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west virginia department of environmental protection

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

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

Friday, October 21, 2016  
WELL WORK PERMIT  
Vertical / Plugging - 2

ANTERO RESOURCES CORPORATION  
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit approval for 2  
47-017-03072-00-00

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: 2  
Farm Name: HILL, G. W.  
U.S. WELL NUMBER: 47-017-03072-00-00  
Vertical / Plugging - 2  
Date Issued: 10/21/2016

Promoting a healthy environment.

10/21/2016

## 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

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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 within two years of the date of issuance of this permit.

1) Date July 11, 2016  
2) Operator's  
Well No. G.W. Hill 2  
3) API Well No. 47-017 - 03072

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 1075' Watershed Headwaters Middle Island Creek  
District Central County Doddridge Quadrangle Pennsboro

6) Well Operator Antero Resources Corporation 7) Designated Agent CT Corporation System - Dianna Stamper  
Address 1615 Wynkoop Street Address 5400 D Big Tyler Road  
Denver, CO 80202 Charleston, WV 25313

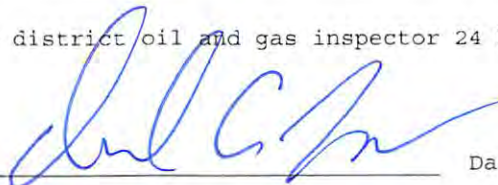
8) Oil and Gas Inspector to be notified Name Daniel Flack  
Address 601 57th Street, SE  
Charleston, WV 25304  
9) Plugging Contractor Name N/A - Antero will plug well  
Address \_\_\_\_\_

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

10/13/16

OCT 14 2016

WV Department of  
Environmental Protection

10/21/2016

MONUMENT VARIANCE

The Office of Oil and Gas is granting a general variance to the requirements under 35CSR4-5.5b of erecting a monument upon the plugging of certain wells. If granted, the following conditions will be met:

gmm

- 1) the well will be surveyed and a plat constructed as required under 22-6 of the WV Code and 35CSR4,
- 2) a readily visible, permanent offset marker, in as close proximity as reasonably possible, will be erected and will provide distance and bearing information to the plugged well,
- 3) the plugging affidavit (form WR-38), will document the absence of a monument at the well location and document the existence and location of the offset marker,
- 4) a steel plate no smaller than one square foot shall be affixed to the well casing no deeper than three feet below the ground surface and be inscribed with the api number of the well.

To qualify under the general variance, an operator may make a variance request to the Chief of the Office of Oil and Gas for a specific well(s) in conjunction with a showing of good cause by the surface owner.

PLEASE, FOLLOW THE ABOVE-REFERENCED CONDITIONS TO ACCEPT THE MONUMENT VARIANCE REQUEST MADE FOR API WELL 47-017-03072P.

JMM  
8/15/16



Hill, G.W. #2  
 Doddridge County, WV  
 API #47-017-03072

**Objective:** Plug and Abandon Wellbore.

**Pipe Schedule:**

1. 13 5/8" set @ 20'. Cemented to surface.
2. 8-5/8" 20# set @ 400'. Cemented to surface
3. 4-1/2" 10.5# set @ 2,400' with estimated TOC to be confirmed

Elevation: 1,075'

**Oil and Gas Zones:**

1. Big Injun: 2,020'-2,040' ; perfs @ 2,075'
2. Weir 2,105'-2,250' ; perfs @ 2,320'

**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 (Doddridge 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.
8. RU wireline and lubricator.
9. Make gauge ring run to casing TD @ 2,410'. Pull out of hole. Note fluid depth tagged.
10. MIRU logging crew
11. Load hole with 6% gel.
12. Run CBL from TD to surface
13. Locate Top of Cement around 4.5" casing (estimated @ 1,650').
14. Discuss results with completions engineers before proceeding.
15. TIH with tubing to 2,350'.
16. MIRU cement services. Mix and pump 39 sacks (Class A cement + 2% CaCl<sub>2</sub>, 20% excess included yield =1.18 ft<sup>3</sup>/sk, WR=5.2 gal/sk) Plug should cover from 1,920'-2,350'.
  - a. Displace to balance plug
  - b. Slowly pull out of cement plug and LD 200' of tubing.
  - c. Reverse circulate tubing clear of cement
  - d. Wait on cement 8hrs.
  - e. RIH w/ tubing and tag TOC at 1,920'.
  - f. If top of cement is deeper than 1,920', mix and spot cement so top is a minimum depth of 1,920'.
  - g. Tag TOC after each/every plug set.
17. POOH with tubing.
18. Lubricate and RIH w/ CIBP and set at 1,920. POOH w/ wireline.
19. PT CIBP to 500 psi.
20. RIH wireline and run free point above top of cement in 4 1/2" casing.
  - a. Chemical cut at xxxx' (depth as determined via freepoint and TOC from cement bond log)
  - b. RU casing jacks and POOH and LD 4.5" casing.
21. Pick up tubing and run in hole to 1,919' (One foot above CIBP).
22. Mix and pump 19 sacks (200') (Class A cement + 2% CaCl<sub>2</sub>, 20% excess included yield =1.18 ft<sup>3</sup>/sk, WR=5.2 gal/sk).
  - a. Displace to balance plug
  - b. Slowly pull out of cement plug and LD 200' of tubing.
  - c. Reverse circulate tubing clear of cement
23. Pull up to xxxx' (200' below casing cut)
24. Pump a 400' elevation plug using 87 sks (Class A cement + 2% CaCl<sub>2</sub>, 20% excess included yield =1.18 ft<sup>3</sup>/sk, WR=5.2 gal/sk). Plug should cover 200' below and 200' above cut casing.
  - a. Trip out of hole and wait on cement.
  - b. Tag TOC 200' above 4.5" casing cut.
25. Pull up to 500'

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26. Mix and pump 173 sacks from 500'-30' (depth per elevation cut) (Class A cement + 2% CaCl<sub>2</sub>, 20% excess included yield =1.18 ft<sup>3</sup>/sk, WR=5.2 gal/sk).
  - a. TOOH
  - b. Wait on cement 8 hrs.
27. During construction of new pad, cut off casing at 30' below ground level (1,045').
28. Weld marker plate with API number ( API No.: 47-017-03072)
29. Establish remote dry hole marker & provide direction and distance to DEP.

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RECEIVED

1703072P

FORM IV-35 (Obverse)

APR 23 1982

STATE OF WEST VIRGINIA DEPARTMENT OF MINES, OIL AND GAS DIVISION

Date: April 22, 1982

Operator: Watkins & Watkins Well No. No. 2

[08-78]

OIL AND GAS DIVISION DEPARTMENT OF MINES

WELL OPERATOR'S REPORT OF

API Well No. 57-017-3072 State/County: Penn

DRILLING, FRACTURING AND/OR STIMULATION, OR PHYSICAL CHANGE

WELL TYPE: Oil X / Gas X / Liquid Injection / Waste Disposal (If "Gas", Production / Underground storage / Deep / Shallow) LOCATION: Elevation: 1075 Watershed: Cabin Run Hughes River District: County: Doddridge / Quadrangle: Pennsboro. WELL OPERATOR: Watkins & Watkins Address: P. O. Box 386 Lumberport W.V. DESIGNATED AGENT: Watkins & Watkins Address: P.O. Box 386 Lumberport W.V.

PERMITTED WORK: Drill X / Convert / Drill deeper / Redrill / Fracture or stimulate Plug-off old formation / Perforate new formation Other physical change in well (specify)

PERMIT ISSUED ON 1-13-82 OIL & GAS INSPECTOR FOR THIS WORK: Name: Steve Casey Address: Jane Lew W.V.

GEOLOGICAL TARGET FORMATION: Weir Depth: 2,400 feet Depth of completed well: 2,500 feet Rotary X / Cable Tools Water strata depth: Fresh, 215 feet; salt Is coal being mined in the area? Work was commenced 2-1-82 and completed 2-6-82

CASING AND TUBING PROGRAM

Table with columns: CASING OR TUBING TYPE, SPECIFICATIONS (Size, Grade, Weight per ft, New, Used), FOOTAGE INTERVALS (For drilling, Left in well), CEMENT FILL-UP OR SACKS (Cubic feet), PACKERS (Kinds, Sizes, Perforations: Top, Bottom)

OPEN FLOW DATA

Producing formation Big Tujun Pay zone depth 2047 - 2075 feet Gas: Initial open flow, 30,000 Mcf/d Oil: Initial open flow, 0 Bbl/d Final open flow, 100,000 Mcf/d Final open flow, 1 Bbl/d Time of open flow between initial and final tests, 24 hours Static rock pressure, 350# psig (surface measurement) after 8 hours shut in

Second producing formation Weir Pay zone depth 2290-2320 feet Gas: Initial open flow, 150,000 Mcf/d Oil: Initial open flow, 0 Bbl/d Final open flow, 300,000 Mcf/d Final open flow, 2 Bbl/d Time of open flow between initial and final tests, 8 hours Static rock pressure, 1150# psig (surface measurement) after 24 hours shut in

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FORM IV-35  
(Reverse)  
(08-78)

DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC.

