

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, May 22, 2024
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for COKELEY UNIT 1H

47-085-10511-00-00

Sidetrack

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 🔏. Martin

Chief

Operator's Well Number: COKELEY UNIT 1H

Farm Name: MICHAEL UNDERWOOD ET AL

U.S. WELL NUMBER: 47-085-10511-00-00

Horizontal 6A New Drill

Date Modification Issued: 5/22/2024

Promoting a healthy environment.

WW-6B (04/15) CK# 4031789 \$ 7,500.00 5/14/24

API NO. 47-085 - 10511

OPERATOR WELL NO. Cokeley Unit 1H MOD
Well Pad Name: Pinewood Pad

Expedite Mod

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

							T
l) Well Operate	or: Antero	Resources	Corpora	494507062	085 - Ritch	M	Ellenboro 7.5'
				Operator ID	County	District	Quadrangle
2) Operator's V	Vell Numbe	r: Cokeley l	Jnit 1H M	OD Well P	ad Name: Pine	ewood Pad	
3) Farm Name/	Surface Ow	ner: Michael	Underwood	Et Al Public Ro	oad Access: Pi	newood La	ne
4) Elevation, co	urrent groun	nd: 1066' - AS	BUILT E	evation, propose	d post-construc	ction:	
5) Well Type	(a) Gas Other	X	_ Oil	Un	derground Stor	rage	
	(b)If Gas	Shallow	Х	Deep			_
		Horizontal	X				
6) Existing Pad	l: Yes or No	Yes			_		
	_			ipated Thickness ss- 55 feet, Asso			
8) Proposed To	otal Vertical	Depth: 670	0' TVD				
9) Formation a			Marcellus	3			
10) Proposed T	otal Measu	red Depth:	24700' M	D			
11) Proposed F	Horizontal L	eg Length:	15299'	*Open to modifi	cation at a lat	er date	
12) Approxima	ate Fresh W	ater Strata De	epths:	200', 378', 878	3'		
13) Method to	Determine l	Fresh Water I	Depths:	47085088860000, 470850775	00000 Offset well records	Depths have been ac	djusted according to surface elevation
14) Approxima	ate Saltwate	r Depths: 14	190'			The state of the s	
15) Approxima	ate Coal Sea	m Depths: 1	N/A				
16) Approxima	ate Depth to	Possible Voi	id (coal m	ine, karst, other):	None Anticip	oated	
17) Does Propo directly overly				ms Yes	1	No X	
(a) If Yes, pro	ovide Mine	Info: Name	e:				
		Depth	1:		=11	RECEIVED	Gas
		Seam	:		Of		0.4
		Owne	er:			MAY 1 5 20	
					En	VV Department	ection

Jeremy Newlon Jeremy Newlon 5-21-2024

API NO. 47- 085 - 10511

OPERATOR WELL NO. Cokeley Unit 1H MOD

Well Pad Name: Pinewood Pad

18)

CASING AND TUBING PROGRAM

TYPE	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	J-55	94#	100'	100'	CTS, 96 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	928'	928'	CTS, 967 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	3000'	3000'	CTS, 1221 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P110-ICY	23#	24700'	24700'	CTS, 5296 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							
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			
Liners							

PACKERS

Kind:	N/A	
Sizes:	N/A	AECEIVED OF Oil and Gas
Depths Set:	N/A	Nimi tu

WY Department of Environmental Protection

Jeremy Newlon

Jeremy Newlon 5-21-2024

API NO. 47- 085

OPERATOR WELL NO. Cokeley Unit 1H MOD

Well Pad Name: Pinewood 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): 19.86 acres

22) Area to be disturbed for well pad only, less access road (acres): 8.21 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.

