



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

Thursday, March 26, 2020
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for LANCASTER 1H
47-095-02674-00-00

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: LANCASTER 1H
Farm Name: MICHAEL J. & MELINDA R. HOGUE
U.S. WELL NUMBER: 47-095-02674-00-00
Horizontal 6A New Drill
Date Modification Issued: 3/26/2020

Promoting a healthy environment.

WW-6B
(04/15)

API NO. 47- 095 - 02674
OPERATOR WELL NO. Lancaster Unit 1H
Well Pad Name: Hogue 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 Middlebourne 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Lancaster Unit 1H Well Pad Name: Hogue Pad

3) Farm Name/Surface Owner: Michael J. & Melinda R. Hogue Public Road Access: Klondike Acres Road

4) Elevation, current ground: 1033' Elevation, proposed post-construction: ~1014.5

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal

JEB
2/27/2020

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale: 6900' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2850#

8) Proposed Total Vertical Depth: 6900' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 18600' MD

11) Proposed Horizontal Leg Length: 8903'

12) Approximate Fresh Water Strata Depths: 456'

13) Method to Determine Fresh Water Depths: 47-095-00704

14) Approximate Saltwater Depths: 1581'

15) Approximate Coal Seam Depths: 740'

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	16"	New	H-40	94#	80	80	CTS, 63 Cu. Ft.
Fresh Water	10 3/4"	New	J-55	40.5#	506 *see # 19	506 *see # 19	CTS, 368 Cu. Ft.
Coal	75/8"	New	K-55	26.4#	2500	2500	CTS, 698 Cu. Ft.
Intermediate							
Production	5"	New	P-110	18#	18600	18600	4707 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

JCB
2/27/2020

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	16"	20"	0.438"	2630	50	Class A	~1.2
Fresh Water	10 3/4"	13 1/2"	0.35"	2730	1000	Class A	~1.2
Coal	7-5/8"	9 5/8"	0.328"	4140	1500	Class A	~1.2
Intermediate							
Production	5"	6 3/4"	0.362"	15840	2500	Class H	~1.26
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

PACKERS

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

RECEIVED
5/11/2020
2/27/2020
WV Dept. of Environmental Protection

WW-6B
(10/14)

API NO. 47-095 - 02674
OPERATOR WELL NO. Lancaster Unit 1H
Well Pad Name: Hogue 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.

*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

JCB
2/27/2020

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 28.10 acres

22) Area to be disturbed for well pad only, less access road (acres): 12.79 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:

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.



LANCASTER UNIT 1H (HOGUE PAD)- AREA OF REVIEW 35-8-5.11

PERMIT MODIFICATION API # 47-095-02674

Lancaster Unit 1H



Antero Resources Corporation

Lancaster Unit 1H - AOR



REMARKS
No Wells of Interest

October 30, 2019

RECEIVED
Office of Oil and Gas
FEB 25 2020
WV Department of
Environmental Protection

QCB
2/27/2020

Operator's Well Number Lancaster Unit 1H

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>Michael J. & Melinda R. Hogue Lease (TM 20 PCL 108)</u>			
Michael J. & Melinda R. Hogue	Statoil USA Onshore Properties Inc.	1/8	0449/0283
Statoil USA Onshore Properties Inc.	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<u>Ridgetop Capital LP Lease</u>			
Ridgetop Capital LP	Antero Resources Corporation	1/8+	0634/0345
<u>James F. Doan et ux Lease (TM 26 PCL 46.1)</u>			
James F. Doan et ux	Chesapeake Appalachia	1/8	0376/0345
Chesapeake Appalachia	SWN Production Company LLC	Assignment	0465/0463
SWN Production Company	Antero Exchange Properties	Assignment	0544/0242
Antero Exchange Properties	Antero Resources Corporation	Merger	0552/0315
<u>James F. Doan et ux Lease (TM 26 PCL 46.1)</u>			
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Chesapeake Appalachia	SWN Production Company LLC	Assignment	0465/0463
SWN Production Company	Antero Exchange Properties	Assignment	0544/0242
Antero Exchange Properties	Antero Resources Corporation	Merger	0552/0315
<u>Michael J. & Melinda R. Hogue Lease (TM 26 PCL 46.1)</u>			
Michael J. & Melinda R. Hogue	Statoil USA Onshore Properties Inc.	1/8	0449/0283
Statoil USA Onshore Properties Inc.	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
<u>Joe & Shirley Varese Lease</u>			
Joe & Shirley Varese	Antero Resources Appalachian Corporation	1/8+	0408/0456
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Eugene F. Howell et ux Lease</u>			
Eugene F. Howell et ux	Antero Resources Corporation	1/8	0635/0203
<u>Robert C. Kramer Lease</u>			
Robert C. Kramer	Antero Resources Corporation	1/8+	0553/0168
<u>Charles E. Anderson Lease</u>			
Charles E. Anderson	Chesapeake Appalachia LLC	1/8+	0465/0463
Chesapeake Appalachia LLC	SWN Production Company	Assignment	0544/0242
SWN Production Company	Antero Exchange Properties	Assignment	0552/0315
Antero Exchange Properties	Antero Resources Corporation	Name Change	Exhibit 1
<u>Ruth E. Blake Lease</u>			
Ruth E. Blake	Antero Resources Corporation	1/8+	0626/0575

