

#### 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, April 3, 2023 PERMIT MODIFICATION APPROVAL Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET

DENVER, CO 80202

Re:

Permit Modification Approval for JENKINS 1H

47-017-06942-00-00

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.

Operator's Well Number: JENKINS 1H

Farm Name: ANTERO RESOURCES CORPORATION U.S. WELL NUMBER: 47-017-06942-00-00

Horizontal 6A New Drill

Date Modification Issued: 04/03/2023

Promoting a healthy environment.

API NO. 47-017 -		
<b>OPERATOR WELL</b>	NO.	Jenkins Unit 1H MOD
Well Pad Name:	Locke	Pad

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

						6	6	
1) Well Operate	or: Antero Re	sources Corp	man ]		017 - Dodd	Southwe	Oxford 7.5'	1
			Oper	rator ID	County	District	Quadrangle	
2) Operator's V	Vell Number: J	enkins Unit 11	H MOD	_ Well Pa	d Name: Lock	e Pad		
3) Farm Name/	Surface Owner	Antero Resource	s Corporation	Public Ro	ad Access: Ta	ylor Drain R	Road	
4) Elevation, cu	irrent ground:	1100.5' - As Buil	Elevation	ı, proposed	post-construct	ion:		
5) Well Type	(a) Gas X	Oi	1	Und	erground Stora	nge		
	Other							
	(b)If Gas Sh	nallow X		Deep		5		
	He	orizontal X						
6) Existing Pad	: Yes or No Ye	es		<del>-</del> ,_				
7) Proposed Tar Marcellus Sh	rget Formation( ale: 7000' TVD,							
8) Proposed To	tal Vertical Dep	oth: 7000' TV	D					
9) Formation at	Total Vertical	Depth: Marce	ellus					
10) Proposed To	otal Measured I	Depth: 1870	o' MD /					
11) Proposed H	orizontal Leg L	ength: 9457'	*Open to	o modifica	tion at a later	date /		
12) Approximat	te Fresh Water	Strata Depths:	236',	260', 320',	326' /			
13) Method to I	Determine Fresh	Water Depths	47017033900	000, 47017000980	000 Offset well records. De	epths have been adjus	ted according to surface of	elevations.
14) Approximat	te Saltwater De	oths: 1733', 1	750'					
15) Approximat	te Coal Seam D	epths: None	Anticipated					
16) Approximat	te Depth to Poss	sible Void (coa	l mine, kar	st, other):	None Anticipa	ited		
17) Does Propos	sed well location	n contain coal	ceame					
directly overlying				es	No	X		
(a) If Yes, pro-	vide Mine Info:	Name:						
		Depth:						
		Seam:			Off	RECEIVED ice of Oil and G	eas .	
		Owner:				APR 0 3 207		
					P	APK W D ZU	LJ	
					V Envi	VV Department ronmental Prot	of ection	

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03/31/2025

WW-6B (04/15)

API NO. 47- 017 OPERATOR WELL NO. Jenkins Unit 1H MOD
Well Pad Name: Locke Pad

# 18)

### **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	<u>Grade</u>	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	79#	100'	100'	CTS, 96 Cu. Ft.
Fresh Water	13-3/8"	New	J/K-55	54.5#	376'	376'	CTS, 392 Cu. Ft.
Coal	9-5/8"	New	J-/K55	36#	2500'	2500' /	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110CY	20#	18700'	18700'	CTS, 3784 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"	0.375"	2250	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"	14,360	2500	Class G/H	~1.8
Tubing	2-3/8"	4.778"	0.19"	11,200	and the second s		
Liners							

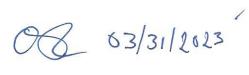
# **PACKERS**

Kind:	N/A	
Sizes:	N/A	
Depths Set:	N/A	BECEIVED
		Office of Oil and Gas

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WW-6B (10/14)

API NO. 47- 017

OPERATOR WELL NO. Jenkins Unit 1H MOD Well Pad Name: Locke Pad

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill a new horizontal shallow well into the 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): 27.54 acres

22) Area to be disturbed for well pad only, less access road (acres): 13.31 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 G/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.

