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west virginia department of environmental protection

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Office of Oil and Gas  
601 57<sup>th</sup> Street, S.E.  
Charleston, WV 25304  
(304) 926-0450  
fax: (304) 926-0452

Jim Justice , Governor  
Austin Caperton , Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Tuesday, March 28, 2017  
WELL WORK PERMIT  
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION (A)  
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit approval for KALAR UNIT 3H  
47-085-10319-00-00

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless 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: KALAR UNIT 3H  
Farm Name: WILLIAM BROADWATER, ET UX  
U.S. WELL NUMBER: 47-085-10319-00-00  
Horizontal 6A / New Drill  
Date Issued: 3/28/2017

Promoting a healthy environment.

03/31/2017

## PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

### CONDITIONS

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1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than one hundred (100) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. 24 hours prior to the initiation of the completion process the operator shall notify the Chief or his designee.
8. During the completion process the operator shall monitor annular pressures and report any anomaly noticed to the chief or his designee immediately.
9. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
10. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

## PERMIT CONDITIONS

11. The operator shall provide to the Office of Oil and Gas the dates of each of the following within 30 days of their occurrence: completion of construction of the well pad, commencement of drilling, cessation of drilling, completion of any other permitted well work, and completion of the well. Such notice shall be provided by sending an email to [DEPOOGNotify@wv.gov](mailto:DEPOOGNotify@wv.gov).

WW-6B  
(04/15)

API NO. 47-085 - 10319  
OPERATOR WELL NO. Kalar Unit 3H  
Well Pad Name: North Fork Pad

1/23

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

1) Well Operator: Antero Resources Corpora 494507062 085 - Ritchie Clay Pennsboro 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: Kalar Unit 3H Well Pad Name: North Fork Pad

3) Farm Name/Surface Owner: William Broadwater, et ux Public Road Access: CR 50/26

4) Elevation, current ground: ~964 Elevation, proposed post-construction: 951'

5) Well Type (a) Gas  Oil \_\_\_\_\_ Underground Storage \_\_\_\_\_

Other \_\_\_\_\_

(b) If Gas Shallow  Deep \_\_\_\_\_

Horizontal  \_\_\_\_\_

*Michael Hoff*  
*2/22/17*

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus Shale: 6400' TVD, Anticipated Thickness- 75 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 6400' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 16200' MD

11) Proposed Horizontal Leg Length: 8711'

12) Approximate Fresh Water Strata Depths: 96', 201', 349'

13) Method to Determine Fresh Water Depths: Offset well records. Depths have been adjusted according to surface elevations.

14) Approximate Saltwater Depths: 1348'

15) Approximate Coal Seam Depths: 610', 1315', 1370'

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) If Yes, provide Mine Info: Name: \_\_\_\_\_

Depth: \_\_\_\_\_

Seam: \_\_\_\_\_

Owner: \_\_\_\_\_

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**FEB 24 2017**



WW-6B  
(04/15)

API NO. 47-085 - 10319  
 OPERATOR WELL NO. Kalar Unit 3H  
 Well Pad Name: North Fork 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	H-40	94#	80'	80'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/48#	405' *see #19	405' *see #19	CTS, 563 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2500'	2500'	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	16200'	16200'	4047 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

*MAG  
2/22/17*

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	30"	24"	0.438"	1530	50	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	1000	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	1500	Class A	1.18
Intermediate							
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12,630	2500	Lead-HPCZ & Tail - 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			

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WW-6B  
(10/14)

API NO. 47-085 - 10319  
OPERATOR WELL NO. Kalar Unit 3H  
Well Pad Name: North Fork Pad

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill, perforate, fracture a new horizontal shallow well and complete 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): 27.13 Acres

22) Area to be disturbed for well pad only, less access road (acres): 4.36 Acres

MAG  
2/22/17

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 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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# Kalar Unit 3H

47085074150000



47085077340000



47085078910000



47085076000000



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KALAR UNIT 3H (NORTH FORK PAD) - AREA OF REVIEW 35-8-5.11 PAGE 2

UWI (API#)	Well Name	Well Number	Operator	Host Oper	Elev. GR	ID	ID (SSIV)	Perforated Interval MD (shallowest, deepest)	Perforated Formation(s)	Productible Formation(s) not perf'd
47085074150000	TAYLOR FLOYD S ETAL	JK-1222	ALLIANCE PETR CORP	J & J ENTERPRISES	1053	5464	-4420	4130-5201'	Riley, Benson, Alexander	Warren, Gordon, Baltown
47085076000000	WILSON BARR ET AL	2517	ALLIANCE PETR CORP	UNION DRILLING CO	885	5238	-4153	4128-4141'	Riley, Benson, Alexander	Warren, Gordon, Baltown
47085077340000	HICKAMAN B H	1	KEY OIL COMPANY	KEY OIL INCORPORATED	913	5220	-4307	4122-5013'	Riley, Benson, Alexander	Warren, Gordon, Baltown
47085078910000	WILSON BARR & BROOKS	2	ENERGY CORP OF AMER	EASTERN AMERICAN ENR	1083	5371	-4282	3390-5193'	Warren, Riley, Benson, Alexander	Gordon, Baltown

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WW-9  
(4/16)

API Number 47 - 085 - 10319  
Operator's Well No. Kalar Unit 3H

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Antero Resources Corporation OP Code 494507062

Watershed (HUC 10) North Fork Hughes River Quadrangle Pennsboro 7.5'

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes  No

Will a pit be used? Yes  No

If so, please describe anticipated pit waste: No pit will be used at this site (Drilling and Flowback Fluids will be stored in tanks. Cuttings will be tanked and hauled off site.)

Will a synthetic liner be used in the pit? Yes  No  If so, what ml.? N/A

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number                      \*UIC Permit # will be provided on Form WR-34 )
- Reuse (at API Number                      Future permitted well locations when applicable. API# will be provided on Form WR-34 )
- Off Site Disposal (Supply form WW-9 for disposal location) (Meadowfill Landfill Permit #SWF-1032-98)
- Other (Explain                      Northwestern Landfill Permit #SWF-1025/ WV0109410)

*MAG  
2/22/17*

Will closed loop system be used? If so, describe: Yes

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Surface - Air/Freshwater, Intermediate - Dust/Surf Foam, Production - Water Based Mud

-If oil based, what type? Synthetic, petroleum, etc. N/A

Additives to be used in drilling medium? Please See Attachment

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Stored in tanks, removed offsite and taken to landfill.

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A

-Landfill or offsite name/permit number? Meadowfill Landfill (Permit #SWF-1032-98), Northwestern Landfill (Permit # SWF-1025/WV0109410)

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

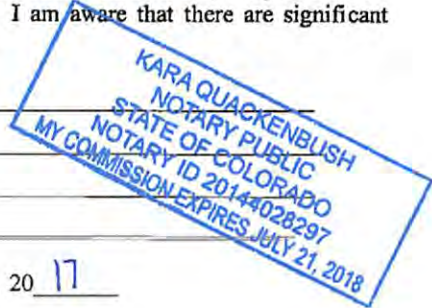
I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature *Cole Kilstrom*

Company Official (Typed Name) Cole Kilstrom

Company Official Title Environmental & Regulatory Manager



Subscribed and sworn before me this 27 day of January, 20 17

*Kunal Kumar* **Received** Notary Public  
**Office of Oil & Gas**

My commission expires July 21, 2018

**FEB 24 2017**

**03/31/2017**

Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 27.13 Acres Prevegetation pH \_\_\_\_\_

Lime 2-4 Tons/acre or to correct to pH 6.5

Fertilizer type Hay or straw or Wood Fiber (will be used where needed)

Fertilizer amount 500 lbs/acre

Mulch 2-3 Tons/acre

Main Access Road 1 (3.92 acres) + Main Access Road 2 (2.85 acres) + Main Access Road 3 (6.39 acres) + Well Pad (4.36 acres) + Water Tank Pad (3.97 acres) + Staging Area (2.27) + Topsoil (2.64 acres) + Spoil (0.73 acres) = 27.13 Acres

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Crownvetch	10-15
Field Bromegrass	40	Tall Fescue	30
<small>See attached table for additional seed type (North Fork Design Page 31)</small>		<small>See attached table for additional seed type (North Fork Design Page 31)</small>	
*or type of grass seed requested by surface owner		*or type of grass seed requested by surface owner	

Attach:

Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, include dimensions (L x W x D) of the pit, and dimensions (L x W), and area in acreage, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Michael Loff

Comments: Preseed & mulch any disturbed areas per WUDEP regulations. Maintain & upgrade E-n-s as necessary. Sound dissipating Barriers may be needed on Well Pad.

Title: \_\_\_\_\_ Date: 2/22/17

Field Reviewed?  Yes  No

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## *Form WW-9 Additives Attachment*

### **SURFACE INTERVAL**

1. Fresh Water
2. Soap –Foamer AC
3. Air

### **INTERMEDIATE INTERVAL**

#### *STIFF FOAM RECIPE:*

- 1) 1 ppb Soda Ash / Sodium Carbonate-Alkalinity Control Agent
- 2) 1 ppb Conqor 404 ( 11.76 ppg) / Corrosion Inhibitor
- 3) 4 ppb KLA-Gard ( 9.17 ppg) / Amine Acid Complex-Shale Stabilizer
- 4) 1ppb Mil Pac R / Sodium Carboxymethylcellulose-Filtration Control Agent
- 5) 12 ppb KCL / Potassium Chloride-inorganic Salt
- 6) Fresh Water 80 bbls
- 7) Air

### **PRODUCTION INTERVAL**

1. Alpha 1655  
Salt Inhibitor
2. Mil-Carb  
Calcium Carbonate
3. Cottonseed Hulls  
Cellulose-Cottonseed Pellets – LCM
4. Mil-Seal  
Vegetable, Cotton & Cellulose-Based Fiber Blend – LCM
5. Clay-Trol  
Amine Acid Complex – Shale Stabilizer
6. Xan-Plex  
Viscosifier For Water Based Muds
7. Mil-Pac (All Grades)  
Sodium Carboxymethylcellulose – Filtration Control Agent
8. New Drill  
Anionic Polyacrylamide Copolymer Emulsion – Shale Stabilizer
9. Caustic Soda  
Sodium Hydroxide – Alkalinity Control
10. Mil-Lime  
Calcium Hydroxide – Lime
11. LD-9  
Polyether Polyol – Drilling Fluid Defoamer
12. Mil Mica  
Hydro-Biotite Mica – LCM