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Earnestine Pelikan & David Leasure Lease</u>			
Earnestine Pelikan & David Leasure	Chesapeake Appalachia LLC	1/8+	0400/0118
Chesapeake Appalachia LLC	SWN Production Company	Assignment	0465/0463
SWN Production Company	Antero Exchange Properties	Assignment	0544/0242
Antero Exchange Properties	Antero Resources Corporation	Name Change	Exhibit 1
<u>Earnestine Pelikan Lease</u>			
Earnestine Pelikan	Antero Resources Corporation	1/8	0563/0549
<u>Rodney Mack Hayes Lease</u>			
Rodney Mack Hayes	Antero Resources Corporation	1/8+	0622/0520
<u>Earl E. Turner Lease</u>			
Earl E. Turner	Antero Resources Corporation	1/8+	0624/0028
<u>Thurl Wayne Jones Lease</u>			
Thurl Wayne Jones	Antero Resources Corporation	1/8+	0624/0019
<u>Brenda Lee Oyster Lease (TM 20A PCL 30)</u>			
Brenda Lee Oyster	Antero Resources Corporation	1/8+	0619/0348
<u>Brenda Lee Oyster Lease (TM 20A PCL 31)</u>			
Brenda Lee Oyster	Antero Resources Corporation	1/8+	0619/0345
<u>Carolyn Westfall Barnhart Lease</u>			
Carolyn Westfall Barnhart	Antero Resources Corporation	1/8+	0666/0334
<u>Sara J. Judge Lease</u>			
Sara J. Judge	Antero Resources Corporation	1/8+	0012/0623
<u>Robert E. Judge Lease</u>			
Robert E. Judge	Antero Resources Corporation	1/8+	0624/0022
<u>James D. Hardesty Lease</u>			
James D. Hardesty	Antero Resources Corporation	1/8+	0625/0185

*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****

WW-6A1
(5/13)

Operator's Well No. Lancaster Unit 1H

**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:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Tustin Family Trust Lease</u>	Tustin Family Trust	Antero Resources Corporation	1/8+	0635/0227

*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

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

**FORM WW-6A1
EXHIBIT 1**

FILED

JUN 10 2013

Natalie E. Tammant,
Secretary of State
1900 Kanawha Blvd E
Bldg 1, Suite 157-E
Charleston, WV 25305



Penney Becker, Manager
Corporations Division
Tel: (304)338-9000
Fax: (304)338-4381
Website: www.wvscot.com
E-mail: business@wvscot.com

**APPLICATION FOR
AMENDED CERTIFICATE
OF AUTHORITY**

Office Hours: Monday - Friday
8:30 a.m. - 5:00 p.m. ET

FILE ONE ORIGINAL
(Two if you want a filed
stamped copy returned to you)
FEE: \$25.00

