



west virginia department of environmental protection

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

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

Thursday, July 19, 2018
WELL WORK PERMIT
Horizontal 6A / New Drill

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit approval for GATRELL UNIT 3H
47-095-02505-00-00

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: GATRELL UNIT 3H
Farm Name: JOHN SHEPHERD
U.S. WELL NUMBER: 47-095-02505-00-00
Horizontal 6A New Drill
Date Issued: 7/19/2018

PERMIT CONDITIONS

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

CONDITIONS

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

PERMIT CONDITIONS

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

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

1) Well Operator: Antero Resources Corporation 494507062 095 - Tyler McElroy Shirley 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Gatrell Unit 3H Well Pad Name: Shepherd Pad

3) Farm Name/Surface Owner: John Shepherd Public Road Access: Sandy Creek Rd

4) Elevation, current ground: 949' Elevation, proposed post-construction: ~935'

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No No

DMH 5-21-18 *GPB 5/21/2018*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale: 7100' TVD, Anticipated Thickness- 55 feet, Associated Pressure- 2950#

8) Proposed Total Vertical Depth: 7100' TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 10500' MD

11) Proposed Horizontal Leg Length: 2181'

12) Approximate Fresh Water Strata Depths: 98', 408'

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

14) Approximate Saltwater Depths: 1586'

15) Approximate Coal Seam Depths: None Identified

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

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

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

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Environmental Protection

WW-6B
(04/15)

4709502505
API NO. 47-095
OPERATOR WELL NO. Gatrell Unit 3H
Well Pad Name: Shepherd Pad

18)

CASING AND TUBING PROGRAM

| TYPE | Size (in) | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling (ft) | INTERVALS: Left in Well (ft) | CEMENT: Fill-up (Cu. Ft.)/CTS |
|--------------|-----------|-------------|-------|------------------------|----------------------------|------------------------------|-------------------------------|
| Conductor | 20" | New | H-40 | 94# | 80' | 80' ✓ | CTS, 77 Cu. Ft. |
| Fresh Water | 13-3/8" | New | J-55 | 54.5# | 460' *see #19 | 460' *see #19 ✓ | CTS, 583 Cu. Ft. |
| Coal | 9-5/8" | New | J-55 | 36# | 2500' | 2500' | CTS, 1018 Cu. Ft. |
| Intermediate | | | | | | | |
| Production | 5-1/2" | New | P-110 | 23# | 10500' | 10500' ✓ | 2480 Cu. Ft |
| Tubing | 2-3/8" | New | N-80 | 4.7# | | 7100' | |
| Liners | | | | | | | |

QEB 5/21/2016 DMH 5-21-18

| TYPE | Size (in) | Wellbore Diameter (in) | Wall Thickness (in) | Burst Pressure (psi) | Anticipated Max. Internal Pressure (psi) | Cement Type | Cement Yield (cu. ft./k) |
|--------------|-----------|------------------------|---------------------|----------------------|--|-----------------------|--------------------------|
| Conductor | 20" | 24" | 0.438" | 1530 | 50 | Class A | ~1.18 |
| Fresh Water | 13-3/8" | 17-1/2" | 0.38" | 2730 | 1000 | Class A | ~1.18 |
| Coal | 9-5/8" | 12-1/4" | 0.352" | 3520 | 1500 | Class A | ~1.18 |
| Intermediate | | | | | | | |
| Production | 5-1/2" | 8-3/4" & 8-1/2" | 0.415" | 12,630 | 2500 | Lead-H/POZ & Tail - H | H/POZ-1.44 & H-1.8 |
| Tubing | 2-3/8" | 4.778" | 0.19" | 11,200 | | | |
| Liners | | | | | | | |

PACKETS RECEIVED
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| | | | |
|-------------|-----|--------------------------|--|
| Kind: | N/A | MAY 25 2018 | |
| Sizes: | N/A | WV Department of | |
| Depths Set: | N/A | Environmental Protection | |

WW-6B
(10/14)

API NO. 47-095 -

OPERATOR WELL NO. Gatrell Unit 3H

Well Pad Name: Shepherd 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.

QJP
5/21/2018
DMH
5-21-18

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): 26.43 acres

22) Area to be disturbed for well pad only, less access road (acres): 8.13 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-43 + 0.05% ACSA-1 + 0.2% ACR-20

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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

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

MAY 25 2018

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Environmental Protection

*Note: Attach additional sheets as needed.

| UWI (API Num) | Well Name | Well Number | Operator | Hist Oper | TD | Perforated Interval MD (shallowest, deepest) | Perforated Formation(s) | Producible Formation(s) not perf'd |
|----------------|-------------|-------------|------------------------------|------------------------------|--------|---|-------------------------|------------------------------------|
| 47017064170000 | KNIGHT UNIT | 2H | ANTERO RESOURCES CORPORATION | ANTERO RESOURCES CORPORATION | 16,957 | 7,189 - 16,854 | Marcellus | |

