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

Earl Ray Tomblin , Governor
Randy C. Huffman , Cabinet Secretary
www.dep.wv.gov

Friday, September 09, 2016
WELL WORK PERMIT
Horizontal 6A / Horizontal 6A Well - 1

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit approval for MANZAREK UNIT 2H
47-017-06776-00-00

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: MANZAREK UNIT 2H
Farm Name: FOSTER, YVONNE
U.S. WELL NUMBER: 47-017-06776-00-00
Horizontal 6A / Horizontal 6A Well - 1
Date Issued: 9/9/2016

API Number: 4701706776

PERMIT CONDITIONS

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

CONDITIONS

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.

2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than one hundred (100) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.

3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.

4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.

5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations,* 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.

6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.

7. 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.

8. 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.

9. 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-6AW
(1-12)

API NO. 47- 017 -
OPERATOR WELL NO. Manzarek Unit 2H
Well Pad Name: Yvonne

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

VOLUNTARY STATEMENT OF NO OBJECTION

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

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

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

VOLUNTARY STATEMENT OF NO OBJECTION

I, _____, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through _____, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows: 4701706776

State:	West Virginia	UTM NAD 83 Easting:	519875.255m
County:	Doddridge	Northing:	4355516.764m
District:	West Union	Public Road Access:	CR 24 (Knight Fork Rd.)
Quadrangle:	West Union 7.5'	Generally used farm name:	Foster, Yvonne
Watershed:	Headwaters Middle Island Creek		

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

*Please check the box that applies	FOR EXECUTION BY A NATURAL PERSON
☐ SURFACE OWNER	Signature: _____
☐ SURFACE OWNER (Road and/or Other Disturbance)	Print Name: _____
☐ SURFACE OWNER (Impoundments/Pits)	Date: _____
☐ COAL OWNER OR LESSEE	**FOR EXECUTION BY A CORPORATION, ETC.**
☐ COAL OPERATOR	Company: _____
☐ WATER PURVEYOR	By: _____
☐ OPERATOR OF ANY NATURAL GAS STORAGE FIELD	Its: _____
	Signature: _____
	Date: _____

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Office of Oil & Gas
JUN 06 2016

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.

6/04

WW-6B
(04/15)

API NO. 47- 017 - 06776
OPERATOR WELL NO. Manzarek Unit 2H
Well Pad Name: Yvonne Pad

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

4701706776

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

2) Operator's Well Number: Manzarek Unit 2H Well Pad Name: Yvonne Pad

3) Farm Name/Surface Owner: Foster, Yvonne Public Road Access: CR 24 (Knight Fork Rd.)

4) Elevation, current ground: ~1253' Elevation, proposed post-construction: 1227'

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

R.O.W. 6-10-16

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale: 7400' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2950#

8) Proposed Total Vertical Depth: 7400' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 15700' MD

11) Proposed Horizontal Leg Length: 7381'

12) Approximate Fresh Water Strata Depths: 287', 378', 462'

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

14) Approximate Saltwater Depths: 872', 1155', 1491'

15) Approximate Coal Seam Depths: 419', 872', 875'

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

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

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

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JUN 21 2016

WW-6B
(04/15)

API NO. 47- 017 -
OPERATOR WELL NO. Manzarek Unit 2H
Well Pad Name: Yvonne Pad

18) **CASING AND TUBING PROGRAM** 4701706778

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#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/48#	520' *see #19	520' *see #19	CTS, 722 Cu. Ft.
Coal	9-5/8"	New	J-55	36#	2550'	2550'	CTS, 1038 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	15700'	15700'	3895 Cu. Ft
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

Bryan O'Hern
6-10-16

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	24"	0.438"	1530	50	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	1000	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	1500	Class A	1.18
Intermediate							
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12,630	2500	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11,200			
Liners							

PACKERS

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

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JUN 21 2016

WW-6B
(10/14)

API NO. 47- 017 -
OPERATOR WELL NO. Manzarek Unit 2H
Well Pad Name: Yvonne Pad

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

Drill, perforate, fracture a new horizontal shallow well and complete Marcellus Shale.
*Antero will be air drilling the fresh water string which makes it difficult to determine when fresh water is encountered. Therefore, we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.

4701706776

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): 35.70 acres

22) Area to be disturbed for well pad only, less access road (acres): 6.9 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 50 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

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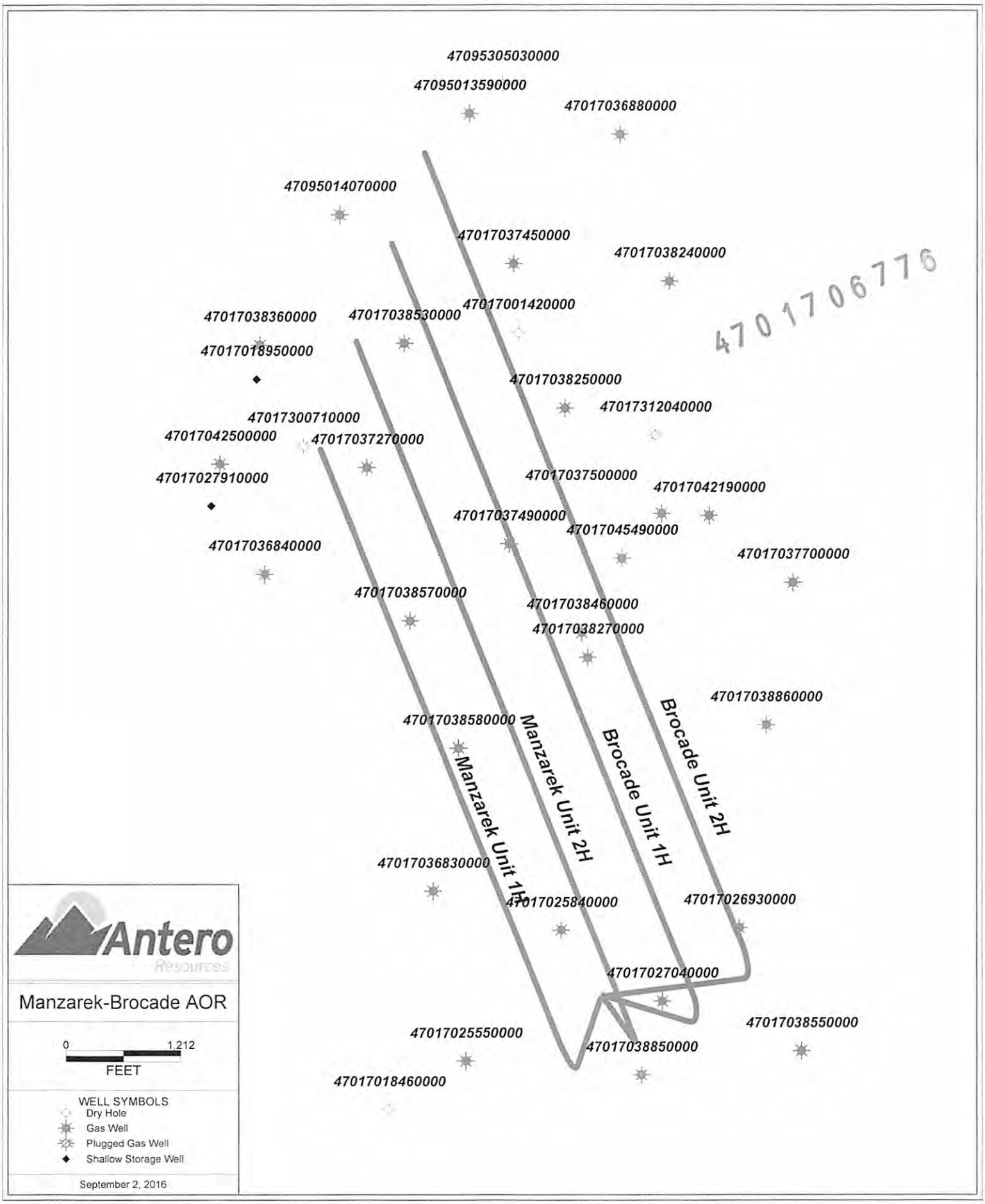
Office of Oil & Gas
JUN 21 2016

*Note: Attach additional sheets as needed.

