



west virginia department of environmental protection

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

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

PERMIT MODIFICATION APPROVAL
Vertical / Plugging - 2

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET

DENVER, CO 80202

Re: Permit Modification Approval for 2
47-017-03072-00-00

Access Route Change

ANTERO RESOURCES CORPORATION

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before 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: 1/6/2017

Promoting a healthy environment.

01/06/2017



December 22, 2015

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

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

RE: Existing G.W. Hill 2 Well (API# 47-017-03072-00)

Mr. McLaughlin:

Antero Resources Corporation (Antero) would like to submit the following application for a permit to plug and abandon the existing well located on property owned by Antero Resources Corporation in Doddridge County, West Virginia. This Permit was approved prior but we have changed our route to access the well. This is a modification to our approved permit.

Attached you will find the following:

- G.W. Hill 2 Submitted Well Records
- Plug and Abandon Permit Application package
- Form WW-7 Well Location Form: GPS and Topo Map

If you have any questions please feel free to contact me at (303) 357-7182.

Thank you in advance for your consideration.

Sincerely,

Mallory Stanton
Permitting Supervisor
Antero Resources Corporation

Enclosures

GENE THIS PLUGGING PERMIT WAS ISSUED ON 10/21/2016. I DO NOT THINK IT REALLY NEEDS A MODIFICATION, BUT THEY SENT ONE. I EXPLAINED TO MALLORY THAT YOU ARE ALWAYS ENTITLED TO AN ACCESS TO YOUR WELL. COULD YOU HANDLE THIS?
JEFF
11/2/2017

01/06/2017

WW-4A
Revised 6-07

1) Date: December 21, 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

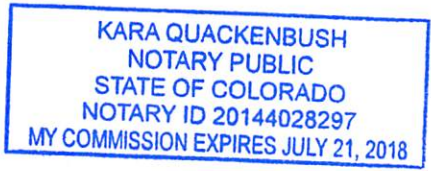
4) Surface Owner(s) to be served:	5) (a) Coal Operator
(a) Name <u>Antero Resources Corp</u>	Name <u>NO DECLARATIONS ON RECORD WITH COUNTY</u>
Address <u>1615 Wynkoop Street</u>	Address _____
<u>Denver CO 80202</u>	_____
(b) Name _____	(b) Coal Owner(s) with Declaration
Address _____	Name <u>NO DECLARATIONS ON RECORD WITH COUNTY</u>
_____	Address _____
(c) Name _____	Name _____
Address _____	Address _____
_____	_____
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.



Well Operator Antero Resources Corporation
 By: Kevin Kilstom
 Its: Senior Vice President of Production
 Address 1615 Wynkoop Street
Denver, CO 80202
 Telephone 303-357-7310

Subscribed and sworn before me this 22nd day of December 2016
Kara Quackenbush Notary Public
 My Commission Expires July 21, 2018

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and 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.

01/06/2017

SURFACE OWNER WAIVER

Operator's Well
Number

G.W. Hill 2

INSTRUCTIONS TO SURFACE OWNERS NAMED ON PAGE WW4-A

The well operator named on page WW-4A is applying for a permit from the State to plug and abandon a well. (Note: If the surface tract is owned by more than three persons, then these materials were served on you because your name appeared on the Sheriff's tax ticket on the land or because you actually occupy the surface tract. In either case, you may be the only owner who will actually receive these materials.) See Chapter 22 of the West Virginia Code. Well work permits are valid for 24 months. If you do not own any interest in the surface tract, please forward these materials to the true owner immediately if you know who it is. Also, please notify the well operator and the Office of Oil and Gas.

**NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.
WHERE TO FILE COMMENTS AND OBTAIN ADDITIONAL INFORMATION:**

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

Time Limits and methods for filing comments. The law requires these materials to be served on or before the date the operator files his Application. You have **FIVE (5) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

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

The Chief has the power to deny or condition a well work permit based on comments on the following grounds:

- 1) The proposed well work will constitute a hazard to the safety of persons.
- 2) The soil erosion and sediment control plan is not adequate or effective;
- 3) Damage would occur to publicly owned lands or resources;
- 4) The proposed well work fails to protect fresh water sources or supplies;
- 5) The applicant has committed a substantial violation of a previous permit or a substantial violation of one or more of the rules promulgated under Chapter 22, and has failed to abate or seek review of the violation...".

If you want a copy of the permit as it is issued or a copy of the order denying the permit, you should request a copy from the Chief.

VOLUNTARY STATEMENT OF NO OBJECTION

I hereby state that I have read the instructions to surface owners and that I have received copies of a Notice and Application For A Permit To Plug And Abandon on Forms WW-4A and WW-4B, and a survey plat.

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

FOR EXECUTION BY A NATURAL PERSON
ETC.

FOR EXECUTION BY A CORPORATION,

Signature

Date

Name Antero Resources Corporation
By [Signature]
Its SRUP - Production Date 12/21/2016
Kevin Kilstrom
Signature Date 01/06/2017

1) Date December 22, 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 9) Plugging Contractor
Name Daniel Flack Name N/A - Antero will plug well
Address 601 57th Street, SE Address _____
Charleston, WV 25304
-

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 _____

01/06/2017

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



Antero Resources
1615 Wynkoop St.
Denver, CO 80202
Office: 303.357.7310
Fax: 303.357.7315

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% CaCl₂, 20% excess included yield =1.18 ft³/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% CaCl₂, 20% excess included yield =1.18 ft³/sk, WR=5.2 gal/sk).
 - a. Displace to balance plug
 - b. Slowly pull out of cement plug 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% CaCl₂, 20% excess included yield =1.18 ft³/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'

01/06/2017

26. Mix and pump 173 sacks from 500'-30' (depth per elevation cut) (Class A cement + 2% CaCl₂, 20% excess included yield =1.18 ft³/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.

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

QUADRANGLE: Pennsboro

SURFACE OWNER: Antero Resources Corporation

ROYALTY OWNER: _____

UTM GPS NORTHING: 4346720.157 From Aerial Mapping

UTM GPS EASTING: 509285.560 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:

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

Survey grade GPS : Post Processed Differential

Real-Time Differential _____

Mapping Grade GPS _____ : Post Processed Differential _____

Real-Time Differential _____

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

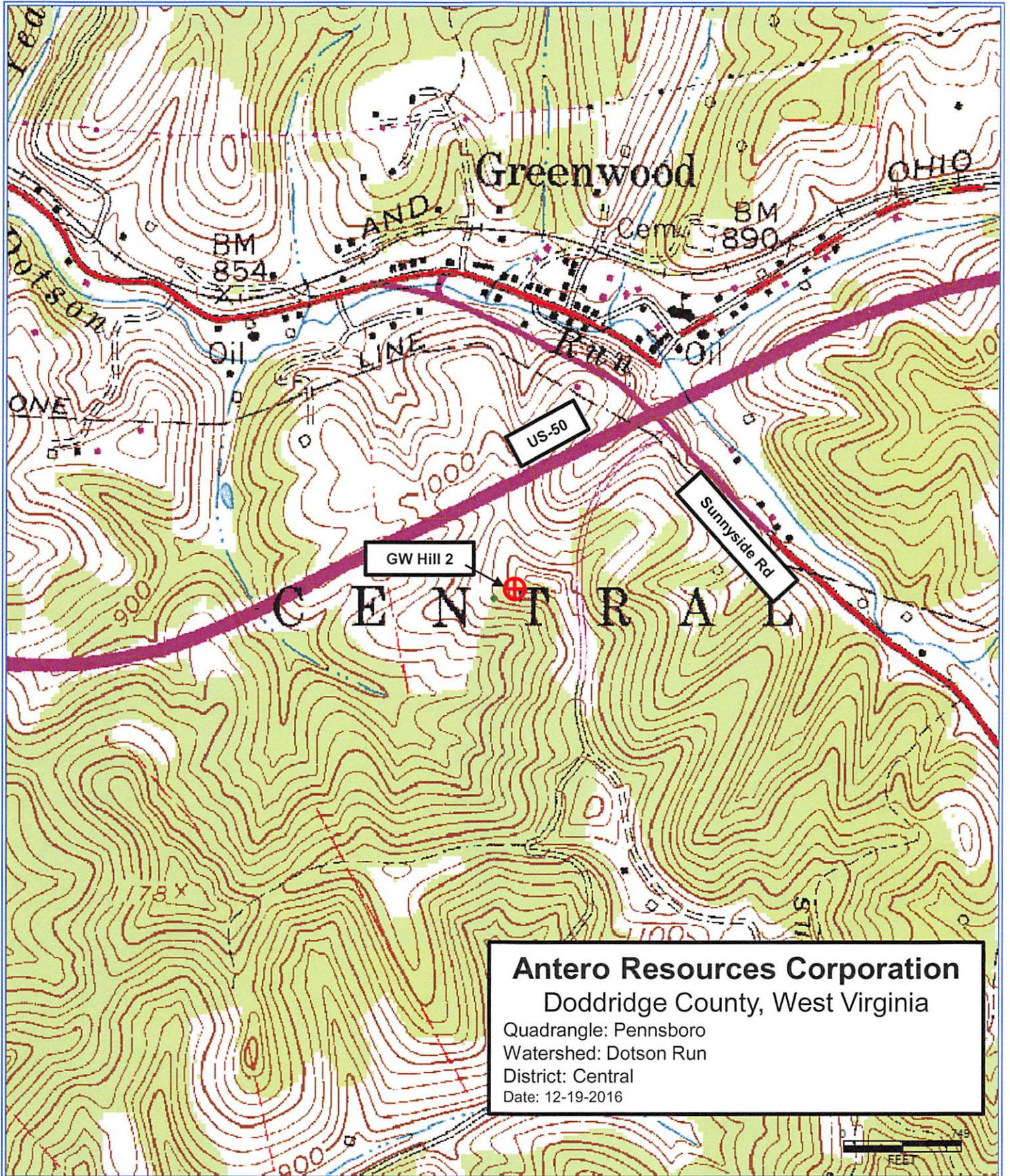
I the undersigned, hereby certify this data is correct to the best of my knowledge and belief and shows all the information required by law and the regulations issued and prescribed by the Office of Oil and Gas.


