

#### 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

Wednesday, July 3, 2024 PERMIT MODIFICATION APPROVAL Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET

DENVER, CO 80202

Re:

Permit Modification Approval for Lambert 1H

47-085-10518-00-00

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.

Martin

Operator's Well Number: Lambert 1H

Farm Name: Nelson Mark Heyhurst

U.S. WELL NUMBER: 47-085-10518-00-00

Horizontal 6A New Drill

Date Modification Issued: 07/03/2024

Promoting a healthy environment.

API NO. 47-085 - 10518	
OPERATOR WELL NO.	Lambert Unit 1H MOD
Well Pad Name: Olym	pus Pad

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

WELL WORK PERMIT APPLICATION
7.51
1) Well Operator: Antero Resources Corporate 494507062   085 - Ritchie Clay   Ellenboro 7.5   Operator ID   County   District   Quadrangle
2) Operator's Well Number: Lambert Unit 1H MOD Well Pad Name: Olympus Pad
2) Operator's Well Number: Lambert Offic 111 MOD Won 1 as 1 amberton Rd
Surface Owner: Nelson Mark Hayhurst Public Road Access: Lamberton Rd      Access: Lamberton Rd
4) Elevation, current ground:  1025'- AS BUILT Elevation, proposed post-construction:  Linderground Storage
4) Elevation, current ground: 1025 - AS BOLL Elevation, proposed per Underground Storage
Other
(b)If Gas Shallow X Deep
Horizontal X
6) Existing Pad: Yes or No Yes  Thickness and Expected Pressure(s):
6) Existing Pad: Yes or No Yes  7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  Marcellus Shale: 6700' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2850#
Marcellus Shale: 6700' TVD, Afficipated Thiomese
8) Proposed Total Vertical Depth: 6700' TVD / Marcellus
9) Formation at Total Vertical Bopts.
10) Proposed 1 otal Measured Depth.
11) Proposed Horizontal Leg Length.
12) Approximate Fresh Water Strata Depths: 173, 230 47085011840000, 47085066380000 Offset well records. Depths have been adjusted according to surface elevations.
13) Method to Determine Fresh water Depths.
14) Approximate Saltwater Depths: 430'
15) Approximate Coal Seam Depths: N/A
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  RECEIVED  Office of Oil and Ga
(a) If Yes, provide Mine Info: Name:
Depth: WV Department of
Seam: Environmental Protecti
Owner:
Juny The 6-24-24
Page 1 of 3

ΔPI	NO	47-	085	-	10518	
711	140.	.,		served in		- Suntenile

OPERATOR WELL NO. Lambert Unit 1H MOD
Well Pad Name: Olympus Pad

18)

# CASING AND TUBING PROGRAM

TYPE		New			DOOM OF F	INTERVALS:	CEMENT:
11112	Size	or	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	Left in Well	Fill-up
	(in)	Used		(10/11)	271111111	<u>(ft)</u>	(Cu. Ft.)/CTS
Conductor	20"	New	J-55	94#	100'	100'	CTS, 96 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	300'	300' /	CTS, 313 Cu. Ft.
FICSII Water					3000'	3000'	CTS, 1221 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	3000	3000	010,1221
Intermediate							
Production	5-1/2"	New	P110-ICY	23#	30200'	30200'	CTS, 6682 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

ТҮРЕ	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							4
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			1
Liners							

## **PACKERS**

Kind:	N/A	RECEIVED Office of Oil and Gas
Sizes:	N/A	JUN 28 2024
Depths Set:	N/A	WV Department of Environmental Protection

Jany Hall 6-24-24

Page 2 of 3

API NO. 47- 085 - 10518 OPERATOR WELL NO. Lambert Unit 1H MOD

Well Pad Name: Olympus 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): 18.11 acres
- 22) Area to be disturbed for well pad only, less access road (acres): 10.00 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