017-3072

WELL LOG

FORMATION	Color	Hard or Soft	Top Feet	Bottom Feet	Remarks Including indication of all fresh and salt water, coal, oil and gas
R. R.	0		0	15	
Sand			15	30	
Shale			30	70	
Sand			70	105	
R Rock			105	140	
Sand			140	210	
Red Rock			210	260	
Sand			260	385	
Shale			385	495	
Sand			495	555	
Shale			555	610	
Sand			610	700	
Shale			700	1040	
Sand			1040	1130	
Shale			1130	1410	
Sand			1410	1545	
Shale			1545	1717	
Sand			1717	1867	
Shale			1867	1890	
Sand			1890	2020	
Shale			2020	2040	
Sand			2040	2105	
Shale			2105	2250	
Sand			2250	2320	
Shale			2320	2410	

(Attach separate sheets to complete as necessary)

Watkins & Watkins  
Well Operator

By Thomas J. Fluharty  
Its Drilling Supervisor

NOTE: Regulation 2.02(i) provides as follows:

"The term 'log' or 'well log' shall mean a systematic, detailed geological record of all formations, including coal, encountered in the drilling of a well."



1703072A

WW-4A  
Revised 6-07

1) Date: July 11 2016  
2) Operator's Well Number  
G. W. Hill 2

3) API Well No.: 47 - 017 - 03072

**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:	5) (a) Coal Operator
(a) Name <u>PLEASE SEE ATTACHMENT</u>	Name <u>NO DECLARATIONS ON RECORD WITH COUNTY</u>
Address _____	Address _____
(b) Name _____	(b) Coal Owner(s) with Declaration
Address _____	Name <u>NO DECLARATIONS ON RECORD WITH COUNTY</u>
(c) Name _____	Address _____
Address _____	Name _____
6) Inspector <u>Daniel Flack</u>	(c) Coal Lessee with Declaration
Address <u>601 57th Street SE</u>	Name <u>NO DECLARATIONS ON RECORD WITH COUNTY</u>
<u>Charleston, WV 25304</u>	Address _____
Telephone <u>304-545-0109</u>	_____

**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 its 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 reverses 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.

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

Well Operator Antero Resources Corporation  
 By: Ward McNeilly  
 Its: Senior Vice President of Reserves Planning & Midstream  
 Address 1615 Wynkoop Street  
Denver, CO 80202  
 Telephone 303-357-7310

Subscribed and sworn before me this 11 day of July 2016  
Kara Quackenbush Notary Public  
 My Commission Expires July 21, 2018

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**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](mailto:depprivacyofficer@wv.gov).

10/21/2016

**WW-4A Notice of Application to Plug & Abandon a Well (G.W. HILL 2)****List of Surface Owner(s):****TM 8 PCL 38 & 38.1**

**Owner:** The John A. Hill Revocable Trust ✓  
**Address:** 1138 Willow Pond Ln.  
Leland, NC 28451

**TM 8 PCL 38.2**

**Owner:** Robert Authur Friend, II ✓  
**Address:** PSC 76 Box 4414  
Apo, AP 96319-0023

**Owner:** Randall Eric Friend  
**Address:** 404 Columbia St. ✓  
West Union, WV 26456

**Part of Route 50**

**Owner:** WV Department of Transportation ✓  
**Address:** 1900 Kanawha Blvd. E  
Charleston, WV 25305

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WW-9  
Rev. 5/08

Page \_\_\_\_\_ of \_\_\_\_\_  
API Number 47 - 017 - 03072  
Operator's Well No. G.W. Hill 2

**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 OP Code 494507062

Watershed Headwaters Middle Island Creek Quadrangle Pennsboro

Elevation 1075' County Doddridge District Central

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:

- 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)  
Northwestern Landfill Permit #SWF-1025/  
WV0109410
- Other (Explain \_\_\_\_\_ )

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 *Donald Gray*

Company Official (Typed Name) Donald Gray

Company Official Title Senior Environmental & Regulatory Manager

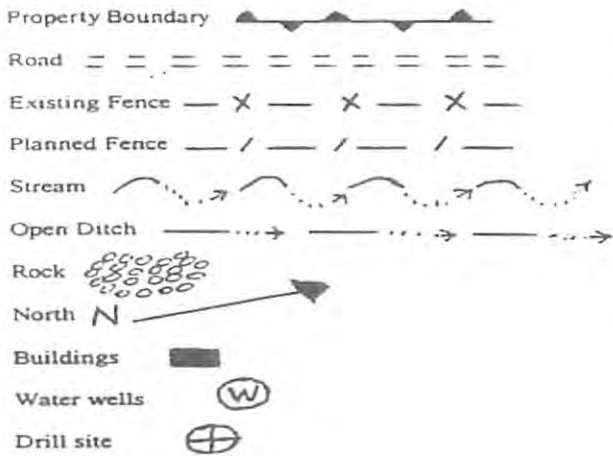
Subscribed and sworn before me this 8 day of July, 2016

*Kara Quackenbush* Notary Public

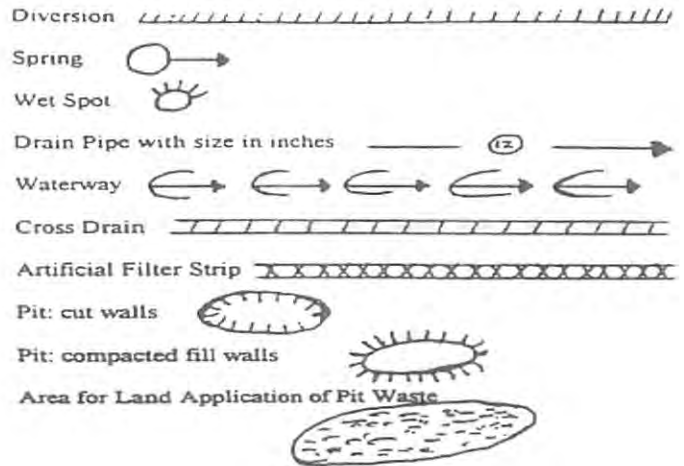
My commission expires July 21, 2018

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KARA QUACKENBUSH  
NOTARY PUBLIC  
STATE OF COLORADO  
NOTARY ID 20144028287  
MY COMMISSION EXPIRES JULY 21, 2016



LEGEND



Proposed Revegetation Treatment: Acres Disturbed 2.3 existing 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

*2mm*

Seed Type	Area I	lbs/acre
Please reference Table IV-3 on page 4 of the G.W. Hill 2 Well Plugging Plan		
_____		
_____		
*or type of grass seed requested by surface owner		

Seed Type	Area II	lbs/acre
Please reference Table IV-4A on page 4 of the G.W. Hill 2 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: \_\_\_\_\_

Comments: \_\_\_\_\_

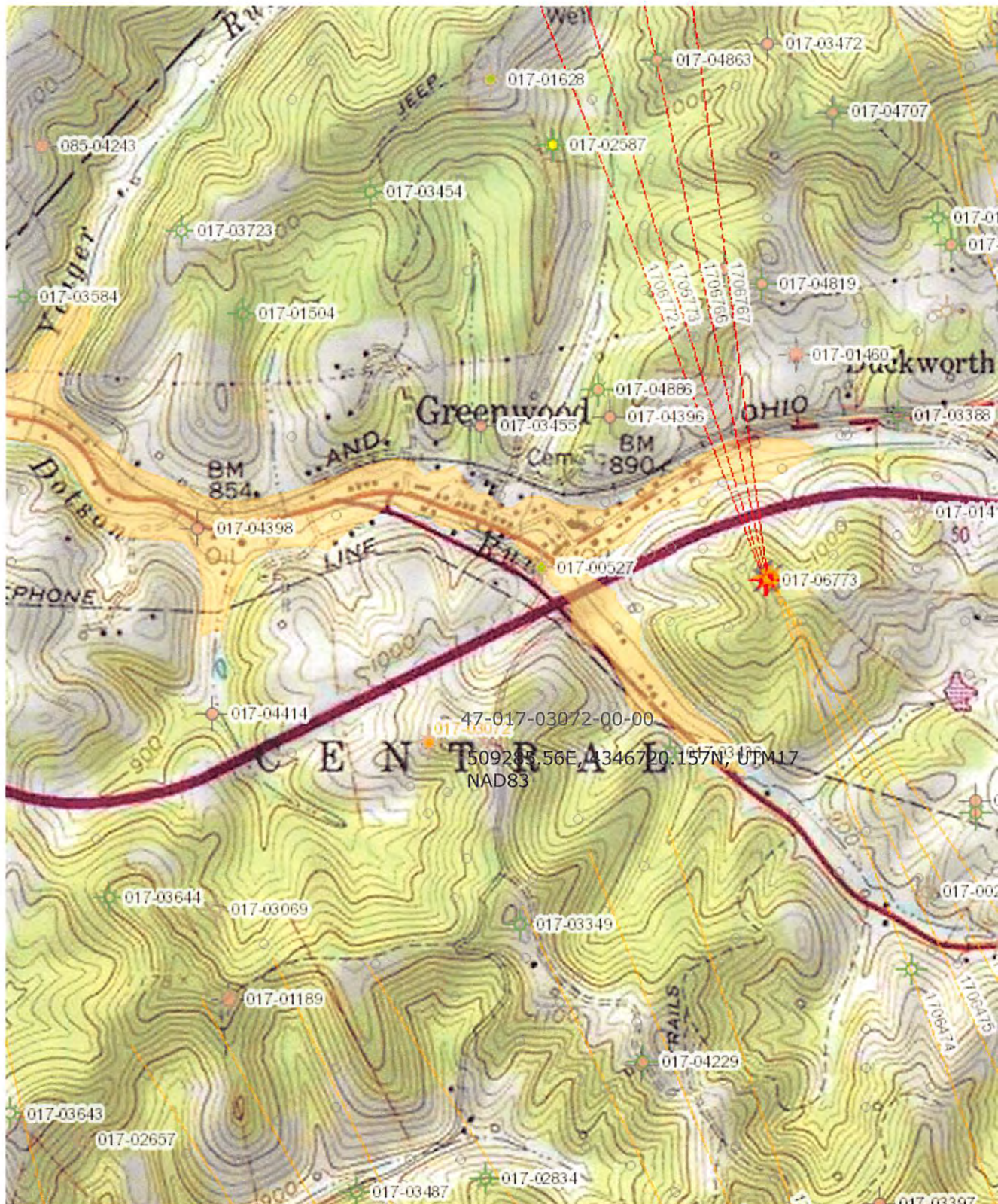
Title: \_\_\_\_\_

Date: \_\_\_\_\_

Field Reviewed? ( ) Yes ( ) No

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WW-7  
8-30-06



West Virginia Department of Environmental Protection  
Office of Oil and Gas

**WELL LOCATION FORM: GPS**

API: 47-017-03072 WELL NO.: G.W Hill 2

FARM NAME: Antero Resources Corporation

RESPONSIBLE PARTY NAME: Antero Resources Corporation

COUNTY: Doddridge DISTRICT: Central - 1

QUADRANGLE: Pennsboro - 539

SURFACE OWNER: Antero Resources Corporation

ROYALTY OWNER: \_\_\_\_\_

UTM GPS NORTHING: 434 6720.2 From Aerial Mapping

UTM GPS EASTING: 509 295.6 GPS ELEVATION: 1075'

