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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

Wednesday, June 28, 2017  
WELL WORK PERMIT  
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION (A)  
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit approval for LASER UNIT 3H  
47-017-06830-00-00

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: LASER UNIT 3H  
Farm Name: WYCKOFF, GEORGE S.  
U.S. WELL NUMBER: 47-017-06830-00-00  
Horizontal 6A / New Drill  
Date Issued: 6/27/2017

Promoting a healthy environment.

# 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.

API Number: \_\_\_\_\_

4701706350

# 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).

4701706830



March 31, 2017

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

West Virginia Department of Environmental Protection  
Office of Oil and Gas  
Attn: Ms. Laura Adkins  
601 57<sup>th</sup> Street  
Charleston, WV 25304

Ms. Laura Adkins:

Antero Resources Corporation (Antero) would like to submit the following applications for a new well work permit to explore for Marcellus Shale potential. Our **Canton** project is located in Doddridge County, WV. On the **new George Scott Pad** consists **one new horizontal** shallow well (Laser Unit 3H) that we are requesting approval to drill.

Attached you will find the following:

- Permit Application package
- CD with copy of permit application

If you have any questions please feel free to contact me at (303) 357-7223.

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in blue ink, appearing to read "SJohnson", written over a horizontal line.

Shelby Johnson  
Permitting Agent  
Antero Resources Corporation

Enclosures

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WW-6B  
(04/15)

API NO. 47-017 - 06830  
OPERATOR WELL NO. Laser Unit 3H  
Well Pad Name: George Scott Pad

2  
4/13

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

1) Well Operator: Antero Resources Corporation 494507062 017 - Doddridge West Union Smithburg 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: Laser Unit 3H Well Pad Name: George Scott Pad

3) Farm Name/Surface Owner: George S. Wyckoff Public Road Access: Smithton Rd (Old US-50)

4) Elevation, current ground: ~1315' Elevation, proposed post-construction: 1283'

5) Well Type (a) Gas  Oil  Underground Storage

Other

(b) If Gas Shallow  Deep

Horizontal

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus Shale: 7600' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2950#

8) Proposed Total Vertical Depth: 7600' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 19200' MD

11) Proposed Horizontal Leg Length: 11162'

12) Approximate Fresh Water Strata Depths: 128', 328', 433'

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

14) Approximate Saltwater Depths: 596', 1504', 1750'

15) Approximate Coal Seam Depths: 450'

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

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

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

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

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

DAS  
5/4/17



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, 77 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/48#	485' *see #19	485' *see #19	CTS, 674 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#	19200'	19200'	4872 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	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	LMC-H/POZ & TBT-H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

**PACKERS**

4701706830

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

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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): 31.57 Acres

22) Area to be disturbed for well pad only, less access road (acres): 5.94 Acres

23) Describe centralizer placement for each casing string:

Conductor: no centralizers  
Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.  
Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.  
Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

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

Conductor: no additives, Class A cement.  
Surface: Class A cement with 2-3% calcium chloride and 1/4 lb of flake  
Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat  
Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51  
Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

25) Proposed borehole conditioning procedures:

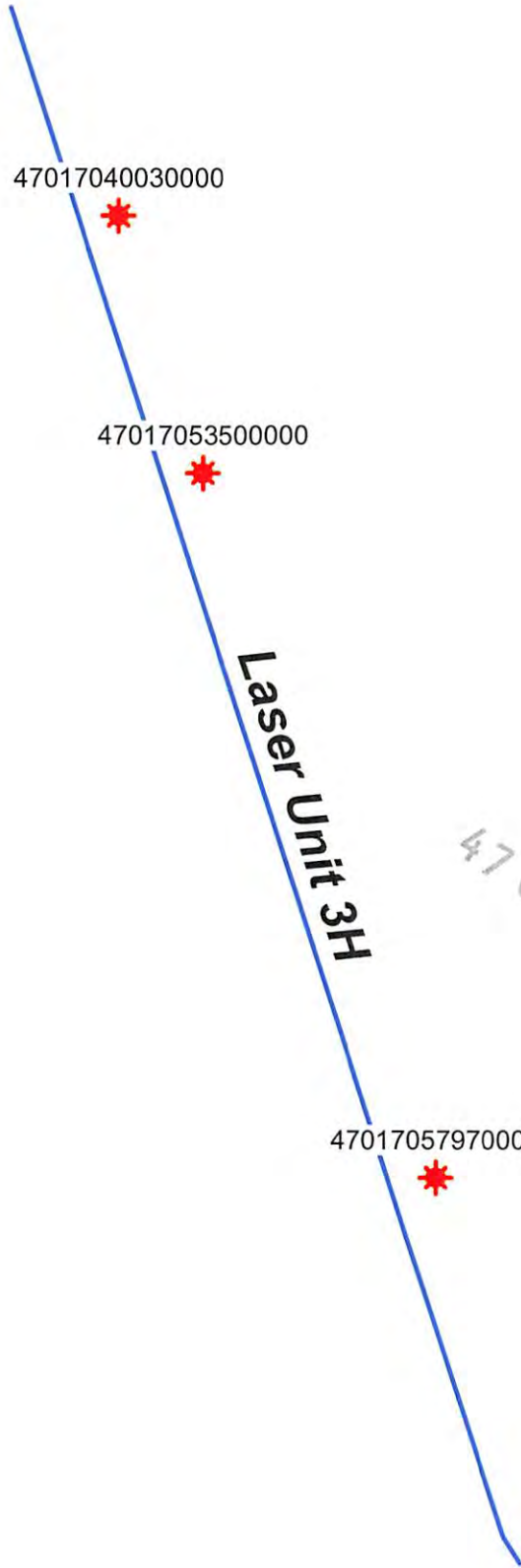
Conductor: blowhole clean with air, run casing, 10 bbls fresh water.  
Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.  
Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.  
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity 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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5/4/17

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Page 3 of 3





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LASER UNIT 3H (GEORGE SCOTT PAD) - AREA OF REVIEW 35-8-5.11 PAGE 2

UWI (APINum)	Well Name	Well Number	Operator	Hist Oper	Elev	TD	TD (SSTVD)	Producing Formations	Producible Formations not perf'd
47017040030000	COX ALICE M ET AL	KC2	CONSOL GAS COMPANY	DAC CORP	1014	5187	-4173	Gordon, Benson	Warren, Riley
47017053500000	PHILLIPS	3	KEY OIL COMPANY	KEY OIL COMPANY	1010	5474	-4464	Warren, Riley, Benson, Alexander	Gordon
47017057970000	COWMAN	3	KEY OIL COMPANY	KEY OIL COMPANY	1313	5792	-4479	Warren, Riley, Benson, Alexander	Gordon

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WW-9  
(4/16)

API Number 47 - 017  
Operator's Well No. Laser 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) Headwaters Middle Island Creek Quadrangle Smithburg 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)

Will closed loop system be used? If so, describe: Yes, fluids stored in tanks, cuttings removed offsite and taken to landfill.

