

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, December 20, 2023 PERMIT MODIFICATION APPROVAL Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET

DENVER, CO 80202

Permit Modification Approval for DARRELL UNIT 1H Re:

47-017-06968-00-00

Extended Lateral Length

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: DARRELL UNIT 1H

Farm Name: Susan Haught Gido, et al

U.S. WELL NUMBER: 47-017-06968-00-00

Horizontal 6A New Drill

Date Modification Issued: 12-20-2023

Promoting a healthy environment.

API NO. 47- 017	. 06966	
OPERATOR V	VELL NO.	Darrell Unit 1H MOD
Well Pad Na	me: Haugh	t Ped

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

	A	D	^	404507060	047 5	Add Nove 842	Man. 18:4 7 5
) Well Operator	: Antero	Kesources	Corpora	Operator ID	County	District	New Milton 7.5' Quadrangle
		Down II the		•	•		Quadrangle
) Operator's We	ell Number	Darrell Un	IIT THI MC	Well I	ad Name: 1	1aught Pad	
) Farm Name/Si	urface Own	er: Susan H	laught Gid	lo, et al Public R	oad Access:	Brushy Fork	Road
) Elevation, curi	rent ground	l: <u>1190'</u>	E	levation, propos	d post-const	ruction: 1194	•
, ,	a) Gas Other	X	_ Oil _	Uı	nderground S	Storage	
(b)If Gas	Shailow	х	Deep			_
		Horizontal	X				
) Existing Pad: '	Yes or No	No			_		
			. , -	cipated Thicknes	-		
) Proposed Tota	ıl Vertical I	Depth: 770	O'TVD				
) Formation at 7			Marcellu	s			
0) Proposed Tot			25000' N	AD			
1) Proposed Ho	rizontal Le	g Length:	13922.2				·
2) Approximate	Fresh Wat	ter Strata De	pths:	271'			
3) Method to De	etermine F	resh Water I	Depths:	47017017980000 Office	well records. Dept	hs have been adjusted	d according to surface elevation
4) Approximate			•		_		
5) Approximate	Coal Sean	n Depths: N	lone Ant	icipated			
		_		nine, karst, other)	: None Ant	icipated	
7) Does Propose irectly overlying				ims Yes		No X	
(a) If Yes, prov	ride Mine li	nfo: Name	»:				
		Depth					
		Seam					

DEC 18 2923

WV Department of Page Yirongnental Protection

API NO. 47- 017 _ 06968

OPERATOR WELL NO. Darrell Unit 1H MOD
Well Pad Name: Haught 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	20"	New	H-40	94#	80	80	CTS, 77 Cu. Ft.
Fresh Water	13-3/8*	New	J-55	54.5#	321	321	CTS, 334 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2500	2500	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	23#	25000	25000	5372 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

Times! L. Degrolos 12-14-23

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"	0.438"	1530	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"	12,630	2500	Less-HPGZ & Tell - 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	

Office of Oil and Gas

DEC 18 2023

WV Department of Environmental Protection Page 2 of 3

WW-6B
(10/14)

API	NO. 47-	017 _	06956	
	OPERAT	OR WEL	L NO.	Durrell Unit 1H MOC
	Wall Pa	d Name	· Haumh	1 Pad

19) l	Describe 1	proposed we	l work.	including	the drilling	e and plueei	ing back of	f any pilot hole:
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Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale.

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): 33.94 acres
- 22) Area to be disturbed for well pad only, less access road (acres): 11.40acres

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 S' 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. (1)

Surface: Class A cement with 2-3% calcium chloride and 1/4 lb of flake (4) intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat (1)

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: Tall 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 400 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.

