Monday, January 22, 2018
WELL WORK PERMIT
Vertical / Plugging

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET
DENVER, CO 80202

Re: Permit approval for BBJ-1
47-033-03256-00-00

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: BBJ-1
Farm Name: BURNSIDE/BLAKE
U.S. WELL NUMBER: 47-033-03256-00-00
Vertical / Plugging
Date Issued: 1/22/2018

Promoting a healthy environment.
PERMIT CONDITIONS

West Virginia Code §22-6-11 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. All pits must be lined with a minimum of 20 mil thickness synthetic liner.

2. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.

3. Well work activities shall not constitute a hazard to the safety of persons.

4. This well is under a consent order and must be plugged under the terms of that agreement.
STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

APPLICATION FOR A PERMIT TO PLUG AND ABANDON

4) Well Type: Oil ___/ Gas X ___/ Liquid injection ___/ Waste disposal ___/
   (If "Gas, Production or Underground storage ___) Deep ___/ Shallow X ___

5) Location: Elevation 1209'
   District Simpson
   Watershed Simpson Creek
   County Harrison
   Quadrangle Clarksburg 7.5'

6) Well Operator Antero Resources Corporation
   Address 1615 Wynkoop Street
   Denver, CO 80202

7) Designated Agent CT Corporation System - Dianna Stamper
   Address 5400 D Big Tyler Road
   Charleston, WV 25313

8) Oil and Gas Inspector to be notified
   Name Sam Ward
   Address 601 57th Street, SE
   Charleston, WV 25304

9) Plugging Contractor
   Name N/A - Antero will plug well
   Address

10) Work Order: The work order for the manner of plugging this well is as follows:

*Please see attached Work Order.

Notification must be given to the district oil and gas inspector 24 hours before permitted work can commence.

Work order approved by inspector ___ Date 10/26/2017
December 13, 2017

**BBJ #1 & BBJ #3 Additional Data for Plug & Abandonment**

- Traffic Control will be utilized at major intersections to reduce Antero’s impact on the neighborhood and people’s day to day activities
- Street parking will have to be managed in order to allow trucks access to the well pads through the designated routes
- Because of the proximity to occupied dwellings, no natural gas will be flared at surface. The well will be Top-Killed by pumping 8.7 ppg to 9.3 ppg completion fluid down the well.
- If mud is present, street sweepers will be utilized on city streets to keep the roads clean.
- All rig operations and excavation work will be performed during daylight hours to reduce noise and light.
Objective: Plug and Abandon Wellbore.

Pipe Schedule:
1. 8-5/8" 24#/ set @ 1,246'. Cemented to surface. Elevation: 1,215'
2. 4-1/2" 10.5#/ set @ 4,615' with estimated TOC @ 1,924' (To Be Confirmed)
3. 1 1/2" tubing loose @ 4,515'.

Oil and Gas Zones:
1. Greenbrier Group: 1,460'-1,645'
2. Fifth Sandstone Formation: perfs from 2,556'-2,564'
3. Speechly: Unknown Thickness; perfs from 3,226'-3,236'
4. Balltown: 3,560' - 3,620'
5. Riley: 4,180' - 4,230'
6. Benson: 4,535'-4,545'; perfs from 4,328'-4,553'