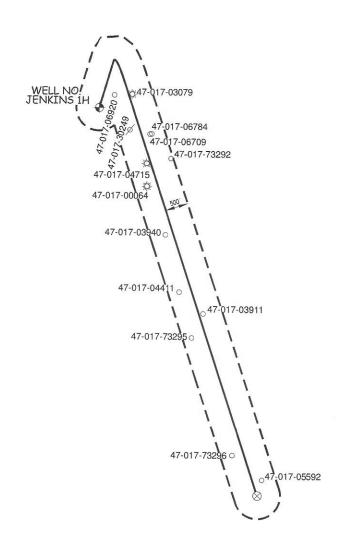
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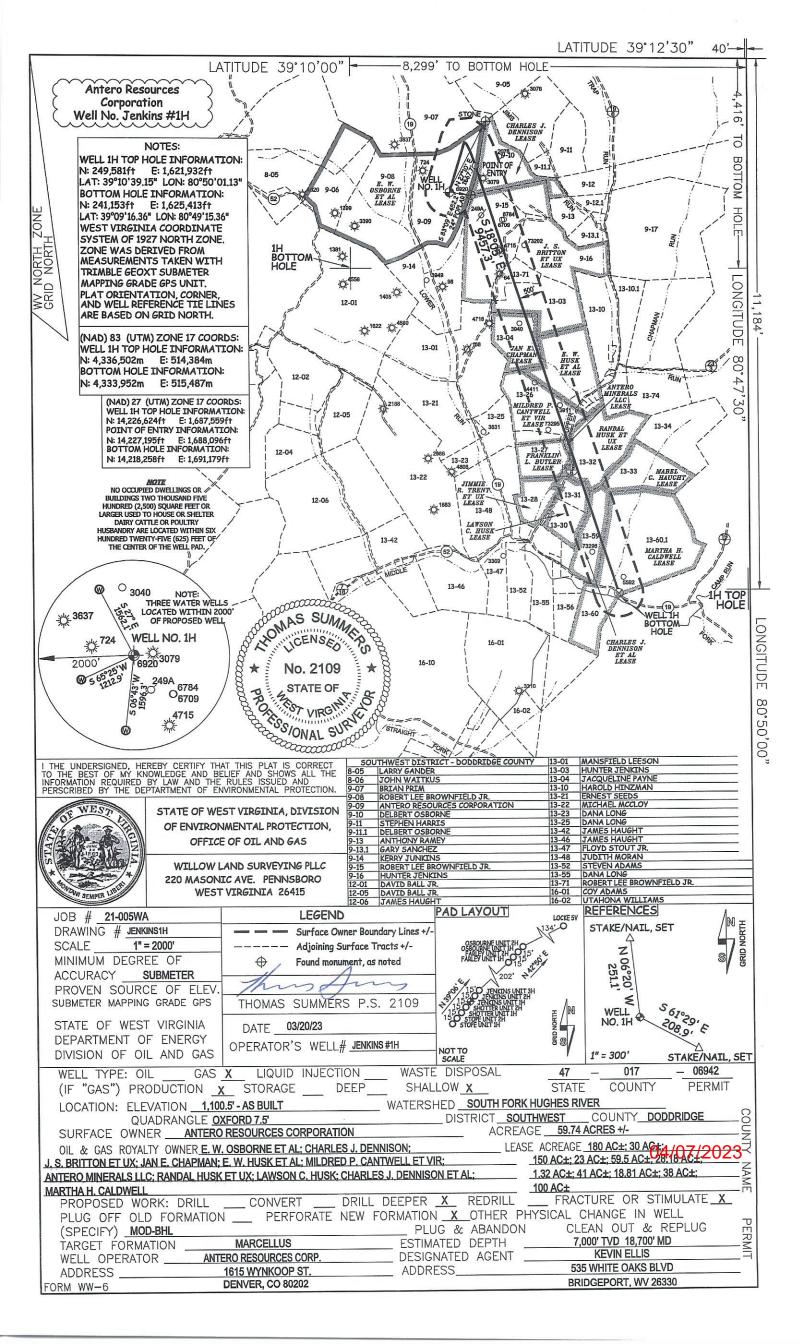