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:

- Datum: NAD 1983, Zone: 17 North, Coordinate Units: meters, Altitude: height above mean sea level (MSL) – meters.
- Accuracy to Datum – 3.05 meters
- Data Collection Method:

Survey grade GPS  : Post Processed Differential

Real-Time Differential \_\_\_\_\_

Mapping Grade GPS \_\_\_\_\_ : Post Processed Differential \_\_\_\_\_

Real-Time Differential \_\_\_\_\_

- 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

Senior Permitting Agent  
Title

7/11/2016  
Date

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JUL 13 2016

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# WELL PLUGGING FOR

# API #47-017-003072 G GREENWOOD TAX DISTRICT,



**LOCATION MAP**

SCALE - 1"=200,000'



7.5 MIN. QUADRANGLE MAP: PENNSBORO, WV

**LOCATION**

SCALE - 1"=200'

## GENERAL NOTES

1. THE TOPOGRAPHIC SURVEY UTILIZED FOR THIS BASE WAS PERFORMED BY RETTEW, FEBRUARY 2015.
2. THE HORIZONTAL DATUM IS WEST VIRGINIA STATE PLANE, NORTH AMERICAN DATUM 1983 (NA83), NORTH ZONE.
3. THE VERTICAL DATUM IS WEST VIRGINIA STATE PLANE, NORTH AMERICAN DATUM 1988 (NA88).
4. THE UTILITIES SHOWN ON THIS PLAN ARE FOR REFERENCE PURPOSES ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION PRIOR TO EXCAVATION BY NOTIFYING WSS UTILITY OF WEST VIRGINIA AT 1-800-245-4848.
5. A WETLANDS PRESENCE/ABSENCE SURVEY WAS PERFORMED BY GAI ASSOCIATES, INC. IN MAY 2015.
6. THE CUT & FILL SUMMARY CALCULATIONS PRESENTED ON THIS PLAN ARE FOR PERMITTING AND INFORMATIONAL PURPOSES ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY EXISTING GRADES AND TO VERIFY EARTHWORK VOLUMES, METHODS AND PROCEDURES. ANY ISSUES ARE TO BE BROUGHT TO THE ENGINEERS AND OWNERS ATTENTION PRIOR TO COMMENCEMENT OF WORK.
7. ALL EXISTING UTILITIES HAVE BEEN SHOWN IN ACCORDANCE WITH THE BEST AVAILABLE INFORMATION.

## LOCAL INTEREST

175 ELK CREEK ROAD | 535  
MT. CLARE, WV 26408 | BRID  
PHONE (304) 622-3842 | PHON

LOCAL CONTACT:  
ELI WAGONER-ENVIRONMENTAL  
PHONE (304) 842-  
CELL (304) 476-9

JOHN KAWCAK-OPERATIONS SUPERVISOR  
CELL (817) 368-1

SHAWN BENNETT-CONSTRUCTION SUPERVISOR  
PHONE (304) 842-  
CELL (304) 641-0

ROBERT WIRKS-DESIGN  
PHONE (304) 842-  
CELL (304) 627-7

10/21/2016

1703072A

# PLUGGING PLAN

# G.H. HILL #2 WELL

# DODDRIDGE COUNTY, WV



**CALL BEFORE YOU DIG!** Dial 811 or 800.245.4848  
Miss Utility of West Virginia

AT LEAST 48 HOURS, BUT NOT MORE THAN 10 WORKING DAYS (EXCLUDING WEEKENDS AND HOLIDAYS), PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THESE ACTIVITIES SHALL CONTACT MISS UTILITY OF WEST VIRGINIA AT 811 OR 1-800-245-4848.

NO.	DATE	REVISION



FOR REVIEW ASSOCIATES BY:  
 MANAGER: ANDREW LEVINE, PE  
 DESIGN BY: JDN  
 DRAWN BY: JDN  
 SURV. CHIEF: FELDBOOK NO. N/A

CLIENT  
**ANTERO RESOURCES CORPORATION**  
 1615 WYNKOOP STREET  
 DENVER, COLORADO 80202

**RETTEW**  
 RETTEW Associates, Inc.  
 One Robinson Plaza, Suite 200, Pittsburgh, PA 15205  
 Phone (412) 446-1728 • Fax (412) 446-1733  
 Email: rettew@rettew.com  
 Website: www.rettew.com

Engineers • Planners • Surveyors • Landscape Architects  
 Environmental Consultants

### LIST OF DRAWINGS

- 1 OF 4 . . . . . COVER SHEET
- 2 OF 4 . . . . . OVERALL PLAN
- 3 OF 4 . . . . . E&S PLAN
- 4 OF 4 . . . . . NOTES AND DETAILS

### LOCATION COORDINATES

	EXISTING ACCESS ROAD	EXISTING WELL
WV SPCS NORTH, NAD 27	N 282941.513 E 1606382.447	N 283393.848 E 1605762.641
WV SPCS NORTH, NAD 83	N 282975.992 E 1574941.350	N 283428.311 E 1574321.547
UTM (METERS) ZONE 17, NAD83	N 4346585.509 E 509476.682	N 4346720.157 E 509285.560
LAT & LONG, NAD83	LAT 39-16-06.81910 LONG -80-53-24.51330	LAT 39-16-11.19442 LONG -80-53-32.48292

**OFFICE**  
 WHITE OAKS BLVD.  
 MARIETTA, WV 26330  
 (304) 842-4100

ENGINEER  
 068  
 70  
 SUPERINTENDENT  
 53  
 SUPERVISOR  
 341  
 71  
 MANAGER  
 401  
 05

DAF  
 10/13/16

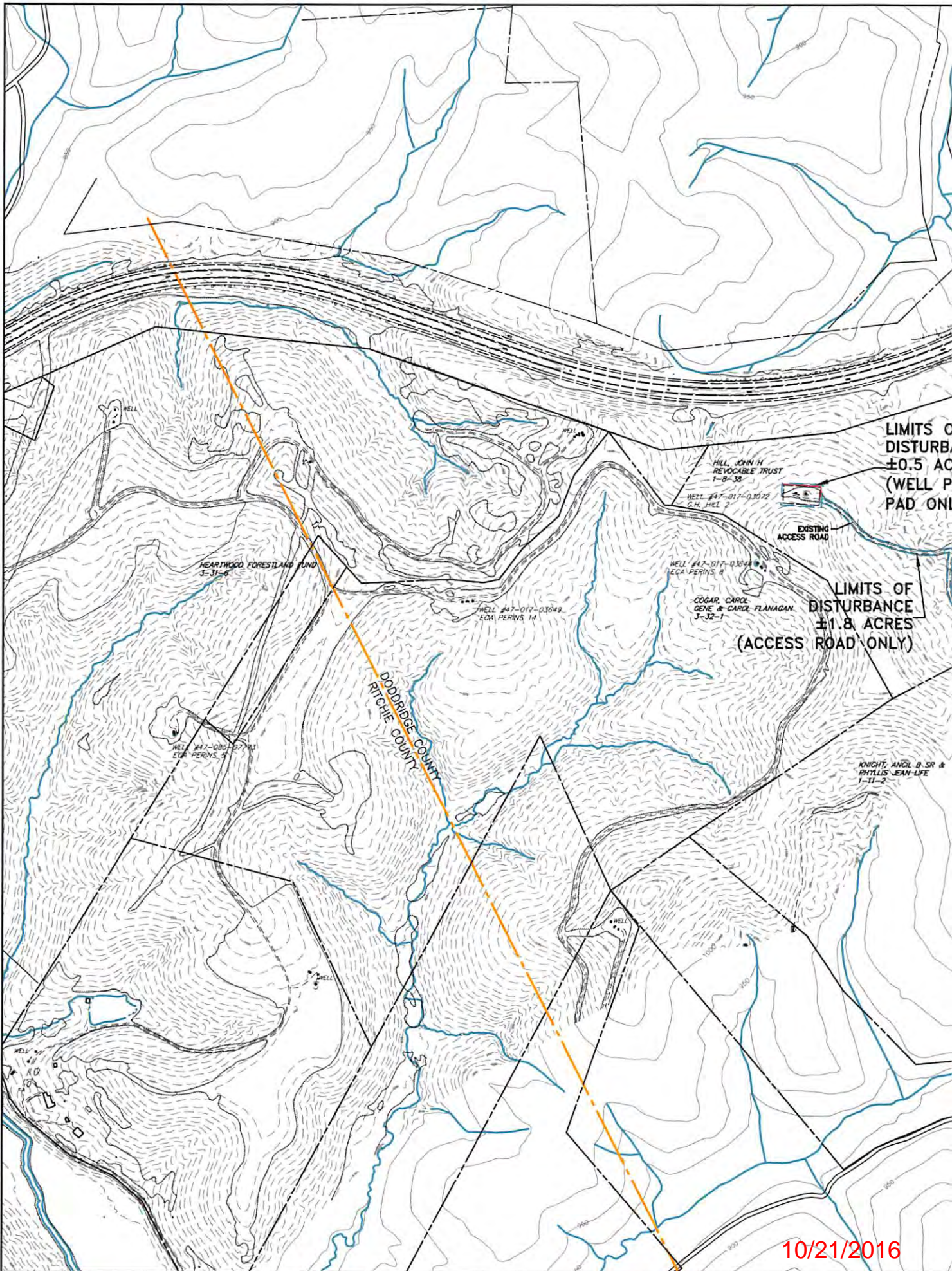
COVER SHEET  
 WELL PLUGGING PLAN  
 FOR  
**API #47-017-03072**  
**G.H. HILL #2 WELL**  
 GREENWOOD TAX DISTRICT DODDRIDGE COUNTY, WV

