

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

Friday, March 1, 2019 PERMIT MODIFICATION APPROVAL Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET

DENVER, CO 80202

Permit Modification Approval for BRADEN UNIT 1H Re:

47-095-02545-00-00

Modified Well Bore Point of Entry

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

Operator's Well Number: BRADEN UNIT 1H

Farm Name: STEPHEN GRIMM

U.S. WELL NUMBER: 47-095-02545-00-00

Horizontal 6A New Drill

Date Modification Issued: March 1, 2019

Promoting a healthy environment.

WW-6B (04/15)

API NO. 47-095	_ 02545 1000001/201	٤
OPERATOR V	VELL NO. Braden Unit 1H	

Well Pad Name: Alta Pad

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

1) Well Operat	or: Antero F	Resources	Corpora	494507062	095 - Tyler	McElroy	Centerpoint 7.5'
, - F	 -	,		Operator ID	County	District	Quadrangle
2) Operator's V	Well Number:	Braden U	nit 1H	Well Pad	Name: Alta F	Pad	
3) Farm Name/	/Surface Own	er: Stephe	en Grimm	Public Roa	d Access: CR	23	
4) Elevation, co	urrent ground	827'	El	evation, proposed	post-constructi	on:	
5) Well Type	(a) Gas \geq Other	(_ Oil	Unde	erground Storag	ge	
	(b)If Gas	Shallow Horizontal	X	Deep			
6) Existing Pac	d: Yes or No	Yes					
, <u>1</u>	•		. , ,	ipated Thickness a ss- 55 feet, Associa	-		
8) Proposed To	otal Vertical D	epth: 710	00' TVD				
9) Formation a			Marcellus	·			
10) Proposed 7	Total Measure	d Depth:	20700' M	D			
11) Proposed H	Horizontal Leg	g Length:	12004'				
12) Approxima	ate Fresh Wate	er Strata De	epths:	29', 369'			
13) Method to 14) Approxima					oths have been ad	justed accord	ing to surface elevations.
15) Approxima	ate Coal Seam	Depths: 1	None Iden	tified			
16) Approxima	ate Depth to P	ossible Voi	id (coal mi	ne, karst, other): _	None Anticipa	ted	
17) Does Propo directly overly				ms Yes	No	X	
(a) If Yes, pro	ovide Mine In	fo: Name	»:				
		Depth	1:	Cont.	RECEIVED.		
		Seam	<u></u>	Fas	5-7264		
		Owne	er:		epartition of the lental Protection		

API NO.	47 ⁰⁹⁵	_ 02545	03/01	<u>/201</u>	S

OPERATOR WELL NO. Braden Unit 1H
Well Pad Name: Alta Pad

18)

CASING AND TUBING PROGRAM

ТҮРЕ	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#	420' *see #19	420' *see #19	CTS, 583 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#	20700'	20700'	5284 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#		7100'	
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				_
Sizes:	N/A				-
Depths Set:	N/A				
	<u> </u>	Office	of Oil and Gas	<u> </u>	

FEB - 7 2019

WV Department of Environmental Protection

OPERATOR WELL NO. Braden Unit 1H

Well Pad Name: Alta 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

- 21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 17.43 acres
- 22) Area to be disturbed for well pad only, less access road (acres): 7.28 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.

Office of Oil and Gas

*Note: Attach additional sheets as needed.

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Permit Modification API# 47-095-02545 MD9

graden Unit 1H



0 1,000 2,000 FEET

No wells of interest REMARKS

February 27, 2018

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WV Department of Environmental Protection

