



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

Tuesday, December 14, 2021
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for CAPITOL UNIT 2H
47-095-02755-00-00

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.

A handwritten signature in blue ink, appearing to read 'James A. Martin', is written over a faint blue circular stamp.

James A. Martin
Chief

Operator's Well Number: CAPITOL UNIT 2H
Farm Name: CLARA SUZANNE WALLACE & RICKIE WALLACE
U.S. WELL NUMBER: 47-095-02755-00-00
Horizontal 6A New Drill
Date Modification Issued: 12/14/2021

Promoting a healthy environment.

12/17/2021

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

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

2) Operator's Well Number: Capitol Unit 2H Well Pad Name: Thin Air Pad

3) Farm Name/Surface Owner: Clara Suzanne Wallace & Rickie Wallace Public Road Access: CR 11

4) Elevation, current ground: 1235' Elevation, proposed post-construction: ~1200'

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: 7300' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2950#

8) Proposed Total Vertical Depth: 7300' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 26,500 MD

11) Proposed Horizontal Leg Length: 16,322'

12) Approximate Fresh Water Strata Depths: 76' and 328'

13) Method to Determine Fresh Water Depths: 47-095-02266

14) Approximate Saltwater Depths: 1660'

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: _____

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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#	378'	378'	CTS, 341 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#	26500	26,500'	5750 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	30"	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"	0.361"	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			

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12/17/2021
Page 2 of 3

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): 45.05 acres

22) Area to be disturbed for well pad only, less access road (acres): 17.67 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:

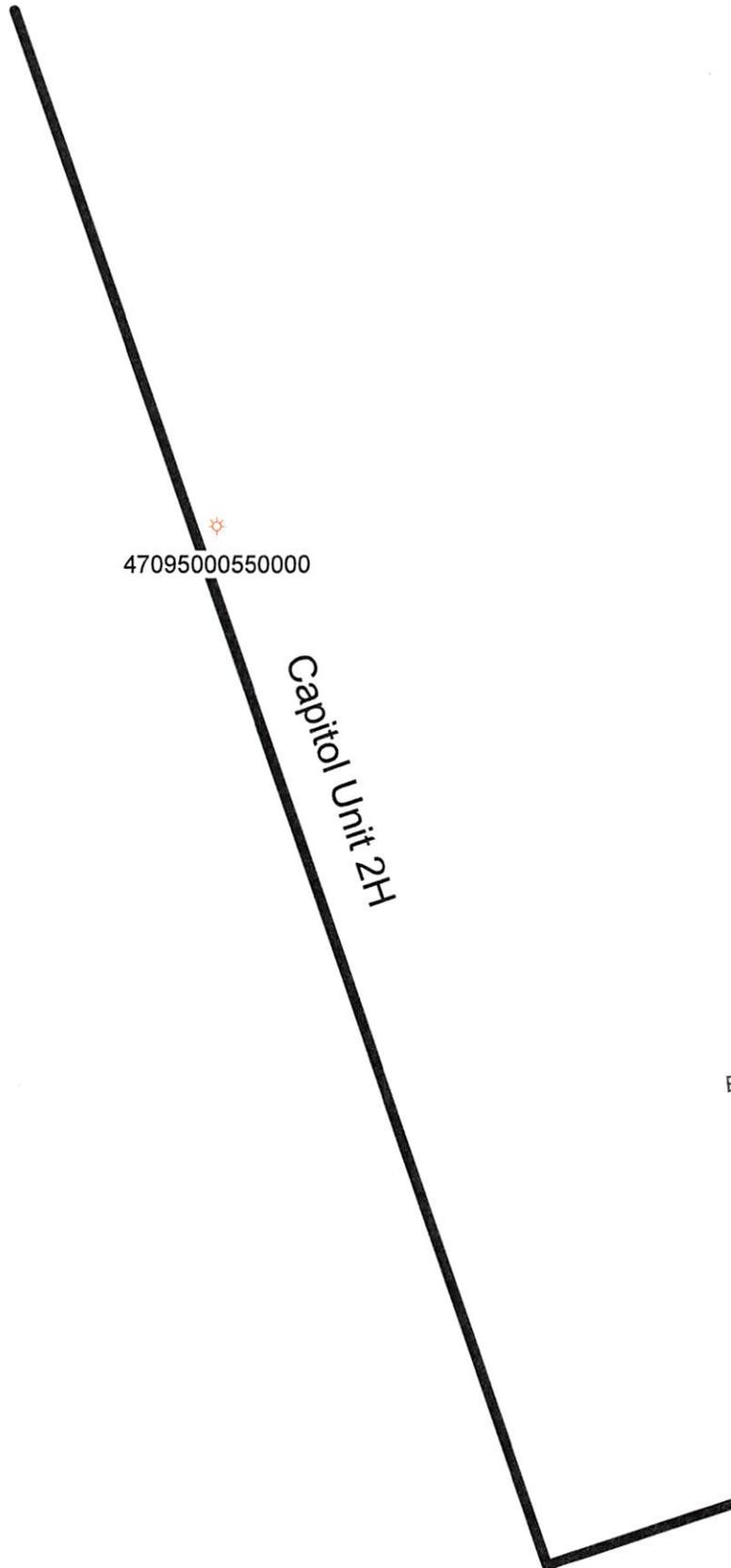
Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