Signature

Permitting Supervisor
Title

12/22/2016
Date

01/06/2017



01/06/2017

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 UIC Permit # will be provided on Form WR-34)
- Reuse (at API Number Future permitted well locations when applicable. API# will be provided on Form WR-34)
- Off Site Disposal (Supply form WW-9 for disposal location) (Meadowfill Landfill Permit #SWF-1032-98)
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*

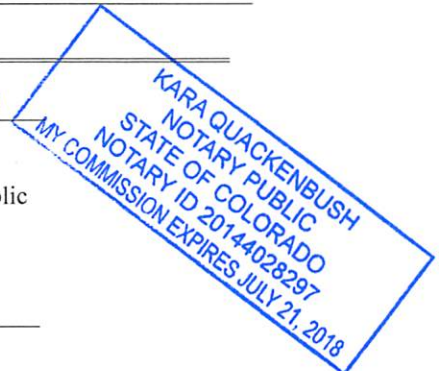
Company Official (Typed Name) Donald Gray

Company Official Title Senior Environmental & Regulatory Manager

Subscribed and sworn before me this 22nd day of December, 20 16

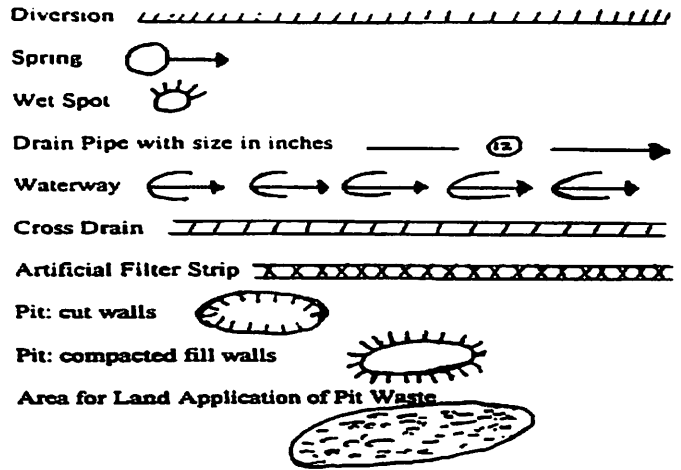
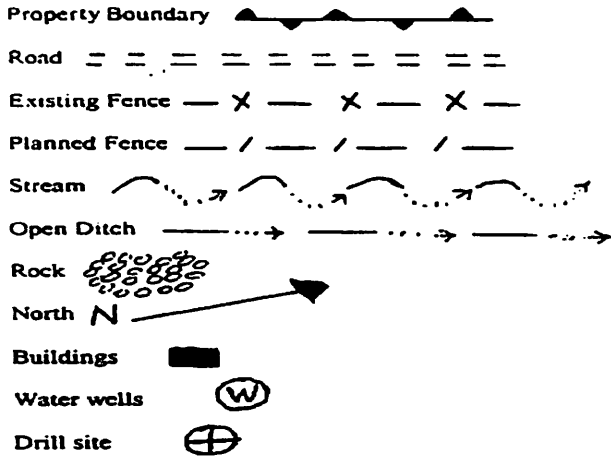
Kara Quackenbush Notary Public

My commission expires July 21, 2018



01/06/2017

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

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



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

WELL NO. Watkins & Watkins No. 2
FARM NAME G. Wynt Hill
API WELL NO. 47 017 3072
DATE Jan. 13, 1982

WELL TYPE: Oil Gas

LOCATION: If "Gas", Production Underground storage Deep Shallow
Elevation: 1075 Watershed: Cabin Run of Hughes River
District: Central County: Doddridge Quadrangle: Pennsboro

WELL OPERATOR: Watkins & Watkins, Inc.
Address: P. O. Box 386
Lumberport, W. Va. 26386

DESIGNATED AGENT: Watkins & Watkins
Address: P. O. Box 386
Lumberport, W. Va. 26386

OIL & GAS ROYALTY OWNER: G. Wynt Hill
Address: Greenwood, W. Va.

COAL OPERATOR: None in Area
Address: _____

SURFACE OWNER: G. Wynt Hill
Address: Greenwood, W. Va.

No record of coal penetration from any surrounding well records.

FIELD SALE (IF MADE) TO: _____
Address: _____

OIL AND GAS INSPECTOR TO BE NOTIFIED:
Name: _____
Address: _____

COAL LESSEE WITH DECLARATION ON RECORD:
Name: _____
Address: _____

The undersigned well operator is entitled to operate for oil or gas purposes at the above location under a deed lease / other contract dated Dec. 28, 1981, to the undersigned well operator from _____

(If said deed, lease, or other contract has been recorded):
Recorded on _____ 19____ in the office of the Clerk of the County Commission of _____ County, West Virginia in _____ Book _____ at page _____. A permit is requested as follows:

PROPOSED WORK: Drill / Drill deeper _____ / Redrill _____ / Fracture or stimulate _____
Plug off old formation _____ / Perforate new formation _____
Other physical change in well (specify) _____

The above named coal operator, coal owner(s), and coal lessee are hereby notified that any objection they wish to make or are required to make by Code §22-4-3, must be filed with the Department of Mines within fifteen (15) days after the receipt of this Application by the Department.
Copies of this Permit Application and the enclosed plat and reclamation plan have been mailed by registered mail or delivered by hand to the above named coal operator, coal owner(s), and coal lessee on or before the day of the mailing or delivery of this Permit Application to the Department of Mines at Charleston, West Virginia.

PLEASE SUBMIT COPIES OF ALL GEOPHYSICAL LOGS DIRECTLY TO
WEST VIRGINIA OIL AND GAS CONSERVATION COMMISSION
1613 WASHINGTON STREET, EAST CHARLESTON, WV 25311
Telephone (304) 348-3092

Company Name: Watkins & Watkins
BY: [Signature]

RECEIVED

JAN 15 1982
OIL AND GAS DIVISION
WV DEPARTMENT OF MINES
01/06/2017

BLANKET BOND

PROPOSED WORK ORDER

THIS IS AN ESTIMATE ONLY.

ACTUAL INFORMATION MUST BE SUBMITTED ON FORM IV-35 UPON COMPLETION.

DRILLING CONTRACTOR (IF KNOWN) Spencer Enterprises
Smithburg, W. Va.

GEOLOGICAL TARGET FORMATION, Big Injun & Weir

Estimated depth of completed well: 2500 feet. Rotary Cable tools

Approximate water strata depth: Fresh, 215 feet; salt, feet.

Approximate coal seam depths: None Is coal being mined in the area? Yes No

CASING AND TUBING PROGRAM

CASING OR TUBING TYPE	SPECIFICATIONS				FOOTAGE INTERVALS		CEMENT FILL-UP or SACKS (Cubic Feet)	PACKERS
	Size	Grade	Weight per ft.	Net Used	For Drilling	Left in well		
Conductor	13	5/8"		X		20	cement to surface	Kind
Fresh Water	8	5/8"	20 lb	X		400		Size
Coal							cement to surface	
Intermediate								Depth set
Production	4 1/4"		10.5 lb.			2500	cement to 300' above producing horizon or as required by Rule 35.01 or into well	Perforations:
Tubing								Top Bottom
Liners								

NOTE: Regulation 7.02 of the Department of Mines provides that the original and four copies of Form IV-2 must be filed with the Department, accompanied by (i) a plat as the form prescribed by Regulation 11, (ii) a bond as one of the forms prescribed by Regulation 12; or in lieu thereof the other security allowed by Code §22-4-2, (iii) Form IV-9 "Reclamation Plan", applicable to the reclamation required by Code §22-4-12b and Regulation 23, (iv) unless previously paid on the same well, the fee required by Code §22-4-12a, and (v) if applicable, the consent required by Code §22-4-8a from the owner of any water well or drilling within 200 feet of the proposed well.

A separate Form IV-2 shall not be required for fracturing or stimulating a well where fracturing or stimulating is to be part of the work for which a permit is sought and is noted as such on the Form IV-2 filed in connection therewith.

The following waiver must be completed by the coal operator and by any coal owner or coal lessee who has recorded a declaration under Code §22-4-20, if the permit is to be issued within fifteen (15) days of receipt thereof.

WAIVER

The undersigned coal operator owner lessee of the coal under this well location has examined this proposed well location. If a mine map exists which covers the area of the well location, the well location has been added to the mine map. The undersigned has no objection to the work proposed to be done at this location, provided, the well operator has complied with all applicable requirements by the West Virginia Code and the governing regulations.