Procedure:
1. Check and record all casing/annular pressures into Wellview.
2. Coordinate and schedule casing jacks.
3. Notify WVDEP prior to commencing work, for plug witnessing (Harrison County Inspector).
4. Move in and rig up flat tank and frac tank (No pits will be utilized).
5. Move in rig up service unit.
6. NU BOPE and test- check and report surface pressure including bradenhead pressure.
7. Kill well prior to pulling tubing.
8. Pull and lay down 1 1/2" tubing.
9. RU wireline and lubricator.
10. Make gauge ring run to @ 4,600'
11. POOH. Note fluid depth tagged.
12. MIRU logging crew.
13. Load Hole with 6% gel.
14. Run CBL from 4,600' to surface.
15. Locate TOC around 4.5" casing.
16. Discuss results with completions engineers before proceeding.
17. TIH with 2 3/8" tubing to 4,600'.
18. MIRU cement services. Mix and pump 55 sacks for a 600' balanced plug from 4,000'-4,600'. (Class A cement + 2% CaCl2, 20% excess included; yield = 1.18 ft^3/sk, WR=5.2 gal/sk)
   a. Displace to balance plug
   b. Slowly pull out of cement plug.
   c. Reverse circulate tubing clear of cement
19. Pull up to 3,640'
20. Mix and pump 19 sacks for a 200' balanced plug from 3,440'-3,640'. (Class A cement + 2% CaCl2, 20% excess included; yield = 1.18 ft^3/sk, WR=5.2 gal/sk)
   a. Displace to balance plug
   b. Slowly pull out of cement plug.
   c. Reverse circulate tubing clear of cement
21. Pull up to 3,290'
22. Mix and pump 10 sacks for 100' balanced plug from 3,190'-3,290'. (Class A cement + 2% CaCl2, 20% excess included; yield = 1.18 ft^3/sk, WR=5.2 gal/sk)
   a. Displace to balance plug
   b. Slowly pull out of cement plug.
   c. Reverse circulate tubing clear of cement
23. Pull up to 3,290' - 4,650'
24. Mix and pump 19 sacks for 200' balanced plug from 2,450'-2,650'. (Class A cement + 2% CaCl2, 20% excess included; yield = 1.18 ft^3/sk, WR=5.2 gal/sk)
   a. Displace to balance plug
   b. Slowly pull out of cement plug.
   c. Reverse circulate tubing clear of cement
   d. WOC and tag TOC @2,450'
25. POOH with tubing.
26. Lubricate and RIH W/CIBP and set @ 2,450'.
27. POOH w/ wireline.
28. Pressure test CIBP to 500 psi
29. RIH wireline and run free point above TOC in 4.5" casing
   a. Chemical cut at ~1,915' (exact depth determined via freepoint and CBL)
   b. RU casing jacks and POOH – LD 4.5" casing.
30. TIH with 2 3/8" tubing to 2,449' (1' above CIBP)
31. MIRU cement services. Mix and pump 10 sacks for balanced plug from 2,450'-2,550'. (Class A cement + 2% CaCl2, 20% excess included; yield =1.18 ft³/sk, WR=5.2 gal/sk)-
   a. Displace to balance plug
   b. Slowly pull out of cement plug.
   c. Reverse circulate tubing clear of cement
32. Pull up to 2,015' (100' below casing cut)
33. Mix and pump 31 sacks for balanced plug from 1,815'-2,015' (Class A cement + 2% CaCl2, 20% excess included; yield =1.18 ft³/sk, WR=5.2 gal/sk).
   a. Displace to balance plug
   b. Slowly pull out of cement plug.
   c. Reverse circulate tubing clear of cement
34. Mix and pump 65 sacks for balanced plug from 1,400'-1,700' (Class A cement + 2% CaCl2, 20% excess included; yield =1.18 ft³/sk, WR=5.2 gal/sk).
   a. Displace to balance plug
   b. Slowly pull out of cement plug.
   c. Reverse circulate tubing clear of cement
35. Pull up to 1,350'
36. Mix and pump 59 sacks for balanced plug from 1,150'-1,350' (Class A cement + 2% CaCl2, 20% excess included; yield =1.18 ft³/sk, WR=5.2 gal/sk).
   a. Displace to balance plug
   b. Slowly pull out of cement plug.
   c. Reverse circulate tubing clear of cement
   d. WOC and tag TOC @ 1,150'
   e. If TOC is deeper than 1,150', mix and spot cement so TOC is a minimum depth of 1,150'.
37. Pull up to 400'
38. Mix and pump 146 sacks from surface-400' (Class A cement + 2% CaCl2, 20% excess included; yield =1.18 ft³/sk, WR=5.2 gal/sk)
39. TOOH
40. Wait on cement 8hrs.
41. Weld on a P&A monument that extends thirty inches above the surface with well name and API number. (API No.: 47-033-03255).
Elev.: 1,215'

Spud: 11/1/1985

8 5/8" Conductor Casing
Set @ 1,246'
Cemented to Surface

300' plug from 1,400'-1,700'

