west virginia department of environmental protection

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

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

December 30, 2013

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-1706416, issued to ANTERO RESOURCES CORPORATION, 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 all 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 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.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-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) 926-0499 ext. 1654.

James Martin
Chief

Operator's Well No: HOSKINS UNIT 1H
Farm Name: HAMILTON, KENNETH E. ,. ET A
API Well Number: 47-1706416
Permit Type: Horizontal 6A Well
Date Issued: 12/30/2013

Promoting a healthy environment.

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 (USACOE). Through this permit, you are hereby being advised to consult with USACOE 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 fifty (50) 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 fill material shall be within plus or minus 2% of the optimum moisture content as determined by the standard proctor density test, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. Each lift must meet 95 % compaction of the optimum density based on results from the standard proctor density test of the actual soils used in specific engineered fill sites. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.

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

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

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

7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.

8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

17-06416 11/14

WW-6B
(9/13)

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

1) Well Operator:	Antero Resources Corporation	494488557	017-Doddridge	Grant	Smithburg 7.5'
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: Hoskins Unit 1H Well Pad Name: Hamilton Pad (existing)

3) Farm Name/Surface Owner: Kenneth E. Hamilton, Jr. and Jodi R. Travis Public Road Access: CR 24

4) Elevation, current ground: 1157' Elevation, proposed post-construction: 1157'

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

DCW
11-19-2013
MDG

6) Existing Pad: Yes or No Yes

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

8) Proposed Total Vertical Depth: 7400' TVD

9) Formation at Total Vertical Depth: Marcellus Shale

10) Proposed Total Measured Depth: 17,500' MD

11) Proposed Horizontal Leg Length: 8963'

12) Approximate Fresh Water Strata Depths: 220'

13) Method to Determine Fresh Water Depths: Gaskins Unit 1H (API# 47-017-06260) on same pad.

14) Approximate Saltwater Depths: None Identified

15) Approximate Coal Seam Depths: 840'

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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WV Dept. of Environmental Protection

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18) **CASING AND TUBING PROGRAM**

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor	20"	New	H-40	94#	40'	40'	CTS, 38 Cu. Ft.
Fresh Water	13-3/8"	New	J-55/H-40	54.5#/ 48#	300'	300'	CTS, 417 Cu. Ft
Coal	9-5/8"	New	J-55	36#	2460'	2460'	CTS, 1002 Cu. Ft.
Intermediate							
Production	5-1/2"	New	P-110	20#	17500'	17500'	4417 Cu. Ft.
Tubing	2-3/8"	New	N-80	4.7#		7100'	
Liners							

DCN
11-19-2013
MDG

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	24"	0.438"	1530	Class A	1.18
Fresh Water	13-3/8"	17-1/2"	0.38"/0.33"	2730/1730	Class A	1.18
Coal	9-5/8"	12-1/4"	0.352"	3520	Class A	1.18
Intermediate						
Production	5-1/2"	8-3/4" & 8-1/2"	0.361"	12630	Lead-H/POZ & Tail - H	H/POZ-1.44 & H-1.8
Tubing	2-3/8"	4.778"	0.19"	11200		
Liners						

PACKERS

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

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017 06416

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.

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."

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 27.12 existing acres

22) Area to be disturbed for well pad only, less access road (acres): 3.14 existing 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% calcium and 1/4 lb flake, 5 gallons of clay treat
Intermediate: Class A cement with 1/4 lb of flake, 5 gallons of clay treat
Production: Lead cement- 50/50 Class H/Poz + 1.5% salt + 1% C-45 + 0.5% C-16a + 0.2% C-12 + 0.45% C-20 + 0.05% C-51
Production: Tail cement- Class H + 45 PPS Calcium Carbonate + 1.0% FL-160 + 0.2% ACGB-47 + 0.05% ACSA-51 + 0.2% ACR-20

25) Proposed borehole conditioning procedures:

Conductor: blowhole clean with air, run casing, 10 bbls fresh water.
Surface: blowhole clean with air, trip to conductor shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate pipe capacity + 40 bbls fresh water followed by 25 bbls bentonite mud, 10 bbls fresh water spacer.
Intermediate: blowhole clean with air, trip to surface casing shoe, trip to bottom, blowhole clean with air, trip out, run casing, circulate 40 bbls brine water followed by 10 bbls fresh water and 25 bbls bentonite mud, pump 10 bbls fresh water.
Production: circulate with 14 lb/gal NaCl mud, trip to middle of lateral, circulate, pump high viscosity sweep, trip to base of curve, pump high viscosity sweep, trip to top of curve, trip to bottom, circulate, pump high viscosity sweep, trip out, run casing, circulate 10 bbls fresh water, pump 48 bbls barite pill, pump 10 bbls fresh water followed by 48 bbls mud flush and 10 bbls water.

*Note: Attach additional sheets as needed.

Office of Oil and Gas
NOV 14 2013
WV Department of
Environmental Protection

017 06416

WW-9
(9/13)

API Number 47 - 017 -
Operator's Well No. Hoskins Unit 1H

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Antero Resources Corporation OP Code 494488557

Watershed (HUC 10) Tributary of Little Flint Run Quadrangle Smithburg 7.5'

Elevation 1157' County Doddridge District Grant

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 ☐ (*An associated frac pit will be used for flowback fluids)

If so, please describe anticipated pit waste: Drilling and Flowback Fluids

Will a synthetic liner be used in the pit? Yes ☑ No ☐ If so, what ml.? 60 mil

Proposed Disposal Method For Treated Pit Wastes:

_____ Land Application
_____ Underground Injection (UIC Permit Number _____)
■ 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 _____

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

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

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

Additives to be used in drilling medium? Please See Attachment

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

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

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

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.

RECEIVED
Office of Oil and Gas
NOV 14 2013
WV Department of
Environmental Protection

Company Official Signature _____

Company Official (Typed Name) Cole Kilstrom

Company Official Title Environmental Specialist

Subscribed and sworn before me this 12 day of NOV, 2013

_____ Notary Public

My commission expires 11/9/2016

LISA BOTTINELLI
Notary Public
State of Colorado
Notary ID 20124072365
My Commission Expires Nov 9, 2016

17 06416

Form WW-9

Operator's Well No. Hoskins Unit 1H

Antero Resources Corporation

Proposed Revegetation Treatment: Acres Disturbed 27.12 Prevegetation pH _____

Lime 2-3 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

Existing Access Roads (12.49) + Existing Drill Pad (3.14) + Existing Frac Pit (3.97) + Existing Spoil Pad (7.52) = 27.12 Existing Acres

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Tall Fescue	40	Tall Fescue	40
Perennial Rye Grass	20	Perennial Rye Grass	20
*or type of grass seed requested by surface owner		*or type of grass seed requested by surface owner	

Attach:
Drawing(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided)

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Douglas Newlon Mike Dolf

Comments: Prevent Mulch install BMPs to WV Dep Regulations

Title: Oil & Gas Inspector Date: 11-19-2013

Field Reviewed? (☐) Yes (☒) No

Water Management Plan:
Primary Water Sources

WMP-01676	API/ID Number:	047-017-06416	Operator:	Antero Resources
		Hoskins Unit 1H		

Important:

For each proposed primary water source (including source intakes for purchased water sources) identified in your water management plan, and summarized herein, DEP has made an evaluation concerning water availability over the specified date range. DEP's assessment is based on the following considerations:

- Statistical analysis of historical USGS stream gauge data (transferred to un-gauged locations as necessary);
- Identification of sensitive aquatic life (endangered species, mussels, etc.);
- Quantification of known existing demands on the water supply (Large Quantity Users);
- Minimum flows required by the Army Corps of Engineers; and
- Designated stream uses.

Based on these factors, DEP has provided, for each intake location (and origination point for purchased water), a reference gauge location and discharge flow reading which must be surpassed prior to withdrawals. Additionally, DEP has established a minimum passby flow at the withdrawal location which must also be surpassed prior to withdrawals. These thresholds are considered terms of the permit and are enforceable as such.

DEP is aware that some intake points will be used for mutiple wells and well sites. In these cases, the thresholds set by the Water Management Plan are to be interepreted as total withdrawal limits for each location over the specified date range regardless of how many wells are supported by that intake.

For all purchased water intakes, determinations of water availability are made at the original source intake location. It is the responsibility of the Oil and Gas Operator, not the seller, to cease withdrawal of water from the seller when flows are less than the minimum gauge reading at the stream gauge referenced by the Water Management Plan in order to protect stream uses.

Note that the determinations made herein are based on the best available data, but it is impossible to predict water availability in the future. While the DEP has carefully established these minimum withdrawal thresholds, it remains the operator's responsibility to protect aquatic life at all times. Approval to withdrawal is contingent upon permission from the land owner. It is the responsibility of the operator to secure and maintain permission prior to any withdrawals.

The operator is reminded that 24-48 hours prior to withdrawing (or purchasing) water, DEP must be notified by email at DEP.water.use@wv.gov.

APPROVED DEC 1 1 2013

Source Summary

WMP-01676 | API Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Stream/River

- Source: **Ohio River @ Ben's Run Withdrawal Site** | Tyler | Owner: **Ben's Run Land Company Limited Partnership**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.46593	-81.110781

☑ Regulated Stream? Ohio River Min. Flow | Ref. Gauge ID: 9999999 | Ohio River Station: Willow Island Lock & Dam

Max. Pump rate (gpm): 3,360 | **Min. Gauge Reading (cfs): 6,468.00** | **Min. Passby (cfs)**

DEP Comments: Refer to the specified station on the National Weather Service's Ohio River forecast website: http://www.erh.noaa.gov/ohrfc//flows.shtml

- Source: **West Fork River @ JCP Withdrawal** | Harrison | Owner: **James & Brenda Raines**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.320913	-80.337572

☑ Regulated Stream? Stonewall Jackson Dam | Ref. Gauge ID: 3061000 | WEST FORK RIVER AT ENTERPRISE, WV

Max. Pump rate (gpm): 2,000 | **Min. Gauge Reading (cfs): 175.00** | **Min. Passby (cfs) 146.25**

DEP Comments:

- Source: **West Fork River @ McDonald Withdrawal** | Harrison | Owner: **David Shrieves**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.16761	-80.45069

☑ Regulated Stream? Stonewall Jackson Dam | Ref. Gauge ID: 3061000 | WEST FORK RIVER AT ENTERPRISE, WV

Max. Pump rate (gpm): 3,000 | **Min. Gauge Reading (cfs): 175.00** | **Min. Passby (cfs) 106.30**

DEP Comments:

- Source **West Fork River @ GAL Withdrawal** Harrison Owner: **David Shrieves**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.16422	-80.45173

☑ Regulated Stream? **Stonewall Jackson Dam** Ref. Gauge ID: **3061000** **WEST FORK RIVER AT ENTERPRISE, WV**

Max. Pump rate (gpm): 2,000 **Min. Gauge Reading (cfs): 175.00** **Min. Passby (cfs) 106.30**

DEP Comments:

- Source **Middle Island Creek @ Mees Withdrawal Site** Pleasants Owner: **Sarah E. Mees**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.43113	-81.079567

☐ Regulated Stream? Ref. Gauge ID: **3114500** **MIDDLE ISLAND CREEK AT LITTLE, WV**

Max. Pump rate (gpm): 3,360 **Min. Gauge Reading (cfs): 52.59** **Min. Passby (cfs) 47.63**

DEP Comments:

- Source **Middle Island Creek @ Dawson Withdrawal** Tyler Owner: **Gary D. and Rella A. Dawson**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.379292	-80.867803