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.



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DEC 09 2021
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Antero Resources Corporation

Capitol Unit 2H - AOR



WELL SYMBOLS
Dry Hole, With Show of Gas

December 2, 2021

12/17/2021

UWI (APINum)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
47095000550000	LESLIE YOST	1	Unknown	Unknown	2,174	Unknown	Big Injun	Berea, Weir, Alexander

LATITUDE 39°32'30" 417'

LATITUDE 39°35'00" 7,678' TO BOTTOM HOLE

4,901' TO BOTTOM HOLE

5,061' LONGITUDE 80°47'30"

Antero Resources Corporation Well No. Capitol Unit 2H

Ellsworth District - Tyler County	
07-07	Lillie Gump
07-09	Harold Yost
07-23	Harold Yost
07-25	BB Farm Investments LLC
07-26	William Hope
07-27	James Kleeh
11-14	Paul Thomas
11-15	BB Farm Investments LLC
11-16	James Kleeh
11-17	James Kleeh
11-18	Sarah Sine
11-18.1	Sarah Sine
11-19	Ezlie Hall
11-20	Edward Quirk
11-21	Edward Quirk
11-22	Nile Harris
11-59	Edward Quirk
11-60	Michael Martin
12-01	James Kleeh
12-02	Gary Midcap
12-07	Coastal Forest Resources Co.
12-08	Shirley Carroll
12-09	Coastal Forest Resources Co.
12-10	Michael Martin
12-11	Rickie Wallace
12-12	Rockford Energy LLC
12-13	Eric Fisher
12-33	Richard Neff

Green District - Wetzel County	
11-16	David Smith Et Al
11-21	Fluharty Family Trust
11-27	Raymond Young
11-28	Raymond Young
11-30	Fluharty Family Trust
11-35	Timothy Lancaster
11-36	Thomas Gaffney
11-38	Charles Gump
11-41	Charles Gump
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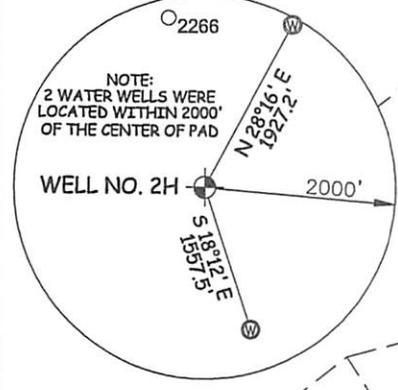
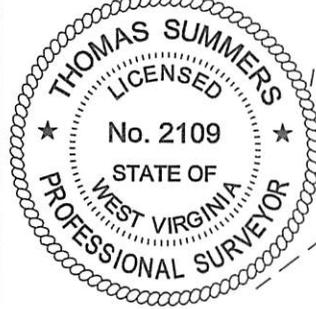
NOTES:
WELL 2H TOP HOLE INFORMATION:
 N: 376,961ft E: 1,635,249ft
 LAT: 39°31'39.98" LON: 80°47'35.33"
BOTTOM HOLE INFORMATION:
 N: 392,402ft E: 1,628,210ft
 LAT: 39°34'11.85" LON: 80°49'07.41"
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE 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:
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NOTE
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WV NORTH ZONE GRID NORTH