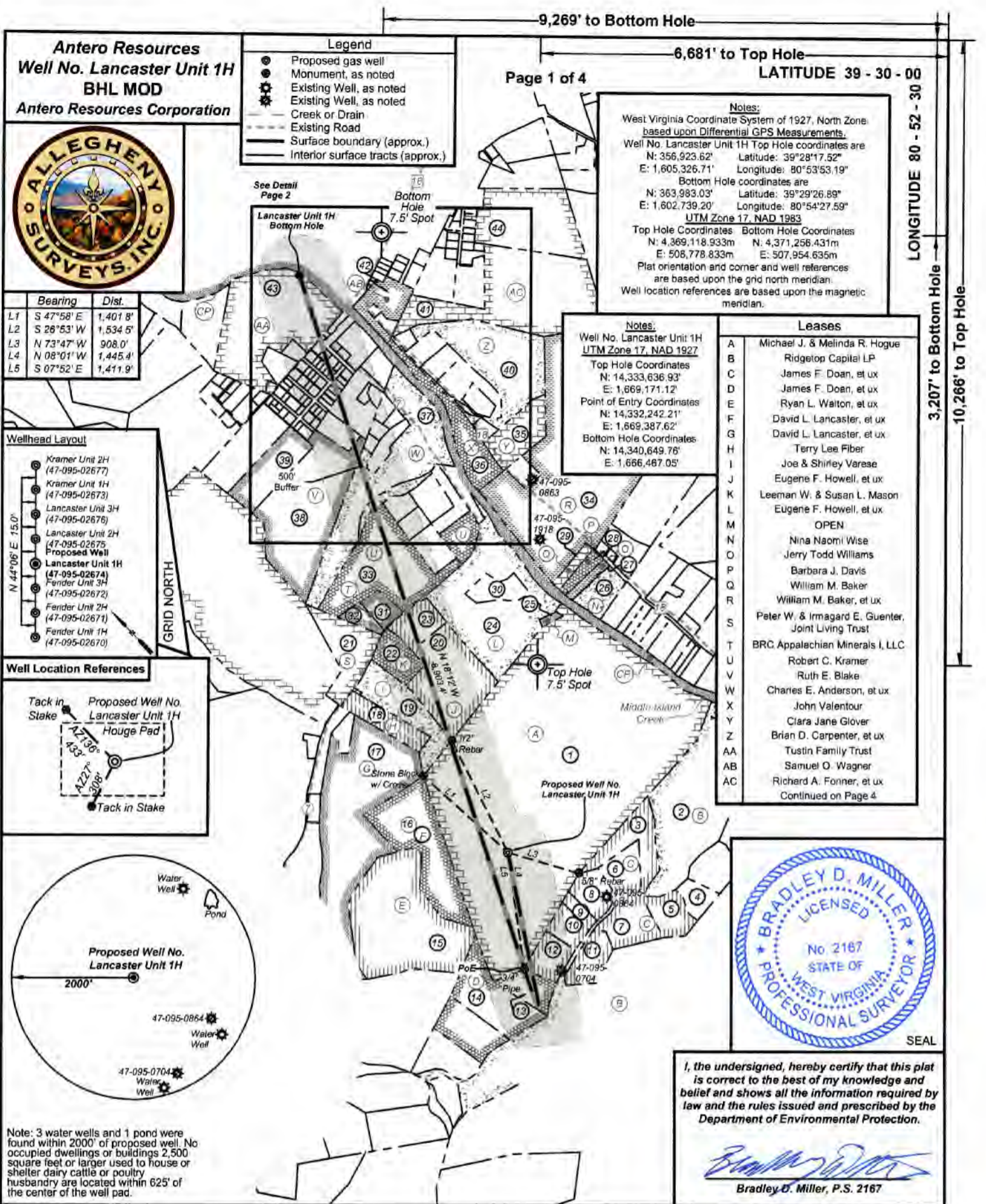
**** In accordance with the provisions of the West Virginia Code, the undersigned corporation hereby ****
applies for an Amended Certificate of Authority and submits the following statement:

- Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachia Corporation
- Date Certificate of Authority was issued in West Virginia: 6/26/2008
- Corporate name has been changed to: Antero Resources Corporation
(Attach one Certified Copy of Name Change as filed in home State of Incorporation.)
- Name the corporation elects to use in WV: Antero Resources Corporation
(due to home state name not being available)
- Other amendments: (attach additional pages if necessary)
- Name and phone number of contact person. (This is optional; however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)

<u>Allyn A. Schopp</u>	<u>(304) 367-7910</u>
Contact Name	Phone Number
- Signature information (See below **Important Local Notice Regarding Signatures**):

Print Name of Signer: <u>Allyn A. Schopp</u>	Title/Capacity: <u>Authorized Person</u>
Signature: <u><i>Allyn A. Schopp</i></u>	Date: <u>June 10, 2013</u>