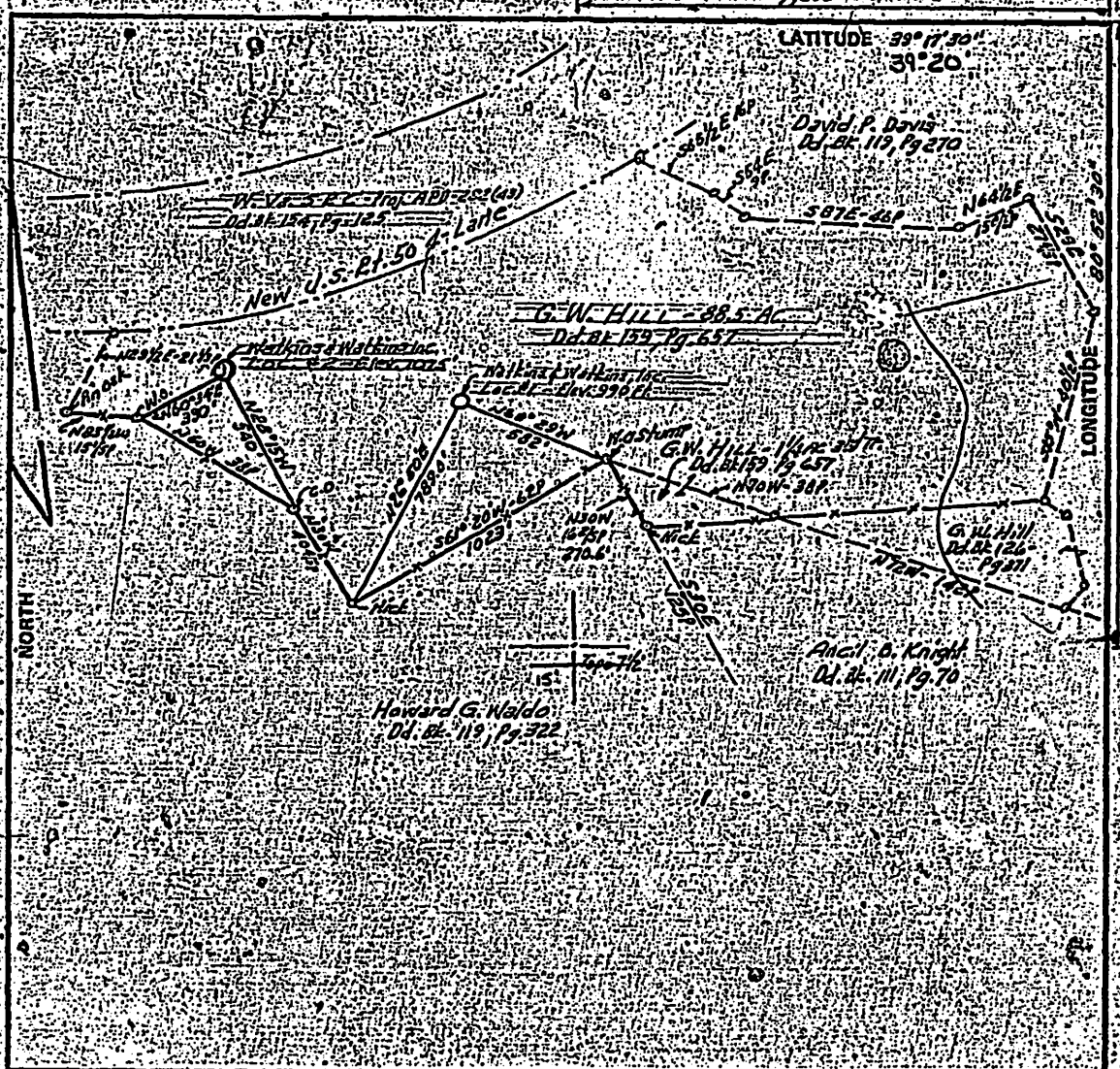
Date: 19 BY:

THIS PERMIT MUST BE POSTED AT THE WELL SITE

All provisions being in accordance with Chapter 22, of the W. Va. Code, the location is hereby approved for drilling. This permit shall expire if operations have not commenced by 9-22-82

J. H. Magg
Deputy Director, Oil & Gas Division

01/06/2017



FILE NO. _____
 DRAWING NO. _____
 SCALE 1" = 500 Feet
 MINIMUM DEGREE OF ACCURACY 1" in 200'
 PROVEN SOURCE OF ELEVATION BM 890 East of Greenwood on R/R Tracts

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN 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 DEPARTMENT OF MINES.
 (SIGNED) M. E. M... ..
 R.P.E. U.S. 7

PLACE SEAL HERE

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS
 FORM IV-B (8-78)



DATE January 11, 1982
 OPERATOR'S WELL NO. 2
 API WELL NO. _____
147-017-3072
 STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
 DEPARTMENT OF MINES
 OIL AND GAS DIVISION

WELL TYPE: OIL GAS LIQUID INJECTION _____ WASTE DISPOSAL _____
 (IF "GAS,") PRODUCTION _____ STORAGE _____ DEEP _____ SHALLOW
 LOCATION: ELEVATION 1075 Ft. WATER SHED HUGHES RIVER
 DISTRICT Central COUNTY Doddridge
 QUADRANGLE Pennsboro
 SURFACE OWNER G.W. HILL ACREAGE 88.5
 OIL & GAS ROYALTY OWNER G.W. HILL LEASE ACREAGE 88.5
 LEASE NO. _____
 PROPOSED WORK: DRILL CONVERT _____ DRILL DEEPER _____ REDRILL _____ FRACTURE OR STIMULATE _____ PLUG OFF OLD FORMATION _____ PERFORATE NEW FORMATION _____ OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____
 PLUG AND ABANDON _____ CLEAN OUT AND REPLUG
 TARGET FORMATION Wair ESTIMATED DEPTH 2800 Ft.
 WELL OPERATOR Walkins & Watkins, Inc. DESIGNATED AGENT Walkins & Watkins, Inc.
 ADDRESS Box 386 - Lumberport, W.Va. 26286 ADDRESS Box 386 - Lumberport, W.Va. 26286

01/06/2017

Form IV-9 (01-80)

Date January 11, 1982
Well No. Watkins & Watkins, Inc. 2
API No. 67-017-3072
State West Virginia County Doddridge Permit

STATE OF WEST VIRGINIA
OFFICE OF OIL AND GAS

Company Name Watkins & Watkins, Inc. Designated Agent Watkins & Watkins, Inc.
Address Box 386, Lumberport, W.Va. Address Box 386, Lumberport, W.Va.
Telephone 584-4170 Telephone 584-4170
Landowner G. Wyatt Hill Soil Cons. District

Revegetation to be carried out by Watkins & Watkins, Inc. (Agent)

This plan has been received by West SCD. All corrections and additions become a part of this plan. 1/14/82 Kenneth Knight (Date) (SCD Agent)

Access Road	Location
Structure <u>culvert</u> (A)	Structure <u>Diversion Ditch</u> (1)
Spacing <u>As needed (min 12' LB)</u>	Material <u>Soil</u>
Page Ref. Manual <u>1-8</u>	Page Ref. Manual <u>1-9</u>
Structure <u>Drainage Ditch</u> (B)	Structure <u>Drilling Pit</u> (2)
Spacing <u>---</u>	Material <u>Soil</u>
Page Ref. Manual <u>2-11</u>	Page Ref. Manual <u>N/A</u>
Structure <u>Cross Drains</u> (C)	Structure <u>---</u> (3)
Spacing <u>200' apart</u>	Material <u>---</u>
Page Ref. Manual <u>3-8</u>	Page Ref. Manual <u>---</u>

RECEIVED

JAN 15 1982

OIL AND GAS DIVISION
WV DEPARTMENT OF MINES

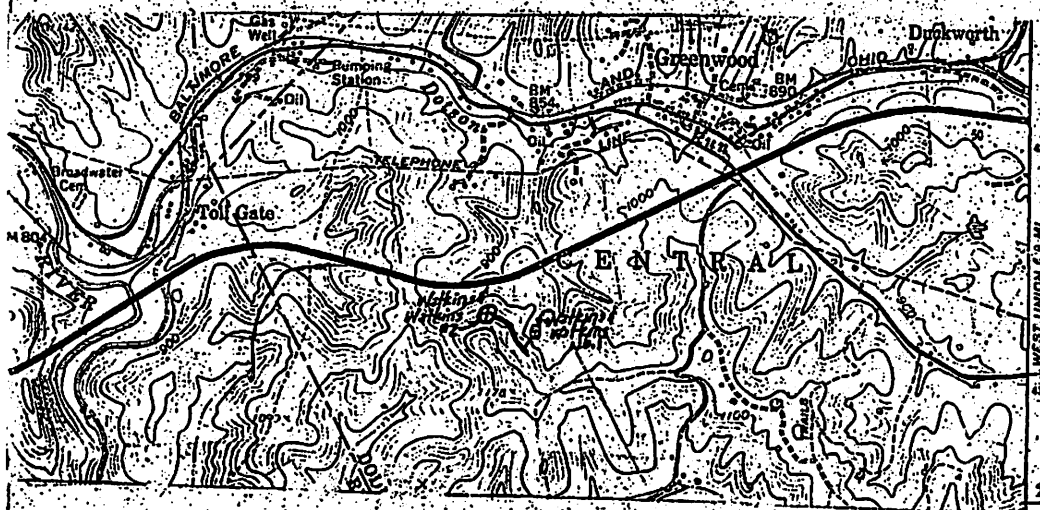
Revegetation

Treatment Area I	Treatment Area II
Lime <u>---</u> Tons/Acre or correct to pH <u>6.5</u>	Lime <u>---</u> Tons/Acre or correct to pH <u>6.5</u>
Fertilizer <u>600</u> lbs/acre (10-20-20 or equivalent)	Fertilizer <u>600</u> lbs/acre (10-20-20 or equivalent)
Mulch <u>Hay</u> 2 Tons/Acre	Mulch <u>Hay</u> 2 Tons/Acre
Seed <u>---</u> lbs/acre	Seed <u>---</u> lbs/acre
<u>Ladino clover</u> 5 lbs/acre	<u>Ladino clover</u> 5 lbs/acre
<u>Kv. 31</u> 35 lbs/acre	<u>Kv. 31</u> 35 lbs/acre

*Inoculate all legumes such as vetch, trefoil and clovers with the proper bacterium. Inoculate with 3X recommended amount.