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13. Escaid 110  
Drilling Fluid Solvent – Aliphatic Hydrocarbon
14. Ligco  
Highly Oxidized Leonardite – Filtration Control Agent
15. Super Sweep  
Polypropylene – Hole Cleaning Agent
16. Sulfatrol K  
Drilling Fluid Additive – Sulfonated Asphalt Residuum
17. Sodium Chloride, Anhydrous  
Inorganic Salt
18. D-D  
Drilling Detergent – Surfactant
19. Terra-Rate  
Organic Surfactant Blend
20. W.O. Defoam  
Alcohol-Based Defoamer
21. Perma-Lose HT  
Fluid Loss Reducer For Water-Based Muds
22. Xan-Plex D  
Polysaccharide Polymer – Drilling Fluid Viscosifier
23. Walnut Shells  
Ground Cellulosic Material – Ground Walnut Shells – LCM
24. Mil-Graphite  
Natural Graphite – LCM
25. Mil Bar  
Barite – Weighting Agent
26. X-Cide 102  
Biocide
27. Soda Ash  
Sodium Carbonate – Alkalinity Control Agent
28. Clay Trol  
Amine Acid complex – Shale Stabilizer
29. Sulfatrol  
Sulfonated Asphalt – Shale Control Additive
30. Xanvis  
Viscosifier For Water-Based Muds
31. Milstarch  
Starch – Fluid Loss Reducer For Water Based Muds
32. Mil-Lube  
Drilling Fluid Lubricant

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**911 Address**  
**155 Sugar Run Rd.**  
**Pennsboro, WV 26415**

## **Well Site Safety Plan**

### **Antero Resources**

**Well Name:** Barr Unit 1H, Barr Unit 2H, Barr Unit 3H, Kalar Unit 2H, Kalar Unit 3H, Future Well

**Pad Location:** NORTH FORK PAD  
 Ritchie County/Clay District

**GPS Coordinates:**

**Entrance** - Lat 39°16'41.55"/Long -80°54'35.43" (NAD83)

**Pad Center** - Lat 39°16'36.49"/Long -80°54'54.58" (NAD83)

*Michael Goff*  
 2/27/22

**Driving Directions:**

From the intersection of I-79 and Hwy 50 near Clarksburg WV. Head west on Hwy 50 for 35.1mi. Turn right onto Northwest Turnpike/Old US 50 E/Sunnyside Rd (1.3mi). Turn Right onto Sugar Run Rd, the pad access road will be immediately on your left.

**Alternate Route:**

From the intersection of I-79 and Hwy 50 near Clarksburg WV. Head west on Hwy 50 for 35.1mi. Turn right onto Northwest Turnpike/Old US 50 E/Sunnyside Rd (1.3mi). Turn Right onto Sugar Run Rd, the pad access road will be immediately on your left.

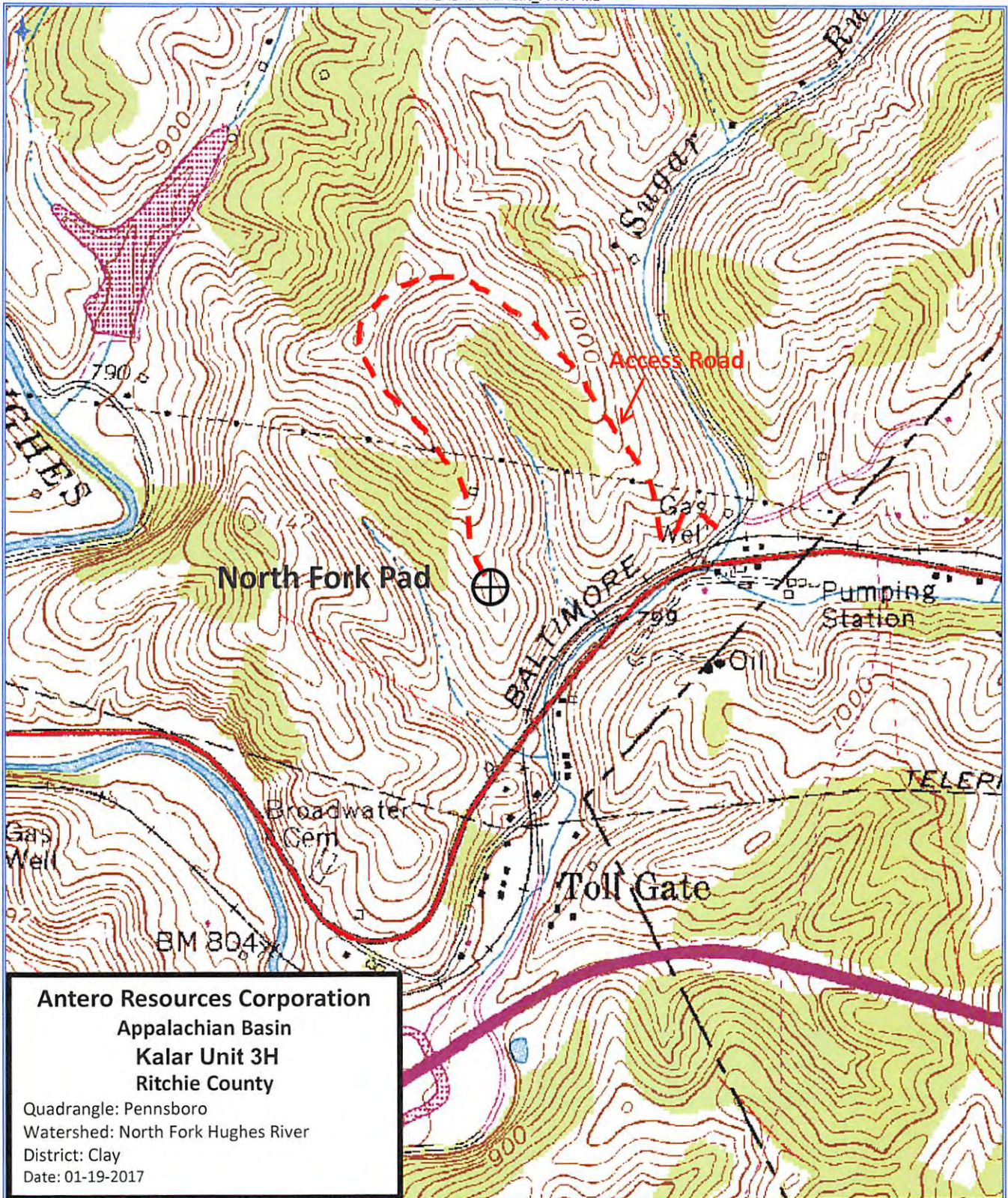
**EMERGENCY (24 HOUR) CONTACT 1-800-878-1373**

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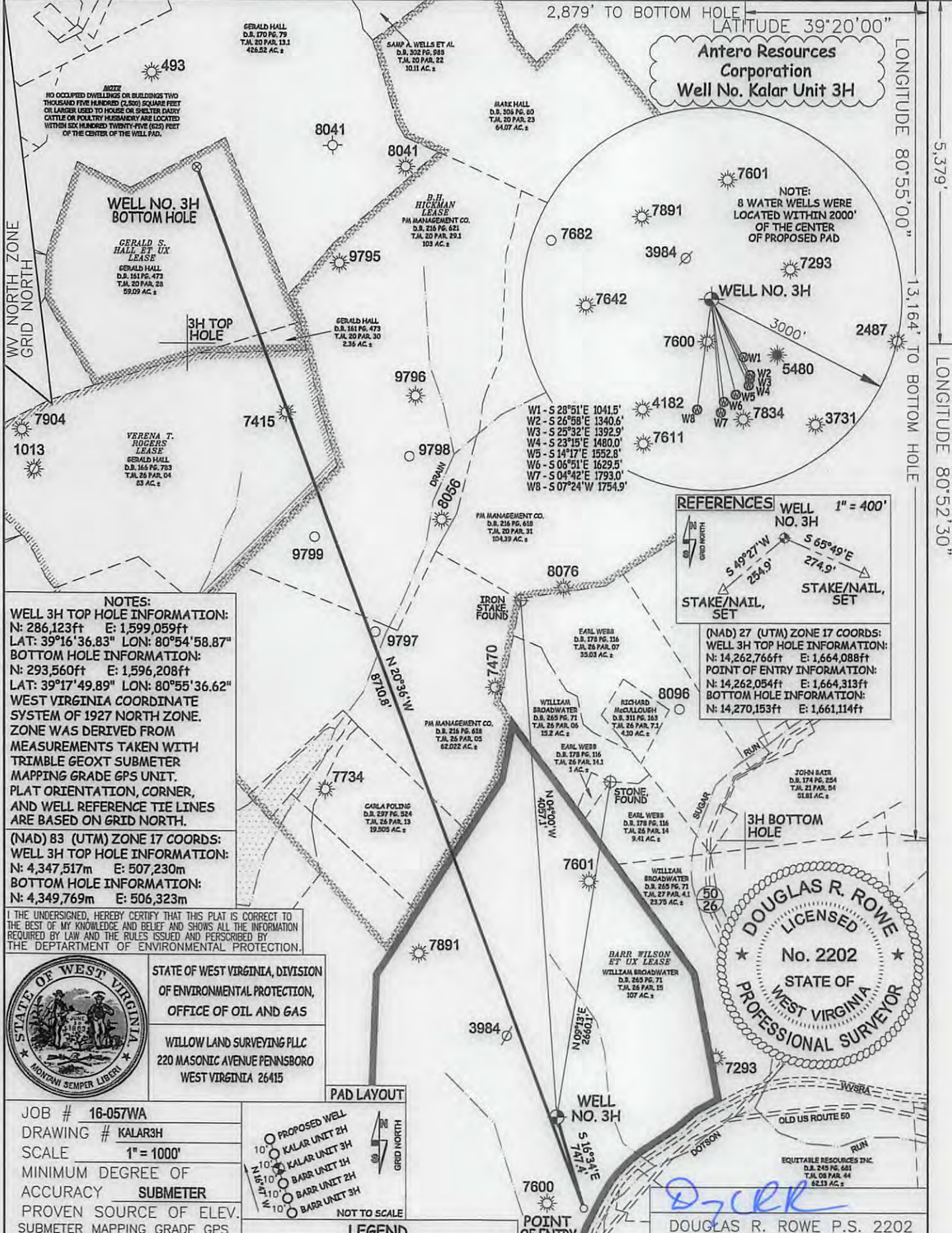
03/31/2017







LATITUDE 39°17'30" 11,706' LATITUDE 39°20'00" LONGITUDE 80°55'00" LONGITUDE 80°52'30"

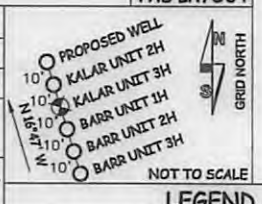


**NOTES:**  
**WELL 3H TOP HOLE INFORMATION:**  
 N: 286,123ft E: 1,599,059ft  
 LAT: 39°16'36.83" LON: 80°54'58.87"  
**BOTTOM HOLE INFORMATION:**  
 N: 293,560ft E: 1,596,208ft  
 LAT: 39°17'49.89" LON: 80°55'36.62"  
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.  
**(NAD) 83 (UTM) ZONE 17 COORDS:**  
**WELL 3H TOP HOLE INFORMATION:**  
 N: 4,347,517m E: 507,230m  
**BOTTOM HOLE INFORMATION:**  
 N: 4,349,769m E: 506,323m

