



 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

Friday, September 21, 2018
 WELL WORK PERMIT
 Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
 1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit approval for SARAHLNE UNIT 1H
 47-095-02518-00-00

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: SARAHLNE UNIT 1H
 Farm Name: ROY A. MEREDITH
 U.S. WELL NUMBER: 47-095-02518-00-00
 Horizontal 6A New Drill
 Date Issued: 9/21/2018

PERMIT CONDITIONS 4709502518 09/21/2018

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.

PERMIT CONDITIONS 4709502518 ^{09/21/2018}

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.

WW-6B
(04/15)

API NO. 47-095 -
OPERATOR WELL NO. Sarahlene Unit 1H
Well Pad Name: Meredith Pad

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

LTB
9/14/18

1) Well Operator: Antero Resources Corporation

<u>494507062</u>	<u>095-Tyler</u>	<u>Centerville</u>	<u>West Union 7.5'</u>
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Operator ID County District Quadrangle

2) Operator's Well Number: Sarahlene Unit 1H Well Pad Name: Meredith Pad

3) Farm Name/Surface Owner: Roy A. Meredith, et al Public Road Access: Haymond Road

4) Elevation, current ground: 1117' Elevation, proposed post-construction: 1114'

5) Well Type (a) Gas Oil Underground Storage
Other _____
(b) If Gas Shallow Deep _____
Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale: 7000' TVD, Anticipated Thickness- 75 feet, Associated Pressure- 2800#

8) Proposed Total Vertical Depth: 7000' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 16800' MD

11) Proposed Horizontal Leg Length: 9006'

12) Approximate Fresh Water Strata Depths: 463', 604', 683'

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

14) Approximate Saltwater Depths: 1521', 1567', 2109'

15) Approximate Coal Seam Depths: 63', 1239'

16) Approximate Depth to Possible Void (coal mine, karst, other): None Anticipated

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes _____ No

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

WW-6B
(04/15)

API NO. 47- 095 -
OPERATOR WELL NO. Sarahlene Unit 1H
Well Pad Name: Meredith Pad

18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New	H-40	94#	93	93	CTS, 89 Cu. Ft.
Fresh Water	13-3/8"	New	J-55	54.5#	740 *see#19	740 *see#19	CTS, 1028 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#	16800	16800	CTS, 4212 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#			
Liners							

CTB 9/18/18

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	Lead-HPOZ & T ₄₀₀ -H	H/POZ~1.44 & H~1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

PACKERS

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

WW-6B
(10/14)

API NO. 47-095 - _____
OPERATOR WELL NO. Sarahlene Unit 1H
Well Pad Name: Meredith Pad

GTB 9/18/18

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

Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale.

*Antero will be air drilling the fresh water string which makes it difficult to determine when fresh water is encountered. Therefore, we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Antero plans to pump Slickwater into the Marcellus Shale formation in order to ready the well for production. The fluid will be comprised of approximately 99 percent water and sand, with less than 1 percent special-purpose additives as shown in the attached "List of Anticipated Additives Used for Fracturing or Stimulating Well."

Anticipated Max Pressure - 9300 lbs
Anticipated Max Rate - 80 bpm

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): Existing 31.17 acres

22) Area to be disturbed for well pad only, less access road (acres): Existing 7.09 acres

23) Describe centralizer placement for each casing string:

Conductor: no centralizers

Surface Casing: one centralizer 10' above the float shoe, one on the insert float collar and one every 4th joint spaced up the hole to surface.

Intermediate Casing: one centralizer above float joint, one centralizer 5' above float collar and one every 4th collar to surface.

Production Casing: one centralizer at shoe joint and one every 3 joints to top of cement in intermediate casing.

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

Conductor: no additives, Class A cement.

Surface: Class A cement with 2-3% calcium chloride and 1/4 lb of flake

Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat

Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51

Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

25) Proposed borehole conditioning procedures:

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.

Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.

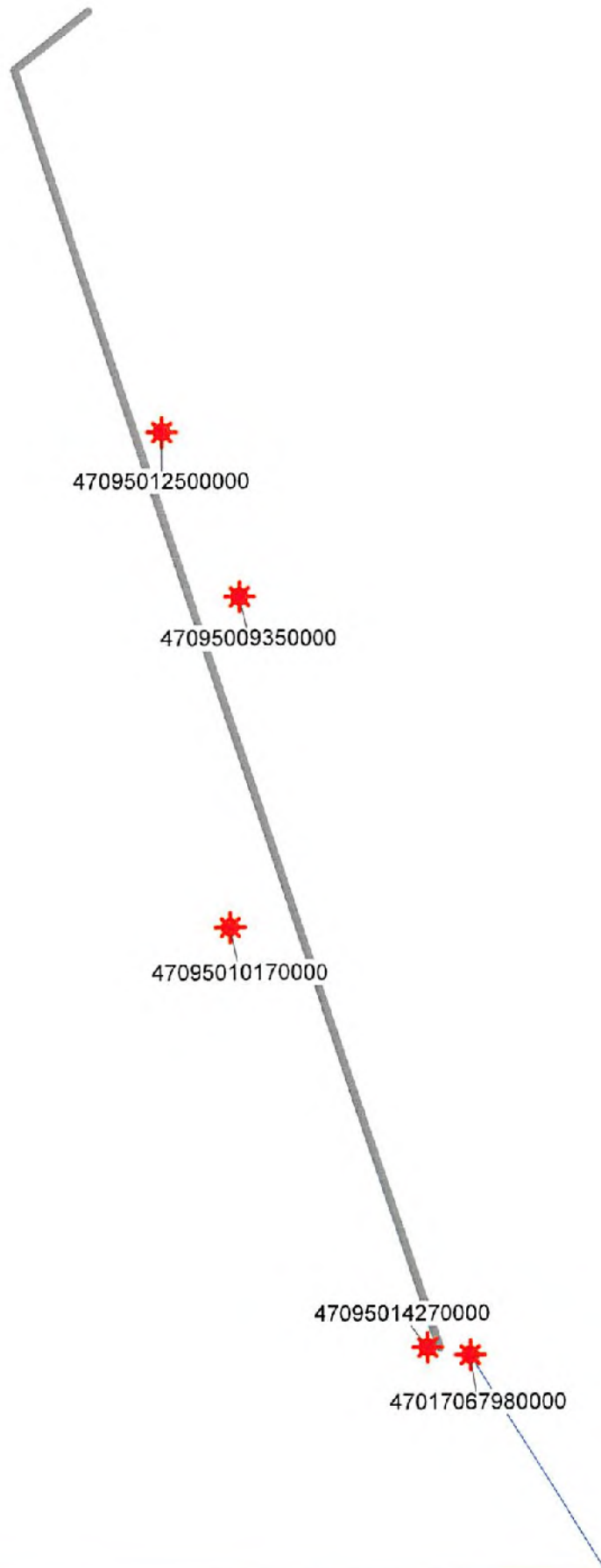
Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.

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

*Note: Attach additional sheets as needed.



4709502518



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Office of Oil and Gas

SEP 4 2018

WV Department of
Environmental Protection



Antero Resources Corporation

Sarahlene Unit 1H - AOR



WELL SYMBOLS
Gas Well

UWI (APIUM)	Well Name	Well Number	Operator	Hist Oper	TD	Perforated Interval [shallowest, deepest]	Perforated Formation(s)	Productive Formation(s) not perf'd
47095012500000	GRIFFIN	1	CONSOL GAS COMPANY	ANVIL OIL COMPANY	5,150	4518-5048	Riley, Benson	Big Injun, Speechley, Balltown, Bradford
27095009350000	WEICHI N M	4-529	ENERGY CORP OF AMER	J & J ENTERPRISES	5,600	4697-5103	Riley, Benson	Big Injun, Speechley, Balltown, Bradford
27095014270000	WALTON	2	ENERGY CORP OF AMER	EASTERN AMERICAN EN	5,511	4540-5253	Riley, Benson, Alexander	Big Injun, Speechley, Balltown, Bradford, Riley
47012067980000	BOULDER UNIT	1H	ANTERO RESOURCES CORPORATION	ANTERO RESOURCES CORPORATION	15,970	7427.16-15867.6	Marcellus Fm.	Big Injun, Speechley, Balltown, Bradford, Riley
47095010170000	GATRELL HEIRS	J-740	ENERGY CORP OF AMER	J & J ENTERPRISES	5,324	4328-4358	Riley	Big Injun, Speechley, Balltown, Bradford

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SEP 4 2018

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WW-9
(4/16)

API Number 47 - 095 - _____
Operator's Well No. Sarahlene Unit 1H

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)

*JOB
6/21/2018*

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/Slit Foam, Production - Water Based Mud or Synthetic based Mud

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

Additives to be used in drilling medium? Please See Attachment

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

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

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

*DMH
6-21-18*

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.