Braden Unit 1H

Permit Modification API# 47-095-02545 WV9

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
M.V. B. George Lease			
M. V. B. George	IM Underwood	1/8	0066/0621
	Hope Natural Gas Company	Assignment	0071/0610
IM Underwood	Consolidated Gas Supply Corp	Assignment	0169/0026
Hope Natural Gas Company	Consolidated Gas Supply Corp Consolidated Gas Transmission Corp	Assignment	0249/0287
Consolidated Gas Supply Corp		Name Change	Exhibit 2
Consolidated Gas Transmission Corp	CNG Transmission Corp	Name Change	Exhibit 3
CNG Transmission Corp	Dominion Transmission, Inc	Assignment	0374/0187
Dominion Transmission, Inc	CONSOL Energy Holding LLC		0293/0252
CONSOL Energy Holdings, LLC	CNX Gas Company	Name Change	0425/0725
CNX Gas Company	Antero Resources Appalachian Corp	Assignment	Exhibit 1
Antero Resources Appalachian Corp	Antero Resources Corp	Name Change	EXMIDIT 1
C.B. Morris & S.A. Smith Irrevocable Trust Lease	1		
C.B. Morris & S.A. Smith Irrevocable Trust	Antero Resources Corporation	1/8	0632/0551
Mary Jo Foster Living Trust Lease /			
Mary Jo Foster Living Trust	Antero Resources Appalachian Corporation	1/8+	0406/0215
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
Randi Michael Lease			
Randi Michael	Antero Resources Corporation	1/8+	0474/0777
Donna Fogus Lease			
Donna Fogus	Antero Resources Corporation	1/8+	0577/0362
Bayard Sweeney Jr, et ux Lease	Drilling Appalachian Corporation	1/8	0319/0308
Bayard Sweeney Jr, et ux		Assignment	0313/0308
Drilling Appalachian Corporation	Antero Resources Appalachian Corporation Antero Resources Corporation	Name Change	Exhibit 1
Antero Resources Appalachian Corporation	Antero Resources Corporation	warne Change	EXHIBIT
Donald Lee Sweeney Lease			
Donald Lee Sweeney	Four Leaf Land Company	1/8	0370/0605
Four Leaf Land Company	Antero Resources Appalachian Corporation	Assignment	0403/0561
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
Life & Abey LLC Lease (TM 16 PCL 5)	REC	EIVED	
Life & Abey LLC	Antero Resources Corporation Office of (Oil and Gas 1/8	0534/0716
Life & Abey LLC Lease	FEB -	7 2010	
Life & Abey LLC Lease	Antero Resources Corporation	1 2019	0534/0716
LIIE & ADEY LLC			0554/0/10
	WV Depa Environment	inment of	

^{*}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.

WW-6A1 (5/13) Operator's Well No. Braden Unit 1H

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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
Bayard Sweeney, Jr., et ux Le	ase			
	Bayard Sweeney, Jr., et ux	Drilling Appalachian Corporation	1/8	0319/0308
	Drilling Appalachian Corporation	Antero Resources Appalachian Corporation	Assignment	0391/0416
	Antero Resources Appalachian Corp.	Antero Resources Corporation	Name Change	Exhibit 1

*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.

By:	Kevin Kilstrom	litus		
Its:	Senior Vice President Production			
Office of (Dil and Gas			
FEB -	7 2019	Page 1 of		

FORM WW-6A1 EXHIBIT 1



Nitalie B. Tennant Sceretary of State 1900 Kanawha Bivd B Bldg 1, Suite 157-K Charleston, WV 25305

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



Penney Barker, Manager
IN THE OFFICE OF Corporations Division
SECRETARY OF STATE Tel: (304)558-8000
Penney Barker, Manager
IN THE OFFICE OF Corporations Division
SECRETARY OF STATE Page (304)558-8381

Webaite: www.wysos.com
E-mail: business@wysos.com

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

APPLICATION FOR AMENDED CERTIFICATE OF AUTHORITY

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

1.	Name under which the corporation was authorized to transact business in WV:	Antero Resources Appalachian Corporation
2.	Date Certificate of Authority was issued in West Virginia:	6/25/2008
3.	Corporate name has been changed to: (Attach one <u>Certified Copy of Name Change</u> as filed in home State of incorporation.)	Antero Resources Corporation
4.		Antero Resources Corporation
5.	Other amendments: (attach additional pages if necessary)	
	5.1	1 3
	* *	
6.	Name and phone number of contact person. (the filing, listing a contact person and phone num document.)	This is optional, however, if there is a problem with nber may avoid having to return or reject the
	Alvyn A. Schopp	(303) 357-7310
	Contact Name	Phone Number
7.	Signature information (See below *Important	Legal Notice Reparding Signature):
	Print Name of Signer: Alayn A. Schopp	Title/Capacity: Authorized Person
	Signature: 43 Hacksop	Date: June 10, 2013
to ti	nortent Level Notice Repartitus Standauge For West Virgi person vino signs a document ha or she knows is false in an he secretary of state for filing is guilty of a misdomessor and, spand dollars or confined in the county or regional jail not mo	y mniorial respect and knows that the document is to be del upon conviction thereof, shall be fined not more than one

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listed by the Office of the Secretary of Siste-RECEIVED Office of Oil and Gas

Revised 4/1

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