☐ Regulated Stream? Ref. Gauge ID: **3114500** **MIDDLE ISLAND CREEK AT LITTLE, WV**

Max. Pump rate (gpm): 3,000 **Min. Gauge Reading (cfs): 76.03** **Min. Passby (cfs) 28.83**

DEP Comments:

Source **McElroy Creek @ Forest Withdrawal** Tyler Owner: **Forest C. & Brenda L. Moore**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.39675	-80.738197

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 74.77** **Min. Passby (cfs) 13.10**

DEP Comments:

Source **Meathouse Fork @ Gagnon Withdrawal** Doddridge Owner: **George L. Gagnon and Susan C. Gagnon**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.26054	-80.720998

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 71.96** **Min. Passby (cfs) 11.74**

DEP Comments:

Source **Meathouse Fork @ Whitehair Withdrawal** Doddridge Owner: **Elton Whitehair**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.211317	-80.679592

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 69.73** **Min. Passby (cfs) 7.28**

DEP Comments:

- Source **Tom's Fork @ Erwin Withdrawal** Doddridge Owner: **John F. Erwin and Sandra E. Erwin**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.174306	-80.702992

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 69.73** **Min. Passby (cfs) 0.59**

DEP Comments:

- Source **Arnold Creek @ Davis Withdrawal** Doddridge Owner: **Jonathon Davis**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.302006	-80.824561

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 69.73** **Min. Passby (cfs) 3.08**

DEP Comments:

- Source **Buckeye Creek @ Powell Withdrawal** Doddridge Owner: **Dennis Powell**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.277142	-80.690386

☐ Regulated Stream? Ref. Gauge ID: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 69.73** **Min. Passby (cfs) 4.59**

DEP Comments:

◉ Source **South Fork of Hughes River @ Knight Withdrawal** Ritchie Owner: **Tracy C. Knight & Stephanie C. Knight**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.198369	-80.870969

☐ Regulated Stream? Ref. Gauge ID: 3155220 ;OUTH FORK HUGHES RIVER BELOW MACFARLAN, W\

Max. Pump rate (gpm): 3,000 **Min. Gauge Reading (cfs): 39.80** **Min. Passby (cfs) 1.95**

DEP Comments:

◉ Source **North Fork of Hughes River @ Davis Withdrawal** Ritchie Owner: **Lewis P. Davis and Norma J. Davis**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		39.322363	-80.936771

☐ Regulated Stream? Ref. Gauge ID: 3155220 ;OUTH FORK HUGHES RIVER BELOW MACFARLAN, W\

Max. Pump rate (gpm): 1,000 **Min. Gauge Reading (cfs): 35.23** **Min. Passby (cfs) 2.19**

DEP Comments:

Source Summary

WMP-01676 | API Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Purchased Water

- Source: **Ohio River @ Select Energy** | Pleasants | Owner: **Select Energy**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000	500,000	39.346473	-81.338727

☑ Regulated Stream? Ohio River Min. Flow | Ref. Gauge ID: 9999998 | Ohio River Station: Racine Dam

Max. Pump rate (gpm): 1,680 | **Min. Gauge Reading (cfs): 7,216.00** | **Min. Passby (cfs)**

DEP Comments: Refer to the specified station on the National Weather Service's Ohio River forecast website: http://www.erh.noaa.gov/ohrfc//flows.shtml

- Source: **Middle Island Creek @ Solo Construction** | Pleasants | Owner: **Solo Construction, LLC**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000	1,000,000	39.399094	-81.185548

☑ Regulated Stream? Ohio River Min. Flow | Ref. Gauge ID: 9999999 | Ohio River Station: Willow Island Lock & Dam

Max. Pump rate (gpm): | **Min. Gauge Reading (cfs): 6,468.00** | **Min. Passby (cfs)**

DEP Comments: Elevation analysis indicates that this location has the same elevation as Middle Island Creek's pour point into the Ohio River. As such, it is deemed that water flow at this location is heavily influenced by the Ohio River.

- Source: **Claywood Park PSD** | Wood | Owner: **Claywood Park PSD**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000		-	-

☑ Regulated Stream? | Ref. Gauge ID: 9999998 | Ohio River Station: Racine Dam

Max. Pump rate (gpm): | **Min. Gauge Reading (cfs): 7,216.00** | **Min. Passby (cfs)**

DEP Comments: Elevation analysis indicates that this location has approximately the same elevation as Little Kanawha's pour point into the Ohio River. As such, it is deemed that water flow at this location is heavily influenced by the Ohio River.

Source	Sun Valley Public Service District	Harrison	Owner:	Sun Valley PSD

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
4/15/2015	4/15/2016	9,730,000	200,000	-	-

☑ Regulated Stream? **Stonewall Jackson Dam** Ref. Gauge ID: **3061000** **WEST FORK RIVER AT ENTERPRISE, WV**

Max. Pump rate (gpm): **Min. Gauge Reading (cfs):** **171.48** **Min. Passby (cfs)**

DEP Comments:

Source Detail

WMP- 01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31119 | Source Name: Ohio River @ Select Energy / Select Energy

Source Latitude: 39.346473

Source Longitude: -81.338727

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 25000 | County: Pleasants

Anticipated withdrawal start date: 4/15/2015

Anticipated withdrawal end date: 4/15/2016

Total Volume from Source (gal): 9,730,000

Max. Pump rate (gpm): 1,680

Max. Simultaneous Trucks:

Max. Truck pump rate (gpm)

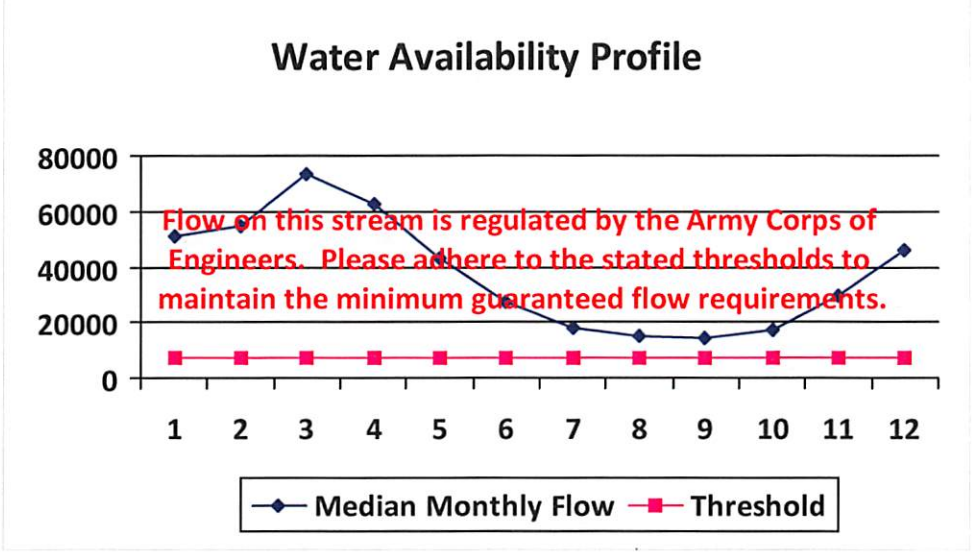
- [ ] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [x] Regulated Stream? — Ohio River Min. Flow
- [ ] Proximate PSD?
- [x] Gauged Stream?

Reference Gaug: 9999998 | Ohio River Station: Racine Dam

Drainage Area (sq. mi.): 25,000.00

Gauge Threshold (cfs): 7216

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	50,956.00	-	-
2	54,858.00	-	-
3	73,256.00	-	-
4	62,552.00	-	-
5	43,151.00	-	-
6	27,095.00	-	-
7	17,840.00	-	-
8	14,941.00	-	-
9	14,272.00	-	-
10	17,283.00	-	-
11	29,325.00	-	-
12	46,050.00	-	-



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	3.74
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31120 | Source Name: Middle Island Creek @ Solo Construction

Solo Construction, LLC

Source Latitude: 39.399094

Source Longitude: -81.185548

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 25000 | County: Pleasants

Anticipated withdrawal start date: 4/15/2015

Anticipated withdrawal end date: 4/15/2016

Total Volume from Source (gal): 9,730,000

Max. Pump rate (gpm):

Max. Simultaneous Trucks:

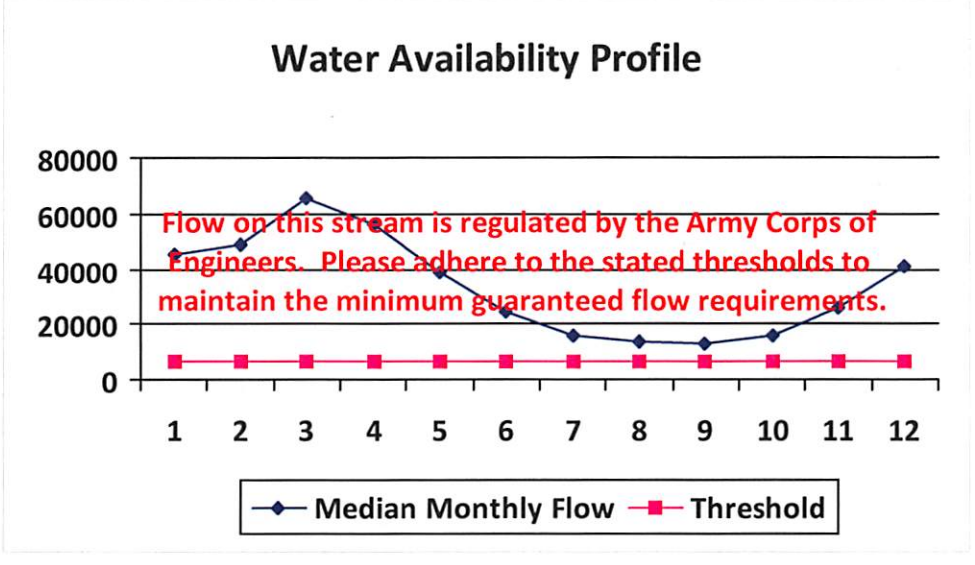
Max. Truck pump rate (gpm): 0

- [ ] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [x] Regulated Stream? — Ohio River Min. Flow
- [x] Proximate PSD? — City of St. Marys
- [x] Gauged Stream?

Reference Gaug: 9999999 | Ohio River Station: Willow Island Lock & Dam

Drainage Area (sq. mi.): 25,000.00 | Gauge Threshold (cfs): 6468

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	45,700.00	-	-
2	49,200.00	-	-
3	65,700.00	-	-
4	56,100.00	-	-
5	38,700.00	-	-
6	24,300.00	-	-
7	16,000.00	-	-
8	13,400.00	-	-
9	12,800.00	-	-
10	15,500.00	-	-
11	26,300.00	-	-
12	41,300.00	-	-



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31121 | Source Name: Claywood Park PSD

Claywood Park PSD

Source Latitude: -

Source Longitude: -

HUC-8 Code: 5030203

Drainage Area (sq. mi.): 25000 | County: Wood

Anticipated withdrawal start date: 4/15/2015

Anticipated withdrawal end date: 4/15/2016

Total Volume from Source (gal): 9,730,000

Max. Pump rate (gpm):

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm) 0

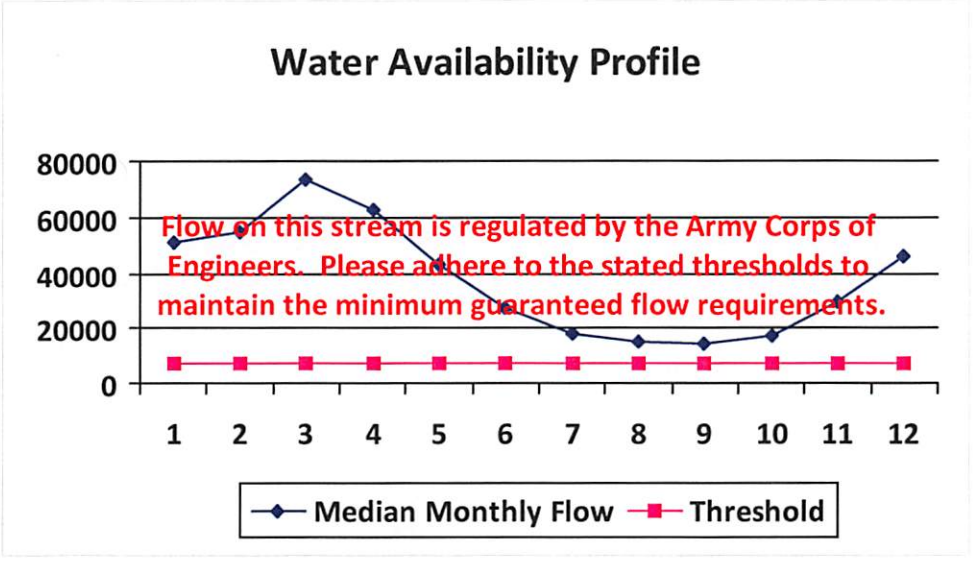
- [ ] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [x] Regulated Stream?
- [x] Proximate PSD? Claywood Park PSD
- [x] Gauged Stream?

