

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

Thursday, June 23, 2022
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET DENVER, CO 80202

Re:

Permit Modification Approval for ELKLICK 2H

47-085-10420-00-00

Lateral Extension. Total Measured Depth 21100' to 23400'. Horizontal Lateral Length 7588' to 14033'. Updated Leases

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: ELKLICK 2H

Farm Name: ELMER W PIERCE

U.S. WELL NUMBER: 47-085-10420-00-00

Horizontal 6A New Drill

Date Modification Issued: 06/23/2022

Promoting a healthy environment.

API NO. 47-085	- 10420	
OPERATOR W	ELL NO.	Elklick Unit 2H MOD
Well Pad Nan	ne: Cashe	w Pad

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

1) Well Operator: Antero	Resources	Corporal	494507062	085-Ritchie	Union	Oxford 7.5'
i) it on opouron			Operator ID	County	District	Quadrangle
2) Operator's Well Numbe	r: Elklick Uni	t 2H MOI	Well Pac	Name: Cash	ew Pad	
3) Farm Name/Surface Ow	ner: Elmer V	V. Pierce	Public Roa	d Access: Plea	asant Hollo	w Road
4) Elevation, current groun	id: 1040'	Ele	evation, proposed	post-constructi	on: ~1019	,¢
5) Well Type (a) Gas Other	X	Oil	Unde	erground Storag	ge	
(b)If Gas	Shallow	X	Deep			
	Horizontal	X				
6) Existing Pad: Yes or No			Secretal Street			
 Proposed Target Format Marcellus Shale: 6900' T 						
8) Proposed Total Vertical	Depth: 6900	D, LAD				
9) Formation at Total Vert	and the second s	Varcellus				
10) Proposed Total Measur	red Depth:	23,400' M	D			
11) Proposed Horizontal L	eg Length:	14,033'				
12) Approximate Fresh Wa	ater Strata De	pths:	53', 236'			
13) Method to Determine I 14) Approximate Saltwate		Depths: 4 09', 1847'	7-085-07654			
15) Approximate Coal Sea	m Depths: N	one Ident	tified			
16) Approximate Depth to	Possible Void	d (coal mi	ne, karst, other):	None Anticipa	ted	
17) Does Proposed well lo directly overlying or adjac			Yes	No.	X	
(a) If Yes, provide Mine	Info: Name:					
	Depth	:				
	Seam:					
	Owner	r:			•	RECEIVED Office of Oil and

JUN 2 3 2022

WV Department of Environmental Protection

Stac MGy 06/24/2022 6-14-22

OPERATOR WELL NO. Elklick Unit 2H MOD

Well Pad Name: Cashew Pad

18)

CASING AND TUBING PROGRAM

ТУРЕ	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	65#	80	80	CTS, 63Cu. Ft.
Fresh Water	10-3/4"	New	J/K-55	40.4#	300	300	CTS, 164 Cu. Ft.
Coal	7-5/8"	New	P-110CY	26.4#	2500	2500	CTS, 698Cu. Ft.
Intermediate							
Production	5"	New	P-110CY	18#	23,400	23,400	2393 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	16"	20"	0.375"	1530	50	Class A	~1.16
Fresh Water	10-3/4"	13-1/2"	0.35"	2730	1000	Class A	~1.16
Coal	7-5/8"	9-7/8"	0.328"	9410	1500	Class A	~1.16
Intermediate							
Production	5"	6-3/4"	0.362"	15,840	12,000	Class G/H	~1.16
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

PACKERS

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

RECEIVED Office of Oil and Gas

JUN 2 3 2022

WV Department of Environmental Protection

Page 2 of 3



API NO. 47-085 - 10420

OPERATOR WELL NO. Elklick Unit 2H MOD

Well Pad Name: Cashew 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): 33.75 acres
- 22) Area to be disturbed for well pad only, less access road (acres): 14.29 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.