4709502505

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4709502505

Gatrell Unit 3H



Antero Resources Corporation

Getrell Unit 3H - AOR



 WELL SYMBOLS
Gas Well

April 11, 2018

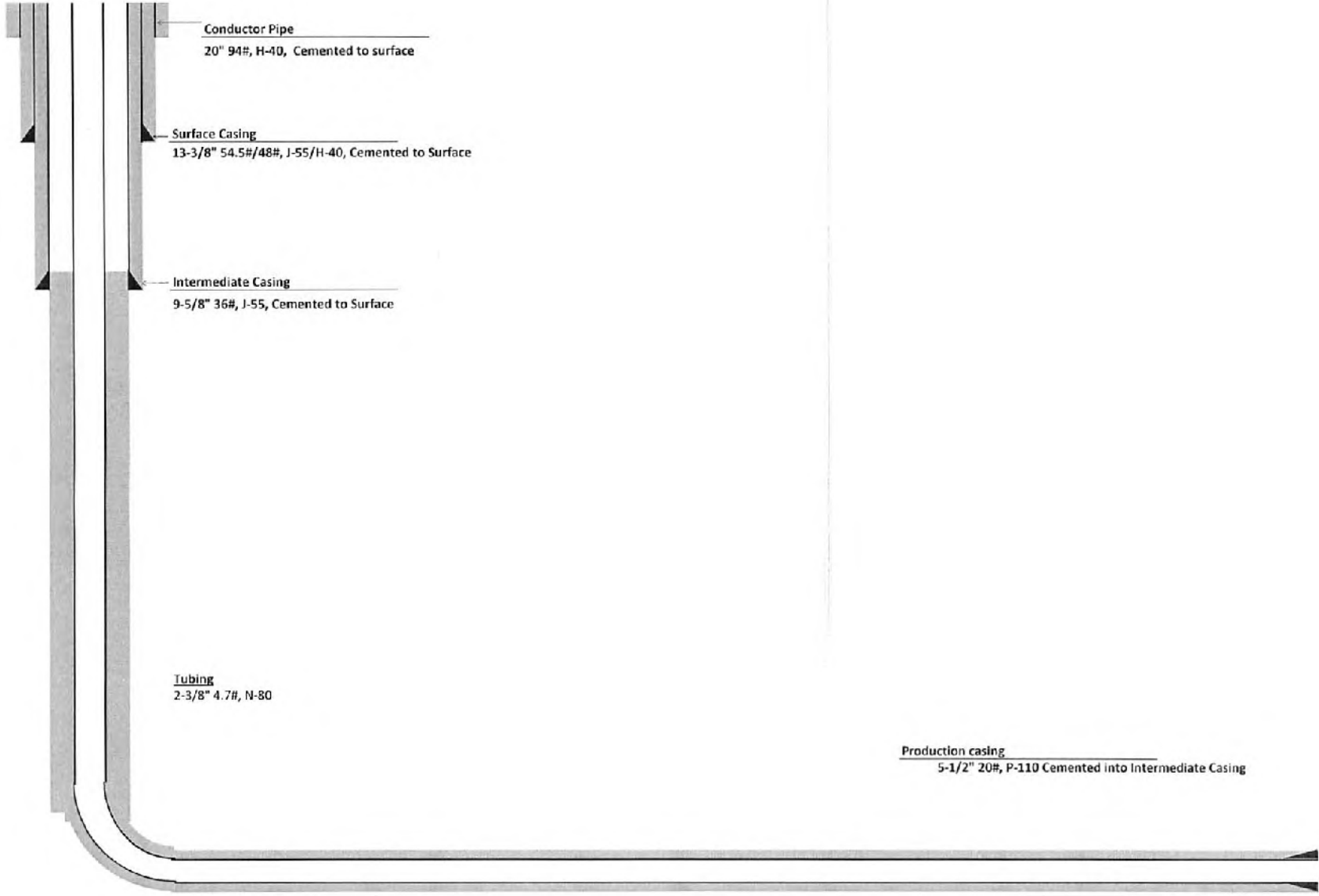
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47017064170000

07/20/2018

4709502505

EXHIBIT 5: WELLBORE SCHEMATIC



WW-9
(4/16)

API Number 47 - 095 - _____
Operator's Well No. Gatrell Unit 3H

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Antero Resources Corporation OP Code 494507062

Watershed (HUC 10) McElroy Creek Quadrangle Shirley 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 binned 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
- Undergound Injection (UIC Permit Number *UIC Permit # will be provided on Form WR-34 ✓)
- Reuse (at API Number Future permitted well locations when applicable. API# will be provided on Form WR-34 ✓)
- Off Site Disposal (Supply form WW-9 for disposal location) (Meadowfill Landfill Permit #SWF-1032-98 ✓)
- Other (Explain Northwestern Landfill Permit #SWF-1025/ WV0109410 ✓)

JOB 5/21/2018
D.M.H. 5/21/18

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

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

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

Additives to be used in drilling medium? Please See Attachment

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

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

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

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

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

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

Company Official Signature *Gretchen Kohler* **RECEIVED**
Office of Oil and Gas
MAY 25 2018

Company Official (Typed Name) Gretchen Kohler

Company Official Title Senior Environmental & Regulatory Manager

West Virginia Department of Environmental Protection

Subscribed and sworn before me this 27 day of April, 2018

[Signature]

Notary Public

My commission expires March 29, 2022

KARIN COX
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20184014160
MY COMMISSION EXPIRES MARCH 29, 2022

Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 26.43 acres Prevegetation pH _____

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

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

Fertilizer amount 500 lbs/acre

Mulch 2-3 Tons/acre

Access Road "A" (8.37 acres) + Temporary Access Road "B" (1.92) + Co. Rt. 62 Bump-Out (0.24) + Well Pad (8.13 acres) + Water Containment Pad (4.22 acres) + Excess/Topsoil Material Stockpiles (3.55 acres) = 26.43 Total Affected Acres

| Temporary | | Permanent | |
|--|----------|---|----------|
| Seed Type | lbs/acre | Seed Type | lbs/acre |
| Annual Ryegrass | 40 | Crownvetch | 10-15 |
| Field Bromegrass | 40 | Tall Fescue | 30 |
| See attached Table IV-3 for additional seed type (Page 25 Shepherd Pad Design) | | See attached Table IV-4A for additional seed type (Page 25 Shepherd Pad Design) | |
| *or type of grass seed requested by surface owner | | *or type of grass seed requested by surface owner | |

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]

Comments: _____

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Title: Oil & Gas Inspector Date: 5/21/2018

Field Reviewed? Yes No

Form WW-9 Additives Attachment**SURFACE INTERVAL**

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

INTERMEDIATE INTERVAL***STIFF FOAM RECIPE:***

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

PRODUCTION INTERVAL

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

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

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911 Address
120 Sandys Run Rd
Shirley, WV 26434

Well Site Safety Plan

Antero Resources

Well Name: Gatrell Unit 3H

Dmt
5/21/18

Pad Location: SHEPHERD PAD

Tyler County/McElroy District

Jeb
5/21/2018

GPS Coordinates:

Entrance - Lat 39°23'29.3"/Long -80°45'55.9" (NAD83)

Pad Center - Lat 39°23'37.2"/Long -80°45'39.9" (NAD83)

Driving Directions:

From Post Office in Shirley: Travel West on WV-23 W towards Co Rd 6/2. Turn left onto Rd 6/2 for 0.1 miles. Slight right to stay on Co Rd 6/2 for 0.5 miles. Turn left for 0.2 miles. Lease road will be on your left.

Alternate Route:

From the intersection of McElroy Creek Road and Big Flint Rd: Head west on WV-23 W toward Braden Hill for 2.3 miles. Turn left onto Rd 6/2 for 0.1 miles. Slight right to stay on Co Rd 6/2 for 0.5 miles. Turn left for 0.2 miles. Lease road will be on your left.