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Office of Oil and Gas

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.

JUN 28 2018

WV Department of Environmental Protection

Company Official Signature *Gretchen Kohler*

Company Official (Typed Name) Gretchen Kohler

Company Official Title Sr. Environmental & Regulatory Manager

Subscribed and sworn before me this 14th day of JUNE, 20 18

Megan Griffith

Notary Public

My commission expires MARCH 13, 2022

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

Form WW-9

Operator's Well No. Sarahlene Unit 1H

Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 31.17 acres Prevegetation pH _____

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

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

Fertilizer amount 500 lbs/acre

Mulch 2-3 Tons/acre

Access Road "A" (2.55 acres) + Access Road "B" (0.25 acres) + Access Road "C" (0.52) + Access Road "D" (7.75 acres) + Access Road "E" (0.46 acres) + Well Pad (7.09 acres) + Water Containment Pad (2.33 acres) + Excess/Topsoil Material Stockpiles (10.22 acres) = 31.17 Acres

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Crownvetch	10-15
Field Bromegrass	40	Tall Fescue	30
See attached Table IV-3 for additional seed type (Meredith Pad Design)		See attached Table IV-4A for additional seed type (Meredith 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: _____

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JUN 29 2018

WV Department of
Environmental Protection

Title: Oil & Gas Inspector Date: 6/21/2018

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

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

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Office of Oil and Gas
JUN 14 2018
WV Department of
Environmental Protection

4709502518



911 Address
2002 Haymonds Ridge Rd.
Pennsboro, WV 26415

Well Site Safety Plan

Antero Resources

Well Name: Horst Unit 1H-3H, Sterling 1H-4H and Sarahlene Unit 1H-4H

Pad Location: MEREDITH PAD
 Tyler County/Centerville District

DMH
6-21-18

GPB
6/21/2018

GPS Coordinates:

Entrance - Lat 39°20'48.69"/Long -80°52'8.20" (NAD83)

Pad Center - Lat 39°20'54.69"/Long -80°52'12.70" (NAD83)

Driving Directions:

From the intersection of I79 and HWY 50 through West Union. Head west on US-50 W for 28.7 miles. Turn right onto WV-18 N for 0.6 miles. Turn left onto Davis St/Old U.S. 50 W for 0.4 miles. Turn right onto WV-18N/Sistersville Pike for 12.2 miles. Turn left onto WV-74 S for 2.0 miles. Turn left onto Co Rd 74/1 for 0.8 miles. Turn left to stay on Co Rd 74/1 for 1.0 mile. The access road will be on the left.

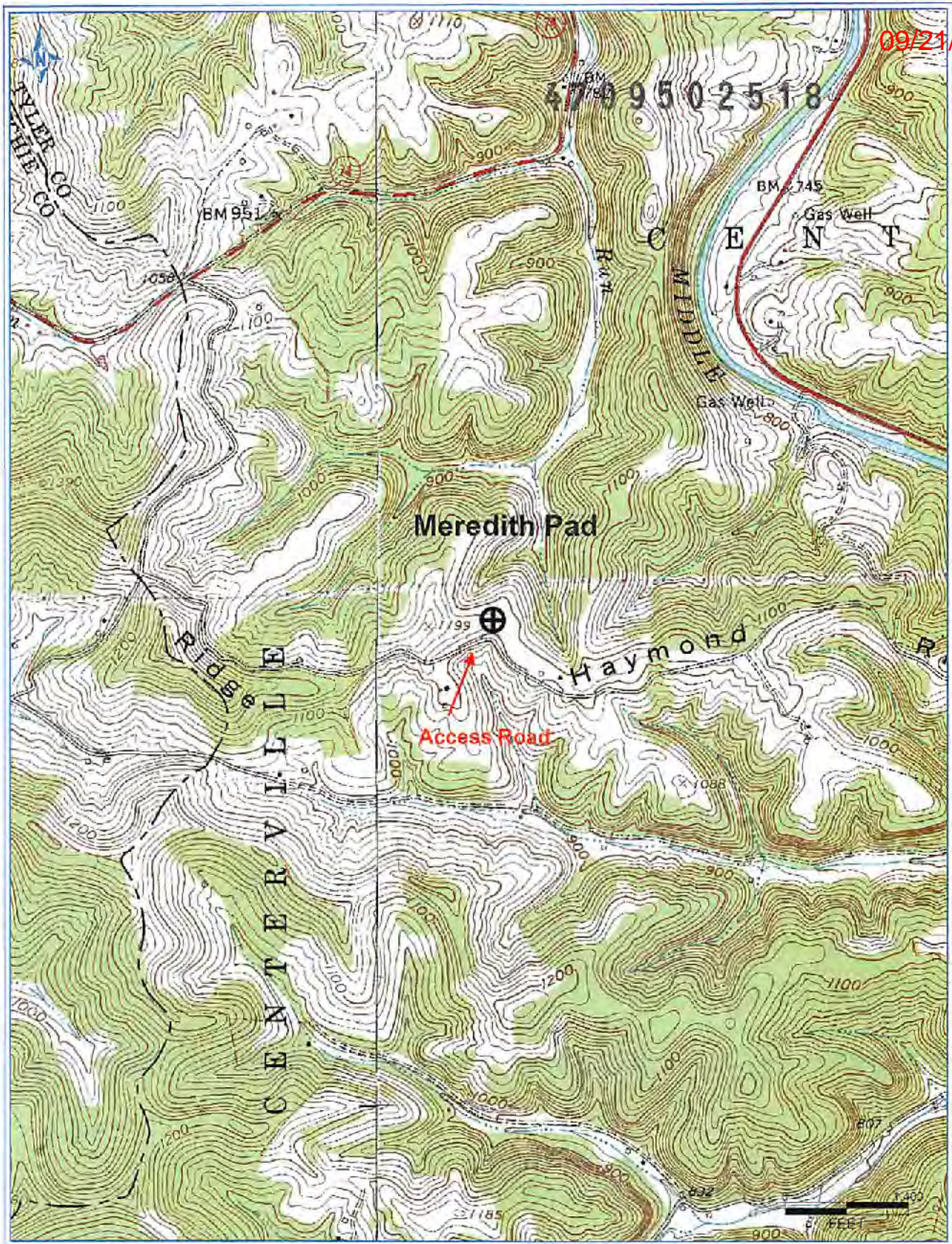
Alternate Route:

From the intersection of I79 and HWY 50 through Alma. Head west on US-50 W for 16.5 miles. Turn right onto WV-23 W for 27.0 miles. Turn left onto WV-18 S for 5.1 miles. Turn right onto WV-74 S for 2.0 miles. Turn left onto Co Rd 74/1 for 0.8 miles. Turn left to stay on Co Rd 74/1 for 1.0 mile. The access road will be on the left.

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 Environmental Protection

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

09/21/2018



4709502518

Antero Resources Corporation
 Appalachian Basin RECEIVED
 Office of Oil and Gas
 Horst Unit 1H-3H, Sarahlene Unit 1H-2H
 Sterling Unit 1H-4H JUN 14 2018
 Tyler County
 WV Department of
 Environmental Protection

Quadrangle: West Union
 Watershed: Middle Island Creek
 District: Centerville
 Date: 6/13/2018

LATITUDE 39°22'30"

LATITUDE 39°20'00"

10,347'