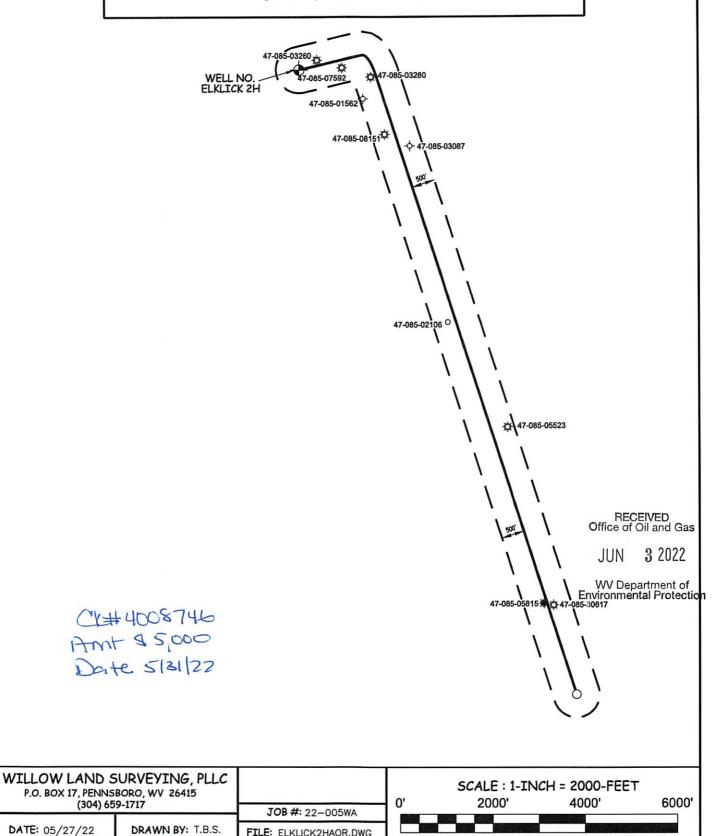
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity illand Gas sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water. JUN 2 3 2022

*Note: Attach additional sheets as needed.