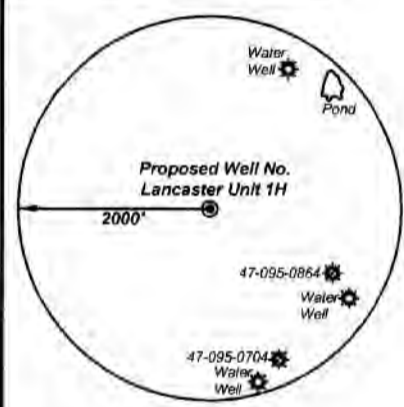
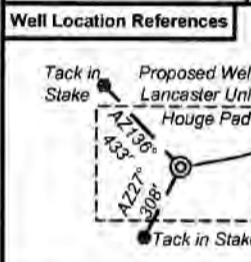
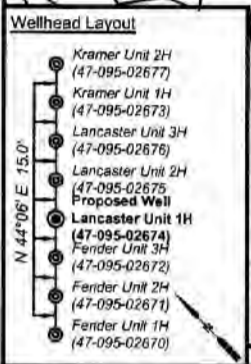
Important Local Notice Regarding Signatures For West Virginia Code §12-2-12b. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.



Antero Resources
Well No. Lancaster Unit 1H
BHL MOD
Antero Resources Corporation



	Bearing	Dist.
L1	S 47°58' E	1,401.8'
L2	S 28°53' W	1,534.5'
L3	N 73°47' W	908.0'
L4	N 08°01' W	1,445.4'
L5	S 07°52' E	1,411.9'



Note: 3 water wells and 1 pond 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.

FILE NO: 11-54-E-19
 DRAWING NO: Lancaster Unit 1H Well Plat
 SCALE: 1" = 1500'
 MINIMUM DEGREE OF ACCURACY: Submeter
 PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

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