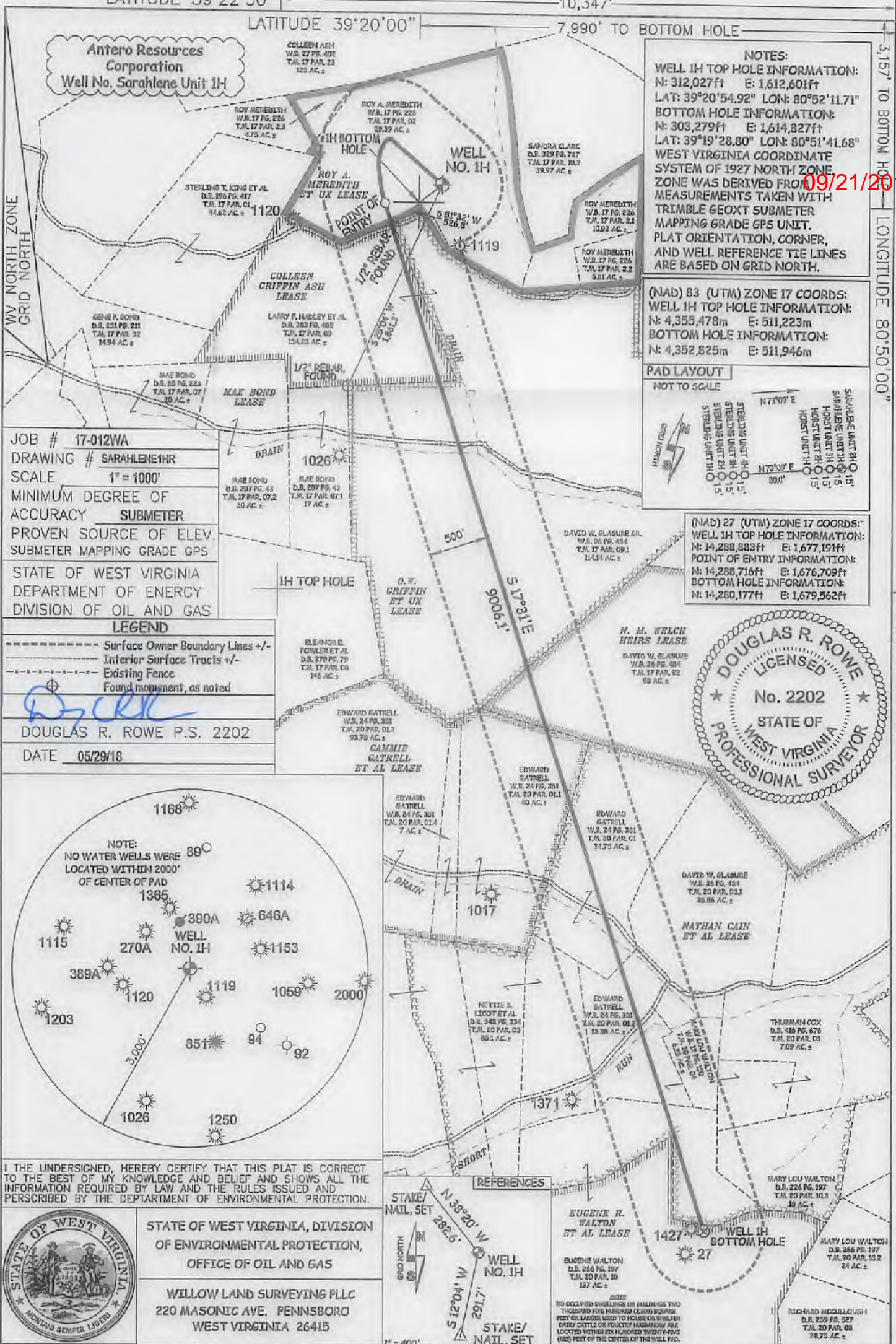
7,990' TO BOTTOM HOLE

3,157' TO BOTTOM HOLE

9,620'

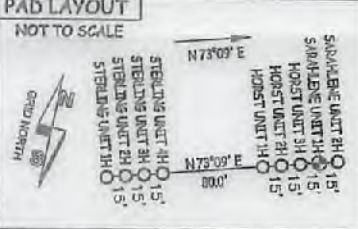
LONGITUDE 80°50'00"

09/21/2018

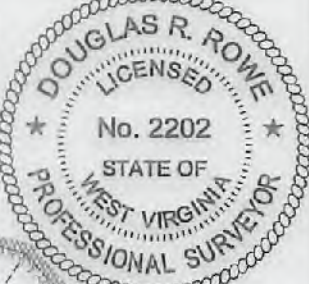


NOTES:
WELL 1H TOP HOLE INFORMATION:
 N: 312,027ft E: 1,612,601ft
 LAT: 39°20'54.92" LON: 80°52'11.71"
BOTTOM HOLE INFORMATION:
 N: 303,279ft E: 1,614,827ft
 LAT: 39°19'28.80" LON: 80°51'41.68"
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
 N: 4,355,478m E: 511,223m
BOTTOM HOLE INFORMATION:
 N: 4,352,825m E: 511,946m



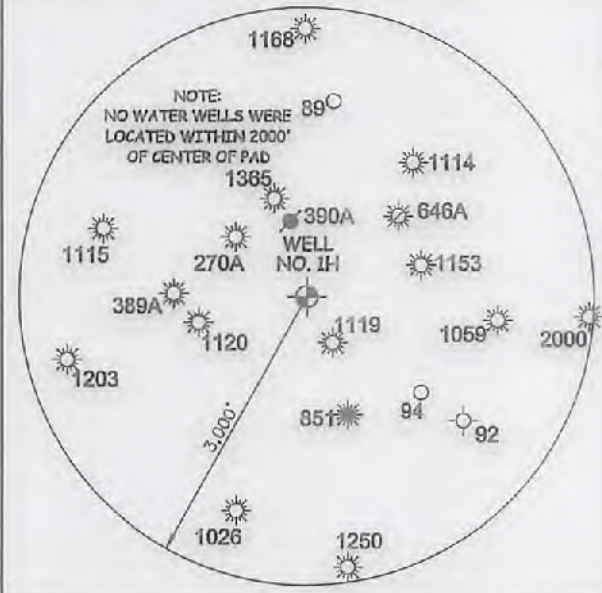
(NAD) 27 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
 N: 14,288,883ft E: 1,677,191ft
POINT OF ENTRY INFORMATION:
 N: 14,288,716ft E: 1,676,709ft
BOTTOM HOLE INFORMATION:
 N: 14,280,177ft E: 1,679,562ft



JOB # 17-012WA
 DRAWING # SARAHLENE1HR
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS
 STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

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

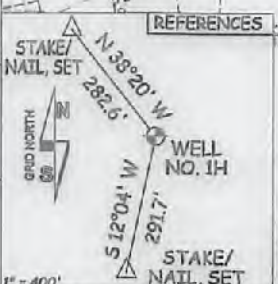
DOUGLAS R. ROWE P.S. 2202
 DATE 05/29/18



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



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



REFERENCES
 EUGENE R. WALTON ET AL LEASE
 BURNIE WALTON D.B. 266 PG. 197 T.M. 20 PAR. 10 187 AC.±
 MARY LOU WALTON D.B. 226 PG. 197 T.M. 20 PAR. 10.3 18 AC.±
 RICHARD MCCULLOUGH D.B. 259 PG. 287 T.M. 20 PAR. 08 78.75 AC.±

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL OPERATOR'S WELL# SARAHLENE UNIT 1H
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW 47 - 095 - 02518 COUNTY NAME
 LOCATION: ELEVATION 1117'-ORIGINAL 1114'-PROPOSED WATERSHED HEADWATERS MIDDLE ISLAND CREEK STATE COUNTY TYLER PERMIT
 QUADRANGLE WEST UNION 7.5' DISTRICT CENTERVILLE COUNTY TYLER
 SURFACE OWNER ROY A. MEREDITH ACREAGE 59.39 ACRES +/-
 OIL & GAS ROYALTY OWNER ROY E. MEREDITH ET UX; COLLEEN GRIFFIN ASH; O.W. GRIFFIN ET UX; LEASE ACREAGE 80 AC.±; 44,187 AC.±; 222 AC.±; COUNTY NAME
 N. M. WELCH HEIRS; CAMMIE GATRELL ET AL; NATHAN CAIN ET AL; EUGENE R. WALTON ET AL 95 AC.±; 139.75 AC.±; 278 AC.±; 137 AC.±; COUNTY NAME
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PERMIT
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL
 (SPECIFY) PLUG & ABANDON CLEAN OUT & REPLUG
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,000' TVD 16,800' MD
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM
 ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD
 FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

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>Roy A. Meredith, et al Lease</u>			
Roy A. Meredith	J & J Enterprises	1/8	0257/0527
J & J Enterprises	Eastern American Energy Corp.	Assignment	0282/0296
Eastern American Energy Corporation	Energy Corporation of America	Assignment	0371/0528
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0398/0416
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>Colleen Griffin Ash Lease</u>			
Colleen Griffin Ash	Antero Resources Appalachian Corporation	1/8+	0407/0657
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1
<u>O.W. Griffin, et ux Lease</u>			
O.W. Griffin, et ux	R.W. Keener	1/8	0196/0234
R.W. Keener	Columbia Gas Transmission Corporation	Assignment	0196/0163
Columbia Gas Transmission Corporation	Columbia Natural Resources, Inc	Assignment	0286/0603
Columbia Natural Resources, Inc	Columbia Natural Resources, LLC	Name Change	09/01
Columbia Natural Resources, LLC	Chesapeake Appalachia, LLC	Merge	0349/0536
Chesapeake Appalachia, LLC	SWN Production Company	Assignment	0465/0463
SWN Production Company	Antero Exchange Properties	Assignment	0544/0242
Antero Exchange Properties	Antero Resources Corporation	Merge	0552/0315
<u>N.M. Welch Heirs</u>			
N.M. Welch Heirs	Petroleum Services, Inc.	1/8	0229/0452
Petroleum Services, Inc.	J&J Enterprises	Assignment	0231/0301
J&J Enterprises	Eastern American Energy Corporation	Assignment	0282/0296
Eastern American Energy Corporation	Energy Corporation of America	Merger	0371/0528
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0398/0416
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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Name Change
JUN 14 2018
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.