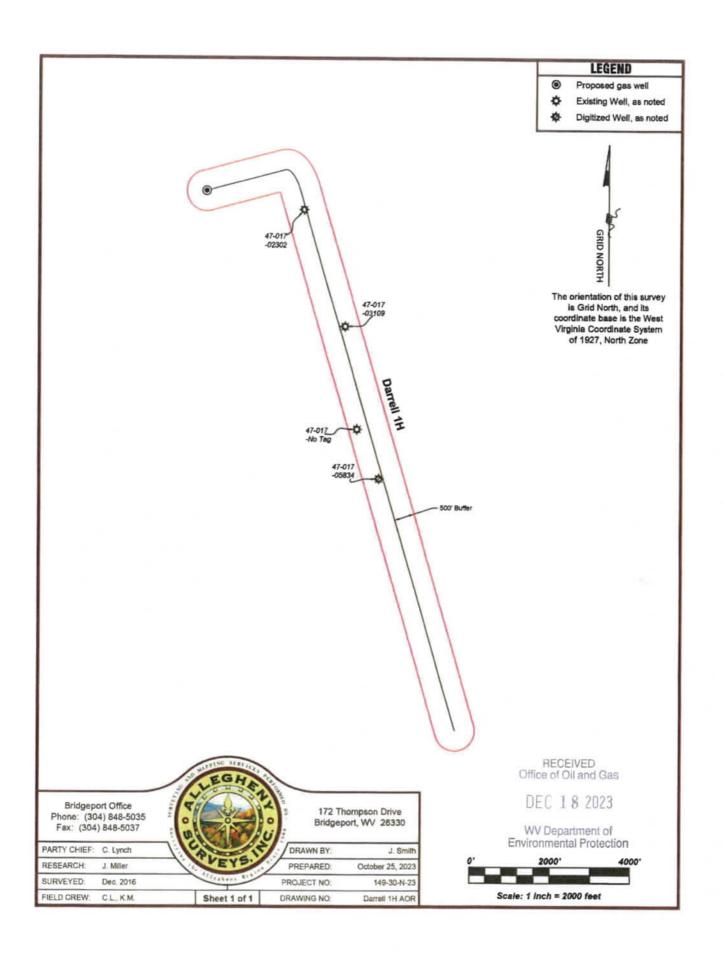
*Note: Attach additional sheets as needed.

Page 3 of 3

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DEC 18 2023

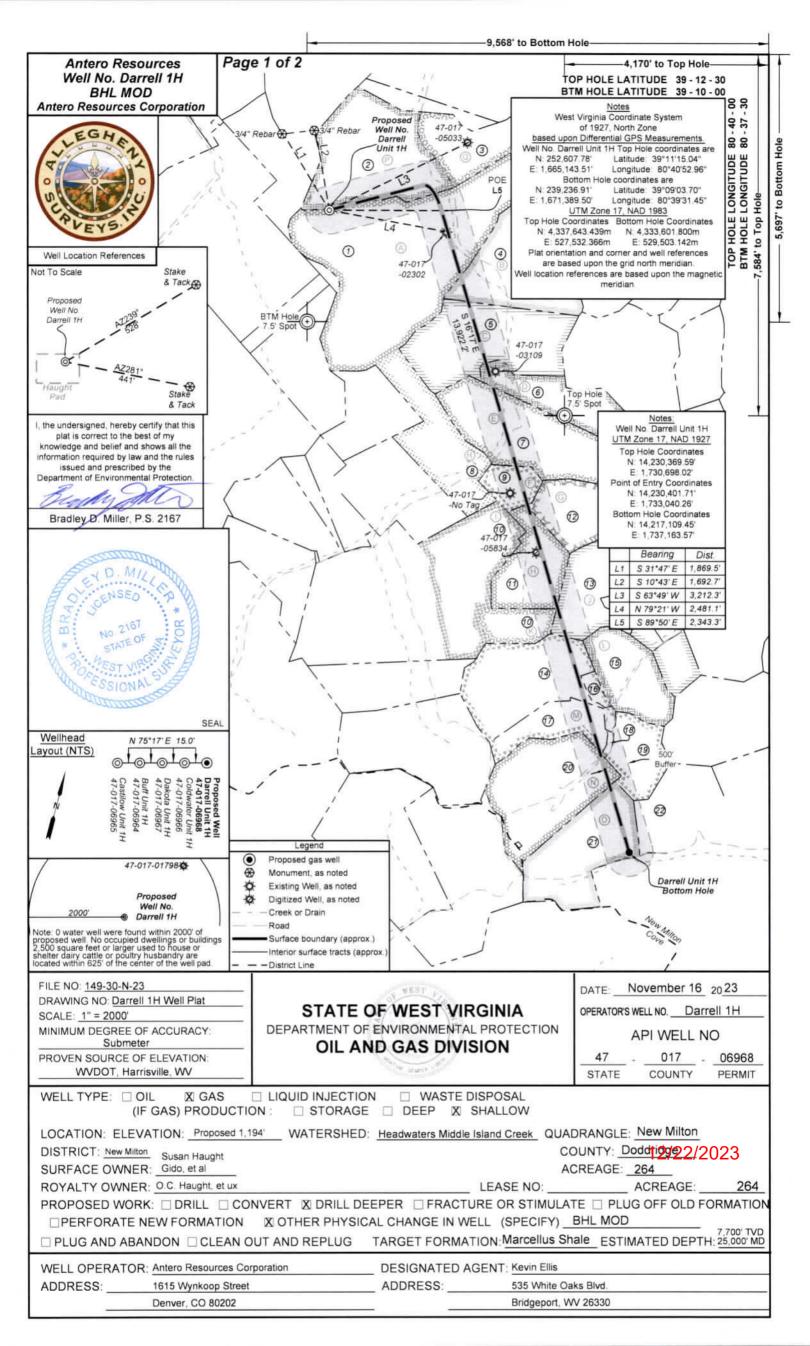
WV Department of Environmental 2/22/2023