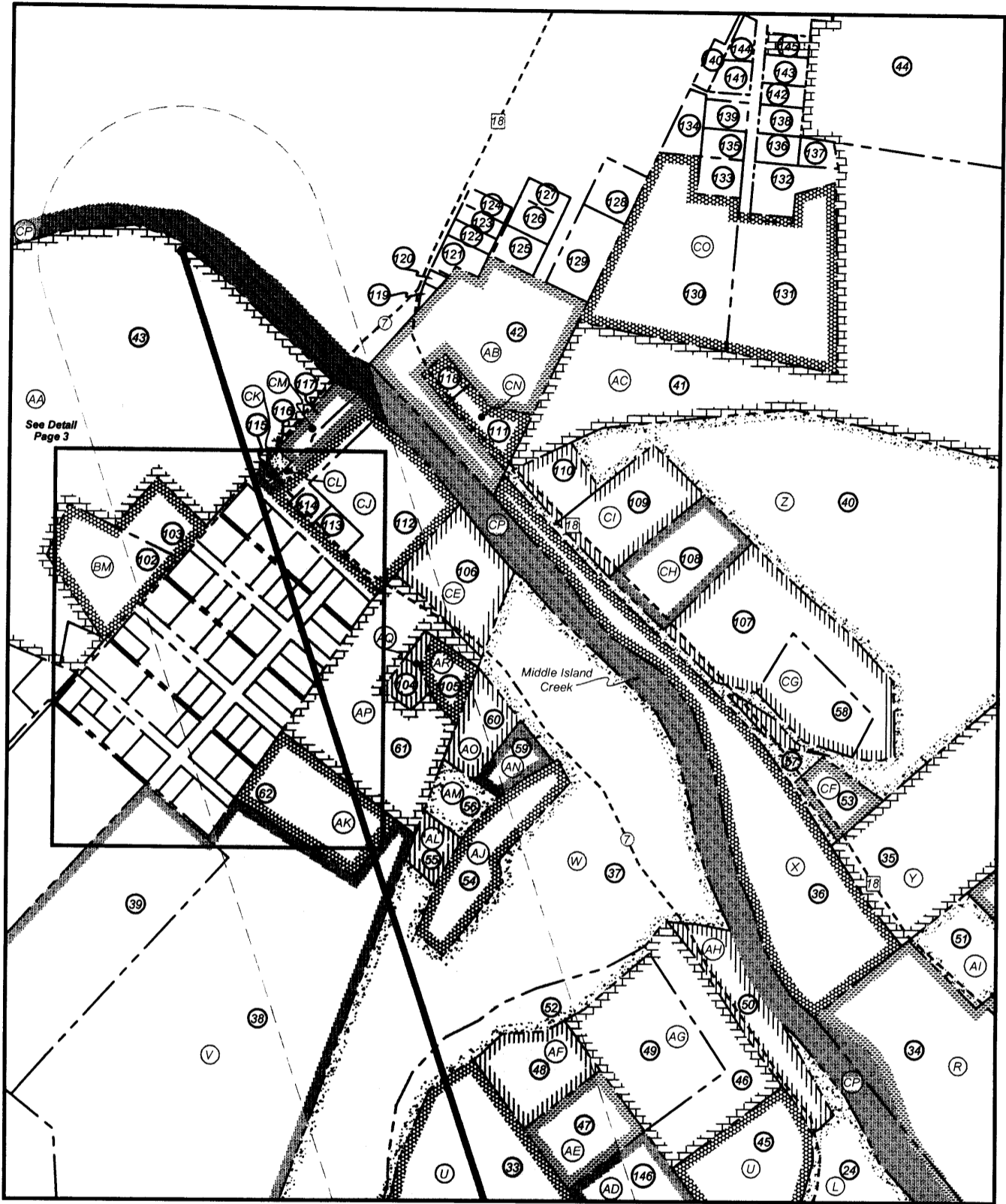
DATE: February 11, 2020
 OPERATOR'S WELL NO. Lancaster 1H
 API WELL NO
 47 - 095 - 02674
 STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
 LOCATION: ELEVATION: Existing 1,033' Proposed 1,014.5' WATERSHED: Outlet Middle Island Creek QUADRANGLE: _____
 DISTRICT: Ellsworth COUNTY: Tyler
 SURFACE OWNER: Michael J. & Melinda R. Hogue ACREAGE: 192.0
 ROYALTY OWNER: Michael J. & Melinda R. Hogue; James F. Doan, et ux; Ridgeloop Capital LP; Ruth E. Blake LEASE NO: _____ ACREAGE: 0.4343; 28.65; 0.70
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) BHL MOD ESTIMATED DEPTH: 6,900' TVD
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 18,600' 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



