LLC	Antero Resources Corporation	1/8+	177/165

*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.

03/24/2023

WW-6A1
(5/13)

Operator's Well No. Peach Fork Unit 2H MOD

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
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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:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Peach Fork Mineral Holdings Lease</u>	Peach Fork Mineral Holdings	Antero Resources Corporation	1/8+	0177/0184

*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.

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

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

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

Well Operator: Antero Resources Corporation
 By: Tim Rady
 Its: Senior Vice President of Land