Attach or photocopy section of involved Topographic map: Quadrangle Pennsboro

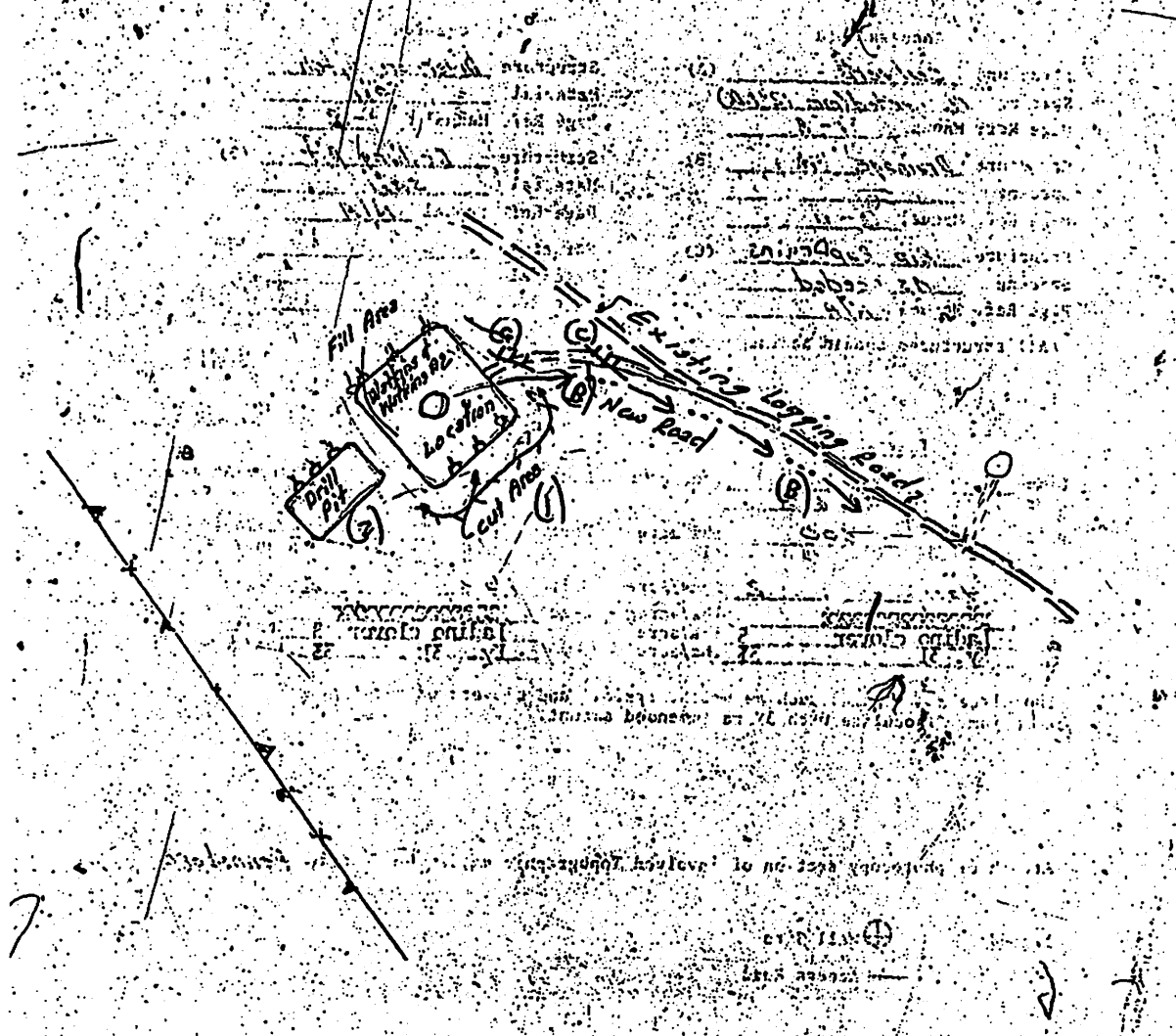
Legend: Well Site
 Access Road



Well Site Plan

- | | | | | |
|---------|-------------------|---------|------------|-------|
| Legend: | Property Boundary | ----- | Diversion | ~~~~~ |
| | Road | == | Spring | ○ |
| | Existing Fence | -x-x- | Wet Spot | ⊕ |
| | Planned Fence | - - - - | Building | □ |
| | Stream | ~~~~~ | Drain Pipe | ○-○-○ |
| | Open Ditch | - - - - | Waterway | ≡≡≡ |

Sketch to include well location, existing access road, roads to be constructed, well site, drilling pits and necessary structures numbered or lettered to correspond with first part of this plan. Include all natural drainage.



Comments: Slope of proposed Access Road not to exceed 3:1, cut area to be constructed at 2:1 unless in Rock, Direction and Drainage to be maintained after Reclamation, Drilling Pit location may be subject to change.

Signature: Wattins & Wattins
 Agent: [Signature] Address: Box 386, Lumberport, W.Va. Phone Number: 524-4170

Please request landowners cooperation to protect new seeding for one growing season.

Flat Top Insurance Agency
P.O. Box 1439
Bluefield, WV 24701

STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY
DIVISION OF OIL & GAS
1613 WASHINGTON STREET, EAST
CHARLESTON, WEST VIRGINIA 25311
BOND FOR SINGLE OIL OR GAS WELL,
SINGLE LIQUID INJECTION WELL,
OR SINGLE WASTE DISPOSAL WELL

KNOW ALL MEN BY THESE PRESENTS:

- (1) That we, R.C. Development Company, Inc.
- (2) Rt. 4, Box 253, Clarksburg, WV 26301
- (3) As Principal, and Ohio Farmers Insurance Company
- (4) P.O. Box 876, St. Albans, WV, 25177

a firm and/or a corporation authorized to do business in the State of West Virginia, as Surety, are held and firmly bound unto the State of West Virginia in the just and full sum of Ten thousand & no/100 dollars (\$10,000.00) to the payment whereof well and truly to make, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above bound Principal in pursuance of the provisions of Chapter 22B, Article 1, of the Code of West Virginia, 1931, as amended, and the regulations promulgated thereunder, has made or intends to make application to the Director for Oil and Gas, Department of Energy, the State of West Virginia for a permit to drill, redrill, deepen, fracture, stimulate, plug, pressure, convert, combine, physically change, partially plug, case, and/or reclaim; purchase or acquire, a single oil or gas well or liquid injection well or waste disposal well, located on the waters of Hughes River in Central District, Doddridge County, West Virginia, assigned by Said Department of Energy API Well No. 47-017-3072; and

WHEREAS, THE Obligor as a condition precedent to the issuance of such Permit or release of other obligation has requested the Principal to furnish a SURETY BOND acceptable to the Obligor guaranteeing the performance of said provisions of Chapter 22B, Article 1, of the Code of West Virginia, 1931, as amended, and the regulations promulgated thereunder;

NOW, THEREFORE, the condition of this obligation is such that if the Principal, its personal representatives, successors, heirs and assigns shall either (1) in drilling, redrilling, deepening, fracturing, stimulating, plugging, pressuring, converting, combining, physically changing, partially plugging, casing, and reclaiming, and furnish all reports, information and affidavits as may be required by the Department of Energy, Division of Oil and Gas, documenting that said well has been plugged and abandoned in accordance with Chapter 22B, Article 1, of the Code of West Virginia, 1931, as amended, and the regulations promulgated thereunder, or (2) deposit with the Director cash from the sale of the oil and gas or both in the amount of Ten thousand dollars (\$10,000.00) then this obligation to be void, otherwise to remain in full force and effect.

(6) This bond shall be effective from the 5th day of August, 1985, until released by the Department of Energy.

IN WITNESS WHEREOF the said Principal has hereunder set his or its hand and affixed his or its seal, and the said surety has caused its corporate name to be signed hereto and its corporate seal to be hereunto affixed by its duly authorized officer or

(7) agent and executed this instrument this 5th day of August, 1985.

(10) Principal (8) R.C. DEVELOPMENT COMPANY, INC. (Seal)

(9) By: [Signature] (Principal)
Title (Must be President or Vice-President)

(13) Surety (11) OHIO FARMERS INSURANCE COMPANY
Corporate Seal

(12) By: [Signature] (Surety)

(14) Countersigned: [Signature]
Resident West Virginia Agent
Flat Top Insurance Agency
P.O. Box 1439, Bluefield, WV 24701

(Telephone) (304) 327-3421

Form IV-77
Obverse
(9-84)



State of West Virginia
Department of Mines
Oil and Gas Division
Charleston 25305

This is to acknowledge that the wells listed on the reverse of this form are hereby transferred from Watkins & Watkins, Inc. (the transferor) to R.C. Development, Inc. (the transferee).

The transferee by this document is accepting all responsibility for compliance with the provisions of Chapter 22 Article 4 of the West Virginia Code and all rules and regulations promulgated thereunder, for the listed wells.

The transferee's Designated agent (name) Patrick H. Cunningham (address) Rt. 4 Box 253, Clarksburg, W.V. 26301 is on file with the Office of Oil and Gas.

The transferee has bonded the said wells by securities, cash, or surety (circle one) bond identified below by amount, effective date, issuing authority, and any identifying number. Attached

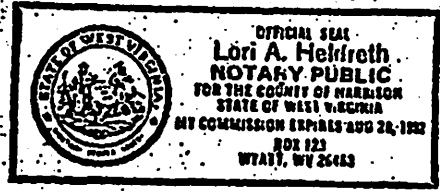
(Transferee) R.C. Development, Inc.
By Patrick H. Cunningham
Its President

Taken, subscribed and sworn to before me this 16th day of August 1985
Notary Public Quenda K. Ingham
My commission expires July 16, 1990

(Transferor) Watkins & Watkins, Inc. & 1984 members interests
was foreclosed upon by The Lumber Bank
By T.W. [Signature] Trustee
Its Attorney for The Lumber Bank

Taken, subscribed and sworn to before me this 5th day of September 1985
Notary Public John Helderich Hamrick
My commission expires 8-20 1992

ACCEPTED THIS 13 DAY OF 9 1985
BY: [Signature]
Director - Division of Oil and Gas



01/06/2017

RECEIVED

FORM IV-35 (Obverse)

(08-78)

APR 23 1982

OIL AND GAS DIVISION
DEPARTMENT OF MINES

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

WELL OPERATOR'S REPORT
OF

DRILLING, FRACTURING AND/OR STIMULATION, OR PHYSICAL CHANGE

Date: April 22, 1982

Operator: Watkins & Watkins
Well No. No. 2

API Well No. 57-017-3072
State County: Permi

WELL TYPE: Oil / Gas / 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 DESIGNATED AGENT: Watkins & Watkins
Address: P. O. Box 386 Address: P. O. Box 386
Lumberport W.V. Lumberport W.V.

PERMITTED WORK: Drill / 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, 1982 OIL & GAS INSPECTOR FOR THIS WORK:

(IF APPLICABLE: PLUGGING OF DRY HOLE OR CONTINUOUS PROGRESSION FROM DRILLING OR REWORKING. VERBAL PERMISSION OBTAINED.)
Name: Steve Casey
Address: Jane Lew
W. V.

GEOLOGICAL TARGET FORMATION: Weir Depth: 2,400 feet

Depth of completed well: 2,500 feet Rotary / Cable Tools ___

Water strata depth: Fresh, 215 feet; salt, ___ feet.