DATE: APRIL 29, 2016

SHEET NO. 1 OF 4  
 DWG NO. 085423

RECEIVED  
 Office of Mineral Resources  
 OCT 4 2016





LIMITS OF DISTURBANCE  
±0.5 AC  
(WELL PAD ONLY)

LIMITS OF DISTURBANCE  
±1.8 ACRES  
(ACCESS ROAD ONLY)

HEARTWOOD FORESTLAND FUND  
3-31-6

HILL JOHN H  
REVOCABLE TRUST  
1-8-38

WELL #47-017-01072  
G.H. HILL 2

WELL #47-017-01044  
ECA PERINS 8

COGAR, CAROL  
GENE & CAROL FLANAGAN  
3-32-1

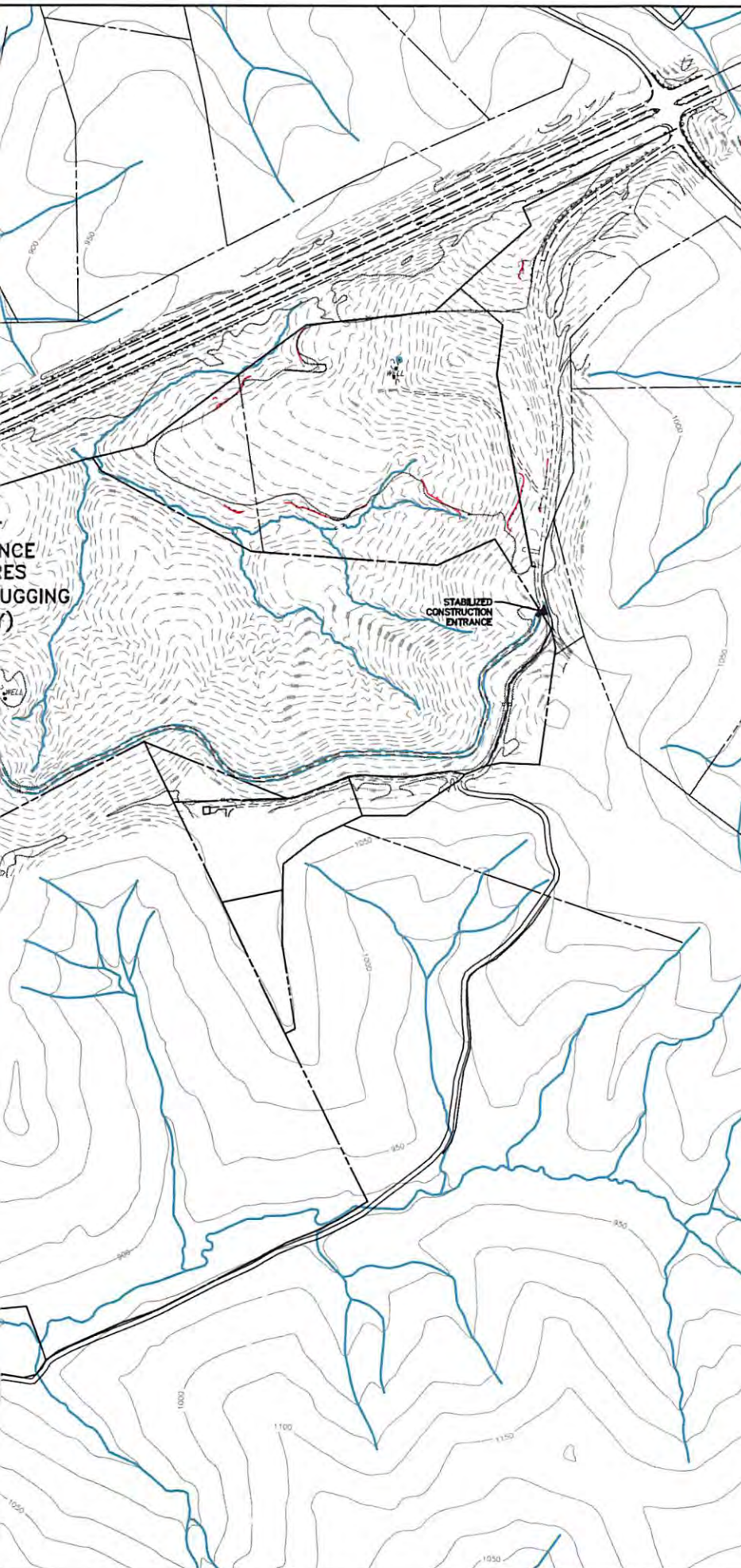
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ECA PERINS 14

WELL #47-080-01743  
ECA PERINS 1

KNIGHT, ANGL B SR &  
PHYLLIS JEAN LIFE  
1-11-2

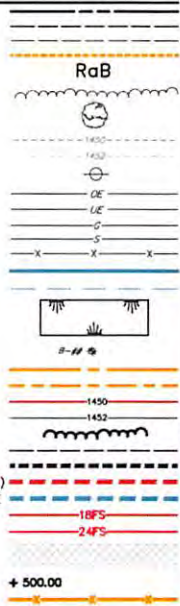
DODDRIDGE COUNTY  
RITCHIE COUNTY

10/21/2016



**LEGEND**

- EXISTING PROPERTY LINE
- EXISTING PAVEMENT
- EXISTING STONE
- EXISTING SOILS BOUNDARY
- SOIL TYPE DESIGNATION
- EXISTING TREELINE
- EXISTING TREE
- EXISTING MAJOR CONTOUR LINE
- EXISTING MINOR CONTOUR LINE
- EXISTING UTILITY POLE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING UNDERGROUND ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING SANITARY SEWER LINE
- EXISTING FENCE LINE
- EXISTING STREAM-EPHEMERAL
- EXISTING STREAM-INTERMITTENT
- EXISTING WETLAND
- BORING LOCATION
- COUNTY LINE
- DISTRICT LINE
- PROPOSED MAJOR CONTOUR LINE
- PROPOSED MINOR CONTOUR LINE
- PROPOSED TREELINE
- PROPOSED GRAVEL
- PROPOSED STORM PIPE
- LIMITS OF DISTURBANCE (PHASE I)
- ULTIMATE LIMITS OF DISTURBANCE
- 18" FILTER SOCK
- 24" FILTER SOCK
- SLOPE LINING
- PROPOSED SPOT ELEVATION
- PROPOSED CONSTRUCTION FENCE



SCALE	1" = 300'
0	150' 300' 600' 900'



FOR RETNEW ASSOCIATES BY:	MANAGER: ANDREW LEVINE, PE
DESIGN BY: JDN	CHKD BY: A.S.L.
DRAWN BY: JDN	CHKD BY: A.S.L.
SURV. CHIEF: N/A	FIELDBOOK NO. N/A