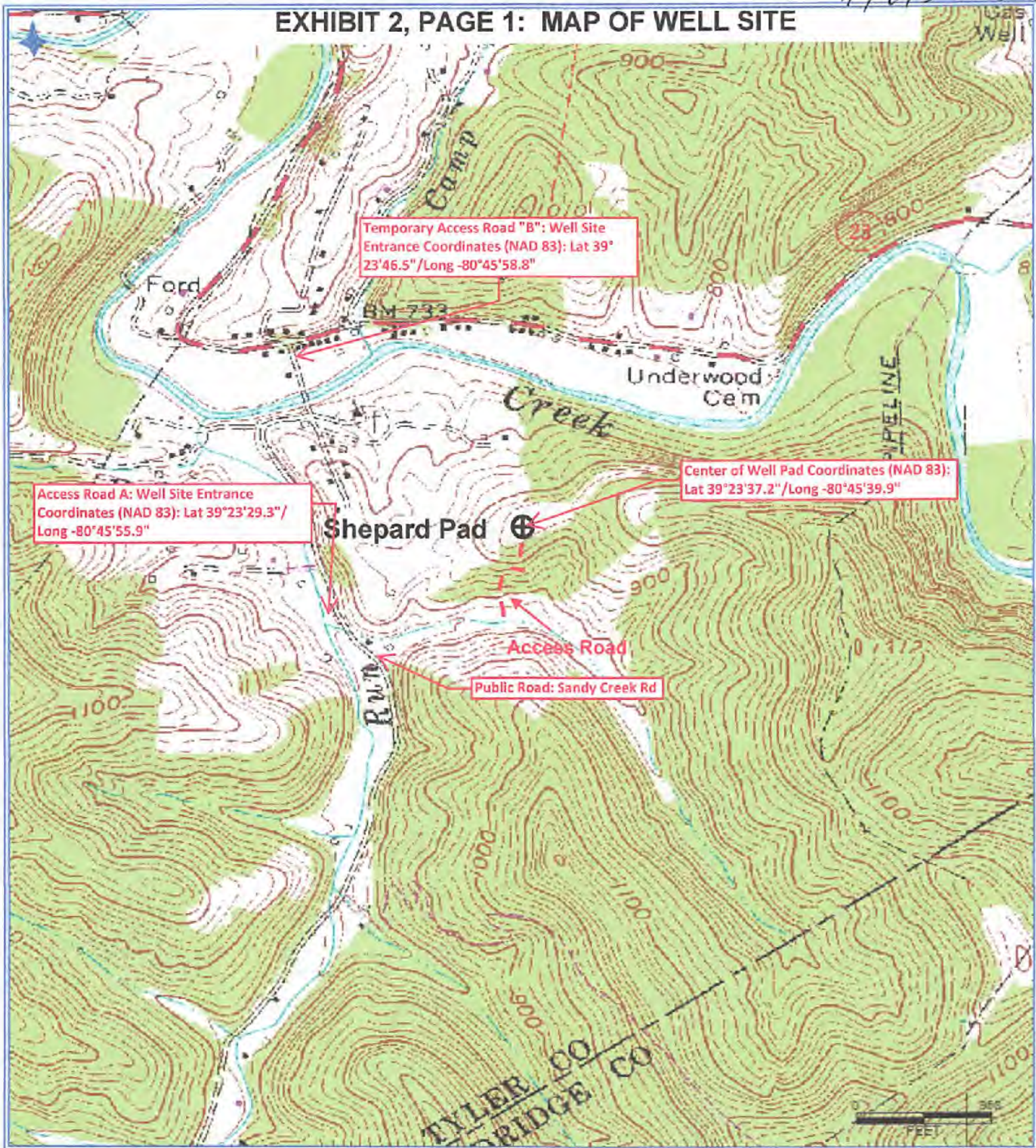
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EMERGENCY (24 HOUR) CONTACT 1-800-878-137