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D LOCKE/DONALD & BARBARA OSBURN		EQT PRODUCTION CO	FOT PRODUCTION CO			december, barrey, bravalles	Well, befea
747017732920000 77047047450000 parteron			PRODUCTION CO	10.359			Weir, Berea
ACTUAL COOCULTACTOR				2000			
4/01/04/130000 BRILLON	1 KE	KEY OIL CO	KEY OIL CO	5.330	3257 - 5141	Marran Crearble Balltanin Billia monde Anna Alexandra	Marie D. Company
47017000640000 J S BRITTON 609	6093 EC	EQUITABLE GAS CO	18W VA GAS	2 062		Allerhany Bir Inlin	Weir, berea
47017302490000 S W STOUT 39	1299 HC	HOPE CONSTR & REFG	100	2774		Anegheny, big injuit	Welf, Benson, Alexander
47017039400000 FISHER BERNARD G ETAL	'AY/FISHER EA	PARKWAY/FISHER FASTERN AMERICAN ENF	RN AMERICAN ENE			i do los	Weir, Benson, Alexander
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47017732960000 W J HICKMAN 1	1 PF	PHILADELPHIA OIL	PHILADELPHIA OIL				Weir, benson, Alexander
-47017055920000 HICKMAN 1	1 RI	RITCHIE PET CORP	JAY BEE PRODUCTION	6,432	6301 - 6411	Marcellus	weil, benson, Alexander

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WV Department of Environmental Protection



Operator's Well Number

Jenkins Unit 1H 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
E.W. Osbourne, et al Lease			<u> </u>
E.W. Osbourne et al	Hope Natural Gas	1/8	F7/422
Hope Natural Gas	Trio Oil and Gas Company	Assignment	57/132
Trio Oil and Gas Company	Charter D. Stinespring, Paul B. Davis and G.W. Hill	20 MAN	72/496
Charter D. Stinespring, Paul B. Davis and G.W. Hill	J & J Enterprises, Inc	Assignment Assignment	131/687
J & J Enterprises, Inc	Eastern American Energy Corporation		131/762
Eastern American Energy Corporation	Energy Corporation of America	Assignment	159/139
Energy Corporation of America	Antero Resources Appalachian Corporation	Merger	6/450
Antero Resources Appalachian Corporation	Antero Resources Corporation	Assignment Name Change	272/307
1	Same of the control o	Name Change	46/523
Charles J. Dennison Lease			
Chareles J. Dennison	Clarence Mutschelknaus et al	1/8	105/129
Clarence Mutschelknaus Et al	Antero Resources Appalachian Corporation	Assignment	262/74
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	46/523
J.S. Britton et ux Lease			
J.S. Britton et ux	U.G. Summers	1/8	22/438
U.G. Summers	The Fisher Oil Company	Assignment	22/443
The Fisher Oil Company	The Philadelphia Company of West Virginia	Assignment	24/64
The Philadelphia Company of West Virginia	Pittsburgh & WV Gas Company	Assignment	32/253
Pittsburgh & WV Gas Company Equitable Gas Company	Equitable Gas Company	Assignment	121/257
Equitable das company Equitrans Inc.	Equitrans Inc.	Assignment	154/475
Equitrans LP	Equitrans LP Equitable Production-Eastern States Inc.	Deed	302/123
Equitable Production-Eastern States Inc.	Equitable Production Company	Assignment	192/19
Equitable Production Company	EQT Production Company	Merge Name Change	281/346
<b>EQT Production Company</b>	Antero Resources Corporation	Assignment	281/346 <b>487/641</b>
/ Jan E. Chapman Lease		-	,
Jan E. Chapman	Antero Resources Corporation	1/0:	
	Antero Resources corporation	1/8+	512/522
E.W. Husk et al Lease			
E.W. Husk et al	Black Bear Oil & Gas Corporation et al	1/8	95/105
Black Bear Oil & Gas Corporation et al	Global Petroleum Investment Inc.	Assignment	97/674
Global Petroleum Investment Inc.	Awyard A. Pursley	Assignment	97/679
Awyard A. Pursley	Parkway Development Corporation et al	Assignment	165/261
Parkway Development Corporation et al Kiedaisch & Summers LLC	Kiedaisch & Summers LLC	Assignment	210/560
Antero Resources Appalachian Corporation	Antero Resources Appalachian Corporation	Assignment RECEIV	VED 303/505
The second cos Apparachian corporation	Antero Resources Corporation	Name Change Office of Oil	and Gas 46/523
Mildred P. Cantwell et vir Lease			
Mildred P. Cantwell et vir	Eastern American Energy Corporation	1/8 MAR 27	2023 181/89
Eastern American Energy Corporation	Energy Corporation of America	Merge WV Done	283/431
Energy Corporation of America	Antero Resources Appalachian Corporation	Merge WV Departm Assignment Environmental F Name Change	ient of 272/307
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	rotection 46/523