Reference Gaug: 9999998 | Ohio River Station: Racine Dam

Drainage Area (sq. mi.) 25,000.00

Gauge Threshold (cfs): 7216

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	50,956.00	-	-
2	54,858.00	-	-
3	73,256.00	-	-
4	62,552.00	-	-
5	43,151.00	-	-
6	27,095.00	-	-
7	17,840.00	-	-
8	14,941.00	-	-
9	14,272.00	-	-
10	17,283.00	-	-
11	29,325.00	-	-
12	46,050.00	-	-



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31122 | Source Name: Sun Valley Public Service District / Sun Valley PSD

Source Latitude: - | Source Longitude: -

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 391.85 | County: Harrison

Anticipated withdrawal start date: 4/15/2015

Anticipated withdrawal end date: 4/15/2016

Total Volume from Source (gal): 9,730,000

Max. Pump rate (gpm):

Max. Simultaneous Trucks:

Max. Truck pump rate (gpm)

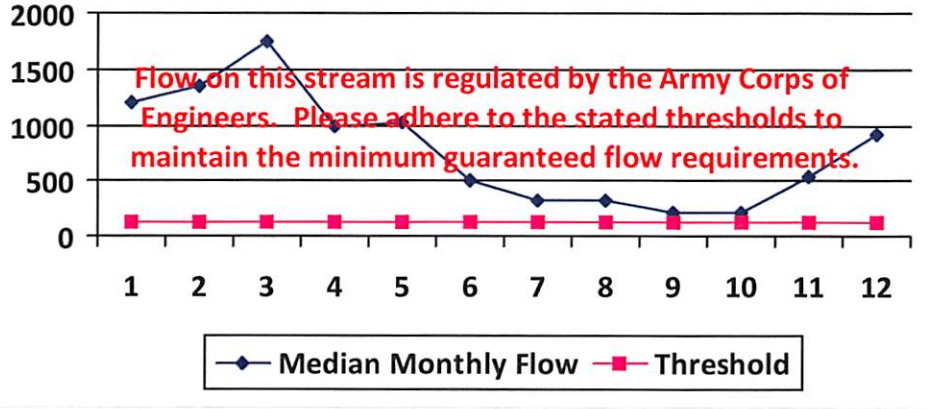
- [ ] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [x] Regulated Stream? — Stonewall Jackson Dam
- [ ] Proximate PSD?
- [x] Gauged Stream?

Reference Gaug: 3061000 | WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.): 759.00 | Gauge Threshold (cfs): 234

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	1,200.75	-	-
2	1,351.92	-	-
3	1,741.33	-	-
4	995.89	-	-
5	1,022.23	-	-
6	512.21	-	-
7	331.86	-	-
8	316.87	-	-
9	220.48	-	-
10	216.17	-	-
11	542.45	-	-
12	926.12	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	
Downstream Demand (cfs):	
Pump rate (cfs):	
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31105 | Source Name: Ohio River @ Ben's Run Withdrawal Site
Ben's Run Land Company Limited Partnership

Source Latitude: 39.46593
Source Longitude: -81.110781

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 25000 | County: Tyler

Anticipated withdrawal start date: 4/15/2015
Anticipated withdrawal end date: 4/15/2016
Total Volume from Source (gal): 9,730,000
Max. Pump rate (gpm): 3,360
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

- [ ] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [x] Regulated Stream?
- [ ] Proximate PSD?
- [x] Gauged Stream?

Ohio River Min. Flow

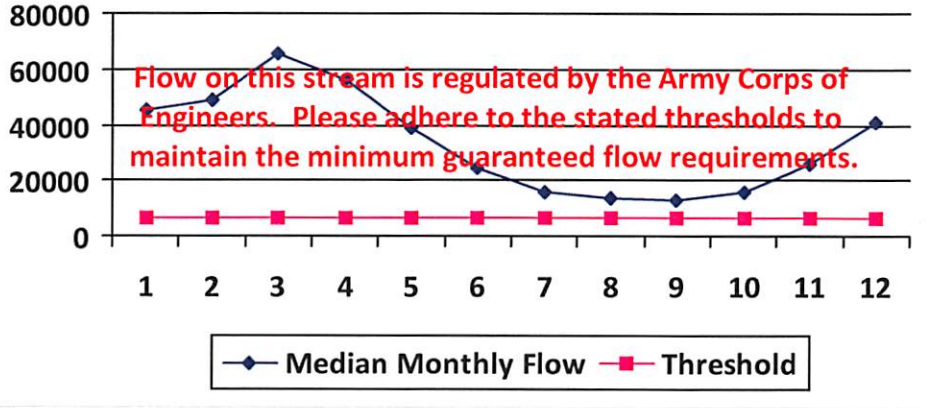
Reference Gaug: 9999999 | Ohio River Station: Willow Island Lock & Dam

Drainage Area (sq. mi.) 25,000.00

Gauge Threshold (cfs): 6468

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	45,700.00	-	-
2	49,200.00	-	-
3	65,700.00	-	-
4	56,100.00	-	-
5	38,700.00	-	-
6	24,300.00	-	-
7	16,000.00	-	-
8	13,400.00	-	-
9	12,800.00	-	-
10	15,500.00	-	-
11	26,300.00	-	-
12	41,300.00	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	7.49
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31106 | Source Name: West Fork River @ JCP Withdrawal
James & Brenda Raines

Source Latitude: 39.320913
Source Longitude: -80.337572

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 532.2 | County: Harrison

Anticipated withdrawal start date: 4/15/2015
Anticipated withdrawal end date: 4/15/2016
Total Volume from Source (gal): 9,730,000
Max. Pump rate (gpm): 2,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

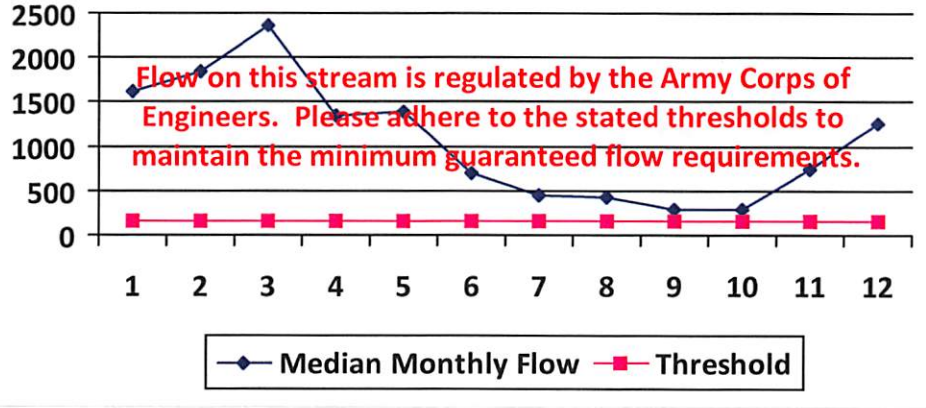
- [ ] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [x] Regulated Stream? — Stonewall Jackson Dam
- [ ] Proximate PSD?
- [x] Gauged Stream?

Reference Gaug: 3061000 | WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.): 759.00 | Gauge Threshold (cfs): 234

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	1,630.82	-	-
2	1,836.14	-	-
3	2,365.03	-	-
4	1,352.59	-	-
5	1,388.37	-	-
6	695.67	-	-
7	450.73	-	-
8	430.37	-	-
9	299.45	-	-
10	293.59	-	-
11	736.74	-	-
12	1,257.84	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	24.29
Downstream Demand (cfs):	0.00
Pump rate (cfs):	4.46
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31107 | Source Name: West Fork River @ McDonald Withdrawal
David Shrieves

Source Latitude: 39.16761
Source Longitude: -80.45069

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 314.91 | County: Harrison

Anticipated withdrawal start date: 4/15/2015
Anticipated withdrawal end date: 4/15/2016
Total Volume from Source (gal): 9,730,000
Max. Pump rate (gpm): 3,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

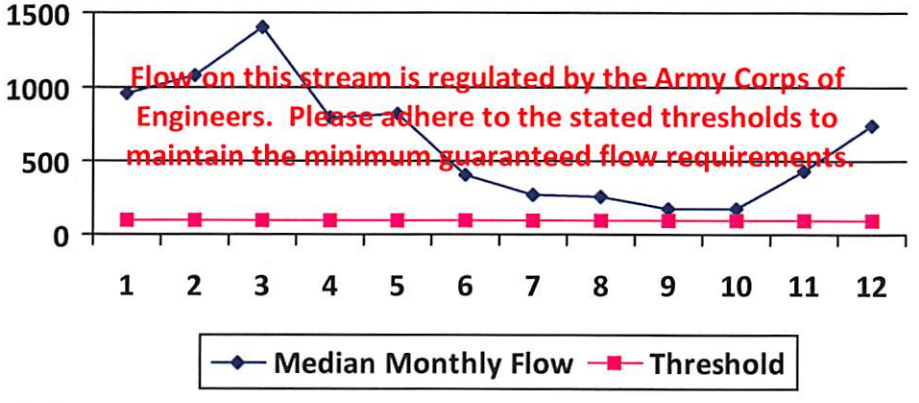
- [ ] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [x] Regulated Stream? — Stonewall Jackson Dam
- [ ] Proximate PSD?
- [x] Gauged Stream?

