

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, January 18, 2022 PERMIT MODIFICATION APPROVAL New Drill / Modification/ Lateral Extension

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET DENVER, CO 80202

Re: Permit Modification Approval for PURPLE UNIT 2H

47-095-02759

Extending Lateral

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: PURPLE UNIT 2H

Farm Name: ANTERO RESOURCES CORPORATION

U.S. WELL NUMBER: 47-095-02759

New Drill Modification/ Lateral Extension

Date Modification Issued: 01/18/2022

Promoting a healthy environment.

API NO.	47-095	_ 02759 MOD

OPERATOR WELL NO. Purple Unit 2H

Well Pad Name: Thin Air Pad

Cht 4002037

\$500000

11/1/21

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

1) Well Operator: Ante	ero Resc	ources (Corporat	4945	07062	095-Tyler	Ellsworth	Porter Falls 7.5'
					ator ID	County	District	Quadrangle
2) Operator's Well Num	ber: Pur	rple Unit	2H		_ Well Pad	Name: Thin A	Air Pad	
3) Farm Name/Surface (Owner: _	Clara Suzanne	Wallace & Rickie	e Wallace	Public Road	d Access: CR	11	
4) Elevation, current gro	ound: _	1235'	Ele	evation	ı, proposed p	ost-construction	on:	
5) Well Type (a) Gas Other	X		Oil	-	Unde	rground Storag	e	
(b)If Ga			X X		Deep		s	
6) Existing Pad: Yes or	No Yes							
7) Proposed Target Form Marcellus Shale: 7300								
8) Proposed Total Vertice	cal Depth	n: 7300	' TVD					
9) Formation at Total Vo	ertical De	epth: N	1arcellus					
10) Proposed Total Mea	sured De	epth: 2	6000' MI	D /				
11) Proposed Horizontal	l Leg Ler	ngth: 1	6574'					
12) Approximate Fresh	Water St	rata Dep	ths:	76' a	nd 328' 🖊			
13) Method to Determin	e Fresh V	Water De	epths: 4	7-095-	02266			
14) Approximate Saltwa	iter Dept	hs: 166	60'					
15) Approximate Coal S	eam Der	oths: No	one Iden	tified				
16) Approximate Depth	to Possil	ble Void	(coal mi	ne, ka	st, other): 1	None Anticipat	ed	
17) Does Proposed well directly overlying or adj					/es	No	X	
(a) If Yes, provide Mir	ne Info:	Name:						
		Depth:						
		Seam:						
		Owner:						

Jeb 15/2022

OPERATOR WELL NO. Purple Unit 2H

Well Pad Name: Thin Air 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/K-55	54.5#	378'	378' /	CTS, 341 Cu. Ft.
Coal	9-5/8"	New	J/K-55	36#	2500'	2500' /	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	PY-110	23#	26000'	26000'	5624Cu. 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							1
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	t	

API NO. 47- 095 - 02759 MOD

OPERATOR WELL NO. Purple Unit 2H

Well Pad Name: Thin Air 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): 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

25) Proposed borehole conditioning procedures:

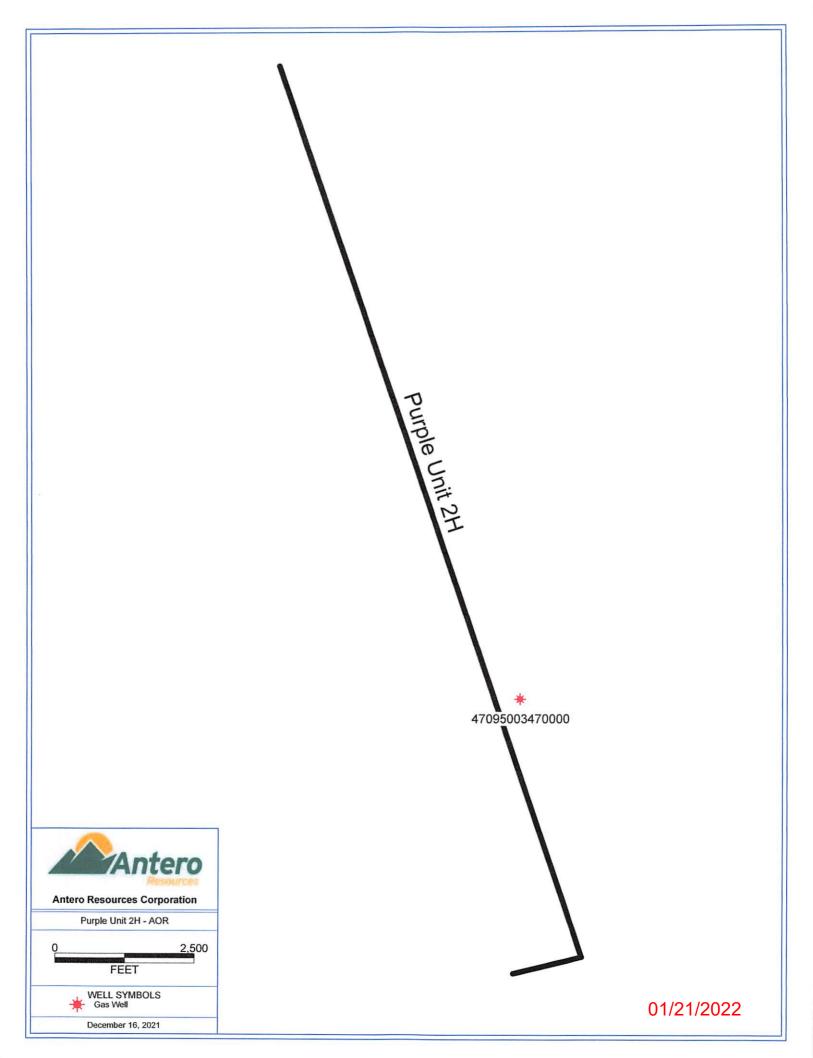
Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

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.

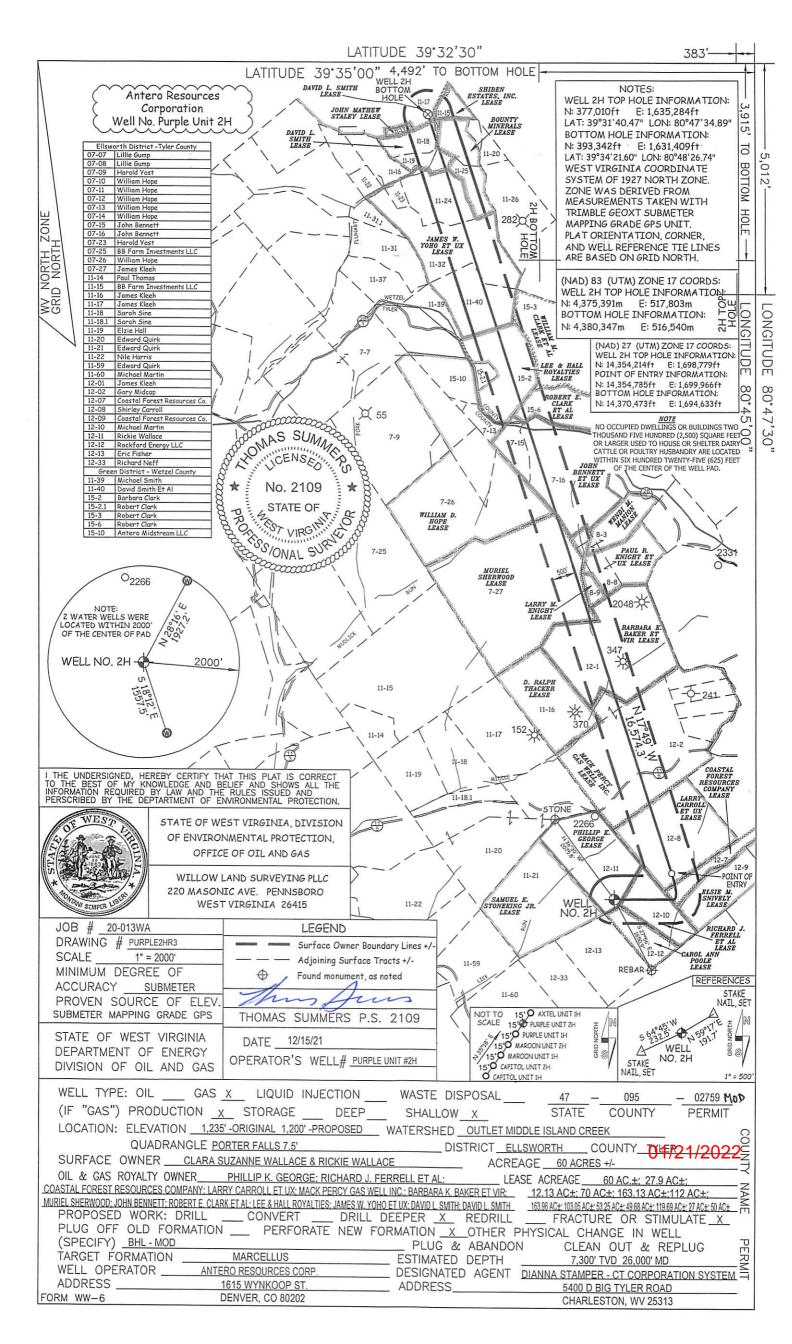
Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

