

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

Monday, February 24, 2025 PERMIT MODIFICATION APPROVAL Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION 1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for Graden Unit 1H

47-103-03696-00-00

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.

James A. Martin

Chief

Operator's Well Number: Graden Unit 1H

Farm Name: Dallison Lumber Company

U.S. WELL NUMBER: 47-103-03696-00-00

Horizontal 6A New Drill

Date Modification Issued: 2/24/2025

Promoting a healthy environment.

API NO. 47-103	_ 03696	
OPERATOR W	ELL NO.	Graden Unit 1H MOD
Well Pad Nan	ne: Cedar	Pad

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

1) Well Operator	r: Antero	Resources	Corpora	494507062	103 - Wetze	Green	Pine Grove 7.5'	
				Operator ID	County	District	Quadrangle	
2) Operator's W	ell Number:	Graden U	nit 1H MC	DD Well Pac	Name: Ceda	r Pad		
3) Farm Name/S	urface Own	er: Dallison	Lumber Co	mpany Public Roa	d Access: CR	52		_
4) Elevation, cur	rent ground	: As-Built	- 1248' El	evation, proposed	post-construction	on:		
5) Well Type	(a) Gas	×	Oil	Unde	erground Storag	ge		
,	Other _							
9	(b)If Gas	Shallow	X	Deep				
		Horizontal	X					
6) Existing Pad:	Yes or No	Yes						
				pated Thickness a				
Marcellus Sha	le: /200' TVI	D, Anticipate	d Thickne	ss- 55 feet, Associa	ated Pressure- 2	850#		_
8) Proposed Total	al Vertical D							_
9) Formation at	Total Vertic	al Depth:	Marcellus					_
10) Proposed To	tal Measure	d Depth:	26700' MI	D				_
11) Proposed Ho	rizontal Leg	g Length:	16829'	Open to modifica	ation at a later	date		
12) Approximate	Fresh Wate	er Strata De	pths:	612'				
13) Method to D	etermine Fr	esh Water D	Depths: 4	7103308970000 Offset wel	l records. Depths have	been adjusted a	according to surface elevations	s.
14) Approximate	Saltwater I	Depths: 21	93'					
15) Approximate	Coal Seam	Depths: 1	010'					
16) Approximate	Depth to P	ossible Voi	d (coal mi	ne, karst, other):	None Anticipat	ed		
17) Does Propos directly overlyin				Yes	No	X		
(a) If Yes, prov	ride Mine In	fo: Name:						
		Depth						
RECE	IVED	Seam:						
office of Oi	and Gas	Owner	r:					_
	0 2025							_

FEB 1 0 2025

WV Department of Environmental Protection

Page 1 of 3
02/28/2025

API NO. 47- 103	-	03696
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OPERATOR WELL NO. Graden Unit 1H MOD
Well Pad Name: Cedar 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#	662'	662'	CTS, 690 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	3200'	3200'	CTS, 1303 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P110-ICY	23#	26700'	26700'	CTS, 5800 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	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	
Depths Set:	N/A RECEIVED	

Office of Oil and Gas

FEB 1 0 2025

Environmental Protection

Page 2 of 3
02/28/2025

OPERATOR WELL NO. Graden Unit 1H MOD Well Pad Name: Cedar 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): 71.85 acres
- 22) Area to be disturbed for well pad only, less access road (acres): 18.45 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/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

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.