WV Department of Environmental Protection

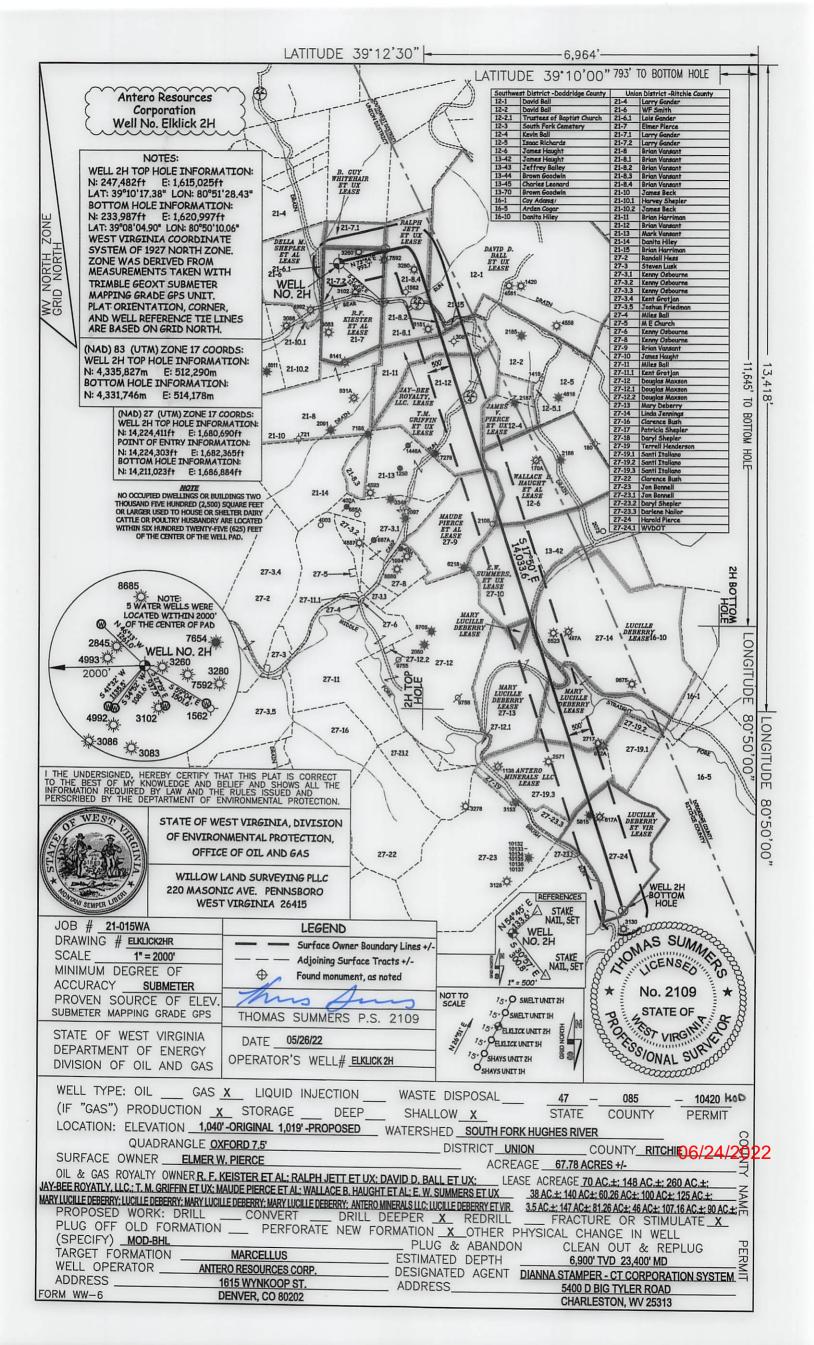


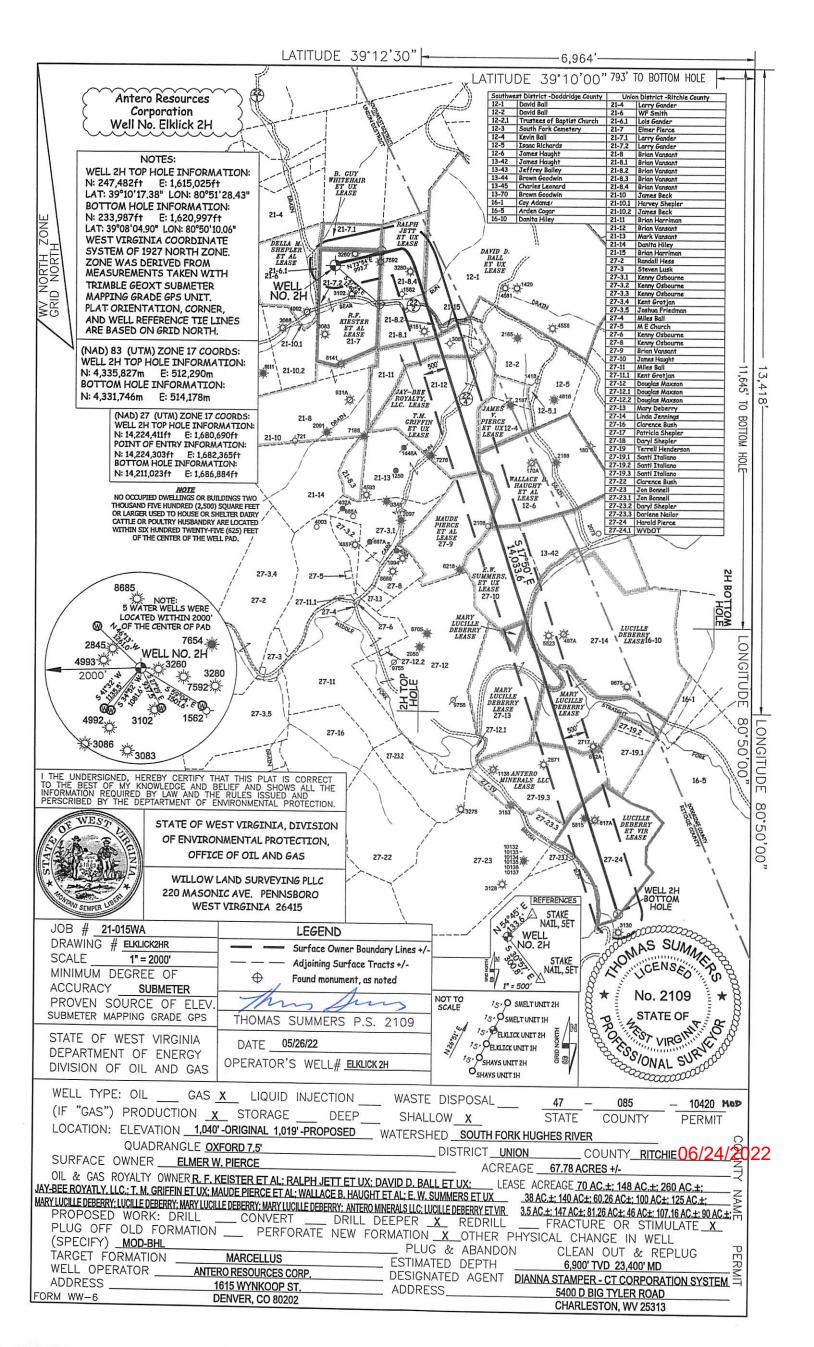
CASHEW PAD ANTERO RESOURCES CORPORATION



FILE: ELKLICK2HAOR.DWG

UWI (APINum)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
47085032600000	R L KEISTER	3	R & R OIL & GAS LLC	OIL STATES SALES	2,013		Big Injun	Gordon, Berea
	JETT MYRTLE ET AL	1	CHARITY GAS INC	STALNAKER GENE INC	5,231		Alexander, Riley, Benson	Gordon, Berea
47085031020000	R L KEISTER	2	R & R OIL & GAS LLC	OIL STATES SALES	1,900		Maxton, Big Injun	Gordon, Berea
47085031080000	J SMITH & R T NELL	2	FERRELL WILLARD E	FERRELL WILLARD E	1,883		Big injun	Gordon, Berea
47085314460000				MOSSOR W H				Gordon, Berea
47085072760000	REXROAD FREDDA ETAL	2	BETA HELIX ENRGY LLC	CHASE PETROLEUM CO	5,430	4434 - 5090		
47085062180000	TOWNSEND ET AL	1	ROSS & WHARTON GAS	CHASE PETROLEUM CO	5,400	3279 - 5112		Gordon, Berea
47085025710000	J I PIERCE	1	DALE DAVID DBA DD OI	LYNCH BRENNIE	1,453		Balltown, Riley, Benson, Alexander	Gordon, Berea
47085031530000		1	R & R OIL & GAS LLC	FRIESTAD FRANCIS	1,806		Big Injun	Gordon, Berea





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 –

- 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
R.F. Keister, et al Lease			
R.F. Keister, et al	G.L. Yaste	1/8	0105/0504
G.L. Yaste	D.L.Y., Inc.	Assignment	0112/0302
D.L.Y.m Inc.	Betty Jean Stalkner and Rosalee Roberts	Assignment	0132/0565
Betty Jean Stalkner and Rosalee Roberts	R & S Gas Company	Assignment	0147/0548
R & S Gas Company	BET-RO Inc	Assignment	0147/0554
BET-RO Inc	Roberts Energy Corporation	Assignment	0240/0036
Roberts Energy Corporation	Antero Resources Corporation	Assignment	0329/0138
Ralph Jett, et ux Lease			