MANZAREK UNIT 1H & 2H (YVONNE PAD) - DATA COLLECTED ON OFFSET WELLS PER 35-8-5.11



4701706776

MANZAREK UNIT 1H & 2H (YVONNE PAD) - DATA COLLECTED ON OFFSET WELLS PER 35-8-5.11

API[Num]	Well Name	Well Number	Operator	Hist Oper	TD	ELEV_GR	TD(SSTVD)	Gross Perf Interval	Producing Formation(s)	Producible Formation(s) not perf'd
4701702350000	SMITH T J HEIRS ET AL		5 BRAXTON OIL& GAS CORP	EASTERN AMERICAN ENE	5522	1300	4222	4870-5320	Riley, Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander
4701702750000	SANDY WILLIAM		6 CONSOL GAS COMPANY	STONEWALL GAS	5709	1266	4230	5249-5718	Keener, Riley, Benson	Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander
4701702780000	SANDY WILLIAM		5 CONSOL GAS COMPANY	STONEWALL GAS	5905	1270	4230	5795-5240	Riley, Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander
4701702480000	WETZEL LOUIS N	1125	ENERGY CORP OF AMER	J & J ENTERPRISES	5471	1320	4150	5374-5479	Weir, Berea, Gordon, Warren, Riley, Benson	Keener, Big Injun, Weir, Balltown, Bradford, Alexander
4701703210000	PITTS STEPHEN		1 CONSOL GAS COMPANY	STONEWALL GAS	5439	1219	4240	5124-5162	Riley, Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander
4701702740000	SANDY WILLIAM		2 CONSOL GAS COMPANY	STONEWALL GAS	5403	1270	4210	5147-5194	Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Riley, Alexander
4701705350000	FREEMAN GEORGE HEIRS		2 CONSOL GAS COMPANY	STONEWALL GAS	5409	1254	4246	4771-5213	Riley, Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander
4701705370000	FREEMAN GEORGE HEIRS		1 CONSOL GAS COMPANY	STONEWALL GAS	5400	1206	4194	4725-5168	Riley, Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander
4701705640000	PITTEL LOUIS N	1124	ENERGY CORP OF AMER	J & J ENTERPRISES	5530	1240	4130	5460-5539	Weir, Speechley, Balltown, Benson	Big Injun, Berea, Gordon, Warren, Bradford, Riley, Alexander
4701705825000	SANDY WILLIAM		4 CONSOL GAS COMPANY	STONEWALL GAS	5358	1101	4248	5045-5091	Keener, Riley, Benson	Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander
4701705940000	SCOTT J N		1 CONSOL GAS COMPANY	STONEWALL GAS	5038	1204	4140	4731-5047	Riley, Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander
4701705980000	SMITH RUDOLPH ET AL		2 CONSOL GAS COMPANY	OAC CORP	5549	1281	4267	5063-5070	Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Riley, Alexander
4701706250000	SCOTT J N HEIRS		2 CONSOL GAS COMPANY	DOMINION APPALACHIAN	5041	1154	4104	4747-5188	Riley	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Benson, Alexander
4701706330000	PITTS STEPHEN		1 CONSOL GAS COMPANY	STONEWALL GAS	5900	1105	4145	5204-5063	Keener, Balltown, Riley, Benson	Big Injun, Weir, Berea, Gordon, Warren, Speechley, Bradford, Alexander
4701706270000	WELCH M & PIERCE C B		1 CONSOL GAS COMPANY	STONEWALL GAS	5504	1082	4218	5370-5068	Speechley, Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Balltown, Bradford, Riley, Alexander
4701706350000	SMITH HEIRS	B-39 2	STALNAKER ENERGY	STALNAKER ENE GENE INC	5283	1099	4183	5194-5276	Speechley, Riley, Benson, Alexander	Keener, Big Injun, Weir, Berea, Gordon, Warren, Balltown, Bradford
4701706830000	SMITH BLONDA ETAL		1 CONSOL GAS COMPANY	OAC CORP	5268	1140	4114	4710-5114	Weir, Gordon, Benson	Keener, Big Injun, Berea, Warren, Speechley, Baltroun, Bradford, Riley, Alexander
4701706960000	MOFFATT M		1 MARSHALL OIL & GAS	STONEWALL GAS	5247	1151	4096	4475-5105	Warren, Speechley, Riley, Benson	Keener, Big Injun, Weir, Berea, Gordon, Balltown, Bradford, Alexander
4701707070000	WELCH MARY		1 CONSOL GAS COMPANY	OAC CORP	5185	985	4113	4936-4989	Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Riley, Alexander
4701708340000	WETZEL LOUIS N	1128	ENERGY CORP OF AMER	J & J ENTERPRISES	5156	930	4158	5010-4961	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Riley, Benson	Balltown, Bradford, Alexander
4701705830000	PITTS STEPHEN		2 CONSOL GAS COMPANY	STONEWALL GAS	5150	1014	4134	4430-4942	Riley, Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander
4701705924000	SANDY WILLIAM		3 CONSOL GAS COMPANY	STONEWALL GAS	5100	954	4134	4450-4915	Riley, Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander
4703502407000	PITTS STEPHEN		3 CONSOL GAS COMPANY	STONEWALL GAS	5250	860	4190	4352-4812	Riley, Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Alexander
4703502359000	SANDY WILLIAM		1 CONSOL GAS COMPANY	STONEWALL GAS	5093	857	4140	4789-4805	Benson	Keener, Big Injun, Weir, Berea, Gordon, Warren, Speechley, Balltown, Bradford, Riley, Alexander

WW-9
(4/16)

API Number 47 - 017 -
Operator's Well No. Manzarek Unit 2H

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

4701706776

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Antero Resources Corporation OP Code 494507062

Watershed (HUC 10) Headwaters Middle Island Creek Quadrangle West Union 7.5'

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

Will a pit be used? Yes ☐ No ☑

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Please See Attachment

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

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

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

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

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

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

Company Official Signature

Company Official (Typed Name) Cole Kilstrom

Company Official Title Environmental & Regulatory Manager

KARA QUACKENBUSH
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20144028287
MY COMMISSION EXPIRES JULY 21, 2018

Received
Office of Oil & Gas
JUN 21 2016

Subscribed and sworn before me this 3 day of June, 20 16

Kara Quackenbush Notary Public

My commission expires July 21, 2018

Form WW-9

Operator's Well No. Manzarek Unit 2H

Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 35.70 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)

47 0 1706776

Fertilizer amount 500 lbs/acre

Mulch 2-3 Tons/acre

Drill & Water Containment Pad (6.9 acres) +Topsoil Spoil Area (0.46 acres) +Material Spoil Pile (1.48 acres) + Access Road (24.2 acres) + Access Road to Existing Well (0.74 acres) + Topsoil Spoil Area 1 (1.4 acres) + Staging Area (0.52 acres) = 35.70Acres

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Tall Fescue	45	Tall Fescue	45
Perennial Rye Grass	20	Perennial Rye Grass	20

*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: Bryan O'Hara

Comments: _____

Title: Inspector Date: 6-10-16

Field Reviewed? (X) Yes ( ) No

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Office of Oil & Gas
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Form WW-9 Additives Attachment

SURFACE INTERVAL

4701709772

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 Fluild Solvent – Aliphatic Hydrocarbon
14. Ligco
    Highly Oxidized Leonardite – Filteration 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

4701706776

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4701706776

911 Address
1199 Knights Fork Rd.
West Union, WV 26456

Well Site Safety Plan
Antero Resources

B.O.H.
6.10.16

Well Name: **Brocade Unit 1H, Brocade Unit 2H, Burlington Unit 1H, Burlington Unit 2H, Manzarek Unit 1H, Manzarek Unit 2H, Manzarek Unit 3H, Walker Unit 1H, Walker Unit 2H, Walker Unit 3H, Yoho Unit 1H**

Pad Location: **YVONNE PAD**
Doddridge County/West Union District

GPS Coordinates: Lat 39°20'54.82"/Long -80°46'10.12" (NAD83)

Driving Directions:

From East. From the town of Clarksburg WV, head west on Hwy 50 for ~16.5 miles. Turn RIGHT onto Tarkiln Run then take immediate left onto Old U.S. 50. Take the first right onto Big Flint Rd and follow for ~10.6 miles. Turn LEFT onto Little Flint Rd and follow for ~1.9 miles. Turn right onto Co Rte 24/ Camp Mistake for ~1.2 miles. Look for rig signs and location on the left.

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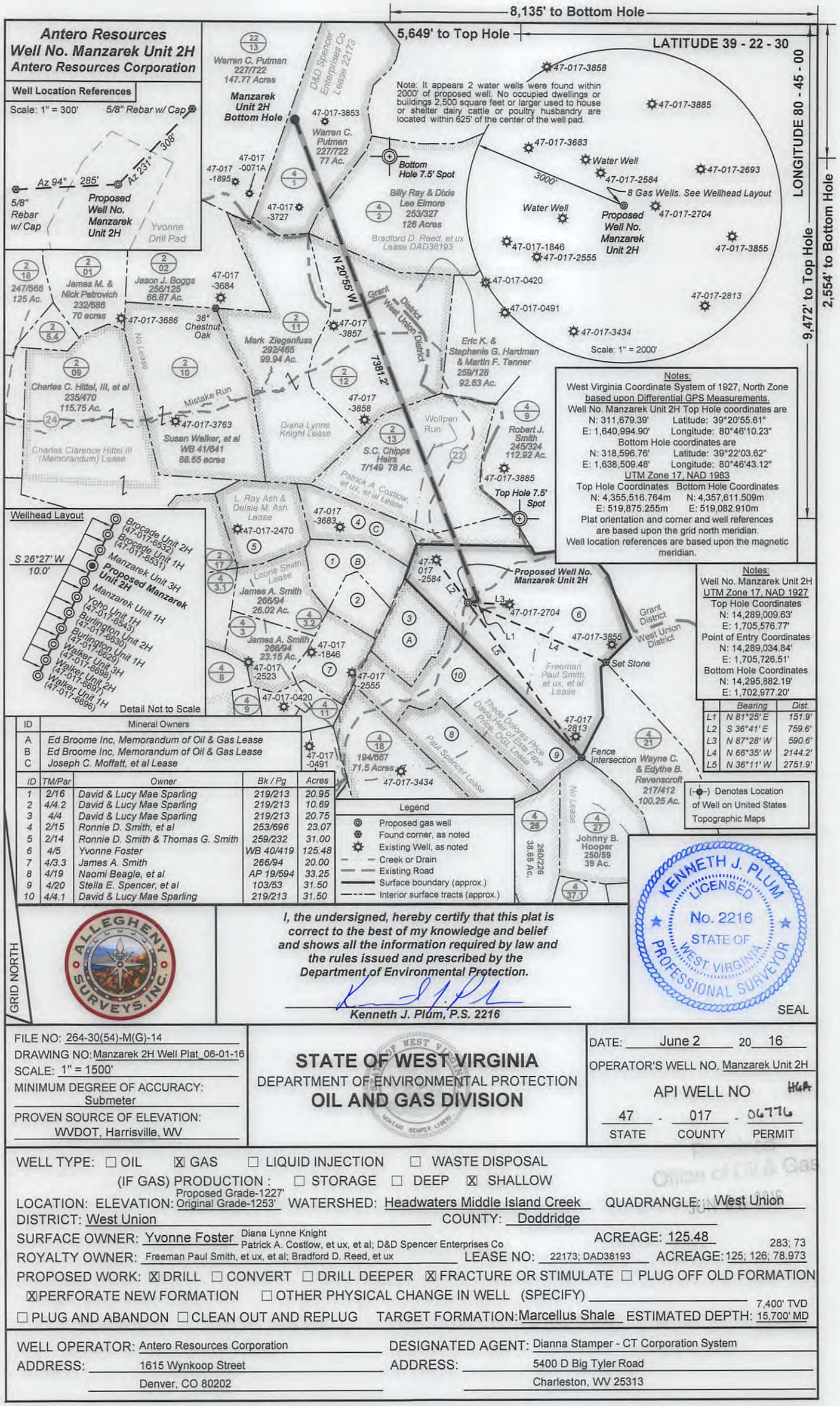
EMERGENCY (24 HOUR) CONTACT 1-800-878-1373

Antero Resources
Well No. Manzarek Unit 2H
Antero Resources Corporation



ID	Mineral Owners
A	Ed Broome Inc, Memorandum of Oil & Gas Lease
B	Ed Broome Inc, Memorandum of Oil & Gas Lease
C	Joseph C. Moffatt, et al Lease

ID	TM/Par	Owner	Bk / Pg	Acres
1	2/16	David & Lucy Mae Sparling	219/213	20.95
2	4/4.2	David & Lucy Mae Sparling	219/213	10.69
3	4/4	David & Lucy Mae Sparling	219/213	20.75
4	2/15	Ronnie D. Smith, et al	253/696	23.07
5	2/14	Ronnie D. Smith & Thomas G. Smith	259/232	31.00
6	4/5	Yvonne Foster	WB 40/419	125.48
7	4/3.3	James A. Smith	266/94	20.00
8	4/19	Naomi Beagle, et al	AP 19/594	33.25
9	4/20	Stella E. Spencer, et al	103/53	31.50
10	4/4.1	David & Lucy Mae Sparling	219/213	31.50

ALLEGHENY SURVEYS, INC.