100' plug from 1,865'-1,965'
Across casing cut

6.25 Estimated Hole Size
CIBP @ 2,650'
topped w/ Plug 2,450'-2,550'

200' plug from 3,440'-3,640'

600' plug from 4,000'-4,600'

400' plug from Surface-400'
Coal Seams (208-320)

200' plug from 1,160'-1,360'
Across bottom of 8 5/8"

Greensbrier Group (1,460'-1,545') - Not Perf'd

Cut Casing @ ~1,915'
TOC @ 1,924'

Unknown Formation
Perfs from: 2,556 - 2,564'

Unknown Formation
Perfs from: 3,226 - 3,230'

Baltown (3,560'-3,620') - Not Perf'd

Riley (4,180'-4,230') - Not Perf'd

Benson (4,535'-4,545')
Perfs from: 4,528'-4,533'

4-1/2" 10.5# Production Casing
Set @ 4,615' w/ 560 sks

TD @ 4,705'

Antero Resources Corporation
BBJ-01
API: 47-033-03256
**State of West Virginia**
Department of Mines
Oil and Gas Division

**WELL OPERATOR'S REPORT**

**OF**

**DRILLING, FRACTURING AND/OR STIMULATING, OR PHYSICAL CHANGE**

**WELL TYPE:** Oil / Gas / Liquid Injection / Waste Disposal

(If "Gas," Production X / Underground Storage / Deep / Shallow X /)

**LOCATION:** Elevation: 1,205' Water supply: Simpson Creek

District: Simpson County Harrison Quadrangle Clarksburg

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**Operator:** DC Enviro-Exploration Co.

**Address:** P. O. Box 298, Buckharm, WV 26201

**Designated Agent:** Barbara Ford

**Address:** P. O. Box 298, Buckharm, WV 26201

**Surface Owner:** Meadow View, Inc.

**Address:** 1400 Johnson Ave, Bridgeport, WV 26330

**Mineral Rights Owner:** Meadow View, Inc & Others

**Address:** 1400 Johnson Ave, Bridgeport, WV 26330

**Oil and Gas Inspector for This Work:**

**Casey Address:** Jane Lane, WV 26378

**Permit Issued:** October 8, 1985

**Drilling Commenced:** October 26, 1985

**Drilling Completed:** November 1, 1985

**If Applicable: Drilling or Work Performed:**

**Casing and Tubing Used in Well:**

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<tr>
<th>Size</th>
<th>20-16</th>
<th>13-10</th>
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<tbody>
<tr>
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<tr>
<td></td>
<td></td>
<td>9 5/8</td>
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<tr>
<td></td>
<td></td>
<td>5 1/2</td>
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<td>3</td>
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<td>1 1/2</td>
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**Left or Cut off Above Ca. ft.:**

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<td>1,246.95</td>
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<td>4,615.00</td>
<td>580 Sks</td>
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<tr>
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<td>4,615.30</td>
<td>4,615.30</td>
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<tr>
<td></td>
<td>Loose</td>
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**Liners used:**

**Geological Target Formation:** Benson

**Depth of completed well:** 4,600 feet

**Water strata depth:** Fresh: 80 feet; Salt: 0 feet

**Is coal being mined in the area? No**

**Open Flow Data:**

**Producing Formation:** Benson

**Pay zone depth:** 4,705 feet

**Gas:**

<table>
<thead>
<tr>
<th>Initial open flow</th>
<th>225,000 Mcf/d</th>
<th>Oil:</th>
<th>Initial open flow</th>
<th>461,000 Bbl/d</th>
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</thead>
<tbody>
<tr>
<td>Final open flow</td>
<td>150,000 Mcf/d</td>
<td>Oil:</td>
<td>Final open flow</td>
<td>961,000 Bbl/d</td>
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**Time of open flow between Initial and Final tests:** 72 hours

**Static rock pressure:** 330 psig (surface measurement) after 72 hours shut in

(If applicable due to multiple completion—)

**Second producing formation:**

**Pay zone depth:**

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<tr>
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**Gas:**