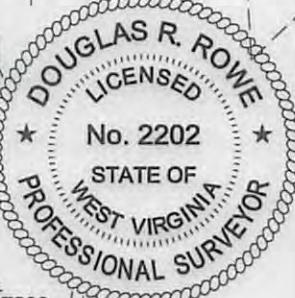
I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
 WILLOW LAND SURVEYING PLLC  
 220 MASONIC AVENUE PENNSBORO WEST VIRGINIA 26415

JOB # 16-057WA  
 DRAWING # KALAR3H  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY SUBMETER  
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS



STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS  
 WELL TYPE: OIL GAS  LIQUID INJECTION WASTE DISPOSAL API WELL #  
 (IF "GAS") PRODUCTION  STORAGE DEEP SHALLOW  47 - 085 - 10319 H6A  
 LOCATION: ELEVATION ORIG 964' - PROPOSED 951' WATERSHED NORTH FORK HUGHES RIVER STATE COUNTY PERMIT  
 QUADRANGLE PENNSBORO 7.5' DISTRICT CLAY COUNTY COUNTY RITCHIE  
 SURFACE OWNER WILLIAM BROADWATER ET UX ACREAGE 107 ACRES +/-  
 OIL & GAS ROYALTY OWNER BARR WILSON ET UX; B.H. HICKMAN; VERENA T. ROGERS; GERALD S. HALL ET UX LEASE ACREAGE 107 ACRES±; 400 ACRES±; 141 ACRES±; 61 ACRES±  
 PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER REDRILL FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION PERFORATE NEW FORMATION   
 OTHER PHYSICAL CHANGE IN WELL (SPECIFY)  
 PLUG & ABANDON CLEAN OUT & REPLUG ESTIMATED DEPTH 6,400' TVD 16,200' MD  
 TARGET FORMATION MARCELLUS  
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER  
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD  
 FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313



DOUGLAS R. ROWE P.S. 2202  
 DATE 01/11/17  
 OPERATOR'S WELL# KALAR UNIT #3H

03/31/2017



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
<b><u>Barr Wilson, et ux Lease</u></b>			
Barr Wilson, et ux	J & J Enterprises, Inc.	1/8	0193/0016
J & J Enterprises	Eastern American Energy Corporation	Confirmatory Deed	0159/0139
Eastern American Energy Corporation	Energy Corporation of America	Confirmatory Deed	0240/0498
Energy Corporation of America	Antero Resources Corporation	Partial Assignment	0328/0648
<b><u>B.H. Hickman Lease</u></b>			
B.H. Hickman	M.G. Zinn	1/8	0029/0447
M.G. Zinn	J.L. Newman	Assignment	0126/0415
J.L. Newman	The Philadelphia Company	Assignment	0091/0265
The Philadelphia Company	Pittsburgh & West Virginia Gas Company	Assignment	0055/0359
Pittsburgh & West Virginia Gas Company	Equitable Gas Company	Assignment	0121/0257
Equitable Gas Company	P.D. Farr II	Assignment	0192/0804
P.D. Farr II	Antero Resources Appalachian Corporation	Assignment	0257/0249
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<b><u>Verena T. Rogers Lease</u></b>			
Verena T. Rogers	J & J Enterprises, Inc.	1/8	0178/0833
J & J Enterprises	Eastern American Energy Corporation	Confirmatory Deed	0159/0139
Eastern American Energy Corporation	Energy Corporation of America	Confirmatory Deed	0240/0498
Energy Corporation of America	Antero Resources Corporation	Partial Assignment	0328/0648

**Received**  
**Office of Oil & Gas**  
**JAN 30 2017**

\*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.



**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:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Gerald S. Hall, et ux Lease</u>	Gerald S. Hall, et ux	Antero Resources Corporation	1/8	0280/1004

\*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 permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Antero Resources Corporation  
 By: Kevin Kilstrom *Kevin Kilstrom* JAN 30 2017  
 Its: Senior VP of Production

Received  
Office of Oil & Gas

FORM WW-6A1  
EXHIBIT 1

FILED

JUN 10 2013

Natalie E. Tennant  
Secretary of State  
1900 Kanawha Blvd E  
Bldg 1, Suite 157-K  
Charleston, WV 25305



Penny Barker, Manager  
Corporations Division  
Tel: (304)558-8000  
Fax: (304)558-8381  
Website: [www.wvso.com](http://www.wvso.com)  
E-mail: [business@wvso.com](mailto:business@wvso.com)

APPLICATION FOR  
AMENDED CERTIFICATE  
OF AUTHORITY

Office Hours: Monday - Friday  
8:30 a.m. - 5:00 p.m. ET

FILE ONE ORIGINAL  
(Two if you want a filed  
stamped copy returned to you)  
FEE: \$25.00

\*\*\*\* In accordance with the provisions of the West Virginia Code, the undersigned corporation hereby \*\*\*\*  
applies for an Amended Certificate of Authority and submits the following statement:

- Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation
- Date Certificate of Authority was issued in West Virginia: 6/25/2008
- Corporate name has been changed to: Antero Resources Corporation  
(Attach one Certified Copy of Name Change as filed in home State of incorporation.)
- Name the corporation elects to use in WV: Antero Resources Corporation  
(due to home state name not being available)
- Other amendments: \_\_\_\_\_  
(attach additional pages if necessary)
- Name and phone number of contact person. (This is optional; however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)  
Alvyn A. Schopp (303) 367-7310  
Contact Name Phone Number
- Signature information (See below \*Important Legal Notice Regarding Signature\*):  
Print Name of Signer: Alvyn A. Schopp Title/Capacity: Authorized Person  
Signature: [Handwritten Signature] Date: June 10, 2013

**\*Important Legal Notice Regarding Signature:** For West Virginia Code §31D-1-129. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.

Received  
Office of Oil & Gas  
JAN 30 2017

85-10319



Antero Resources  
1615 Wynkoop Street  
Denver, CO 80202  
Office 303.357.7310  
Fax 303.357.7315

January 20, 2017

West Virginia Department of Environmental Protection  
Chief, Office of Oil and Gas  
Attn: Mr. James Martin  
601 57<sup>th</sup> Street SE  
Charleston, WV 25304

RE: Kalar Unit 3H  
Quadrangle: Pennsboro 7.5'  
Ritchie County/Clay District, West Virginia

Mr. Martin:

Antero Resources Corporation (Antero) is submitting the following application for a new well work permit for the Kalar Unit 3H horizontal shallow well. As an authorized representative, I certify that Antero has the right to extract, produce or market the oil or gas for all leases through which the Kalar Unit 3H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,

A handwritten signature in blue ink, appearing to read "Thomas Kuhn", is written over a horizontal line. The signature is fluid and cursive.

Thomas Kuhn  
Senior Landman

Received  
Office of Oil & Gas  
JAN 30 2017

03/31/2017



**STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE CERTIFICATION**

Date of Notice Certification: 01/26/2017

API No. 47- 085 - 10319  
Operator's Well No. Kalar Unit 3H  
Well Pad Name: North Fork Pad

**Notice has been given:**

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

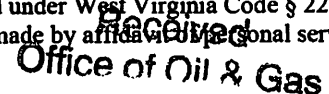
State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>507230m</u>
County:	<u>Ritchie</u>		Northing:	<u>4347517m</u>
District:	<u>Clay</u>	Public Road Access:		<u>CR 50/26</u>
Quadrangle:	<u>Pennsboro 7.5'</u>	Generally used farm name:		<u>William Broadwater, et ux</u>
Watershed:	<u>North Fork Hughes River</u>			

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 40px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p><b>OOG OFFICE USE ONLY</b></p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p>
---	---

**Required Attachments:**

The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A. Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit, personal service, the return receipt card or other postal receipt for certified mailing.



JAN 30 2017

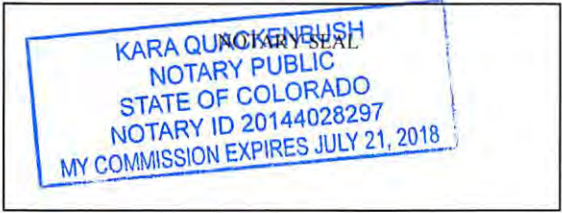
03/31/2017



**Certification of Notice is hereby given:**

THEREFORE, I Kevin Kilstrom, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Well Operator:	<u>Antero Resources Corporation</u>	Address:	<u>1615 Wynkoop Street</u>
By:	<u>Kevin Kilstrom</u> <i>[Signature]</i>		<u>Denver, CO 80202</u>
Its:	<u>Senior VP of Production</u>	Facsimile:	<u>303-357-7315</u>
Telephone:	<u>303-357-7310</u>	Email:	<u>kquackenbush@anteroresources.com</u>



Subscribed and sworn before me this 26 day of January 2017  
*[Signature]* Notary Public  
 My Commission Expires July 21, 2018

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

Received  
 Office of Oil & Gas  
 JAN 30 2017

**STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF APPLICATION**

**Notice Time Requirement:** notice shall be provided no later than the **filing date of permit application.**

**Date of Notice:** 1/27/2017 **Date Permit Application Filed:** 1/27/2017

**Notice of:**

- PERMIT FOR ANY WELL WORK
- CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

**Delivery method pursuant to West Virginia Code § 22-6A-10(b)**

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Application Notice  WSSP Notice  E&S Plan Notice  Well Plat Notice is hereby provided to:

SURFACE OWNER(s)  
Name: PLEASE SEE ATTACHMENT  
Address: \_\_\_\_\_

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

SURFACE OWNER(s) (Road and/or Other Disturbance)  
Name: PLEASE SEE ATTACHMENT  
Address: \_\_\_\_\_

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

SURFACE OWNER(s) (Impoundments or Pits)  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

COAL OWNER OR LESSEE  
Name: NO DECLARATIONS ON RECORD WITH COUNTY  
Address: \_\_\_\_\_

COAL OPERATOR  
Name: NO DECLARATIONS ON RECORD WITH COUNTY  
Address: \_\_\_\_\_

WATER PURVEYOR(s)/OWNER(s) OF WATER WELL, SPRING OR OTHER WATER SUPPLY SOURCE  
Name: PLEASE SEE ATTACHMENT  
Address: \_\_\_\_\_

OPERATOR OF ANY NATURAL GAS STORAGE FIELD  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

\*Please attach additional forms if necessary

Received  
Office of Oil & Gas  
JAN 30 2017



**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

**This Notice Shall Include:**

Pursuant to W. Va. Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Well Location Restrictions**

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items

examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

**Water Well Testing:**

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

**Water Testing Laboratories:**

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

**Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:**

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

**Written Comment:**

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

Chief, Office of Oil and Gas  
Department of Environmental Protection  
601 57<sup>th</sup> St. SE  
Charleston, WV 25304  
(304) 926-0450

Received  
Office of Oil & Gas

JAN 30 2017

Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. **NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.**



**Time Limits and Methods for Filing Comments.**

The law requires these materials to be served on or before the date the operator files its Application. You have **THIRTY (30) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article.