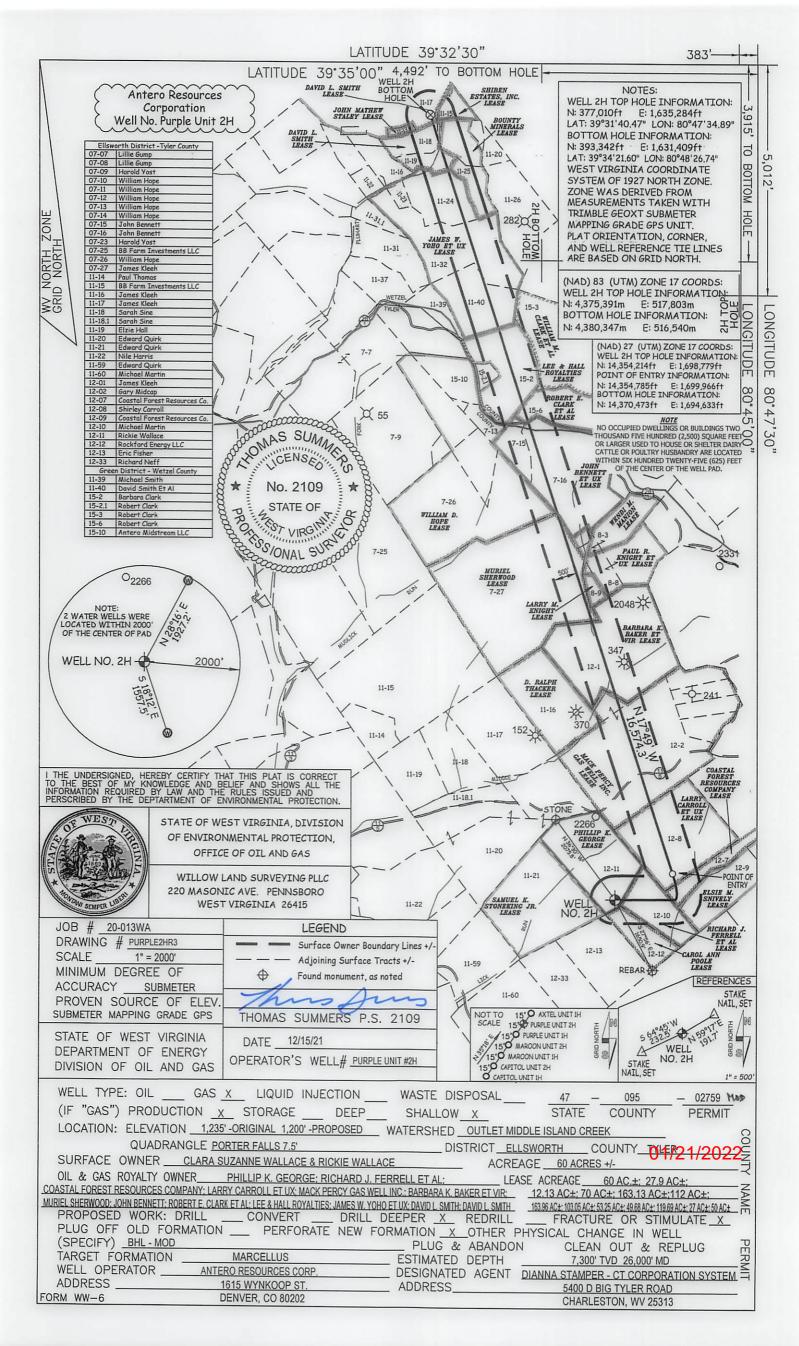
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.



