



west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Monday, March 16, 2020
WELL WORK PERMIT
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET
DENVER, CO 80202

Re: Permit approval for OXFORD 98 5H
47-017-06906-00-00

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: OXFORD 98 5H
Farm Name: MICHAEL R. BRITTON & AN⁺
U.S. WELL NUMBER: 47-017-06906-00-00
Horizontal 6A New Drill
Date Issued: 3/16/2020

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

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: _____

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.

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

1) Well Operator: Antero Resources Corporat 494507062 017-Doddrid West Uni West Union 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Oxford 98 Unit 5H Well Pad Name: Oxford 98 Pad

3) Farm Name/Surface Owner: Michael R. Britton & Angela D. Pratt Public Road Access: US Route 50

4) Elevation, current ground: 1116' Elevation, proposed post-construction: _____

5) Well Type (a) Gas X Oil _____ Underground Storage _____

Other _____

(b) If Gas Shallow X Deep _____

Horizontal X

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale: 7100' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 7100' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 7100' MD

11) Proposed Horizontal Leg Length: 0'

12) Approximate Fresh Water Strata Depths: 363' ✓

13) Method to Determine Fresh Water Depths: 47-017-02837, 47-017-06326 (Included WR-35)

14) Approximate Saltwater Depths: 1653'

15) Approximate Coal Seam Depths: 120'

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 X

(a) If Yes, provide Mine Info: Name: _____

Depth: _____

Seam: _____

Owner: _____

RECEIVED
Office of Oil and Gas

MAR 16 2020

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	54.5#	413 *see #19	413 *see #19	CTS, 574 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2500	2500	CTS, 1018 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	23#	7100	7100	1546 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	24"	0.438"	1530	50	Class A	~1.18
Fresh Water	13-3/8"	17-1/2"	0.38"	2730	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"	0.415"	12,630	2500	Load-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

RECEIVED
Office of Oil and Gas

MAR 16 2020

PACKERS

WV Department of
Environmental Protection

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

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.

(* Consider slowing down while drilling conductor string / Fresh Water)

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): 24.45 acres

22) Area to be disturbed for well pad only, less access road (acres): 5.73 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

RECEIVED
Office of Oil and Gas

MAR 16 2020

WV Department of
Environmental Protection

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.

Reference Wells
w/ FW depths

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47 - 017 - 06326 County DODDRIDGE District WEST UNION
Quad OXFORD 7.5' Pad Name OXF156 Field/Pool Name _____
Farm name HEASTER, CHARLES P., ET AL Well Number 513138
Operator (as registered with the OOG) EQT Production Company
Address 625 Liberty Ave. EQT Plaza, Suite 1700 City Pittsburgh State PA Zip 15222

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4342165.4 Easting 518343.6
Landing Point of Curve Northing 4342305.4 Easting 518319.4
Bottom Hole Northing 4344220.7 Easting 517351.7

Elevation (ft) 1202 GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine

Mud Type(s) and Additive(s)
SBM 12.8ppg - powdered hydrocarbon resin, calcium carbonate, ground almond hulls, barium sulfate, calcium chloride, lecithin liquid, organophilic clay, polyaminated fatty acid, calcium hydroxide, polyimide surfactant, modified fatty acid, dimer.trimer fatty acid, ground walnut hulls, refined base oil.

Date permit issued 11/20/2013 Date drilling commenced 5/7/2014 Date drilling ceased 9/6/2014
Date completion activities began 12/16/2014 Date completion activities ceased 12/31/2014
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 169,216,320,386,462,600,1084 Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1456 Void(s) encountered (Y/N) depths N
Coal depth(s) ft 1272,1312 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by: _____

API 47-017 - 06326

Farm name HEASTER, CHARLES P., ET AL Well number 513138

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	24"	20"	40'	New	94lb/ft	N/A	Y
Surface	17-1/2"	13-3/8"	1,177'	New	54.5lb/ft	367'	Y
Coal							
Intermediate 1	12-3/8"	9-5/8"	5,255'	New	40lb/ft	2,267'2,362'3,918'	Y
Intermediate 2							
Intermediate 3							
Production	8-1/2"	5-1/2"	14,020'	New	20lb/ft	N/A	N
Tubing							
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	38	15.6	1.18	44.84	0	8
Surface	Class A	995	15.6	1.19	1184	0	8
Coal							
Intermediate 1	Class A /Class A/Class A	400/340/1015	14.2/15.6/15.6	1.28/1.18/1.18	2111	0	8
Intermediate 2							
Intermediate 3							
Production	Class A/Class H	250/930	14.2/15.2	1.26/1.97	2,147	4,684'	72
Tubing							

Drillers TD (ft) 14,023'

Loggers TD (ft) N/A

Deepest formation penetrated Marcellus

Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5,303'

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING Conductor- N/A

Surface-Bowstring centralizer on shoe track and every 300' to surface

Intermediate-Bowstring centralizer on shoe track and every 500' to surface

Production- Composite bodied centralizers on every joint from Shoe track up to 4,279'

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

Drilling Contractor: **Savanna Drilling**

Address: **125 Industry Road**

City: **Waynesburg** State: **PA**

Zip: **15370**

Cementing Company **Nabors Well Services**

Address **2504 Smith Creek Road**

City **Waynesburg**

State **PA** Zip **15370**

Logging Company _____

Address _____

City _____

State _____ Zip _____

513138 Final Formations API #47-017-06326

Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
FRESH WATER ZONE	1	1	1,084.00	1,084.00
SAND/SHALE	1	1	1,272.00	1,272.00
COAL	1,272.00	1,272.00	1,277.00	1,277.00
SAND/SHALE	1,277.00	1,277.00	1,312.00	1,312.00
COAL	1,312.00	1,312.00	1,318.00	1,318.00
SAND/SHALE	1,318.00	1,318.00	1,513.00	1,513.00
MAXTON	1,513.00	1,513.00	1,865.00	1,865.00
BIG LIME	1,865.00	1,865.00	1,923.00	1,923.00
KEENER	1,923.00	1,923.00	2,163.00	2,163.00
WEIR	2,163.00	2,163.00	2,358.00	2,358.00
BEREA	2,358.00	2,358.00	2,367.00	2,367.00
GANTZ	2,367.00	2,367.00	2,442.00	2,442.00
50F	2,442.00	2,442.00	2,563.00	2,563.00
30F	2,563.00	2,563.00	2,612.00	2,612.00
GORDON	2,612.00	2,612.00	2,710.00	2,710.00
4TH	2,710.00	2,710.00	2,918.00	2,918.00
BAYARD	2,918.00	2,918.00	3,207.00	3,207.00
WARREN	3,207.00	3,207.00	3,293.00	3,293.00
SPEECHLEY	3,293.00	3,293.00	3,796.00	3,796.00
BALLTOWN A	3,796.00	3,796.00	4,023.00	4,023.00
BALLTOWN B	4,023.00	4,023.00	4,183.00	4,182.90
BRADFORD	4,183.00	4,182.90	4,424.00	4,423.90
RILEY	4,424.00	4,423.90	4,871.00	4,870.80
BENSON	4,871.00	4,870.80	5,122.00	5,121.80
ALEXANDER	5,122.00	5,121.80	6,428.00	6,395.30
MIDDLESEX	6,428.00	6,395.30	6,490.00	6,446.70
GENESEE	6,490.00	6,446.70	6,582.00	6,514.30
GENESEO	6,582.00	6,514.30	6,656.00	6,558.50
TULLY	6,656.00	6,558.50	6,708.00	6,582.90
HAMILTON	6,708.00	6,582.90	6,753.00	6,599.30
MARCELLUS	6,753.00	6,599.30		

8-2

DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC.