Reference Gaug: 3061000 | WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.) 759.00 | Gauge Threshold (cfs): 234

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	964.98	-	-
2	1,086.47	-	-
3	1,399.42	-	-
4	800.34	-	-
5	821.52	-	-
6	411.64	-	-
7	266.70	-	-
8	254.66	-	-
9	177.19	-	-
10	173.72	-	-
11	435.94	-	-
12	744.28	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	24.29
Downstream Demand (cfs):	0.00
Pump rate (cfs):	6.68
Headwater Safety (cfs):	24.27
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31108 | Source Name: West Fork River @ GAL Withdrawal
David Shrieves

Source Latitude: 39.16422
Source Longitude: -80.45173

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 313.67 | County: Harrison

Anticipated withdrawal start date: 4/15/2015
Anticipated withdrawal end date: 4/15/2016
Total Volume from Source (gal): 9,730,000
Max. Pump rate (gpm): 2,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

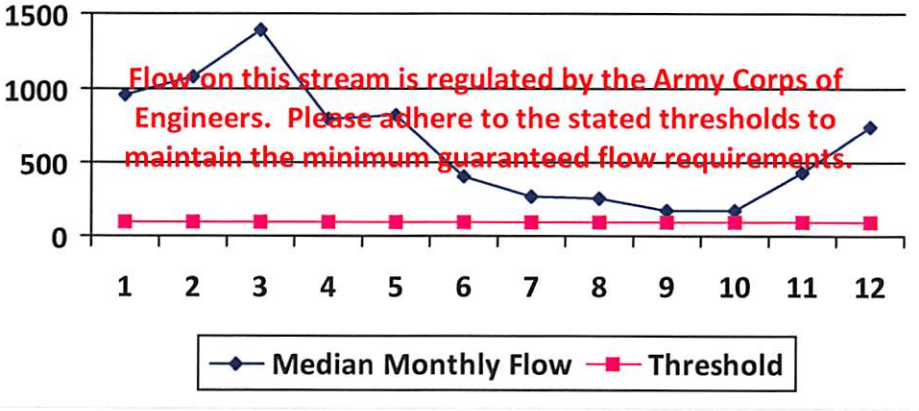
- [ ] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [x] Regulated Stream? — Stonewall Jackson Dam
- [ ] Proximate PSD?
- [x] Gauged Stream?

Reference Gaug: 3061000 | WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.) 759.00 | Gauge Threshold (cfs): 234

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	961.18	-	-
2	1,082.19	-	-
3	1,393.91	-	-
4	797.19	-	-
5	818.28	-	-
6	410.02	-	-
7	265.65	-	-
8	253.65	-	-
9	176.49	-	-
10	173.04	-	-
11	434.22	-	-
12	741.35	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	24.29
Downstream Demand (cfs):	0.00
Pump rate (cfs):	4.46
Headwater Safety (cfs):	24.18
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31109 | Source Name: Middle Island Creek @ Mees Withdrawal Site

Sarah E. Mees

Source Latitude: 39.43113

Source Longitude: -81.079567

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 484.78 | County: Pleasants

Anticipated withdrawal start date: 4/15/2015

Anticipated withdrawal end date: 4/15/2016

Total Volume from Source (gal): 9,730,000

Max. Pump rate (gpm): 3,360

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm) 0

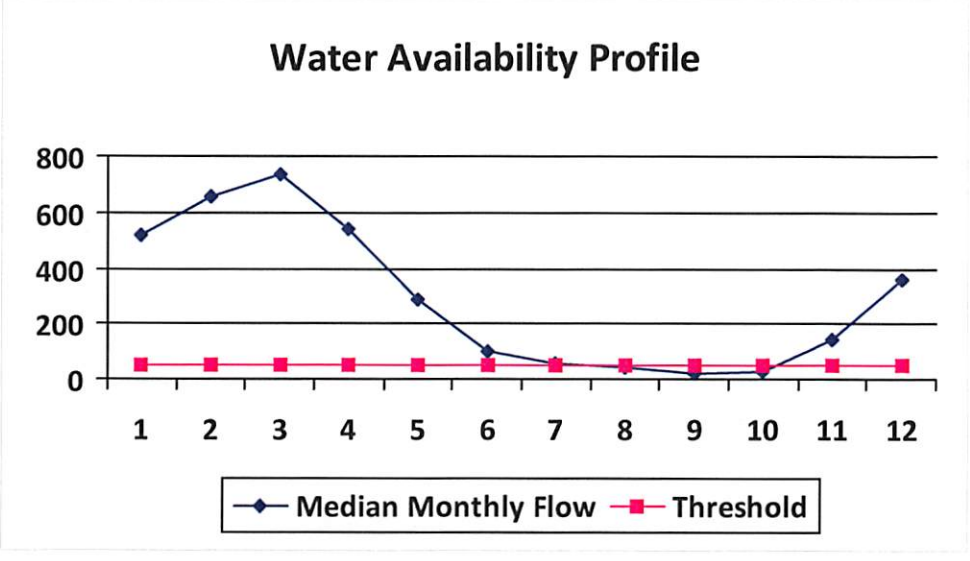
- [x] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [x] Gauged Stream?

Reference Gaug: 3114500 | MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	519.88	55.12	465.14
2	653.95	55.12	599.22
3	731.75	55.12	677.01
4	543.38	55.12	488.65
5	286.64	55.12	231.90
6	100.10	55.12	45.36
7	56.65	55.12	1.91
8	46.64	55.12	-8.10
9	23.89	55.12	-30.85
10	30.01	55.12	-24.72
11	146.56	55.12	91.83
12	358.10	55.12	303.37



Water Availability Assessment of Location

Base Threshold (cfs):	47.63
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	7.49
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	52.49
Passby at Location (cfs):	47.63

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31110 | Source Name: Middle Island Creek @ Dawson Withdrawal
Gary D. and Rella A. Dawson

Source Latitude: 39.379292
Source Longitude: -80.867803

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 181.34 | County: Tyler

Anticipated withdrawal start date: 4/15/2015
Anticipated withdrawal end date: 4/15/2016
Total Volume from Source (gal): 9,730,000
Max. Pump rate (gpm): 3,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

- [x] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [x] Gauged Stream?

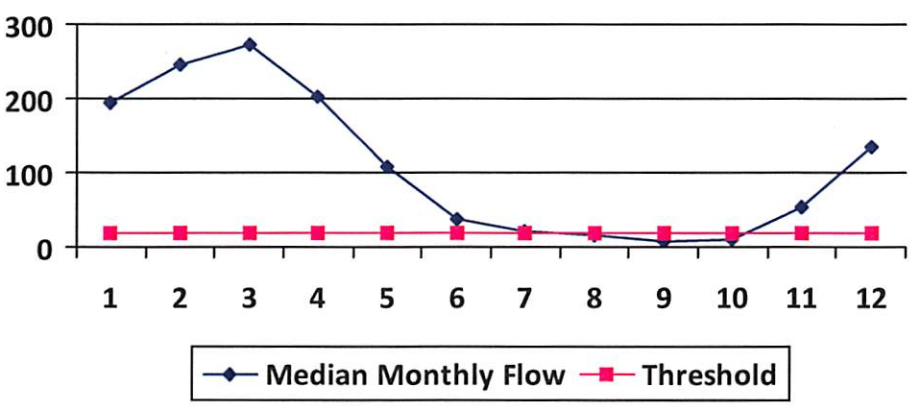
Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	194.47	42.06	152.68
2	244.62	42.06	202.83
3	273.72	42.06	231.93
4	203.26	42.06	161.47
5	107.22	42.06	65.43
6	37.44	42.06	-4.35
7	21.19	42.06	-20.60
8	17.45	42.06	-24.34
9	8.94	42.06	-32.85
10	11.23	42.06	-30.56
11	54.82	42.06	13.04
12	133.96	42.06	92.17

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	17.82
Upstream Demand (cfs):	13.10
Downstream Demand (cfs):	6.55
Pump rate (cfs):	6.68
Headwater Safety (cfs):	4.45
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	**76.03**
Passby at Location (cfs):	**28.82**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31111 | Source Name: McElroy Creek @ Forest Withdrawal
Forest C. & Brenda L. Moore

Source Latitude: 39.39675
Source Longitude: -80.738197

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 88.85 | County: Tyler

Anticipated withdrawal start date: 4/15/2015
Anticipated withdrawal end date: 4/15/2016
Total Volume from Source (gal): 9,730,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

☐ Endangered Species? ☐ Mussel Stream?
☐ Trout Stream? ☐ Tier 3?
☐ Regulated Stream?
☐ Proximate PSD?
☐ Gauged Stream?

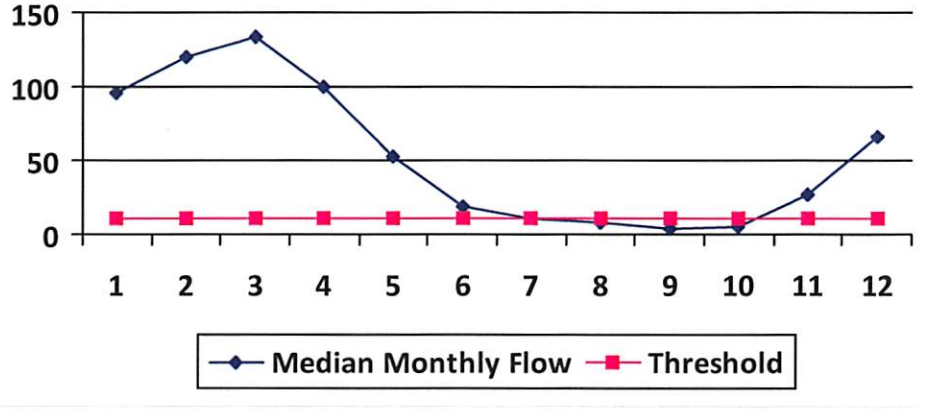
Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	95.28	19.78	75.68
2	119.86	19.78	100.25
3	134.11	19.78	114.51
4	99.59	19.78	79.99
5	52.54	19.78	32.93
6	18.35	19.78	-1.26
7	10.38	19.78	-9.22
8	8.55	19.78	-11.05
9	4.38	19.78	-15.23
10	5.50	19.78	-14.10
11	26.86	19.78	7.26
12	65.63	19.78	46.03

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	8.73
Upstream Demand (cfs):	4.46
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	2.18
Ungauged Stream Safety (cfs):	2.18
Min. Gauge Reading (cfs):	**74.19**
Passby at Location (cfs):	**13.09**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31112 | Source Name: Meathouse Fork @ Gagnon Withdrawal
George L. Gagnon and Susan C. Gagnon

Source Latitude: 39.26054
Source Longitude: -80.720998

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 60.6 | County: Doddridge

Anticipated withdrawal start date: 4/15/2015
Anticipated withdrawal end date: 4/15/2016
Total Volume from Source (gal): 9,730,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

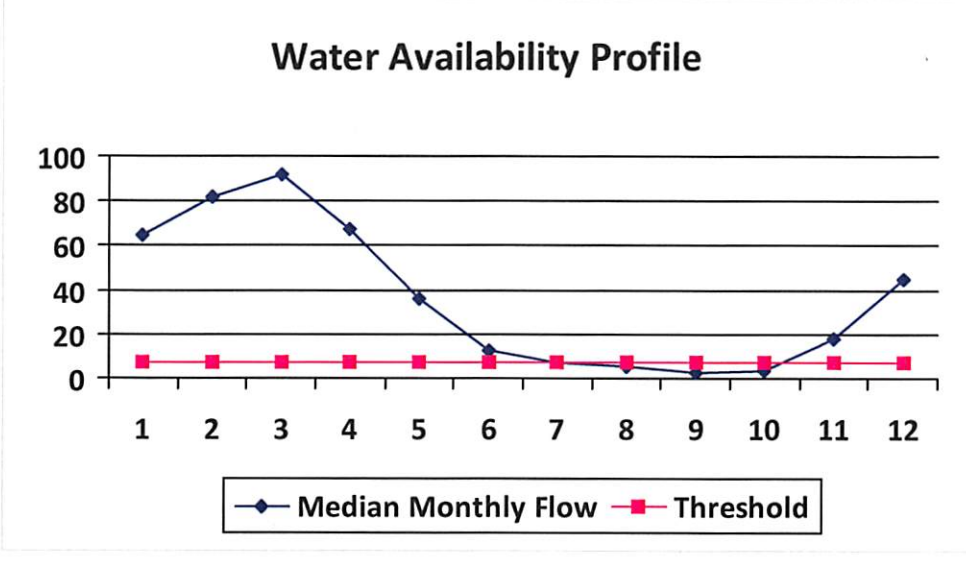
- [x] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [ ] Gauged Stream?