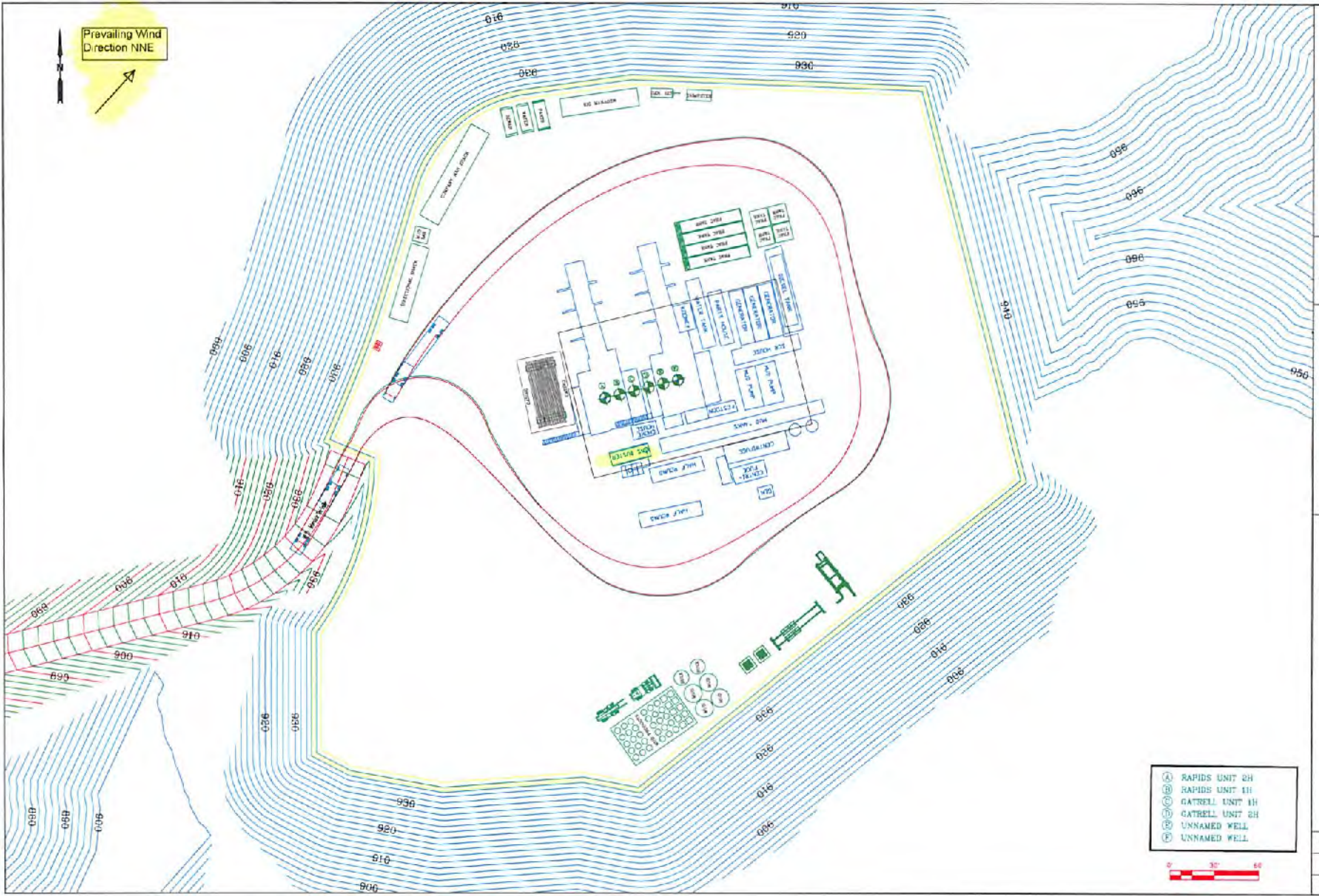
EXHIBIT 2, PAGE 1: MAP OF WELL SITE



Antero Resources Corporation
 Appalachian Basin
 Shepherd Pad
 Tyler County

Quadrangle: Shirley
 Watershed: McElroy Creek
 District: McElroy
 Date: 4-12-2018

5052056064



| REVISION | DATE |
|----------|------|
| | |
| | |
| | |



**SHEPARD PAD
DRILLING EXHIBIT
FRONTIER 22**
NORTH CANTON PROSPECT

Date: 07/20/17
Drawn By: BR
Scale: As Shown

LATITUDE 39°25'00" 3,162'
 LATITUDE 39°25'00" 3,003'

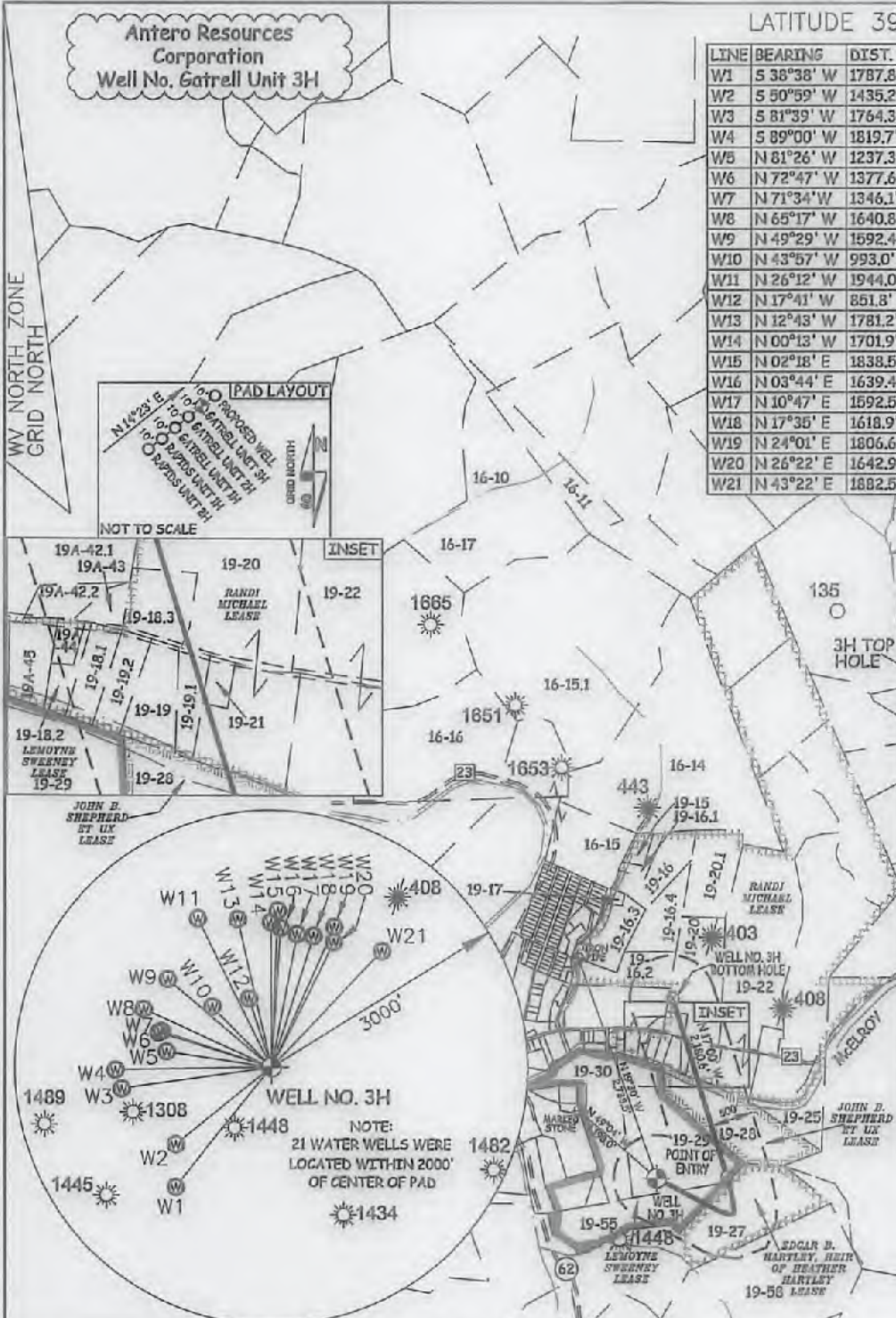
LONGITUDE 80°45'00" 8,430'
 LONGITUDE 80°45'00" 6,318' TO BOTTOM HOLE

Antero Resources Corporation
 Well No. Gatrell Unit 3H

| LINE | BEARING | DIST. |
|------|------------|---------|
| W1 | S 38°38' W | 1787.8' |
| W2 | S 50°59' W | 1435.2' |
| W3 | S 81°39' W | 1764.3' |
| W4 | S 89°00' W | 1819.7' |
| W5 | N 81°26' W | 1237.3' |
| W6 | N 72°47' W | 1377.6' |
| W7 | N 71°34' W | 1346.1' |
| W8 | N 65°17' W | 1640.8' |
| W9 | N 49°29' W | 1592.4' |
| W10 | N 43°57' W | 993.0' |
| W11 | N 26°12' W | 1944.0' |
| W12 | N 17°41' W | 851.8' |
| W13 | N 12°43' W | 1781.2' |
| W14 | N 00°13' W | 1701.9' |
| W15 | N 02°18' E | 1838.5' |
| W16 | N 03°44' E | 1639.4' |
| W17 | N 10°47' E | 1592.5' |
| W18 | N 17°35' E | 1618.9' |
| W19 | N 24°01' E | 1805.6' |
| W20 | N 26°22' E | 1642.9' |
| W21 | N 43°22' E | 1882.5' |