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

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JUN 28 2024

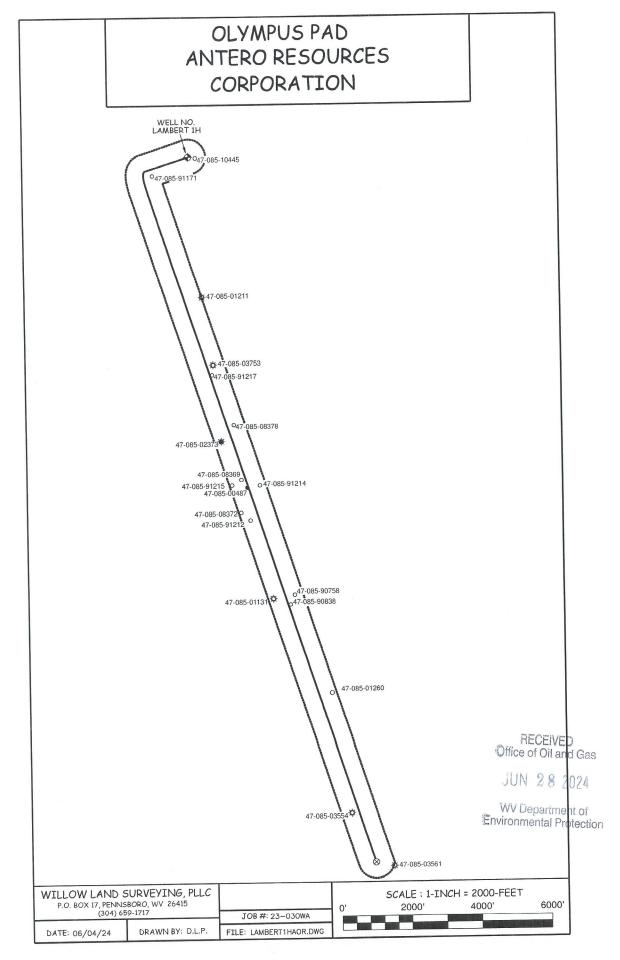
25) Proposed borehole conditioning procedures:

WV Department of 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 pipection 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.