**Comment Requirements**

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

Disclaimer: All comments received will be placed on our web site <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx> and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

**Permit Denial or Condition**

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

- (1) The proposed well work will constitute a hazard to the safety of persons;
- (2) The plan for soil erosion and sediment control is not adequate or effective;
- (3) Damage would occur to publicly owned lands or resources; or
- (4) The proposed well work fails to protect fresh water sources or supplies.

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

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03/31/2017

WW-6A  
(8-13)

API NO. 47- 085 - 10319  
OPERATOR WELL NO. Kalar Unit 3H  
Well Pad Name: North Fork Pad

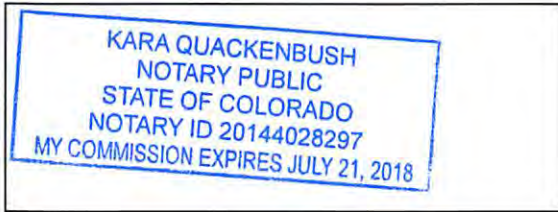
**Notice is hereby given by:**

Well Operator: Antero Resources Corporation  
Telephone: (303) 357-7310  
Email: kquackenbush@anteroresources.com

Address: 1615 Wynkoop Street  
Denver, CO 80202  
Facsimile: 303-357-7315

**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).



Subscribed and sworn before me this 27 day of January 2017.

Kara Quackenbush Notary Public

My Commission Expires July 21, 2018

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**WW-6A Notice of Application Attachment (NORTH FORK PAD):****List of Surface Owner(s) with Proposed Disturbance associated with North Fork Well Pad:**

**WELL PAD – This owner was notified of all well work permit applications, and has executed signed Surface Use Agreements with Antero Resources Corporation.**

**TM 26 PCL 4.2, 15**

**Owner:** Wilson Barr (Life), William Barr & Janet K. Broadwater  
**Address:** 306 59<sup>th</sup> St.  
 Vienna, WV 26105

**ROAD AND/OR OTHER DISTURBANCE****TM 26 PCL 4.2, 15**

**Owner:** Wilson Barr (Life), William Barr  
 & Janet K. Broadwater  
**Address:** 306 59<sup>th</sup> St.  
 Vienna, WV 26105

\*Please note that existing disturbance located within WVDOH right-of-way is covered by Antero's approved permit with WVDOH.

**WATER SOURCE OWNERS**

(W1) 1 Water Source - 1042'

**Owner:** Robert M. Thomas, et al  
**Address:** 3019 County Line Rd.  
 St. Mary's WV 26170

(W2) 1 Water Source - 1341'

**Owner:** William R. Gain  
**Address:** 2572 NW Turnpike  
 Pennsboro, WV 26415

(W3, W4) 2 Water Sources - 1393' and 1480'

**Owner:** Earl E. Beck, et al  
**Address:** 2532 NW Turnpike  
 Pennsboro, WV 26415

\*Please note there are 4 additional water sources shown on the attached map, but they are located greater than 1500' from the subject pad location.

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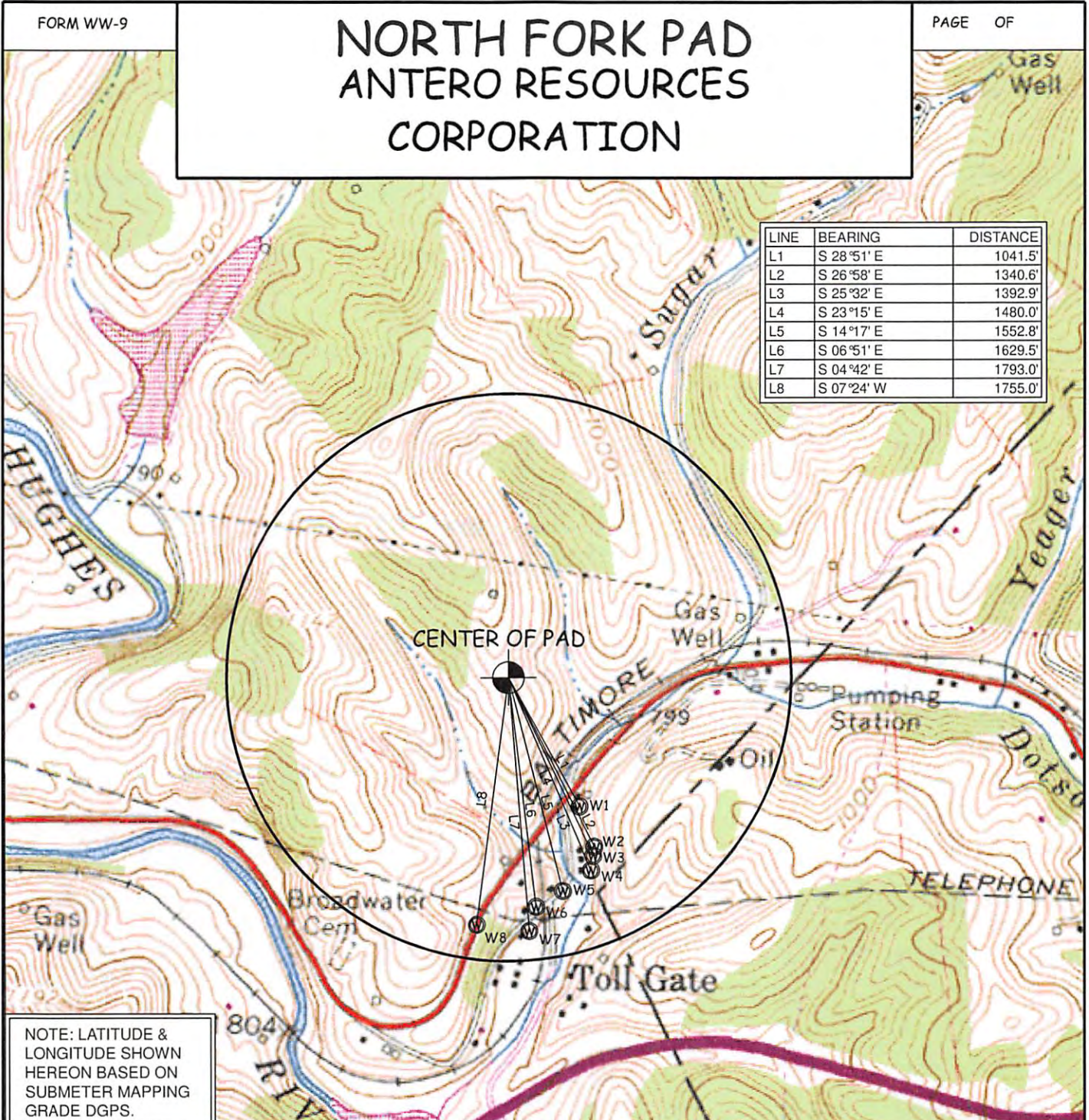
JAN 30 2017

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# NORTH FORK PAD ANTERO RESOURCES CORPORATION

LINE	BEARING	DISTANCE
L1	S 28°51' E	1041.5'
L2	S 26°58' E	1340.6'
L3	S 25°32' E	1392.9'
L4	S 23°15' E	1480.0'
L5	S 14°17' E	1552.8'
L6	S 06°51' E	1629.5'
L7	S 04°42' E	1793.0'
L8	S 07°24' W	1755.0'



NOTE: LATITUDE & LONGITUDE SHOWN HEREON BASED ON SUBMETER MAPPING GRADE DGPS.

WELL	SURFACE OWNER	ADDRESS	DISTRICT-TAX MAP-PARCEL	WELL LATITUDE	WELL LONGITUDE
W1	ROBERT M. THOMAS ET AL	3019 COUNTY LINE RD, ST.MARYS, WV 26170	3-26-26.2	39°16'27.85"	80°54'52.28"
W2	WILLIAM R. GAIN	2572 NW TURPIKE, PENNSBORO, WV 26415	3-26-28	39°16'25.07"	80°54'50.88"
W3	EARL E. BECK ET AL	2532 NW TURNPIKE, PENNSBORO, WV 26415	3-26-29	39°16'24.46"	80°54'50.96"
W4	EARL E. BECK ET AL	2532 NW TURNPIKE, PENNSBORO, WV 26415	3-26-30	39°16'23.44"	80°54'51.15"
W5	IRENE T. CUNNINGHAM	363 CUNNINGHAM HILL, HARRISVILLE, WV 26362	3-26-26.3	39°16'21.98"	80°54'53.68"
W6	AMANDA E. VEON	2054 NW TURNPIKE, TOLL GATE, WV 26415	3-26-25	39°16'20.83"	80°54'56.05"
W7	CHARLES L. BARNIAK ET AL	90 SPARROW LN, PENNSBORO, WV 26415	3-26-36	39°16'19.15"	80°54'56.62"
W8	LINDA JONES (LIFE)	RT 1 BOX 137J, PENNSBORO, WV 26415	3-26-58.7	39°16'19.55"	80°55'01.37"

WILLOW LAND SURVEYING, PLLC P.O. BOX 17, PENNSBORO, WV 26415 (304) 659-1717	TOPO SECTION(S) OF : PENNSBORO 7.5' JOB #: 16-032WA FILE: NORTHFORKPADWATERMAP	SCALE : 1-INCH = 1000-FEET 0'      1000'      2000'      3000' 
DATE: 01/18/17	DRAWN BY: D.L.P.	



**STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF ENTRY FOR PLAT SURVEY**

**Notice Time Requirement:** Notice shall be provided at least SEVEN (7) days but no more than FORTY-FIVE (45) days prior to entry

**Date of Notice:** 12/22/2016      **Date of Planned Entry:** ~1/1/2017\*

\*Please note that this is an estimated date. Antero may begin surveying seven (7) days but no more than forty-five (45) after your receipt of this notice (whichever comes first).