NOTES:
 WELL 3H TOP HOLE INFORMATION:
 N: 327,941ft E: 1,643,577ft
 LAT: 39°23'36.69" LON: 80°45'40.27"
 BOTTOM HOLE INFORMATION:
 N: 330,050ft E: 1,643,765ft
 LAT: 39°23'57.56" LON: 80°45'38.25"
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:
 WELL 3H TOP HOLE INFORMATION:
 N: 4,360,484m E: 520,579m
 BOTTOM HOLE INFORMATION:
 N: 4,361,128m E: 520,626m



| TM-Per | Surface Owner | Book/Pg | Acreage |
|----------|------------------|----------|----------|
| 16-10 | Miles Ross Inc. | 365/372 | 43 AC |
| 16-11 | Charles Straight | 347/232 | 12 AC |
| 16-14 | John Merritt | W63/39 | 86.25 AC |
| 16-15 | Kan Der Jr. | 352/408 | 27.84 AC |
| 16-15.1 | Kan Der Jr. | 349/278 | 99.98 AC |
| 16-16 | Harry Vannoy | W58/559 | 57.79 AC |
| 16-17 | Charles Straight | 264/597 | 98.77 AC |
| 19-15 | Sharon George | 316/481 | 1.89 AC |
| 19-16 | Teresa Weekley | 328/431 | 8.72 AC |
| 19-16.1 | Teresa Weekley | W29/263 | 1.84 AC |
| 19-16.2 | Clifton Weekley | 328/431 | 8.98 AC |
| 19-16.3 | Clarissa Seass | 328/434 | 8.88 AC |
| 19-16.4 | Perry Weekley | 328/649 | 8.72 AC |
| 19-17 | Barren Seass | 322/62 | 0.81 AC |
| 19-18.1 | Michael Daws | 359/302 | 1.36 AC |
| 19-18.2 | Charles Ferrebee | 347/651 | 0.296 AC |
| 19-18.3 | Denver Giffin | 279/290 | 1.55 AC |
| 19-19 | Anita Doll | 363/45 | 1.65 AC |
| 19-19.1 | Gary Hamilton | 327/379 | 1 AC |
| 19-19.2 | Michael Davis | 359/302 | 1.09 AC |
| 19-20 | Howard Stubbs | 228/32 | 18.75 AC |
| 19-20.1 | Howard Stubbs | 330/630 | 12 AC |
| 19-21 | Howard Stubbs | 469/437 | 1.03 AC |
| 19-22 | Dauglas Enrie | 334/268 | 8.27 AC |
| 19-25 | Jonathan Yost | 350/298 | 14 AC |
| 19-27 | Sandra Hopper | 337/168A | 99 AC |
| 19-28 | William Ferbee | 474/512 | 18 AC |
| 19-29 | John Shepherd | 330/115 | 31.75 AC |
| 19-30 | John Shepherd | 330/115 | 18.04 AC |
| 19-35 | Heith Howell | 518/784 | 7 AC |
| 19-38 | Robert Gille | 317/545 | 86.13 AC |
| 19A-42.1 | Clarissa Reed | AR48/13 | 4.25 AC |
| 19A-42.2 | Clarissa Reed | AR48/13 | 0.75 AC |
| 19A-43 | Dean Garrison | 348/558 | 0.5 AC |
| 19A-44 | Charles Ferrebee | 347/651 | 0.35 AC |
| 19A-45 | Mary Stubbs | 190/481 | 3.24 AC |

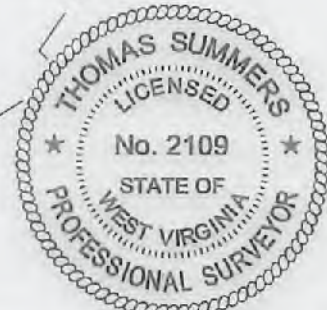
I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



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

(NAD) 27 (UTM) ZONE 17 COORDS:
 WELL 3H TOP HOLE INFORMATION:
 N: 14,305,307ft E: 1,707,886ft
 POINT OF ENTRY INFORMATION:
 N: 14,305,345ft E: 1,708,714ft
 BOTTOM HOLE INFORMATION:
 N: 14,307,418ft E: 1,708,039ft

NOTE:
 NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.



| | | |
|--|----------------------------------|------------------------------------|
| JOB # 18-003WA | LEGEND | REFERENCES |
| DRAWING # GATRELL3Hsherty | Surface Owner Boundary Lines +/- | STAKE/NAIL, SET |
| SCALE 1" = 2000' | Interior Surface Tracts +/- | WELL NO. 3H |
| MINIMUM DEGREE OF ACCURACY SUBMETER | Existing Fence | DATE 04/13/18 |
| PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS | Found monument, as noted | OPERATOR'S WELL # GATRELL UNIT #3H |
| STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS | THOMAS SUMMERS P.S. 2109 | |
| WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL | | |
| (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X | | |
| LOCATION: ELEVATION 949' - ORIGINAL 935' PROPOSED | | |
| QUADRANGLE SHIRLEY 7.5' | | |
| SURFACE OWNER JOHN SHEPHERD | | |
| OIL & GAS ROYALTY OWNER LEMOYNE SWEENEY; EDGAR B. HARTLEY, HEIR OF HETHER HARTLEY; | | |
| JOHN B. SHEPHERD ET UX; RANDI MICHAEL | | |
| PROPOSED WORK: DRILL X CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE X | | |
| PLUG OFF OLD FORMATION PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL | | |
| (SPECIFY) PLUG & ABANDON CLEAN OUT & REPLUG | | |
| TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,100' TVD 10,500' MD | | |
| WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM | | |
| ADDRESS 1815 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD | | |
| DENVER, CO 80202 CHARLESTON, WV 25313 | | |

07/20/2018

WW-6A1

Operator's Well Number Gatrell Unit 3H

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

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

| Grantor, lessor, etc. | Grantee, lessee, etc. | Royalty | Book/Page |
|---|--|-------------|-----------|
| <u>Lemoyne Sweeney Lease</u> | | | |
| Lemoyne Sweeney | Four Leaf Land Company | 1/8 | 0370/0617 |
| Four Leaf Land Company | Antero Resources Appalachian Corporation | Assignment | 0403/0566 |
| Antero Resources Appalachian Corporation | Antero Resources Corporation | Name Change | Exhibit 1 |
| <u>Edgar B. Hartley, Heir of Heather Hartley Lease</u> | | | |
| Edgar B. Hartley, Heir of Heather Hartley | Antero Resources Corporation | 1/8+ | 0498/0326 |
| <u>John B. Shepherd et ux Lease</u> | | | |
| John B. Shepherd et ux | Antero Resources Appalachian Corporation | 1/8+ | 0437/0327 |
| Antero Resources Appalachian Corporation | Antero Resources Corporation | Name Change | Exhibit 1 |

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*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.