Coal seam depths: None Is coal being mined in the area? ___

Work was commenced 2 - 1, 1982 and completed 2 - 6, 1982

CASING AND TUBING PROGRAM

CASING OR TUBING TYPE	SPECIFICATIONS				FOOTAGE INTERVALS		CEMENT FILL-UP OR SACKS (Cubic feet)	PACKERS
	Size	Grade	Weight per ft	New	Used	For drilling		
Conductor	13	5/8		X			20'	Kinds
Fresh water	8	5/8		X			400'	To surface
Coal								Sizes
Intermediate								
Production	4 1/2		10.5	X			2400'	300' above top Producing Depth
Tubing								horizon
Liners								Perforations:
								Top Bottom
								2047 2320

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

(If applicable due to multiple completion--)

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

01/06/2017

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

017-3072

WELL LOG

FORMATION	Color	Hard or Soft	Top Feet	Bottom Feet	RESERVOIR 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	
Snad			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."

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

INSPECTOR'S WELL REPORT

Permit No. 17-3072

Oil or Gas Well
(KIND)

Company	CASING AND TUBING	USED IN DRILLING	LEFT IN WELL	PACKERS
	Size			Kind of Packer
<u>Watkins + Watkins</u>	16			
Address	13			
Farm <u>W. Hill</u>	10			Size of
Well No. <u>2</u>	8 1/4			Depth set
District <u>Central</u> County <u>Dodd</u>	0%			
Drilling commenced	5 3/16			Perf. top
Drilling completed	3			Perf. bottom
Date shot	2			Perf. top
Initial open flow	Liners Used			Perf. bottom
Open flow after tubing				
Volume	CASING CEMENTED	SIZE	No. FT.	Date
Block pressure	NAME OF SERVICE COMPANY			
Oil	COAL WAS ENCOUNTERED AT FEET INCHES			
Fresh water	FEET	INCHES	FEET	INCHES
Salt water	FEET	INCHES	FEET	INCHES

RECEIVED

FEB 16 1983

OIL AND GAS DIVISION
WV DEPARTMENT OF MINES

Drillers' Names

Remarks:

roughed in, not completed

Steve Casey

2-8-83

DATE

INSPECTOR

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

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FEB 12 1982

OIL AND GAS DIVISION
WV DEPARTMENT OF MINES

INSPECTOR'S WELL REPORT

Permit No. 17-3072

Oil or Gas Well
(KIND)

Company Watkins + Watkins

Address _____

Farm Gil W. Hill

Well No. 3

District Central County Dodd

Drilling commenced _____

Drilling completed _____ Total depth _____

Date shot _____ Depth of shot _____

Initial open flow _____ /10ths Water in _____ Inch

Open flow after tubing _____ /10ths Merc. in _____ Inch

Volt. ac _____ Gu. Ft. _____

Stock pressure _____ lbs _____ hrs.

Oil _____ bbls., 1st 24 hrs.

Fresh water _____ feet _____ feet

Salt water _____ feet _____ feet

CASING AND TUBING	USED IN DRILLING	LEFT IN WELL	PACKERS
Size			
16			Kind of Packer
13			
10			Size of
8 3/4			
6 3/4			Depth set
5 3/16			
3			Perf. top
2			Perf. bottom
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED _____ SIZE _____ No. FT. _____ Date _____

NAME OF SERVICE COMPANY _____

COAL WAS ENCOUNTERED AT _____ FEET _____ INCHES

_____ FEET _____ INCHES _____ FEET _____ INCHES

_____ FEET _____ INCHES _____ FEET _____ INCHES

Drillers' Names Spencer rig 5

Remarks: Starting today

2-9-82
DATE

Steve Cooney
DISTRICT WELL INSPECTOR
01/06/2017

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

INSPECTOR'S WELL REPORT

Permit No. 17-3072

Oil or Gas Well
(KIND)

Company Watkins & Watkins
 Address _____
 Farm G W Hill
 Well No. 3
 District Central County Dodd
 Drilling commenced _____
 Drilling completed _____ Total depth _____
 Date shot _____ Depth of shot _____
 Initial open flow _____ /10ths Water in _____ Inch
 Open flow after tubing _____ /10ths Merc. in _____ Inch
 Volume _____ Cu. Ft.
 Rock pressure _____ lbs. _____ hrs.
 Oil _____ bbls., 1st 24 hrs.
 Fresh water _____ feet _____ feet
 Salt water _____ feet _____ feet

CASING AND TUBING	USED IN DRILLING	FEET IN WELL	PACKERS
Size			Kind of Packer
16			
18			Size of
10			
8 1/2			Depth set
6 3/8			
3			Perf. top
2			Perf. bottom
Liners Used			Perf. top
			Perf. bottom

RECEIVED

FEB 1 1902

OIL AND GAS DIVISION
WV DEPARTMENT OF MINES

CASING CEMENTED _____ SIZE _____ No. FT. _____ Date _____

NAME OF SERVICE COMPANY _____

COAL WAS ENCOUNTERED AT _____ FEET _____ INCHES

_____ FEET _____ INCHES _____ FEET _____ INCHES

_____ FEET _____ INCHES _____ FEET _____ INCHES

Drillers' Names Spencer rig 5

Remarks: 2-9 start
2-10 rig down again (water & ice in fuel)

2-10-02

DATE

Steve Casey

DISTRICT INSPECTOR

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

RECEIVED

FEB 22 1982

OIL AND GAS DIVISION
WV DEPARTMENT OF MINES

INSPECTOR'S WELL REPORT

Permit No. 17-3072

Oil or Gas Well
(KIND)

Company Watkins & Watkins

Address _____

Farm Hill

Well No. 2

District Central County Dodd

Drilling commenced 2-9-82

Drilling completed _____ Total depth _____

Date shot _____ Depth of shot _____

Initial open flow _____ /10ths Water in _____ Inch

Open flow after tubing _____ /10ths Merc. in _____ Inch

Volume _____ Cu. Ft.

Rock pressure _____ lbs. _____ hrs.

Oil _____ bbls. 1st 24 hrs.

Fresh water _____ feet _____ feet

Salt water _____ feet _____ feet

CASING AND TUBING	USED IN DRILLING	LA. T IN. WELL	PACKERS
Size			Kind of Packer
16			
13			
10			Size of
8 1/4			
6 3/4			Depth set
5 3/16			
3			Perf. top
2			Perf. bottom
Liners Used			Perf. top
			Perf. bottom

CASING CEMENTED 5 3/8 SIZE 365' No. FT. 90 SKS Date _____

NAME OF SERVICE COMPANY _____

COAL WAS ENCOUNTERED AT _____ FEET _____ INCHES

_____ FEET _____ INCHES _____ FEET _____ INCHES

_____ FEET _____ INCHES _____ FEET _____ INCHES

Drillers' Names Spencer rig 5

Remarks: TD 2412' 4 1/2 at 2375' 140 SKS.
rig stacked for a few days only, next loc. not ready.

2-17-82
DATE

Steve Casey
DISTRICT WELL INSPECTOR
01/06/2017



State of West Virginia
Department of Mines
Oil and Gas Division
Charleston 25305

RECEIVED
FEB 7 - 1984

OIL & GAS DIVISION
DEPT. OF MINES

FINAL INSPECTION REPORT
INSPECTOR'S COMPLIANCE REPORT

COMPANY Watkins & Watkins

PERMIT NO. 017-3072

P. O. Box 167

FARM & WELL NO. G.W. Hill, 2nd

Clarksburg, W. Va. 25301

DIST. & COUNTY Central - Dodd

RULE	DESCRIPTION	IN COMPLIANCE	
		YES	NO
23.06	Notification Prior to Starting Work		
25.04	Prepared before Drilling to Prevent Waste		
25.03	High-Pressure Drilling		
16.01	Required Permits at Wellsite		
15.03	Adequate Fresh Water Casing		
15.02	Adequate Coal Casing		
15.01	Adequate Production Casing		
15.04	Adequate Cement Strength		
15.05	Cement Type		
23.02	Maintained Access Roads		
25.01	Necessary Equipment to Prevent Waste		
23.04	Reclaimed Drilling Pits		
23.05	No Surface or Underground Pollution		
23.07	Requirements for Production & Gathering Pipelines		
16.01	Well Records on Site		
16.02	Well Records Filed		
7.05	Identification Markings		

I HAVE INSPECTED THE ABOVE CAPTIONED WELL AND RECOMMEND THAT IT BE RELEASED:

SIGNED Mick Underwood

DATE 2-2-84

Your well record was received and reclamation requirements approved. In accordance with Chapter 22, Article 4, Section 2, the above well will remain under bond coverage for the life of the well.

T. H. ...
Administrator - Oil & Gas Division

February 10, 1984
DATE

TS/rl

01/06/2017



STATE OF WEST VIRGINIA
DEPARTMENT OF MINES

RECEIVED

SEP 12 1983

OIL & GAS DIVISION
DEPT. OF MINES

Oil and Gas Division
NOTICE OF VIOLATION

Permit Number 17-3072
Company Watkins + Watkins
Address Box 386
Street
Lumberton
City
W. Va.
State

Farm G.W. Hill Acres 88.5
Location of Well (Waters) Cabin Run of Hughes Rv.
Company Well No. 2
District Central
County Dodd

Responsible Agent Watkins + Watkins
Address Same

The above described well is being posted this 31 day of Aug, 1983. A copy of this violation notice has this day been posted at the well site and either delivered personally or sent by Registered Mail, (return receipt requested) to the above address in accordance with the provisions of Chapter 22, Article 4, Section 1g of the Official Code of West Virginia for the following violation.

Chapter 22, Article 4, Section 126

Administrative Regulation Rule No. 2

Detailed description of violation:
reclamation started - never completed
no permit number

You are hereby granted until Sept 7, 1983 to totally abate the above described violation.

Failure to comply with this order will prompt action by the Oil and Gas Division under Chapter 22, Article 4, Section 17, Offenses, Penalties, or Chapter 22, Article 4, Section 18, Injunctive Relief of the West Virginia Code.

Signed Stephen L. Cassey
Oil and Gas Inspector

Date 8-31-83 01/06/2017

RECEIVED

FORM IV-30

SEP 26 1983

Date: 9-16-83 1983

Operator's Well Number 2

API Well No. 47-17-3072

State County Permit

OIL & GAS DIVISION STATE OF WEST VIRGINIA
DEPT. OF MINES MINES, OFFICE OF OIL AND GAS
ORDER FOR FAILURE TO ABATE VIOLATION

WELL TYPE: Oil Gas Liquid Injection Waste Disposal
If "Gas" - Production Storage Deep Shallow

LOCATION: Elevation: _____ Watershed: Cabin Run
District: Central County: Dodd Quadrangle

WELL OPERATOR: Watkins + Watkins
Address: Box 386 Lumberport W. Va.