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.



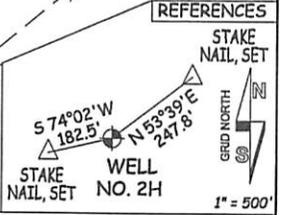
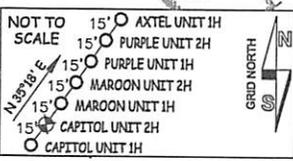
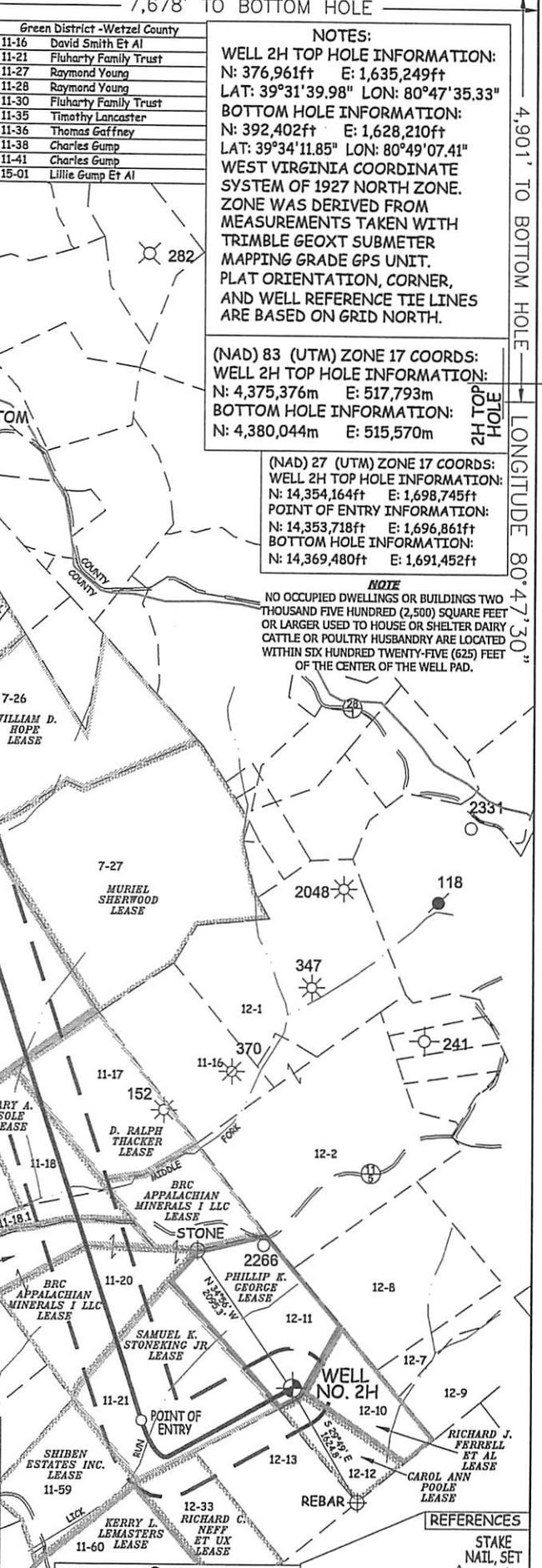
STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
 WILLOW LAND SURVEYING PLLC
 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