Reference Gaug: 3114500 MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	64.99	13.39	51.70
2	81.75	13.39	68.46
3	91.47	13.39	78.19
4	67.93	13.39	54.64
5	35.83	13.39	22.55
6	12.51	13.39	-0.77
7	7.08	13.39	-6.20
8	5.83	13.39	-7.45
9	2.99	13.39	-10.30
10	3.75	13.39	-9.53
11	18.32	13.39	5.04
12	44.76	13.39	31.48



Water Availability Assessment of Location

Base Threshold (cfs):	5.95
Upstream Demand (cfs):	2.23
Downstream Demand (cfs):	2.81
Pump rate (cfs):	2.23
Headwater Safety (cfs):	1.49
Ungauged Stream Safety (cfs):	1.49
Min. Gauge Reading (cfs):	71.96
Passby at Location (cfs):	11.74

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31113 | Source Name: Meathouse Fork @ Whitehair Withdrawal

Elton Whitehair

Source Latitude: 39.211317

Source Longitude: -80.679592

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 30.37 | County: Doddridge

Anticipated withdrawal start date: 4/15/2015

Anticipated withdrawal end date: 4/15/2016

Total Volume from Source (gal): 9,730,000

Max. Pump rate (gpm): 1,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm) 0

- [x] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [ ] Gauged Stream?

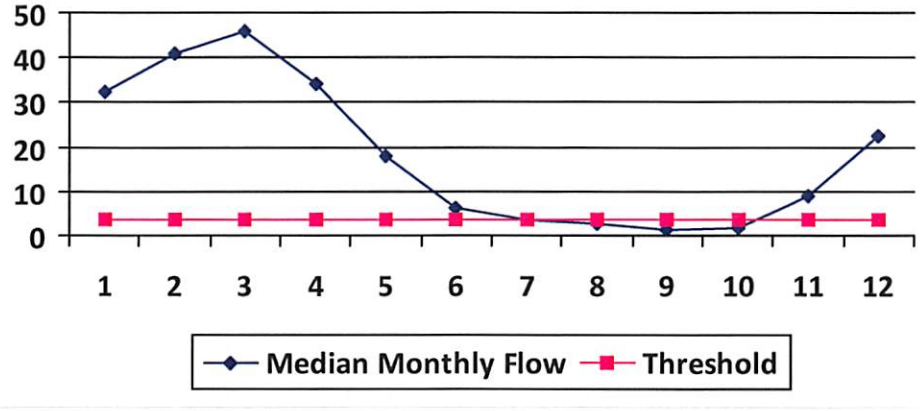
Reference Gaug: 3114500 | MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.): 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	32.57	6.70	26.15
2	40.97	6.70	34.55
3	45.84	6.70	39.42
4	34.04	6.70	27.62
5	17.96	6.70	11.54
6	6.27	6.70	-0.15
7	3.55	6.70	-2.87
8	2.92	6.70	-3.50
9	1.50	6.70	-4.92
10	1.88	6.70	-4.54
11	9.18	6.70	2.76
12	22.43	6.70	16.01

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	2.98
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	2.81
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.75
Ungauged Stream Safety (cfs):	0.75
Min. Gauge Reading (cfs):	69.73
Passby at Location (cfs):	7.29

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31114 | Source Name: Tom's Fork @ Erwin Withdrawal
John F. Erwin and Sandra E. Erwin

Source Latitude: 39.174306
Source Longitude: -80.702992

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 4.01 | County: Doddridge

Anticipated withdrawal start date: 4/15/2015
Anticipated withdrawal end date: 4/15/2016
Total Volume from Source (gal): 9,730,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

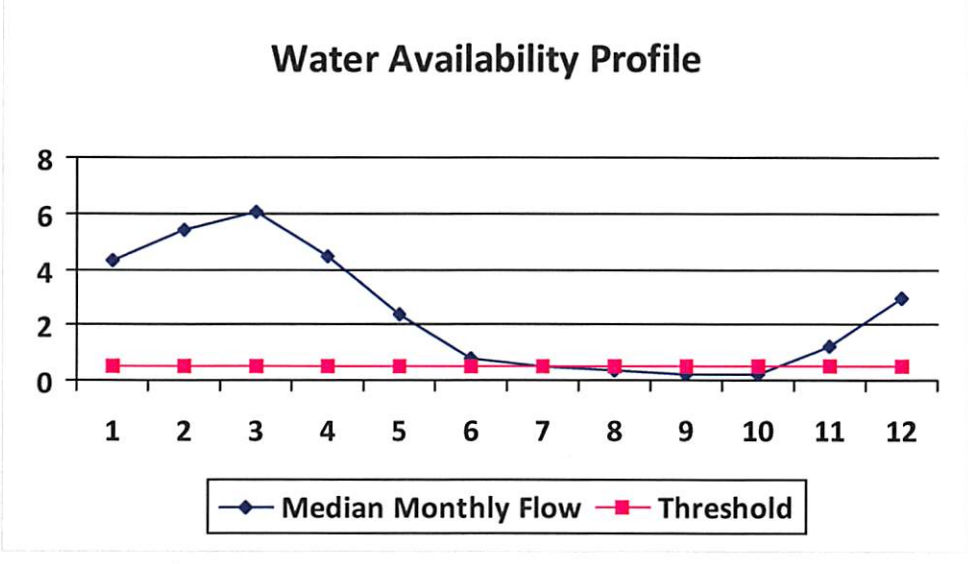
- [ ] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [ ] Gauged Stream?

Reference Gaug: 3114500 | MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	4.30	2.82	1.88
2	5.41	2.82	2.98
3	6.05	2.82	3.63
4	4.49	2.82	2.07
5	2.37	2.82	-0.05
6	0.83	2.82	-1.60
7	0.47	2.82	-1.96
8	0.39	2.82	-2.04
9	0.20	2.82	-2.23
10	0.25	2.82	-2.18
11	1.21	2.82	-1.21
12	2.96	2.82	0.54



Water Availability Assessment of Location

Base Threshold (cfs):	0.39
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.10
Ungauged Stream Safety (cfs):	0.10
Min. Gauge Reading (cfs):	69.73
Passby at Location (cfs):	0.59

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31115 | Source Name: Arnold Creek @ Davis Withdrawal
Jonathon Davis

Source Latitude: 39.302006
Source Longitude: -80.824561

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 20.83 | County: Doddridge

Anticipated withdrawal start date: 4/15/2015
Anticipated withdrawal end date: 4/15/2016
Total Volume from Source (gal): 9,730,000
Max. Pump rate (gpm): 1,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

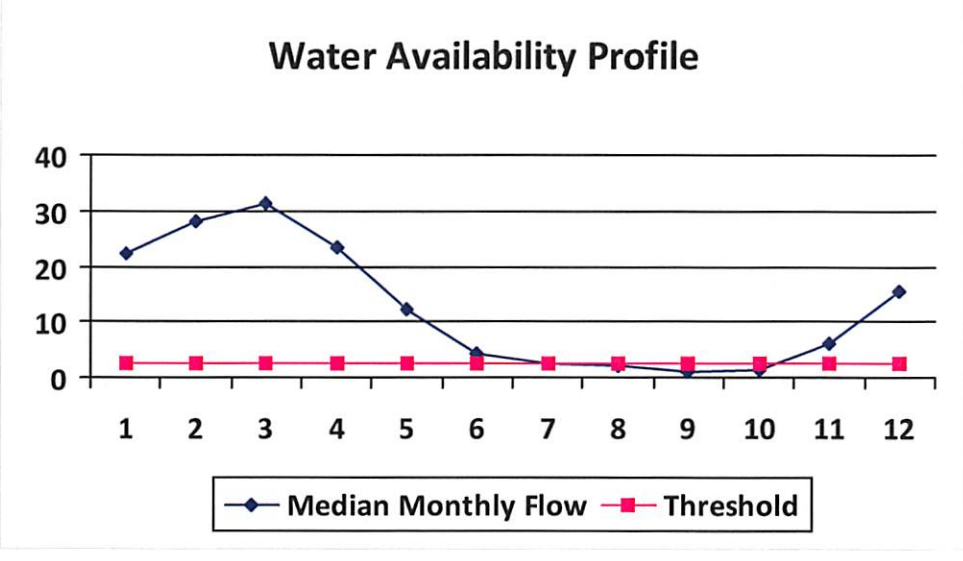
- [ ] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [ ] Gauged Stream?

Reference Gaug: 3114500 | MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	22.34	5.30	17.29
2	28.10	5.30	23.05
3	31.44	5.30	26.39
4	23.35	5.30	18.30
5	12.32	5.30	7.26
6	4.30	5.30	-0.75
7	2.43	5.30	-2.62
8	2.00	5.30	-3.05
9	1.03	5.30	-4.03
10	1.29	5.30	-3.76
11	6.30	5.30	1.25
12	15.39	5.30	10.34



Water Availability Assessment of Location

Base Threshold (cfs):	2.05
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.51
Ungauged Stream Safety (cfs):	0.51
Min. Gauge Reading (cfs):	**69.73**
Passby at Location (cfs):	**3.07**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31116 | Source Name: Buckeye Creek @ Powell Withdrawal / Dennis Powell

Source Latitude: 39.277142

Source Longitude: -80.690386

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 31.15 | County: Doddridge

Anticipated withdrawal start date: 4/15/2015

Anticipated withdrawal end date: 4/15/2016

Total Volume from Source (gal): 9,730,000

Max. Pump rate (gpm): 1,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm) 0

- [ ] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [ ] Gauged Stream?

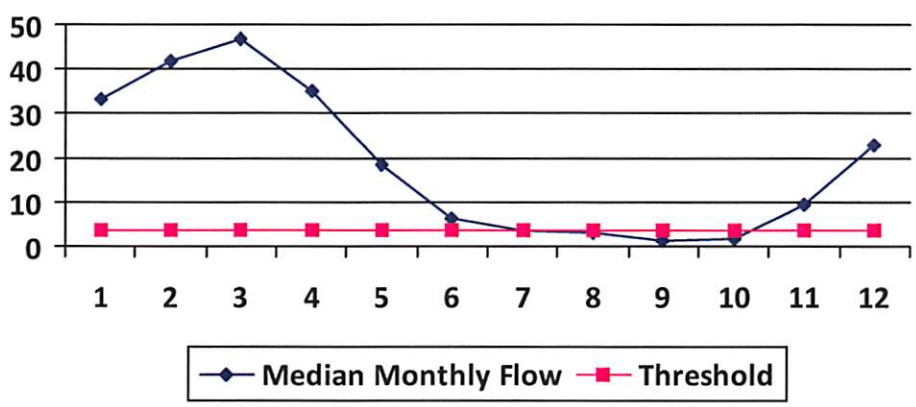
Reference Gaug: 3114500 | MIDDLE ISLAND CREEK AT LITTLE, WV

Drainage Area (sq. mi.) 458.00

Gauge Threshold (cfs): 45

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	33.41	6.82	26.95
2	42.02	6.82	35.56
3	47.02	6.82	40.56
4	34.92	6.82	28.46
5	18.42	6.82	11.96
6	6.43	6.82	-0.03
7	3.64	6.82	-2.82
8	3.00	6.82	-3.46
9	1.53	6.82	-4.92
10	1.93	6.82	-4.53
11	9.42	6.82	2.96
12	23.01	6.82	16.55

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	3.06
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.77
Ungauged Stream Safety (cfs):	0.77
Min. Gauge Reading (cfs):	**69.73**
Passby at Location (cfs):	**4.59**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP- 01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31117 | Source Name: South Fork of Hughes River @ Knight Withdrawal
Tracy C. Knight & Stephanie C. Knight

Source Latitude: 39.198369
Source Longitude: -80.870969

HUC-8 Code: 5030203

Drainage Area (sq. mi.): 16.26 | County: Ritchie

Anticipated withdrawal start date: 4/15/2015
Anticipated withdrawal end date: 4/15/2016
Total Volume from Source (gal): 9,730,000
Max. Pump rate (gpm): 3,000
Max. Simultaneous Trucks: 0
Max. Truck pump rate (gpm) 0

- [x] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [x] Gauged Stream?