Alexander - Perforated interval 5159'-5195' (26 shots). Broke down formation with 1000 gal. 15% HCl. Fraced with 20,000# 80/100 sand and 60,000# of 20/40 sand suspended in crosslinked gel.

Weir - Perforated interval 2164'-2242' (32 shots). Broke down formation with 2000 gal. 15% HCl. Fraced with 15,000# 80/100 sand and 75,000# 20/40 sand suspended in crosslinked gel and energized with nitrogen.

Big Injun - Perforated interval 1995'-2004' (19 shots). Broke down formation with 1000 gal. 15% HCl, 10 bbl. water, and nitrogen. Fraced with 60,000# 20/40 sand in a gel system energized with nitrogen.

WELL LOG

FORMATION	COLOR	HARD OR SOFT	TOP FEET	BOTTOM FEET	REMARKS
					Including indication of all fresh and salt water, coal, oil and gas
Shale			0	25	
Sand			25	55	
Red Rock			55	62	
Sand			62	130	
Red Rock			130	150	
Shale & Red Rock			150	275	Water @ 155'
Sand			275	295	
Red Rock			295	325	
Sand			325	415	
Red Rock			415	440	
Sand			440	470	
Red Rock & Shale			470	499	
Sand			499	511	
Shale & Red Rock			511	615	
Red Rock			615	640	
Shale			640	778	
Sand			778	809	
Shale			809	1000	
Sand			1000	1026	
Shale			1026	1070	
Sand			1070	1290	
Shale			1290	1495	
Sand			1495	1598	
Shale			1598	1616	
Sand			1616	1628	
Shale			1628	1698	
Sand			1698	1730	
Shale			1730	1765	
Lime			1765	1850	
Big Injun Sand			1850	2004	
Shale			2004	2048	
Sand			2048	2060	
Shale			2060	2156	
Weir Sand			2156	2264	
Shale			2264	2356	
Berea Sand			2356	2364	

CONTINUED ON ATTACHMENT

(Attach separate sheets as necessary)

Cities Service Company
Well Operator

By: William L. Smith William L. Smith
Region Petroleum Engineer

Date: November 19, 1981

Note: Regulation 2.02(i) provides as follows:
"The term 'log' or 'well log' shall mean a systematic detailed geological record of all formations, including coal, encountered in the drilling of a well."

WELL OPERATOR'S REPORT OF DRILLING
ATTACHMENT

Lewis Maxwell "A" #67-A
API #47-017-2837

RECEIVED

NOV 24 1981

OIL AND GAS DIVISION
WV DEPARTMENT OF MINES

B-3

OPEN FLOW DATA:

Producing Formation Big Injun Pay zone depth 2004 feet
Gas: Initial open flow _____ Mcf/D Oil: Initial open flow _____ Bbl/d
Final open flow 73 Mcf/D Final open flow _____ Bbl/d
Time of open flow between initial and final tests 48 hours
Static rock pressure 280 psig (surface measurement) after 42 hours shut in

THE WELL WAS TESTED BY CONSOLIDATED WITH ALL THE ZONES COMMINGLED:

880 Mcf/D after flowing 4 hours.

375 psig static rock pressure after 12 days shut in

CONTINUATION OF WELL LOG:

Formation	Top Feet	Bottom Feet	Remarks
Shale	2364	2584	
Gordon Sand	2584	2602	
Shale	2602	3220	
Warren Sand	3220	3384	
Shale	3384	4870	
Benson Sand	4870	4878	
Shale	4878	5154	
Alexander Sand	5154	5208	
Shale	5208	5335	T.D.

William L. Smith
William L. Smith
Region Petroleum Engineer



OXFD 98 5H



47017054480000



Antero Resources Corporation

OXFD 98 5H



WELL SYMBOLS
Gas Well

December 11, 2019

RECEIVED
Office of Oil and Gas

DEC 27 2019

WV Department of
Environmental Protection

x 101706906

WW-9
(4/16)

API Number 47 - 017

Operator's Well No. Cxford 98 Unit 5H

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 West Union 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/Stiff Foam, Production - Water 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 Gretchen Kohler RECEIVED Office of Oil and Gas
Company Official (Typed Name) Gretchen Kohler JAN 31 2020
Company Official Title Senior Environmental & Regulatory Manager

WV Department of Environmental Protection

Subscribed and sworn before me this 16th day of DECEMBER, 2019

[Signature] Notary Public
My commission expires 3.13.2022

DAC
1-27-2020

MEGAN GRIFFITH
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20184011666
MY COMMISSION EXPIRES MARCH 13, 2022

Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 24.45 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

Tank Pad Acreage (2.43 acres) + Well Pad Acreage (5.73 acres) + Stockpile Acreage (4.60 acres) + Tank Pad Access (1.18 acres) + Well Pad Access (10.51 acres) = 24.45 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 (Oxford 98 Pad Design)

See attached Table IV-4A for additional seed type (Oxford 98 Pad Design)

*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: *[Signature]*

Comments: _____

RECEIVED
Office of Oil and Gas

JAN 31 2020

WV Department of
Environmental Protection

Title: Oil & Gas Inspector

Date: 1-27-2020

Field Reviewed? Yes No

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

RECEIVED
Office of Oil and Gas

DEC 27 2019

WV Department of
Environmental Protection

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

RECEIVED
Office of Oil and Gas

DEC 27 2019

WV Department of
Environmental Protection



911 Address
2045 Smithton Road
West Union, WV 26456

will be updated

Well Site Safety Plan

Antero Resources

Well Name: Oxford 98 Unit 5H

Pad Location: OXFORD 98 PAD

Doddridge County/West Union District

GPS Coordinates:

Entrance - Lat 39°25'63.08"/Long -80°79'18.37" (NAD83)

Pad Center - Lat 39°25'31.21"/Long -80°79'95.00" (NAD83)

Driving Directions:

From Doddridge High School: Go west on IS-50 W for 1.3 miles - turn left onto Arnolds Creek Road/Central Station Road/Right Fork Run Road for 0.7 miles - continue straight onto Left Fork Run Road for 1.5 miles - lease road will be on the right.

Alternate Route:

From West Union: Head north on Neely Ava toward Marie Street/Old US 50E for 36 feet - turn left at the 1st cross street onto Marie Street/Old US 50 W for 2.3 miles - turn right onto US 50 for 0.4 miles - continue straight onto Left Fork Run Road for 1.5 miles - lease road will be on the right.