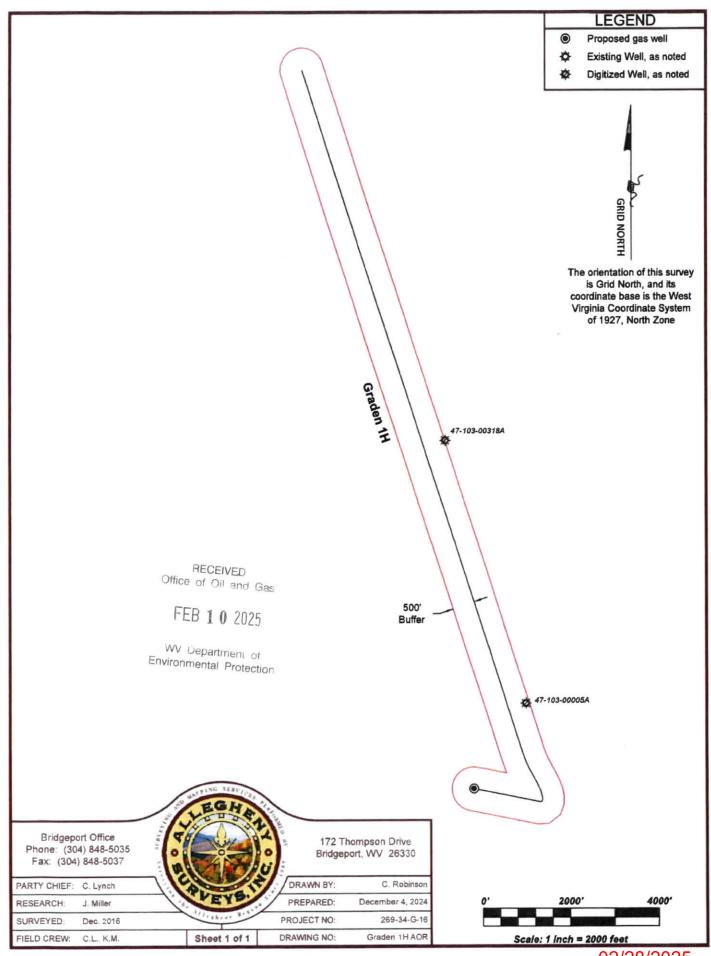
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls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

*Note: Attach additional sheets as needed.

RECEIVED Office of Oil and Gas

FEB 1 0 2025

WV Department of Environmental Protection



UWI (APINum)	Well Name	Well Number	Operator	Historical Operator	TD	Perforated interval (shallowest, deepest)	Perforated Formation(s)	Producible Formation(s) not perf'd
47103003180000			UNKNOWN	UNKNOWN	1,810			
47103000050000	S S MAIN HRS	3385	HORNER OIL & GAS PRODUCTION INC	MANUFACT LIGHT &HEAT	3,260		Gordon	Weir, Benson, Alexander