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

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

Additives to be used in drilling medium? Please See Attachment

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Drill cuttings 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

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Subscribed and sworn before me this 31 day of March, 20 17

*Sgar* Notary Public

My commission expires 7/8/2020

WV Department of Environmental Protection  
NOTARY PUBLIC  
STATE OF COLORADO  
NOTARY ID 20164028060  
MY COMMISSION EXPIRES JULY 8, 2020



**Antero Resources Corporation**

Proposed Revegetation Treatment: Acres Disturbed 31.57 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

Access Road "B" 3500' (12.93 acres) + Access Road "C" 247' (0.92 acres) + Access Road "D" 169' (0.72 acres) + Well Pad (5.94 acres) + Excess/Topsoil Material Stockpiles (11.96 acres) = 31.57 Acres

**Seed Mixtures**

**Temporary**

**Permanent**

Seed Type	lbs/acre
Annual Ryegrass	40
Field Bromegrass	40

Seed Type	lbs/acre
Crownvetch	10-15
Tall Fescue	30

See attached table IV-3 for additional seed type (George Scott Design Page 43)

See attached table IV-4A for additional seed type (George Scott Design Page 43)

\*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: \_\_\_\_\_

*[Handwritten Signature]* Daniel Fleck

Comments:

*Maintain and upgrade ETS controls as needed. Do not move rig equipment onto site until all seeding & mulching is complete as per DEP Regs.*

Title:

*D: H Gas Inspector*

Date:

*5/4/17*

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**  
**1995 Smithton Road**  
**West Union, WV 26456**

## **Well Site Safety Plan**

### **Antero Resources**

**Well Name:** Clipper Unit 1H-3H, Cortina Unit 1H-3H,  
Lakota Unit 1H-3H, Laser Unit 1H-3H

**Pad Location:** **GEORGE SCOTT PAD**  
Doddridge County/West Union District

**GPS Coordinates:**

**Entrance** - Lat 39°17'50.7258"/Long -80°44'38.6556" (NAD83)

**Pad Center** - Lat 39°18'27.7266"/Long -80°43'59.7144" (NAD83)

**Driving Directions:**

From Clarksburg: Drive west on US-50 W for approximately 22 miles. Turn left onto CO Rte 50/22, go 0.2 miles. Turn right onto Smithton Rd, go 1.3 miles. Access road will be on the right. Once on the access road, continue on past the Peggy June pad to the George Scott Pad.

**Alternate Route:**

From Parkersburg: Drive on US-50 E for 46.3 miles. Turn left onto WV-18 N, go 0.6 miles. Turn right onto Davis St/Smithton Rd, go 2.0 miles. Access road will be on the left. Once on the access road, continue on past the Peggy June pad to the George Scott Pad.

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

MAY 05 2017

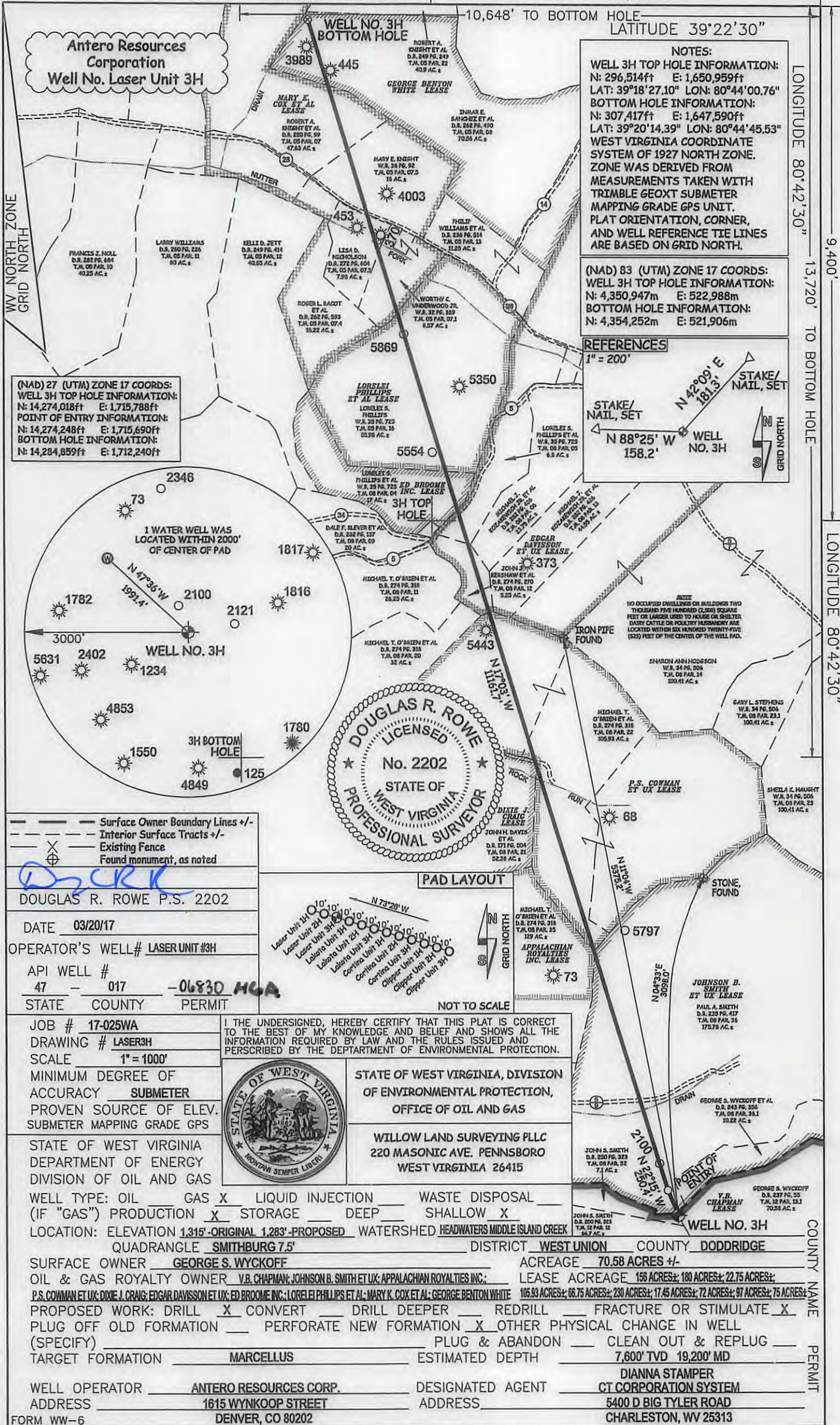
WV Department of  
Environmental Protection



LATITUDE 39°20'00"