I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the rules issued and prescribed by the Department of Environmental Protection.

Kenneth J. Plum, P.S. 2216

KENNETH J. PLUM LICENSED No. 2216 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

SEAL

FILE NO: 264-30(54)-M(G)-14
DRAWING NO: Manzarek 2H Well Plat_06-01-16
SCALE: 1" = 1500'
MINIMUM DEGREE OF ACCURACY: Submeter
PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

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

DATE: June 2 20 16
OPERATOR'S WELL NO. Manzarek Unit 2H
API WELL NO HGA
47 - 017 - 06776
STATE COUNTY PERMIT

WELL TYPE: ☐ OIL ☒ GAS ☐ LIQUID INJECTION ☐ WASTE DISPOSAL
(IF GAS) PRODUCTION : ☐ STORAGE ☐ DEEP ☒ SHALLOW
LOCATION: ELEVATION: Proposed Grade-1227' Original Grade-1253' WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union
DISTRICT: West Union COUNTY: Doddridge
SURFACE OWNER: Yvonne Foster Diana Lynne Knight Patrick A. Costlow, et ux, et al; D&D Spencer Enterprises Co ACREAGE: 125.48 283; 73
ROYALTY OWNER: Freeman Paul Smith, et ux, et al; Bradford D. Reed, et ux LEASE NO: 22173; DAD38193 ACREAGE: 125; 126; 78.973
PROPOSED WORK: ☒ DRILL ☐ CONVERT ☐ DRILL DEEPER ☒ FRACTURE OR STIMULATE ☐ PLUG OFF OLD FORMATION
☒ PERFORATE NEW FORMATION ☐ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____
☐ PLUG AND ABANDON ☐ CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 7,400' TVD 15,700' MD

WELL OPERATOR: Antero Resources Corporation
ADDRESS: 1615 Wynkoop Street, Denver, CO 80202
DESIGNATED AGENT: Dianna Stamper - CT Corporation System
ADDRESS: 5400 D Big Tyler Road, Charleston, WV 25313

Antero Resources
Well No. Manzarek Unit 2H
Antero Resources Corporation

8,135' to Bottom Hole

5,649' to Top Hole

LATITUDE 39 - 22 - 30

LONGITUDE 80 - 45 - 00

9,472' to Top Hole

2,554' to Bottom Hole

Well Location References

Scale: 1" = 300' 5/8" Rebar w/ Cap

Az 94° 285' Az 231° 308'

5/8" Rebar w/ Cap

Proposed Well No. Manzarek Unit 2H

Yvonne Drill Pad

Warren C. Putman 227/722 147.77 Acres

Manzarek Unit 2H Bottom Hole

47-017-3853

Warren C. Putman 227/722 77 Ac.

D&D Spencer Enterprises Co Lease 22173

47-017-0071A

47-017-1895

47-017-3727

Bottom Hole 7.5' Spot

Billy Ray & Dixie Lee Elmore 253/327 126 Acres

Bradford D. Reed, et ux Lease DAD38193

Note: It appears 2 water wells were found within 2000' of proposed well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad.

47-017-3858

47-017-3885

47-017-3683

Water Well

47-017-2693

47-017-2584

3000'

8 Gas Wells. See Wellhead Layout

Water Well

Proposed Well No. Manzarek Unit 2H

47-017-2704

47-017-1846

47-017-2555

47-017-3855

47-017-0420

47-017-2813

47-017-0491

47-017-3434

Scale: 1" = 2000'

James M. & Nick Petrovich 232/686 70 acres

Jason J. Boggs 256/125 66.87 Ac.

247/566 125 Ac.

47-017-3684

47-017-3686

36" Chestnut Oak

No Lease

Mark Ziegenfuss 292/465 99.94 Ac.

47-017-3857

N 20°55' W 7381.2'

Grant District

West Union District

Eric K. & Stephanie G. Hardman & Martin F. Tanner 259/128 92.63 Ac.

Charles C. Hittel, III, et al 235/470 115.75 Ac.

Mistake Run

47-017-3763

Susan Walker, et al WB 41/641 88.65 acres

Charles Clarence Hittel III (Memorandum) Lease

Diana Lynne Knight Lease

47-017-3858

Wolfpen Run

Robert J. Smith 245/324 112.92 Ac.

S.C. Chipps Heirs 7/149 78 Ac.

47-017-3885

Top Hole 7.5' Spot

Patrick A. Costlow, et ux, et al Lease

L. Ray Ash & Delsie M. Ash Lease

47-017-2470

47-017-3683

Wellhead Layout

S 26°27' W 10.0'

Brocade Unit 2H (47-017-6532)

Brocade Unit 1H (47-017-6531)

Manzarek Unit 3H

Proposed Manzarek Unit 2H

Manzarek Unit 1H

Yoho Unit 1H (47-017-6543)

Burlington Unit 2H (47-017-6630)

Burlington Unit 1H (47-017-6629)

Walker Unit 3H (47-017-6698)

Walker Unit 2H (47-017-6697)

Walker Unit 1H (47-017-6696)

Detail Not to Scale

Lourie Smith Lease

James A. Smith 266/94 26.02 Ac.

James A. Smith 266/94 23.15 Ac.

47-017-1846

47-017-2523

47-017-2555

47-017-0420

47-017-2584

Proposed Well No. Manzarek Unit 2H

47-017-2704

47-017-3855

Set Stone

Grant District

West Union District

Freeman Paul Smith, et ux, et al Lease

Theda Dolores Price Davis, Heir of Estis Faye Price, O&G Lease

Paul Spencer Lease

47-017-2813

Fence Intersection

Wayne C. & Edythe B. Ravenscroft 217/412 100.25 Ac.

194/667 71.5 Acres

47-017-3434

47-017-0491

No Lease

Johnny B. Hooper 250/59 39 Ac.

260/226 38.65 Ac.

Notes:

West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements.

Well No. Manzarek Unit 2H Top Hole coordinates are

N: 311,679.39' Latitude: 39°20'55.61"

E: 1,640,994.90' Longitude: 80°46'10.23"

Bottom Hole coordinates are

N: 318,596.76' Latitude: 39°22'03.62"

E: 1,638,509.48' Longitude: 80°46'43.12"

UTM Zone 17, NAD 1983

Top Hole Coordinates	Bottom Hole Coordinates
N: 4,355,516.764m	N: 4,357,611.509m
E: 519,875.255m	E: 519,082.910m

Plat orientation and corner and well references are based upon the grid north meridian.

Well location references are based upon the magnetic meridian.

Notes:

Well No. Manzarek Unit 2H

UTM Zone 17, NAD 1927

Top Hole Coordinates

N: 14,289,009.63'

E: 1,705,576.77'

Point of Entry Coordinates

N: 14,289,034.84'

E: 1,705,726.51'

Bottom Hole Coordinates

N: 14,295,882.19'

E: 1,702,977.20'

	Bearing	Dist.
L1	N 81°25' E	151.9'
L2	S 36°41' E	759.6'
L3	N 87°28' W	590.6'
L4	N 66°35' W	2144.2'
L5	N 36°11' W	2751.9'

(-⊕-) Denotes Location of Well on United States Topographic Maps

ID	Mineral Owners
A	Ed Broome Inc, Memorandum of Oil & Gas Lease
B	Ed Broome Inc, Memorandum of Oil & Gas Lease
C	Joseph C. Moffatt, et al Lease

ID	TM/Par	Owner	Bk / Pg	Acres
1	2/16	David & Lucy Mae Sparling	219/213	20.95
2	4/4.2	David & Lucy Mae Sparling	219/213	10.69
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4	2/15	Ronnie D. Smith, et al	253/696	23.07
5	2/14	Ronnie D. Smith & Thomas G. Smith	259/232	31.00
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8	4/19	Naomi Beagle, et al	AP 19/594	33.25
9	4/20	Stella E. Spencer, et al	103/53	31.50
10	4/4.1	David & Lucy Mae Sparling	219/213	31.50

Legend

- Proposed gas well
- Found corner, as noted
- Existing Well, as noted
- Creek or Drain
- Existing Road
- Surface boundary (approx.)
- Interior surface tracts (approx.)

GRID NORTH

ALLEGHENY SURVEYS, INC.

I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the rules issued and prescribed by the Department of Environmental Protection.