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24) Describe all cement additives associated with each cement type:

MAY 15 2024

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

WV Department of Environmental Protection

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,

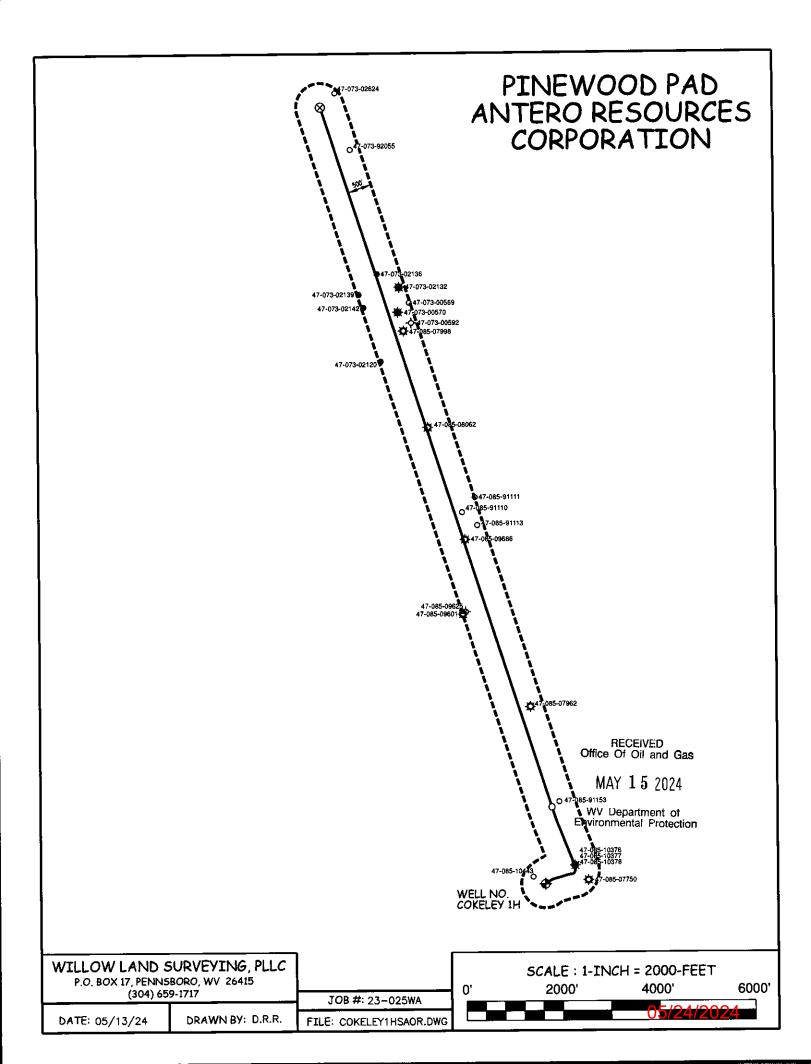
circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

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.