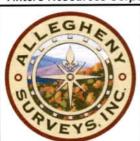
UWI (APINum)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated Interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perfd
47017023020000	O C HAUGHT LEASE	1	TARGA DEVELOPMENT INC	ROCKWELL PETROLEUM	5,374	4461 - 5250	Benson, Alexander	Weir
47017031090000	BARTON	1	ANTERO RESOURCES CORP	SWIFT ENERGY CO	5,841	5002 - 5498	Benson, Alexander, Elk	Weir
47017								Weir
47017058340000	BEE	1	BEE FAMILY ENTERPRISES INC	BEE FAMILY ENTERPRISES INC	2,473	1523 - 1647	1st Salt Sand, 2nd Salt Sand	Weir

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Antero Resources Well No. Darrell 1H BHL MOD Antero Resources Corporation Page 2 of 2



	Leases
Α	O.C.Haught, et ux
В	Ruby Farr Maxwell, et ux
C	Haught Family Trust, et al
D	Haught Family Trust, et al
Е	Susan B. Gum
F	Mary K. Post Revocable Trust - 2017, et al
G	Warren Bee, et ux
Н	Warren Bee, et ux
1	O.C.Haught, et al
J	Louis E. Nicholson, et ux
K	HG Energy II Appalachia, LLC
L	Darrell E. Reed, et al
M	HG Energy II Appalachia, LLC
N	Trever S. Gum
0	Michael Dale & Janet L. Nicholson
Р	Haught Family Trust, et al
Q	Haught Family Trust, et al
R	Michael B. Duffelmeyer

ID	TM-Par	Owner	Bk/Pg	Acres
1	15-15	Susan Haught Gido, et al	WB62/407	264.00
2	15-6	Susan Haught Gido, et al	WB62/407	119.23
3	15-7	Susan Haught Gido, et al	WB62/407	53.00
4	16-10	Melvin L. Davis, Jr.	264/324	121.41
5	16-14	Melvin L. & Misty D. Davis	445/159	104.13
6	16-16	James Schray & Roma C. Kohn	175/280	52.65
7	16-15	Garry R. Norton	176/265	104.40
8	19-6	Garry R. Norton	176/265	68.49
9	20-1	Leonard Gandy	193/66	21.25
10	19-7	Susan Haught Gido, et al	WB62/407	269.50
11	20-3	Warren & Judy Bee	218/585	56.00
12	20-4	Clifford Devericks	241/611	39.00
13	20-9	Warren & Judy Bee	228/360	90.17
14	20-20.1	Harvey C. Woodruff, III	252/715	92.69
15	20-9.1	Darrell E. Reed & Darrell E. Reed, Jr.	214/337	55.78
16	20-20.2	Harvey C. Woodruff, III	257/292	5.00
17	20-20.3	Harvey C. Woodruff, III	257/292	33.73
18	20-20	Harvey C. Woodruff III	257/288	1.51
19	20-22	Shawn E. & David B. Smith	262/664	37.59
20	20-21	Trevor S. Gum	364/471	100.28
21	24-1	Michael & Janet Nicholson	472/87	83.74
22	24-2	Eleanor R. Nicholson	206/363	69.82

STATE OF WEST VIRGINIA OIL AND GAS DIVISION

MEST

DATE: _	No	vembe	er 16	. :	2023
OPERATOR	'S WE	LL NO	Dar	TE	II 1H
		PI WE			
47	0000	017			06968
OTATE	-	0011	ITY		DEDMIT