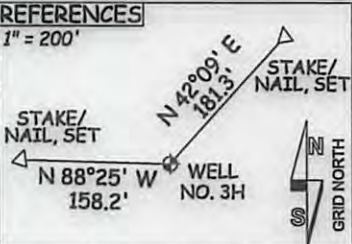
7,134'

LATITUDE 39°22'30"



**NOTES:**  
**WELL 3H TOP HOLE INFORMATION:**  
 N: 296,514ft E: 1,650,959ft  
 LAT: 39°18'27.10" LON: 80°44'00.76"  
**BOTTOM HOLE INFORMATION:**  
 N: 307,417ft E: 1,647,590ft  
 LAT: 39°20'14.39" LON: 80°44'45.53"  
 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: 4,350,947m E: 522,988m  
**BOTTOM HOLE INFORMATION:**  
 N: 4,354,252m E: 521,906m



**(NAD) 27 (UTM) ZONE 17 COORDS:**  
**WELL 3H TOP HOLE INFORMATION:**  
 N: 14,274,018ft E: 1,715,788ft  
**POINT OF ENTRY INFORMATION:**  
 N: 14,274,248ft E: 1,715,690ft  
**BOTTOM HOLE INFORMATION:**  
 N: 14,284,859ft E: 1,712,240ft



— Surface Owner Boundary Lines +/-  
 - - - Interior Surface Tracts +/-  
 X Existing Fence  
 ⊕ Found monument, as noted

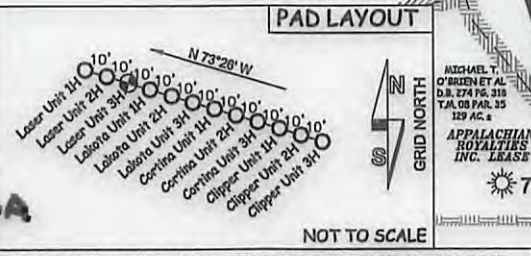
DOUGLAS R. ROWE P.S. 2202

DATE 03/20/17

OPERATOR'S WELL# LASER UNIT #3H

API WELL # 47 - 017 - 0683D MGA

STATE COUNTY PERMIT



JOB # 17-025WA  
 DRAWING # LASER3H  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY SUBMETER  
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC  
 220 MASONIC AVE. PENNSBORO  
 WEST VIRGINIA 26415

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 PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

LOCATION: ELEVATION 1,315'-ORIGINAL 1,283'-PROPOSED WATERSHED HEADWATERS MIDDLE ISLAND CREEK  
 QUADRANGLE SMITHBURG 7.5' DISTRICT WEST UNION COUNTY DODDRIDGE

SURFACE OWNER GEORGE S. WYCKOFF ACREAGE 70.58 ACRES +/-  
 OIL & GAS ROYALTY OWNER Y.B. CHAPMAN; JOHNSON B. SMITH ET UX; APPALACHIAN ROYALTIES INC.; LEASE ACREAGE 156 ACRES+; 180 ACRES+; 22.75 ACRES+;  
 P.S. COWMAN ET UX; DIXIE J. CRAIG; EDGAR DAVISSON ET UX; ED BROOME INC.; LORELEI PHILLIPS ET AL.; MARY K. COX ET AL.; GEORGE BENTON WHITE 105.93 ACRES+; 66.75 ACRES+; 230 ACRES+; 17.45 ACRES+; 72 ACRES+; 97 ACRES+; 75 ACRES+;

PROPOSED WORK: DRILL X CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE X  
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL (SPECIFY) PLUG & ABANDON CLEAN OUT & REPLUG  
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,600' TVD 19,200' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER  
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD  
 CT CORPORATION SYSTEM  
 DENVER, CO 80202 CHARLESTON, WV 25313

LONGITUDE 80°42'30" TO BOTTOM HOLE



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>V.B. Chapman Lease</u></b>			
V.B. Chapman, et ux	J.L. Mann	1/8	LB 0020/0162
J.L. Mann, et ux	W.S. Hoskins, Trustee for the Rock Run Oil & Gas Company	Assignment	LB 0024/0003
Rock Run Oil & Gas Company	Columbian Carbon Company	Assignment	LB 0027/0471
Columbian Caron Company	Columbian Fuel Corporation	Assignment	LB 0079/0202
Columbian Fuel Corporation	Cities Service Oil Company	Merger	Exhibit 2
Cities Service Oil Company	Cities Service Company	Assignment	LB 0103/0328
Cities Service Company	Cities Service Oil & Gas Corporation	Assignment	LB 0132/0177
Cities Service Oil & Gas Corporation	OXY USA Inc.	Name Change	DB 0205/0614
OXY USA Inc.	Ashland Exploration, Inc.	Assignment	LB 0160/0679
Ashland Exploration, Inc.	Ashland Exploration Holdings, Inc.	Name Change	Exhibit 3
Ashland Exploration Holdings, Inc.	Blazer Energy Corporation	Assignment	LB 0181/0421
Blazer Energy Corporation	Eastern States Oil & Gas, Inc.	Name Change	Exhibit 4
Eastern States Oil & Gas, Inc.	Equitable Production-Eastern States, Inc.	Name Change	Exhibit 5
Equitable Production Company	EQT Production Company	Name Change	DB 0281/0346
EQT Production Company	Antero Resources Corporation	Assignment	LB 0325/0539
<b><u>Johnson B. Smith, et ux Lease</u></b>			
Johnson B. Smith, et ux	Eastern Oil Company	1/8	LB 0022/0231
Eastern Oil Company	A.W. Stevens	Assignment	LB 0042/0328
A.W. Stevens	Eastern Union Gas Company	Assignment	LB 0042/0330
Eastern Union Gas Company	Pittsburgh & West Virginia Gas Company	Assignment	DB 0085/0334
Pittsburgh & West Virginia Gas Company	Equitable Gas Company	Assignment	DB 0121/0257
Equitable Gas Company, a division of Equitable Resources, Inc.	Equitrans, Inc.	Assignment	LB 0154/0475
Equitrans, Inc.	EQT Capital Corporation	Name Change	Exhibit 6
EQT Capital Corporation	Antero Resources Corporation	Assignment	LB 0325/0528
<b><u>Appalachian Royalties Inc. Lease</u></b>			
Appalachian Royalties Inc.	Antero Resources Corporation	1/8+	357/79
<b><u>P.S. Cowman, et ux Lease</u></b>			
P.S. Cowman, et ux	W.D. Gribble	1/8	0051/0364
W.D. Gribble	Nell Gribble	Appraisal Book	0003/0055
Nell Gribble	Carolyn Farr & Marian Goodwin	Appraisal Book	0006/0157
Marian Goodwin	Carolyn Farr	Assignment	0126/0065
Carolyn Farr	Clarence Sigley, Executor	Will	0025/0024
Clarence Sigley	Antero Resources Appalachian Corporation	Assignment	0271/0551
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