Kenneth J. Plum, P.S. 2216

KENNETH J. PLUM LICENSED No. 2216 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

SEAL

FILE NO: 264-30(54)-M(G)-14

DRAWING NO: Manzarek 2H Well Plat_06-01-16

SCALE: 1" = 1500'

MINIMUM DEGREE OF ACCURACY: Submeter

PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

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

DATE: June 2 20 16

OPERATOR'S WELL NO. Manzarek Unit 2H

API WELL NO H6A

47 - 017 - 06776

STATE COUNTY PERMIT

WELL TYPE: ☐ OIL ☒ GAS ☐ LIQUID INJECTION ☐ WASTE DISPOSAL

(IF GAS) PRODUCTION : ☐ STORAGE ☐ DEEP ☒ SHALLOW

LOCATION: ELEVATION: Proposed Grade-1227' Original Grade-1253' WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union

DISTRICT: West Union COUNTY: Doddridge

SURFACE OWNER: Yvonne Foster Diana Lynne Knight Patrick A. Costlow, et ux, et al; D&D Spencer Enterprises Co ACREAGE: 125.48 283; 73

ROYALTY OWNER: Freeman Paul Smith, et ux, et al; Bradford D. Reed, et ux LEASE NO: 22173; DAD38193 ACREAGE: 125; 126; 78.973

PROPOSED WORK: ☒ DRILL ☐ CONVERT ☐ DRILL DEEPER ☒ FRACTURE OR STIMULATE ☐ PLUG OFF OLD FORMATION

☒ PERFORATE NEW FORMATION ☐ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____

☐ PLUG AND ABANDON ☐ CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 7,400' TVD 15,700' MD

Received Office of Oil & Gas JUN 06 2016

WELL OPERATOR: Antero Resources Corporation

ADDRESS: 1615 Wynkoop Street, Denver, CO 80202

DESIGNATED AGENT: Dianna Stamper - CT Corporation System

ADDRESS: 5400 D Big Tyler Road, Charleston, WV 25313

WW-6A1

Operator's Well Number Manzarek Unit 2H

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
Freeman Paul Smith et ux, et al Lease			
Freeman Paul Smith	Key Oil Company	1/8	0108/0423
Key Oil Company	J&J Enterprises, Inc.	Assignment & Security Agreement	0115/0558
J&J Enterprises, Inc.	Eastern American Energy Corporation	Confirmatory Deed & Assignment of Leases	0159/0139
Eastern American Energy Corporation	Energy Corporation of America	Confirmatory Deed & Assignment of Leases	0240/0498
Energy Corporation of America	Antero Resources Appalachian Corporation	Partial Assignment of Oil & Gas Leases	0272/0307
Antero Resources Appalachian Corporation	**Antero Resources Corporation**	**Name Change**	**Exhibit 1**
Patrick A. Costlow et ux, et al Lease			
Patrick A. Costlow et ux	**Antero Resources Corporation**	**1/8+**	**307/25**
Diana Lynne Knight Lease			
Diana Lynne Knight	**Antero Resources Corporation**	**1/8+**	**371/330**
Bradford D. Reed, et ux Lease			
Bradford D. & Sarah R. Reed	Bojacque Incorporated	1/8	0153/0203
Bojacque Incorporated	Stonewall Gas Co.	Assignment	0155/0192
Stonewall Gas Co.	Mountain Gas Drilling	Assignment	0176/0190
Mountain Gas Drilling	Dominion Appalachian Development Properties	Assignment	0177/0559
Dominion Appalachian Development Properties	Antero Resources Appalachian Corporation	Assignment	0230/0113
Antero Resources Appalachian Corporation	**Antero Resources Corporation**	**Name Change**	**Exhibit 1**

4701706772

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

****CONTINUED ON NEXT PAGE****

WW-6A1
(5/13)

Operator's Well No. Manzarek Unit 2H

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:

4701700777

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
D&D Spencer Enterprise Co. Lease 22173				
	D&D Spencer Enterprise Co.	Antero Resources Appalachian Corp.	1/8+	262/595
	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

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Received
Office of Oil & Gas
JUN 06 2016

Well Operator: Antero Resources Corporation
By: Kevin Kilstrom
Its: Senior VP of Production

FORM WW-6A1
EXHIBIT 1

FILED

JUN 10 2013

IN THE OFFICE OF SECRETARY OF STATE

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

Penney Barker, Manager
Corporations Division
Tel: (304)558-8000
Fax: (304)558-8381
Website: www.wvsos.com
E-mail: business@wvsos.com

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

APPLICATION FOR AMENDED CERTIFICATE OF AUTHORITY

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

1. Name under which the corporation was authorized to transact business in WV: Antero Resources Appalachian Corporation

2. Date Certificate of Authority was issued in West Virginia: 6/25/2008

3. Corporate name has been changed to: Antero Resources Corporation
(Attach one Certified Copy of Name Change as filed in home State of incorporation.)

4. Name the corporation elects to use in WV: Antero Resources Corporation
(due to home state name not being available)

5. Other amendments:
(attach additional pages if necessary)

6. Name and phone number of contact person. (This is optional, however, if there is a problem with the filing, listing a contact person and phone number may avoid having to return or reject the document.)

Alvyn A. Schopp — Contact Name
(303) 357-7310 — Phone Number

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

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

Signature: — Date: June 10, 2013

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

Received
Office of Oil & Gas
JUN 06 2016

WV/013 - 04/16/2013 Wolters Kluwer CCH Inc

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

June 3, 2016

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

RE: Manzarek Unit 2H
Quadrangle: West Union 7.5'
Doddridge County/West Union District, West Virginia

Mr. Martin:

Antero Resources Corporation (Antero) is submitting the following application for a new well work permit for the Manzarek Unit 2H 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 Manzarek Unit 2H horizontal lateral will drill through including any and all roads crossed under as identified on the attached survey plat.

Sincerely,

Brett Kuhn
Landman

4701706777

Received
Office of Oil & Gas
JUN 06 2016

WW-6AC
(1/12)

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

Date of Notice Certification: 06/02/2016

API No. 47- 017 -
Operator's Well No. Manzarek Unit 2H
Well Pad Name: Yvonne 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:	West Virginia	UTM NAD 83	Easting:	519875.255m
County:	Doddridge		Northing:	4355516.764m
District:	West Union	Public Road Access:		CR 24 (Knight Fork Rd.)
Quadrangle:	West Union 7.5'	Generally used farm name:		Foster, Yvonne
Watershed:	Headwaters Middle Island Creek			

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.

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: *PLEASE CHECK ALL THAT APPLY	OOG OFFICE USE ONLY
☐ 1. NOTICE OF SEISMIC ACTIVITY or ☒ NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED	☐ RECEIVED/ NOT REQUIRED
☐ 2. NOTICE OF ENTRY FOR PLAT SURVEY or ☒ NO PLAT SURVEY WAS CONDUCTED	☐ RECEIVED
☒ 3. NOTICE OF INTENT TO DRILL or ☐ NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or ☐ WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)	☐ RECEIVED/ NOT REQUIRED
☒ 4. NOTICE OF PLANNED OPERATION	☐ RECEIVED
☒ 5. PUBLIC NOTICE	☐ RECEIVED
☒ 6. NOTICE OF APPLICATION	☐ RECEIVED

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.

Received
Office of Oil & Gas
JUN 06 2016

WW-6AC
(1/12)

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:	Antero Resources Corporation	Address:	1615 Wynkoop Street
By:	Kevin Kilstrom		Denver, CO 80202
Its:	Senior VP of Production	Facsimile:	303-357-7315
Telephone:	303-357-7310	Email:	kquackenbush@anteroresources.com

NOTARY SEAL

KARA QUACKENBUSH
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20144028297
MY COMMISSION EXPIRES JULY 21, 2018

Subscribed and sworn before me this 2 day of June 2016.

Kara Quackenbush Notary Public

My Commission Expires July 21, 2018

Oil and Gas Privacy Notice:

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

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Office of Oil & Gas
JUN 06 2016

WW-6A
(9-13)

API NO. 47- 017 -
OPERATOR WELL NO. Manzarek Unit 2H
Well Pad Name: Yvonne 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: 6/3/2016 **Date Permit Application Filed:** 6/3/2016

Notice of:

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

4701706

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

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

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

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

☑ SURFACE OWNER(s)
Name: PLEASE SEE ATTACHMENT
Address: _____

Name: _____
Address: _____

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

Name: _____
Address: _____

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

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

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

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

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

*Please attach additional forms if necessary

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JUN 06 2016

WW-6A
(8-13)

API NO. 47- 017 -
OPERATOR WELL NO. Manzarek Unit 2H
Well Pad Name: Yvonne Pad

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.

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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

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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:

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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.**

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(8-13)

API NO. 47- 017 -
OPERATOR WELL NO. Manzarek Unit 2H
Well Pad Name: Yvonne Pad

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.

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

Received
Office of Oil & Gas
JUN 06 2016

WW-6A
(8-13)

API NO. 47- 017 -
OPERATOR WELL NO. Manzarek Unit 2H
Well Pad Name: Yvonne Pad

Notice is hereby given by:

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

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

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Oil and Gas Privacy Notice:

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

KARA QUACKENBUSH
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20144028297
MY COMMISSION EXPIRES JULY 21, 2018

Subscribed and sworn before me this 3 day of June 2016.

Kara Quackenbush Notary Public

My Commission Expires July 21, 2018

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Office of Oil & Gas
JUN 06 2016

WW-6A Notice of Application Attachment (YVONNEPAD):

List of Surface Owner(s) with Proposed Disturbance associated with Yvonne Well Pad:

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

TM 4 PCL 5
Owner: Yvonne R. Foster
Address: 2395 Tallmansville Road
Buckhannon, WV 26201

Owner: Yvonne R. Foster (2nd Address)
Address: HC 36 Box 335
Buckhannon, WV 26201

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

TM 4 PCL 4.1
Owner: David & Lucy Mae Sparling
(ON LEASE)
Address: 1024 Chipps Run
West Union, WV 26456

TM 4 PCL 5
Owner: Yvonne R. Foster
(ON LEASE)
Address: 2395 Tallmansville Road
Buckhannon, WV 26201

Owner: Yvonne R. Foster (2nd Address)
(ON LEASE)
Address: HC 36 Box 335
Buckhannon, WV 26201

TM 4 PCL 9
Owner: Robert J. Smith
(OFF LEASE)
Address: 2725 Canton Rd.
West Union, WV 26456

TM 4 PCL 10
Owner: Antero Resources Corp
(OFF LEASE)
Address: 1615 Wynkoop St.
Denver, CO 80202

TM 4 PCL 11.1
Owner: Antero Resources Corp
(OFF LEASE)
Address: 1615 Wynkoop St.
Denver, CO 80202

TM 4 PCL 11
Owner: Antero Resources Corp
(OFF LEASE)
Address: 1615 Wynkoop St.
Denver, CO 80202

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WW-6A Notice of Application Attachment (YVONNE PAD):

WATER SOURCE OWNERS: Within 1500'