PROVEN SOURCE OF ELEVATION:	OIL AND GAS DIVISION	47	017	06968
WVDOT, Harrisville, WV	Name of Street	STATE	COUNTY	PERMIT
WELL TYPE: ☐ OIL	□ LIQUID INJECTION □ WASTE DISPOSAL ON: □ STORAGE □ DEEP ☒ SHALLOW			
LOCATION: ELEVATION: Proposed 1,19	94' WATERSHED: Headwaters Middle Island Creek QU	ADRANGLE:	New Milton	
DISTRICT: New Milton Susan Haught	9	COUNTY: D	oddr <u>idgs</u> 2/2	023
SURFACE OWNER: Gido, et al		ACREAGE: _	264	200-00-00
ROYALTY OWNER: O.C. Haught, et ux	LEASE NO:		ACREAGE: _	264_
PROPOSED WORK: ☐ DRILL ☐ CONVERT X DRILL DEEPER ☐ FRACTURE OR STIMULATE ☐ PLUG OFF OLD FORMATION			ORMATION	
	X OTHER PHYSICAL CHANGE IN WELL (SPECIFY)			7.700' TVD
☐ PLUG AND ABANDON ☐ CLEAN O	UT AND REPLUG TARGET FORMATION: Marcellus S	Shale_ESTIN	MATED DEPT	H: 25,000 MD
WELL OPERATOR: Antero Resources Corp	poration DESIGNATED AGENT: Kevin Ellis			
ADDRESS: 1615 Wynkoop Street		Oaks Blvd.		
Denver, CO 80202		WV 26330		

Operato	or's	Well	Num	ber
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Darrell 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
A: O.C. Haught, et ux Lease			
O.C. Haught, et ux	Rockwell Petroleum Company	1/8	103/367
Rockwell Petroleum Company	Rockwell Resources LLC	Successor of Interest	260/429
Rockwell Resources LLC	Antero Resources Appalachian Corporation	Assignment	267/244
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	46/523
P: Haught Family Trust, et al			
Haught Family Trust, et al	Bluestone Energy Partners	1/8	244/312
Bluestone Energy Partners	Antero Resources Bluestone, LLC	Merge	288/1
Antero Resources Bluestone, LLC	Antero Resources Corporation	Merged	WV SOS
A: O.C. Haught, et ux Lease			
O.C. Haught, et ux	Rockwell Petroleum Company	1/8	103/367
Rockwell Petroleum Company	Rockwell Resources LLC	Successor of Interest	260/429
Rockwell Resources LLC	Antero Resources Appalachian Corporation	Assignment	267/244
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	46/523
B: Ruby Farr Maxwell, et ux Lease			
Ruby Farr Maxwell, et al	Clarence W. Mutschelknaus	1/8	119/242
Clarence W. Mutschelknaus	Antero Resources Appalachian Corporation	Assignment	293/602
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	46/523
S. U			
C: Haught Family Trust, et al Lease	01	4.40	
Haught Family Trust, et al	Bluestone Energy Partners	1/8	244/312
Bluestone Energy Partners	Antero Resources Bluestone LLC	Merge	288/1
Antero Resources Bluestone LLC	Antero Resources Corporation	Merged	wvsos
D: Haught Family Trust, et al Lease			
Haught Family Trust, et al	Antero Resources Appalachian Corporation	1/8+	302/571
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	46/523
E: Susan B. Gum Lease			
Susan B. Gum	Antero Resources Appalachian Corporation	1/8+	264/725
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	46/253
F: Mary K. Post Revocable Trust – 2017, et al			
<u>Lease</u> Mary K. Post Revocable Trust – 2017, et al	Antero Resources Corporation	1/8+	512/685
G: Warren Bee, et ux Lease			
Warren Bee, et ux	Antero Resources Corporation	1/8+	278/19
H: Warren Bee, et ux Lease			
Warren Bee, et ux	Antero Resources Corporation	1/8+	448/147

Operator's Well Number

Darrell Unit 1H MOD

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
K: HG Energy II Appalachia, LLC Lease HG Energy II Appalachia, LLC	Antero Resources Corporation	1/8+	512/384
J: Louis E. Nicholson, et ux Lease Louis E. Nicholson, et ux Rockwell Petroleum Company Rockwell Resources LLC Antero Resources Appalachian Corporation	Rockwell Petroleum Company Rockwell Resources LLC Antero Resources Appalachian Corporation Antero Resources Corporation	1/8 Successor of Interest Assignment Name Change	109/293 260/429 267/244 46/523
M: HG Energy II Appalachia, LLC Lease HG Energy II Appalachia, LLC	Antero Resources Corporation	1/8+	512/384
N: Trever S. Gum Lease Trever S. Gum	Antero Resources Corporation	1/8+	505/378

^{*}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.

^{*}Cotenancy 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

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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
O: Mic	hael Dale & Janet L. Nicholson I	ense:			_
		Michael Dale & Janet L. Nicholson	Antero Resources Corporation	1/8+	515/330

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WAY Department of Environmental Protection

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 Resources Corporation		
By:	Tim Rady		
Its:	Senior Vice	President of Land	

Page 1 of 1