CLIENT

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**RETNEW**

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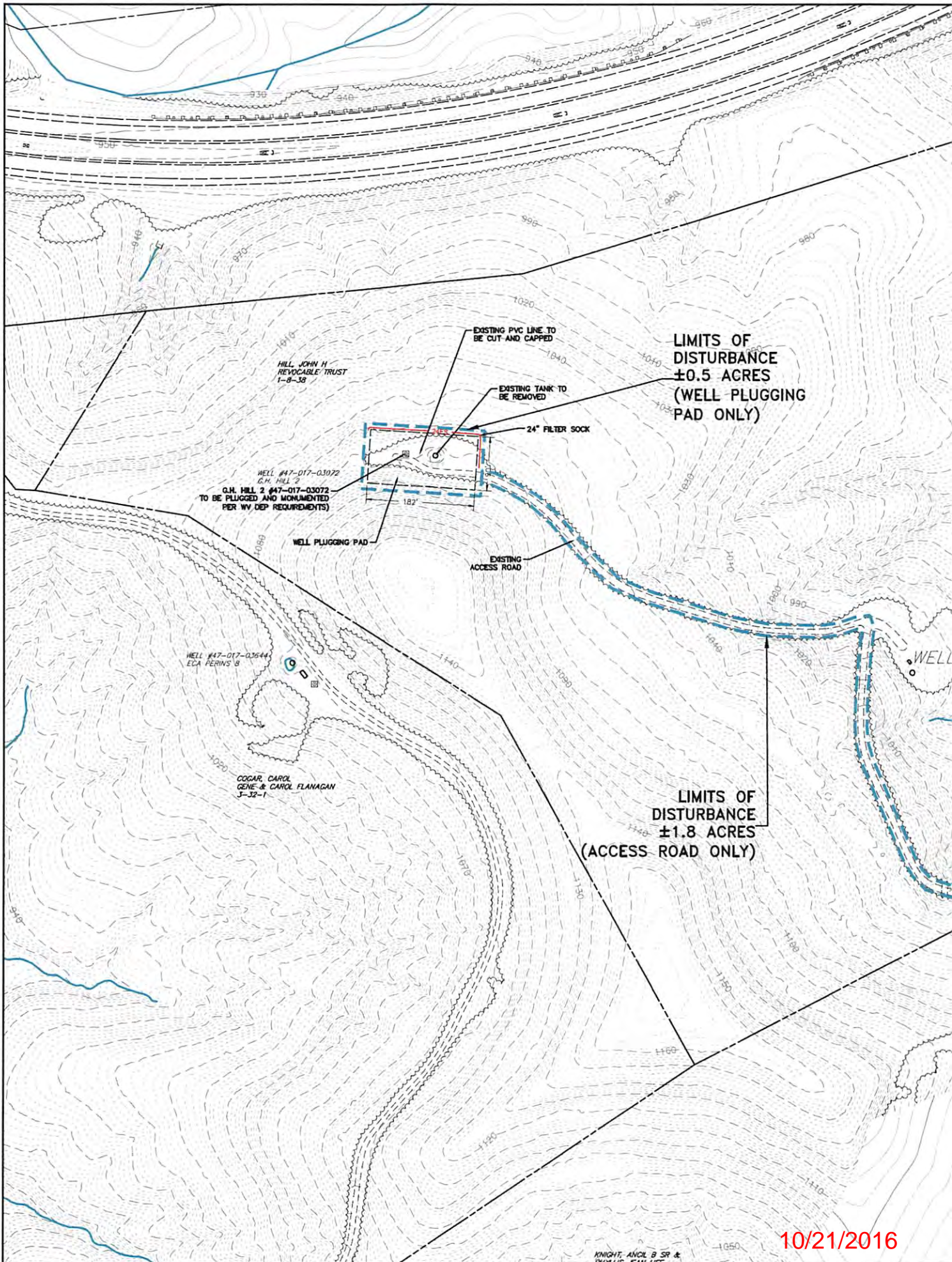
FOR  
**API #47-017-03072**  
**G.H. HILL #2 WELL**

GREENWOOD TAX DISTRICT    DODDRIDGE COUNTY, WY

DATE:	APRIL 29, 2016
SHEET NO. 2 OF 4	
DWG. NO.	09545227

DAF  
10/13/16

OCT 14 2016



HILL JOHN H  
REVOCABLE TRUST  
1-8-38

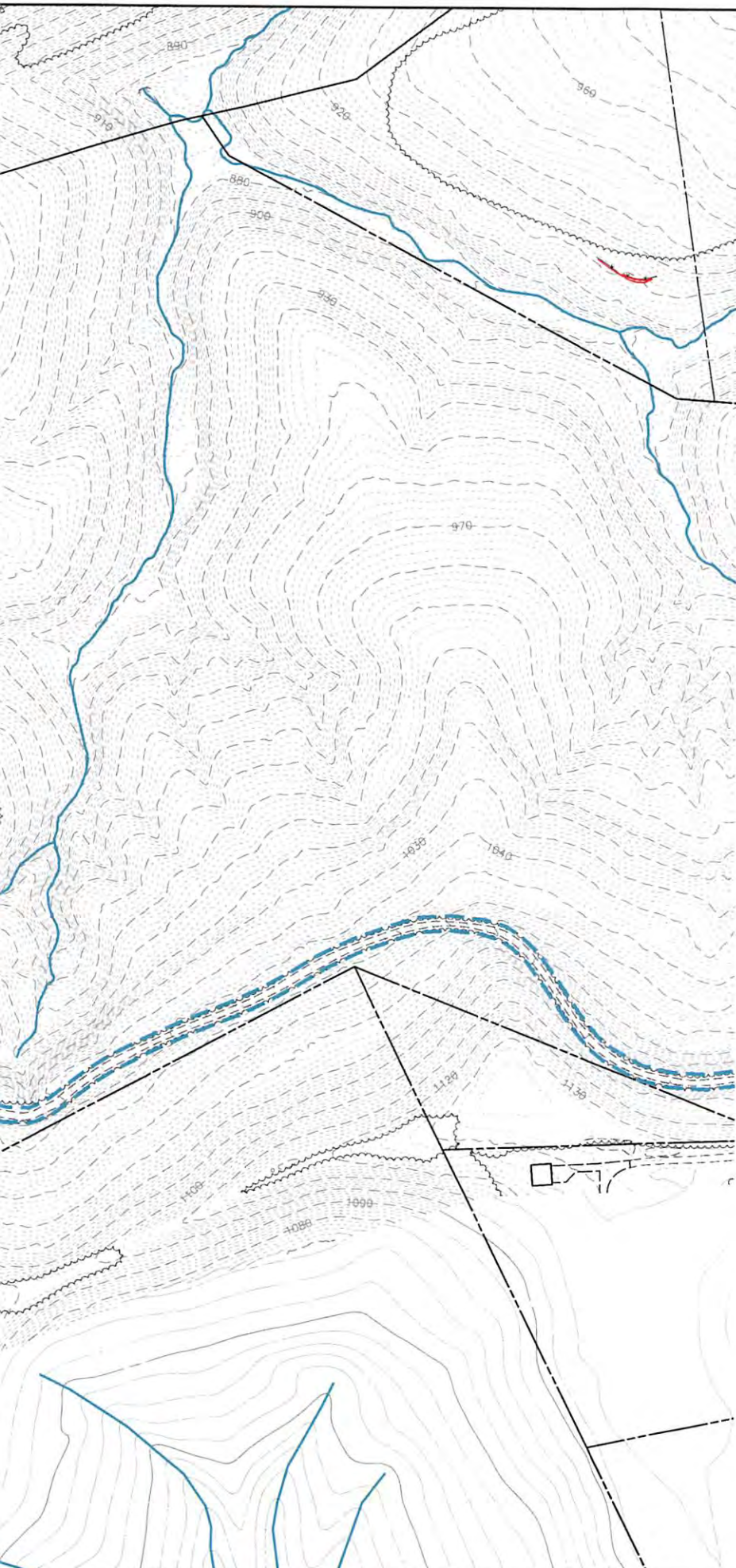
WELL #47-017-03072  
G.H. HILL 2  
G.H. HILL 2 #47-017-03072  
TO BE PLUGGED AND MONUMENTED  
PER WV DEP REQUIREMENTS)

LIMITS OF  
DISTURBANCE  
±0.5 ACRES  
(WELL PLUGGING  
PAD ONLY)

LIMITS OF  
DISTURBANCE  
±1.8 ACRES  
(ACCESS ROAD ONLY)

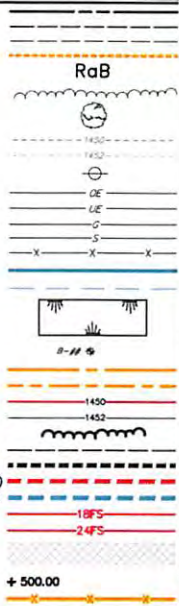
10/21/2016

KNIGHT, ANCL B SR &  
BULLIS, FAU, LLC



**LEGEND**

- EXISTING PROPERTY LINE
- EXISTING PAVEMENT
- EXISTING STONE
- EXISTING SOILS BOUNDARY
- SOIL TYPE DESIGNATION
- EXISTING TREELINE
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- 24" FILTER SOCK
- SLOPE LINING
- PROPOSED SPOT ELEVATION
- PROPOSED CONSTRUCTION FENCE



SCALE

1" = 100'

0 50' 100' 200' 300'

NO.	DATE	REVISION



FOR RETTEW ASSOCIATES BY:

MANAGER:	ANDREW LEVINE, PE
DESIGN BY:	ANDREW LEVINE, PE
DRAWN BY:	JON
SURV. CHIEF:	N/A

CLIENT

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E&S PLAN  
 WELL PLUGGING PLAN  
 FOR  
**API #47-017-03072**  
**G.H. HILL #2 WELL**

GREENWOOD TAX DISTRICT DODDRIIDGE COUNTY, WV

DATE: APRIL 29, 2016

SHEET NO. 3 OF 4

DWG. NO. 095452271

DAK  
 10/13/16

**REVEGETATION SPECIFICATIONS:**

**TEMPORARY SEEDING**

**a. GENERAL CONDITIONS WHERE PRACTICE APPLIES:**

WHERE EXPOSED SOIL SURFACES ARE NOT TO BE FINE-GRADED OR WORKED FOR PERIODS LONGER THAN 21 DAYS, TEMPORARY VEGETATIVE COVER WITH SEDIMENT CONTROLS MUST BE ESTABLISHED WHERE RUNOFF WILL GO DIRECTLY INTO A STREAM, IMMEDIATELY UPON CONSTRUCTION OF THE SITE (SITE INCLUDES ROAD AND LOCATION). VEGETATION MUST BE ESTABLISHED ON ROAD BANK AND LOCATION SLOPES. A PERMANENT VEGETATIVE COVER SHALL BE APPLIED TO AREAS THAT WILL BE LEFT UNWORKED FOR A PERIOD OF MORE THAN 6 MONTHS.