<table>
<thead>
<tr>
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<th>Oil:</th>
<th>Initial open flow</th>
<th>325,000 Bbl/d</th>
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<td>75,000 Mcf/d</td>
<td>Oil:</td>
<td>Final open flow</td>
<td>185,000 Bbl/d</td>
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**Time of open flow between Initial and Final tests:** 72 hours

**Static rock pressure:** 330 psig (surface measurement) after 72 hours shut in

(Continue on reverse side)
**WELL LOG**

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<thead>
<tr>
<th>FORMATION</th>
<th>COLOR</th>
<th>HAND OR SOFT</th>
<th>TOP FEET</th>
<th>BOTTOM FEET</th>
<th>REMARKS</th>
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<tr>
<td>Top Soil</td>
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<tr>
<td>Sand - Shale</td>
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<td></td>
<td>10</td>
<td>20</td>
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<tr>
<td>Red Rock &amp; Shale</td>
<td></td>
<td></td>
<td>20</td>
<td>80</td>
<td>Hole Wet 80'</td>
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<tr>
<td>Sand</td>
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<td></td>
<td>60</td>
<td>120</td>
<td>App. 1/2&quot; Stream</td>
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<tr>
<td>Shale &amp; Red Rock</td>
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<td></td>
<td>170</td>
<td>305</td>
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<td>TD</td>
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<td>4,705</td>
<td>TD</td>
<td>Check Gas 6,315' Gas 1&quot; F w/w</td>
</tr>
</tbody>
</table>

(Note: Section 8.18(4) provides as follows: The term 'log' or 'well log' shall mean a systematic detailed geological record of all formations, including well, encountered in the drilling of a well.)

Glen B. Johnson  
Deer Johnson Energy Co  
Well Operator

Date 12-30-81

RECEIVED  
WV Department of Environmental Protection

NOV 09 2017  
Office of Oil and Gas
Well: County = 33 Permit = 03256

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<thead>
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<th>Location Information: View Map</th>
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<tbody>
<tr>
<td>API</td>
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<tr>
<td>410330256</td>
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There is no Bottom Hole Location data for this well.

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<th>Owner Information</th>
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<tbody>
<tr>
<td>API</td>
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<table>
<thead>
<tr>
<th>Pay/Show/Water Information:</th>
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<tbody>
<tr>
<td>API</td>
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<tr>
<td>410330256</td>
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<table>
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<tr>
<th>Production Gas Information: (Volumes in Mscf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>API</td>
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<tr>
<th>Production Oil Information: (Volumes in Bbl) <strong>some operators may have reported NGL under Oil</strong></th>
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<tbody>
<tr>
<td>API</td>
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<thead>
<tr>
<th>Production NGL Information: (Volumes in Bbl) <strong>some operators may have reported NGL under Oil</strong></th>
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<td>410330256</td>
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<tr>
<th>Production Water Information: (Volumes in Gallons)</th>
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</thead>
<tbody>
<tr>
<td>API</td>
</tr>
<tr>
<td>410330256</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stratigraphy Information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>API</td>
</tr>
</tbody>
</table>

There is no Wireline (E-Log) data for this well.

There is no Plugging data for this well.
STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF APPLICATION TO PLUG AND ABANDON A WELL

4) Surface Owner(s) to be served:  
(a) Name  
Khan T. and Laverne Keesleman  
(b) Name  
3 ADDED SURFACE OWNERS  
(c) Name  
*All other surface owners with existing access road disturbance are off-deed and not required to be notified.  

5) Coal Operator  
(a) Name  
NO DECLARATIONS ON RECORD WITH COUNTY  
(b) Name  
NO DECLARATIONS ON RECORD WITH COUNTY  
(c) Name  
NO DECLARATIONS ON RECORD WITH COUNTY

6) Inspector  
Samm Ward  

TO THE PERSONS NAMED ABOVE: You should have received this Form and the following documents:

(1) The application to Plug and Abandon a Well on Form WW-4B, which sets out the parties involved in the work and describes the well site and the plugging work order; and

(2) The plat (surveyor's map) showing the well location on Form WW-6.

The reason you received these documents is that you have rights regarding the application which are summarized in the instructions on the reverse side. However, you are not required to take any action at all.