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

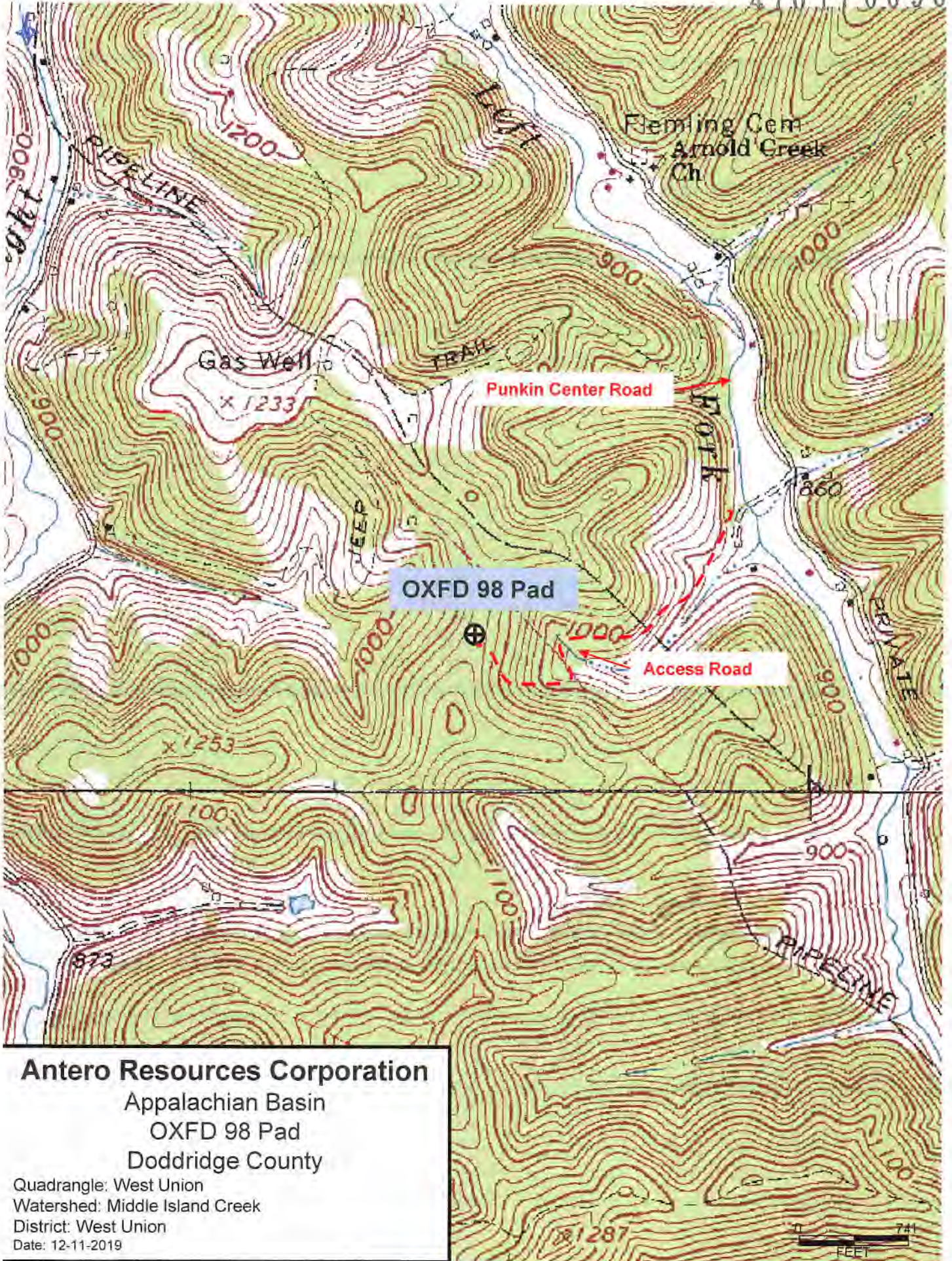
Antero
11-27-2020

RECEIVED
Office of Oil and Gas

JAN 31 2020

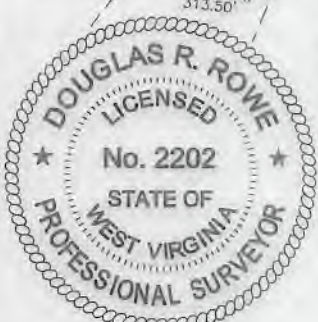
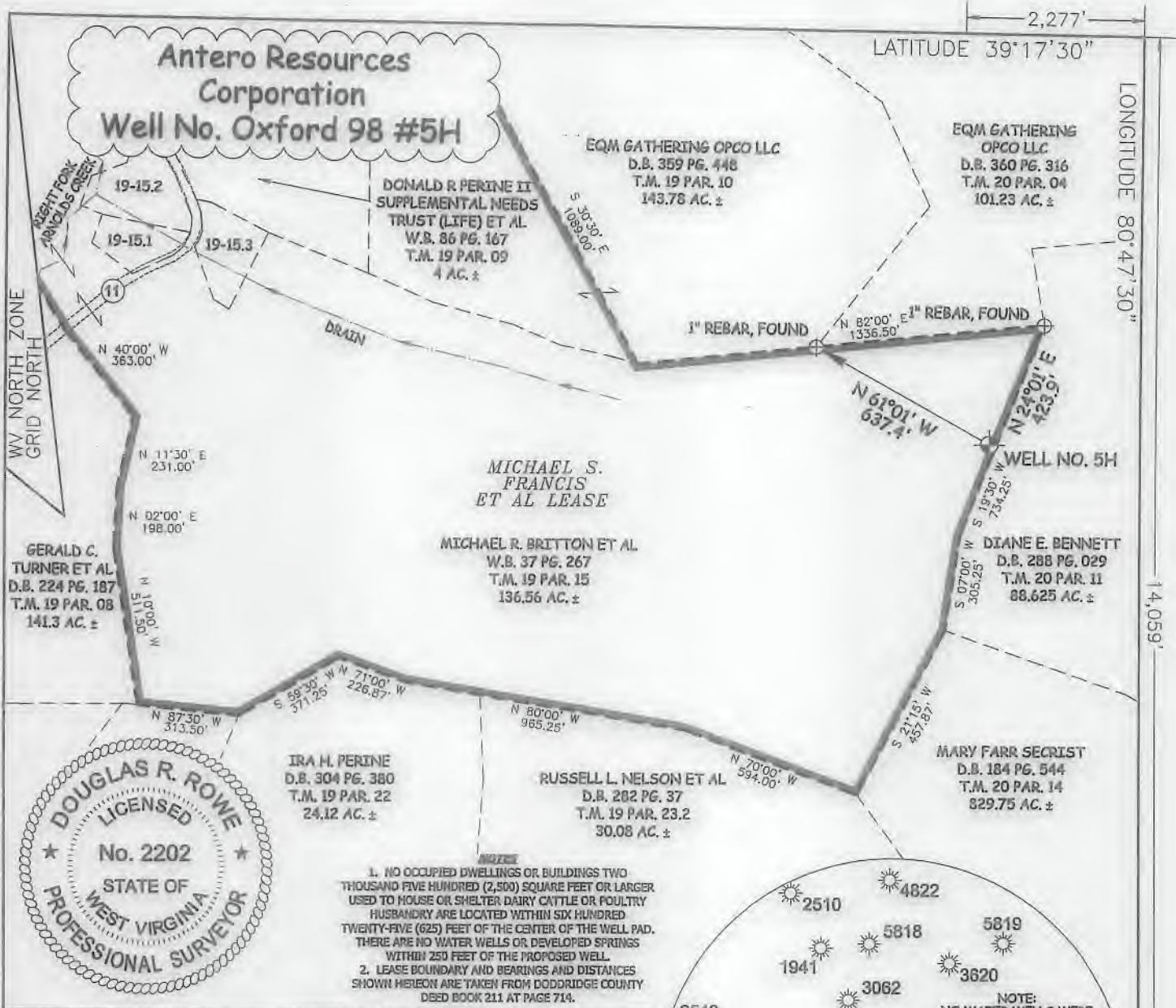
1