Operator's Well Number Sarahlene Unit 1H

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)

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Grantor, lessor, etc.	Grantee, lessee, etc.	Royalty	Book/Page
<u>Cammie Gatrell, et al Lease</u>			
Cammie Gatrell, et al	Exxon Corporation	1/8	0211/0104
Exxon Corporation	Petro-Enterprises, Inc.	Assignment	0249/0414
Petro-Enterprises, Inc.	J&J Enterprises	Assignment	0229/0518
J&J Enterprises	Eastern American Energy Corporation	Assignment	0282/0296
Eastern American Energy Corporation	Energy Corporation of America	Merger	0371/0528
Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0398/0416
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	0557/0430
<u>Nathan Cain, et al Lease</u>			
Nathan Cain, et al	J.E. Trainer	1/8	072/0216
J.E. Trainer, et al DBA Sun Gas Company	W.W. Hepburn	Assignment	080/0346
W.W. Hepburn	Eastern Petroleum Company	Assignment	080/0338
Eastern Petroleum Company	Clifton Oil & Gas Company	Assignment	094/061
Clifton Oil & Gas Company	Quaker State Oil Refining Company	Assignment	0270/0111
Quaker State Oil Refining Company	Quaker State Corporation	Name Change	WVSOS
Quaker State Corporation	Bolden & Blake Corporation	Assignment	0311/0584
Bolden & Blake Corporation	Peake Energy	Assignment	0312/0340
Peake Energy	North Coast Energy Eastern, Inc.	Name Change	08/0702
North Coast Energy Eastern, Inc.	Exco-North Coast Energy Eastern, Inc.	Name Change	09/080
EXCO-North Coast Energy Eastern, Inc.	EXCO Resources (WV) Inc.	Name Change	WVSOS
EXCO Resources (WV) Inc.	EXCO Production Company (WV) Inc.	Name Change	WVSOS
EXCO Production Company (WV) LLC	Antero Resources Appalachian Corporation	Assignment	0406/0195
Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

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JUN 14 2018
WV Department of
Environmental Protection

WW-6A1
(5/13)

Operator's Well No. Sarahlene Unit 1H

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

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Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
<u>Eugene R. Walton, et al Lease</u>	Eugene R. Walton, et al	Eastern American Energy Corporation	1/8	0282/033
	Eastern American Energy Corporation	Energy Corporation of America	Merger	0371/0528
	Energy Corporation of America	Antero Resources Appalachian Corporation	Assignment	0398/0416
	Antero Resources Appalachian Corporation	Antero Resources Corporation	Name Change	Exhibit 1

*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:

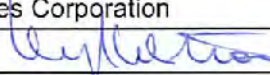
- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

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JUN 14 2018

WV Department of

The applicant further acknowledges that any Office of Oil and Gas permit in any way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Antero Resources Corporation
 By: Kevin Kilstrom 
 Its: Senior Vice President - Production

FORM WW-6A1
EXHIBIT 1

FILED

JUN 10 2013

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



Fenny Backer, Manager
Corporation Division
Tel: (304)558-8000
Fax: (304)559-8181
Website: www.wvscd.com
E-mail: business@wvscd.com

APPLICATION FOR
AMENDED CERTIFICATE
OF AUTHORITY

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

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

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

- Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation
- Date Certificate of Authority was issued in West Virginia: 6/25/2009
- Corporate name has been changed to: Antero Resources Corporation
(Attach one Certified Copy of Name Change as filed in home State of Incorporation.)
- Name the corporation elects to use in WV: Antero Resources Corporation
(due to home state name not being available)
- Other amendments: _____
(attach additional pages if necessary)
- Name and phone number of contact person. (This is optional; however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)

<u>Alwyn A. Schopp</u>	<u>(304) 367-7310</u>
Contact Name	Phone Number
- Signature information (See below *Important Legal Notice Regarding Signature*):

Print Name of Signer: <u>Alwyn A. Schopp</u>	Title/Capacity: <u>Authorized Person</u>
Signature: <u><i>Alwyn A. Schopp</i></u>	Date: <u>June 10, 2013</u>

Important Legal Notice Regarding Signature For West Virginia Code §12D-1-12b. Penalty for signing false document. Any person who signs a document he or she knows is false in any material respect and knows that the document is to be delivered to the secretary of state for filing is guilty of a misdemeanor and, upon conviction thereof, shall be fined not more than one thousand dollars or confined in the county or regional jail not more than one year, or both.

JUN 14 2013

Revised 4/12
WV Department of
Environmental Protection



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

June 15, 2018

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

RE: Sarahlene Unit 1H
Quadrangle: West Union 7.5'
Tyler County/Centerville District, West Virginia

Mr. Martin:

Antero Resources Corporation (Antero) is submitting the following application for a new well work permit for the Sarahlene Unit 1H 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 Sarahlene Unit 1H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,

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

Thomas Kuhn
Senior Landman

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JUN 14 2018
WV Department of
Environmental Protection

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

Date of Notice Certification: 06/13/2018

API No. 47- 095 -

Operator's Well No. Sarahlene Unit 1H

Well Pad Name: Meredith Pad

Notice has been given:

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>511223m</u>
County:	<u>Tyler</u>		Northing:	<u>4355478m</u>
District:	<u>Centerville</u>	Public Road Access:	<u>Haymond Road</u>	
Quadrangle:	<u>West Union 7.5'</u>	Generally used farm name:	<u>Roy Alfred Meredith, et al</u>	
Watershed:	<u>Headwaters Middle Island Creek</u>			

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

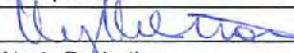
<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input checked="" type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 100px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p style="text-align: center;">OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p>
<p>RECEIVED Office of Oil and Gas JUN 14 2018 WV Department of Environmental Protection</p>	

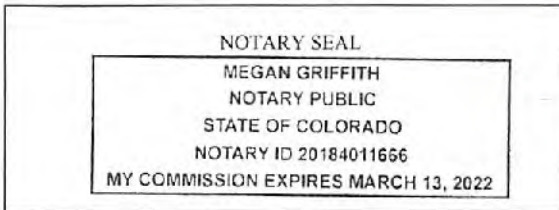
Required Attachments:

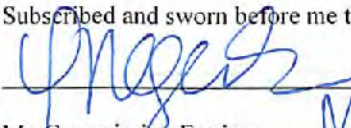
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

Certification of Notice is hereby given:

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

Well Operator:	<u>Antero Resources Corporation</u>	Address:	<u>1615 Wynkoop Street</u>
By:	<u>Kevin Kilstrom</u> 		<u>Denver, CO 80202</u>
Its:	<u>Senior Vice President - Production</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 June, 2018.

 _____ Notary Public
 My Commission Expires MARCH 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 depprivacyofficer@wv.gov.

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JUN 14 2018
WV Department of
Environmental Protection

WW-6A
(9-13)

4709502518
API NO. 47-095 - 09/21/2018
OPERATOR WELL NO. Sarahlene Unit 1H
Well Pad Name: Meredith 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: 6/13/2018 Date Permit Application Filed: _____

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: Roy A. Meredith & Carol A. Meredith
Address: 86 Midland Drive
Washington, WV 26181

Name: _____
Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: _____
Address: _____

Name: _____
Address: _____

SURFACE OWNER(s) (Impoundments or Pits)
Name: _____
Address: _____

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

COAL OPERATOR
Name: NO DECLARATIONS ON RECORD WITH COUNTY
Address: _____

WATER PURVEYOR(s)/OWNER(s) OF WATER WELL, SPRING OR OTHER WATER SUPPLY SOURCE
Name: NO DECLARATIONS ON RECORD WITH COUNTY
Address: _____

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

*Please attach additional forms if necessary

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JUN 14 2018
WV Department of
Environmental Protection

WW-6A
(8-13)

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Office of Oil and Gas
4709502518
APT NO. 47-095 - 09/21/2018
JUN 24 03
OPERATOR WELL NO. Sarahlene Unit 1H
Well Pad Name: Meredith Pad
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

WW-6A
(8-13)

API NO. 47-095 **4709502518**
OPERATOR WELL NO. Sarahlene Unit 1H **09/21/2018**
Well Pad Name: Meredith Pad

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

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

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

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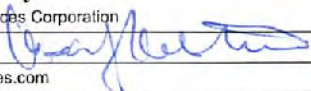
WW-6A
(8-13)

4709502518
API NO. 47-095
OPERATOR WELL NO. Sarahlene Unit 1H
Well Pad Name: Meredith Pad

09/21/2018

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

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.

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

Subscribed and sworn before me this 13th day of June 2018.


Notary Public
My Commission Expires March 13, 2022

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STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF INTENT TO DRILL

Pursuant to W. Va. Code § 22-6A-16(b), the Notice of Intent to Drill is only required if the notice requirements of W. Va. Code § 22-6A-10(a) have NOT been met or if the Notice of Intent to Drill requirement has NOT been waived in writing by the surface owner.