**Delivery method pursuant to West Virginia Code § 22-6A-10a**

- PERSONAL SERVICE
- REGISTERED MAIL
- METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

**Notice is hereby provided to:**

SURFACE OWNER(s)

Name: Wilson Barr (Life), William Barr & Janet K. Broadwater  
Address: 306 59th St.  
Vienna, WV 26105 (Tax Map 26 Parcel 4.2)

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

COAL OWNER OR LESSEE

Name: NO DECLARATIONS ON RECORD WITH THE COUNTY  
Address: \_\_\_\_\_

MINERAL OWNER(s)

Name: PLEASE SEE ATTACHMENT  
Address: \_\_\_\_\_  
\*please attach additional forms if necessary

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

State: <u>West Virginia</u>	Approx. Latitude & Longitude: <u>App. 39.277015, -80.916191 (NAD 83)</u>
County: <u>Ritchie</u>	Public Road Access: <u>CR 50/26 (Sugar Run)</u>
District: <u>Clay</u>	Watershed: <u>Cabin Run-North Fork Hughes River</u>
Quadrangle: <u>Pennsboro 7.5'</u>	Generally used farm name: <u>Broadwater, William Barr &amp; Janet K.</u>

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Notice is hereby given by:**

Well Operator: Antero Resources Corporation  
Telephone: (303) 357-7310  
Email: kquackenbush@anteroresources.com

Address: 1615 Wynkoop Street  
Denver, CO 80202  
Facsimile: (303) 357-7315

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**Oil and Gas Privacy Notice:**

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

**WW-6A3 Notice of Entry For Plat Survey Attachment:**

**Mineral Owners:**

Tax Parcel ID: 3-26-4.2 & 3-26-15

**Owner:** Trustees of the Ritchie County  
Educational Trust

**Address:** 134 South Penn Avenue  
PO Box 239  
Harrisville, WV 26362

**Owner:** Sandra Kay Reed

**Address:** 414 Fream St.  
Pennsboro, WV 26415

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85-10319



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

**Division of Highways**

1900 Kanawha Boulevard East • Building Five • Room 110  
Charleston, West Virginia 25305-0430 • (304) 558-3505

Earl Ray Tomblin  
Governor

Paul A. Mattox, Jr., P. E.  
Secretary of Transportation/  
Commissioner of Highways

January 11, 2017

James A. Martin, Chief  
Office of Oil and Gas  
Department of Environmental Protection  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304

Subject: DOH Permit for the North Fork Pad, Ritchie County  
**Kalar Unit 3H Well site**

Dear Mr. Martin,

This well site will be accessed from a DOH permit #03-2015-0584 which has been issued to Antero Resources Corporation for access to the State Road for a well site located off County Route 50/26 in Ritchie County.

This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

A handwritten signature in blue ink that reads "Gary K. Clayton".

Gary K. Clayton, P.E.  
Regional Maintenance Engineer  
Central Office O&G Coordinator

Cc: Kara Quackenbush  
Antero Resources Corporation  
CH, OM, D-3  
File

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# List of Anticipated Additives Used for Fracturing or Stimulating Well

Additives	Chemical Abstract Service Number (CAS #)
Fresh Water	7732-18-5
2 Phosphobutane 1,2,4 tricarboxylic acid	37971-36-1
Ammonium Persulfate	7727-54-0
Anionic copolymer	Proprietary
Anionic polymer	Proprietary
BTEX Free Hydrotreated Heavy Naphtha	64742-48-9
Cellulase enzyme	Proprietary
Demulsifier Base	Proprietary
Ethoxylated alcohol blend	Mixture
Ethoxylated Nonylphenol	68412-54-4
Ethoxylated oleylamine	26635-93-8
Ethylene Glycol	107-21-1
Glycol Ethers	111-76-2
Guar gum	9000-30-0
Hydrogen Chloride	7647-01-0
Hydrotreated light distillates, non-aromatic, BTEX free	64742-47-8
Isopropyl alcohol	67-63-0
liquid, 2,2-dibromo-3-nitrilopropionamide	10222-01-2
Microparticle	Proprietary
Petroleum Distillates (BTEX Below Detect)	64742-47-8
Polyacrylamide	57-55-6
Propargyl Alcohol	107-19-7
Propylene Glycol	57-55-6
Quartz	14808-60-7
Sillica, crystalline quartz	7631-86-9
Sodium Chloride	7647-14-5
Sodium Hydroxide	1310-73-2
Sugar	57-50-1
Surfactant	68439-51-0
Suspending agent (solid)	14808-60-7
Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7
Solvent Naphtha, petroleum, heavy aliph	64742-96-7
Soybean Oil, Me ester	67784-80-9
Copolymer of Maleic and Acrylic Acid	52255-49-9
DETA phosphonate	15827-60-8
Hexamethylene Triamine Penta	34690-00-1
Phosphino Carboxylic acid polymer	71050-62-9
Hexamethylene Diamine Tetra	23605-75-5
2-Propenoic acid, polymer with 2 propenamide	9003-06-9
Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5
Diethylene Glycol	111-46-6
Methenamine	100-97-0
Polyethylene polyamine	68603-67-8
Coco amine	61791-14-8
2-Propyn-1-olcompound with methyloxirane	38172-91-7

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## Antero Resources Corporation Erosion and Sediment Control Plan for North Fork Well Pad

*Antero Resources Corporation (Antero) is submitting the following narrative and set of drawings in compliance with §35-8-5.4. This plan is submitted in conjunction with the North Fork Well Pad Final Site Design Construction Plans, & Erosion & Sediment Control Plans prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection and Office of Oil and Gas, and certified by Civil & Environmental Consultants, Inc., a West Virginia registered professional engineer.*

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**Requirement §5.4.b.1.** *A general sequence of events that describe in relative terms how and when each construction phase (i.e. clearing and grubbing, mass grading, stabilization) will occur and when each erosion and sediment control best management practice ("BMP") will be installed;*

**Antero Response:**

The following includes a general sequence of events that describe in relative terms how and when each construction phase is anticipated to occur and erosion and sediment control BMPs to be installed. Please refer to the North Fork Well Pad Final Site Design Construction Plans, & Erosion & Sediment Control Plans (Site Design) prepared and certified by Civil & Environmental Consultants, Inc. for specific construction measures. Compliance with the measures outlined in the Site Construction Plan (§35-8-5.4) submitted in conjunction with this plan will also be maintained.

1. Stake the limits of construction and mark/flag all identified wetlands, streams, utilities, and other areas of concern for construction activities. Install signs to designate the areas and orange safety fence to identify important project attributes such as approved access roads, no refueling zones, wetlands/steam bounds, etc.
2. If applicable, convey upslope drainage around the Access Road, Well Pad, and Water Containment pad areas by constructing all diversion berm(s) and/or compost filter sock diversion(s) as shown on the plans.
3. Strip the topsoil from the access road. Prior to placing any fill, the exposed subgrade shall be compacted and proof rolled to produce a stable and unyielding site. All stripped topsoil shall be stockpiled in areas shown in the plans, or re-spread at an approximate depth of 2-4 inches on all proposed 2:1 or flatter slopes, and immediately stabilized. Additional BMP measures shall be constructed around topsoil stockpiles, if necessary.
4. The construction site should be stabilized as soon as possible after completion. Establishment of final stabilization must be initiated no later than 7 days after reaching final grade. Final stabilization means that all soil-disturbing activities are completed, and that either a permanent vegetative cover with a density of 70% or greater has been established or that the surface had been stabilized by hard cover such as pavement or buildings. It should be noted that the 70% requirement refers to the total area vegetated and not just a percent of the site.

**Requirement §5.4.b.2.** *A description of the stabilization methods to be used, including the application rates for temporary and permanent seeding and mulching, and provide the timeframes for establishing stabilization*

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**Antero Response:**

Stabilization methods used include seeding and mulching of disturbed areas as well as the implementation of erosion and sediment control BMPs. Please refer to "Construction Notes" on page 3 and "Construction Details" on pages 31-37 for detailed descriptions of the different stabilization methods to be used. Seeding and mulching is to be in accordance with the WVDOT Standard Specifications unless specified otherwise in the plans or unless specified otherwise by the construction engineer or Antero representative. Please refer to "Construction Details" on page 31 of the Site Design for more specific information regarding application, liming, and mulching rates.

Erosion and sediment BMPs will be constructed, stabilized, and functional before site disturbance begins within the tributary areas of those BMPs. In a timely manner after earth disturbance activities cease, Antero shall stabilize any areas disturbed by the activities. During non-germination periods, mulch must be applied at the specified rates. Disturbed areas which are not at finish grade and which will be re-disturbed within 1 year will be stabilized in accordance with the temporary vegetative stabilization and specifications. Disturbed areas which are finished grade or which will not be re-disturbed within 1 year will be stabilized in accordance with the permanent vegetative stabilization specification. Please refer to "Construction Notes" on page 3 for more information regarding timeframes for establishing stabilization and erosion and sediment BMPs.

The site shall be considered to have achieved full stabilization when it has a minimum uniform 70% perennial vegetative cover or other permanent non-vegetative cover with a density sufficient to resist accelerated surface erosion and subsurface characteristics to resist sliding and other movements. Until the site achieves final stabilization, Antero will assure that the best management practices (BMPs) are implemented, inspected, operated, and maintained. As such, Antero will maintain written inspection logs. All maintenance work, including cleaning, repair, replacement, regarding, and re-stabilization shall be performed immediately upon discovery of deficiency. After final stabilization has been achieved, temporary erosion and sediment BMPs controls will be removed. Areas disturbed during removal of the BMPs will be stabilized immediately.

**Requirement §5.4.b.3.** *Details of specifications for the erosion and sediment control BMPs employed on the project.*

**Antero Response:**

Please refer to the "Construction Notes," and "Construction Details" on pages 3 and 31-37 in the Site Design for specifications including instructions for installation, inspection, and maintenance for erosion and sediment control BMPs employed at this site.

**Requirement §5.4.c.1.** *A vicinity map locating the site in relation to the surrounding area and roads;*

**Antero Response:**

A vicinity map locating the site in relation to the surrounding area and roads is included on page 1 of the Site Design.

**Requirement §5.4.c.2** *A plan view site map at a scale of one inch equal to one hundred feet (1"=100') or greater, showing appropriate detail of all site features, including the identification of site access that provides for a stabilized construction entrance and exit to reduce tracking of sediment on to public or private roads; and*

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**Antero Response:**

"Overall Site Plan" and "Final Site Design" maps are included on pages 5-8 of the Site Design. Specific design, layout and inspection and maintenance notes for a stabilized construction entrance are included in the "Construction Notes" verbiage on page 3.

***Requirement §5.4.c.3. The location of all proposed erosion and sediment control BMPs***

**Antero Response:**

"Overall Site Plan" and "Final Site Design" maps included on pages 5-8 of the Site Design locate all proposed erosion and sediment control BMPs.

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## Antero Resources Corporation Site Construction Plan for North Fork Well Pad

*Antero Resources Corporation (Antero) is submitting the following Site Construction Plan in compliance with §35-8-5.5. This plan is submitted in conjunction with the North Fork Well Pad Final Site Design, Construction Plans, & Erosion & Sediment Control Plans prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection and Office of Oil and Gas, and certified by Civil & Environmental Consultants, Inc., a West Virginia registered professional engineer.*

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**Requirement §5.5.a.** *The plan should describe the nature and purpose of the construction project and identify the procedures for construction that will be used to achieve site stability. The plan shall be considered conditions of the permit and be enforceable as such.*

### **Antero Response**

The nature and purpose of the subject project is to perforate, fracture, and complete one or more horizontal shallow wells. Procedures to achieve site stability include seeding and mulching of earth disturbed areas and implementation of erosion and sediment best management practices (BMPs). Details of seeding and mulching rates as well as procedures for installation and maintenance of erosion and sediment BMPs are outlined on page 3 and 31 of "North Fork Well Pad Final Site Design, Construction Plans, & Erosion & Sediment Control Plans" (Site Design) prepared and certified by Civil & Environmental Consultants, Inc. of West Virginia.

These procedures will be considered as conditions of the permit and shall be inspected and maintained for continual compliance measures outlined in §35-8-5.5.