WV Department of
Environmental Protection

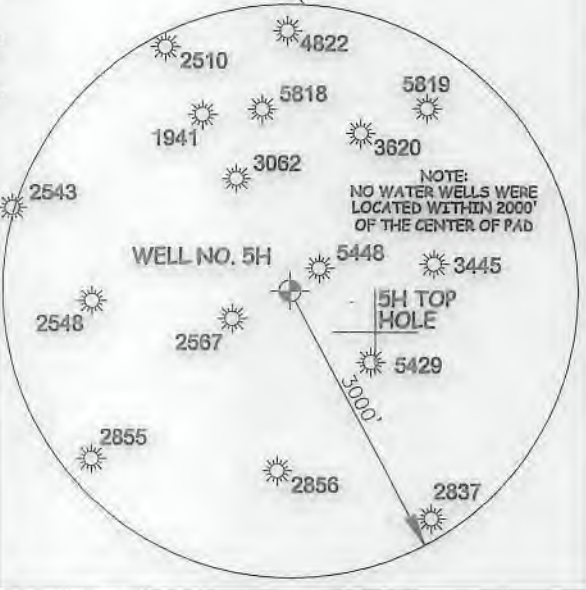


Antero Resources Corporation
 Appalachian Basin
 OXFD 98 Pad
 Doddridge County

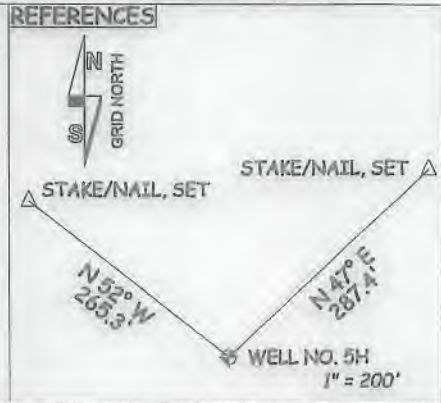
Quadrangle: West Union
 Watershed: Middle Island Creek
 District: West Union
 Date: 12-11-2019



NOTES
 1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD. THERE ARE NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF THE PROPOSED WELL.
 2. LEASE BOUNDARY AND BEARINGS AND DISTANCES SHOWN HEREON ARE TAKEN FROM DODDRIDGE COUNTY DEED BOOK 211 AT PAGE 714.



NOTES:
 WELL 5H TOP HOLE INFORMATION:
 WY STATE PLANE MAD 27 COORDS:
 N: 276,945ft E: 1,631,951ft
 GEOGRAPHIC MAD 27 COORDS:
 LAT: 39°15'11.04" LON: 80°47'58.95"
 (NAD) 83 (UTM) ZONE 17 COORDS:
 N: 4,344,889m E: 517,297m
 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.



JOB # 19-039WA
 DRAWING # OXFORD085H
 SCALE 1" = 500'

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.

LEGEND
 ----- Surface Owner Boundary Lines +/-
 - - - - - Adjoining Surface Tracts +/-
 ⊕ Found monument, as noted

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
 266 HUSHERS RUN RD PENNSBORO WEST VIRGINIA 26415

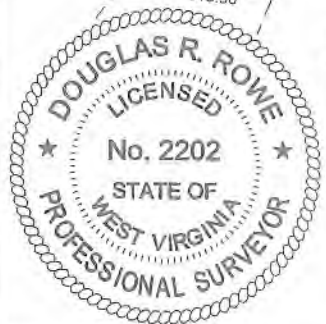
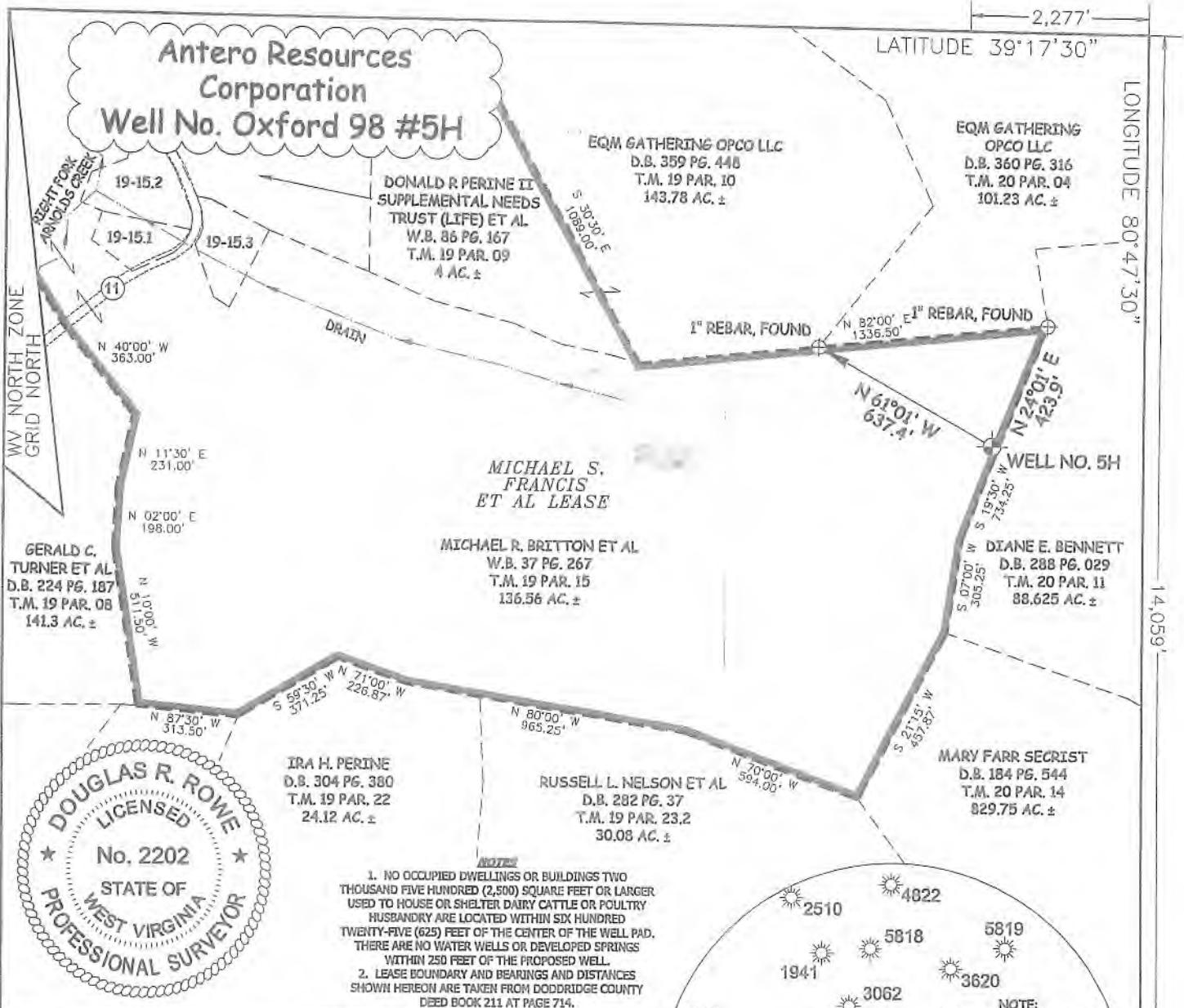
D. Rowe
 DOUGLAS R. ROWE P.S. 2202