UWI (APINum)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
47095003470000	ANDREW RICE HEIRS	1	DEE DRILLING CO	DEE DRILLING CO	2,842		Gordon	Beres, Weir, Alexander





Purple 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
Philip K. George Lease			
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
Richard J. Ferrell, et al Lease			
Richard Ferrell, et al	Stone Energy Corporation	1/8	0394/0294
Stone Energy Corporation	EQT Production Company	Assignment	0547/0662
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
Coastal Forest Resources Company Lease			
Coastal Forest Resources dba Coastal	Antero Resources Corporation	1/8+	0624/0346
Timberlands Company			
Larry Carrol, et ux Lease			
Larry S. and Shirley L. Carroll	Stone Energy Corporation	1/8+	0393/0096
Stone Energy Corporation	EQT Production Company	Assignment	0556/0132
EQT Production Company	Antero Resources Corporation	Assignment	0148/0620
Mack Percy Gas Well Inc Lease	Autora Passureas Campuntian	1/8+	108/411
Mack Percy Gas Well Inc	Antero Resources Corporation	1/07	100/411
Barbara K. Baker, et vir Lease			
Barbara K. Baker, et vir	Mountain Link Associates Inc	1/8	0355/0307
Mountain Link Associates Inc	Whittle Corporation	Assignment	0363/0068
Whittle Corporation	Montani Energy	Assignment	0404/0496
Montani Energy	Antero Resources Appalachian Corporation	Assignment	0409/0593
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	0557/0430
Antero Resources Corporation	Stone Energy Corporation	Assignment	0447/0772
Stone Energy Corporation	EQT Production Company	Assignment	0556/0132
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
Muriel Sherwood Lease			
Muriel Sherwood, widow, by her Attorney-in- Fact Philip K. Sherwood	Petroedge Energy LLC	1/8	0383/0318
Petroedge Energy LLC	Statoil USA Onshore Properties Inc	Assignment	0409/0147
Statoil USA Onshore Properties Inc	EQT Production Company	Assignment	0539/0239
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001
John Bennett, et ux Lease			
John B. Bennett, et ux	EQT Production Company	1/8+	0606/0779
EQT Production Company	Antero Resources Corporation	Assignment	0663/0001

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
Robert E. Clark, et al Lease			
Robert E. Clark, et al	Antero Resources Corporation	1/8+	215A/0590
Lee and Hall Royalties Lease			
Lee and Hall Royalties	Antero Resources Corporation	1/8+	258A/0551
James W. Yoho, et ux Lease			
James W. Yoho, et ux	Gastar Exploration Inc	1/8+	111A/0718
Gastar Exploration Inc	Stone Energy Corporation	Assignment	152A/0521
Stone Energy Corporation	EQT Production Company	Assignment	183A/0305
EQT Production Company	Antero Resources Corporation	Assignment	230A/0501
David L. Smith Lease			
David Lee Smith	Antero Resources Corporation	1/8+	273A/0442
Bounty Minerals Lease			
Bounty Minerals	Antero Resources Corporation	1/8+	190A/0562
David L. Smith Lease			
David Lee Smith	Antero Resources Corporation	1/8+	273A/0442
		2, 0.	270742772

^{*}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)

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
David I. Smith Lease				
	David L Smith	Antero Resources Corporation	1/8+	273/442

*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.

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 Reso	Antero Resources Corporation		
By:	Tim Rady	Can Veclar		
Its:	VP of Land			

Page 1 of 1



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

Expedited Horizontal H6A Well Work Permits Thin Air Pad

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

Wed, Jan 19, 2022 at 10:09 AM

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

I have attached a copy of the newly issued well permit number. This will serve as your copy.

47-095-02753 - AXTEL UNIT 1H 47-095-02758 - PURPLE UNIT 1H 47-095-02759 - PURPLE UNIT 2H

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

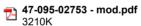
Charleston, WV 25304

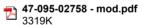
(304) 926-0499 ext. 41115

(304) 926-0452 fax

Wade.A.Stansberry@wv.gov

3 attachments





47-095-02759 - mod.pdf 2953K