Graden 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
Y: Jenkins Miller Lease			
Jenkins Miller	Hope Natural Gas Company	1/8	0107/0056
Hope Natural Gas Company	Consolidated Gas Supply Corporation	Assignment	0233/0387
Consolidated Gas Supply Corporation	Consolidated Gas Transmission Corporation	Assignment	066A/0069
Consolidated Gas Transmission Corporation	Eastern States Oil & Gas Inc	Assignment	076A/0232
Eastern States Oil & Gas Inc	Blazer Energy Corp	Merger	0012/0253
Blazer Energy Corp	Eastern States Oil & Gas Inc	Name Change	0012/0259
Eastern States Oil & Gas Inc	Equitable Production- Eastern States INC	Name Change	WVSOS
Equitable Production- Eastern States INC	Appalachian Natural Gas Trust	Assignment	079A/0244
Appalachian Natural Gas Trust	EQT Production Company	Merger	0096/0505
EQT Production Company	Antero Resources Corporation	Assignment	230A/0801
Z: Eddie D. Dallison Lease Eddie D. Dallison	Antero Resources Corporation	1/8+	307A/0447
Y: Jenkins Miller Lease		. 10	04.07/0056
Jenkins Miller	Hope Natural Gas Company	1/8	0107/0056
Hope Natural Gas Company	Consolidated Gas Supply Corporation	Assignment	0233/0387
Consolidated Gas Supply Corporation	Consolidated Gas Transmission Corporation	Assignment	066A/0069
Consolidated Gas Transmission Corporation	Eastern States Oil & Gas, Inc.	Assignment	076A/0232
Eastern States Oil & Gas, Inc.	Blazer Energy Corp	Merger	0012/0253 0012/0259
Blazer Energy Corp	Eastern States Oil & Gas, Inc.	Name Change	WVSOS
Eastern States Oil & Gas, Inc.	Equitable Production- Eastern States, Inc.	Name Change	079A/0244
Equitable Production- Eastern States, Inc.	Appalachian Natural Gas Trust	Assignment	0096/0505
Appalachian Natural Gas Trust	EQT Production Company	Merger Assignment	230A/0801
EQT Production Company	Antero Resources Corporation	Assignment	230A/0001
X: James E. & Shawn L. Coen Lease			
James E. & Shawn L. Coen	Antero Resources Corporation	1/8+	268A/0779
V: Chesapeake Appalachia, LLC Lease			
Chesapeake Appalachia, LLC	SWN Production Company, LLC	1/8	157A/0640
SWN Production Company, LLC	Antero Exchange Properties, LLC	Assignment	177A/0533
Antero Exchange Properties, LLC	Antero Resources Corporation	Merger	0013/0311
<u>U: Stephen H. Stocker Lease</u> Stephen H. Stocker	Antero Resources Corporation	1/8+	376A/0864
S: The Tracy Living Trust Lease The Tracy Living Trust	Antero Resources Corporation	1/8+	305A/0039
R: Acropolis, Inc. Lease		1/0.	201 A /0002
Acropolis, Inc.	Antero Resources Corporation	1/8+	291A/0003
P: Robert Bassett Lease Robert Bassett Office of	EIVED Anterogesources Corporation	1/8+	297A/0398
O: Bounty Minerals, LLC Lease Bounty Minerals, LLC	Antero Resources Corporation	1/8+	296A/0326

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
L: Marilee S. Morgan Lease Marilee S. Morgan	Antero Resources Corporation	1/8+	363A/0805
H: Venable Royalty, LTD, et al Lease Venable Royalty, LTD, et al	Antero Resources Corporation	1/8+	300A/0880
<u>J: John Timothy Taylor Lease</u> John Timothy Taylor	Antero Resources Corporation	1/8+	381A/0296
H: Venable Royalty, LTD, et al Lease Venable Royalty, LTD, et al	Antero Resources Corporation	1/8+	300A/0880
C: Debra Carol Miller Lease Debra Carol Miller TH Exploration	TH Exploration Antero Resources Corporation	1/8+ Assignment	195A/0327 254A/0933
<u>E: Belinda K. Harrison Lease</u> Belinda K. Harrison	Antero Resources Corporation	1/8+	345A/0753
D: Jay H. Renner Lease Jay H. Renner Spartan Exploration Company Acadian Energy Resources, LLC CB Energy, LLC B & R Construction, LLC B & R Holdings, Inc. Stone Energy Corporation, LLC EQT Production Company	Spartan Exploration Company Acadian Energy Resources, LLC CB Energy, LLC B & R Construction, LLC B & R Holdings, Inc. Stone Energy Corporation, LLC EQT Production Company Antero Resources Corporation	1/8 Assignment Assignment Assignment Assignment Assignment Assignment Assignment Assignment	089A/0093 103A/0193 108A/0491 108A/0521 118A/0694 179A/0848 183A/0305 385A/0323



^{*}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.

^{*}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.

WW-6A1 (5/13)

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Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
7 20 20 20 20 20 20 20 20 20 20 20 20 20	Giantoi, Lessoi, etc.	Granice, Lessee, etc.	Royalty	DOOK! age
B: Deborah Carol Miller Lease				
	_ 0 0 _ 0 _ 0 00			
	Deborah Carol Miller	TH Exploration	1/8+	195A/0327
	TH Exploration	Antero Resources Corporation	Assignment	254A/0933

*Fooling/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.

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.