Jeremy Newlon

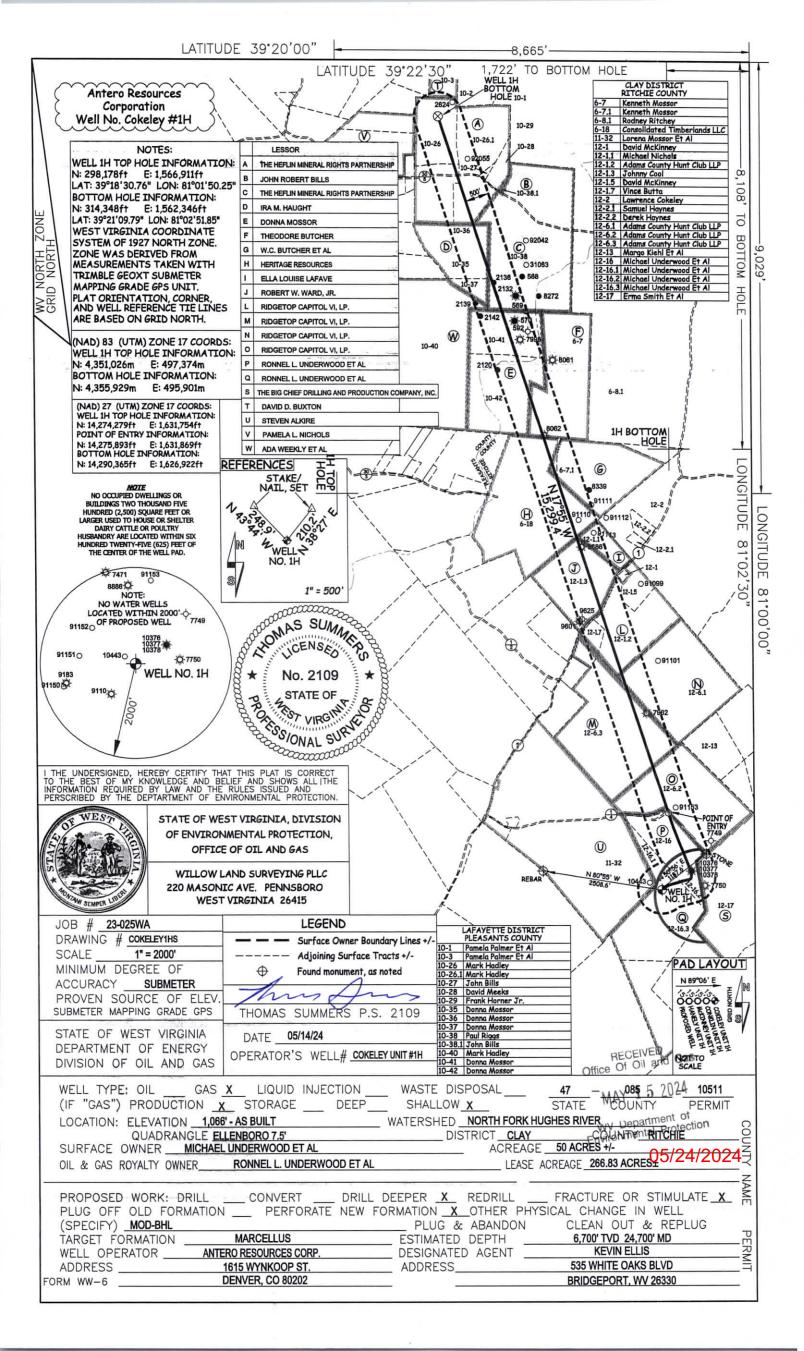
05/24/2024 Page 3 of 3



	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
UWI (APINum)			ANTERO RESOURCES CORP	ANTERO RESOURCES CORP		CONTRACTOR OF THE PARTY OF THE		
47085104430000		5V	HARPER CROSBY HOLDINGS LLC	RARE EARTH ENERGY	3,035	1790 - 2921	Salt Sands, Big Injun, Fifty foot, Gordon	Weir, Benson, Alexander
	UNDERWOOD RONNEL & GAIL		ANTERO RESOURCES CORP	ANTERO RESOURCES CORP	14,453	6640 - 14330	Marcellus	
47085103780000		1H	ANTERO RESOURCES CORP	ANTERO RESOURCES CORP	16,519	6512 - 16398	Marcellus	
47085103770000		2H	ANTERO RESOURCES CORP	ANTERO RESOURCES CORP	15,544	6693 - 15373	Marcellus	
47085103760000	HAYHURST UNIT	1H	ANTERO RESOURCES CORP	ANTERO RESCORCES CORF	13,544			
47085911530000			LILEGE CO CONTROL DINICOLLI C	RARE EARTH ENERGY	2,933	1917 - 2867	Keener, Big Injun, Weir, Thirty Foot	Gordon, Benson, Alexander
	NICHOLS MICHAEL	3	HARPER CROSBY HOLDINGS LLC	KEY OIL CO	3,300	1517 2007		Weir, Gordon, Benson, Alexander
47085096010000		1	KEY OIL CO	KEY OIL CO	4,845	4673 - 4676	Benson	Weir, Gordon, Benson, Alexander
47085096250000		1	KEY OIL CO	CARDON AND AND AND AND AND AND AND AND AND AN	4,838	4701 - 4704	Benson	Weir, Gordon, Benson, Alexander
47085096860000	COOL JOHN	3	KEY OIL CO	KEY OIL CO	4,030	4701-4704	Densen	
47085911130000								A LANGUAGE EN PROPERTY OF
47085911100000								
47085911100000						4906 - 4912	Benson	Weir, Gordon, Benson, Alexander
47085080620000	T BUTCHER	2	ALLIANCE PETROLEUM CO LLC	PARDEE GAS	5,050	4906 - 4912	Belison	Weir, Gordon, Benson, Alexander
47073021200000	JOHN FREELAND	6	WV WELLS LTD	BIG KNOT OIL CO	2,022			Treat, contain, contain,
47085079980000	SMITH JOHN A	4	PARDEE GAS	PARDEE GAS		4004 4000		
47073005920000	JOHN FREELAND	10	WV WELLS LTD	HANLON OIL & GAS CO	2,072	1821 - 1830		
47073005700000	JOHN FREELAND	9	WV WELLS LTD	HANLON OIL & GAS CO	1,975			
47073005690000								Weir, Gordon, Benson, Alexander
47073021320000		3	WV WELLS LTD	BIG KNOT OIL CO	1,875			Weir, Gordon, Benson, Alexander
	ELROY WAGNER HRS	7	WV WELLS LTD	BIG KNOT OIL CO	1,873			Well, Goldon, Benson, Alexander
	JOHN FREELAND	1	ALEXANDER PRODUCTION CO	HANLON OIL & GAS CO		CHARLES THE SECTION OF THE SECTION OF		C
47073021390000		1	WV WELLS LTD	BIG KNOT OIL CO		Designation of the Control of the Co		
47073920550000			EVEN LE BUILDING DE LA CONTRACTION DEL CONTRACTION DE LA CONTRACTI	Committee State of the State of				Weir, Gordon, Benson Alexander
47073026240000		1	S D COSS & C T SMITH	S D COSS & C T SMITH	1,975			Weir, Gordon, Benson Alexander
47073020240000								