Ralph Jett, et ux	W.R. Development Co. Inc.	1/8	0191/0378
W.R. Development Co. Inc.	Whittle Corporation	Assignment	0254/0910
	Antero Resources Appalachian Corporation	Assignment	0255/0526
Whittle Corporation Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	0015/0702
A position field about losses			
David D. Ball, et ux Lease David Dale Ball Jr.	Antero Resources Corporation	1/8+	04170123
R.F. Kelster et al Lease		1/8	0105/0504
R.F. Kelster et al	G.L. Yaste	Assignment	0112/0302
G.L. Yaste	D.L.Y., Inc.	Assignment	0132/0565
D.L.Y.m Inc.	Betty Jean Stalkner and Rosalee Roberts	Assignment	0147/0548
Betty Jean Stalkner and Rosalee Roberts	R & S Gas Company	Assignment	0147/0554
R & S Gas Company	BET-RO Inc	Assignment	0240/0036
BET-RO Inc	Roberts Energy Corporation	Assignment	0329/0138
Roberts Energy Corporation	Antero Resources Corporation	Assignment	0323, 0230
Jay-Bee Royalty, LLC Lease		4/0.	0330/0506
Jay-Bee Royalty, LLC	Antero Resources Corporation	1/8+	03307 0300
Raiph Jett, et ux Lease		1/0	0191/0378
Raiph Jett, et ux	W.R. Development Co. Inc.	1/8	0254/0910
W.R. Development Co. Inc.	Whittle Corporation	Assignment	0255/0526
Whittle Corporation	Antero Resources Appalachian Corporation	Assignment	0015/0702
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	0013/0/02
T.M. Griffin, et ux Lease		1/0	0029/0385
T.M. Griffin, et ux	The Philadelphia Company of West Virginia	1/8	0032/0253
The Philadelphia Company of West Virginia	Pittsburgh and West Virginia Gas Company	Assignment	0126/0473
Pittsburgh and West Virginia Gas Company	Equitable Gas Company	Conveyance	
Equitable Gas Company	Equitrans, Inc	Assignment	R £054/0475 Office 00006/0751 Gas
Equitrans, Inc.	EQT Capital Corporation	Merger	Office diopherat das