Owner: Ronnie D. Smith, et al
Address: 114 Marshall Ct.
Parkersburg, WV 26101

Owner: David & Lucy Mae Sparling
Address: 1024 Chipps Run
West Union, WV 26456

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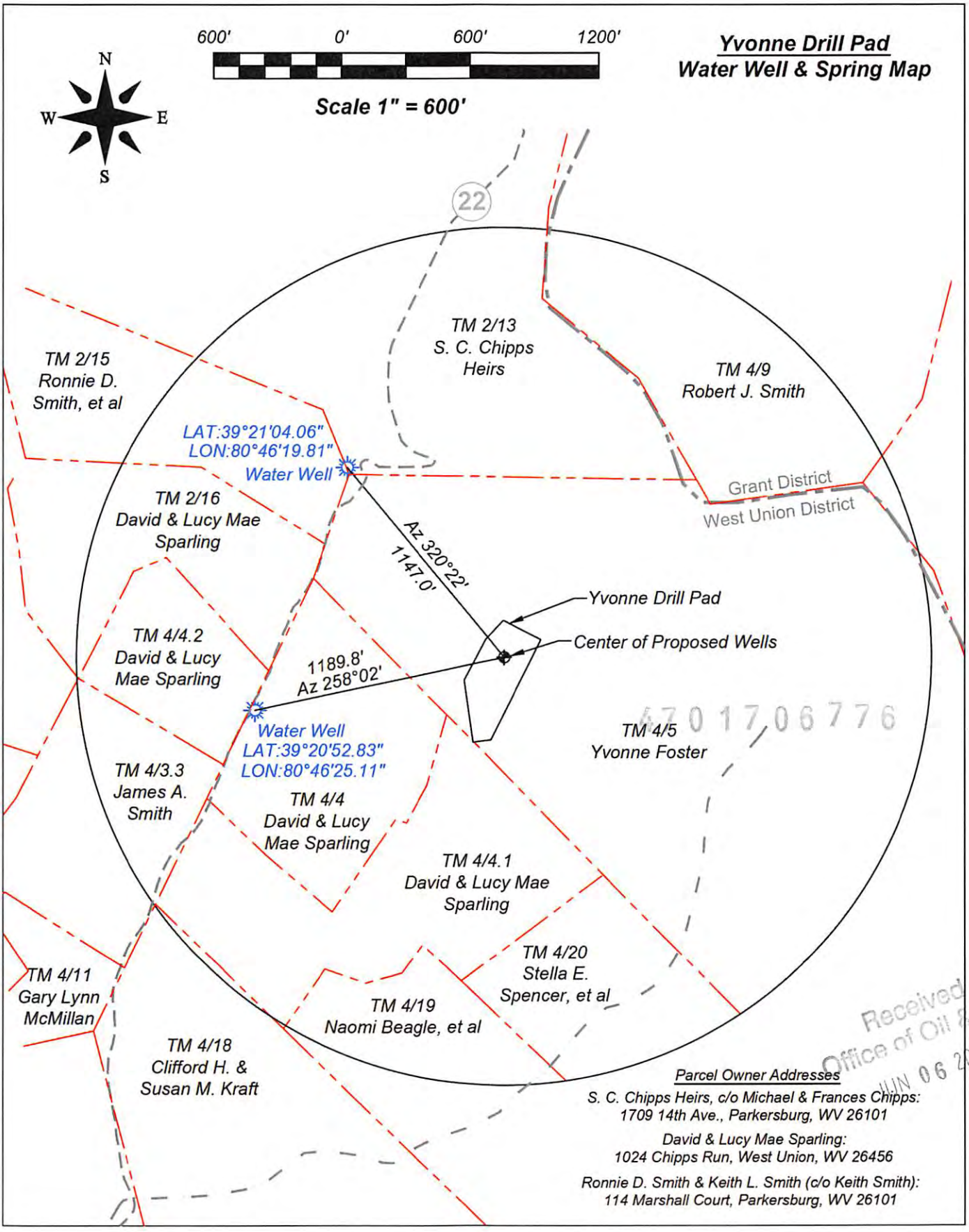

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WW-6A4
(1/12)

Operator Well No. Manzarek Unit 2H
Multiple Wells on Yvonne Pad

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: 05/20/2016 **Date Permit Application Filed:** 06/03/2016

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: Yvonne R. Foster
Address: HC 63 Box 335
Buckhannon, WV 26201

Name: Yvonne R. Foster (2nd Address)
Address: 2395 Tallmansville Rd.
Buckhannon, WV 26201

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
County: Doddridge
District: Grant
Quadrangle: West Union 7.5'
Watershed: McElroy Creek

UTM NAD 83 Easting: 519863.03m(Approximate Pad Center)
Northing: 4355483.28m (Approximate Pad Center)
Public Road Access: CR 24 (Knights Fork Rd.)
Generally used farm name: Yvonne R. Foster

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: 303-357-7323
Email: asteele@anteroresources.com
Facsimile: 303-357-7315

Authorized Representative: Ashlie Steele
Address: 1615 Wynkoop St.
Denver, CO 80202
Telephone: 303-357-7323
Email: asteele@anteroresources.com
Facsimile: 303-357-7315

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Oil and Gas Privacy Notice:

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

WW-6A5
(1/12)

Operator Well No. Manzarek Unit 2H

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: 06/03/2016 **Date Permit Application Filed:** 06/03/2016

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

☒ CERTIFIED MAIL RETURN RECEIPT REQUESTED ☐ HAND 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: Yvonne R. Foster
Address: 2395 Tallmansville Rd.
Buckhannon, WV 26201

Name: Yvonne R. Foster (2nd Address)
Address: HC 36 Box 335
Buckhannon, WV 26201

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: West Virginia
County: Doddridge
District: West Union
Quadrangle: West Union 7.5'
Watershed: Headwaters Middle Island Creek

UTM NAD 83 Easting: 519875.255m
Northing: 4355516.764m
Public Road Access: CR 24 (Knight Fork Rd.)
Generally used farm name: Foster, Yvonne

This Notice Shall Include:
Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1)A copy of this code section; (2) The information required to be provided by **W. Va. Code § 22-6A-10(b)** to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

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

Received
Office of Oil & Gas
JUN 06 2016

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Earl Ray Tomblin
Governor

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

Reissued June 3, 2016

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 Yvonne Pad, Doddridge County
Manzarek Unit 2H Well site

4701706776

Dear Mr. Martin,

This well site will be accessed from a DOH permit #04-2014-0257 which has been applied for by Antero Resources Corporation for access to the State Road for a well site located off of Doddridge County Route 24 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

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

Received
Office of Oil & Gas
JUN 06 2016

Cc: Kara Quackenbush
Antero Resources Corporation
CH, OM, D-4
File

List of Anticipated Additives Used for Fracturing or Stimulating Well

Additives	Chemical Abstract Service Number (CAS #)
Fresh Water	7732-18-5
2 Phosphobutane 1,2,4 tricarboxylic acid	37971-36-1
Ammonium Persulfate	7727-54-0
Anionic copolymer	Proprietary
Anionic polymer	Proprietary
BTEX Free Hydrotreated Heavy Naphtha	64742-48-9
Cellulase enzyme	Proprietary
Demulsifier Base	Proprietary
Ethoxylated alcohol blend	Mixture
Ethoxylated Nonylphenol	68412-54-4
Ethoxylated oleylamine	26635-93-8
Ethylene Glycol	107-21-1
Glycol Ethers	111-76-2
Guar gum	9000-30-0
Hydrogen Chloride	7647-01-0
Hydrotreated light distillates, non-aromatic, BTEX free	64742-47-8
Isopropyl alcohol	67-63-0
liquid, 2,2-dibromo-3-nitrilopropionamide	10222-01-2
Microparticle	Proprietary
Petroleum Distillates (BTEX Below Detect)	64742-47-8
Polyacrylamide	57-55-6
Propargyl Alcohol	107-19-7
Propylene Glycol	57-55-6
Quartz	14808-60-7
Sillica, crystalline quartz	7631-86-9
Sodium Chloride	7647-14-5
Sodium Hydroxide	1310-73-2
Sugar	57-50-1
Surfactant	68439-51-0
Suspending agent (solid)	14808-60-7
Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7
Solvent Naphtha, petroleum, heavy aliph	64742-96-7
Soybean Oil, Me ester	67784-80-9
Copolymer of Maleic and Acrylic Acid	52255-49-9
DETA phosphonate	15827-60-8
Hexamthylene 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

10170776

Received
Office of Oil & Gas
JUN 06 2016

YVONNE WELL AND WATER
SITE DESIGN & CONST
EROSION & SEDIMENT C

API#1706531
API#1706532
API#1706543

ANTERO RESOURCES C

Bryan D'Henni
6-10-16

PROJECT CONTACTS

PROJECT OWNER

ANTERO RESOURCES
1615 WYNKOOP STREET
DENVER, CO 80202

CONTACT: ANTHONY SMITH
FIELD ENGINEER
304.869.3405 OFFICE
304.673.6196 CELL

CONTACT: JOHN KAWCAK
ENGINEER
817.368.1553

CONTACT: ELI WAGONER
ENVIRONMENTAL ENGINEER
304.622.3842, EXT 311
OFFICE

CONTACT: AARON KUNZLER
CONSTRUCTION SUPERVISOR
405.227.8344

LOCATION SURVEYOR

TRIPLE H ENTERPRISES
CONTACT: DARELL BOICE, PS
204 NEELEY AVE
WEST UNION, WV 26456
304.873.3360

ENGINEER OF RECORD

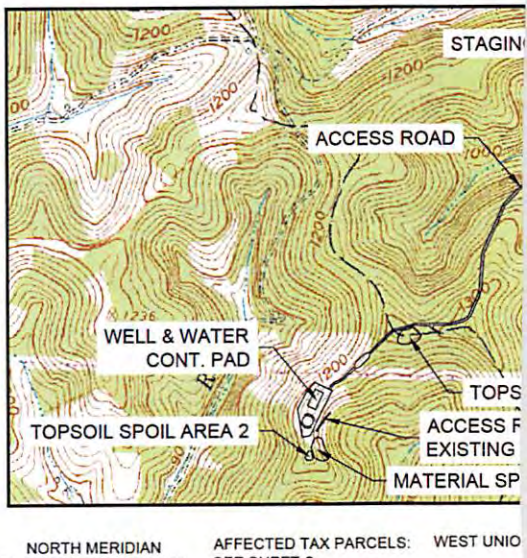
KLEINFELDER EAST, INC.
CONTACT: JEFFERY B. CRISP, PE
WV PE #20354
3500 GATEWAY CENTRE BLVD, SUITE 200
MORRISVILLE, NC 27560
919.755.5011 OFFICE
919.755.1414 FAX

ENVIRONMENTAL/ DELINEATION BOUNDARY

GAI CONSULTANTS, INC.
CONTACT: JASON COOK
300 SUMMER ST, SUITE 1100
CHARLESTON, WV 25301
304.920.8100 OFFICE
303.709.3306 CELL