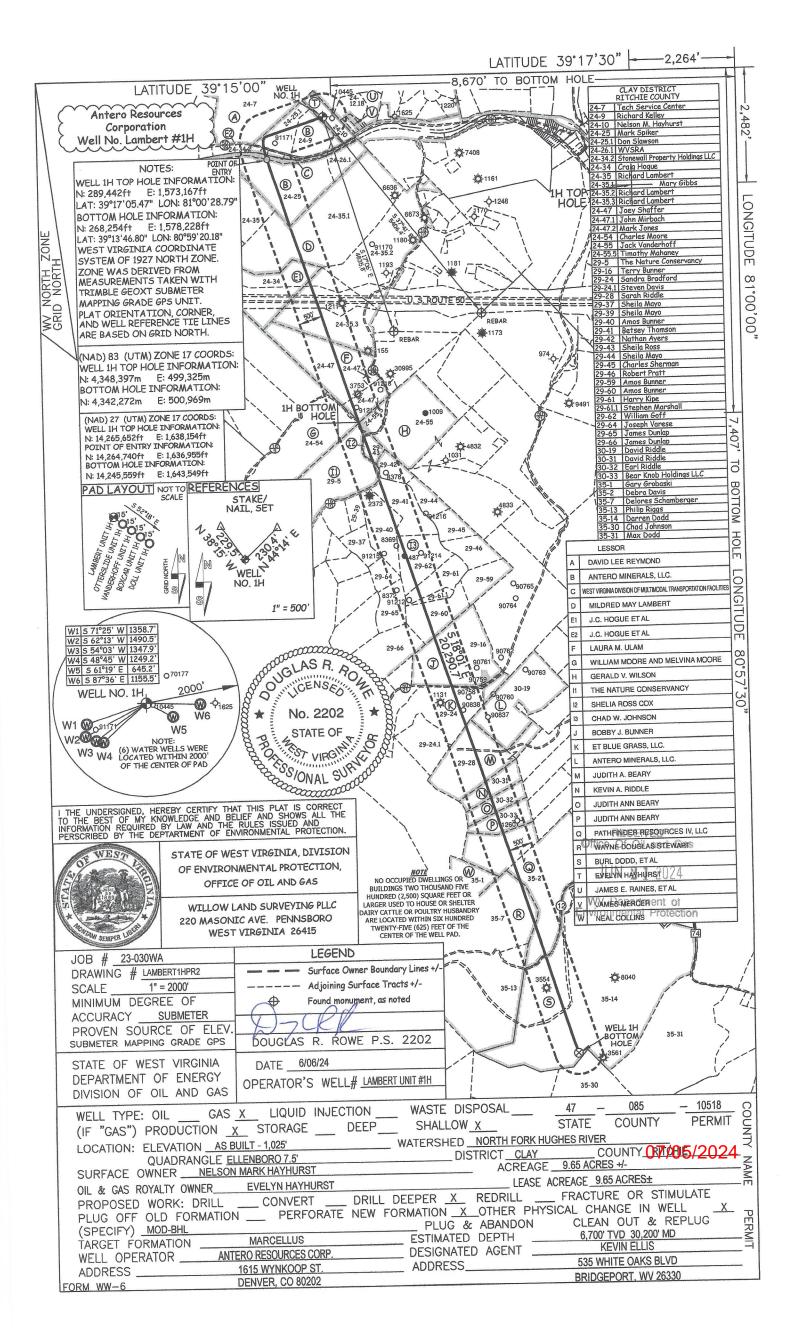


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Perforated Formation(s)			Riø Iniun	Big Iniun			Big Iniun			Wasser Big Inilli	Neellel, Dig						Rio Iniun	Big Injun	6: 83		
(shallowest deepest)	Perforated Interval (Silanowass)				1848 - 1898														1876 - 1984	10	
	Q.			2,020	1,925			2,202			1 01/1	TTC'T			1.872	-		1,878	2,026	1,915	1
	Historical Operator			- ANADEDTII	MIDVIN OIL CO	MONAIN	NAONANI	SOLUTION OF S. GAS	DOMINION OF SECTION	UNKNOWN		CHALMERS OIL & GAS		UNKNOWN	10000	COLLINS C		PLATISED WELL SEBVICE	BLAUSEN WELL SERVICE	BLAUSEN WELE SE	MILLENGLONG
		Operator	ANTERO RESOURCES CORP			DEEM J F OIL & GAS LLC	0.00	CHARITY GAS INC	BIALEK OIL & GAS CORP	UNKNOWN		CHALMERS OIL & GAS		BIALEK OIL & GAS CORP		COLLINS C I			LUCAS WELL SERVICE INC	LUCAS WELL SERVICE INC	MILLER GEORGE W&ASSC
		Well Number	5V		4	1		22/C&L	11	• 13		∞		16		1			1	5	1
		Well Name	47085104450000 OLYMPUS UNIT	9	10 L L LAMBERT	47085037530000 FRANK BUMMER	0(	MCGINNIS	A7085023730000 I W MCGINNIS	MCGINNIS		4/08391Z130000 4/08391Z130000 MCGINNIS HFIRS		SINNIS		30 L J MORRIS	00	00	47085035540000 EARL WILSON	47085035610000 EARL WILSON	00 E R MILLER
		UWI (APINum)	4708510445000	47085911710000	47085012110000 L LAMBERT	4708503753000	47085912170000	47085083780000 MCGINNIS	A708502373000	A7085083690000 MCGINNIS	4700001110000	4/0859121300	4/0050048/000	47085912140000 47095083720000 MCGINNIS	47085912120000	47085011310000 LJ MORRIS	47085907580000	47085908380000	470850355400	470850356100	47085012600000 E R MILLER

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WV Department of Environmental Protection