4707100030

RECEIVED  
Office of Oil and Gas  
Office of Environmental Protection  
WV Department of Environmental Protection  
APR 03 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:

Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Dixie J. Craig Lease</u>			
Dixie J. Craig	Antero Resources Corporation	1/8+	0434/0003
<u>Edgar Davisson, et ux Lease</u>			
Edgar Davisson, et ux	The Carter Oil Company	1/8	LB 0020/0050
The Carter Oil Company	Hope Natural Gas Company	Assignment	LB 0042/0410
Hope Natural Gas Company	Consolidated Gas Supply Corporation	Merger	DB 0143/0345
Consolidated Gas Supply Corporation	Consolidated Gas Transmission Corporation	Assignment	LB 0135/0583
Consolidated Gas Transmission Corporation	CNG Transmission Corporation	Name Change & Merger	Exhibit 7
CNG Transmission Corporation	Dominion Transmission, Incorporated	Name Change & Merger	Exhibit 8
Dominion Transmission, Incorporated	Consol Energy Holdings, LLC	Assignment	LB 0245/0001
Consol Energy Holdings, LLC, et al	CNX Gas Company, LLC	Merger	DB 0292/0469
<u>Ed Broome, Inc. Lease</u>			
Ed Broome, Inc.	Antero Resources Corporation	1/8	0304/0135
<u>Lorelei Phillips, et al Lease</u>			
Lorelei Phillips, et al	Key Oil Company	1/8	0210/0328
Key Oil Company	Antero Resources Appalachian Corporation	Assignment	0256/0285
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Marie K. Cox, et al Lease</u>			
Marie K. Cox, et al	Stanley N. Vaughn	1/8	0063/0380
Stanley N. Vaughn	Ferrell L. Prior	Assignment of Oil & Gas Leasehold Estate	0064/0203
Ralph W. Hoyer, Trustee of the Bankruptcy Estate of Ferrell Prior, an individual d/b/a	Waco Oil & Gas Company, Inc.	Assignment	0129/0428
Waco Oil & Gas Company, Inc.	John H. Underwood	Assignment & Bill of Sale	0165/0397
John H. Underwood	Drilling Appalachian Corporation	Corrected Assignment of Oil & Gas Lease	0168/0147
Drilling Appalachian Corporation	Antero Resources Appalachian Corporation	Partial Assignment of Oil & Gas Leases	0278/0307
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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APR 03 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.

WV Department of  
Environmental Protection

**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)**

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- (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>George Benton White Lease</u>	George Benton White	Antero Resources Corporation	1/8	343/594

\*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:

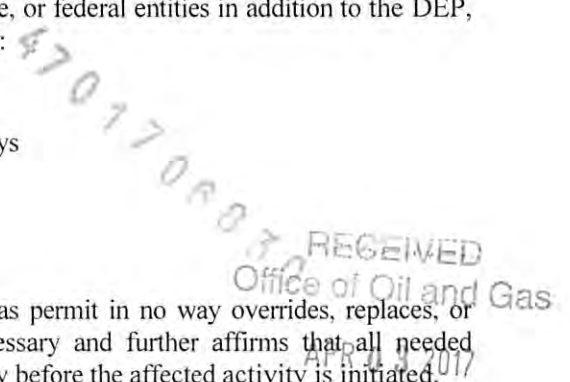
- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

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: Ward McNeilly *[Signature]*

Its: Senior Vice President - Reserves Planning and Midstream





FILED

JUN 10 2013

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



Penney Barker, Manager  
Corporations Division  
IN THE OFFICE OF SECRETARY OF STATE  
Tel: (304)558-8000  
Fax: (304)558-8381  
Website: [www.wvsos.com](http://www.wvsos.com)  
E-mail: [business@wvsos.com](mailto:business@wvsos.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:

- 1. Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation
- 2. Date Certificate of Authority was issued in West Virginia: 6/25/2008
- 3. Corporate name has been changed to: Antero Resources Corporation  
(Attach one Certified Copy of Name Change as filed in home State of incorporation.)
- 4. Name the corporation elects to use in WV: Antero Resources Corporation  
(due to home state name not being available)
- 5. Other amendments: \_\_\_\_\_  
(attach additional pages if necessary)

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6. 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) 357-7310  
Contact Name Phone Number

7. Signature information (See below *\*Important Legal Notice Regarding Signature\**):

Print Name of Signer: Alvyn A. Schopp Title/Capacity: Authorized Person

Signature: *Alvyn A. Schopp* Date: June 10, 2013

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Office of Oil and Gas

*\*Important Legal Notice Regarding Signature:* Per West Virginia Code §311-1-129. Penalty for signing false documents. 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.



Office of Secretary of State

I, Elisha C. Dukes, Secretary of State of the State of Delaware, do hereby certify that the above and foregoing is a true and correct copy of Certificate of Ownership of the "CITIES SERVICE OIL COMPANY", merging the "COLUMBIAN FUEL CORPORATION", pursuant to Section 253 of the General Corporation Law of the State of Delaware, as received and filed in this office the first day of July, A.D. 1968, at 8:30 o'clock A.M.

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In Testimony Whereof, I have hereunto set my hand and official seal at Dover this thirtieth day of July in the year of our Lord one thousand nine hundred and sixty-eight

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Office of Oil and Gas

APR 03 2017

WV Department of Environmental Protection  
Secretary of State

*Elisha C. Dukes*

*A. T. Downer*

Asst's Secretary of State







*I, Ken Hechler, Secretary of State of the  
State of West Virginia, hereby certify that*

originals of an application by

**ASHLAND EXPLORATION, INC.**

for an amended certificate of authority to transact business in West Virginia are  
filed in my office, as required by the provisions of Chapter 31, Article 1, Sections  
57 and 59 of the West Virginia Code and conform to law. Therefore, I issue this

AMENDED CERTIFICATE OF AUTHORITY

to transact business in West Virginia under the name of

**ASHLAND EXPLORATION HOLDINGS, INC.**

and I attach to this certificate a duplicate original of the application.

4701706830

*Given under my hand and the  
Great Seal of the State of*

*West Virginia, on this*

SEVENTEENTH day of APR 03 2011

SEPTEMBER 19 96

*Ken Hechler*

Secretary of State



RECEIVED  
Department of Oil and  
Environmental Protection



# State of West Virginia



## Certificate

*I, Ken Heckler, Secretary of State of the State of West Virginia, hereby certify that*

the following and hereto attached is a true copy of the articles of merger of **EASTERN STATES OIL & GAS, INC.**, a qualified Virginia and **BLAZER ENERGY CORP.**, a qualified Delaware corp.

Therefore, I hereby issue this CERTIFICATE OF MERGER, merging **EASTERN STATES OIL & GAS, INC.** with and into **BLAZER ENERGY CORP.**, the survivor.