Notice Time Requirement: Notice shall be provided at least **TEN (10)** days prior to filing a permit application.
Date of Notice: 03/15/2018 **Date Permit Application Filed:** _____

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

HAND DELIVERY **CERTIFIED MAIL RETURN RECEIPT REQUESTED**

Pursuant to W. Va. Code § 22-6A-16(b), at least ten days prior to filing a permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner notice of its intent to enter upon the surface owner's land for the purpose of drilling a horizontal well: *Provided*, That notice given pursuant to subsection (a), section ten of this article satisfies the requirements of this subsection as of the date the notice was provided to the surface owner: *Provided, however*, That the notice requirements of this subsection may be waived in writing by the surface owner. The notice, if required, shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative.

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

Name: Roy A. Meredith
Address: 88 Midland Dr.
Washington, WV 26181

Name: _____
Address: _____

Notice is hereby given:

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

State: West Virginia UTM NAD 83 Easting: 511183.81m
County: Tyler Northing: 4355460.10m
District: Centerville Public Road Access: CR 74/1
Quadrangle: West Union Generally used farm name: Roy A. Meredith
Watershed: Headwaters Middle Island Creek

This Notice Shall Include:

Pursuant to West Virginia Code § 22-6A-16(b), this notice shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative. 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.

Notice is hereby given by:

Well Operator: Antero Resources Appalachian Corporation
Address: 1615 Wynkoop St.
Denver, CO 80202
Telephone: 303-357-7223
Email: mgriffith@anteroresources.com
Facsimile: 303-357-7315

Authorized Representative: Megan Griffith
Address: 1615 Wynkoop St.
Denver, CO 80202
Telephone: 303-357-7223
Email: mgriffith@anteroresources.com
Facsimile: 303-357-7315

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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.

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: 06/13/2018 **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: <u>Roy A. Meredith & Carol A. Meredith</u>	Name: _____
Address: <u>86 Midland Drive</u>	Address: _____
<u>Washington, WV 25181</u>	_____

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>511223m</u>
County: <u>Tyler</u>	Northing: <u>4355478m</u>
District: <u>Centerville</u>	Public Road Access: <u>Haymond Road</u>
Quadrangle: <u>West Union 7.5'</u>	Generally used farm name: <u>Roy Alfred Meredith, et al</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: <u>Antero Resources Corporation</u>	Address: <u>1615 Wynkoop Street</u>
Telephone: <u>(303) 357-7223</u>	<u>Denver, CO 80202</u>
Email: <u>mgriffith@anteroresources.com</u>	Facsimile: <u>303-357-7315</u>

Oil and Gas Privacy Notice:

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

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

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

June 12, 2018

Jill M. Newman
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 Meredith Pad, Tyler County
Sarahlene Unit 1H Well Site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2017-0517 which has been issued to Antero Resources Corporation for access to the State Road for a well site located off of Tyler County 74/1 SLS.

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

Very Truly Yours,

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

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

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List of Anticipated Additives Used for Fracturing or Stimulating Well

09/21/2018

4709502518

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

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4709502518

MEREDITH WELL PAD & WATER CONTAINMENT PAD SITE DESIGN & CONSTRUCTION PLAN, EROSION & SEDIMENT CONTROL PLANS

CENTREVILLE DISTRICT, TYLER COUNTY, WEST VIRGINIA
ARNOLD CREEK & CONAWAY RUN-MIDDLE ISLAND CREEK WATERSHEDS
USGS 7.5 PENNSBORO & WEST UNION QUAD MAPS



LOCATION COORDINATES:
WELLPAD ACCESS ROAD ENTRANCE
LATITUDE 39.344666 LONGITUDE -80.868889 (NAD 83)
N 4355475.74 E 511894.61 (UTM ZONE 17 METERS)

INTERSECTION CO RD 567.2 & ACCESS ROAD "D"
LATITUDE 39.343064 LONGITUDE -80.870116 (NAD 83)
N 4354492.03 E 510935.94 (UTM ZONE 17 METERS)

INTERSECTION CO RD 74.1 & ACCESS ROAD "D"
LATITUDE 39.347099 LONGITUDE -80.870200 (NAD 83)
N 4355325.26 E 511005.17 (UTM ZONE 17 METERS)

INTERSECTION CO RD 74.1 & ACCESS ROAD "F"
LATITUDE 39.347099 LONGITUDE -80.871267 (NAD 83)
N 4355365.02 E 511093.87 (UTM ZONE 17 METERS)

CENTER OF TANK
LATITUDE 39.347442 LONGITUDE -80.868889 (NAD 83)
N 4355444.91 E 511874.60 (UTM ZONE 17 METERS)

CENTER OF PAD
LATITUDE 39.346506 LONGITUDE -80.870200 (NAD 83)
N 4355406.10 E 511885.01 (UTM ZONE 17 METERS)

GENERAL DESCRIPTION:
THE ACCESS ROAD(S), WATER CONTAINMENT PAD, AND WELL PAD ARE BEING CONSTRUCTED TO AID IN THE DEVELOPMENT OF INDIVIDUAL MARCELLUS SHALE GAS WELLS.

FLOODPLAIN NOTES:
THE PROPOSED SITE IS LOCATED WITHIN FEMA FLOOD ZONE "X" PER FEMA FLOOD MAP #5406500300 & 5406500700.

MISS UTILITY STATEMENT:
ANTERO RESOURCES CORPORATION WILL NOTIFY MISS UTILITY OF WEST VIRGINIA FOR THE LOCATING OF UTILITIES PRIOR TO THIS PROJECT BEGINNING WITH THE START OF CONSTRUCTION FOR THIS PROJECT WILL BE CONTACTED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION FOR THIS PROJECT.

ENTRANCE PERMIT:
ANTERO RESOURCES CORPORATION WILL OBTAIN AN ENCROACHMENT PERMIT (FORM MM-108) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

ENVIRONMENTAL NOTES:
STREAM AND WETLAND RECONNAISSANCE WERE PERFORMED ON MAY 8, 2017 BY ELENFELDER AND MAY 2014, JULY 2014 & MARCH 2016 BY ALSTAM ECOLOGY TO REVIEW THE SITE FOR WATERS AND WETLANDS THAT ARE MOST LIKELY WITHIN THE REGULATORY JURISDICTION OF THE U.S. ARMY CORPS OF ENGINEERS (USACE) AND/OR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP). THE JUNE 8, 2017 RECONNAISSANCE MAP WAS PREPARED BY ELENFELDER AND THE JUNE 28, 2016 JURISDICTIONAL STREAMS & WETLANDS MAP WAS PREPARED BY ALSTAM ECOLOGY AND SUMMARIZED THE RESULTS OF THE FIELD RECONNAISSANCE. THE MAP DOES NOT, IN ANY WAY, REPRESENT A JURISDICTIONAL DETERMINATION OF THE LANDWARD LIMITS OF WATERS AND WETLANDS WHICH MAY BE REGULATED BY THE USACE OR THE WVDEP.

GEOLOGICAL NOTES:
A SURFACE INVESTIGATION OF THE PROPOSED SITE WAS PERFORMED BY PENNSYLVANIA SOIL & ROCK, INC. IN JULY, 2014. THE REPORT PREPARED BY PENNSYLVANIA SOIL & ROCK, INC. DATED AUGUST 19, 2014 (REVISED MAY 19, 2016 AND JANUARY 26, 2017) REFLECTS THE RESULTS OF THE SURFACE INVESTIGATION. THE INFORMATION AND RECOMMENDATIONS CONTAINED IN THIS REPORT WERE USED IN THE PREPARATION OF THESE PLANS. PLEASE REFER TO THE SURFACE INVESTIGATION REPORT BY PENNSYLVANIA SOIL & ROCK, INC. FOR ADDITIONAL INFORMATION, AS NEEDED.