**Requirement §5.5.b.1.** *A vicinity map location the site in relation to the surrounding area and roads;*

### **Antero Response**

Please refer to the vicinity maps on page 1 for the location of the site in relation to the surrounding area and roads.

**Requirement §5.5.b.2.** *A plan view site map at a scale of one inch equal to one hundred feet (1"=100') or greater that shows appropriate detail of all site features and:*

**Requirement §5.5.b.2.A.** *Clearly identifies the limit of disturbance for the project;*

### **Antero Response**

"Overall Site Plan" and "Final Site Design" maps are included on pages 5-8 of the Site Design.

**Requirement §5.5.b.2.B.** *Provides existing topographic information on a contour interval that affords sufficient detail to illustrate site terrain conditions*

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**Antero Response**

Please refer to the "Existing Conditions Plan" map on page 2 of the Site Design for the current topographic conditions for the constructed pad on a contour interval that affords sufficient detail to illustrate site terrain conditions.

*Requirement §5.5.b.2.C. Identifies proposed cut and fill areas with grading contours at an interval that provides sufficient detail to accurately depict slope ratios, indicating top and bottom of slopes; and*

**Antero Response**

Please refer to "Overall Site Plan" and "Final Site Design" maps on pages 5-8 as well as the "Staging Pad Profile and Cross Sections," "Water Tank Pad Profile and Cross Sections," "Well Pad Profile and Cross Sections," "Main Access Road 1 Profiles and Cross Sections," "Main Access Road 2 Profiles and Cross Sections," and "Main Access Road 3 Profiles and Cross Sections," on pages 9-30 of the Site Design for proposed cut and fill areas with grading contours.

*Requirement §5.5.b.2.D. Identifies any existing structures, roads, water bodies, and other critical areas within the area that would most likely be affected by the construction.*

**Antero Response**

Please refer to "Overall Site Plan" and "Final Site Design" maps on pages 5-8 for the maps identifying any structures, roads, water bodies, and other critical areas within the area of interest that would be most likely affected by construction.

*Requirement §5.5.b.3. A cross-section of the length and width of the location, providing cut and fill volumes; and*

**Antero Response**

Please refer to "Overall Site Plan" and "Final Site Design" maps on pages 5-8 as well as the "Staging Pad Profile and Cross Sections," "Water Tank Pad Profile and Cross Sections," "Well Pad Profile and Cross Sections," "Main Access Road 1 Profiles and Cross Sections," "Main Access Road 2 Profiles and Cross Sections," and "Main Access Road 3 Profiles and Cross Sections," on pages 9-30 for a cross-section of the location. The cut and fill volumes can be found in "Summary of Quantities" on page 4.

*Requirement §5.5.b.4. Any other engineering designs or drawings necessary to construct the project.*

**Antero Response**

All other engineering designs and drawings necessary to construct this project are included in the Site Design.

*Requirement §5.5.c. At a minimum, site construction shall be conducted in accordance with the following criteria:*

**Antero Response**

All Antero contractors shall be notified of and comply with the measures outlined in Section 5.5.c. of §35-8.

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**Requirement §5.5.c.1.** *All woody material, brush, and trees shall be cleared from the site area and kept to the minimum necessary for proper construction, including the installation of necessary sediment controls. Trees six inches in diameter and larger shall be cut and logs stacked;*

**Antero Response**

The Site Design outlines measures to maintain compliance with Section 201 of the WVDOH Specifications which outlines clearing and grubbing measures. Please refer to "Construction Notes" on page 3 of the Site Design.

**Requirement §5.5.c.2.** *Topsoil shall be removed from construction areas and stockpiled for reuse during reclamation. In woodland areas, tree stumps, large roots, large rocks, tree and leaf debris, and ground vegetation shall be removed prior to actual site constructions;*

**Antero Response**

The Site Design outlines procedures for stripping and stocking topsoil. Please refer to "Construction Notes" on page 3 of the Site Design. In addition, soil for stockpiling and use as fill shall be further compliant with measures outlined in Section 5.5.c.2. of §35-8-5.5.

**Requirement §5.5.c.3.** *No embankment fill shall be placed on frozen material;*

**Antero Response**

All Antero contractors shall be notified of and comply with measures outlined in Section 5.5.c.3. of §35-8-5.5.

**Requirement §5.5.c.4.** *The fill material shall be clean mineral soil, free of roots, woody vegetation, stumps, sod, large rocks, frozen soil or other objectionable material;*

**Antero Response**

The Site Design outlines procedures for stripping and stocking topsoil. Please refer to "Construction Notes" on page 3 of the Site Design. In addition, soil shall be further defined to the measures outlined in Section 5.5.c.4. of §35-8-5.5.

**Requirement §5.5.c.5.** *Embankment material shall exhibit adequate soil strength and contain the proper amount of moisture to ensure that compaction will be achieved;*

**Antero Response**

All Antero contractors shall be notified of and comply with measures outlined in Section 5.5.c.5. of §35-8-5.5.

**Requirement §5.5.c.6** *Earthen fill slopes should be constructed with slopes no steeper than a ratio of two to one (2:1);*

**Antero Response**

The Site Design outlines all earthen fill slopes to be constructed with slopes no steeper than a ratio of two to one (2:1).

Received  
Office of Oil & Gas  
JAN 30 2017

03/31/2017

**Requirement §5.5.c.7.** *Fill material will be placed in lifts or layers over the length of the fill. Lift thickness of soil shall be as thin as the suitable random excavated material will permit, typically from six to twelve (12) inches; and*

**Antero Response**

Please refer to the "Construction Notes" on page 3 of the Site Design. Fill shall be placed in horizontal lifts of maximum loose depth of 12 inches. Compaction will be performed with a compactor with a minimum of five ton static drum weight vibratory roller or five ton static drum weight sheeps footed compactor as appropriate for the type of soil material at the site or other compactor approved by the Engineer.

**Requirement §5.5.c.8.** *The size of rock lifts shall not exceed thirty-six (36) inches. The rock shall not be greater in any dimension than thirty-six (36) inches;*

**Antero Response**

All Antero contractors shall be notified of and comply with measures outlined in Section 5.5.c.8. of §35-8-5.5.

**Requirement §5.5.c.9.** *Compaction shall be obtained by compaction equipment or by routing the hauling equipment over the fill so that the entire surface of each fill lift is compacted by at least one wheel or tread track of equipment or by a compactor. Each lift shall be compacted before beginning the next lift;*

**Antero Response**

Compaction compliance measures are outlined in the "Construction Notes" on page 3. Compaction is required with a compactor with a minimum of five ton static drum weight vibratory roller or five ton static drum weight sheeps footed compactor as appropriate for the type of soil material at the site or other compactor approved by the Engineer.

**Requirement §5.5.c.10.** *Surface water diversion ditches shall be constructed above the disturbed area to intercept water and to divert surface water runoff around the site; and*

**Antero Response**

"Construction Notes" on page 3 of the Site Design identifies the surface diversions used to prevent surface water and subsurface water from flowing on to the well pad and coming into contact with the stormwater associated with the well pad. Additional Erosion & Sediment BMPs will be used to prevent sediment discharges from the project.

**Requirement §5.5.c.11.** *In areas of steep terrain, a terraced bench shall be constructed at the base of the slope where fill is to be placed, creating a toe foundation and aid in holding fill material. Additional terracing shall be constructed from each additional fifty (50) vertical feet of slope and shall be a minimum of ten (10) feet wide.*

**Antero Response**

All Antero contractors shall be notified of and comply with the measures outlined in Section 5.5.c.11.. of §35-8-5.5.

Received  
Office of Oil & Gas  
JAN 30 2017

03/31/2017

**APPROVED  
WVDEP OOG**  
2/9/2017

# NORTH FORK WELL PAD FINAL SITE DESIGN, CONSTRUCTION PLANS, & EROSION & SEDIMENT CONTROL PLANS ANTERO RESOURCES CORPORATION

LAT/LONG: N 39° 16' 47.69" W 80° 54' 46.74"  
(APPROXIMATE CENTER OF PROJECT)

WEST VIRGINIA 811 ONE CALL WAS PERFORMED IN NOVEMBER, 2016  
THE FOLLOWING UTILITY COMPANIES MAY BE PRESENT IN THE PROJECT AREA:

- FRONTIER COMMUNICATIONS (FORMERLY VERIZON)
- ALLIANCE PETROLEUM CORPORATION
- AT&T TRANSMISSION
- CONSUMERS GAS UTILITY COMPANY
- ENERGY CORPORATION OF AMERICA
- EQT MIDSTREAM
- DOMINION HOPE
- FIRST ENERGY CORP
- TOWN OF WEST UNION WATER DEPARTMENT
- ELLENBORO-LAMBERTON PUBLIC SERVICE DISTRICT



WEST VIRGINIA STATE LAW REQUIRES THAT YOU CALL TWO BUSINESS DAYS BEFORE YOU DIG IN THE STATE OF WEST VIRGINIA. IT'S THE LAW!

**PROJECT OWNER/APPLICANT**  
ANTERO RESOURCES CORPORATION  
535 WHITE OAKS BLVD  
BRIDGEPORT, WV 26330  
PH: (304) 842-4100  
CONTACT: ROBERT WIRKS

**WVDOH**  
DISTRICT THREE  
PH: (304) 420-8445  
CONTACT: DISTRICT ENGINEER  
JAMES E. NOTEN, JR.

**CIVIL ENGINEERS**  
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.  
600 MARKETPLACE AVE - SUITE 200  
BRIDGEPORT, WV 26330  
PH: (304) 833-1119  
CONTACT: JOSEPH D. HOBSON, P.E.