WV Department of Environmental Protection

Office Of Oil and Gas
MAY 1 5 2024



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:

Q: Ronnel L. Underwood Et Al Name Ronnel L. Underwood Et Al Lease Ridgeto Capitol VI, LP. Lease Ridg	Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
Walter C. Alkire The Walter C. Alkire T	O. Barrell, Underwood St Allegra			
water C. Alkire, Jr. Family Trust Agreement Assignment O271/0834 The Walter C. Alkire, Jr. Family Trust Antero Resources Corporation Assignment O271/0834 The Walter C. Alkire, Jr. Family Trust Antero Resources Corporation Assignment O271/0834 The Walter C. Alkire, Jr. Family Trust Antero Resources Corporation I/8 0199/0202 O271/0834 Walter C. Alkire, Jr. Family Trust The Walter C. Alkire, Jr. Family Trust Antero Resources Corporation I/8 0336/0803 O271/0834 Assignment O271/0834 Assignment O271/0834 O336/0889 O336/0887 O336/0880 I/8+ 0336/0880 I/8+ 0336/0880 I/8+ 0336/0880 I/8+ 0336/0880 O336/0880 I/8+ 0336/0880 O336/0884 O336/0886 I/8+ 0336/0886 O336/0886		Walter C Alkine	1/8	0233/0273
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Donna Mossor Antero Resources Corporation 1/8+ U3/24/2U26359/0540	F: Donna Mossor Lease		05/24/	2024
	Donna Mossor	Antero Resources Corporation	1/8+ 03/24/	∠∪∠ 0359/0540

Operator's Well Number

Cokeley 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
C: The Heflin Mineral Rights Partnership Lease The Heflin Mineral Rights Partnership	Antero Resources Corporation	1/8+	0356/0412
D: Ira M. Haught Lease Ira M. Haught	Antero Resources Corporation	1/8+	0338/0586

*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

MAY 15 2024

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.

WW-6A1 (5/13)

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Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
A: The Heflin Mineral Rights Partnership Lease				
	The Heflin Mineral Rights Partnership	Antero Resources Corporation	1/8+	0356/0412

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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

Office Of Oil and Gas
MAY 15 202+

WV Department of Environmental Protection

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

Senior Vice President of Land

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