DESIGNATED AGENT: Same
Address: _____

Notice is hereby given that the undersigned authorized oil and gas inspector has made a special inspection of the above-named well on 9-16-1983.

Upon the expiration of a period of time originally fixed for abatement.

_____ Upon the order of the Administrator for the Office of Oil and Gas at the request of the well operator.

_____ Upon the request of the Administrator for the Office of Oil and Gas.

The violation of Code 22-4-12b heretofore found to exist on 8-31-1983

by Form IV-27, "Notice of Violation" _____, Form IV-28, "Imminent Danger Order" _____

of that date has not been totally abated and it has been determined that no further extension of time should be permitted for the following reasons:

(USE REVERSE SIDE OF THIS ORDER IF NECESSARY)

Therefore, in accordance with the provisions of Code 22-4-1g, the well operator is hereby ORDERED:

_____ To continue cessation of operations until the imminent danger is fully abated.

To cease further operations until the violation has been fully abated.

In accordance with Code 22-4-1h, a well operator or complaining coal operator, owner, or lessee may apply for review of this Order within 15 days of the date of this Order.

PURCHASER: _____
Address: _____

Stephen L. Casey
Oil and Gas Inspector

Address: Rt. 2 Janebent W. Va.

Telephone: 884-7470

(Copies of this ORDER have been posted at the well site and sent by certified or registered mail to the indicated well operator or his designated agent.)

01/06/2017

RECEIVED

FORM IV-30

SEP 26 1983

Date: 9-16- 19 83

Operator's Well Number Regatt 1

API Well No. 47-117-3188
State County Permit

OIL & GAS DIVISION
DEPT. OF MINES STATE OF WEST VIRGINIA
DEPARTMENT OF MINES, OFFICE OF OIL AND GAS

ORDER FOR FAILURE TO ABATE VIOLATION

WELL TYPE: Oil Gas Liquid Injection Waste Disposal
if "Gas" - Production Storage Underground Deep Shallow

LOCATION: Elevation: _____ Watershed: _____
District: New Milton County: Wald Quadrangle Wolf Pass Run

WELL OPERATOR: Watkins + Watkins
Address: Box 380 Lewisburg w. Va.

DESIGNATED AGENT: Teady Watkins
Address: Same

Notice is hereby given that the undersigned authorized oil and gas inspector has made a special inspection of the above-named well on 9-16- 19 83.

Upon the expiration of a period of time originally fixed for abatement.
 Upon the order of the Administrator for the Office of Oil and Gas at the request of the well operator.

Upon the request of the Administrator for the Office of Oil and Gas.

The violation of Code 22-4-12c heretofore found to exist on 8-29 19 83 by Form IV-27, "Notice of Violation" _____, Form IV-28, "Imminent Danger Order" _____ of that date has not been totally abated and it has been determined that no further extension of time should be permitted for the following reasons:-

(USE REVERSE SIDE OF THIS ORDER, IF NECESSARY)

Therefore, in accordance with the provisions of Code 22-4-1g, the well operator is hereby ORDERED:

To continue cessation of operations until the imminent danger is fully abated.
 To cease further operations until the violation has been fully abated.

In accordance with Code 22-4-1h, a well operator or complaining coal operator, owner, or lessee may apply for review of this Order within 15 days of the date of this Order.

PURCHASER: _____
Address: _____

Stephen L. Casey
Oil and Gas Inspector
Address: Box 2 Jane Lew
Telephone: 384-7470

(Copies of this ORDER have been posted at the well site and sent by certified or registered mail to the indicated well operator or his designated agent.)

Date: 5-30-85
Operator's Well Number Two
API Well No.: 47 - 017 - 3072
State County Permit

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

RECEIVED
JUN 4 - 1985

NOTICE OF ABATEMENT

OIL & GAS DIVISION
DEPT. OF MINES

WELL TYPE: OIL Gas Liquid Injection Waste disposal
Underground Surface
If "Gas": Production Storage Deep Shallow

LOCATION: Elevation: _____ Watershed: C&W Rm
District: CENTRAL County: Dutch Quadrangle: _____

WELL OPERATOR: WATKINS & WATKINS DESIGNATED AGENT: TEENY WATKINS
Address: Box 306 - Lumberton, N.C. Address: Same

Notice is hereby given that the undersigned authorized oil and gas inspector made a special inspection of the above named well on 5-31-85 1985

The violation of Code § 22-4-12B heretofore found to exist on Aug-31-83 1983 by Form IV-27, "Notice of Violation" Form IV-28; "Imminent Danger Order" of that date has been totally abated. If the abated violation was found by an Imminent Danger Order requiring operations to cease, such requirement is hereby rescinded, and the well operator is hereby notified that he may resume operations.

COMMENTS: Violation has been abated

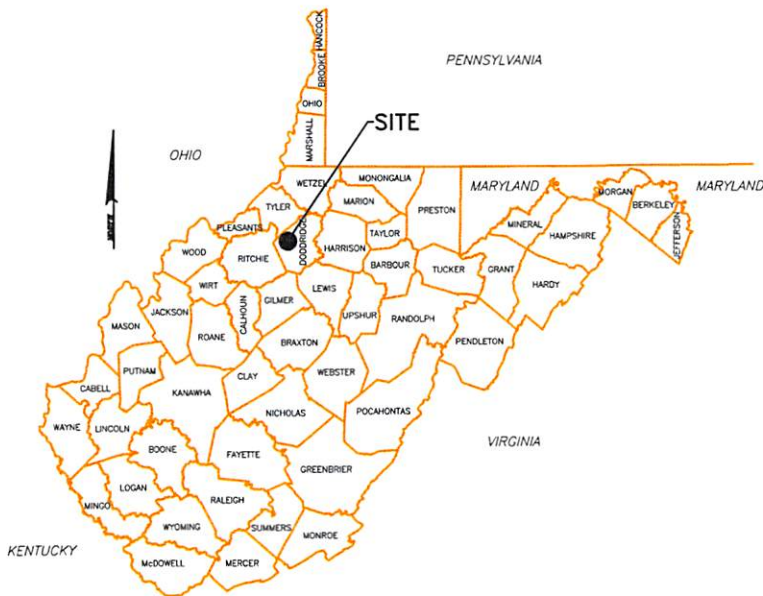
A copy of this notice has been posted at the well site and sent by certified or registered mail to the indicated well operator or his designated agent.

Alfred Underwood
Oil and Gas Inspector
Address: R.P.O. Box 135
SABIN, W. VA 26426
Telephone: 782-1043

WELL PLUGG FOR

API #47-017-003072 C

GREENWOOD TAX DISTRICT,



LOCATION MAP

SCALE - 1"=200,000'



7.5 MIN. QUADRANGLE MAP: PENNSBORO, WV

LOCATION

SCALE - 1"=2000'

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 (NAD 83), NORTH ZONE.
3. THE VERTICAL DATUM IS WEST VIRGINIA STATE PLANE, NORTH AMERICAN DATUM 1988 (NAVD 88).
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 MSS 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 ANTER

175 ELK CREEK ROAD | 53
MT. CLARE, WV 26408 | BR
PHONE (304) 622-3842 | PH

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

JOHN KAWCAK-OPERATIONS
CELL (817) 368-

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

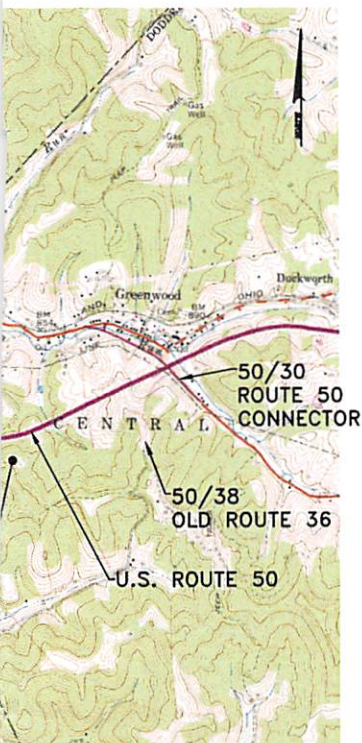
ROBERT WIRKS-DESIGN
PHONE (304) 842-
CELL (304) 627-

01/06/2017

ING PLAN

G.H. HILL #2 WELL

DODDRIDGE COUNTY, WV



MAP



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.

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 ENTRANCE	EXISTING WELL
WV SPCS NORTH, NAD 27	N 280032.693 E 1598489.752	N 282474.910 E 1603327.983
WV SPCS NORTH, NAD 83	N 280066.955 E 1567048.690	N 282509.306 E 1571866.900
UTM (METERS) ZONE 17, NAD83	N 85364.579 E 477637.396	N 86109.009 E 479112.085
LAT & LONG, NAD83	LAT 39-15-36.85 LONG -80-55-04.28	LAT 39-16-01.74 LONG -80-54-03.26

OFFICE

3 WHITE OAKS BLVD.
DGEPORT, WV 26330
TNE (304) 842-4100

TS:
TAL ENGINEER
-4068
-9770

SUPERINTENDENT
-1553

CTION SUPERVISOR
-4341
-0071

4 MANAGER
-4401
-7405

NO.	DATE	REVISION



FOR RETTEW ASSOCIATES BY:

MANAGER: ANDREW LEVINE, PE	CHKD BY: ASL	CHKD BY: ASL
DESIGN BY: JDN	DRAWN BY: JDN	SURV. CHIEF: FIELDBOOK NO. N/A

CLIENT

ANTERO RESOURCES CORPORATION
1615 WYNKOOP STREET
DENVER, COLORADO 80202

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

COVER SHEET
WELL PLUGGING PLAN

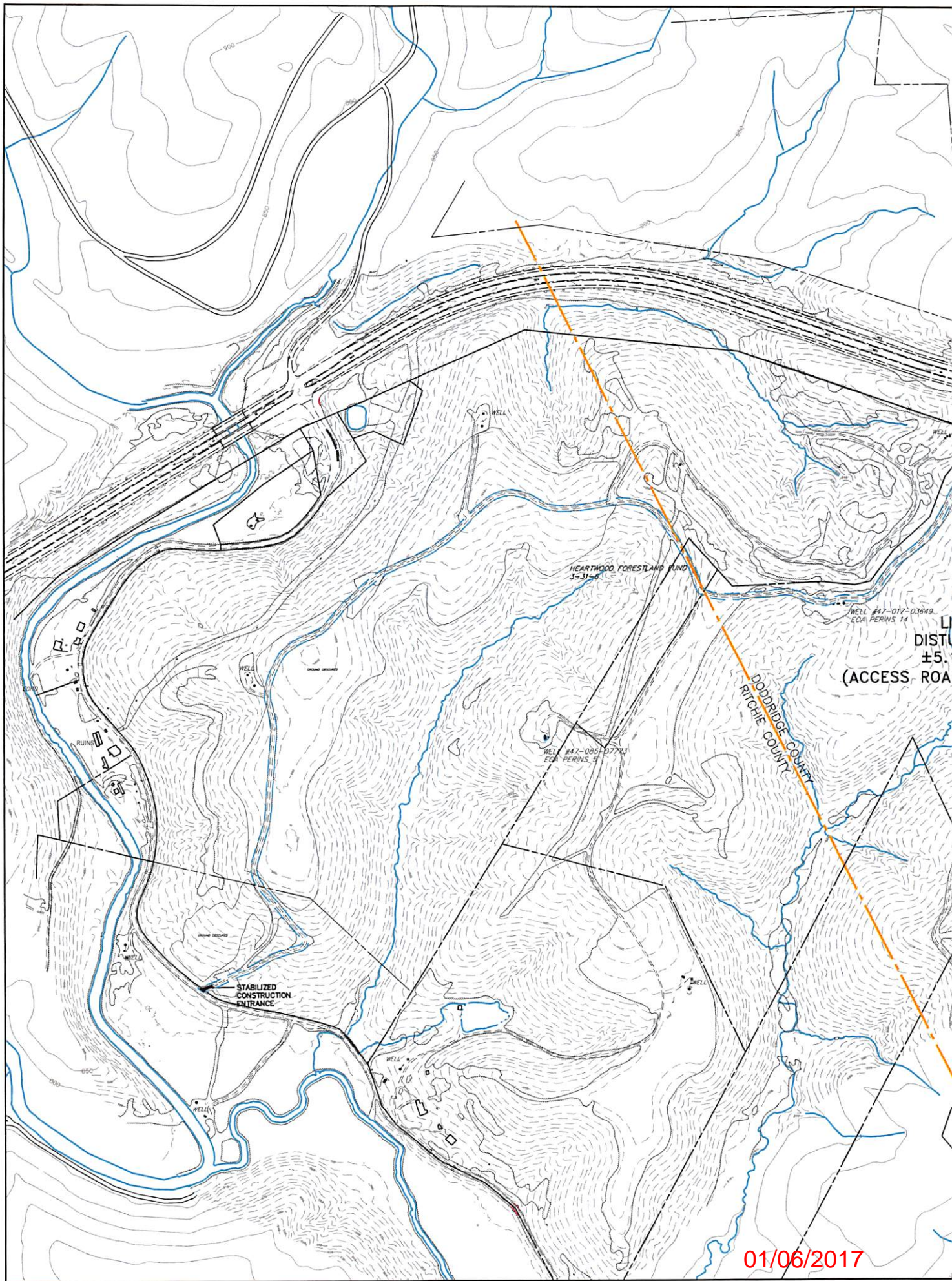
FOR
API #47-017-03072
G.H. HILL #2 WELL

GREENWOOD TAX DISTRICT DODDRIDGE COUNTY, WV

DATE: APRIL 29, 2016

SHEET NO. 1 OF 4
DWG. NO. 095452271

01/06/2017



HEARTWOOD FORESTLAND FUND
3-31-06

WELL #47-080-07741
ECA PERINS, S

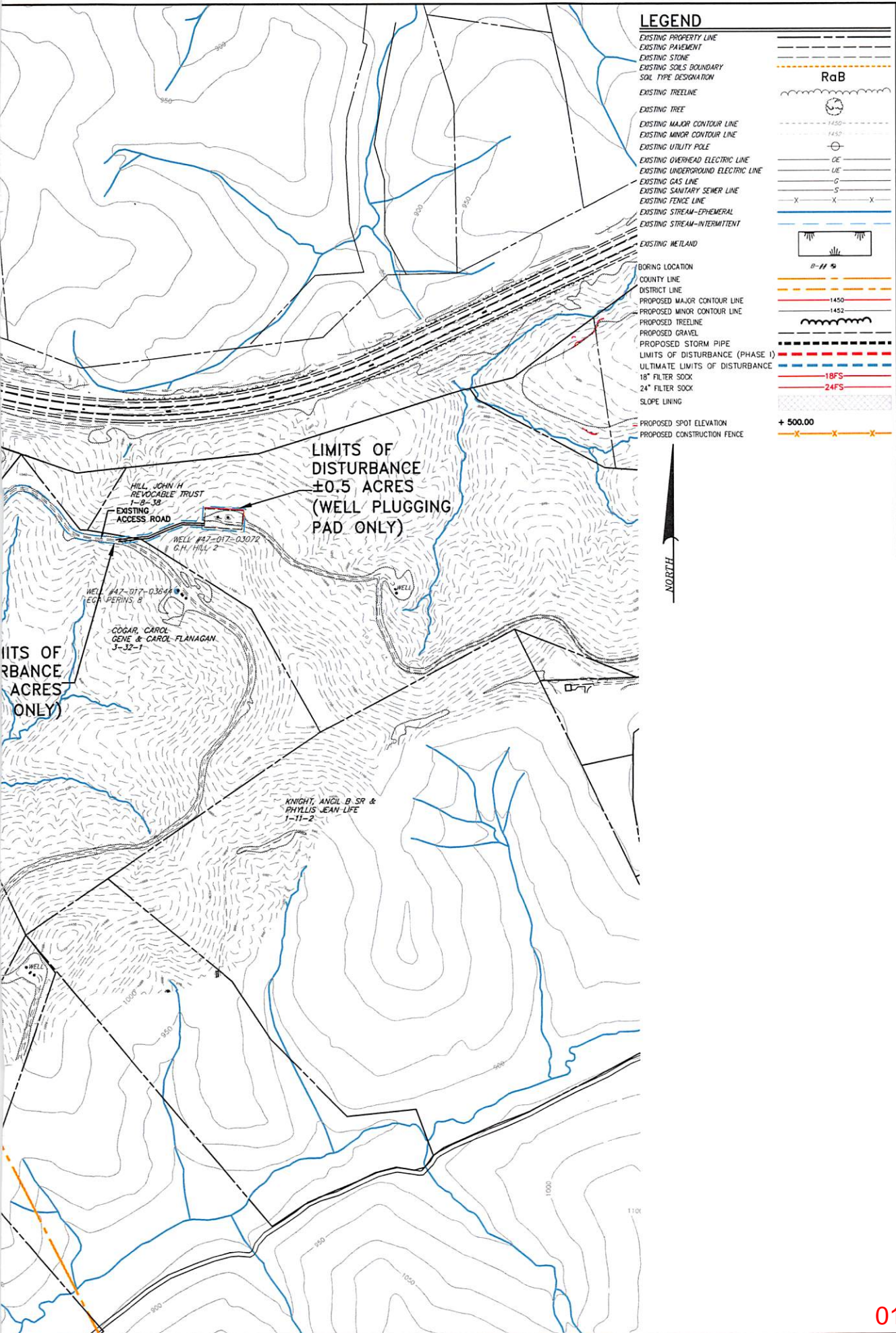
WELL #47-017-03649
ECA PERINS, T4

DODDRIDGE COUNTY
RITCHIE COUNTY

DISTANCE
±5.
(ACCESS ROAD)

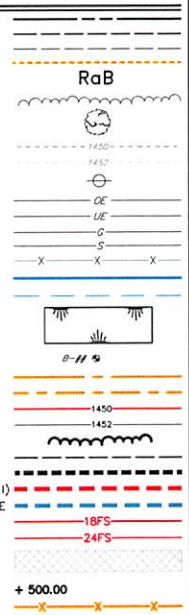
STABILIZED
CONSTRUCTION
ENTRANCE

01/06/2017



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-EPIHEMERAL
- EXISTING STREAM-INTERMITTENT
- EXISTING WETLAND
- BORING LOCATION
- COUNTY LINE
- DISTRICT LINE
- PROPOSED MAJOR CONTOUR LINE
- PROPOSED MINOR CONTOUR LINE
- PROPOSED TREELINE
- PROPOSED GRANEL
- 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		NO.	DATE	REVISION
0	150' 300' 600' 900'			



FOR RETTEW ASSOCIATES BY:	
MANAGER: ANDREW LEVINE, PE	CHD BY: ASL
DESIGN BY: JDN	CHD BY: ASL
DRAWN BY: JDN	CHD BY: ASL
SURV. CHIEF: N/A	REDBOOK NO:

CLIENT

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 DENVER, COLORADO 80202

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OVERALL PLAN
 WELL PLUGGING PLAN