PROJECT CONTACTS:
CHARLES E. DONOHUE III SURVEYING COORDINATOR
CELL (304) 719-8419

OPERATOR:
ANTERO RESOURCES CORPORATION
255 WHITE OAK BLVD
BRIARCLIFF, WY 26300
PHONE (304) 842-4150
FAX (304) 842-4152

SEI WAGNER - ENVIRONMENTAL ENGINEERS
OFFICE (304) 842-4283 CELL (304) 478-9774

JON MCNEVIN - OPERATIONS SUPERINTENDENT
OFFICE (304) 357-6799 CELL (304) 404-2423

ALAN KUNYER - CONSTRUCTION SUPERVISOR
CELL (405) 527-1644

ROBERT B. WILES - FIELD ENGINEER
OFFICE (304) 842-4100 CELL (304) 827-7406

DAVID PATSY - LAND AGENT
CELL (304) 478-6000

ENGINEER/SURVEYOR:
WATERS ENGINEERING, INC.
CYNUS S. HUMP, P.E. - PROJECT MANAGER/ENGINEER
OFFICE (888) 662-4150 CELL (540) 686-6747

ENVIRONMENTAL:
ELENFELDER
JAMES BRULMAN - PROJECT MANAGER
OFFICE (610) 294-1444 CELL (610) 630-4410

ALSTAM ECOLOGY, LLC
RYAN L. WARD - ENVIRONMENTAL SCIENTIST
OFFICE (866) 213-2980 CELL (504) 992-7477

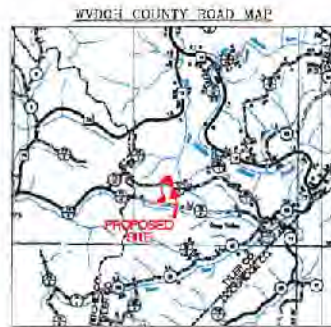
GEOLOGICAL:
PENNSYLVANIA SOIL & ROCK, INC.
CHRISTOPHER W. JAMES - PROJECT ENGINEER
OFFICE (412) 372-8000 CELL (412) 518-2882



SCALE 1" = 2000'



(INCH TO SCALE)



SCALE 1" = 5000'

MISS UTILITY of West Virginia
1-800-245-4848
West Virginia State Law
(Section XIV Chapter 24-C)
Require that you call two
business days before you dig in
the state of West Virginia.
IT'S THE LAW!

DESIGN CERTIFICATION:
THE DRAWINGS, CONSTRUCTION NOTES
AND REFERENCE DIAGRAMS ATTACHED
HEREIN HAVE BEEN PREPARED BY
ACCORDANCE WITH THE WEST VIRGINIA
CODE OF STATE RULES, DIVISION OF
ENVIRONMENTAL PROTECTION, OFFICE
OF OIL AND GAS PER 36-10.

REPRODUCTION NOTE:
THIS PLAN WAS CREATED TO BE PRINTED ON 22CM X 28CM (A)S) D) PAPER. FULL SCALE DRAWINGS ARE ON A1 (A)S) D) PAPER.
THIS PLAN WAS CREATED FOR COLOR PLOTTING AND ANY REPRODUCTIONS IN GRAY SCALE OR COLOR MAY RESULT IN A LOSS OF INFORMATION AND SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES.

SHEET INDEX:

- COVER SHEET
- CONSTRUCTION AND PAD CONTROL NOTES
- ACCESS ROAD
- MATERIAL QUANTITIES
- STORM DRAINAGE & EROSION CONTROL COMPUTATIONS
- EXISTING CONDITIONS
- EXISTING UTILITIES & FEATURES
- ORIGINAL PLAN SHEET INDEX & VOLUMES
- ACCESS ROAD PLAN
- ACCESS ROAD, WATER CONTAINMENT PAD & WELL PAD PLAN
- WATER CONTAINMENT PAD GRADING PLAN
- WELL PAD GRADING PLAN
- ACCESS ROAD PIPELINES
- ACCESS ROAD SECTIONS
- WELL PAD & WATER CONTAINMENT PAD SECTIONS
- WELL PAD SECTIONS
- STOCKPILE AREA SECTIONS
- STORM DRAINAGE DETAILS
- CONSTRUCTION DETAILS
- ACCESS ROAD RECLAIMATION PLAN
- ACCESS ROAD, WATER CONTAINMENT PAD & WELL PAD RECLAIMATION PLAN

02000-02007 - GEOTECHNICAL DETAILS

MATERIAL QUANTITIES FOR DISTURBED AREA (AC)

Total Area	Permitted	Modification	TOTAL
Access Road "A" (1.0781)	2.58	0.00	2.58
Access Road "D" (0.91)	2.25	0.00	2.25
Access Road "E" (1.95)	5.93	0.00	5.93
Access Road "F" (2.2181)	7.74	0.00	7.74
Access Road "G" (2.17)	6.46	0.00	6.46
Well Pad	7.20	0.00	7.20
Water Containment Pad	2.33	0.00	2.33
Excise/Topsoil Material Stockpiles	2.74	3.48	6.22
Total Affected Area	27.89	3.48	31.37
Total Wooded Acres Disturbed	7.18	0.00	7.18

Impacts to Row Across Middle Island TM 17-2

Access Road "A" (1.0781)	1.47	0.00	1.47
Access Road "D" (0.91)	0.28	0.00	0.28
Access Road "E" (1.95)	0.50	0.00	0.52
Well Pad	7.00	0.00	7.00
Water Containment Pad	2.33	0.00	2.33
Excise/Topsoil Material Stockpiles	2.65	0.00	2.65
Total Affected Area	14.19	0.00	14.19
Total Wooded Acres Disturbed	3.13	0.00	3.13

Impacts to Antero Midstream LLC TM 17-4

Access Road "A" (1.0781)	1.08	0.00	1.08
Access Road "D" (0.91)	5.48	0.00	5.48
Excise/Topsoil Material Stockpiles	3.51	3.48	7.00
Total Affected Area	10.07	3.48	13.55
Total Wooded Acres Disturbed	5.19	0.00	5.19

Impacts to Robert L. & Donna J. Snow TM 17-1

Access Road "D" (0.91)	1.40	0.00	1.40
Access Road "E" (1.95)	5.48	0.00	5.48
Excise/Topsoil Material Stockpiles	5.50	0.00	5.50
Total Affected Area	2.85	0.00	2.85
Total Wooded Acres Disturbed	1.80	0.00	1.80

Proposed Well Name	WV North NAD 83	WV North UTM (METERS) NAD 83	Zone 17	HAD 83 Lat & Long
Well 1	N 317887.63	N 732523.33	N 435845.21	Lat 39-244-8096
Well 2	N 317887.63	N 732523.33	N 435845.21	Long 80-02-12-2860
Well 3	N 317887.63	N 732523.33	N 435845.21	Lat 39-234-8098
Well 4	N 317887.63	N 732523.33	N 435845.21	Long 80-02-12-2860
Well 5	N 317887.63	N 732523.33	N 435845.21	Lat 39-234-8098
Well 6	N 317887.63	N 732523.33	N 435845.21	Long 80-02-12-2860
Well 7	N 317887.63	N 732523.33	N 435845.21	Lat 39-234-8098
Well 8	N 317887.63	N 732523.33	N 435845.21	Long 80-02-12-2860
Well 9	N 317887.63	N 732523.33	N 435845.21	Lat 39-234-8098
Well 10	N 317887.63	N 732523.33	N 435845.21	Long 80-02-12-2860
Well 11	N 317887.63	N 732523.33	N 435845.21	Lat 39-234-8098
Well 12	N 317887.63	N 732523.33	N 435845.21	Long 80-02-12-2860
Well 13	N 317887.63	N 732523.33	N 435845.21	Lat 39-234-8098
Well 14	N 317887.63	N 732523.33	N 435845.21	Long 80-02-12-2860
Well 15	N 317887.63	N 732523.33	N 435845.21	Lat 39-234-8098
Well 16	N 317887.63	N 732523.33	N 435845.21	Long 80-02-12-2860
Well 17	N 317887.63	N 732523.33	N 435845.21	Lat 39-234-8098
Well 18	N 317887.63	N 732523.33	N 435845.21	Long 80-02-12-2860
Well 19	N 317887.63	N 732523.33	N 435845.21	Lat 39-234-8098
Well 20	N 317887.63	N 732523.33	N 435845.21	Long 80-02-12-2860

MEREDITH PERENNIAL STREAM IMPACT (LINEAR FEET)

Stream and Impact Cause	Perennial Impacts		Temp. Impacts	Temp. Obstr.	Total Disturbance (LF)
	Culvert (F&E) Structures (LF)	Intake/Outlets (LF)			
MLP Stream 11 (Road "G")	120	0	18	0	138

MEREDITH PERENNIAL STREAM IMPACT (LINEAR FEET)

Stream and Impact Cause	Perennial Impacts		Temp. Impacts	Temp. Obstr.	Total Disturbance (LF)
	Culvert (F&E) Structures (LF)	Intake/Outlets (LF)			
Merced WP Equipment Stream 4 (Road "A")	10	24	0	11	45
Merced WP Equipment Stream 5 (Road "A")	9	14	0	8	40
Merced WP Equipment Stream 2 (Road "A")	7	15	16	8	41
MLP Stream 03 (Road "D")	125	12	8	15	158

MEREDITH WETLAND IMPACT (SQUARE FEET)

Wetland and Impact Cause	FE (SF)	Total Impact (SF)	Total Impact (AC)
FEM Wetland 04 (Road "D")	559	559	0.01

NAVITUS ENERGY ENGINEERING

REVISION:

DATE	BY	REVISION
04/27/2018	WATERS	REVISED FOR CONSTRUCTION
04/27/2018	WATERS	REVISED STOCKPILE "U"
04/27/2018	WATERS	REVISED PAD CONTAINMENT BURN DETAIL
04/27/2018	WATERS	REVISED F&E ACCESS ROAD MONITORING
04/27/2018	WATERS	REVISED USE CLIENT BURNDET
04/27/2018	WATERS	REVISED F&E WOOD CUMBERS
04/27/2018	WATERS	REVISED STREAM CROSSING "A"
04/27/2018	WATERS	REVISED ROAD "D" "G" & "H" SECTIONS



MEREDITH WELL PAD & WATER CONTAINMENT PAD
CENTREVILLE DISTRICT
TYLER COUNTY, WEST VIRGINIA



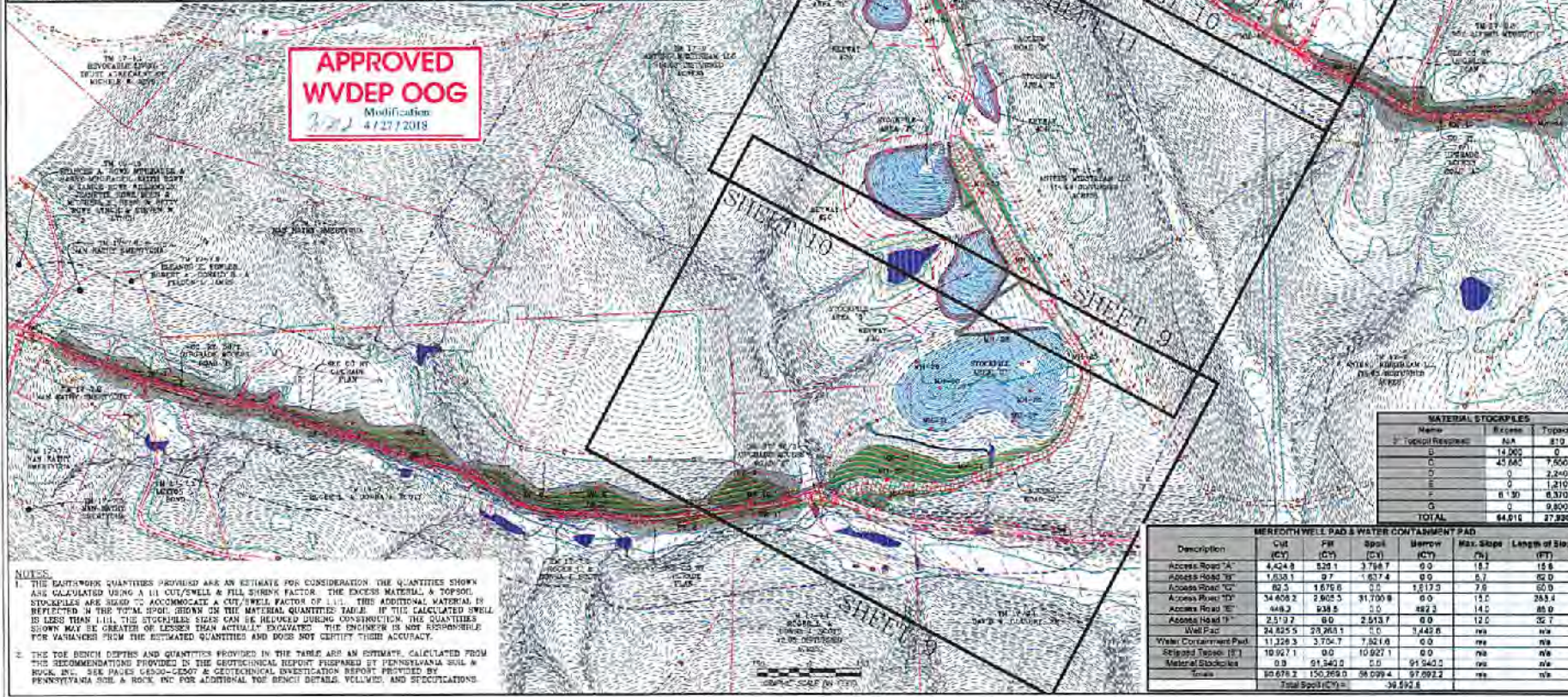
DATE: 05/23/2018
SCALE: AS SHOWN
SHEET 1 OF 34

4709502518

OVERALL PLAN SHEET
INDEX & VOLUMES

LIMITS OF DISTURBANCE
LEGEND
SEE COUNTY
ROAD UPGRADE
PLAN

Description	MEREDITH TOE BENCH QUANTITIES														Totals
	Keyway #1A	Keyway #1B	Keyway #1C	Keyway #1D	Keyway #1E	Keyway #1F	Keyway #1G	Keyway #1H	Keyway #1I	Keyway #2A	Keyway #2B	Keyway #2C	Keyway #2D	Keyway #2E	
Approach Depth (LF)	0	4	5	0	5	8	5	5	5	5	5	5	5	5	N/A
Approach Width (ft. min.)(LF)	16	16	16	16	16	16	16	16	16	16	16	16	16	16	N/A
Length (LF)	430	210	255	690	1,000	200	490	968	360	330	760	680	630	6,310	
Permeable Drain (LF)	420	210	245	680	1,000	200	480	960	360	330	750	680	630	6,210	
ASPH/OT#7 Drain (TONS)	609	312	39	75	152	30	726	1,355	35	30	115	101	92	3,221	
5 in. Non-woven Geotextile (LF)	11,807	1,842	1,842	4,454	6,840	1,388	12,054	28,564	2,318	2,125	4,894	4,378	16,126	76,126	
Decorative (LF)	2,900	1,930	1,410	8,478	4,500	1,700	2,420	8,700	2,100	2,820	6,500	5,550	43,240		
Toe Bench Outer Drains															
Average Length of Outlet Drain Pipe (LF)	60	75	60	60	60	75	60	60	60	60	60	60	60	60	N/A
Outlet Drain Pipe (LF)	240	225	150	420	360	150	375	500	180	180	360	420	360	3,888	
5 in. Non-woven Geotextile (LF)	1,680	1,575	1,050	2,520	4,500	1,050	1,825	4,200	1,200	1,200	2,520	3,040	3,040	27,930	
ASPH/OT#7 Drain (TONS)	27	25	17	47	72	17	31	87	20	18	58	57	42	442	
Bonding Bench															
Approach Depth (LF)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A
Approach Width (LF)	10	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A
Number of Runways (EA)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	N/A
Length (LF)	200	0	0	0	0	0	0	0	0	0	0	0	0	0	940
Permeable Drain (LF)	270	0	0	0	0	0	0	0	0	0	0	0	0	0	2,260
ASPH/OT#7 Drain (TONS)	204	0	0	0	0	0	0	0	0	0	0	0	0	0	1,127
5 in. Non-woven Geotextile (LF)	4,463	0	0	0	0	0	0	0	0	0	0	0	0	0	17,555
Decorative (LF)	500	0	0	0	0	0	0	0	0	0	0	0	0	0	4,250
Bonding Bench Outer Drains															
Average Length of Outlet Drain Pipe (LF)	50	0	0	0	0	0	0	50	0	0	0	0	0	0	N/A
Outlet Drain Pipe (LF)	160	0	0	0	0	0	0	1,280	0	0	0	0	0	0	1,410
5 in. Non-woven Geotextile (LF)	1,590	0	0	0	0	0	0	5,820	0	0	0	0	0	0	8,870
ASPH/OT#7 Drain (TONS)	17	0	0	0	0	0	0	140	0	0	0	0	0	0	187
Additional Excavation															
Excavation Material (Cubic Yd)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,080	N/A	N/A	N/A	N/A	N/A	N/A	3,583



NOTES:
1. THE QUANTITIES PROVIDED ARE AN ESTIMATE FOR CONSIDERATION. THE QUANTITIES SHOWN ARE CALCULATED USING A 1:1 CUT/SWELL & FILL SWELL FACTOR. THE EXCESS MATERIAL & STOCKPILES ARE USED TO ACCOMMODATE A CUT/SWELL FACTOR OF 1.1:1. THIS ADDITIONAL MATERIAL IS REFLECTED IN THE TOTAL HOPE SHOWN ON THE MATERIAL QUANTITIES TABLE. IF THIS CALCULATED SWELL IS LESS THAN 1:1, THE STOCKPILE SIZES CAN BE REDUCED DURING CONSTRUCTION. THE QUANTITIES SHOWN MAY BE GREATER OR LESSER THAN ACTUAL. EXACTLY. THE ENGINEER IS NOT RESPONSIBLE FOR VARIANCES FROM THE ESTIMATED QUANTITIES AND DOES NOT CERTIFY THEIR ACCURACY.
2. THE TOE BENCH DEPTHS AND QUANTITIES PROVIDED IN THE TABLE ARE AN ESTIMATE, CALCULATED FROM THE RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT PREPARED BY PENNSYLVANIA SOIL & ROCK, INC. SEE TABLE 4.500-2.000 & GEOTECHNICAL INVESTIGATION REPORT PROVIDED BY PENNSYLVANIA SOIL & ROCK, INC. FOR ADDITIONAL TOE BENCH DETAILS, VOLUMES, AND SPECIFICATIONS.