TOPO SURVEYOR

BLUE MOUNTAIN AERIAL MAPPING
CONTACT: CRAIG FRY
11023 MASON DIXON HIGHWAY
BURTON, WV 26562
304.662.2626 OFFICE
304.815.4890 CELL



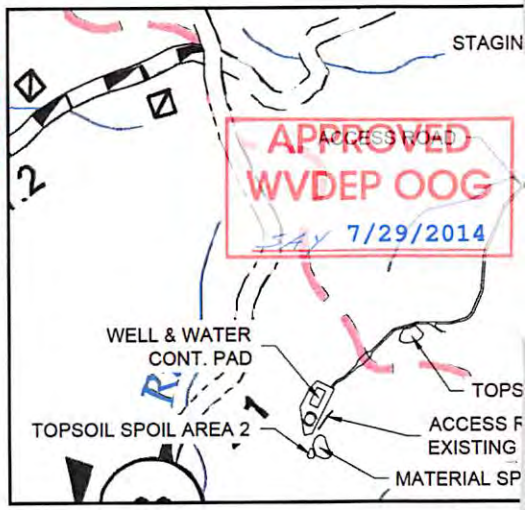
NORTH MERIDIAN REFERENCED TO NAD83 WEST VIRGINIA STATE PLANE NORTH ZONE

AFFECTED TAX PARCELS: SEE SHEET 2

WEST UNIO

4

SITE LOCATIONS				
DESCRIPTION	NAD 83 (WV NORTH ZONE)		UTM ZONE 17 (METERS)	
	LATITUDE	LONGITUDE	NORTHING	EASTING
CENTROID OF WELL AND WATER CONT. PAD	39° 20' 54.82"	-80° 46' 10.12"	4355483.28	519863.03
CENTER OF MOBILE FRESH WATER CORRAL	39° 20' 53.39"	-80° 46' 10.73"	4355439.28	519848.56
PRIMARY ACCESS ROAD ENTRANCE	39° 21' 33.00"	-80° 45' 18.20"	4356663.53	521102.53



FLOODPLAIN CONDITIONS		
DO SITE CONSTRUCTION ACTIVITIES TAKE PLACE IN FLOODPLAIN:		NO
PERMIT NEEDED FROM COUNTY FLOODPLAIN COORDINATOR:		NO
HEC-RAS STUDY COMPLETED:		N/A
FLOODPLAIN SHOWN ON DRAWINGS:		N/A
FIRM MAP NUMBER(S) FOR SITE:	54017C0110C	
ACREAGES OF CONSTRUCTION IN FLOODPLAIN:		N/A

ACCESS ROAD LENGTH (FEET)	
DESCRIPTION	FEET
ACCESS ROAD	5,830
ACCESS ROAD TO EXISTING WELL	247
TOTAL	6,077

811
Know what's below.
Call before you dig.
MISS UTILITY OF WEST VIRGINIA
1-800-245-4848
WEST VIRGINIA STATE LAW REQUIRES 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 HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE WEST VIRGINIA CODE OF STATE RULES, DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS §35-8.

MM-109 PERMIT
ANTERO RESOURCES WILL OBTAIN AN ENCROACHMENT PERMIT (MM-109) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

Electronic Version of These Plans May Be V

ATTACHED IMAGES: Images: New Antero Logo PNG Images; cal811_logo_horiz.jpg; Images: West Virginia Map gif Images: west_union.tif
ATTACHED XREFS: XRef: ANTERO 11x17 TITLE BLOCK; XRef: Yvonne_Base; XRef: Yvonne_Parcels; XRef: Yvonne_Survey; XRef: Yvonne_USGS
CAD FILE: G:_clients\Antero\Facilities\Yvonne\Design\Civil\Site Plans - Final\ LAYOUT: 1 COVER PAGE & LOCATION MAP

10-15-12 REVISED BY: CAL

CONTAINMENT PAD
RUCTION PLAN,
CONTROL PLANS
ORPORATION

PLAN REPRODUCTION WARNING

THE PLANS HAVE BEEN CREATED ON ANSI D (22"x34") SHEETS. FOR REDUCTIONS, REFER TO GRAPHIC SCALE.

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

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

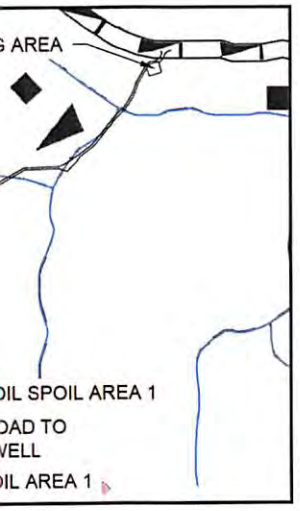
NO.	REVISION	BY	DATE
1	EC & TOE BENCH REVISIONS	KLF	04-08-14
2	REVISED WELL HEAD LAYOUT	KLF	05-14-14
3	CORPORATE ADDRESS	KLF	06-03-14
4	DEP COMMENTS	KLF	07-28-14
5	-	---	---

WELL HEAD LAYOUT				
WELL NAME	NAD 83 (WV NORTH ZONE)			
	NORTHING	EASTING	LATITUDE	LONGITUDE
WALKER UNIT 1H	311652.18	1609522.47	39° 20' 55.28"	-80° 46' 09.99"
WALKER UNIT 2H	311661.13	1609526.93	39° 20' 55.37"	-80° 46' 09.94"
WALKER UNIT 3H	311670.08	1609531.38	39° 20' 55.46"	-80° 46' 09.88"
BURLINGTON UNIT 1H	311679.04	1609535.84	39° 20' 55.55"	-80° 46' 09.83"
BURLINGTON UNIT 2H	311687.99	1609540.29	39° 20' 55.64"	-80° 46' 09.77"
YOHO UNIT 1H	311696.94	1609544.75	39° 20' 55.73"	-80° 46' 09.72"
MANZAREK UNIT 1H	311705.89	1609549.20	39° 20' 55.82"	-80° 46' 09.66"
MANZAREK UNIT 2H	311714.85	1609553.66	39° 20' 55.91"	-80° 46' 09.61"
MANZAREK UNIT 3H	311723.80	1609558.12	39° 20' 55.99"	-80° 46' 09.55"
BROCADE UNIT 1H	311732.75	1609562.57	39° 20' 56.08"	-80° 46' 09.49"
BROCADE UNIT 2H	311741.70	1609567.03	39° 20' 56.17"	-80° 46' 09.44"

WELL HEAD LAYOUT				
WELL NAME	NAD 27 (WV NORTH ZONE)		UTM ZONE 17 (METERS)	
	NORTHING	EASTING	NORTHING	EASTING
WALKER UNIT 1H	311616.72	1640963.71	4355497.51	519866.07
WALKER UNIT 2H	311625.67	1640968.16	4355500.26	519867.38
WALKER UNIT 3H	311634.62	1640972.60	4355503.01	519868.69
BURLINGTON UNIT 1H	311643.57	1640977.05	4355505.76	519870.00
BURLINGTON UNIT 2H	311652.52	1640981.50	4355508.51	519871.31
YOHO UNIT 1H	311661.48	1640985.99	4355511.26	519872.63
MANZAREK UNIT 1H	311670.43	1640990.43	4355514.01	519873.94
MANZAREK UNIT 2H	311679.38	1640994.88	4355516.76	519875.25
MANZAREK UNIT 3H	311688.33	1640999.33	4355519.51	519876.56
BROCADE UNIT 1H	311697.29	1641003.78	4355522.26	519877.87
BROCADE UNIT 2H	311706.24	1641008.26	4355525.01	519879.19

7.5 QUAD

1000 500 0 1000
SCALE: 1 INCH = 1000 FEET



SHEET INDEX	
PAGE NO.	DESCRIPTION
1	COVER PAGE AND LOCATION MAP
2	SCHEDULE OF QUANTITIES
3	NOTES
4 - 5	EXISTING CONDITIONS
6	OVERALL PLAN
7 - 11	SITE PLANS
12	WELL & W.C. PAD CROSS SECTIONS & PROFILE
13 - 17	ACCESS ROAD CROSS SECTIONS & PROFILE
18	ACCESS ROAD TO EXISTING WELL CROSS SECTIONS & PROFILE
19 - 24	DETAILS
25 - 29	RECLAMATION PLAN

4701706776

ISSUED FOR CONSTRUCTION

WELL LOCATION RESTRICTIONS

WELL PAD IS TO COMPLY WITH WELL LOCATION RESTRICTIONS OF WV CODE 22-6A-12. THE PADS COMPLY WITH THE FOLLOWING RESTRICTIONS:

- 250' FROM AN EXISTING WELL OR DEVELOPED SPRING USED FOR HUMAN OR DOMESTIC ANIMALS
- 625' FROM AN OCCUPIED DWELLING OR BARN GREATER THAN 2500 SF USED FOR POULTRY OR DAIRY MEASURED FROM THE CENTER OF THE PAD
- 100' FROM EDGE OF DISTURBANCE TO WETLANDS, PERENNIAL STREAMS, NATURAL OR ARTIFICIAL LAKE, POND OR RESERVOIR
- 300' FROM EDGE OF DISTURBANCE TO NATURALLY REPRODUCING TROUT STREAMS
- 1000' OF SURFACE OR GROUND WATER INTAKE TO A PUBLIC WATER SUPPLY

ewed at: Q\OIL GAS\SAY FILES\REVIEWS

JEFFERY B. CRAIG 20354 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER
7/28/14
SEAL

Received
Office of Oil & Gas
JUN 2 2 2015

KLEINFELDER
Bright People. Right Solutions.
230 EXECUTIVE DRIVE, SUITE 122
CRANBERRY TOWNSHIP, PA 16066
PH. 724-772-7072 FAX. 724-772-7079
www.kleinfelder.com