### 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
T: Evelyn Hayhurst Lease Evelyn Hayhurst Antero Resources Appalachian Corporation	Antero Resources Appalachian Corporation Antero Resources Corporation	1/8+ Name Change	0260/0279 <b>0015/070</b> 5
B: Antero Minerals, LLC Lease Antero Minerals, LLC	Antero Resources Corporation	1/8+	0337/0050
C: West Virginia Division of Multimodal Transportation Facilities Lease West Virginia Division of Multimodal Transportation Facilities	Antero Resources Corporation	1/8+	0287/0001
Antero Minerals, LLC Lease Antero Minerals, LLC	Antero Resources Corporation	1/8+	0337/0050
D: Mildred May Lambert Lease Mildred May Lambert Alan Gabe Oil Development Co. GasSearch Corporation Linn Energy Holdings, LLC XTO Energy, Inc.	Alan Gable Oil Development Co. GasSearch Corporation Linn Energy Holdings, LLC XTO Energy, Inc. Antero Resources Corporation	1/8+ Assignment Assignment Assignment Assignment	0157/0769 0207/0628 0239/0118 0246/0814 0295/0836
J.C. Hogue Et Al Lease J.C. Hogie Et Al Claude C. Cottrille Eula M., Guy C., Claudette B., and Phillip A. Cottrille J.A. & M. Oil and Gas Company Charity Gas, Inc.	Claude C. Cottrille Eula M., Guy C., Claudette B., and Phillip A. Cottrille J.A. & M. Oil and Gas Company Charity Gas, Inc. Antero Resources Corporation	1/8 Will Assignment Assignment Assignment	0083/0390 0018/0820 0196/0430 0016/0052 0308/0033
D: Mildred May Lambert Lease Mildred May Lambert Alan Gabe Oil Development Co. GasSearch Corporation Linn Energy Holdings, LLC XTO Energy, Inc.	Alan Gable Oil Development Co. GasSearch Corporation Linn Energy Holdings, LLC XTO Energy, Inc. Antero Resources Corporation	1/8+ Assignment Assignment Assignment <b>Assignment</b>	0157/0769 0207/0628 0239/0118 0246/0814 0295/0836
F: Laura M. Ulam Lease Laura M. Ulam	Antero Resources Corporation	1/8+	0317/0635

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Lambert Unit 1H MOD

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	Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
	G: William Moore and Melvina Moore Lease William Moore and Melvina Moore Pittsburgh & West Virginia Gas Company A.W. Barnhart Robert E. Elder H.G. Hardbarger W.H. Mossor Mossor Enterprises, Inc. J. Frank Deem CHK Louisiana, LLC Chesapeake Appalachia, LLC SWN Production Company, LLC	Pittsburgh & West Virginia Gas Company A.W. Barnhart Robert E. Elder H.G. Hardbarger W.H. Mossor Mossor Enterprises, Inc. J. Frank Deem CHK Louisiana, LLC Chesapeake Appalachia, LLC SWN Production Company, LLC Antero Resources Corporation	1/8 Assignment	0045/0163 0046/0329 0046/0592 0083/0248 0101/0578 0133/0403 0201/0163 0247/0624 0247/0933 0280/0707 Pooled Tract
1	<mark>H: Gerald V. Wilson Lease</mark> Gerald V. Wilson	Antero Resources Corporation	1/8+	0339/0007
1	I1: The Nature Conservancy Lease The Nature Conservancy	Antero Resources Corporation	Assignment	Pooled Tract
1	<u>12: Shelia Ross Cox Lease</u> Shelia Ross Cox	Antero Resources Corporation	1/8+	0318/0733
1	11: The Nature Conservancy The Nature Conservancy	Antero Resources Corporation	Assignment	Pooled Tract
1	<u>I3: Chad W. Johnson Lease</u> Chad W. Johnson	Antero Resources Corporation	1/8+	0346/0120
1	J: Bobby J. Bunner Lease Bobby J. Bunner	Antero Resources Corporation	1/8+	0338/0990
1	K: ET Blue Grass, LLC. Lease ET Blue Grass, LLC.	Antero Resources Corporation	1/8+	0343/0564
1	M: Judith A. Beary Lease Judith A. Beary	Antero Resources Corporation	1/8+	0340/0260
1	N: Kevin A. Riddle Lease Kevin A. Riddle	Antero Resources Corporation	1/8+	0341/0229
1	O: Judith Ann Beary Lease Judith Ann Beary	Antero Resources Corporation	1/8+	0340/0441
1	P: Judith Ann Beary Lease Judith Ann Beary	Antero Resources Corporation	1/8+	Office of Oil a 0338/0402
/	Q: Pathfinder Resources IV, LLC Lease Pathfinder Resources IV, LLC SEP Exploration, LLC	SEP Exploration, LLC Antero Resources Corporation	1/8+ Agreement	JUN 28 2024 0344/0739 WV Department of Environmental Protection