MATERIAL STOCKPILES		
Name	Excise	Total
Topsoil/Residual	N/A	0
C	43,040	7,600
S	0	2,240
F	0	1,210
G	8,130	6,300
O	0	2,800
TOTAL	64,610	27,930

MEREDITH WELL PAD & WATER CONTAINMENT PAD						
Description	Cut (CY)	Fill (CY)	Spill (CY)	Borrow (CY)	Max. Slope (%)	Length of Slope (FT)
Access Road 'A'	4,424.8	828.1	3,796.7	0.0	18.7	16.6
Access Road 'B'	1,633.1	97	1,637.4	0.0	6.1	65.0
Access Road 'C'	80.5	1,676.6	0.0	1,813.0	7.6	50.0
Access Road 'D'	34,608.2	2,805.5	31,700.8	0.0	15.0	263.4
Access Road 'E'	648.2	938.5	0.0	882.3	14.0	85.0
Access Road 'F'	2,517.7	0.0	2,513.7	0.0	12.0	35.7
Well Pad	24,825.5	23,263.1	0.0	3,445.8	na	na
Water Containment Pad	11,228.3	3,704.7	7,523.6	0.0	na	na
Striped Topsoil (CY)	10,927.1	0.0	10,927.1	0.0	na	na
Material Stockpiles	0.0	91,340.0	0.0	91,340.0	na	na
Total	80,676.2	150,765.0	58,099.4	97,692.2	na	na
Total Spill (CY)			36,592.8			

NAVITUS ENERGY ENGINEERING

DATE: 05/23/2019
SCALE: 1" = 150'
SHEET 8 OF 34

APPROVED FOR CONSTRUCTION
11/08/2017 REVISED STOCKPILE "D"
12/08/2017 REVISED PALE CONFORMANCE FROM DETAIL
01/08/2018 REVISED THE ACCESS ROAD REQUIREMENTS
02/08/2018 REVISED FOR CLIENT REQUEST
03/08/2018 REVISED FOR WOOD CHANGING
07/08/2018 REVISED STREAM CROSSING, A-
04/28/2019 REVISED ROAD "F", "G" & STOCKPILES

Antera

THIS DOCUMENT WAS PREPARED FOR ANTERA RESOURCES CORPORATION

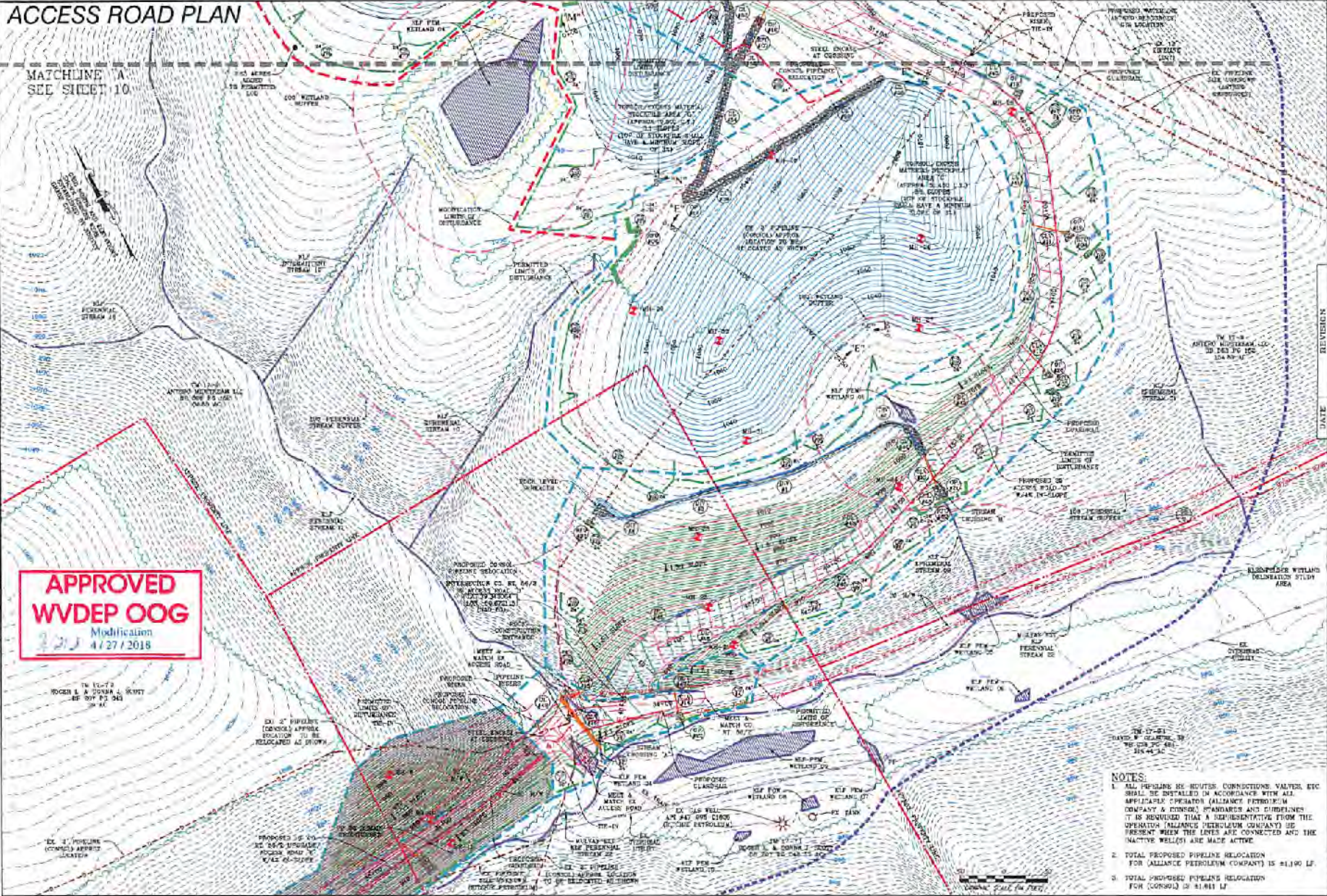
OVERALL PLAN SHEET INDEX & VOLUMES
MEREDITH WELL PAD & WATER CONTAINMENT PAD
GATERSVILLE DISTRICT
PUBLIC COUNTY, WEST VIRGINIA

DATE: 05/23/2019
SCALE: 1" = 150'
SHEET 8 OF 34

4709502518

ACCESS ROAD PLAN

MATCHLINE 'A'
SEE SHEET 10



APPROVED WVDEP OOG
Modification
3/21/2018
4/27/2018

NAVITUS
ENERGY ENGINEERING

DATE	REVISION
01/20/17	REVISED FOR CONSTRUCTION
01/20/17	REVISED STOCKPILE
02/09/17	REVISED FOR CONSTRUCTION PER UTILITY
03/10/17	REVISED FOR ACCESS ROAD MODIFICATION
04/12/17	REVISED FOR CLIENT INQUIRY
06/28/17	REVISED FOR PITCH COMPUTES
07/26/17	REVISED STREAM CROSSING &
10/24/17	REVISED ROAD 'A' W/ A RECONSTRUCT



THIS DOCUMENT WAS PREPARED FOR ANTERO RESOURCES CORPORATION

ACCESS ROAD PLAN
MEREDITH
WELL PAD & WATER CONTAINMENT PAD
CENTREVILLE DISTRICT
TYLER COUNTY, WEST VIRGINIA



DATE 05/23/2016
SCALE 1" = 50'
SHEET 9 OF 34

- NOTES:**
1. ALL PIPELINE RE-ROUTES, CONNECTIONS, VALVES, ETC SHALL BE DETAILED IN ACCORDANCE WITH ALL APPLICABLE OPERATOR (ALLIANCE PETROLEUM COMPANY & CHESTER, HANOVER AND CUMBERLAND) IT IS REQUESTED THAT A REPRESENTATIVE FROM THE OPERATOR (ALLIANCE PETROLEUM COMPANY) BE PRESENT WHEN THE LINES ARE CONNECTED AND THE INACTIVE WELLS ARE MADE ACTIVE.
 2. TOTAL PROPOSED PIPELINE RELOCATION FOR (ALLIANCE PETROLEUM COMPANY) IS 21,190 LF
 3. TOTAL PROPOSED PIPELINE RELOCATION FOR (CHESTER) IS 21,811 LF