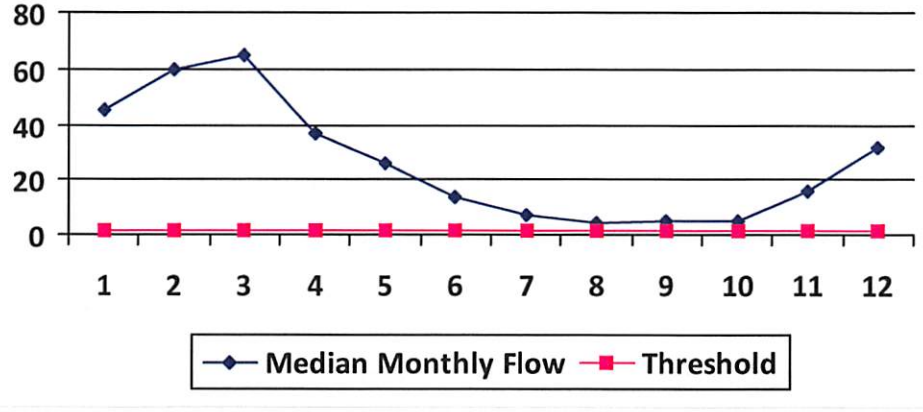
Reference Gaug: 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Drainage Area (sq. mi.) 229.00

Gauge Threshold (cfs): 22

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	45.67	14.26	31.44
2	59.55	14.26	45.31
3	65.21	14.26	50.97
4	36.87	14.26	22.63
5	25.86	14.26	11.63
6	13.90	14.26	-0.33
7	6.89	14.26	-7.34
8	3.98	14.26	-10.25
9	4.79	14.26	-9.45
10	5.20	14.26	-9.04
11	15.54	14.26	1.30
12	32.06	14.26	17.82

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	1.56
Upstream Demand (cfs):	5.62
Downstream Demand (cfs):	0.00
Pump rate (cfs):	6.68
Headwater Safety (cfs):	0.39
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	**39.80**
Passby at Location (cfs):	**1.95**

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Source Detail

WMP-01676 | API/ID Number: 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Source ID: 31118 | Source Name: North Fork of Hughes River @ Davis Withdrawal

Lewis P. Davis and Norma J. Davis

Source Latitude: 39.322363

Source Longitude: -80.936771

HUC-8 Code: 5030203

Drainage Area (sq. mi.): 15.18 | County: Ritchie

Anticipated withdrawal start date: 4/15/2015

Anticipated withdrawal end date: 4/15/2016

Total Volume from Source (gal): 9,730,000

Max. Pump rate (gpm): 1,000

Max. Simultaneous Trucks: 0

Max. Truck pump rate (gpm) 0

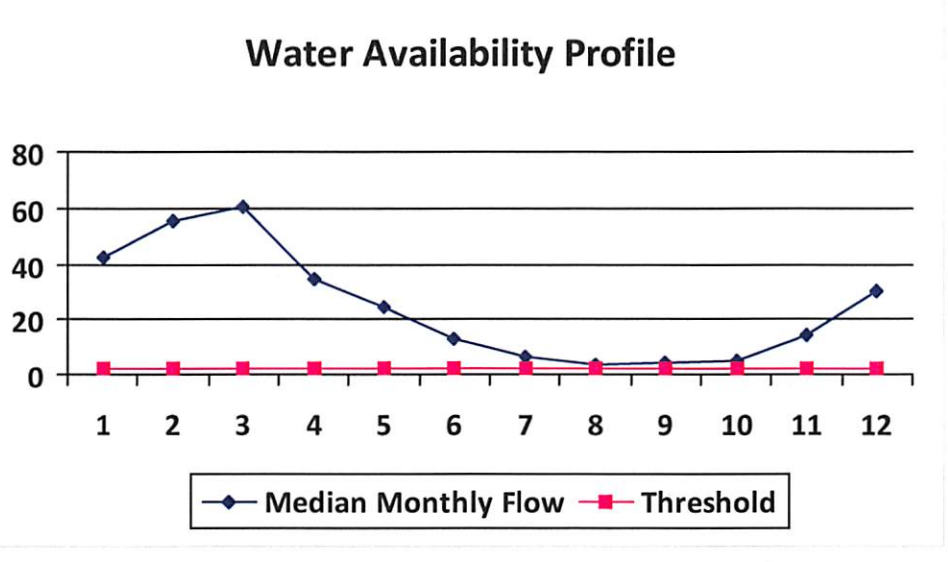
- [x] Endangered Species?
- [x] Mussel Stream?
- [ ] Trout Stream?
- [ ] Tier 3?
- [ ] Regulated Stream?
- [ ] Proximate PSD?
- [ ] Gauged Stream?

Reference Gaug: 3155220 SOUTH FORK HUGHES RIVER BELOW MACFARLAN, WV

Drainage Area (sq. mi.) 229.00

Gauge Threshold (cfs): 22

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	42.64	4.42	38.36
2	55.59	4.42	51.32
3	60.88	4.42	56.60
4	34.42	4.42	30.14
5	24.15	4.42	19.87
6	12.98	4.42	8.70
7	6.44	4.42	2.16
8	3.72	4.42	-0.56
9	4.47	4.42	0.19
10	4.85	4.42	0.57
11	14.50	4.42	10.23
12	29.93	4.42	25.65



Water Availability Assessment of Location

Base Threshold (cfs):	1.46
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	2.23
Headwater Safety (cfs):	0.36
Ungauged Stream Safety (cfs):	0.36
Min. Gauge Reading (cfs):	35.23
Passby at Location (cfs):	2.19

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

Water Management Plan:
Secondary Water Sources

WMP-01676 | API/ID Number 047-017-06416 | Operator: Antero Resources

Hoskins Unit 1H

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Lake/Reservior

Source ID: 31123 Source Name: City of Salem Reservior (Lower Dog Run)
Public Water Provider

Source start date: 4/15/2015
Source end date: 4/15/2016

Source Lat: 39.28834 Source Long: -80.54966 County: Harrison

Max. Daily Purchase (gal): 1,000,000 Total Volume from Source (gal): 9,730,000

DEP Comments:

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Source ID: 31124 Source Name: Pennsboro Lake
Source start date: 4/15/2015
Source end date: 4/15/2016
Source Lat: 39.281689 Source Long: -80.925526 County: Ritchie
Max. Daily Purchase (gal): Total Volume from Source (gal): 9,730,000
DEP Comments:

Source ID: 31125 Source Name: Powers Lake (Wilderness Water Park Dam)
Private Owner
Source start date: 4/15/2015
Source end date: 4/15/2016
Source Lat: 39.255752 Source Long: -80.463262 County: Harrison
Max. Daily Purchase (gal): Total Volume from Source (gal): 9,730,000
DEP Comments:

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Source ID: 31126 Source Name: Powers Lake Two

Source start date: 4/15/2015
Source end date: 4/15/2016

Source Lat: 39.247604 Source Long: -80.466642 County: Harrison

Max. Daily Purchase (gal):

Total Volume from Source (gal): 9,730,000

DEP Comments:

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Other

Source ID: 31127 Source Name: Poth Lake (Landowner Pond) / Private Owner
Source start date: 4/15/2015
Source end date: 4/15/2016
Source Lat: 39.221306 Source Long: -80.463028 County: Harrison
Max. Daily Purchase (gal): Total Volume from Source (gal): 9,730,000
DEP Comments:

Source ID: 31128 Source Name: Williamson Pond (Landowner Pond)
Source start date: 4/15/2015
Source end date: 4/15/2016
Source Lat: 39.19924 Source Long: -80.886161 County: Ritchie
Max. Daily Purchase (gal): Total Volume from Source (gal): 9,730,000
DEP Comments:

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Source ID: 31129 Source Name: Eddy Pond (Landowner Pond)
Source start date: 4/15/2015
Source end date: 4/15/2016
Source Lat: 39.19924 Source Long: -80.886161 County: Ritchie
Max. Daily Purchase (gal): Total Volume from Source (gal): 9,730,000
DEP Comments:

Source ID: 31130 Source Name: Hog Lick Quarry
Industrial Facility
Source start date: 4/15/2015
Source end date: 4/15/2016
Source Lat: 39.419272 Source Long: -80.217941 County: Marion
Max. Daily Purchase (gal): 1,000,000 Total Volume from Source (gal): 9,730,000
DEP Comments:

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

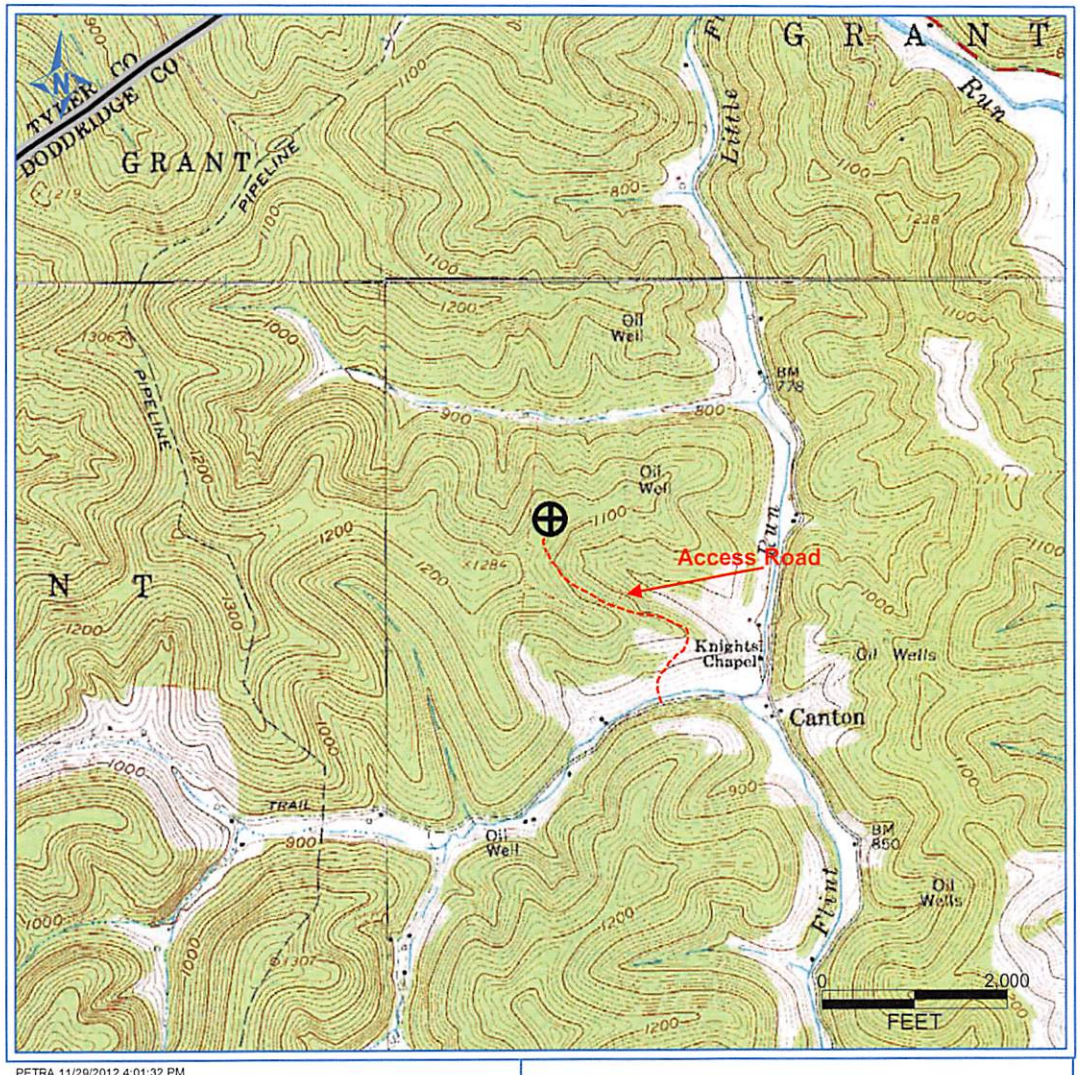
- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Source ID: 31131 Source Name: Glade Fork Mine Industrial Facility
Source start date: 4/15/2015
Source end date: 4/15/2016
Source Lat: 38.965767 Source Long: -80.299313 County: Upshur
Max. Daily Purchase (gal): 1,000,000 Total Volume from Source (gal): 9,730,000
DEP Comments:

Recycled Frac Water

Source ID: 31132 Source Name: Various
Source start date: 4/15/2015
Source end date: 4/15/2016
Source Lat: Source Long: County:
Max. Daily Purchase (gal): Total Volume from Source (gal): 9,730,000
DEP Comments: Sources include, but are not limited to: Knight Unit 2H

plat spotted



PETRA 11/29/2012 4:01:32 PM

Antero Resources Corporation

APPALACHIAN BASIN

Hoskins Unit 1H

Doddridge County

0 2,000 4,000
FEET

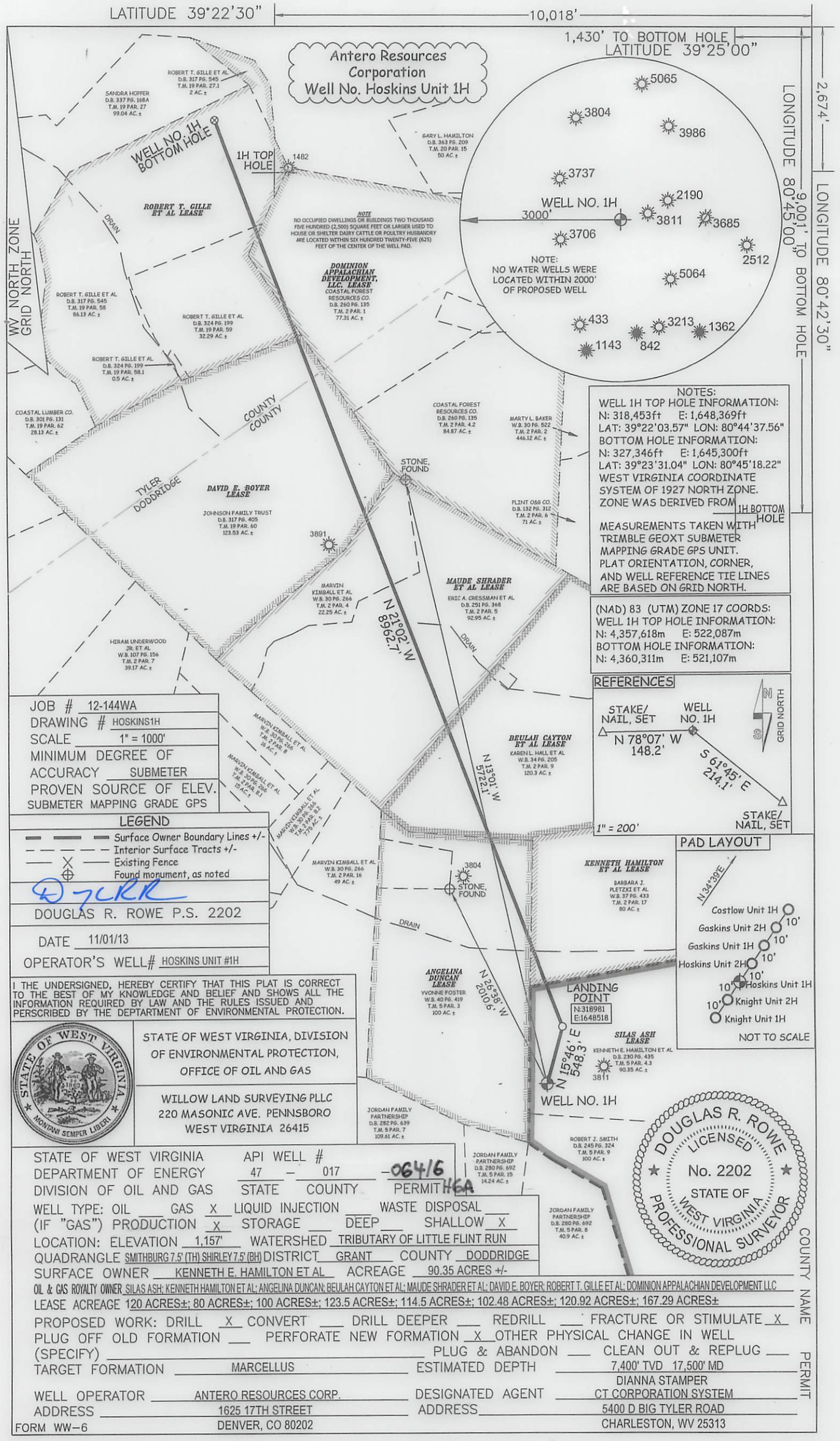
REMARKS

QUADRANGLE: SMITHBURG
WATERSHED: TRIBUTARY OF LITTLE FLINT RUN
DISTRICT: GRANT

Date: 12/05/2012

017 06416

RECEIVED
Office of Oil and Gas
NOV 14 2013
WV Department of
Environmental Protection


LATITUDE 39°22'30"
10,018'
1,430' TO BOTTOM HOLE
LATITUDE 39°25'00"
2,674'
LONGITUDE 80°45'00"
9,001' TO BOTTOM HOLE
LONGITUDE 80°42'30"
Antero Resources Corporation
Well No. Hoskins Unit 1H
WV NORTH ZONE GRID NORTH
WELL NO. 1H BOTTOM HOLE
1H TOP HOLE
1482
ROBERT T. GILLE ET AL LEASE
DRAIN
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.
DOMINION APPALACHIAN DEVELOPMENT, LLC. LEASE
COASTAL FOREST RESOURCES CO.
D.B. 260 PG. 135
T.M. 2 PAR. 1
77.31 AC. ±
SANDRA HOPPER
D.B. 337 PG. 168A
T.M. 19 PAR. 27
99.04 AC. ±
ROBERT T. GILLE ET AL
D.B. 317 PG. 545
T.M. 19 PAR. 27.1
2 AC. ±
GARY L. HAMILTON
D.B. 363 PG. 209
T.M. 20 PAR. 15
50 AC. ±
ROBERT T. GILLE ET AL
D.B. 317 PG. 545
T.M. 19 PAR. 58
86.13 AC. ±
ROBERT T. GILLE ET AL
D.B. 324 PG. 199
T.M. 19 PAR. 59
32.29 AC. ±
ROBERT T. GILLE ET AL
D.B. 324 PG. 199
T.M. 19 PAR. 58.1
0.5 AC. ±
COASTAL LUMBER CO.
D.B. 301 PG. 131
T.M. 19 PAR. 62
28.13 AC. ±
COUNTY
COUNTY
TYLER
DODDRIDGE
DAVID E. BOYER LEASE
JOHNSON FAMILY TRUST
D.B. 317 PG. 405
T.M. 19 PAR. 60
123.53 AC. ±
3891
COASTAL FOREST RESOURCES CO.
D.B. 260 PG. 135
T.M. 2 PAR. 4.2
84.87 AC. ±
MARTY L. BAKER
W.B. 30 PG. 522
T.M. 2 PAR. 2
446.12 AC. ±
STONE, FOUND
FLINT O&G CO.
D.B. 132 PG. 312
T.M. 2 PAR. 6
71 AC. ±
1H BOTTOM HOLE
MARVIN KIMBALL ET AL
W.B. 30 PG. 266
T.M. 2 PAR. 4
22.25 AC. ±
MAUDE SHRADER ET AL LEASE
ERIC A. CRESSMAN ET AL
D.B. 251 PG. 368
T.M. 2 PAR. 5
92.95 AC. ±
N 21°02' W
8962.7'
DRAIN
HIRAM UNDERWOOD JR. ET AL
W.B. 107 PG. 156
T.M. 2 PAR. 7
39.17 AC. ±
MARVIN KIMBALL ET AL
W.B. 30 PG. 266
T.M. 2 PAR. 8
16 AC. ±
MARVIN KIMBALL ET AL
W.B. 30 PG. 266
T.M. 2 PAR. 8.1
15 AC. ±
MARVIN KIMBALL ET AL
W.B. 30 PG. 266
T.M. 2 PAR. 8.2
77.9 AC. ±
BEULAH CAYTON ET AL LEASE
KAREN L. HALL ET AL
W.B. 34 PG. 205
T.M. 2 PAR. 9
120.3 AC. ±
N 13°01' W
5722.1'
MARVIN KIMBALL ET AL
W.B. 30 PG. 266
T.M. 2 PAR. 16
49 AC. ±
3804
STONE, FOUND
DRAIN
KENNETH HAMILTON ET AL LEASE
BARBARA J. PLETZKI ET AL
W.B. 37 PG. 433
T.M. 2 PAR. 17
80 AC. ±
ANGELINA DUNCAN LEASE
YVONNE FOSTER
W.B. 40 PG. 419
T.M. 5 PAR. 3
100 AC. ±
N 26°38' W
2010.6'
LANDING POINT
N:318981
E:1648518
N 15°46' E
548.3'
SILAS ASH LEASE
KENNETH E. HAMILTON ET AL
D.B. 230 PG. 435
T.M. 5 PAR. 4.3
90.35 AC. ±
3811
WELL NO. 1H
JORDAN FAMILY PARTNERSHIP
D.B. 282 PG. 639
T.M. 5 PAR. 7
109.61 AC. ±
ROBERT J. SMITH
D.B. 245 PG. 324
T.M. 5 PAR. 9
100 AC. ±
JORDAN FAMILY PARTNERSHIP
D.B. 280 PG. 692
T.M. 5 PAR. 15
14.24 AC. ±
JORDAN FAMILY PARTNERSHIP
D.B. 280 PG. 692
T.M. 5 PAR. 8
40.9 AC. ±
5065
3804
3986
3737
2190
WELL NO. 1H
3000'
3811
3685
3706
2512
5064
433
3213
1362
1143
842
NOTE:
NO WATER WELLS WERE LOCATED WITHIN 2000' OF PROPOSED WELL
NOTES:
WELL 1H TOP HOLE INFORMATION:
N: 318,453ft E: 1,648,369ft
LAT: 39°22'03.57" LON: 80°44'37.56"
BOTTOM HOLE INFORMATION:
N: 327,346ft E: 1,645,300ft
LAT: 39°23'31.04" LON: 80°45'18.22"
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE.
ZONE WAS DERIVED FROM
MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT.
PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.
(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 1H TOP HOLE INFORMATION:
N: 4,357,618m E: 522,087m
BOTTOM HOLE INFORMATION:
N: 4,360,311m E: 521,107m
REFERENCES
STAKE/ NAIL, SET
WELL NO. 1H
N 78°07' W
148.2'
S 61°45' E
214.1'
STAKE/ NAIL, SET
1" = 200'
HARON GRID
PAD LAYOUT
N 34°39' E
Costlow Unit 1H
Gaskins Unit 2H
Gaskins Unit 1H
Hoskins Unit 2H
Hoskins Unit 1H
Knight Unit 2H
Knight Unit 1H
10'
NOT TO SCALE
JOB # 12-144WA
DRAWING # HOSKINS1H
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS
LEGEND
Surface Owner Boundary Lines +/-
Interior Surface Tracts +/-
Existing Fence
Found monument, as noted
DOUGLAS R. ROWE P.S. 2202
DATE 11/01/13
OPERATOR'S WELL# HOSKINS UNIT #1H
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 DEPTARTMENT OF ENVIRONMENTAL PROTECTION.
STATE OF WEST VIRGINIA
JUNE 22, 1863
MONTANI SEMPER LIBERI
STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WILLOW LAND SURVEYING PLLC
220 MASONIC AVE. PENNSBORO
WEST VIRGINIA 26415
DOUGLAS R. ROWE
LICENSED
No. 2202
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR
STATE OF WEST VIRGINIA API WELL # 47 - 017 - 06416
DEPARTMENT OF ENERGY
DIVISION OF OIL AND GAS
STATE COUNTY PERMIT
WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,157' WATERSHED TRIBUTARY OF LITTLE FLINT RUN
QUADRANGLE SMITHBURG 7.5' (TH) SHIRLEY 7.5' (BH) DISTRICT GRANT COUNTY DODDRIDGE
SURFACE OWNER KENNETH E. HAMILTON ET AL ACREAGE 90.35 ACRES +/-
OIL & GAS ROYALTY OWNER SILAS ASH; KENNETH HAMILTON ET AL; ANGELINA DUNCAN; BEULAH CAYTON ET AL; MAUDE SHRADER ET AL; DAVID E. BOYER; ROBERT T. GILLE ET AL; DOMINION APPALACHIAN DEVELOPMENT LLC
LEASE ACREAGE 120 ACRES±; 80 ACRES±; 100 ACRES±; 123.5 ACRES±; 114.5 ACRES±; 102.48 ACRES±; 120.92 ACRES±; 167.29 ACRES±
PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X
PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL (SPECIFY) ___ PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,400' TVD 17,500' MD
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1625 17TH STREET DENVER, CO 80202 ADDRESS CT CORPORATION SYSTEM 5400 D BIG TYLER ROAD CHARLESTON, WV 25313
FORM WW-6
COUNTY NAME PERMIT