**b. SEED MIXTURES AND PLANTING DATES:**

REFER TO TABLES 2-4 FOR RECOMMENDED DATES TO ESTABLISH VEGETATIVE COVER AND THE APPROVED LISTS OF TEMPORARY AND PERMANENT PLANT SPECIES, AND PLANTING RATES. TABLE 3 GIVES RECOMMENDED TYPES OF TEMPORARY VEGETATION, RATES OF APPLICATION, AND OPTIMUM SEEDING DATES. IN SITUATIONS WHERE ANOTHER COVER IS DESIRED CONTACT THE LOCAL SOIL CONSERVATION DISTRICT FOR SEEDING RECOMMENDATIONS.

**c. SEED APPLICATION:**

APPLY SEED BY BROADCASTING, DRILLING, OR BY HYDROSEEDING ACCORDING TO THE RATES INDICATED IN TABLE IV-3. PERFORM ALL PLANTING OPERATIONS AT RIGHT ANGLES TO THE SLOPE. NECESSARY SITE PREPARATION, ROUGHENING OF THE SOIL SURFACE, SHOULD BE DONE JUST PRIOR TO SEEDING. SEEDBED PREPARATION MAY NOT BE REQUIRED ON NEWLY DISTURBED AREAS.

**PERMANENT SEEDING**

**a. GENERAL:**

PERMANENT VEGETATIVE COVER WILL BE ESTABLISHED WHERE NO FURTHER SOIL DISTURBANCE IS ANTICIPATED OR NEEDED. SOIL FERTILITY AND pH LEVEL SHOULD BE TESTED AND ADJUSTED ACCORDING TO SEED SPECIES PLANTED. PLANTING OF PERMANENT VEGETATIVE COVERS MUST BE PERFORMED ON ALL DISTURBED AREAS AFTER THE COMPLETION OF THE DRILLING PROCESS. ANY SITE THAT CONTAINS SIGNIFICANT AMOUNTS OF TOPSOIL SHALL HAVE THE TOPSOIL REMOVED AND STOCKPILED WHEN FEASIBLE. TOPSOIL SHOULD NOT BE ADDED TO SLOPES STEEPER THAN 2:1 UNLESS A GOOD BONDING TO THE SUB-LAYER CAN BE ACHIEVED. AFTER PROPER WEED AND SEEDBED PREPARATION, THE VEGETATION WILL REESTABLISH GROUND COVER FOR THE CONTROL OF SURFACE WATER RUNOFF AND EROSION.

ALL REQUIRED SEEDBED PREPARATION, LOOSENING OF SOIL BY DISKING OR DOZER TRACKING, SHOULD BE PERFORMED JUST PRIOR TO SEEDING. IF SEEDBED PREPARATION IS NOT FEASIBLE, SOME MORE SEED SHALL BE ADDED TO THE RECOMMENDED RATES SHOWN IN TABLES IV 3-4.

WHEN HYDROSEEDING, SEEDBED PREPARATION MAY NOT BE NECESSARY IF ADEQUATE SITE PREPARATION WAS PERFORMED. INCORPORATE THE APPROPRIATE AMOUNT OF LIME AND/OR FERTILIZER IN THE SLURRY MIX WHEN HYDROSEEDING.

WHEN HYDROSEEDING, FIRST MIX THE LIME, FERTILIZER, AND HYDRO-MULCH IN THE RECOMMENDED AMOUNT OF WATER. MIX THE SEED AND INOCULATE TOGETHER WITHIN ONE HOUR PRIOR TO PLANTING, AND ADD TO THE SLURRY JUST BEFORE SEEDING. APPLY THE SLURRY UNIFORMLY OVER THE PREPARED SITE. ASSURE THAT AGITATION IS CONTINUOUS THROUGHOUT THE SEEDING OPERATION AND THAT THE MIX IS APPLIED WITHIN ONE HOUR OF INITIAL MIXING.

**b. LIME AND FERTILIZER:**

- LIME SHALL BE APPLIED TO ALL PERMANENT SEEDINGS. THE pH OF THE SOIL IS TO BE DETERMINED AND LIME APPLIED ACCORDINGLY. ONCE THE pH IS KNOWN, SELECT THE AMOUNT OF LIME TO BE APPLIED FROM TABLE IV-5.
- FERTILIZER SHALL BE APPLIED IN ALL PERMANENT SEEDINGS. APPLY THE EQUIVALENT OF 500 LBS. MINIMUM 10-40-20 FERTILIZER PER ACRE OR USE THE AMOUNT OF FERTILIZER AND LIME RECOMMENDED BY A CERTIFIED SOIL TEST.
- APPLICATION: FOR BEST RESULTS AND MAXIMUM BENEFITS THE LIME AND FERTILIZER ARE TO BE APPLIED AT THE TIME OF SEEDBED PREPARATION.

**c. PERMANENT SEED MIXTURES:**

PLANNERS SHOULD TAKE INTO CONSIDERATION THE SPECIES MAKEUP OF THE EXISTING PASTURE AND THE LANDOWNER'S FUTURE PASTURE MANAGEMENT PLANS WHEN RECOMMENDING SEED MIXTURES. SELECTION: FROM TABLES IV 4A AND B. PERMANENT SEEDING MIXTURES SUITABLE FOR ESTABLISHMENT IN WEST VIRGINIA.

- ALL LEGUMES MUST BE PLANTED WITH THE PROPER INOCULATE PRIOR TO SEEDING.
- LATHOOF FLATPEA IS POTENTIALLY POISONOUS TO SOME LIVESTOCK.
- ONLY ENDOPHYTIC FREE VARIETIES OF TALL FESCUE SHOULD BE USED. TALL FESCUE AND CROWNWETCH ARE ALSO A VERY INVASIVE SPECIES NON-NATIVE TO WV.
- FOR UNPREPARED SEEDBEDS OR SEEDING OUTSIDE THE OPTIMUM TIMEFRAMES, ADD SOME MORE SEED TO THE SPECIFIED RATE. MIXTURES IN TABLE 4B ARE MORE WILDLIFE AND FARM FRIENDLY; THOSE LISTED IN BOLD ARE SUITABLE FOR USE IN SHADED WOODLAND SETTINGS. MIXTURES IN ITALICS ARE SUITABLE FOR USE IN FILTER STRIPS.

**d. SEEDING FOR WILDLIFE HABITAT:**

CONSIDER THE USE OF NATIVE PLANTS OR LOCALLY ADAPTED PLANTS WHEN SELECTING COVER TYPES AND SPECIES FOR WILDLIFE HABITAT. WILDLIFE FRIENDLY SPECIES OR MIXES THAT HAVE MULTIPLE VALUES SHOULD BE CONSIDERED. SEE WILDLIFE FRIENDLY SPECIES/MIXTURES IN TABLE IV-4B. CONSIDER SELECTING HIGH OR LOW MAINTENANCE LONG-LIVED PLANTS ADAPTABLE TO SITES WHICH MAY BE DIFFICULT TO MAINTAIN WITH EQUIPMENT.

**MULCHING**

**a. GENERAL ORGANIC MULCHES**

THE APPLICATION OF STRAW, HAY OR OTHER SUITABLE MATERIALS TO THE SOIL SURFACE TO PREVENT EROSION, STRAW MADE FROM WHEAT OR OATS IS THE PREFERRED MULCH. THE USE OF HAY IS PERMISSIBLE, BUT NOT ENCOURAGED DUE TO THE RISK OF SPREADING INVASIVE SPECIES. MULCH MUST BE APPLIED TO ALL TEMPORARY AND PERMANENT SEEDING ON ALL DISTURBED AREAS, DEPENDING ON SITE CONDITIONS. IN CRITICAL AREAS SUCH AS WATERWAYS, OR STEEP SLOPES, ADDITIONAL OR SUBSTITUTE SOIL PROTECTIVE MEASURES MAY BE USED IF DEEMED NECESSARY. EXAMPLES INCLUDE JUTE MESH, AND SOIL STABILIZATION BLANKETS OR EROSION CONTROL MATTING.

AREAS THAT HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDED SHOULD BE MULCHED IMMEDIATELY FOLLOWING SEEDING. MULCHES CONSERVE DESIRABLE SOIL PROPERTIES, REDUCE SOIL MOISTURE LOSS, PREVENT CRUSTING AND SEALING OF THE SOIL SURFACE AND PROVIDE A SUITABLE MICROCLIMATE FOR SEED GERMINATION.

AREAS THAT CANNOT BE SEEDED BECAUSE OF THE SEASON SHOULD BE MULCHED TO PROVIDE SOME PROTECTION TO THE SOIL SURFACE. AN ORGANIC MULCH, STRAW OR HAY, SHOULD BE USED AND THE AREA THEN SEEDED AS SOON AS WEATHER OR SEASONAL CONDITIONS PERMIT. DO NOT USE FIBER MULCH (CELLULOSE-HYDROSEED) ALONE FOR THIS PRACTICE; AT NORMAL APPLICATION RATES IT WILL NOT GIVE THE SOIL PROTECTION OF OTHER TYPES OF MULCH.

WOOD CELLULOSE FIBER MULCH, IS USED IN HYDROSEEDING OPERATIONS AND APPLIED AS PART OF THE SLURRY. IT CREATES THE BEST SEED-SOIL CONTACT WHEN APPLIED OVER TOP OF (AS A SEPARATE OPERATION) NEWLY SEEDED AREAS. FIBER MULCH DOES NO ALONE PROVIDE SUFFICIENT PROTECTION ON HIGHLY ERODIBLE SLOPES, OR DURING LESS THAN FAVORABLE GROWING CONDITIONS. FIBER MULCH SHOULD NOT BE USED ALONE DURING THE DRY SUMMER MONTHS OR WHEN USED FOR LATE FALL MULCH COVER. USE STRAW MULCH DURING THESE PERIODS, AND FIBER MULCH MAY BE USED TO TACK (ANCHOR) THE STRAW MULCH. FIBER MULCH IS WELL SUITED FOR STEEP SLOPES, CRITICAL AREAS, AND AREAS SUSCEPTIBLE TO WIND.