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS
 WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
 (IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
 LOCATION: ELEVATION 1,118' WATERSHED HEADWATERS MIDDLE ISLAND CREEK
 QUADRANGLE WEST UNION 7.5' DISTRICT WEST UNION COUNTY DODDRIDGE

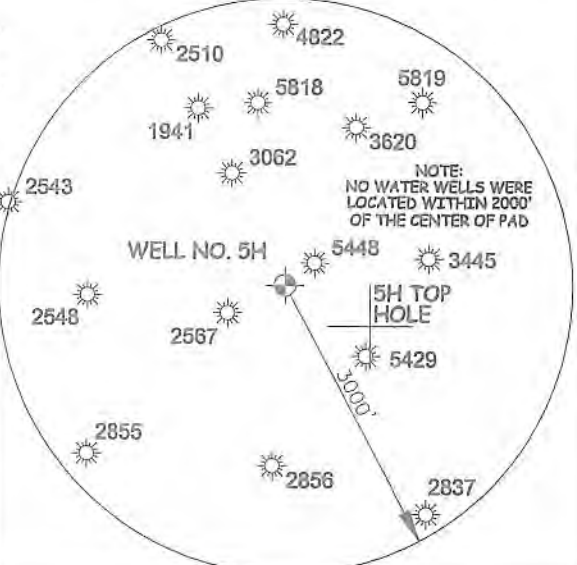
DATE 12/12/19
 OPERATOR'S WELL # OXFORD 98 #5H
 API WELL # 47 - 017 - 06906 HGA
 STATE COUNTY PERMIT

SURFACE OWNER MICHAEL R. BRITTON & ANGELA D. PRATT ACREAGE 136.56 ACRES +/-
 OIL & GAS ROYALTY OWNER MICHAEL S. FRANCIS ET AL LEASE ACREAGE 173 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 ___ ESTIMATED DEPTH 7,100' TVD 7,100' MD
 TARGET FORMATION MARCELLUS
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
DENVER, CO 80202 CHARLESTON, WV 25313

LONGITUDE 80°47'30" COUNTY NAME PERMIT



NOTES:
 1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD. THERE ARE NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF THE PROPOSED WELL.
 2. LEASE BOUNDARY AND BEARINGS AND DISTANCES SHOWN HEREON ARE TAKEN FROM DODDRIDGE COUNTY DEED BOOK 211 AT PAGE 714.



NOTES:
 WELL 5H TOP HOLE INFORMATION:
 WV STATE PLANE NAD 27 COORDS:
 N: 276,945ft E: 1,631,951ft
 GEOGRAPHIC NAD 27 COORDS:
 LAT: 39°15'11.04" LON: 80°47'58.95"
 (NAD) 83 (UTM) ZONE 17 COORDS:
 N: 4,344,889m E: 517,297m
 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.



JOB # 19-039WA
 DRAWING # OXFORD985H
 SCALE 1" = 500'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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
 266 HUSHERS RUN RD PENNSBORO WEST VIRGINIA 26415

LEGEND
 - - - - - Surface Owner Boundary Lines +/-
 - - - - - Adjoining Surface Tracts +/-
 ⊕ Found monument, as noted

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

DOUGLAS R. ROWE P.S. 2202

WELL TYPE: OIL ___ GAS LIQUID INJECTION ___ WASTE DISPOSAL ___
 (IF "GAS") PRODUCTION STORAGE ___ DEEP ___ SHALLOW
 LOCATION: ELEVATION 1,116' WATERSHED HEADWATERS MIDDLE ISLAND CREEK

DATE 12/12/19
 OPERATOR'S WELL # OXFORD 88 #5H

QUADRANGLE WEST UNION 7.5 DISTRICT WEST UNION COUNTY DODDRIDGE

API WELL # 47 - 017 - 06906
 STATE COUNTY PERMIT

SURFACE OWNER MICHAEL R. BRITTON & ANGELA D. PRATT ACREAGE 136.56 ACRES +/-
 OIL & GAS ROYALTY OWNER MICHAEL S. FRANCIS ET AL LEASE ACREAGE 173 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 7,100' TVD 7,100' MD
 TARGET FORMATION MARCELLUS
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
 DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME PERMIT

WW-6A1

Operator's Well Number Oxford 98 Unit 5H

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>Michael Francis et al Lease</u>			
Michael Francis et al	Key Oil Company	1/8	0106/0273
Key Oil Company	Columbia Gas Transmission Corporation	Assignment	0115/0436
Columbia Gas Transmission Corporation	Columbia Natural Resources Inc	Assignment	0161/0068
Columbia Natural Resources Inc	Columbia Natural Resources LLC	Name Change	0256/0588
Columbia Natural Resources LLC	Chesapeake Appalachia LLC	Merger	0264/0447
Chesapeake Appalachia LLC	CNX Gas Company	Assignment	0372/0585
CNX Gas Company	Antero Resources Corporation	Assignment	0387/0216

RECEIVED
Office of Oil and Gas
DEC 27 2019
WV Department of
Environmental Protection

*Partial Assignments to Antero Resources Corporation include 100% rights to extract, produce and market the oil and gas from the Marcellus and any other formations completed with this well.

CONTINUED ON NEXT PAGE

WW-6A1
(5/13)

Operator's Well No. Oxford 98 Unit 5H

**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
Michael Francis et al Lease

Michael Francis et al	Key Oil Company	1/8	0106/0273
Key Oil Company	Columbia Gas Transmission Corporation	Assignment	0115/0436
Columbia Gas Transmission Corporation	Columbia Natural Resources Inc	Assignment	0161/0068
Columbia Natural Resources Inc	Columbia Natural Resources LLC	Name Change	0256/0588
Columbia Natural Resources LLC	Chesapeake Appalachia LLC	Merger	0264/0447
Chesapeake Appalachia LLC	CNX Gas Company	Assignment	0372/0585
CNX Gas Company	Antero Resources Corporation	Assignment	0387/0216

*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.

RECEIVED
Office of Oil and Gas

7 2019

WV Department of
Environmental Protection

Well Operator: Antero Resources Corporation

By: Tim Rady

Its: VP of Land



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

December 13, 2019


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

RE: Oxford 98 Unit 5H
Quadrangle: West Union 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 Oxford 98 Unit 5H 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 Oxford 98 Unit 5H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,


Brett Kuhn
Senior Landman

RECEIVED
Office of Oil and Gas

DEC 27 2019

WV Department of
Environmental Protection

Certification of Notice is hereby given:

THEREFORE, I Diana Hoff, 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>Diana Hoff</u> <i>[Signature]</i>		<u>Denver, CO 80202</u>
Its:	<u>VP of Operations</u>	Facsimile:	<u>303-357-7315</u>
Telephone:	<u>303-357-7310</u>	Email:	<u>mgriffith@anteroresources.com</u>



Subscribed and sworn before me this 13th day of December 2019
[Signature] Notary Public
 My Commission Expires 3.13.2022

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 deprivacyofficer@wv.gov.