07/20/2018

WW-6A1
(5/13)

Operator's Well No. Gatrell Unit 3H

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

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

| Lease Name or Number | Grantor, Lessor, etc. | Grantee, Lessee, etc. | Royalty | Book/Page |
|----------------------------|-----------------------|------------------------------|---------|-----------|
| <u>Randi Michael Lease</u> | Randi Michael | Antero Resources Corporation | 1/8+ | 0474/0777 |

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

**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

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

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Environmental Protection

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

Well Operator: Antero Resources Corporation
By: Diana Hoff
Its: Vice President of Operations

4709502505



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

April 27th, 2018

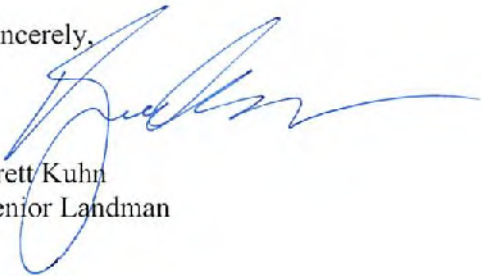
West Virginia Department of Environmental Protection
Chief, Office of Oil and Gas
Attn: Mr. James Martin
601 57th Street SE
Charleston, WV 25304

RE: Gatrell Unit 3H
Quadrangle: Shirley 7.5'
Tyler County/McElroy District, West Virginia

Mr. Martin:

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

Sincerely,


Brett Kuhn
Senior Landman

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WV Department of
Environmental Protection

07/20/2018

APR 30 2018

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

Date of Notice Certification: 04/26/2018

API No. 47- 095 - _____
Operator's Well No. Gatrell Unit 3H
Well Pad Name: Shepherd Pad

Notice has been given:

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

| | | |
|---------------------------------|--|---------------------------|
| State: <u>West Virginia</u> | UTM NAD 83 | Easting: <u>520579m</u> |
| County: <u>Tyler</u> | | Northing: <u>4360484m</u> |
| District: <u>McElroy</u> | Public Road Access: <u>Sandy Creek Rd</u> | |
| Quadrangle: <u>Shirley 7.5</u> | Generally used farm name: <u>John Shepherd</u> | |
| Watershed: <u>McElroy Creek</u> | | |

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

| | | |
|---|--|--|
| 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 |
| <input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED | | <input type="checkbox"/> RECEIVED/ NOT REQUIRED |
| <input type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input checked="" type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED | | <input type="checkbox"/> RECEIVED |
| <input checked="" type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or <input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH) | | <input type="checkbox"/> RECEIVED/ NOT REQUIRED |
| <input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION | | <input type="checkbox"/> RECEIVED |
| <input checked="" type="checkbox"/> 5. PUBLIC NOTICE | | <input type="checkbox"/> RECEIVED |
| <input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION | | <input type="checkbox"/> RECEIVED |

Required Attachments:

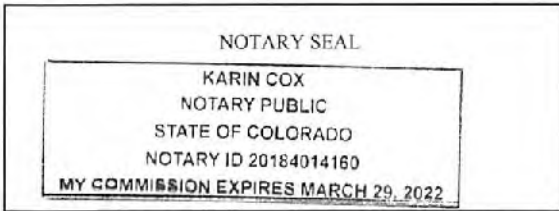
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication 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.

WW-6AC
(1/12)

Certification of Notice is hereby given:

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

| | | | |
|----------------|--------------------------------------|------------|-------------------------------------|
| Well Operator: | <u>Antero Resources Corporation</u> | Address: | <u>1615 Wynkoop Street</u> |
| By: | <u>Diana Hoff <i>[Signature]</i></u> | | <u>Denver, CO 80202</u> |
| Its: | <u>Vice President - Operations</u> | Facsimile: | <u>303-357-7315</u> |
| Telephone: | <u>303-357-7310</u> | Email: | <u>mstanton@anteroresources.com</u> |



Subscribed and sworn before me this 26 day of April, 2018.

[Signature] Notary Public

My Commission Expires March 29, 2022

Oil and Gas Privacy Notice:

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

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WV Department of
Environmental Protection

WW-6A
(9-13)

4709502505
API NO. 47-095 -
OPERATOR WELL NO. Gatrell Unit 3H
Well Pad Name: Shepherd 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: 4/27/2018 **Date Permit Application Filed:** 4/27/2018

Notice of:

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

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

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

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

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

SURFACE OWNER(s)
Name: John B. Shepherd & Tammy L. Shepherd
Address: 102 Sandys Run Rd
West Union, WV 26456

Name: Heith Michael Howell
Address: 686 Daolin Run Road
New Martinsville, WV 26155

SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: Please See Attached
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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WV Department of Environmental Protection

07/20/2018

WW-6A
(8-13)

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30 2018

4709502505
API NO. 47-095 -
OPERATOR WELL NO. Gatrell Unit 3H
Well Pad Name: Shepherd 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.

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

07/20/2018

WW-6A
(8-13)

4709502505
API NO. 47-095
OPERATOR WELL NO. Garrell Unit 3H
Well Pad Name: Shepherd Pad

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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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WV Department of
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Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

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WV Department of
Environmental Protection

WW-6A
(8-13)

4709502505
API NO. 47-095
OPERATOR WELL NO. Gatrell Unit 3H
Well Pad Name: Shepherd Pad

Jane O. Hill

Notice is hereby given by:

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

Address: 1515 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.

KARIN COX
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20184014160
MY COMMISSION EXPIRES MARCH 29, 2022

Subscribed and sworn before me this 27 day of April 2018.

Karin Cox Notary Public

My Commission Expires March 29, 2022

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WV Department of
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WW-6A Notice of Application Attachment (SHEPHERD PAD):**List of Surface Owner(s) with Proposed Disturbance associated with Shepherd Well Pad:****WELL PAD – These owners were notified of all well work permit applications, and have executed signed Surface Use Agreements with Antero Resources Corporation.****TM 19 PCL 29**

Owner: John B. Shepherd &
Tammy L. Shepherd
Address: 102 Sandys Run Road
West Union, WV 26456

TM 19 PCL 29

Owner: Heith Michael Howell
Address: 686 Doolin Run Road
New Martinsville, WV 26155

ROAD AND/OR OTHER DISTURBANCE - All owners have executed signed Surface Use and/or Road Agreements with Antero Resources Corporation. However, they were only notified if their tracts were overlying the oil and gas leasehold being developed by the proposed well work.**TM 19 PCL 29**

Owner: John B. Shepherd &
Tammy L. Shepherd
Address: 102 Sandys Run Road
West Union, WV 26456

TM 19 PCL 27 (continued...)