HAMILTON DRILL PAD SITE
FINAL SITE DESIGN, CONSTRUCTION PLAN, AND EROSION & SEDIMENT CONTROL PLANS

ANTERO RESOURCES APPALACHIAN CORPORATION

APPROVED
WVDEP OOG
2/27/2013
SAY

NORTH/SURFACE REFERENCED TO NAD83 WEST VIRGINIA STATE PLANE NORTH ZONE

DATE SUBMITTED	SHEET NO.	TOTAL SHEETS
1-16-2013	1	38

White Brothers Consulting, LLC
ENGINEERING AND SURVEYING
400 WASHINGTON AVE. SUITE 216
CHARLESTON, WV 25312
(304)550-9484
www.white-brothers.com

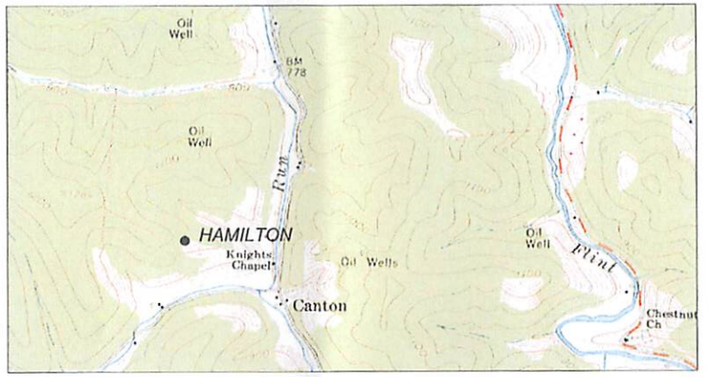
TIMOTHY T. WHITE REGISTERED 14275 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER
1-16-13

ANTERO RESOURCES

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES APPALACHIAN CORP

FINAL SITE DESIGN, QUANTITES AND CONSTRUCTION SEQUENCE
HAMILTON DRILL PAD
GRANT DISTRICT
DODDRIDGE COUNTY, WV

● PROJECT LOCATION



WATERSHED (HUC8): LITTLE MUSKINGUM-MIDDLE ISLAND

SMITHBURG 7.5 QUAD

● PROJECT LOCATION
SCALE 1" = 2000'

AFFECTED TAX PARCELS:
KENNETH E. JR & JODI HAMILTON
DB 230 PG 435
TM 5 PARCEL 4.3
GRANT DISTRICT

ROBERT J. SMITH
DB 245 PG324
TM 5 PARCEL 9
GRANT DISTRICT

WELL HEAD LAYOUT
STATE PLANE NAD 83 (WV NORTH ZONE)

	NORTH	EAST	LATITUDE	LONGITUDE
COSTLOW UNIT 1H	318521.4615	1616950.4098	39-22-04.1970	-80-44-36.6521
GASKINS UNIT 2H	318513.2360	1616944.7229	39-22-04.1150	-80-44-36.7231
GASKINS UNIT 1H	318505.0105	1616939.0359	39-22-04.0329	-80-44-36.7940
HOSKINS UNIT 2H	318496.7850	1616933.3490	39-22-03.9508	-80-44-36.8650
HOSKINS UNIT 1H	318488.5595	1616927.6620	39-22-03.8688	-80-44-36.9359
KNIGHT UNIT 2H	318480.3341	1616921.9751	39-22-03.7867	-80-44-37.0069
KNIGHT UNIT 1H	318472.1086	1616915.2881	39-22-03.7046	-80-44-37.0779

WELL LOCATION RESTRICTIONS

THE PAD AND FRACTURE PIT COMPLIES WITH THE FOLLOWING RESTRICTIONS:

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

PROJECT CONTACTS
ANTERO RESOURCES
ANTHONY SMITH, FIELD ENGINEER
304-869-3405 OFFICE
304-673-6198 CELL

ELI WAGONER, ENVIRONMENTAL ENGINEER
304-622-3842, EXT. 311
OFFICE 304-476-9770

JOHN KAWCAK, ENGINEER
817-368-1553

AARON KUNZLER, CONSTRUCTION SUPERVISOR
405-277-8344

SURVEYOR & ENGINEER
WHITE BROTHERS CONSULTING, LLC
LEE SNYDER, P.S.
304-550-9484
TIMOTHY T. WHITE, P.E.
304-561-4477

SITE LOCATIONS
STATE PLANE NAD 83 (WV NORTH ZONE)

	LATITUDE	LONGITUDE
CENTER OF PAD	39-22-04.0741	-80-44-36.7579
BEGIN ACCESS ROAD	39-21-45.9436	-80-44-19.6066
CENTER OF PAD (UTM 83-17 M)	N 4357624.214	E 522091.573
CENTER OF FRAC PIT	39-22-08.7255	-80-44-24.3560

LOD AREAS (ACRES)

DESCRIPTION	AREA
MAIN ACCESS ROADS TO PAD & FRAC PIT	13.17
DRILL PAD	3.14
FRAC PIT	3.97
SPOIL PAD	7.52
TOTAL	27.80
TOTAL WOODED	25.17

LENGTH (FEET)

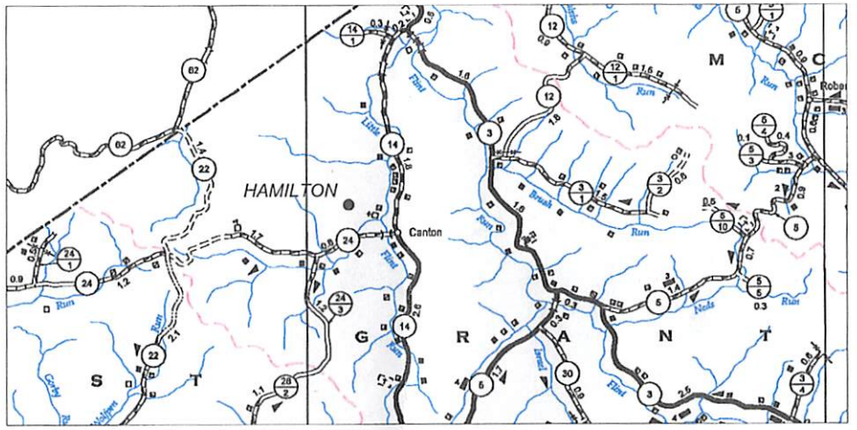
DESCRIPTION	FEET
COUNTY ROUTE TO FRAC PIT	3,890
FRAC PIT TO DRILL PAD	1,455
TOTAL	5,345

STREAM IMPACTS (LINEAR FEET)

DESCRIPTION	LINEAR FEET
RPW PERENNIAL	0
EPHEMERAL SWV-KMM-003	41
EPHEMERAL SWV-KMM-012	21
PEM WETLANDS	0
RPW INTERMITTENT	0
TOTAL	62

TOTAL DISTURBANCE (ACRES)

LAND OWNER	AREA
KENNETH E JR & JODI HAMILTON	17.30
ROBERT J SMITH	10.42



FLOODPLAIN CONDITIONS

DO SITE CONSTRUCTION ACTIVITIES TAKE PLACE IN FLOODPLAIN:	NO
PERMIT NEEDED FROM COUNTY FLOODPLAIN COORDINATOR:	NO
HEC-RAS STUDY COMPLETED:	N/A
FLOODPLAIN SHOWN ON DRAWINGS:	N/A
FIRM MAP NUMBER(S) FOR SITE: 54017C0130C	
ACREAGES OF CONSTRUCTION IN FLOODPLAIN:	N/A

SHEET INDEX

COVER PAGE & LOCATION MAP	1
SCHEDULE OF QUANTITIES	2
CONSTRUCTION, GENERAL AND E&S NOTES	3
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ACCESS ROAD & PAD ROAD PROFILE	16-17
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PAD ROAD CROSS-SECTIONS	31-32
CONSTRUCTION DETAILS	33-34
RECLAMATION PLAN	35-38

DESIGN CERTIFICATION
THE DRAWINGS, CONSTRUCTION NOTES, AND REFERENCE DIAGRAMS ATTACHED HERETO HAVE BEEN PREPARED IN ACCORDANCE WITH THE WEST VIRGINIA CODE OF STATE RULES, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS §35-4-21.

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

MISS UTILITY OF WEST VIRGINIA
1-800-245-4848
WEST VIRGINIA STATE LAW REQUIRES THAT YOU CALL TWO BUSINESS DAYS BEFORE YOU DIG IN THE STATE OF WEST VIRGINIA. IT'S THE LAW!!

811
Know what's below.
Call before you dig.

Electronic Version of Plans Can Be Viewed at: Q\OIL GAS\SAY FILES\REVIEWS

NUMBER	SHEET	REVISION	DATE	BY

\\SERVER-PC\SCANS\SURVEY\12-500-17 HAMILTON-SMITH PADS\FINAL\DWG\TITLE.DWG 1/16/2013 5:26 PM