RECEIVED
Office of Oil and Gas

DEC 27 2019

WV Department of
Environmental Protection

WW-6A
(9-13)

API NO. 47-017 **4701706906**
OPERATOR WELL NO. Oxford 98 Unit 5H
Well Pad Name: Oxford 98 Pad

**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: 12/13/2019 **Date Permit Application Filed:** 12/13/2019

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: Diane E. Bennet
Address: 106 Chevront Avenue
West Union, WV 26456

Name: Michael R. Britton
Address: 138 Cascara Road
Salem, WV 26426

SURFACE OWNER(s) (Road and/or Other Disturbance)

Name: Diane E. Bennet
Address: 106 Chevront Avenue
West Union, WV 26456

Name: Michael R. Britton
Address: 138 Cascara Road
Salem, WV 26426

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: NONE IDENTIFIED WITHIN 1500'
Address: _____

OPERATOR OF ANY NATURAL GAS STORAGE FIELD
Name: _____
Address: _____

*Please attach additional forms if necessary

RECEIVED
Office of Oil and Gas

DEC 27 2019

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 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting 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 57th St. SE
Charleston, WV 25304
(304) 926-0450

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.

RECEIVED
Office of Oil and Gas

DEC 27 2019

WV Department of
Environmental Protection

WW-6A
(8-13)

API NO. 47- 017 -
OPERATOR WELL NO. Oxford 98 Unit 5H
Well Pad Name: Oxford 98 Pad

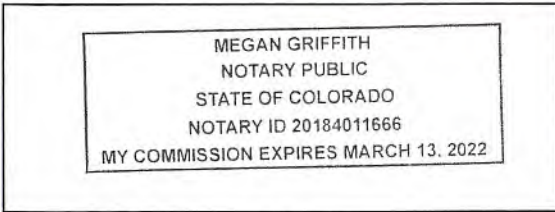
Notice is hereby given by:

Well Operator: Antero Resources Corporation
Telephone: (303) 357-7310 *[Signature]*
Email: mgriffith@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 deprivacyofficer@wv.gov.



Subscribed and sworn before me this 13th day of December 2019
[Signature] Notary Public
My Commission Expires 3.13.2022

RECEIVED
Office of Oil and Gas
DEC 27 2019
WV Department of
Environmental Protection

**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: 1/9/2019 **Date of Planned Entry:** *1/23/2019

*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: Diane E. Bennett c/o Susan Hudkins

Address: 50 Cheuvront Ave
West Union, WV 26456

Name: Michael R. Britton & Angela D. Pratt

Address: 1960 Arnold's Creek Road
West Union, WV 26456

Name: _____

Address: _____

COAL OWNER OR LESSEE

Name: NO DECLARATIONS ON RECORD WITH 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: West Virginia

County: Doddridge

District: West Union

Quadrangle: West Union 7.5'

Approx. Latitude & Longitude: Approx. 39.253056, -80.799544

Public Road Access: US Route 50

Watershed: Headwaters Middle Island Creek

Generally used farm name: Michael R. Britton & Angela D. Pratt

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 57th 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.

Notice is hereby given by:

Well Operator: Antero Resources Corporation

Telephone: (303) 357-7223

Email: mgriffith@anteroresources.com

Address: 1615 Wynkoop Street
Denver, CO 80202

Facsimile: (303) 357-7315

RECEIVED
Office of Oil and Gas

DEC 27 2019

West Virginia Department of
Environmental Protection

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.

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

Mineral Owners:

Tax Parcel ID: 8-20-11

Owner: Richard Michael Minnis
Address: 1902 Yaupan Valley Road
Austin, TX 78746

Owner: John D. Minnis Trust
Address: c/o Richard M. Minnis Trustee
1902 Yaupan Valley Road
Austin, TX 78746

Owner: James D. Rogers, Trustee
Address: P.O. Box 985
Clarksburg, WV 26301

Owner: XTO Energy, Inc
Address: c/o Exxon Mobil Property Tax
Department
P.O. Box 52
Houston, TX 77001-0053

Owner: G. Stan Bennett
Address: 2014 Crisfield Drive
Sugar land, TX 77479

Owner: Livingston S. Bee
Address: 1235 Sunnyside Road
West Union, WV 26456

Owner: Barbara Jo Way
Address: 2725 Pullman Road
Harrisville, WV 26362

Owner: Donald A. Casto
Address: 138 Ann Court
Lancaster, OH 43130

Owner: Richard Paul Hildebrand
Address: 2192 Meadowood Blvd.
Twinsburg, OH 44087

Owner: April Jo Hildebrand
Address: 1200 Forrest Ridge Drive
Dover, OH 44622

Owner: Jan E. Chapman
Address: 22 Garton Plaza
Weston, WV 26452

Owner: Franklin L. Butler
Address: 2567 Spring Hills Road
Staunton, VA 24401

Owner: Estate of Madeline B. Brosey
Address: c/o Elizabeth Ann Gibbons
7115 Nettlewood Place
Colorado Springs, CO 80918

Owner: Albert A. Hileman
Address: 145 St. John Street
Barberton, OH 44203

Owner: Walter Aaron Hileman
Address: 137 Alder Ave
Altamonte Springs, FL 32714

Owner: Nancy Heller
Address: 8205 Jonnie Lane
Gaithersburg, MD 20882

Owner: Orval Hileman
Address: 34 Silent Hill Drive
Fairmont, WV 26554

Owner: Wanda Krus
Address: 1093 Montana Road
Fairmont, WV 26554

Owner: Linda Barker
Address: 56 Symonds Road
Washington, NH 03280

Owner: JoAnn Glaze
Address: 30 Celtic Way
Fairmont, WV 26554

Owner: Becky Dickens
Address: 489 Old Monongah Road
Fairmont, WV 26554

Owner: Henry Hileman
Address: 756 Orchard Ave.
Barberton, OH 44203

Owner: Tim Hileman
Address: 3265 Reimer Road
Norton, OH 44203

Owner: Joyce A. Keen
Address: 84 W. View Drive
Tallmadge, OH 44278

WEST VIRGINIA
DEPARTMENT OF
ENVIRONMENTAL PROTECTION

DEC 27 2019

RECEIVED
Office of Oil and Gas

Mineral Owners:

Tax Parcel ID: 8-20-11

Owner: Janet L. McNeil
Address: 2249 Bryn Mawr Drive
Stow, OH 44224

Owner: Ruth Martin
Address: 1656 Crooked Run Road
Clarksburg, WV 26301-6453

Owner: Naomi Jean Barnes
Address: 8311 Plainwood Ave.
Clarksburg, WV 26301-6453

Owner: Issaac Aaron Hileman
Address: 1002 Briarwood Road
Bridgeport, WV 26330

Owner: Kathy Jackson
Address: 932 Tarklin Road
Salem, WV 26426

Owner: Debbi Adams
Address: 43 Seneca Drive
Greensburg, PA 15601

Owner: Mary Morris
Address: P.O. Box 701
Clarksburg, WV 26302

Owner: Mark Hileman
Address: 190 Winfair Drive
Tyrone, GA 30290

Owner: Hershel Hileman, Jr.
Address: 434 Haymond Street
Fairmont, WV 26554

Owner: Bobbie Sue Gallo
Address: 434 Haymond Street
Fairmont, WV 26554

Owner: Tammy Urban
Address: 110 Limestone Drive
Pleasant Gap, PA 16823

Owner: Elizabeth Jane Adams
Address: 743 E. Meda Ave
Glendora, CA 91741

Owner: Susan Rebecca Swiger
Address: P.O. Box 402
Salem, WV 26426

Owner: Robert Aaron Swiger
Address: 5126 Arnolds Creek Road
West Union, WV 26456

Owner: Barbara Ann Leggett
Address: 205 B&B Farms Drive
West Union, WV 26456

Owner: Anda Keith Hileman
Address: 1466 Taylor Drain Road
West Union, WV 26456

Owner: Key Oil Company
Address: 22 Garton Plaza
Weston, WV 26452

Owner: Larry Robin Trader
Address: 1401 Doug Baker Blvd., STE 107-1
Birmingham, AL 35242

Owner: Tierra Oil Company, LLC
Address: P.O. Box 700968
San Antonio, TX 78270-0968

Owner: Clarence W. & Mary Mutschelknaus
Address: P.O. Box 351
Salem, WV 26426

Owner: CNX Gas Company, LLC
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

WV Department of
Environmental Protection

REC 27 2019

RECEIVED
Office of Oil and Gas

Mineral Owners:

Tax Parcel ID: 8-19-15



Owner: Michael S. Francis
Address: P.O. Box 40
New Martinsville, WV 26155

Owner: John M. Francis
Address: 203 Maupin Ave
Salisbury, NC 28144

Owner: William E. Yoke, Jr.
Address: 554 East Main Street
Clarksburg, WV 26301

Owner: Margaret Yoke Booth
Address: 19 Kinleighs Cor
Shinnston, WV 26431

Owner: David E. Romine
Address: 122 Chestnut Ave.
Narberth, PA 19072

Owner: Donald Yoke
Address: 321 Worley Ave.
Clarksburg, WV 26301

WV Department of
Environmental Protection

DEC 27 2019

RECEIVED
Office of Oil and Gas

WW-6A5
(1/12)

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: _____ **Date Permit Application Filed:** _____

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: Diane E. Bennet
Address: 106 Chevront Avenue
West Union, WV 26456

Name: Michael R. Britton
Address: 138 Cascara Road
Salem, WV 26426

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>517297m</u>
County:	<u>Doddridge</u>		Northing:	<u>4344889m</u>
District:	<u>West Union</u>	Public Road Access:	<u>US Route 50</u>	
Quadrangle:	<u>West Union 7.5'</u>	Generally used farm name:	<u>Michael R. Britton & Angela D. Pratt</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 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

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

Address: 1615 Wynkoop Street
Denver, CO 80202
Facsimile: 303-357-7316

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.

RECEIVED
Office of Oil and Gas

8 7 2019

WV Department of
Environmental Protection

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
VOLUNTARY STATEMENT OF NO OBJECTION

Instructions to Persons Named on Page WW-6A

The well operator named on page WW-6A is applying for a permit from the State of West Virginia to conduct oil or gas well work. Well work permits are valid for twenty-four (24) months. Please contact the listed well operator and the Office of Oil and Gas if you do not own any interest in the listed surface tract.

Comment and Waiver Provisions

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.

Pursuant to West Virginia Code § 22-6A-8(b) No permit may be issued less than thirty days after the filing date of the application for any well work except plugging or replugging; and no permit for plugging or replugging may be issued less than five days after the filing date of the application except a permit for plugging or replugging a dry hole: *Provided*, That if the applicant certifies that all persons entitled to notice of the application under the provisions of subsection (b), section ten of this article have been served in person or by certified mail, return receipt requested, with a copy of the well work application, including the erosion and sediment control plan, if required, and the well plat, and further files written statements of no objection by all such persons, the secretary may issue the well work permit at any time.

VOLUNTARY STATEMENT OF NO OBJECTION

I, _____, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through _____, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows:

State: <u>West Virginia</u>	UTM NAD 83 Easting: <u>517297m</u>
County: <u>Doddridge</u>	UTM NAD 83 Northing: <u>4344889m</u>
District: <u>West Union</u>	Public Road Access: <u>US Route 50</u>
Quadrangle: <u>West Union 7.5'</u>	Generally used farm name: <u>Michael R. Britton & Angela D. Pratt</u>
Watershed: <u>Headwaters Middle Island Creek</u>	

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials.

<p>*Please check the box that applies</p> <p><input type="checkbox"/> SURFACE OWNER</p> <p><input type="checkbox"/> SURFACE OWNER (Road and/or Other Disturbance)</p> <p><input type="checkbox"/> SURFACE OWNER (Impoundments/Pits)</p> <p><input type="checkbox"/> COAL OWNER OR LESSEE</p> <p><input type="checkbox"/> COAL OPERATOR</p> <p><input type="checkbox"/> WATER PURVEYOR</p> <p><input type="checkbox"/> OPERATOR OF ANY NATURAL GAS STORAGE FIELD</p>	<p>FOR EXECUTION BY A NATURAL PERSON</p> <p>Signature: _____</p> <p>Print Name: _____</p> <p>Date: _____</p>
	<p>FOR EXECUTION BY A CORPORATION, ETC.</p> <p>Company: _____</p> <p>By: _____</p> <p>Its: _____</p>
	<p>Signature: _____</p> <p>Date: _____</p>
	<p>RECEIVED Office of Oil and Gas</p>
	<p>DEC 27 2019</p>
	<p>WV Department of Environmental Protection</p>

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.



4701706906

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways

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

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

December 19, 2019

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

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

Subject: DOH Permit for the Oxford 98 Pad, Doddridge County
Oxford 98 Unit 5H Well Site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2014-0553 which has been issued to Antero Resources Corporation for access to the State Road for a well site located off Doddridge County Route 11/4 SLS.

This operator is in compliance with §22-6A-20 of the WV Code. 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 October 1, 2018.

RECEIVED
Office of Oil and Gas

DEC 27 2019

WV Department of
Environmental Protection

Very Truly Yours,

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

Cc: Megan Griffith
Antero Resources Corporation
CH, OM, D-6
File

List of Anticipated Additives Used for Fracturing or Stimulating Well

4701706906

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

Antero Resources Corporation Erosion and Sediment Control Plan for OXF-98 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 OXF-98 Well Pad 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 RETTEW Associates, Inc., a West Virginia registered professional engineer.