Owner: Sandra Hopper
Address: 564 Sandys Run Road
West Union, WV 26456

TM 19 PCL 55

Owner: Heith Michael Howell
Address: 686 Doolin Run Road
New Martinsville, WV 26155

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WW-6A Notice of Application Attachment (SHEPHERD PAD):**WATER SOURCE OWNERS – Within 1500'**

*NOTE: On attached water well map 15 other water sources are identified, but they are located greater than 1500' from the subject well pad location.

1 Water Source: W2 – 1435'

Owner: Heith Howell
Address: 686 Doolin Run Road
New Martinsville, WV 26155

3 Water Sources: W5 – 1237', W6 – 1378', W7 – 1346'

Owner: Gary Wright
Address: P.O. Box 347
Middlebourne, WV 26149

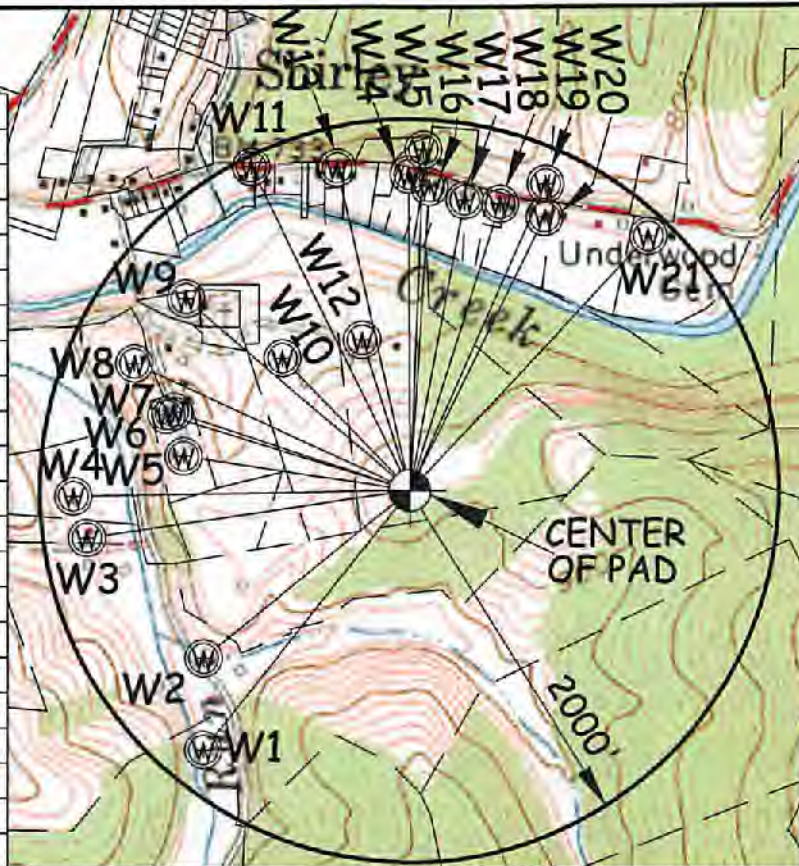
2 Water Sources: W10 – 993', W12 – 852'

Owner: John Shepherd
Address: 102 Sandys Run Road
West Union, WV 26456

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Environmental Protection

SHEPHERD PAD ANTERO RESOURCES CORPORATION

| LINE | BEARING | DIST. |
|------|------------|---------|
| W1 | S 38°38' W | 1787.8' |
| W2 | S 50°59' W | 1435.2' |
| W3 | S 81°39' W | 1764.3' |
| W4 | S 89°00' W | 1819.7' |
| W5 | N 81°26' W | 1237.3' |
| W6 | N 72°47' W | 1377.6' |
| W7 | N 71°34' W | 1346.1' |
| W8 | N 65°17' W | 1640.8' |
| W9 | N 49°29' W | 1592.4' |
| W10 | N 43°57' W | 993.0' |
| W11 | N 26°12' W | 1944.0' |
| W12 | N 17°41' W | 851.8' |
| W13 | N 12°43' W | 1781.2' |
| W14 | N 00°13' W | 1701.9' |
| W15 | N 02°18' E | 1838.5' |
| W16 | N 03°44' E | 1639.4' |
| W17 | N 10°47' E | 1592.5' |
| W18 | N 17°35' E | 1618.9' |
| W19 | N 24°01' E | 1806.6' |
| W20 | N 26°22' E | 1642.9' |
| W21 | N 43°22' E | 1882.5' |