**b. CHEMICAL MULCHES, SOIL BINDERS AND TACKIFIERS:**

A WIDE RANGE OF SYNTHETIC, SPRAY-ON MATERIALS ARE MARKETED TO STABILIZE AND PROTECT THE SOIL SURFACE. THESE ARE USED WITH WATER AND SPRAYED OVER THE MULCH AND TO THE SOIL. THEY MUST BE USED ALONE IN SOME CASES AS TEMPORARY STABILIZERS, OR IN CONJUNCTION WITH FIBER MULCH, STRAW OR HAY.

WHEN USED ALONE MOST CHEMICAL MULCHES DO NOT HAVE THE CAPABILITY TO INSULATE THE SOIL OR RETAIN SOIL MOISTURE THAT ORGANIC MULCHES HAVE.

**c. SPECIFICATIONS:**

FROM TABLE IV-6 SELECT THE TYPE OF MULCH AND RATE OF APPLICATION THAT WILL BEST SUIT THE CONDITIONS AT THE SITE.

**d. ANCHORING:**

DEPENDING ON THE FIELD SITUATION, MULCH MAY NOT STAY IN PLACE BECAUSE OF WIND ACTION OR RAPID WATER RUNOFF. IN SUCH CASES, MULCH IS TO BE ANCHORED MECHANICALLY OR WITH MULCH NETTING.

- MECHANICAL ANCHORING: APPLY MULCH AND PULL A MULCH ANCHORING TOOL OVER THE MULCH. WHEN A DISK IS USED, SET THE DISK STRAIGHT AND PULL ACROSS THE SLOPE. MULCH MATERIAL SHOULD BE TUCKED INTO THE SOIL ABOUT THREE INCHES.
- MULCH NETTING: FOLLOW MANUFACTURER'S RECOMMENDATIONS WHEN POSITIONING AND STAPLING THE MULCH NETTING IN THE SOIL.

**NOTE:**

a. NO FESCUE OR TIMOTHY GRASS SHALL BE USED

**EROSION AND SEDIMENTATION CONTROL NOTES**

EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IMPLEMENTED DURING THE CONSTRUCTION AND POST CONSTRUCTION PERIOD TO PREVENT SOIL EROSION, SEDIMENTATION, AND OTHER POLLUTANTS FROM ENTERING STREAMS, NEIGHBORING PROPERTY, ROADS, ETC. THESE MEASURES INCLUDE FILTER SOCKS, TOPSOIL STOCKPILES, ROCK CONSTRUCTION ENTRANCE, ETC. AS SHOWN ON THE DRAWINGS.

THE CONTRACTOR WILL BE REQUIRED TO INCORPORATE ALL APPLICABLE EROSION AND SEDIMENTATION CONTROL FEATURES INTO THE PROJECT AT THE EARLIEST PRACTICAL TIME.

**TEMPORARY EROSION CONTROL MEASURES**

- TEMPORARY VEGETATION SHALL BE ESTABLISHED ON ALL SLOPES, ON STOCKPILED TOPSOIL, AND ON ALL DISTURBED AREAS LEFT UNSTABILIZED, OR DISCONTINUED EARTHMOVING ACTIVITY, WILL BE STABILIZED WITHIN 21 DAYS.
- DURING CONSTRUCTION, THE AMOUNT OF DISTURBED SOILS SHALL BE KEPT TO A MINIMUM AND, WHENEVER POSSIBLE, A SUITABLE VEGETATIVE BUFFER WILL BE MAINTAINED AROUND ALL CONSTRUCTION AREAS.
- ALL EARTHMOVING ACTIVITIES SHALL BE CARRIED OUT IN SUCH A MANNER AS TO MINIMIZE THE AMOUNT OF DISTURBED AREA.
- ALL SOIL STOCKPILES ARE TO BE SEEDED WITH A TEMPORARY GRASS COVER WITHIN 21 DAYS.
- UPON GENERAL COMPLETION OF THE FINAL GRADING, TOPSOIL SHALL BE PLACED AND FINAL-GRADING PASSES SHALL BE MADE PARALLEL TO THE DIRECTION OF RUNOFF.
- RE-SEED AND REESTABLISH ANY BARREN AND DISTURBED AREAS NOT HAVING ESTABLISHED GROUND COVER.
- SILT SOCK SHALL BE PLACED AT CRITICAL EROSION AREAS, AS SHOWN ON THE PLAN, IN ORDER TO PREVENT SEDIMENT FROM ENTERING INTO ADJACENT PROPERTIES, ROADWAY AND WATERWAYS.
- SILT SOCK SHALL BE INSTALLED AND MAINTAINED PER THE SUPPLIER'S INSTRUCTIONS.
- WHERE DUST OR WIND EROSION IS A PROBLEM, THE UNSTABLE SURFACE(S) SHALL BE SPRINKLED WITH WATER OR OTHER SUITABLE DUST SUPPRESSOR; HOWEVER, WASHING OF ROADWAYS IS NOT PERMITTED.
- ANY WATER PUMPED FROM ANY EXCAVATION, FOR ANY REASON, SHALL BE DIRECTED THROUGH A SEDIMENT FILTER BAG (DIRT BAG).
- THE CONTRACTOR SHALL EMPLOY MEASURES DURING CONSTRUCTION TO PREVENT SPILLS OF FUELS OR LUBRICANTS. IF A SPILL OCCURS, IT SHALL BE CONTROLLED IMMEDIATELY TO PREVENT ITS ENTRY INTO NEARBY WATERWAYS. OWNER SHALL BE NOTIFIED IMMEDIATELY IF ANY SPILLS OCCUR.

**CONSTRUCTION SEQUENCE**

DESCRIBED BELOW ARE THE MAJOR CONSTRUCTION ACTIVITIES THAT ARE THE SUBJECT OF THE EROSION AND SEDIMENTATION POLLUTION CONTROL PLAN. THEY ARE PRESENTED IN THE ORDER (OR SEQUENCE) THAT THEY ARE EXPECTED TO BEGIN, BUT EACH ACTIVITY WILL NOT NECESSARILY BE COMPLETED BEFORE THE NEXT BEGINS. ALSO, THESE ACTIVITIES COULD OCCUR IN A DIFFERENT ORDER IF NECESSARY TO MAINTAIN ADEQUATE EROSION AND SEDIMENT CONTROL. THE OWNER OR ENGINEER MUST APPROVE DEVIATIONS FROM THE APPROVED PLAN AND CONSTRUCTION SEQUENCE.

A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES.

AT LEAST 48 HOURS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITY, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY MISS UTILITY OF WEST VIRGINIA AT 1-800-245-4848 FOR LOCATION OF EXISTING UNDERGROUND UTILITIES.

ALL EARTH DISTURBANCE ACTIVITIES ARE EXPECTED TO PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. SPECIFIC SITE RESTRICTIONS MAY NECESSITATE THE ACTIVITIES PROCEEDING IN A DIFFERENT ORDER TO MAINTAIN ADEQUATE EROSION AND SEDIMENT CONTROL.

- INSTALL CONSTRUCTION ENTRANCE.
- INSTALL SILT BARRIERS.
- REMOVE EXISTING EQUIPMENT AS SHOWN.
- PLACE TOPSOIL.
- STABILIZE SOIL AND INSTALL PERMANENT SEEDING AS SOON AS POSSIBLE.

**SCHEDULE OF MAINTENANCE OF EROSION & SEDIMENTATION CONTROLS**

THE SOIL EROSION AND SEDIMENTATION CONTROLS UTILIZED IN THE DEVELOPMENT OF THIS PLAN SHALL BE MAINTAINED AND REPAIRED IN ORDER TO KEEP THEM IN EFFECTIVE CONDITION UNTIL PERMANENT STABILIZATION OCCURS. THE CONTRACTOR SHALL PERFORM CERTAIN PERIODIC DUTIES IN ORDER TO ASSURE PROPER FUNCTION. MAINTENANCE OF THE CONTROLS SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING MAINTENANCE PROCEDURES FOR UTILIZED CONTROLS:

**FILTER SOCK**

- THE FILTER SOCK SHALL BE INSPECTED AFTER EVERY RUNOFF EVENT AND WEEKLY. ANY NECESSARY REPAIRS WILL BE MADE IMMEDIATELY.
- ACCUMULATED SEDIMENT WILL BE REMOVED AS REQUIRED TO KEEP THE FILTER SOCK FUNCTIONAL. IN ALL CASES, REMOVE DEPOSITS WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FILTER SOCK.
- ADHERE TO ANY MANUFACTURER'S RECOMMENDATIONS FOR REPLACING FILTER SOCK.
- ACCUMULATED SEDIMENT REMOVED FROM FILTER SOCKS SHALL BE SPREAD, SEEDED & MULCHED IN AN AREA NOT SUBJECT TO EROSION.