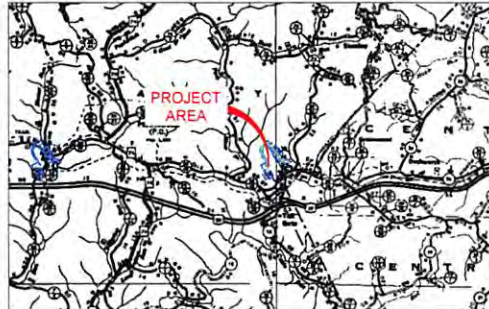
**EPRI/HOTLINE**  
WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP)  
PH: (800) 642-3074  
NATIONAL RESPONSE CENTER  
PH: (800) 424-8802

LOCAL EMERGENCY SERVICES		
AMBULANCE	NAME	TELEPHONE NO.
HOSPITAL EMERGENCY ROOM	UNITED HOSPITAL CENTER	(800) 222-1222
FIRE DEPARTMENT		911
POLICE DEPARTMENT		(801) 342-1200
POISON CONTROL CENTER	WEST VIRGINIA POISON CENTER	911



**WELL RESTRICTIONS CHECKLIST (HORIZONTAL 6A WELL)**

AT LEAST 100 FEET FROM PAD AND LOD (INCLUDING ANY EBS CONTROL FEATURE) TO ANY PERENNIAL STREAM LAKE, POND, RESERVOIR OR WELL AND	YES
AT LEAST 300 FEET FROM PAD AND LOD (INCLUDING ANY EBS CONTROL FEATURE) TO ANY NATURALLY OCCURRING TROUT STREAM	YES
AT LEAST 1000 FEET FROM PAD AND LOD (INCLUDING ANY EBS CONTROL FEATURE) TO ANY DRINKING WATER INTAKE OR PUBLIC WATER SUPPLY	YES
AT LEAST 250 FEET FROM AN EXISTING WATER WELL OR DEVELOPED SPRING TO BEING DRILLED	YES
AT LEAST 925 FEET FROM AN OCCUPIED DWELLING STRUCTURE TO CENTER OF PAD	YES
AT LEAST 925 FEET FROM AGRICULTURAL BUILDINGS LARGER THAN 2500 SQUARE FEET TO THE CENTER OF THE PAD	YES



**LIMITS OF DISTURBANCE PARCEL BREAKUPS**

NAME	WILLIAM BARR & JANET K BROADWATER
TAXMAP	26 PARCEL 4.2
DEED BOOK	265 PAGE 71
ACERAGE	100.75
AFFECTED AREA FROM MAIN ACCESS ROAD 3	0.50 AC
AFFECTED AREA FROM WELL PAD	1.38 AC

NAME	WILLIAM BARR & JANET K BROADWATER
TAXMAP	26 PARCEL 15
DEED BOOK	265 PAGE 71
ACERAGE	107
AFFECTED AREA FROM MAIN ACCESS ROAD 1	1.54 AC
AFFECTED AREA FROM MAIN ACCESS ROAD 2	2.85 AC
AFFECTED AREA FROM MAIN ACCESS ROAD 3	5.89 AC
AFFECTED AREA FROM WELL PAD	2.98 AC
AFFECTED AREA FROM FRESHWATER TANK PAD	3.27 AC
AFFECTED AREA FROM STAGING AREA	2.92 AC
AFFECTED AREA FROM TOPSOIL	1.49 AC

NAME	WILLIAM BARR & JANET K BROADWATER
TAXMAP	27 PARCEL 12
DEED BOOK	265 PAGE 115
ACERAGE	23.73
AFFECTED AREA FROM MAIN ACCESS ROAD 1	2.36 AC
AFFECTED AREA FROM TOPSOIL	1.15 AC
AFFECTED AREA FROM SPOIL	0.73 AC

**FLOOD PLAIN CONDITIONS**

DO SITE CONSTRUCTION ACTIVITIES TAKE PLACE IN FLOODPLAIN	NO
PERMIT NEEDED FROM COUNTY FLOODPLAIN COORDINATOR	NO
HEC-RAS STUDY COMPLETED	NO
FLOODPLAIN SHOWN ON DRAWINGS	NO

FIRM MAP NUMBER(S) FOR SITE: 540860-025C  
ACREAGE OF CONSTRUCTION IN FLOODPLAIN: 0.00

**WELL LEGEND**

WELL HEAD	WV NORTH NAD83	WV NORTH NAD83	UTM-M	NAD83
OPEN BLDG	N 280141 910748	N 280178 205145	N 434733 185401	JAT: 36.277028° E: 1589053 602701
KALAR UNIT 2H	N 280132 346817	N 280166 831078	N 434750 206919	LAT: 36.277006° E: 1589056 468123
KALAR UNIT 3H	N 280122 771480	N 280157 057001	N 434715 381868	LAT: 36.276980° E: 1589059 375448
BARR UNIT 1H	N 280113 147951	N 280147 428299	N 434714 478918	LAT: 36.276955° E: 1589062 225907
BARR UNIT 2H	N 280103 529234	N 280137 906857	N 434711 577770	LAT: 36.276927° E: 1589065 130260
BARR UNIT 3H	N 280094 048106	N 280128 534785	N 434708 675722	LAT: 36.276901° E: 1589068 037811

**L.O.D. AREAS**

DESCRIPTION	ACRES
MAIN ACCESS ROAD 1	3.92
MAIN ACCESS ROAD 2	2.85
MAIN ACCESS ROAD 3	6.39
WELL PAD	4.36
FRESHWATER TANK PAD	3.97
STAGING AREA	2.27
TOPSOIL	2.64
SPOIL	0.73
TOTAL	27.13
WOODED	14.43

**SITE LOCATIONS**

	NAD 83 (2011)		UTM83-17	
	WEST VIRGINIA NORTH ZONE	NORTHINGS	EASTING	EASTING
MAIN ACCESS ROAD ENTRANCE	36 275007	-80 909841	4347854 1420	507776 3411
CENTROID OF PAD	36 277015	-80 916191	4347487 9519	507917 8610
CENTROID OF FRESHWATER TANK	36 282878	-80 918801	4348171 7183	507176 8127
CENTROID OF STAGING PAD	36 273588	-80 913078	4347807 1178	507467 4188

**SHEET INDEX**

SHEET 1 OF 40	COVER SHEET
SHEET 2 OF 40	EXISTING CONDITIONS PLAN
SHEET 3 OF 40	CONSTRUCTION NOTES
SHEET 4 OF 40	SUMMARY OF QUANTITIES
SHEET 5 OF 40	OVERALL SITE PLAN
SHEETS 6-8 OF 40	FINAL SITE DESIGN PLAN
SHEETS 9-13 OF 40	STAGING PAD PROFILE AND CROSS SECTIONS
SHEETS 11-16 OF 40	FRESHWATER TANK PAD PROFILE AND CROSS SECTIONS
SHEETS 17-20 OF 40	WELL PAD PROFILE AND CROSS SECTIONS
SHEETS 21-22 OF 40	MAIN ACCESS ROAD 1 PROFILES AND CROSS SECTIONS
SHEETS 23-24 OF 40	MAIN ACCESS ROAD 2 PROFILES AND CROSS SECTIONS
SHEETS 25-29 OF 40	MAIN ACCESS ROAD 3 PROFILES AND CROSS SECTIONS
SHEET 31 OF 40	CLAUVERT PROFILES
SHEETS 32-37 OF 40	CONSTRUCTION DETAILS
SHEETS 38-40 OF 40	RECLAMATION PLAN

**PLAN REPRODUCTION WARNING**  
THE PLANS HAVE BEEN CREATED ON ANSI D (22" X 34") SHEETS. FOR REDUCTIONS, REFER TO GRAPHIC SCALE.  
THE PLANS HAVE BEEN CREATED FOR FULL COLOR PLOTTING. ANY SET OF THE PLANS THAT IS NOT PLOTTED IN FULL COLOR SHALL NOT BE CONSIDERED ADEQUATE FOR CONSTRUCTION PURPOSES.  
\*\*WARNING\*\* INFORMATION MAY BE LOST IN COPYING AND/OR GRAY SCALE PLOTTING.



**REVISION RECORD**

DATE	BY	DESCRIPTION
01/11/17	JDH	ISSUED FOR PERMITTING
01/11/17	JDH	ISSUED FOR PERMITTING
01/11/17	JDH	ISSUED FOR PERMITTING
01/11/17	JDH	ISSUED FOR PERMITTING
01/11/17	JDH	ISSUED FOR PERMITTING
01/11/17	JDH	ISSUED FOR PERMITTING
01/11/17	JDH	ISSUED FOR PERMITTING
01/11/17	JDH	ISSUED FOR PERMITTING
01/11/17	JDH	ISSUED FOR PERMITTING
01/11/17	JDH	ISSUED FOR PERMITTING

**Civil & Environmental Consultants, Inc.**  
600 Marketplace Ave., Suite 200, Bridgeport, WV 26330  
PH: 304-833-1119, 855-488-8531, FAX: 304-833-3327  
www.cecinc.com

**ANTERO RESOURCES CORPORATION**  
NORTH FORK WELL PAD  
CLAY DISTRICT  
RITCHIE COUNTY, WEST VIRGINIA

**COVER SHEET**

DATE: NOVEMBER 2016 (ISSUED BY: JDH)  
PROJECT NO: AS SHOWN (CHECKED BY: JDH)  
DRAWN BY: JDH

DRAWING NO: **C000**  
SHEET 1 OF 40











# WELL PAD CONSTRUCTION PLANS, & CONTROL PLANS CORPORATION

80° 54' 46.74"  
PROJECT)



WELL RESTRICTIONS CHECKLIST (HORIZONTAL 6A WELL)	
AT LEAST 100 FEET FROM PAD AND LOD (INCLUDING ANY E&S CONTROL FEATURE) TO ANY PERENNIAL STREAM, LAKE, POND, RESERVOIR OR WETLAND:	YES
AT LEAST 300 FEET FROM PAD AND LOD (INCLUDING ANY E&S CONTROL FEATURE) TO ANY NATURALLY PRODUCING TROUT STREAM:	YES
AT LEAST 1000 FEET FROM PAD AND LOD (INCLUDING ANY E&S CONTROL FEATURE) TO ANY GROUNDWATER INTAKE OR PUBLIC WATER SUPPLY:	YES
AT LEAST 250 FEET FROM AN EXISTING WATER WELL OR DEVELOPED SPRING TO WELL BEING DRILLED:	YES
AT LEAST 625 FEET FROM AN OCCUPIED DWELLING STRUCTURE TO CENTER OF PAD:	YES
AT LEAST 625 FEET FROM AGRICULTURAL BUILDINGS LARGER THAN 2500 SQUARE FEET TO THE CENTER OF THE PAD:	YES

LIMITS OF DISTURBANCE PARCEL BREAKUPS			
NAME	WILLIAM BARR & JANET K BROADWATER		
TAXMAP	26	PARCEL	4.2
DEED BOOK	265	PAGE	71
ACERAGE	100.75		
AFFECTED AREA FROM MAIN ACCESS ROAD 3	0.50	AC	
AFFECTED AREA FROM WELL PAD	1.38	AC	
NAME	WILLIAM BARR & JANET K BROADWATER		
TAXMAP	26	PARCEL	15
DEED BOOK	265	PAGE	71
ACERAGE	107		
AFFECTED AREA FROM MAIN ACCESS ROAD 1	1.54	AC	
AFFECTED AREA FROM MAIN ACCESS ROAD 2	2.85	AC	
AFFECTED AREA FROM MAIN ACCESS ROAD 3	5.89	AC	
AFFECTED AREA FROM WELL PAD	2.98	AC	
AFFECTED AREA FROM WATER TANK PAD	3.97	AC	
AFFECTED AREA FROM STAGING AREA	2.27	AC	
AFFECTED AREA FROM TOPSOIL	1.49	AC	
NAME	WILLIAM BARR & JANET K BROADWATER		
TAXMAP	27	PARCEL	12
DEED BOOK	265	PAGE	115
ACERAGE	23.73		
AFFECTED AREA FROM MAIN ACCESS ROAD 1	2.36	AC	
AFFECTED AREA FROM TOPSOIL	1.15	AC	
AFFECTED AREA FROM SPOIL	0.73	AC	
NAME	WEST VIRGINIA DEPARTMENT OF HIGHWAYS		
TAXMAP	0	PARCEL	0
DEED BOOK	0	PAGE	0
ACERAGE	0.00		
AFFECTED AREA FROM MAIN ACCESS ROAD 1	0.02	AC	