4701706830



*Given under my hand and the Great Seal of the State of West Virginia on this Twentieth day of October 1999*

*Ken Heckler*

WV Department of Environmental Protection  
Secretary of State

# State of West Virginia



## Certificate

*I, Ken Hechler, Secretary of State of the  
State of West Virginia, hereby certify that*

originals of the Application for Amended Certificate of Authority of

**EASTERN STATES OIL & GAS, INC.**

are filed in my office, signed and verified, as required by the provisions of West Virginia Code §§31-1-57 and 59 and conform to law. Therefore, I issue this

### CERTIFICATE OF AMENDMENT TO THE CERTIFICATE OF AUTHORITY

changing the name of the corporation to

**EQUITABLE PRODUCTION - EASTERN STATES, INC.**

and I attach to this certificate a duplicate original of the Application for Amended Certificate of Authority.



4701706830  
RECEIVED  
Office of the Secretary of State

Given under my hand and the  
Great Seal of the State of  
West Virginia on this day of  
June 16, 2000

WV Department of  
Environmental Protection

Secretary of State



FORM WW-6A1  
EXHIBIT 6, Page 1

BOOK 512 PAGE 781.

ARTICLES OF MERGER  
OF  
KENTUCKY WEST VIRGINIA GAS COMPANY

a West Virginia Company

Into

EQT CAPITAL CORPORATION

a Delaware Company

FILED  
NOV 20 1995  
IN THE OFFICE OF  
SECRETARY OF STATE  
WEST VIRGINIA

Pursuant to the provisions of Section 38, Article 1, Chapter 31 of the Code of West Virginia, 1931, as amended, the undersigned corporation adopts the following Articles of Merger for the purpose of merging a subsidiary corporation into the undersigned as the surviving corporation:

The undersigned foreign corporation is incorporated under the laws of Delaware and the laws of such jurisdiction permit such a merger.

The following Plan of Merger was adopted by the undersigned corporation in the manner prescribed by the laws of the jurisdiction under which it is organized.

This Plan of Merger dated as of November 20, 1995, is among EQT Capital Corporation ("EQT"), a Delaware corporation, Equitrans, Inc. ("Equitrans"), a Delaware corporation and Kentucky West Virginia Gas Company ("Kentucky West"), a West Virginia corporation. The terms of the merger shall be as follows:

1. Equitrans and Kentucky West shall merge into EQT. EQT shall be the surviving corporation with its corporate identity, existence, purposes, powers, franchises, rights and immunities unimpaired.
2. The issued and outstanding shares of common stock of Equitrans and Kentucky West, shall without further action on the part of Equitrans, Kentucky West or EQT, be cancelled and of no further effect as of the Effective Date of the merger (as defined below).
3. A Certificate of Merger shall be filed as required by law with the Secretary of State of the State of West Virginia and the Secretary of State of the State of Delaware. The Effective Date of the merger shall be the last date of filing with the respective secretaries of state (the "Effective Date"). On the Effective Date, Equitrans and Kentucky West will cease to exist as separate corporations and EQT will succeed to all of the assets, rights, privileges, immunities, powers, duties and liabilities of Equitrans and Kentucky West in accordance with the provisions of the West Virginia Corporation Act and of the Delaware General Corporation Law.
4. The current Certificate of Incorporation of EQT shall be its Certificate of Incorporation on and after the Effective Date of the merger.

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Office of Oil and Gas

APR 03 2017

WV Department of  
Environmental Protection

FORM WW-6A1  
EXHIBIT 6, Page 2

BOOK 512 PAGE 782

5. This Plan of Merger shall be executed by the corporate officers of Kentucky West, Equitrans and EQT.

The number of outstanding shares of each class of the subsidiary corporation and the number of such shares of each class owned by the surviving corporation are as follows:

Name of Subsidiary	Number of Shares Outstanding	Designation of Class	Number of Shares Owned by Surviving Corporation
Kentucky West Virginia Gas	331,754	Common	331,754

A copy of the Plan of Merger set forth above was mailed on September 1, 1995 to each Shareholder of the subsidiary corporation.

The undersigned corporation hereby: (a) agrees that it may be served with process in the State of West Virginia in any proceeding for the enforcement of the rights of a dissenting shareholder of the above-mentioned subsidiary corporation against the surviving corporation; (b) irrevocably appoints the Secretary of State of the State of West Virginia as its agent to accept service of process in any such proceeding; and (c) agrees that it will promptly pay to the dissenting shareholders of such domestic corporation the amount, if any, to which they shall be entitled under Section 123, Articles 1, Chapter 31 of the Code of West Virginia with respect to the rights of dissenting shareholders.

Dated November 20, 1995.

EQT CAPITAL CORPORATION

By *A. Michael Blomovitz*  
Its President

and *Gregory C. Mullen*  
Its Corporate Secretary

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RECEIVED  
Office of Oil and Gas  
APR 03 2017  
WV Department of  
Environmental Protection





*I, Ken Heckler, - Secretary of State of the  
State of West Virginia, hereby certify that  
originals of an application by*

**CONSOLIDATED GAS TRANSMISSION CORPORATION**

for an amended certificate of authority to transact business in West Virginia are  
filed in my office, as required by the provisions of Chapter 31, Article 1, Sections  
57 and 59 of the West Virginia Code and conform to law. Therefore, I issue this

**AMENDED CERTIFICATE OF AUTHORITY**

to transact business in West Virginia under the name of

**CNG TRANSMISSION CORPORATION**

and I attach to this certificate a duplicate original of the application.

*Given under my hand and the  
Great Seal of the State of  
West Virginia, on this*

THIRTEENTH day of  
JANUARY 1988

*Ken Heckler*

Secretary of State



RECEIVED  
Office of Oil and Gas

APR 03 2017

WV Department of  
Environmental Protection

# State of West Virginia



## Certificate

*I, Ken Hechler, Secretary of State of the  
State of West Virginia, hereby certify that*

originals of an application by

**CNG TRANSMISSION CORPORATION**

for an amended certificate of authority to transact business in West Virginia are filed in my office, as required by the provisions of Chapter 31, Article 1, Sections 57 and 59 of the West Virginia Code and conform to law. Therefore, I issue this

### AMENDED CERTIFICATE OF AUTHORITY

to transact business in West Virginia under the name of

**DOMINION TRANSMISSION, INC.**

and I attach to this certificate a duplicate original of the application.