JOB # 20-011WA
 DRAWING # CAPITOL2HR3
 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

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

DATE 12/06/21
 OPERATOR'S WELL# CAPITOL UNIT #2H



WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___ 47 - 095 - 02755 **MOD**
 (IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X STATE COUNTY PERMIT
 LOCATION: ELEVATION 1,235'-ORIGINAL 1,200'-PROPOSED WATERSHED OUTLET MIDDLE ISLAND CREEK
 QUADRANGLE PORTER FALLS 7.5' DISTRICT ELLSWORTH COUNTY TYLER
 SURFACE OWNER CLARA SUZANNE WALLACE & RICKIE WALLACE ACREAGE 60 ACRES +/-
 OIL & GAS ROYALTY OWNER PHILLIP K. GEORGE; SAMUEL K. STONEKING JR; BRC APPALACHIAN MINERALS I LLC; LEASE ACREAGE 60 AC.±; 76.88 AC.±; 50 AC.±;
BRC APPALACHIAN MINERALS I LLC; GARY A. SOLE; D. RALPH THACKER; MERCER MINERALS LLC; MERCER MINERALS LLC; WILLIAM D. HOPE, 25.37 AC.±; 41.3 AC.±; 59 AC.±; 132 AC.±; 106 AC.±; 109 AC.±;
HAROLD S. YOST ET UX; BRC APPALACHIAN MINERALS I LLC; BRC APPALACHIAN MINERALS I LLC; SUZANNE HILL; SUZANNE HILL; DAVID LEE SMITH 87 AC.±; 25 AC.±; 52 AC.±; 51.4 AC.±; 93.5 AC.±; 35 AC.±;
 PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER X REDRILL ___ FRACTURE OR STIMULATE X
 PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL
 (SPECIFY) MOD-BHL PLUG & ABANDON CLEAN OUT & REPLUG
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,300' TVD 26,900' 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

LATITUDE 39°32'30" 417'

LATITUDE 39°35'00" 7,678' TO BOTTOM HOLE

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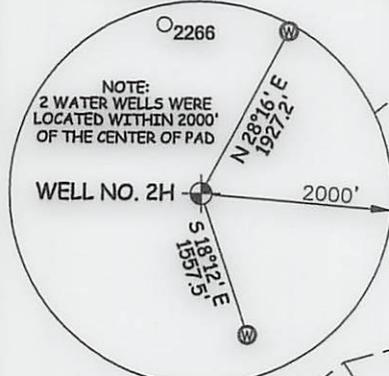
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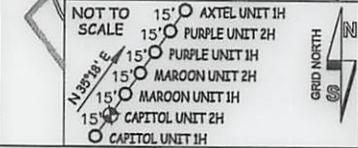
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Thomas Summers
 THOMAS SUMMERS P.S. 2109