JUN 2 3 2022

WV Department of



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
FOT Control Corporation	Equitable Resources, Inc	Merger	0023/032
EQT Capital Corporation	Egultrans, LP	Assignment	0329/0645
Equitable Resources, Inc	Equitable Production - Eastern States, Inc	Assignment	0234/0830
Equitrans, LP	Equitable Production Company	Merger	0281/0346
Equitable Production - Eastern States, Inc	EQT Production Company	Name Change	0218/0346
Equitable Production Company EQT Production Company	Antero Resources Corporation	Assignment	0323/0964
Maude Pierce, et al Lease			
Maude Pierce, et al	W.H. Mossor	1/8	0090/0113
W.H. Mossor	Term Energy Corporation	Assignment	0132/0314
Term Energy Corporation	Antero Resources Appalachian Corporation	Assignment	0257/0362
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	0015/0705
Wallace B Haught, et al Lease			
Wallace B. Haught, et al	Consolidated Gas Supply Corporation	1/8+	0095/0375
Consolidated Gas Supply Corporation	Consolidated Gas Transmission Corporation	Assignment	0135/0583
Consolidated Gas Transmission Corporation	CNG Development Company	Assignment	0139/0041
CNG Development Company	CNG Producing Company	Merger	0167/0210
CNG Producing Company	Dominion Exploration and Production, Inc	Merger	0049/0340
Dominion Exploration and Production, Inc	CONSOL Gas Company	Name Change	0293/0252
CONSOL Gas Company	CNX Gas Company	Merger	0293/0252
CNX Gas Company	Antero Resources Corporation	Assignment	0409/0672
E.W. Summers et ux Lease	W	1/0	25/260
E.W. Summers et ux	G.W. Thompson	1/8	Unrecorded
G.W. Thompson	The Philadelphia Company of West Virginia	Assignment Assignment	32/253
The Philadelphia Company of West Virginia	Pittsburgh and West Virginia Gas Company	Conveyance	126/473
Pittsburgh and West Virginia Gas Company	Equitable Gas Company Equitrans Inc	Assignment	154/475
Equitable Gas Company	EQT Capital Corporation	Merger	6/751
Equitrans Inc EQT Capital Corporation	Equitable Resources Inc	Merger	23/32
Equitable Resources Inc	Equitrans LP	Assignment	329/645
Equitrans LP	Equitable Production Easters States Inc	Assignment	234/830
Equitable Production Eastern States Inc	Equitable Production Company	Merger	281/346
Equitable Production Company EQT Production Company	EQT Production Company Antero Resources Corporation	Name Change Assignment	218/346 487/641
Mary Lucille Deberry Lease			
Mary Lucille Deberry	Antero Resources Corporation	1/8+	330/316
Lucille Deberry Lease	Consolidated Gas Supply Corporation	1/8	96/201
Lucille Deberry Consolidated Gas Supply Corporation	Consolidated Gas Transmission Corporation	Assignment	135/583
Consolidated Gas Transmission Corporation	CNG Transmission Corporation	Name Change	332/563
CNG Transmission Corporation	Mike Ross Inc	Assignment	RECEIVED 227/130 Office of Oil and Gas

JUN 2 3 2022



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 –

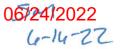
- the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

	Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
	Mike Ross Inc	Antero Resources Corporation	Assignment	445/632 NOT
1	Mary Lucille Deberry Lease Mary Lucille Deberry	Antero Resources Corporation	1/8+	330/318
/	Mary Lucille Deberry Lease Mary Lucille Deberry	Antero Resources Corporation	1/8+	330/338
1	Antero Minerals LLC Lease Antero Minerals LLC	Antero Resources Corporation	1/8	394/103

RECEIVED Office of Oil and Gas

JUN 2 3 2022

WV Department of Environmental Protection



^{*}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.

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	Bool	c/Page
Lucille Deberry et vir Lease	Lucille Deberry et vir Hope Natual Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corpora CNG Development Company CNG Producing Company Dominion Exploration & Production Inc CONSOL Gas Company CNX Gas Company	Hope Natural Gas Company Consolidated Gas Supply Corporation Ass Consolidated Gas Transmission Corporatio tion CNG Development Company CNG Producing Company Dominion Exploration & Production Inc CONSOL Gas Company CNX Gas Company LLC Antero Resources Corporation	on	1/8 Name Change Assignment Assignment Merger Merger Name Change Merger Assignment	81/472 WVSOS 169/756 176/601 WVSOS WVSOS 6/634 6/634 308/581

*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.

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 Office of Oil and Gas

Its: Senior VP of Land

JUN 2 3 2022

Page I of 1 Environmental Protection