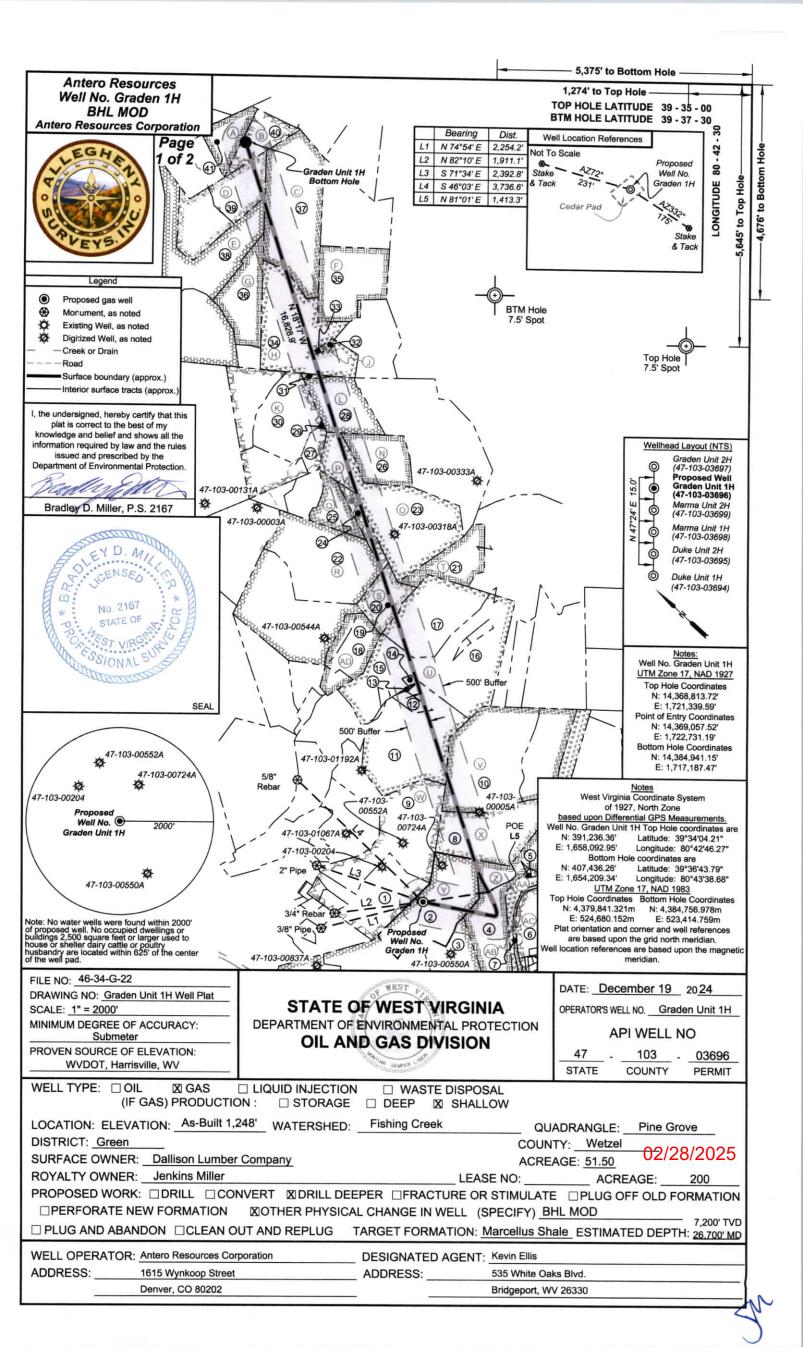
	Well Operator:	Antero Resources Corporation		
OF WED	By:	Tim Rady		
RECEIVED HICE of Oil and Gas	Its:	Senior Vice President of Land		
mice .				