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 ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD
 DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME 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>Philip K. George Lease</u>			
Philip K. George	Statoil USA Onshore Properties	1/8+	0466/0193
Statoil USA Onshore Properties	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<u>Samuel K. Stoneking Jr Lease</u>			
Samuel K. Stoneking Jr	Statoil USA Onshore Properties Inc	1/8	456/688
Statoil USA Onshore Properties Inc	EQT Production Company	Assignment	539/239
EQT Production Company	Antero Resources Corporation	Assignment	663/1
<u>BRC Appalachian Minerals I LLC Lease</u>			
BRC Appalachian Mineral I LLC	BRC Working Interest Company LLC	1/8	369/300
BRC Working Interest Company LLC	Chesapeake Appalachia LLC	Assignment	369/784
Chesapeake Appalachia LLC	Statoil USA Onshore Properties Inc	Assignment	423/165
Statoil USA Onshore Properties Inc	EQT Production Company	Assignment	539/239
EQT Production Company	Antero Resources Corporation	Assignment	663/1
<u>Gary A. Sole Lease</u>			
Gary A. Sole	Antero Resources Corporation	1/8+	607/122
<u>D. Ralph Thacker et al Lease</u>			
D. Ralph Thacker et al	Petroedge Energy LLC	1/8	385/157
Petroedge Energy LLC	Statoil USA Onshore Properties Inc	Assignment	406/147
Statoil USA Onshore Properties Inc	EQT Production Company	Assignment	539/239
EQT Production Company	Antero Resources Corporation	Assignment	663/1
<u>Mercer Minerals LLC Lease</u>			
Mercer Minerals LLC	Antero Resources Corporation	1/8+	81/182
<u>Mercer Mineral LLC Lease</u>			
Mercer Minerals LLC	Antero Resources Corporation	1/8+	547/643
<u>William D. Hope Lease</u>			
William D. Hope	Antero Resources Corporation	1/8+	4/734
<u>Harold S. Yost Et Ux Lease</u>			
Harold S Yost Et Ux	Harrison Energy Services LLC	1/8	569/424
Harrison Energy Services LLC	Antero Resources Corporation	Assignment	584/437

*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.

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Chesapeake Appalachia LLC	Statoil USA Onshore Properties Inc	Assignment	423/165
Statoil USA Onshore Properties Inc	EQT Production Company	Assignment	539/239
EQT Production Company	Antero Resources Corporation	Assignment	663/1
<u>Suzanne Hill Lease</u>			
Suzanne Hill	Antero Resources Corporation	1/8+	263A/587
<u>Charles E. Gump Et Ux Lease</u>			
Charles E. Gump Et Ux	Antero Resources Corporation	1/8+	216A/831
<u>Suzanne Hill Lease</u>			
Suzanne Hill	Antero Resources Corporation	1/8+	237A/130

*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. 12/17/2021

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)**

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

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

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>David Lee Smith Lease</u>	David Lee Smith	Antero Resources Corporation	1/8+	237A/442

*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.

***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**

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

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

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

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

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



December 8, 2021

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: Mr. Taylor Brewer
601 57th Street
Charleston, WV 25304

Mr. Brewer:

Antero Resources Corporation (Antero) would like to submit the following permit modifications for approved well on the existing Thin Air Pad: Capitol Unit 2H (47-095-02755-00) and Maroon Unit 1H (47-095-02756-00) Expedited.

Attached you will find the following:

- Revised Form WW-6B
- Revised Form WW-6A1
- Revised Mylar Plat
- AOR

*CHK # 4002034
Amt \$ 5000
Date 11/2/21*

If you have any questions please feel free to contact me at (303) 357-7182.

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in blue ink, appearing to read "M Stanton".

Mallory Stanton
Permitting Supervisor
Antero Resources Corporation

Enclosures

RECEIVED
Office of Oil and Gas

DEC 09 2021

WV Department of
Environmental Protection

12/17/2021



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

Modification Horizontal H6A Well Work Permit (API: 47-095-02755 & 47-095-02756)

1 message

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

Wed, Dec 15, 2021 at 11:28 AM

To: Mallory Stanton <mstanton@anteroresources.com>, mhamsher@anteroresources.com, Dani DeVito <ddevito@shalepro.com>, Douglas Newlon <douglas.c.newlon@wv.gov>, ljackson@wvassessor.com

I have attached a copy of the newly issued well [permit](#) number:

47-095-02755 - CAPITOL UNIT 2H**47-095-02756 - MAROON UNIT 1H**

This will serve as your copy.

If you have any questions, then [please](#) contact us here at the Office of Oil and Gas.

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**

2 attachments **47-095-02755 - mod.pdf**
2845K **47-095-02756 - mod.pdf**
2383K**12/17/2021**