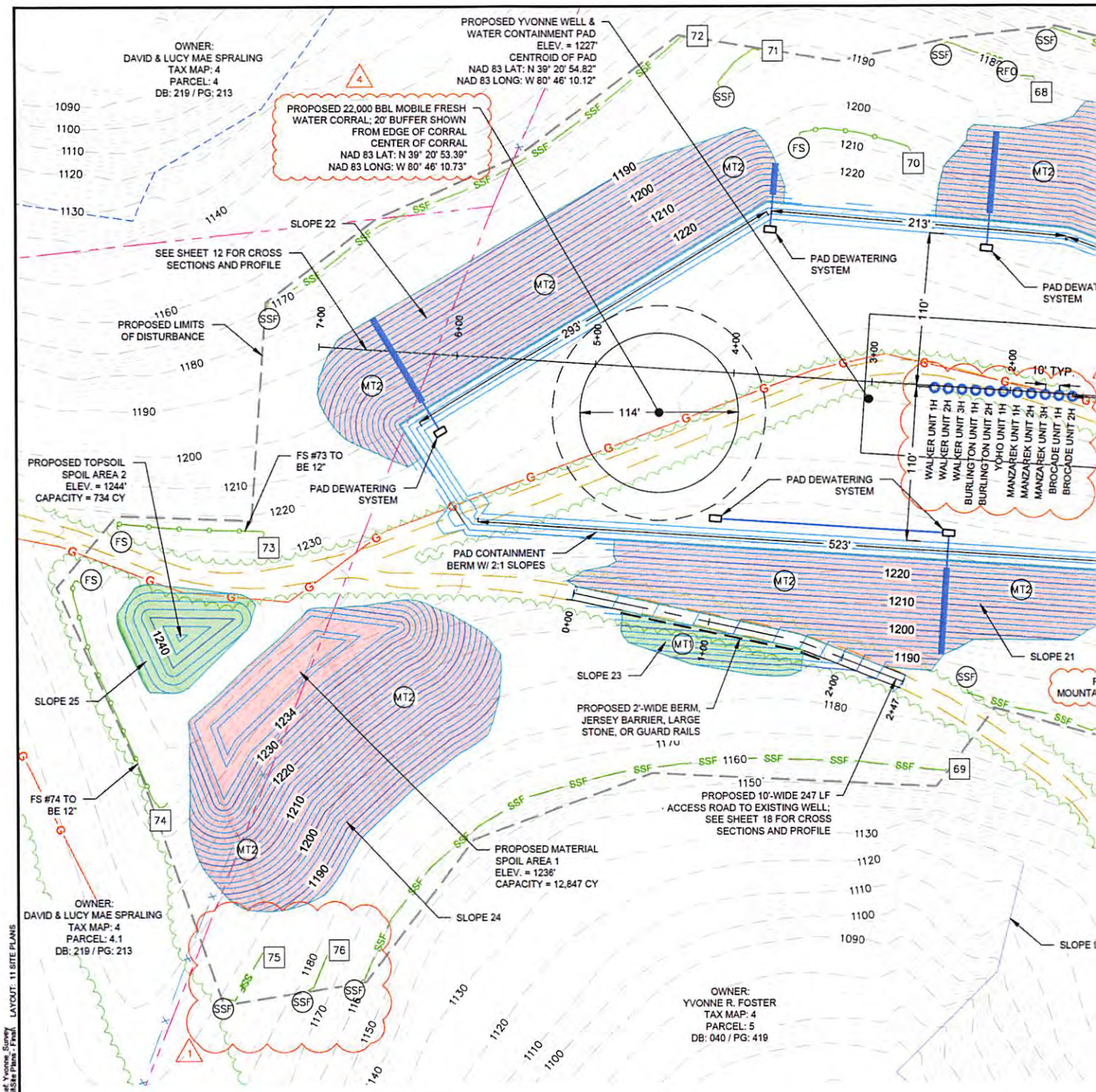
PROJ. NO. 134371
ACAD FILE: COVER.dwg

YVONNE WELL & W.C. PAD
COVER PAGE & LOCATION MAP

ANTERO RESOURCES CORPORATION
YVONNE WELL & WATER CONTAINMENT PAD
WEST UNION DISTRICT DODDRIDGE COUNTY WEST VIRGINIA

DESIGNED BY: RAP
MODIFIED BY:
CHECKED BY: JBC
DATE: 03-21-2014
SCALE:
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS
0 0.5 1.0 1.5 2.0
CONSTRUCTION
1
1 of 29 sheets

PLOTTED: 28 Jul 2014, 4:40pm, CLewis



LEGEND

- EX. INDEX CONTOUR (1360)
- EX. INTERMEDIATE CONTOUR
- EX. TREE LINE
- EX. PROPERTY LINE
- EX. WETLAND
- EX. STREAM
- EX. DRAINAGE FEATURE
- EX. CULVERT
- EX. GAS LINE (G)
- EX. OVERHEAD POWER LINE (OHW)
- EX. UTILITY POLE
- EX. ROAD
- EX. TRAIL
- EX. FENCE
- EX. STRUCTURE
- STREAM/WETLAND AREA OF INTEREST
- PROP. LIMITS OF DISTURBANCE
- PROP. FRENCH DRAIN
- PROP. INDEX CONTOUR (1360)
- PROP. INTERMEDIATE CONTOUR
- PROP. ROAD CENTERLINE
- PROP. PADS & ROAD EDGE
- PROP. 2' WIDE BERM, JERSEY BARRIER, LARGE STONE, OR GUARD RAILS
- SUPER SILT FENCE AND FILTER SOCK INDICATION (SEE SHEET 21 FOR SUPER SILT FENCE AND FILTER SOCK TABLE (24))
- PROP. PAD PERIMETER SUMP
- PROP. WELL HEAD
- PROP. PVC PIPE FOR SUMP SYSTEM
- PROP. FILTER SOCK (FS)
- PROP. SUPER SILT FENCE (SSF)
- PROP. NAG SC150 EROSION CONTROL MATTING* (MT1)
- PROP. NAG SC250 EROSION CONTROL MATTING* (MT2)
- PROP. OUTLET PROTECTION (OP)
- PROP. INLET PROTECTION (IP)
- PROP. ROCK FILTER OUTLET (RFO)

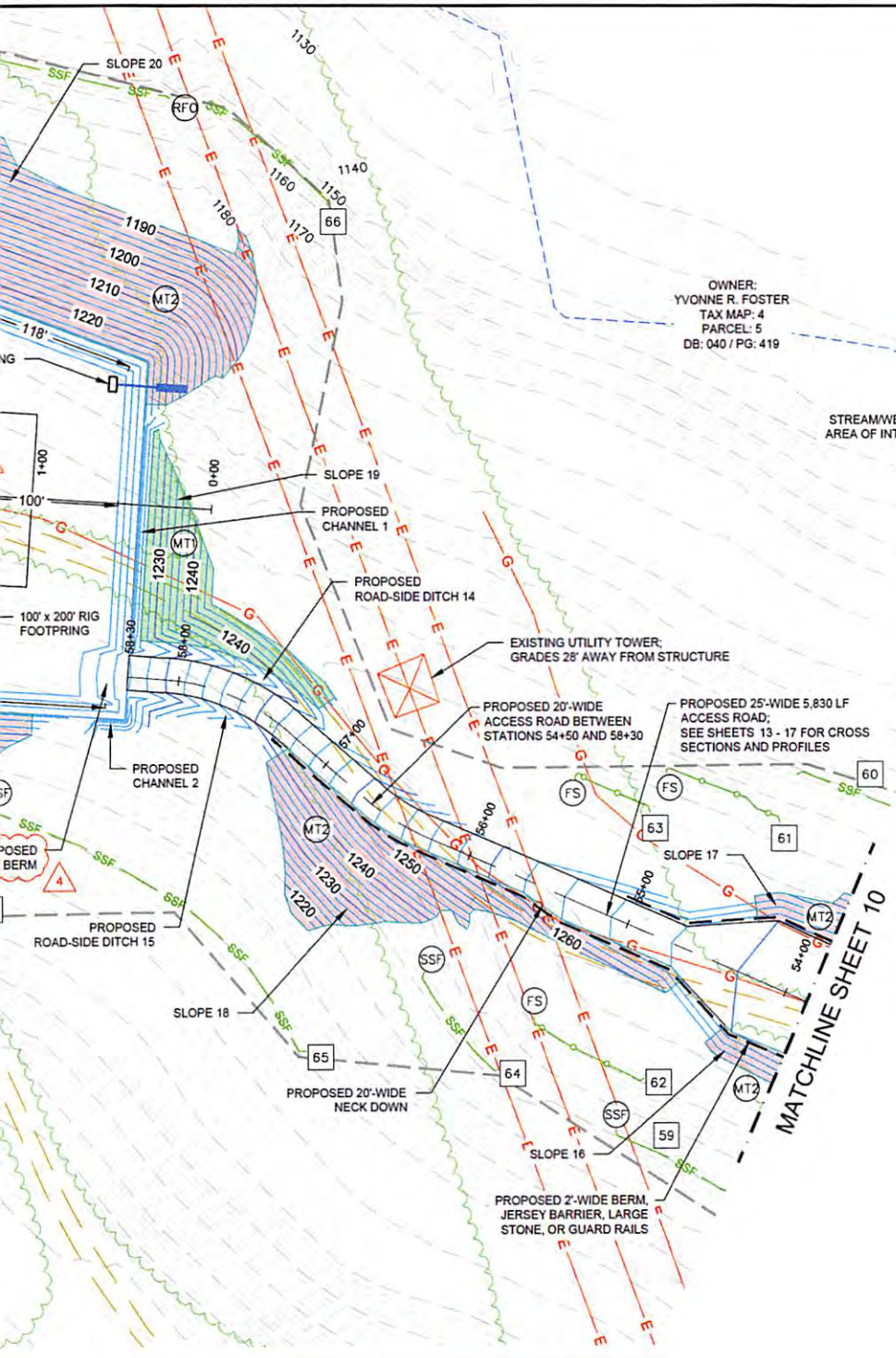
*HYDROMULCHING MAY BE USED IN LIEU OF MATTING PER MANUFACTURERS SPECIFICATIONS

NOTES:

1. THE GRADES SHOWN REPRESENT FINISH GRADE ELEVATIONS.
2. PIPE MATERIALS SHALL BE AS NOTED ON THE PLAN AND IN THE STORM DRAINAGE
3. CUT AND FILL SLOPES SHALL BE AT 2H:1V UNLESS NOTED OTHERWISE.
4. FILL SHALL BE PLACED IN 12" LIFTS AND BE COMPACTED TO 95% STANDARD PROCT
5. INTERMEDIATE TOE BENCHES SHALL BE INSTALLED ON FILL SLOPES AT INTERVALS
6. ALL FILL SLOPES SHALL BE TOE KEYED PER THE DETAIL SHOWN ON SHEET 22.
7. POSITIVE FLOW FROM PAD TO SUMPS. SEDIMENTS AND MATERIAL REMOVED FRO APPROVED COMMERCIAL VENDOR.
8. ALL STORMWATER CONVEYANCES ON THE SITE HAVE BEEN DESIGNED TO ACCOM
9. SEE DETAIL 2, SHEET 20 FOR RIP RAP OUTLET PROTECTION SIZING AND DESIGN.
10. CONTRACTOR TO INSTALL ROCK CHECK DAMS WITHIN ROADSIDE DITCHES. SEE DE MEASURES AND REMAIN IN PLACE AS PERMANENT CHECK DAMS AFTER CONSTRU
11. ALL FILTER SOCK TO BE 18" UNLESS OTHERWISE NOTED.
12. IN TOPSOIL PLACEMENT AREAS, CONTRACTOR TO INSTALL PROPER BMPS TO ENSU
13. INSTALL ROCK FILTER OUTLETS ALONG SEDIMENT BARRIERS AS SHOWN AND AT L

ATTACHED IMAGES:
ATTACHED XREFS: XRef: ANTERO 11x17 TITLE BLOCK; XRef: Yvonne_Base; XRef: Yvonne_Parcels; XRef: Yvonne_Survey
CAD FILE: G:_clients\Antero\Facilities\Yvonne\Design\Civil\Site Plans - Final_LAYOUT: 11 SITE PLANS

10-15-12 REVISED BY: CAL



APPROVED
WVDEP OOG
SAY 7/29/2014

NO.	REVISION	BY	DATE
1	EC & TOE BENCH REVISIONS	KLF	04-08-14
2	REVISED WELL HEAD LAYOUT	KLF	05-14-14
3	CORPORATE ADDRESS	KLF	06-03-14
4	DEP COMMENTS	KLF	07-28-14
5	-	---	---

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CRANBERRY TOWNSHIP, PA 16066
PH. 724-772-7072 FAX. 724-772-7079
www.kleinfelder.com

PROJ. NO. 134371
ACAD FILE: SITE PLAN.dwg

YVONNE WELL & W.C. PAD SITE PLANS

ANTERO RESOURCES CORPORATION
YVONNE WELL & WATER CONTAINMENT PAD
WEST UNION DISTRICT
DODDRIDGE COUNTY
WEST VIRGINIA

50 25 0 50
SCALE: 1 INCH=50 FEET

ISSUED FOR CONSTRUCTION

UTILITIES WITHIN PROPOSED GRADING TO BE RELOCATED; SEE UTILITY EXHIBIT

MPUTATION TABLE.

50' VERTICAL FEET OR LESS IF SOILS CONDITIONS WARRANT ADDITIONAL SLIP PRECAUTIONS.

HE PAD SUMPS SHALL BE PUMPED TO ON-SITE HOLDING/STORAGE TANKS AND SUBSEQUENTLY REMOVED FROM SITE BY AN

DATE THE 10-YEAR STORM EVENT.

L ON PAGE 21 FOR SPACING REQUIREMENTS. ROCK CHECK DAMS WILL BE INSTALLED DURING CONSTRUCTION AS EROSION CONTROL
ON IS COMPLETE.

E NO OFFSITE EROSION & SEDIMENTATION RUNOFF.

POINTS AS IDENTIFIED IN THE FIELD.

JEFFERY B. CRISP
REGISTERED
20354
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER

SEAL

Received
Office of Oil & Gas
JUN 21 2014

DESIGNED BY: RAP
MODIFIED BY: -
CHECKED BY: JBC
DATE: 03-21-2014
SCALE:

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS
0 0.5 1.0 1.5 2.0

CONSTRUCTION

11

11 of 29 sheets

PLOTTED: 28 Jul 2014, 4:45pm, CLewis

Antero Resources Corporation Erosion and Sediment Control Plan for Yvonne Well and Water Containment Pad

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

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

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

4701706776

1. A pre-construction Conference will be held on site with contractor to review the construction drawings and provide any requested guidance.
2. Stake/Flag distributed work area, clearly identifying wetland and stream edges and buffers. Install signs to designate the area and orange safety fence to identify important project attributes such as approved access roads, no refueling zones, wetland/stream bounds, ETC.
3. Construct the construction entrance.
4. Construct all proposed sediment control devices as soon as clearing and grubbing operations allow. Diversions and sediment basins shall be seeded and mulched immediately.
5. Prior to grading or other earth disturbance on the parcel, permanent down slope BMPs are to be installed.
6. Clear and grub, remove topsoil and place as shown on the plans. Topsoil stockpile to be seeded and mulched. E&S BMPs shall be constructed around topsoil stockpiles as shown.
7. Grading operations as required. Cut slopes and all slopes shall be topsoiled as needed. Ditch lines shall be cleaned. All ditches will have at least grass lining protection or as specified in site calculations on sheet 4.
8. The access road shall be constructed up to the proposed pads. The access road shall receive a stone surface.
9. Install proposed equipment pad and equipment pad berms.
10. Culvert inlet and outlet protection shall be constructed immediately upon placement of inlets and culverts. Installation of matting and/or RIP RAP to occur once ditches are constructed.
11. Side slope stabilization matting and stabilization shall occur as soon as possible.
12. At the end of each work day, where the parcel has been graded, including any stripping, stumping, leveling, 2:1 on side slopes, ETC. BMPs are to be installed. In no case is the contractor

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to leave the job site at the end of the work day without temporary or permanent BMPs being installed. The contractor is not required to maintain waterbars during the work day unless the environmental inspector determines that there is a risk of a rain event that warrants their immediate installation.

13. When final grade is achieved, topsoil to be placed on all disturbed areas not lined. Seed all disturbed areas as required. A soil sample should be taken and tested to determine recommended rates. If no soils sample is taken the following rates should be applied as a minimum: Lime at a rate of 4 tons per acre. Fertilize at a rate of 500 lbs. of 10-20-10 per acre. Seed with 45 lbs. Per acre of tall fescue and 20 lbs. per acre of perennial rye grass.
14. Lime, fertilizer, and seed will be applied. Hydro-mulch products shall be mixed and installed in accordance with manufacturer's specifications, or erosion control blanket shall be installed per plans & specifications.
15. Final seeding must occur within 7 days of final grading.
16. When site is stabilized, all erosion and sediment control measures can be removed and repair/stabilize those areas in accordance with state standards.
17. Make modifications for permanent stormwater management.
18. Final site inspection. A notice of termination should be filed with DEP upon final stabilization.

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

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Antero Response:
Stabilization methods used include seeding and mulching of disturbed areas as well as the implementation of erosion and sediment control BMPs. Please refer to Notes on page 3 as well as "Details" on page 19-24 for detailed descriptions of the different stabilization methods to be used. Seeding and mulching is to be in accordance with the WVDOT Standard Specifications unless specified otherwise in the plans or unless specified otherwise by the construction engineer or Antero representative. Please refer to number 11 under General Erosion & Sediment Control Notes on page 3 of the Site Design for more specific information regarding application, liming, and mulching rates.

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

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

temporary erosion and sediment BMPs controls will be removed. Areas disturbed during removal of the BMPs will be stabilized immediately.

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

Antero Response:
Please refer to the "Notes" on pages 3 and "Details" on pages 19-24 in the Site Design for specifications including instructions for installation, inspection, and maintenance for erosion and sediment control BMPs employed at this site.

Requirement §5.4.b.3. *A vicinity map locating the site in relation to the surrounding area and roads;*

Antero Response:
A "Vicinity Map" locating the site in relation to the surrounding area and roads is included on page 1 the Site Design.

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

Antero Response:
"Overall Site plan" maps are included on page 6 of the Site Design. Specific design and layout and inspection and maintenance notes for a stabilized construction entrance are included in the "Notes" verbiage on page 3.

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

Antero Response:
"Notes" and "Overall Site Plans" maps included on pages 3 and 6 of the Site Design locate all proposed erosion and sediment control BMPs.

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Antero Resources Corporation Site Construction Plan for

Yvonne Well and Water Containment Pad

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

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

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

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

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

Antero Response
Please refer to the vicinity map on page 1 for the location the site in relation to the surrounding area and roads.

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

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

Antero Response
The limit of disturbance for the Yvonne Well and Water Containment Pad can be found on "Overall Site Plan" on page 6 of the Site Design.

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

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Antero Response
Please refer to the "Existing Conditions" map on page 4-5 of the Site Design for the current topographic conditions for the constructed pad on a contour interval that affords sufficient detail to illustrate site terrain conditions.

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

Antero Response
Please refer to the "Overall Site Plan" on page 6 as well as the "Well & W.C Pad Cross Sections & Profile," "Access Road Cross Sections & Profile," and "Access Road to Existing well Cross Sections & Profile," on pages 12-18 of the Site Design for proposed cut and fill areas with grading contours.

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

Antero Response
Please refer to "Overall Site Plan" and "Site Plans" on pages 6-11 of the Site Design for the maps identifying any structures, roads, water bodies, and other critical areas within the area of interest that would be most likely affected by construction.

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

Antero Response
Please refer to the the "Overall Site Plan" on page 6 as well as the "Well & W.C Pad Cross Sections & Profile," "Access Road Cross Sections & Profile," and "Access Road to Existing well Cross Sections & Profile," on pages 12-18 for a cross-section of the location. The cut and fill volumes can be found in "Schedule of Quantities" on page 2.

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

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

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

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

> ***Requirement §5.5.c.1.*** *All woody material, brush, and trees shall be cleared from the site area and kept to the minimum necessary for proper construction, including the installation of*

necessary sediment controls. Trees six inches in diameter and larger shall be cut and logs stacked;

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

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

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

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

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

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

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

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Requirement §3.2.b.5. *Embankment material shall exhibit adequate soil strength and contain the proper amount of moisture to ensure that compaction will be achieved;*

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

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

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

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

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

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

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

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

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

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

Antero Response
"Notes," "Site Plans" and "Details" on pages 3, 7-11, and 19-24 of the Site Design identifies the surface diversions used to prevent surface water and subsurface water from flowing on to the well pad and coming into contact with the stormwater associated with the well pad. Additional Erosion & Sediment BMPs will be used to prevent sediment discharges from the project.

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

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

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