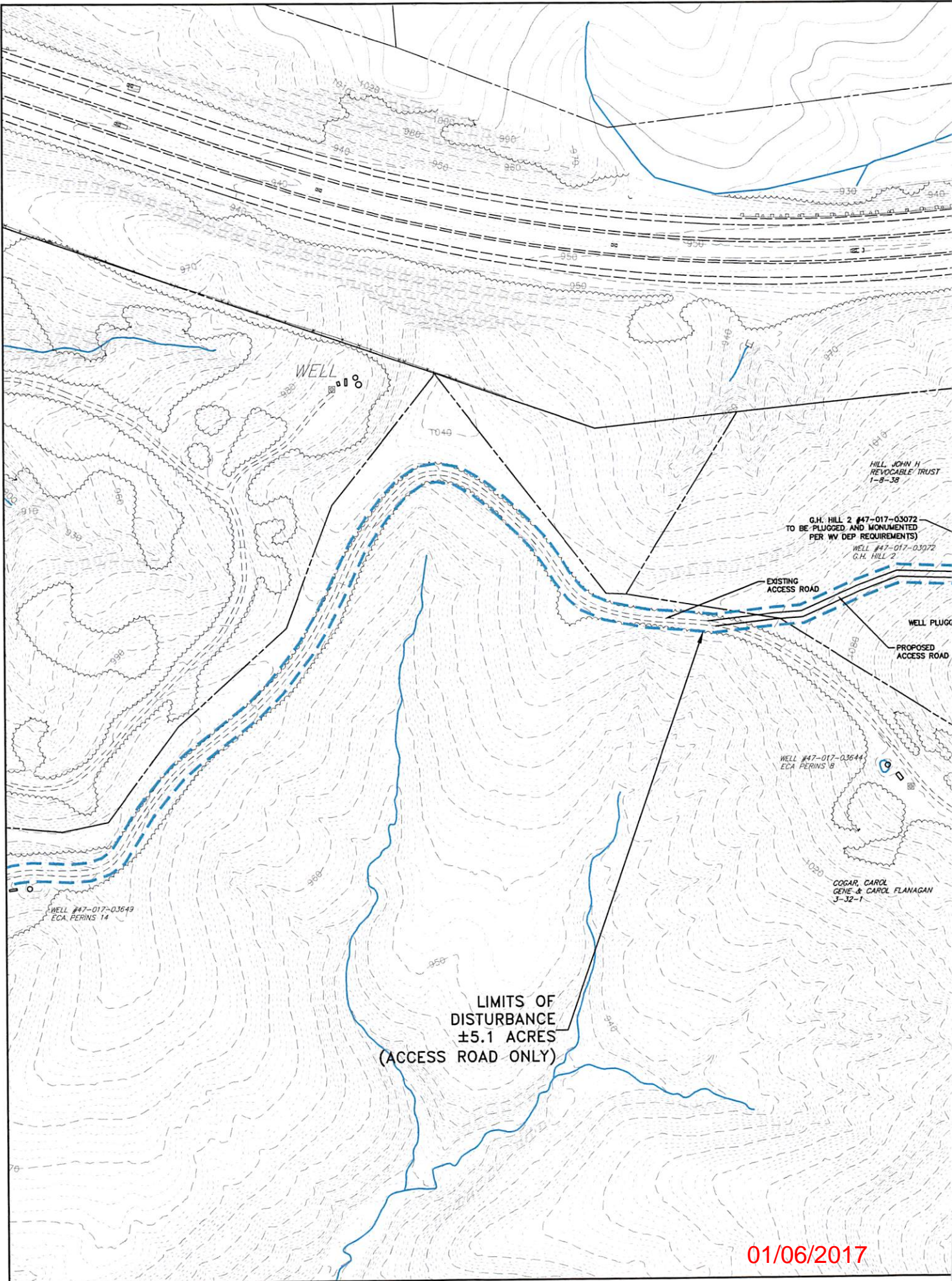
FOR
API #47-017-03072
G.H. HILL #2 WELL

GREENWOOD TAX DISTRICT
 DODDRIDGE COUNTY, WV

DATE: APRIL 29, 2016

SHEET NO. 2 OF 4

01/06/2017



WELL

7040

HILL, JOHN H.
REVOCABLE TRUST
1-8-38

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

WELL #47-017-03072
G.H. HILL 2

EXISTING
ACCESS ROAD

WELL PLUGG

PROPOSED
ACCESS ROAD

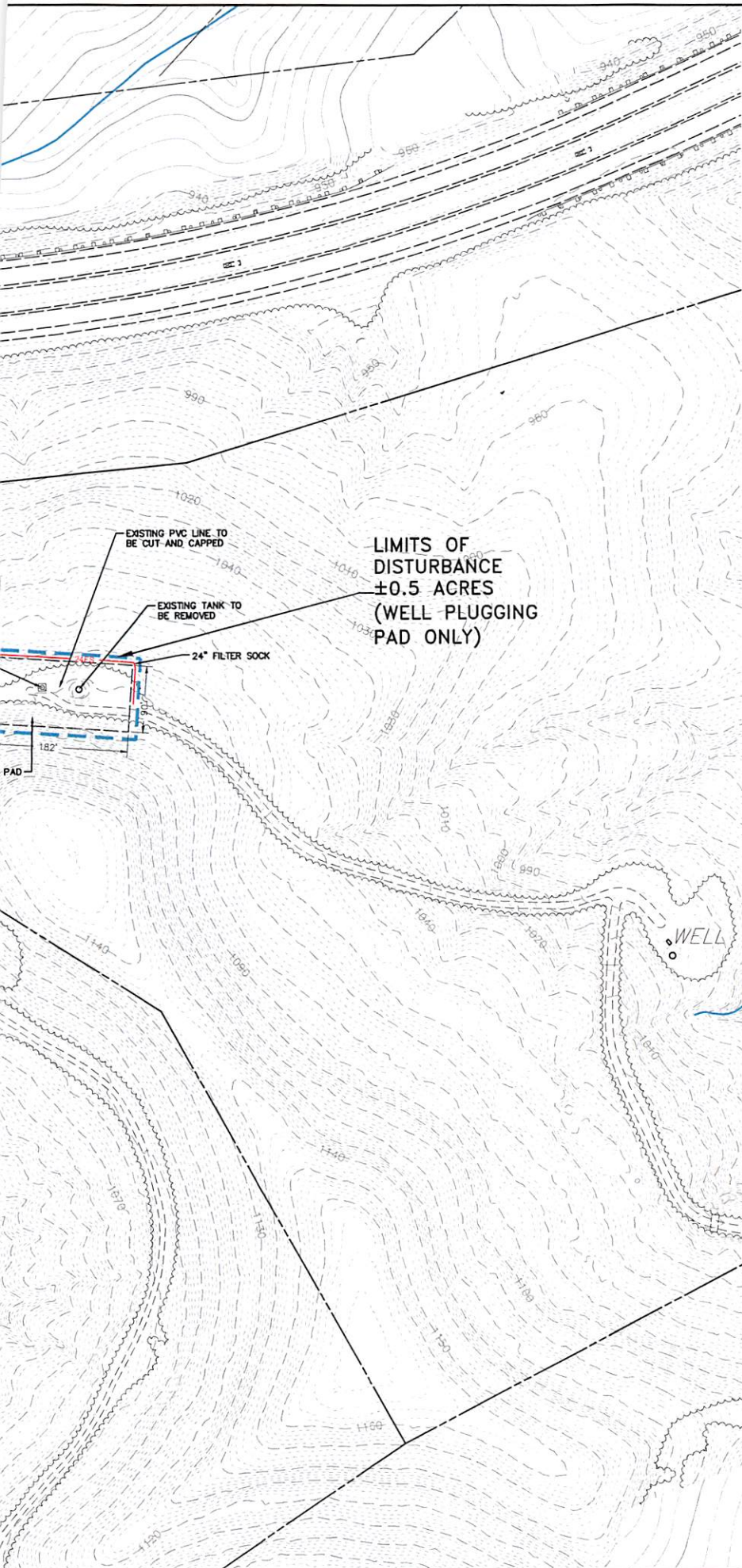
WELL #47-017-03644
ECA PERINS B

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

WELL #47-017-03649
ECA PERINS 14

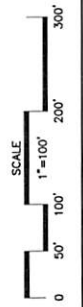
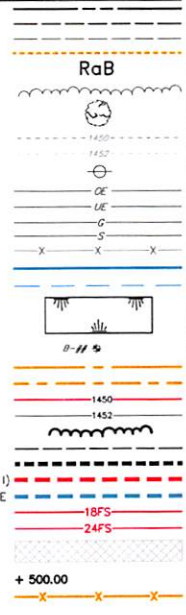
LIMITS OF
DISTURBANCE
±5.1 ACRES
(ACCESS ROAD ONLY)

01/06/2017



LEGEND

- EXISTING PROPERTY LINE
- EXISTING PAVEMENT
- EXISTING STONE
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- PROPOSED CONSTRUCTION FENCE



NO.	DATE	REVISION



MANAGER: ANDREW LEVINE, PE	CHD BY: ASL
DESIGN BY: JDN	CHD BY: ASL
DRAWN BY: JDN	REDBOOK NO: N/A
SURV. CHIEF: N/A	

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 Website: www.rettew.com

Engineers • Planners • Surveyors • Landscape Architects
 Environmental Consultants

E&S PLAN
 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. 3 OF 4
 DWG NO. 095462271

01/06/2017

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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 SLOPE 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 GRADING 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, 50% 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 10-20-20 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.
- 'LATHO' FLATPEA IS POTENTIALLY POISONOUS TO SOME LIVESTOCK.
- ONLY ENDOPHYTIC FREE VARIETIES OF TALL FESCUE SHOULD BE USED. TALL FESCUE AND CROWNVEATCH ARE ALSO A VERY INVASIVE SPECIES NON-NATIVE TO WV.
- FOR UNPREPARED SEEDBEDS OR SEEDING OUTSIDE THE OPTIMUM TIMEFRAMES, ADD 50% 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 MIXES WHEN SELECTING COVER TYPES AND SPECIES FOR WILDLIFE HABITAT. WILDLIFE FRIENDLY SPECIES OR PLANTS THAT HAVE MULTIPLE VALUES SHOULD BE CONSIDERED. SEE WILDLIFE FRIENDLY SPECIES/MIXTURES IN TABLE IV-4B. CONSIDER SELECTING NO OR LOW MAINTENANCE LONG-LIVED PLANTS ADAPTIBLE 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 NOT ALONE PROVIDE SUFFICIENT PROTECTION ON HIGHLY ERODIBLE SOILS, 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 MIXED 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.

SEQUENCE 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	0000 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	80	400LBS 10-20-20
CS GRASS & LEGUME	30	60	60	300LBS 10-20-20
TEMPORARY COVER	40	40	40	200LBS 19-19-19

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

pH OF SOIL	LIME IN TONS PER ACRE	FERTILIZER, LBS., PER ACRE 10-20-20 OR EQUIVALENT
ABOVE 6.0	2	500
5.0 TO 6.0	3	500
BELOW 5.0	4	500

01/06/2017