**TABLE IV-1  
RECOMMENDED SEEDING DATES FOR PERMANENT AND TEMPORARY COVER UNLESS OTHERWISE SPECIFIED.**

PLANTING DATES	SUITABILITY
MARCH 1 - APRIL 15 AND AUGUST 1 - OCTOBER 1	BEST SEEDING PERIODS
APRIL 15 - AUGUST 1	HIGH RISK - MOISTURE STRESS LIKELY
OCTOBER 1 - DECEMBER 1	HIGH RISK - FREEZE DAMAGE TO YOUNG SEEDLINGS
DECEMBER 1 - MARCH 1	GOOD SEEDING PERIOD. DORMANT SEEDING.

**TABLE IV-2  
ACCEPTABLE FERTILIZER RECOMMENDATION IN ABSENCE OF SOIL TEST**

SPECIES	N(LBS/AC)	P205(LBS/AC)	K2O(LBS/AC)	EXAMPLES REC. (PER ACRE)
COOL SEASON GRASS	40	80	60	400LBS 10-20-20
CS GRASS & LEGUME	30	60	60	300LBS 10-20-20
TEMPORARY COVER	40	40	40	200LBS 10-10-10

SPECIES
ANNUAL RY
FIELD BROU
SPRING I
SUDANGR
WINTER
WINTER W
JAPANESE
REDT
ANNUAL RY
SPRING I

NOTE: THESE AUGUST 1 A  
PER

SPECIES
CROWNVE
TALL FE
PEREN
REYER
FLATPEA
PERENNIAL
TALL FE
LADINO CL
SEECIA LES
TALL FE
TALL FES
REDT
CROWNVE
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REDT
TALL FES
CREeping
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PERENNIAL RY
TALL FES
LADINO FL

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SPECIES
KY BLUEG
REDT
LADINO CL
BRODSFOOT
TIMOTHY
ALFALF
TIMOTHY
BRODSFOOT
ORCHARDGR
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REDT
ORCHARDGR
LADINO C
ORCHARDGR
PEREN
RYEGR
CREeping
FESCUE
PERENNIAL R
ORCHARDGR
KY BLUEG
BRODSFOOT
REDT
ORCHARD
LADINO FL
PERENNIAL R
LATHOOF FL
ORCHARD

pH OF SOIL
ABOVE 6.0
5.0 TO 6.0
BELOW 5.0

**TABLE IV-3  
TEMPORARY COVER SUITABLE FOR ESTABLISHMENT IN  
WEST VIRGINIA**

	RATES IN LBS PER ACRE	OPTIMUM SEEDING DATES	DRAINAGE	pH RANGE
GRASS	40	3/1-6/15 OR 8/15-9/15	WELL-POORLY	5.5-7.5
GRASS	40	3/1-6/15 OR 8/15-9/15	WELL-MOD. WELL	6.0-7.0
GRASS	96	3/1-6/15	WELL-POORLY	5.5-7.0
GRASS	40	5/15-8/15	WELL-POORLY	5.5-7.5
GRASS	168	8/15-10/15	WELL-POORLY	5.5-7.5
GRASS	180	8/15-11/15	WELL-MOD. WELL	5.5-7.0
GRASS	30	6/15-8/15	WELL	4.5-7.0
GRASS	5	3/1-6/15	WELL	4.0-7.5
GRASS	28	3/1-6/15	WELL-POORLY	5.5-7.5
GRASS	64	3/1-6/15	WELL-POORLY	5.5-7.5

RATES SHOULD BE INCREASED BY 50% IF PLANTED APRIL 15 - OCTOBER 1 - MARCH 1.

**TABLE IV-4a  
PERMANENT SEEDING MIXTURES SUITABLE FOR  
ESTABLISHMENT IN WEST VIRGINIA**

	RATES IN LBS PER ACRE	DRAINAGE	pH RANGE
GRASS/LEGUME	10-15 30	WELL-MOD. WELL	5.0-7.5
GRASS/LEGUME	10-15 20	WELL-MOD. WELL	5.0-7.5
GRASS/LEGUME	20 15	WELL-MOD. WELL	4.0-8.0
GRASS/LEGUME	30 25 2	WELL-MOD. WELL	4.5-7.5
GRASS/LEGUME	40 3 3	WELL-MOD. WELL	5.0-7.5
GRASS/LEGUME	10 20 3	WELL-MOD. WELL	5.0-7.5
GRASS/LEGUME	40 10 3	WELL-MOD. WELL	5.0-7.5
GRASS/LEGUME	25 30 3	WELL-MOD. WELL	4.5-7.5
GRASS/LEGUME	30 3 50	WELL-MOD. WELL	5.0-7.5
GRASS/LEGUME	50	WELL-POORLY	4.5-7.5
GRASS/LEGUME	10 15 20	WELL-POORLY	5.0-8.0

**TABLE IV-4b  
PERMANENT SEEDING MIXTURES SUITABLE FOR  
ESTABLISHMENT IN WEST VIRGINIA (WILDLIFE &  
FARM FRIENDLY)**

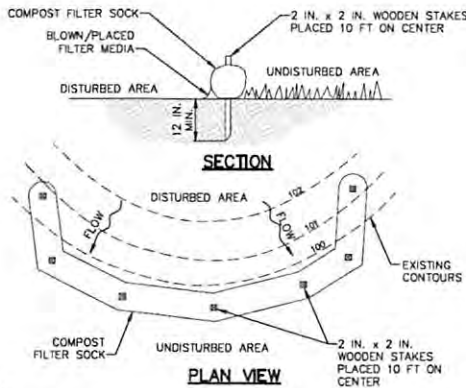
	RATES IN LBS PER ACRE	DRAINAGE	pH RANGE
GRASS/LEGUME	20 3 2/10	WELL-MOD. WELL	5.5-7.5
GRASS/LEGUME	5 12	WELL-MOD. WELL	6.5-8.0
GRASS/LEGUME	5 8	WELL-POORLY	5.5-7.5
GRASS/LEGUME	10 2 2	WELL-MOD. WELL	5.5-7.5
GRASS/LEGUME	10 2	WELL-MOD. WELL	5.5-7.5
GRASS/LEGUME	20 10	WELL-MOD. WELL	5.0-7.5
GRASS/LEGUME	30 10	WELL-MOD. WELL	5.0-7.5
GRASS/LEGUME	20 20	WELL-MOD. WELL	6.0-7.5
GRASS/LEGUME	10 5	WELL-MOD. WELL	5.5-7.5
GRASS/LEGUME	30 20	WELL-MOD. WELL	5.5-7.5
GRASS/LEGUME	30 20	WELL-MOD. WELL	5.5-7.5

**TABLE IV-5  
LIME AND FERTILIZER APPLICATION TABLE**

LIME IN TONS PER ACRE	FERTILIZER, LBS., PER ACRE 10-20-20 OR EQUIVALENT
2	500
3	500
4	500

**TABLE IV-6  
MULCH MATERIALS RATES AND USES**

MATERIAL	MINIMUM RATES PER ACRE	COVERAGE	REMARKS
HAY OR STRAW	2 TO 3 TONS 100 TO 150 BALES	COVER 75 TO 90% OF SURFACE	SUBJECT TO WIND BLOWING OR WASHING UNLESS TIED DOWN
WOOD FIBER PULP FIBER WOOD-CELLULOSE RECYCLED PAPER	1000 TO 1500 LBS.	COVER ALL DISTURBED AREAS	FOR HYDROSEEDING



**NOTES:**

SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1 OF THE PA DEP EROSION CONTROL MANUAL. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2 OF THE PA DEP EROSION CONTROL MANUAL.

COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.

TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.

ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.

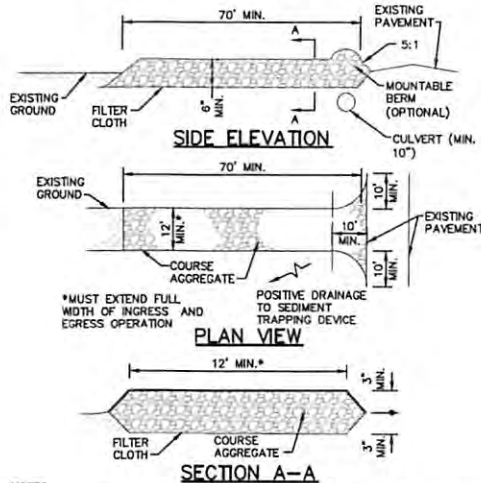
COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.

BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

**COMPOST FILTER SOCK**

NOT TO SCALE



**NOTES:**

- USE 2-4" STONE FOR LOW VOLUME ENTRANCES. LARGER STONE (4-6") FOR HEAVY USE OR MATERIAL DELIVERY ENTRANCES.
- LENGTH IS AS REQUIRED, BUT NOT LESS THAN 70' (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30' MIN. LENGTH WOULD APPLY).
- THICKNESS SHOULD BE NOT LESS THAN 6".
- THE WIDTH SHALL BE A MIN. OF 10', BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS AND EGRESS OCCURS.
- GEOTEXTILE FABRIC SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
- ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF A CULVERT IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES SHALL BE USED.
- IF NECESSARY, DIVERT ANY WATER RUNNING DOWN ACCESS ROAD TO A SEDIMENT TRAP LOCATED ON EITHER SIDE OF THE STABILIZED CONSTRUCTION ENTRANCE.

**STABILIZED CONSTRUCTION ENTRANCE**

NOT TO SCALE

FOR REVIEW ASSOCIATES BY:

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Environmental Consultants

NOTES AND DETAILS  
WELL PLUGGING PLAN

FOR  
**API #47-017-03072**  
G.H. HILL #2 WELL

GREENWOOD TAX DISTRICT  
DODDRIEGE COUNTY, WV

DATE: APRIL 29, 2016

SHEET NO. 10/21/2016

DWG. NO. 095452271