/ Antero Minerals LLC Lease

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	Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
	Antero Minerals LLC	Antero Resources Corporation	1/8+	503/362
/	Randall Husk et ux Lease Randall Husk et ux Clarence Mutschelknaus et ux Clarence Mutschelknaus, Jr.	Clarence Mutschelknaus et ux Clarence Mutschelknaus, Jr. Clarence Mutschelknaus, Jr. & Helen Suzanne	1/8 Assignment	128/763 234/273
	Clarence Mutschelknaus, Jr. & Helen Suzanne Osborne Blue Stone Energy Partners BEP Merger Sub LP Antero Resources Bluestone LLC	Osborne Blue Stone Energy Partners  BEP Merger Sub LP Antero Resources Bluestone LLC Antero Resources Appalachian Corporation	Assignment Assignment Merge Merge Merge Merge	234/323 245/542 288/1 288/1 WV SOS
1	Antero Resources Appalachian Corporation  Lawson C. Husk Lease Lawson C. Husk Clarence Mutschelknaus	Antero Resources Corporation  Clarence Mutschelknaus  Antero Resources Corporation	Name Change  1/8 Assignment	127/643 327/340
-	Charles J. Dennison et al Lease Charles J. Dennison et al Clarence Mutschelknaus	Clarence Mutschelknaus Antero Resources Corporation	1/8 Assignment	111/74 327/340



\*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.

Operator's	Wall	NIO	Jenkins	Unit	1H	MOD
Operator S	WEII	INO.	Commo	Offic	111	IVIOL

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Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
Martha H. Caldwell Lease			January Table 1	20011 480
	Martha H. Caldwell Jay-Bee Production Company JBU LLC	Jay-Bee Production Company JBU LLC Antero Resources Corporation	1/8 Assignment <b>Assignment</b>	206/384 278/209 <b>453/234</b>

\*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.

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

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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

Page 3 of 3



March 23, 2023

West Virginia Department of Environmental Protection Office of Oil and Gas Attn: Mr. Taylor Brewer 601 57<sup>th</sup> Street Charleston, WV 25304 Antero Resources 1615 Wynkoop Street Denver, CO 80202 Office 303.357.7310 Fax 303.357.7315

Mr. Brewer:

Antero Resources Corporation (Antero) would like to submit the following permit modifications for approved well on the existing Locke Pad: Jenkins Unit 1H (47-017-06942), Jenkins Unit 2H (47-017-06943), and Shotter Unit 2H (47-017-06946) Expedited.

Attached you will find the following:

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

CK#4018154 # 2500

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

Thank you in advance for your consideration.

Sincerely,

Enclosures

Stefan Gaspar Permitting Agent

Antero Resources Corporation

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