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 OXF-98 Well Erosion & Sediment Control Plans (Site Design) prepared and certified by RETTEW Associates, 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. A pre-construction conference with the contractor and the appropriate erosion and sediment control inspector 48 hours prior to beginning work to review the construction drawings and provide any requested guidance.
2. 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.
3. Construct the rock construction entrance. All vehicles entering and exiting the site shall do so via the rock construction entrance.
4. Construct all BMP's as soon as clearing and grubbing operations allow. Diversions and sediment trap(s)/basin(s) shall be seeded and mulched immediately.
5. If applicable, convey upslope drainage around the AST Pad by constructing all diversion berm(s) and/or compost filter sock diversion(s) as shown on the plans.
6. Clear and grub the site. All woody material, brush, trees, stumps, large roots, boulders, and debris 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. Smaller trees, brush, & stumps shall be cut and/or grubbed and windrowed in appropriate areas for use as sediment barriers at water drainage outlets (as shown on the plans), windrowed below the well site, used for wildlife habitat, burned (as per WV forest fire laws), removed from site, or disposed of by other methods approved by WV DEP.
7. If applicable, install all wetland or stream crossings as shown on the plans.
8. 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.

9. Construct the access road. All fill areas, including excess material stockpiles, shall be "Keyed In" and compacted in horizontal lifts with a maximum loose lift thickness of 12" and maximum particle size as outlined in the geotechnical report. All fill shall be compacted by a vibrating sheepsfoot roller to 95% per the standard proctor test (ASTM – D698). Moisture content will be controlled in accordance with the standard proctor test (ASTM – D698) results. It is also recommended that each lift be proof rolled with a loaded haul truck where applicable. Ditch relief culverts shall be installed at a grade of 1-8% to minimize outlet velocities to the extent possible. Install outlet protection once ditch relief culverts are installed, as shown on plans. Stabilize the road with geotextile fabric & stone and side slopes as specified with permanent seeding. Excess material shall be stockpiled (if necessary) in areas shown in the plans and immediately stabilized. Topsoil shall be stripped from all stockpile areas prior to construction of stockpiles. After stockpiles are constructed, topsoil is to be reapplied at a depth of 2"-4". Slopes shall be tracked by running tracked machinery up and down the slope, leaving tread marks parallel to the contour. All ditch lines shall be cleaned prior to installation of lined protection.
10. Strip the topsoil from the AST pad area. 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.
11. Grade the AST pad areas as shown on the plans. Install pad sumps (with 4" PVC drain pipe and outlet protection) and containment berm and replace liner system. Immediately stabilize the outer areas of the AST pad. The AST pad areas shall be stabilized with geotextile fabric & stone and the side slopes with seed and mulch. Apply seed and mulch to all disturbed areas. This shall include all areas that will not be subject to regular traffic activity (to be stabilized with stone), or any disturbed area that will not be re-disturbed before site reclamation begins.
12. All BMP's must remain in place and functional until all areas within the limit of disturbance are complete and permanently stabilized. Maintenance must include inspection of all erosion and sediment controls after each runoff event in excess of 0.5" and on a biweekly basis.
13. 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.
14. All permanent sediment control measures can be removed after the site is permanently stabilized and approval is received from the WVDEP.
15. Any areas disturbed by removal of controls shall be repaired, stabilized, and permanently seeded.

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*

RECEIVED
Office of Oil and Gas

▶ -11-27-2019

WV Department of
Environmental Protection

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 “Notes and Detail Sheet” on page 21 and “Notes and Detail Sheet” on pages 22-29 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 “Erosion Control Narrative” under “Notes and Detail Sheet” on page 21 as well as “Vegetative Establishment Notes” on page 27 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 “Notes and Detail Sheet” on page 27 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 “Notes and Detail Sheet,” on pages 21-29 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 onto public or private roads; and*

RECEIVED
Office of Oil and Gas

DEC 27 2019

WV Department of
Environmental Protection

Antero Response:

"Key Map Plan," "Layout Plan 'A'," "Layout Plan 'B'," "Layout Plan 'C'," "Layout Plan 'D'," "Overall Grading Plan," "Grading & Erosion Control Plan 'A'," "Grading & Erosion Control Plan 'B'," "Grading & Erosion Control Plan 'C'," and "Grading & Erosion Control Plan 'D'," maps are included on pages 4-13 of the Site Design. Specific design, layout and inspection and maintenance notes for a stabilized construction entrance are included in the "Notes and Detail Sheet" verbiage on page 21

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

Antero Response:

"Key Map Plan," "Layout Plan 'A'," "Layout Plan 'B'," "Layout Plan 'C'," "Layout Plan 'D'," "Overall Grading Plan," "Grading & Erosion Control Plan 'A'," "Grading & Erosion Control Plan 'B'," "Grading & Erosion Control Plan 'C'," and "Grading & Erosion Control Plan 'D'," maps are included on pages 4-13 of the Site Design locate all proposed erosion and sediment control BMPs.

RECEIVED
Office of Oil and Gas

▶ DEC 27 2019

WV Department of
Environmental Protection

Antero Resources Corporation Site Construction Plan for OXF-98 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 OXF-98 Well Pad 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 RETTEW Associates, Inc., a West Virginia registered professional engineer.

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 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 21 of "OXF-98 Well Erosion & Sediment Control Plans" (Site Design) prepared and certified by RETTEW Associates, Inc. of Pennsylvania.

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

"Key Map Plan," "Layout Plan 'A'," "Layout Plan 'B'," and "Layout Plan 'C'," "Layout Plan 'D'" maps are included on pages 4-8 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*

RECEIVED
Office of Oil and Gas

▶ 12 7 2019

WV Department of
Environmental Protection

Antero Response

Please refer to the "Existing Conditions" map on page 3 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 "Key Map Plan," "Layout Plan 'A'," "Layout Plan 'B'," and "Layout Plan 'C'," "Layout Plan 'D'" maps are included on pages 4-8 as well as the "Overall Grading Plan," "Grading & Erosion Control Plan 'A'," "Grading & Erosion Control Plan 'B'," "Grading & Erosion Control Plan 'C'," "Grading & Erosion Control Plan 'D'," "Original Access Profile Sheet," "AST Access Profile Sheet," "Original access Cross Sections," and "AST Access and Pad Cross Sections" on pages 9-20 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 "Key Map Plan," "Layout Plan 'A'," "Layout Plan 'B'," and "Layout Plan 'C'," "Layout Plan 'D'" maps are included on pages 4-8 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 "Key Map Plan," "Layout Plan 'A'," "Layout Plan 'B'," and "Layout Plan 'C'," "Layout Plan 'D'" maps are included on pages 4-8 as well as the "Overall Grading Plan," "Grading & Erosion Control Plan 'A'," "Grading & Erosion Control Plan 'B'," "Grading & Erosion Control Plan 'C'," "Grading & Erosion Control Plan 'D'," "Original Access Profile Sheet," "AST Access Profile Sheet," "Original access Cross Sections," and "AST Access and Pad Cross Sections" on pages 9-20 for a cross-section of the location. The cut and fill volumes can be found in "Schedule of Quantities" on page 2.

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.

RECEIVED
Office of Oil and Gas

DEC 27 2019

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 “Notes and Detail Sheet” on page 21 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 “Notes and Detail Sheet” on page 21 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 “Notes and Detail Sheet” on page 21 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 and Gas

DEC 27 2019

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 “Notes and Detail Sheet” on page 21 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 “Notes and Detail Sheet” on page 21. 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

“Notes and Detail Sheet” on page 21 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 and Gas

DEC 27 2019

WV Department of
Environmental Protection