Take notice that under Chapter 22-6 of the West Virginia Code, the undersigned well operator proposes to file or has filed this Notice and Application and accompanying documents for a permit to plug and abandon a well with the Chief of the Office of Oil and Gas, West Virginia Department of Environmental Protection, with respect to the well at the location described on the attached Application and depicted on the attached Form WW-6. Copies of this Notice, the Application, and the plat have been mailed by registered or certified mail or delivered by hand to the person(s) named above (or by publication in certain circumstances) on or before the day of mailing or delivery to the Chief.

Well Operator  
Antero Resources Corporation

By:  
Kevin Klette

Its:  
Sr Vice President of Production

Address  
1615 Wynkoop Street

Telephone  
303-357-7310

Subscribed and sworn before me this 4 day of October 2017
My Commission Expires 7/8/2020

Notary Public

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as a 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.
STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

CONSTRUCTION AND RECLAMATION PLAN AND SITE REGISTRATION APPLICATION FORM
GENERAL PERMIT FOR OIL AND GAS PIT WASTE DISCHARGE

Operator Name: Antero Resources Corporation
Watershed: Simpson Creek
Elevation: 1209'

Description of anticipated Pit Waste: No pit will be used at this site (All fluids will be stored in tanks and either reused or hauled off site.)

Will a synthetic liner be used in the pit? N/A

Proposed Disposal Method For Treated Pit Wastes:
- 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)

Proposed Work For Which Pit Will Be Used:
- Drilling
- Swabbing
- Workover
- Plugging
- Other (Explain)

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): Gretchen Kohler
Company Official Title: Senior Environmental & Regulatory Manager

Subscribed and sworn before me this 1st day of October, 2017

Notary Public
Proposed Revegetation Treatment: Acres Disturbed 0.51 acres

Prevegetation pH

Lime 2-3 Tons/acre or to correct to pH 6.5

Fertilizer (10-20-20 or equivalent) 500 lbs/acre (500 lbs minimum)

Mulch 2-3 Tons/acre (Hay, straw or wood fiber (will be used where needed)

Seed Mixtures

<table>
<thead>
<tr>
<th>Seed Type</th>
<th>Area I</th>
<th>Area II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Ryegrass</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Field Bromegrass</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Crownvetch</td>
<td>10-15</td>
<td></td>
</tr>
<tr>
<td>Tall Fescue</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

Please reference Table IV-3 on page 5 of the BBJ-1 Well Plugging Plan

*or type of grass seed requested by surface owner

Attach:
Drawing(s) of road, location, pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]

Comments:

Title: OOG Inspector Date: 10/26/2017

Field Reviewed? ( ) Yes ( ) No
Antero Resources Corporation
Appalachian Basin
BBJ-1
Harrison County
Quadrangle: Clarksburg 7.5'
Watershed: Simpson Creek
District: Simpson
Date: 10-03-2017
West Virginia Department of Environmental Protection
Office of Oil and Gas
WELL LOCATION FORM: GPS

API: 47-033-03256  WELL NO.: BBJ-1
FARM NAME: Burnside/Blake

RESPONSIBLE PARTY NAME: Antero Resources Corporation
COUNTY: Harrison  DISTRICT: Simpson
QUADRANGLE: Clarksburg
SURFACE OWNER: Khan T & Laverne R Kesselman
ROYALTY OWNER: Antero Resources Corporation

UTM GPS NORTHING: 4350902.93 m
UTM GPS EASTING: 562859.65 m  GPS ELEVATION: 368.35 m

The Responsible Party named above has chosen to submit GPS coordinates in lieu of preparing a new well location plat for a plugging permit or assigned API number on the above well. The Office of Oil and Gas will not accept GPS coordinates that do not meet the following requirements:

2. Accuracy to Datum – 3.05 meters
3. Data Collection Method:
   Survey grade GPS X: Post Processed Differential _____
   Real-Time Differential X
   Mapping Grade GPS X: Post Processed Differential _____
   Real-Time Differential X

4. Letter size copy of the topography map showing the well location.

I the undersigned, hereby certify this data is correct to the best of my knowledge and belief and shows all the information required by law and the regulations issued and prescribed by the Office of Oil and Gas.

Signature
Permitting Supervisor

Date 10/4/17
Title