Lambert Unit 1H MOD

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
R: Wayne Douglas Stewart Lease Wayne Douglas Stewart	Antero Resources Corporation	1/8+	0337/0680
O: Pathfinder Resources IV, LLC Lease Pathfinder Resources IV, LLC SEP Exploration, LLC	SEP Exploration, LLC Antero Resources Corporation	1/8+ Agreement	0344/0739 <b>0345/0533</b>

\*Co-tenancy utilization – Antero is utilizing the Co-tenancy Modernization and Majority Protection Act to proceed with development of certain royalty owners' interests in this tract.

\*\*Pooling/Unitization – Antero has filed a horizontal well unitization application with the West Virginia Oil and Gas Conservation Commission that seeks to pool certain owners in this tract.

Office of Oil and Gas
JUN 28 2024

WV Department of Environmental Protection

<sup>\*</sup>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)

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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
S: Burl Dodd, Et Al Lease	Burl Dodd, Et Al	Dennis D. Blauser	1/8	0118/0318
	Dennis D. Blauser	Thomas H. Burrows	Assignment	0118/0792
	Thomas H. Burrows	Cedar Petroleum	Assignment	0118/0790
	Cedar Petroleum	Donald V. Belatini	Affidavit	0265/0645
	Donald V. Belatini	Blauser Energy Corporation	Assignment	0169/0352
	Blauser Energy Corporation	Antero Resources Corporation	Assignment	0265/0648

<sup>\*</sup>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 EIVED permits/approvals should be acquired from the appropriate authority before the affected activity is initiated of Oil and Gas

Well Operator:	Antero Resources Corporation	JUN 28 2024
By:	Tim Rady ( Ledy	WV Department of
Its:	Senior Vice President of Land	Environmental Protection

Page 1 of 1

<sup>\*</sup>Co-tenancy utilization - Antero is utilizing the Co-tenancy Modernization and Majority Protection Act to proceed with the development of certain royalty owners' interests in this tract.

<sup>\*\*</sup> Pooling/Unitization - Antero has filed a horizontal well unitization application with the West Virginia Oil and Gas Conservation Commission that seeks to pool certain owners in this tract.



**Antero Resources** 1615 Wynkoop Street

Denver, CO 80202 Office 303.357.7310

Fax 303.357.7315

June 19, 2024

West Virginia Department of Environmental Protection Office of Oil and Gas Attn: Mr. Taylor Brewer 601 57th Street

Charleston, WV 25304

Mr. Brewer:

CK# 4632244
614124
614124
500.00 Antero Resources Corporation (Antero) would like to submit the following permit modification for approved well on the existing Olympus Pad: Lambert Unit 1H (47-085-10518) Expedited.

Attached you will find the following:

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

Office July 2 1 2021

WV Department of World Distribution (WV) Department of Environmental Protection

If you have any questions please feel free to contact me at (303) 357-6959.

Thank you in advance for your consideration.

Sincerely,

Stefan Gaspar Permitting Agent

Antero Resources Corporation

**Enclosures**