Given under my hand and the  
Great Seal of the State of  
West Virginia on

May 10, 2000  
WV Department of  
Environmental Protection

Secretary of State





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

March 31, 2017

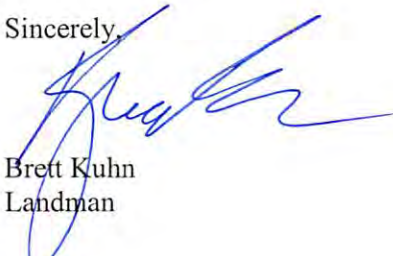
West Virginia Department of Environmental Protection  
Chief, Office of Oil and Gas  
Attn: Mr. James Martin  
601 57<sup>th</sup> Street SE  
Charleston, WV 25304

RE: Laser Unit 3H  
Quadrangle: Smithburg 7.5'  
Doddridge County/West Union District, West Virginia

Mr. Martin:

Antero Resources Corporation (Antero) is submitting the following application for a new well work permit for the Laser 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 Laser Unit 3H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,

  
Brett Kuhn  
Landman

4701706830

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Office of Oil and Gas  
APR 03 2017  
WV Department of  
Environmental Protection

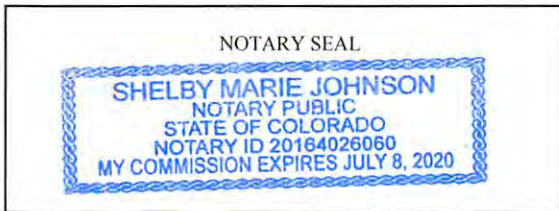




**Certification of Notice is hereby given:**

THEREFORE, I Ward McNeilly, 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>Ward McNeilly</u> <i>W. McNeilly</i>		<u>Denver, CO 80202</u>
Its:	<u>Senior Vice President - Reserves Planning and Midstream</u>	Facsimile:	<u>303-357-7315</u>
Telephone:	<u>303-357-7310</u>	Email:	<u>shjohnson@anteroresources.com</u>



Subscribed and sworn before me this 30 day of March 2017  
*Shelby Marie Johnson* Notary Public  
 My Commission Expires 7/8/2020

**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 of your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

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RECEIVED  
 Office of Oil and Gas  
 APR 03 2017  
 WV Department of  
 Environmental Protection

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: 3/31/2017 Date Permit Application Filed: 3/31/2017

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: 470170683

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: NONE IDENTIFIED WITHIN 1500'  
Address: \_\_\_\_\_  
\*Please note there is 1 water source, but it is located greater than 1500' from the subject pad location

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

\*Please attach additional forms if necessary

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APR 03 2017  
WV Department of Environmental Protection



**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





**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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WW-6A  
(8-13)

API NO. 47-017 -  
OPERATOR WELL NO. Laser Unit 3H  
Well Pad Name: George Scott Pad

**Notice is hereby given by:**

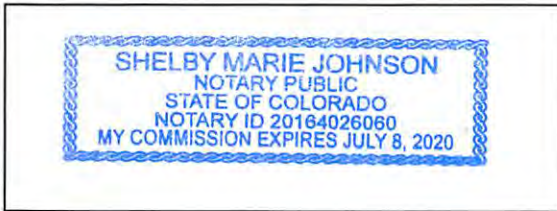
Well Operator: Antero Resources Corporation  
Telephone: (303) 357-7310  
Email: shjohnson@anteroresources.com



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 31<sup>st</sup> day of March 2017.

[Signature] Notary Public

My Commission Expires 7/8/2020

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**WW-6A Notice of Application Attachment (GEORGE SCOTT PAD):**

**List of Surface Owner(s) with Proposed Disturbance associated with George Scott Well Pad:**

**WELL PAD** – These owners were notified of all well work permit applications and have executed signed Surface Use Agreements with Antero Resources Corporation.

**TM 12 PCL 12, TM 8 PCL 52**

**Owner:** John S. & Peggy J. Smith  
**Address:** 142 N. 6<sup>th</sup> St.  
Paden City, WV 26159

**Owner:** John S. & Peggy J. Smith (2<sup>nd</sup> Address)  
**Address:** 2721 Glenmore Ave  
Pittsburgh, PA 15216

**TM 8 PCL 36**

**Owner:** Paul Amos Smith  
**Address:** 140 Belvue Dr.  
Los Gatos, CA 95032

**TM 12 PCL 13.1, TM 8 PCL 36.1**

**Owner:** George S. & Susan R. Wyckoff  
**Address:** PO Box 102  
Smithburg, WV 26436

**ROAD AND/OR OTHER DISTURBANCE** – These owners has executed a signed Agreement with Antero Resources Corporation. However, they were only notified if their tract is overlying the oil and gas leasehold being developed by the proposed well work as outlined in WV Code 22-6A-10(b)(2).