FLOOD PLAIN CONDITIONS	
DO SITE CONSTRUCTION ACTIVITIES TAKE PLACE IN FLOODPLAIN:	NO
PERMIT NEEDED FROM COUNTY FLOODPLAIN COORDINATOR:	NO
HEC-RAS STUDY COMPLETED:	NO
FLOODPLAIN SHOWN ON DRAWINGS:	NO
FIRM MAP NUMBER(S) FOR SITE:	54085C0125C
ACREAGE OF CONSTRUCTION IN FLOODPLAIN:	10.00

WELL LEGEND:				
WELL HEAD	WV NORTH NAD27	WV NORTH NAD83	UTM-M	NAD83
OPEN SLOT	N: 286141.919745 E: 1599053.600701	N: 286176.205145 E: 1567612.534988	N: 4347523.185961 E: 507227.694861	LAT: 39.277032° LONG: -80.916204°
KALAR UNIT 2H	N: 286132.345617 E: 1599056.488123	N: 286166.631073 E: 1567615.422399	N: 4347520.283913 E: 507228.623192	LAT: 39.277006° LONG: -80.916193°
KALAR UNIT 3H	N: 286122.771489 E: 1599059.375545	N: 286157.057001 E: 1567618.309810	N: 4347517.381866 E: 507229.551523	LAT: 39.276980° LONG: -80.916182°
BARR UNIT 1H	N: 286113.197361 E: 1599062.262967	N: 286147.482929 E: 1567621.197221	N: 4347514.479618 E: 507230.470855	LAT: 39.276953° LONG: -80.916171°
BARR UNIT 2H	N: 286103.623234 E: 1599065.150389	N: 286137.908857 E: 1567624.084632	N: 4347511.577770 E: 507231.408186	LAT: 39.276927° LONG: -80.916161°
BARR UNIT 3H	N: 286094.049106 E: 1599068.037811	N: 286128.334785 E: 1567626.972044	N: 4347508.675722 E: 507232.336517	LAT: 39.276901° LONG: -80.916150°

L.O.D. AREAS	
DESCRIPTION	ACRES
MAIN ACCESS ROAD 1	3.92
MAIN ACCESS ROAD 2	2.85
MAIN ACCESS ROAD 3	6.39
WELL PAD	4.36
WATER TANK PAD	3.97
STAGING AREA	2.27
TOPSOIL	2.64
SPOIL	0.73
TOTAL	27.13
WOODED	14.43

SITE LOCATIONS	NAD 83 (2011) WEST VIRGINIA NORTH ZONE		UTM83-17 WEST VIRGINIA NORTH ZONE	
	LATITUDE	LONGITUDE	NORTHING	EASTING
MAIN ACCESS ROAD ENTRANCE	39.278207	-80.900841	4347654.1400	507776.3411
CENTROID OF PAD	39.277015	-80.916191	4347497.9519	507317.6510
CENTROID OF WATER TANK	39.282876	-80.916801	4348171.7183	507175.6127
CENTROID OF STAGING PAD	39.279588	-80.913073	4347807.1178	507497.4168

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SHEETS 11-16 OF 40	WATER TANK PAD PROFILE AND CROSS SECTIONS
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SHEETS 23-24 OF 40	MAIN ACCESS ROAD 2 PROFILES AND CROSS SECTIONS
SHEETS 25-30 OF 40	MAIN ACCESS ROAD 3 PROFILES AND CROSS SECTIONS
SHEET 31 OF 40	CULVERT PROFILES
SHEETS 32-37 OF 40	CONSTRUCTION DETAILS
SHEETS 38-40 OF 40	RECLAMATION PLAN

**PLAN REPRODUCTION WARNING**

THE PLANS HAVE BEEN CREATED ON ANSI D (22" X 34") SHEETS FOR REDUCTIONS, REFER TO GRAPHIC SCALE.

THE PLANS HAVE BEEN CREATED FOR FULL COLOR PLOTTING. ANY SET OF THE PLANS THAT IS NOT PLOTTED IN FULL COLOR SHALL NOT BE CONSIDERED ADEQUATE FOR CONSTRUCTION PURPOSES.

**\*\*WARNING\*\***: INFORMATION MAY BE LOST IN COPYING AND/OR SCALE PLOTTING.



REVISION RECORD		DESCRIPTION
NO.	DATE	
1	12/15/16	CHANGES PER ANTERO COMMENTS
2	12/15/16	CHANGES PER ANTERO COMMENTS
3	12/15/16	UPDATED STREAM AND WETLAND DELINEATIONS
4	1/10/17	REVISED WELL HEAD LOGGING
5	1/10/17	UPDATED LODS - QUANTITIES, E&S, AND TREE DRAWING

**Civil & Environmental Consultants, Inc.**  
600 Marketplace Ave - Suite 200 - Bridgeport, WV 26330  
Ph: 304.933.3119 • 855.488.9539 • Fax: 304.933.3327  
www.ccecinc.com

**ANTERO RESOURCES CORPORATION**  
**NORTH FORK WELL PAD**  
**CLAY DISTRICT**  
**RITCHIE COUNTY, WEST VIRGINIA**

**COVER SHEET**  
FEB 24 2017

ICAR, ILS  
ZMD  
152-923

DATE: NOVEMBER 20 16 (DRAWN BY)  
PROJECT NO: 152-923  
APPROVED BY: JDR

DRAWING NO. **C000**  
03/31/2017

*Michael Goff*  
8/22/17

WV Department of Environmental Protection  
Professional Engineer





NORTH FORK WELL PAD  
 ANTERO RESOURCES CORPORATION  
 FINAL PLANS - ISSUE FOR PERMIT

REVISION RECORD		
NO	DATE	DESCRIPTION
1	12/20/15	CHANGES PER ANTERO COMMENTS: UPDATED LOD AND ACCED ACCESS ROAD TO MAINWAY
2	04/20/16	UPDATED STREAM AND WETLAND DELINEATIONS
3	07/19/17	UPDATED LOD - QUANTIFIED - EAS - AND TOE-OUT CHAINS

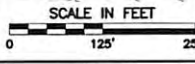
**Civil & Environmental Consultants, Inc.**  
 600 Marketplace Ave - Suite 200 - Bridgeport, WV 26330  
 Ph: 304.933.3119 - 855.488.9639 - Fax: 304.933.3327  
 www.cecinc.com

**ANTERO RESOURCES CORPORATION**  
**NORTH FORK WELL PAD**  
**CLAY DISTRICT**  
**RITCHIE COUNTY, WEST VIRGINIA**

**OVERALL SITE PLAN**

DATE: NOVEMBER 2015 DRAWN BY: ICA/RLS  
 DWG SCALE: 1"=125' CHECKED BY: ZMD  
 PROJECT NO: 152-923  
 APPROVED BY: JDR

DRAWING NO: **C302**  
 SHEET: **03/31/2017**

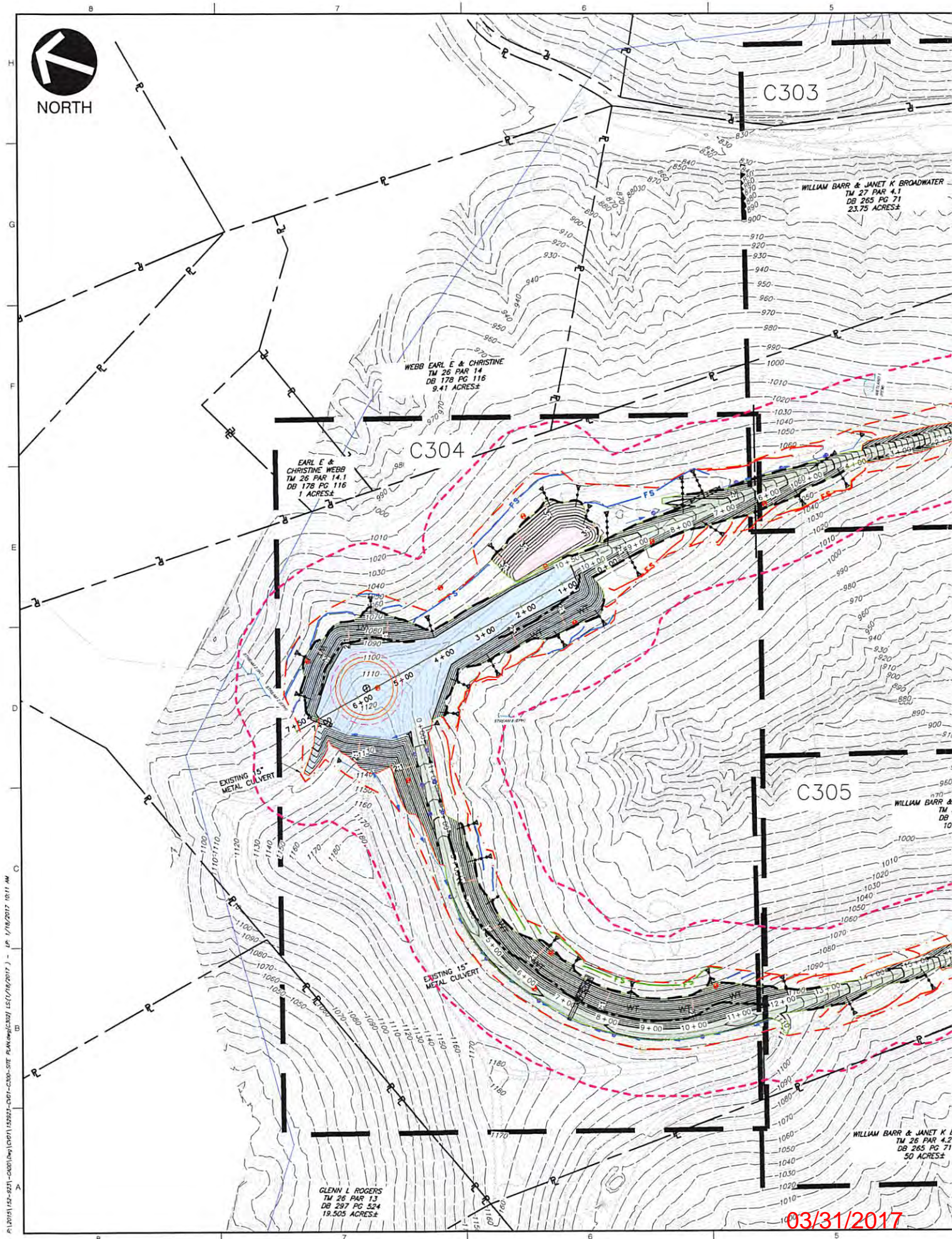


MAG  
 2/10/17





NORTH



P:\2015\152-9231-0000\DWG\15231-0001-C303-SITE PLAN.dwg (C303) LS(1/18/2017) - LP: 1/18/2017 10:11 AM

03/31/2017