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, P.S. 2167



See Detail
Page 3

Middle Island Creek

FILE NO: 11-54-E-19
 DRAWING NO: Lancaster Unit 1H Well Plat
 SCALE: 1" = 1500'
 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: February 11, 2020
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 API WELL NO
 47 - 095 - 02674
 STATE COUNTY PERMIT

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

LOCATION: ELEVATION: Existing 1,033' Proposed 1,014.5' WATERSHED: Outlet Middle Island Creek QUADRANGLE: _____

DISTRICT: Ellsworth COUNTY: Tyler

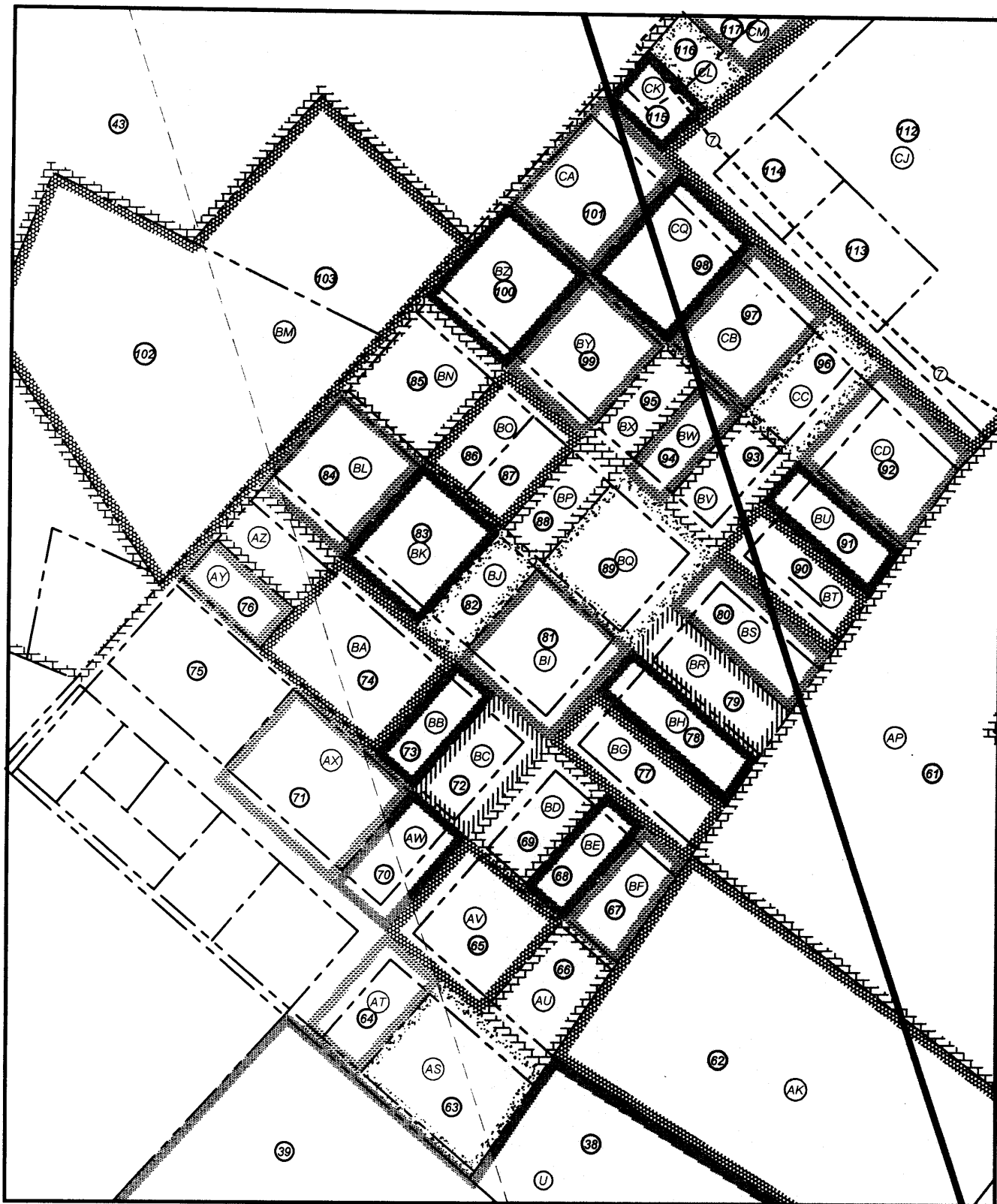
SURFACE OWNER: Michael J. & Melinda R. Hogue ACREAGE: 192.0

ROYALTY OWNER: Michael J. & Melinda R. Hogue; James F. Doan, et ux; Ridgetop Capital LP; Ruth E. Blake LEASE NO: _____ ACREAGE: 0.4343; 28.65; 0.70

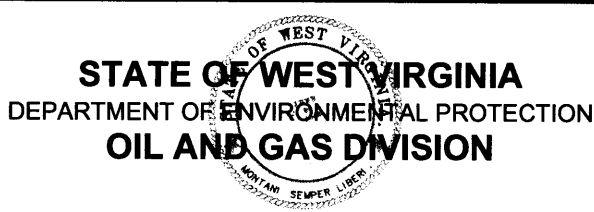
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PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 18,600' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
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 Submeter
 PROVEN SOURCE OF ELEVATION:
 WVDOT, Harrisville, WV



DATE: February 11, 2020
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 STATE COUNTY PERMIT

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

LOCATION: ELEVATION: Existing 1,033' Proposed 1,014.5'
 DISTRICT: Ellsworth
 SURFACE OWNER: Michael J. & Melinda R. Hogue
 ROYALTY OWNER: Michael J. & Melinda R. Hogue; James F. Doan, et ux; Ridgetop Capital LP; Ruth E. Blake
 WATERSHED: Outlet Middle Island Creek
 QUADRANGLE:
 COUNTY: Tyler
 ACREAGE: 192.0

0.16751;
 0.19971; 0.16319;
 41.425; 191.5; 81.33;
 310.393; 11.318;
 5.493; 47.016;
 25.189; 23.964;
 29.806; 3.0; 6.39;
 0.19322; 0.21657;
 0.1951; 0.05739;
 0.4343; 28.65; 0.70

PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
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 6,900' TVD

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 Denver, CO 80202
 DESIGNATED AGENT: Dianna Stamper - CT Corporation System
 ADDRESS: 5400 D Big Tyler Road
 Charleston, WV 25313