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Page 1 of 1

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Antero Resources Well No. Graden 1H BHL MOD Antero Resources Corporation

EGHEN

Page 2 of 2



ID	TM-Par	Owner	Bk/Pg	Acres
1	13-40	Kenneth E. & Vicky A. Van Dyne	357/204	42.33
2	14-19	Dallison Lumber Company	357/267	51.50
3	14-34	Thelma Deaton	493/482	41.00
4	14-20	Dallison Lumber Company	357/270	109.91
5	14-21	Dominion Gathering & Processing, Inc.	460/781	3.20
6	14-36	Dominion Gathering & Processing, Inc.	460/781	57.41
7		Big Fishing Creek	400/101	07.41
8	14-16	Antero Midstream, LLC	491/484	54.00
9	13-26.7	John M. & Stanley D. Pittman	458/837	55.00
10	14-5	Donald L. & Myrna R. Mason	390/62	93.70
11	13-17	Laura Ann Slater	423/93	83.50
12	13-17.1	Laura A. & Clayton L. Slater	461/185	6.50
13	13-11	Laura Ann Slater	423/93	0.13
14	13-10.2	Ida Morris	A110/206	
15	13-10	Blue Racer Midstream LLC	452/542	25.99
16	14-1	Kenneth & Vicky A. Van Dyne	339/427	69.39
17	9-52	WSD Properties, LLC	441/793	50.00
18	9-60	Ester Ruth Coen	269A/114	
19	9-43	Goodnight Cemetery	/	0.35
20	9-52.1	WSD Properties, LLC	441/793	25.00
21	9-44	Jerry L. & Karen B. Mason	353/216	152.00
22	9-42	WSD Properties, LLC	441/793	149.00
23	9-33	Thomas Rogers & Eliot Stearns	352/98	50.00
24	9-32	Richard David Hornbeck	334/514	16.25
25	9-31	Richard David Hornbeck	334/514	17.00
26	9-20	Richard David Hornbeck	372/423	29.30
27	9-19	Richard David Hornbeck	334/514	9.50
28	9-17	Donzel A. Hornbeck	346/142	35.00
29	9-18	Donzel A. Hombeck	346/142	0.42
30	9-15	Keith A. Milhoan	407/375	45.25
31	9-16	Donzel A. & Rebecca L. Hornbeck	346/373	1.00
32	9-6	Ashland Cemetery	/	0.92
33	9-5	M.E. Church	92/392	0.92
34	9-1	Antero Resources Corporation	462/582	71.30
35	4-44	Richard D. Hornbeck	372/421	42.50
36	4-43	Donzel A. & Rebecca L. Hombeck	346/373	35.30
37	4-30	Debra C. Miller	A103/410	76.80
38	3-38	Julie Marie Lemons	493/298	39.80
39	4-29	Timothy S. Harrison	439/202	23.00
40	4-11	Debra C. Miller	A103/410	
41	4-10	Debra C. Miller	A103/410	

FILE NO	46-34-G-22
DRAWIN	IG NO: Graden Unit 1H Well Plat
SCALE:	1" = 2000'
MINIMUN	M DEGREE OF ACCURACY: Submeter
PROVEN	SOURCE OF ELEVATION:

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION OIL AND GAS DIVISION

WEST

DATE: December 19 2024 OPERATOR'S WELL NO. Graden Unit 1H API WELL NO

47 - 103 - 03696

WVDOT, Harrisville, WV	SEMPER LANCE	STATE COUNTY PERMIT		
WELL TYPE: ☐ OIL ☑ GAS (IF GAS) PRODUCTIO	□ LIQUID INJECTION □ WASTE DIS ON: □ STORAGE □ DEEP ☒ S	SPOSAL HALLOW		
LOCATION: ELEVATION: As-Built 1,2 DISTRICT: Green SURFACE OWNER: Dallison Lumber		QUADRANGLE:Pine Grove COUNTY:Wetzel ACREAGE: 51.50		
ROYALTY OWNER: Jenkins Miller LEASE NO: ACREAGE: 200 PROPOSED WORK: DRILL CONVERT MORILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION MOTHER PHYSICAL CHANGE IN WELL (SPECIFY) BHL MOD PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 26,700° MD				
WELL OPERATOR: Antero Resources Cor ADDRESS: 1615 Wynkoop Street Denver, CO 80202	poration DESIGNATED AG	ENT: Kevin Ellis		