**TM 12 PCL 12 (ON LEASE)**

**TM 8 PCL 52 (ON LEASE)**

**TM 12 PCL 11 (OFF LEASE)**

**Owner:** John S. & Peggy J. Smith ✓  
**Address:** 142 N. 6<sup>th</sup> St.  
Paden City, WV 26159

**Owner:** John S. & Peggy J. Smith (2<sup>nd</sup> Address) ✓  
**Address:** 2721 Glenmore Ave  
Pittsburgh, PA 15216

**TM 8 PCL 36 (ON LEASE)** ✓

**Owner:** Paul Amos Smith  
**Address:** 140 Belvue Dr.  
Los Gatos, CA 95032

**TM 12 PCL 13.1 (ON LEASE)** ✓

**TM 8 PCL 36.1 (ON LEASE)** ✓

**Owner:** George S. & Susan R. Wyckoff  
**Address:** PO Box 102  
Smithburg, WV 26436

**TM 12 PCL 17 (OFF LEASE)**

**Owner:** George M. & Sandra A. Wyckoff  
**Address:** 191 Jockey Camp Rd.  
West Union, WV 26436

**TM 8 PCL 51 (OFF LEASE)**

**Owner:** Robert L. Holland  
**Address:** 225 Watchung Fork  
Westfield, NJ 07090

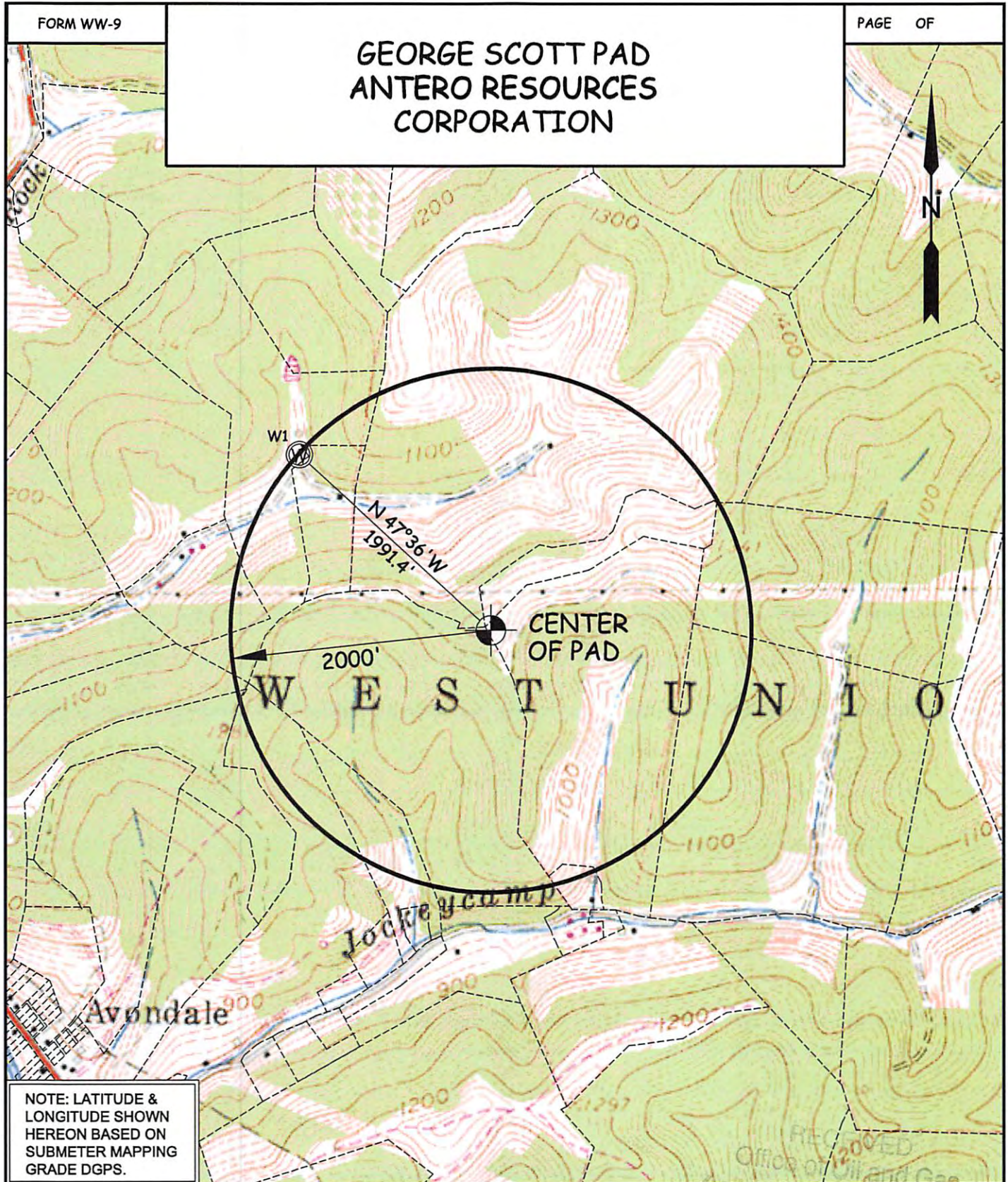
**TM 12 PCL 14 (OFF LEASE)**

**Owner:** L.W. Coulchan & Chad W. Johnson  
**Address:** 109 Platinum Drive, Suite 300

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WV Department of  
Environmental Protection



# GEORGE SCOTT PAD ANTERO RESOURCES CORPORATION



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

WELL	SURFACE OWNER	ADDRESS	TAX MAP-PARCEL	WELL LATITUDE	WELL LONGITUDE
W1	MICHAEL O'BRIEN	487 OBRIEN HOLLOW WEST UNION, WV 26456	8-35	39° 18' 40.07"	80° 44' 19.27"

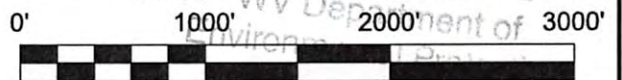
**WILLOW LAND SURVEYING, PLLC**  
P.O. BOX 17, PENNSBORO, WV 26415  
(304) 659-1717

TOPO SECTION(S) OF :  
SMITHBURG 7.5' QUAD.

JOB #: 17-025WA

FILE: GEORGESCOTTWATERMAP

SCALE : 1-INCH = 1000-FEET



DATE: 03/21/17

DRAWN BY: T.B.S.





## WW-6A4 Notice of Intent to Drill Attachment:

### Surface Owners:

Tax Parcel ID: 8-8-36

**Owner:** Paul Amos Smith  
**Address:** 140 Belvue Dr  
Los Gatos, CA 95032

Tax Parcel ID: 8-8-36.1; 8-12-13.1

**Owner:** George and Susan Wyckoff  
**Address:** Po Box 102  
Smithburg, WV 26436

Tax Parcel ID: 8-8-52; 8-12-12

**Owner:** John Samuel Smith & Peggy June Smith  
**Address:** 142 N. 6<sup>th</sup> St.  
Paden City, WV 26159

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

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

**Date of Notice:** 03/31/2017      **Date Permit Application Filed:** 03/31/2017

**Delivery method pursuant to West Virginia Code § 22-6A-16(c)**

- CERTIFIED MAIL                                       HAND  
RETURN RECEIPT REQUESTED                                      DELIVERY

Pursuant to W. Va. Code § 22-6A-16(c), no later than the date for filing the permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner whose land will be used for the drilling of a horizontal well notice of the planned operation. The notice required by this subsection shall include: (1) A copy of this code section; (2) The information required to be provided by subsection (b), section ten of this article to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. (d) The notices required by this section shall be given to the surface owner at the address listed in the records of the sheriff at the time of notice.

**Notice is hereby provided to the SURFACE OWNER(s)**

(at the address listed in the records of the sheriff at the time of notice):

Name: <u>PLEASE SEE ATTACHMENT</u>	Name: _____
Address: _____	Address: _____

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-16(c), notice is hereby given that the undersigned well operator has developed a planned operation on the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

State: <u>West Virginia</u>	UTM NAD 83    Easting: <u>522968m</u>
County: <u>Doddridge</u>	Northing: <u>4350947m</u>
District: <u>West Union</u>	Public Road Access: <u>Smithton Rd (Old US-50)</u>
Quadrangle: <u>Smithburg 7.5'</u>	Generally used farm name: <u>George S. Wyckoff</u>
Watershed: <u>Headwaters Middle Island Creek</u>	

**This Notice Shall Include:**

Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1) A copy of this code section; (2) The information required to be provided by **W. Va. Code § 22-6A-10(b)** to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. 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 Operator: <u>Antero Resources Corporation</u>	Address: <u>1615 Wynkoop Street</u>
Telephone: <u>(303) 357-7310</u>	<u>Denver, CO 80202</u>
Email: <u>shjohnson@anteroresources.com</u>	Facsimile: <u>303-357-7315</u>

**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 of your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

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WV Department of  
Environmental Protection

**WW-6A5 Notice of Planned Operations Attachment (GEORGE SCOTT PAD):**

**List of Surface Owner(s) with Proposed Disturbance associated with George Scott Well Pad:**

**TM 12 PCL 12, TM 8 PCL 52**

**Owner:** John S. & Peggy J. Smith  
**Address:** 142 N. 6<sup>th</sup> St.  
Paden City, WV 26159

**Owner:** John S. & Peggy J. Smith (2<sup>nd</sup> Address)  
**Address:** 2721 Glenmore Ave  
Pittsburgh, PA 15216

**TM 8 PCL 36**

**Owner:** Paul Amos Smith  
**Address:** 140 Belvue Dr.  
Los Gatos, CA 95032

**TM 12 PCL 13.1, TM 8 PCL 36.1**

**Owner:** George S. & Susan R. Wyckoff  
**Address:** PO Box 102  
Smithburg, WV 26436



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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Jim Justice  
Governor

Thomas J. Smith, P. E.  
Secretary of Transportation/  
Commissioner of Highways

February 22, 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 George Scott Pad, Doddridge County  
Laser Unit 3H Well Site 47-017-06830

Dear Mr. Martin,

This well site will be accessed from a DOH permit #04-2016-0698 which has been issued to Antero Resources Corporation for access to the State Road for a well site located off of Doddridge County Route 50/30 SLS.