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

| WELL | SURFACE OWNER | ADDRESS | DIST-TAX MAP-PAR | WELL LATITUDE | WELL LONGITUDE |
|------|-----------------------|---|------------------|---------------|----------------|
| W1 | WILLIAM BALL | 1220 ELMHURST DR., WEIRTON, WV 26062 | 5-19-57 | 39°23'22.63" | 80°45'54.38" |
| W2 | HEITH HOWELL | 686 Doolin Run Road, New Martinsville, WV 26155 | 5-19-55 | 39°23'27.51" | 80°45'54.46" |
| W3 | LARRY MARABLE | 4605 HOLMEHURST WAT, BOWIE, MD 20720 | 5-19-53.1 | 39°23'33.82" | 80°46'02.61" |
| W4 | VIOLET JEFFERS | P.O. BOX 1, SHIRLEY, WV 26434 | 5-19-53 | 39°23'36.02" | 80°46'03.59" |
| W5 | GARY WRIGHT | P.O. BOX 347, MIDDLEBOURNE, WV 26149 | 5-19-32.1 | 39°23'38.24" | 80°45'56.04" |
| W6 | GARY WRIGHT | P.O. BOX 347, MIDDLEBOURNE, WV 26149 | 5-19-33 | 39°23'40.44" | 80°45'57.25" |
| W7 | GARY WRIGHT | P.O. BOX 347, MIDDLEBOURNE, WV 26149 | 5-19-33 | 39°23'40.52" | 80°45'56.76" |
| W8 | ELLSWORTH CORK JR. | 52 OLD SCHOOLHOUSE RD, SHIRLEY, WV 26434 | 5-19-38 | 39°23'43.17" | 80°45'59.53" |
| W9 | SHIRLEY E.U.B. CHURCH | | 5-19-37 | 39°23'46.65" | 80°45'56.02" |
| W10 | JOHN SHEPHERD | 102 SANDYS RUN RD, WEST UNION, WV 26456 | 5-19-30 | 39°23'43.56" | 80°45'49.32" |
| W11 | JAMES FELTON | P.O. BOX 142, SHIRLEY, WV 26434 | 5-19A-51 | 39°23'53.71" | 80°45'51.67" |
| W12 | JOHN SHEPHERD | 102 SANDYS RUN RD, WEST UNION, WV 26456 | 5-19-29 | 39°23'44.58" | 80°45'43.86" |
| W13 | GREGORY SHEPHERD | P.O. BOX 4, SHIRLEY, WV 26434 | 5-19A-47.1 | 39°23'53.71" | 80°45'45.72" |
| W14 | MICHAEL DAVIS | 6630 MCELROY CREEK RD, WEST UNION, WV 26456 | 5-19-18.1 | 39°23'53.41" | 80°45'40.80" |
| W15 | DEAN GARRISON | P.O. BOX 163, SHIRLEY, WV 26434 | 5-19A-43 | 39°23'54.76" | 80°45'39.81" |
| W16 | | 6630 MCELROY CREEK RD, WEST UNION, WV 26456 | 5-19-19.2 | 39°23'52.78" | 80°45'39.35" |
| W17 | ANITA DOLL | 6660 MCELROY CREEK RD, WEST UNION, WV 26456 | 5-19-19 | 39°23'52.10" | 80°45'36.90" |
| W18 | HOWARD STUBBS | 6693 MCELROY CREEK RD, WEST UNION, WV 26456 | 5-19-21 | 39°23'51.91" | 80°45'34.47" |
| W19 | HOWARD STUBBS | 6693 MCELROY CREEK RD, WEST UNION, WV 26456 | 5-19-20 | 39°23'53.00" | 80°45'31.35" |
| W20 | HOWARD STUBBS | 6693 MCELROY CREEK RD, WEST UNION, WV 26456 | 5-19-20 | 39°23'51.24" | 80°45'31.39" |
| W21 | DOUGLAS ENEIX | 6756 MCELROY CREEK RD, WEST UNION, WV 26456 | 5-19-22 | 39°23'50.30" | 80°45'24.20" |

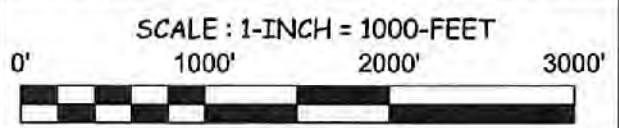
WILLOW LAND SURVEYING, PLLC
P.O. BOX 17, PENNSBORO, WV 26415
(304) 659-1717

TOPO SECTION(S) OF ;
SHIRLEY 7.5'
JOB #: 18-003WA

DATE: 04/13/18

DRAWN BY: T.B.S.

FILE: SHEPHERD PAD WW.DWG



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: 02/28/2018 Date Permit Application Filed: 04/27/2018

RECEIVED
Office of Oil and Gas

APR 30 2018

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

WV Department of
Environmental Protection

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: John B. Shepherd and Tammy L. Shepherd
Address: 102 Sandys Run Rd.
West Union, WV 26456

Name: Heith Michael Howell
Address: 686 Doolin Run Rd.
New Martinsville, WV 26155

Notice is hereby given:

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

State: West Virginia UTM NAD 83 Easting: 520579m
County: Tyler Northing: 4360484m
District: McElroy Public Road Access: Sandy Creek Rd.
Quadrangle: Shirley 7.5' Generally used farm name: John B. Shepherd
Watershed: McElroy Creek

This Notice Shall Include:

Pursuant to West Virginia Code § 22-6A-16(b), this notice shall include the name, address, telephone number, and if available, facsimile number and electronic mail address of the operator and the operator's authorized representative. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: Antero Resources Corporation
Address: 1615 Wynkoop St.
Denver, CO 80202
Telephone: 303-357-7182
Email: mstanton@anteroresources.com
Facsimile: 303-357-7315

Authorized Representative: Mallory Stanton
Address: 1615 Wynkoop St.
Denver, CO 80202
Telephone: 303-357-7182
Email: mstanton@anteroresources.com
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.

WW-6A5
(1/12)

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

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

Date of Notice: 04/27/2018 **Date Permit Application Filed:** 04/27/2018

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Office of Oil and Gas

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WV Department of
Environmental Protection

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

CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

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

Notice is hereby provided to the SURFACE OWNER(s)

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

Name: John B. Shepherd and Tammy L. Shepherd

Address: 102 Sandys Run Road

West Union, WV 26455

Name: Heith Michael Howell

Address: 686 Doolin Run Road

New Martinsville, WV 26155

Notice is hereby given:

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

| | | | | |
|-------------|----------------------|---------------------------|-----------------------|-----------------|
| State: | <u>West Virginia</u> | UTM NAD 83 | Easting: | <u>520579m</u> |
| County: | <u>Tyler</u> | | Northing: | <u>4360484m</u> |
| District: | <u>McElroy</u> | Public Road Access: | <u>Sandy Creek Rd</u> | |
| Quadrangle: | <u>Shirley 7.5'</u> | Generally used farm name: | <u>John Shepherd</u> | |
| Watershed: | <u>McElroy Creek</u> | | | |

This Notice Shall Include:

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

Well Operator: Antero Resources Corporation

Telephone: (303) 357-7310

Email: mstator@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 of your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

07/20/2018



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways

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

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

April 23, 2018

Jill M. Newman
 Deputy Commissioner

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

Subject: DOH Permit for the Shepherd Pad, Tyler County
 Gatrell Unit 3H Well Site

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 Office of Oil and Gas

APR 30 2018

Dear Mr. Martin,

WV Department of
 Environmental Protection

This well site will be accessed from a DOH permit #06-2018-0098 which has been issued to Antero Resources Corporation for access to the State Road for a well site located off of SLS 62 in Tyler County.

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

Cc: Karin Cox
 Antero Resources Corporation
 CH, OM, D-6
 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 |
| Hexamethylene Triamine Penta | 34690-00-1 |
| Phosphino Carboxylic acid polymer | 71050-62-9 |
| Hexamethylene Diamine Tetra | 23605-75-5 |
| 2-Propenoic acid, polymer with 2 propenamide | 9003-06-9 |
| Hexamethylene diamine penta (methylene phosphonic acid) | 23605-74-5 |
| Diethylene Glycol | 111-46-6 |
| Methenamine | 100-97-0 |
| Polyethylene polyamine | 68603-67-8 |
| Coco amine | 61791-14-8 |
| 2-Propyn-1-olcompound with methyloxirane | 38172-91-7 |

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