The operator has signed a STATEWIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

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

Cc: Shelby Johnson  
Antero Resources Corporation  
CH, OM, D-4  
File

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WV Department of  
Environmental Protection

# List of Anticipated Additives Used for Fracturing or Stimulating Well

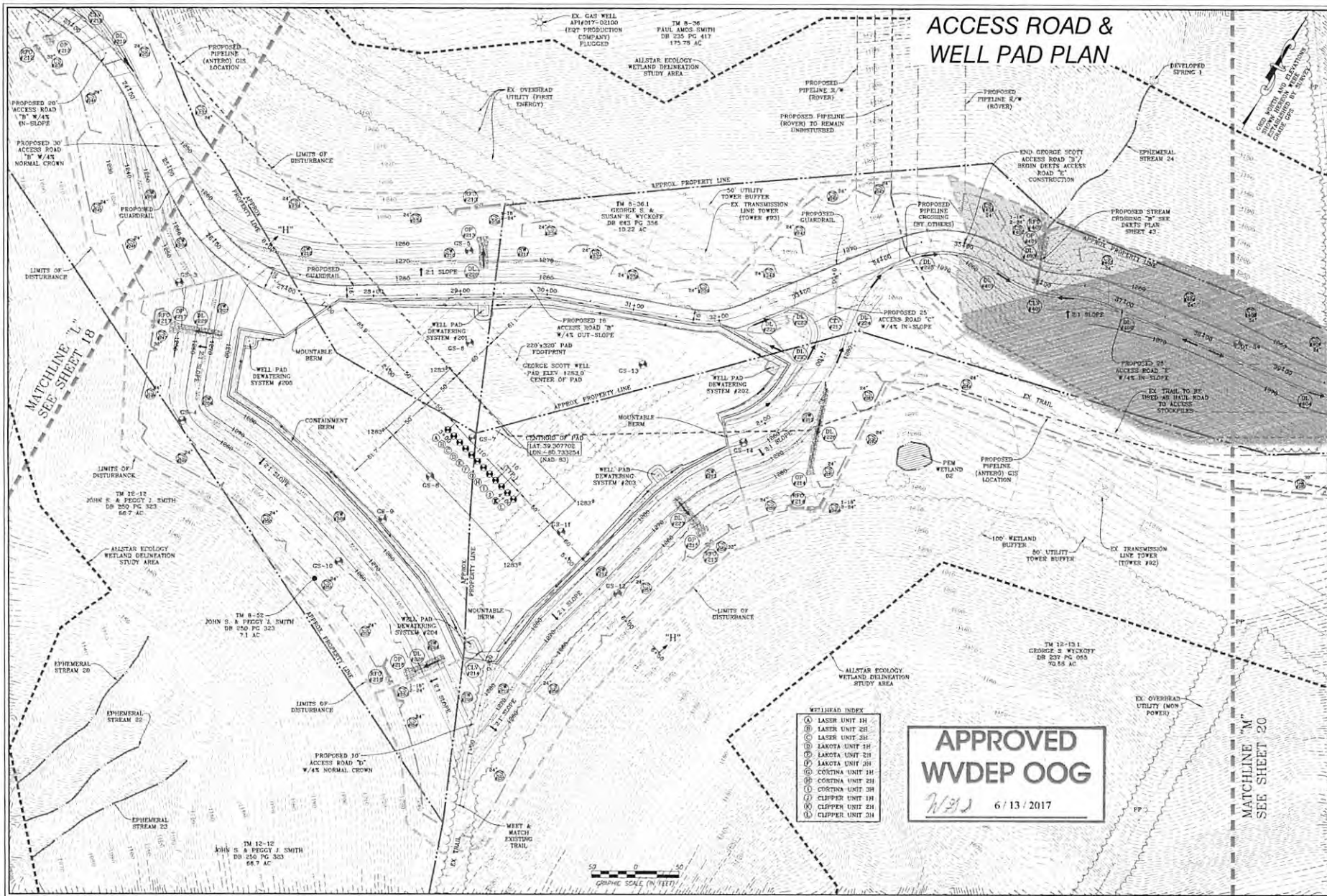
Additives	Chemical Abstract Service Number (CAS #)
Fresh Water	7732-18-5
2 Phosphobutane 1,2,4 tricarboxylic acid	37971-36-1
Ammonium Persulfate	7727-54-0
Anionic copolymer	Proprietary
Anionic polymer	Proprietary
BTEX Free Hydrotreated Heavy Naphtha	64742-48-9
Cellulase enzyme	Proprietary
Demulsifier 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	5827-60-8
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

47 01700 107-19-7  
57-55-6

Department of  
 Oil and Gas  
 APR 03 2017  
 Environmental Protection







# ACCESS ROAD & WELL PAD PLAN

**NAVITUS**  
ENERGY ENGINEERING

DATE	REVISION

**Antero**  
THIS DOCUMENT WAS PREPARED FOR ANTERO RESOURCES CORPORATION

ACCESS ROAD & WELL PAD PLAN  
**GEORGE SCOTT WELL PAD**  
WEST UNION DISTRICT  
DODDRIDGE COUNTY, WEST VIRGINIA

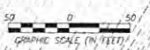


DATE 03/30/2017  
SCALE 1" = 50'  
SHEET 19 OF 50

**WELL PAD INDEX**

Ⓐ	LASER UNIT 1H
Ⓑ	LASER UNIT 2H
Ⓒ	LASER UNIT 2H
Ⓓ	LAKOTA UNIT 1H
Ⓔ	LAKOTA UNIT 2H
Ⓚ	COSTINA UNIT 1H
Ⓛ	COSTINA UNIT 2H
Ⓜ	CLIFFER UNIT 1H
Ⓝ	CLIFFER UNIT 2H
Ⓟ	CLIFFER UNIT 3H

**APPROVED WVDEP OOG**  
*WWS* 6/13/2017



MATCHLINE "L"  
SEE SHEET 18

MATCHLINE "M"  
SEE SHEET 20