



**west virginia** department of environmental protection

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

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

June 12, 2014

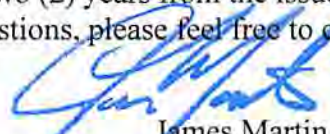
**WELL WORK PERMIT**  
**Horizontal 6A Well**

This permit, API Well Number: 47-4902288, issued to TRANS ENERGY, INC., is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

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

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.



James Martin  
Chief

Operator's Well No: MCDONNELL 2H  
Farm Name: YOUNG, MAX K. & JAQUELINE  
**API Well Number: 47-4902288**  
**Permit Type: Horizontal 6A Well**  
Date Issued: 06/12/2014

## PERMIT CONDITIONS

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

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### CONDITIONS

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1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.
9. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

4704902288

WW-6B  
(9/13)

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

49 04 374

1) Well Operator: Trans Energy Inc 494481575 Marion Mannington Glover Gap  
Operator ID County District Quadrangle

2) Operator's Well Number: McDonnell 2H Well Pad Name: McDonnell

3) Farm Name/Surface Owner: Max K Young & Jaqueline K Young Public Road Access: Co Rd 3

4) Elevation, current ground: 1432' Elevation, proposed post-construction: 1410'

5) Well Type (a) Gas  Oil  Underground Storage   
Other

(b) If Gas Shallow  Deep   
Horizontal

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):  
Marcellus Shale 7200' 60' thick 4000 psi

8) Proposed Total Vertical Depth: 7200'

9) Formation at Total Vertical Depth: Marcellus Shale

10) Proposed Total Measured Depth: 12,180'

11) Proposed Horizontal Leg Length: 4980'

12) Approximate Fresh Water Strata Depths: 60, 150

13) Method to Determine Fresh Water Depths: Water Wells drilled in the County, information provided by Health Dept.

14) Approximate Saltwater Depths: 1525'

15) Approximate Coal Seam Depths: 1220'

16) Approximate Depth to Possible Void (coal mine, karst, other): N/A

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

(a) If Yes, provide Mine Info: Name: Mason Dixon Proposed Mine  
Depth: \_\_\_\_\_  
Seam: \_\_\_\_\_  
Owner: \_\_\_\_\_

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WRH  
1-24-14

JAN 30 2014



WW-6B  
(9/13)

18)

**CASING AND TUBING PROGRAM**

<b>TYPE</b>	<b>Size</b>	<b>New or Used</b>	<b>Grade</b>	<b>Weight per ft. (lb/ft)</b>	<b>FOOTAGE: For Drilling</b>	<b>INTERVALS: Left in Well</b>	<b>CEMENT: Fill-up (Cu. Ft.)</b>
Conductor	20	new	J-55	94	110'	110'	CTS
Fresh Water	13-3/8	new	J-55	54.5	1270'	1270'	CTS
Coal							
Intermediate	9-5/8	new	J-55	36	3000'	3000'	CTS
Production	5-1/2	new	P-110	20	12180'	12180'	to 3000'
Tubing							
Liners							

*WRH  
1-21-14*

<b>TYPE</b>	<b>Size</b>	<b>Wellbore Diameter</b>	<b>Wall Thickness</b>	<b>Burst Pressure</b>	<b>Cement Type</b>	<b>Cement Yield (cu. ft./k)</b>
Conductor	20	26	0.538	1530	Type 1	13 cu ft/sk
Fresh Water	13-3/8	17-1/2	.38	2730	Type 1	1.25 cu ft/sk
Coal						
Intermediate	9-5/8	12-1/2	.352	3520	Type 1	1.26 cu ft/sk
Production	5-1/2	8/3/4	.361	12360	Poz H Class H	1.18 cu ft/sk
Tubing						
Liners						

**PACKERS**

Kind:				
Sizes:				
Depths Set:				

Received

*IAN 3/1/14*

McDonnell

2H 4902288

WW-6B  
(9/13)

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill and complete horizontal well in the Marcellus Shale. Lateral to be approximately 4980' in length

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

A water fracture treatment is proposed a mixture of sand and water will be used to stimulate the Marcellus Shale.

Max Pressure 10,000  
Max Rate 10 bbl/min

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 21.11 acres

22) Area to be disturbed for well pad only, less access road (acres): 6.37 acres

23) Describe centralizer placement for each casing string:

Fresh Water String - 1 centralizer every 160'  
Intermediate String - 1 centralizer every 100' from 3300' to 900'  
Production String - 1 centralizer every 80' from TD to above ROP (7000')

24) Describe all cement additives associated with each cement type:

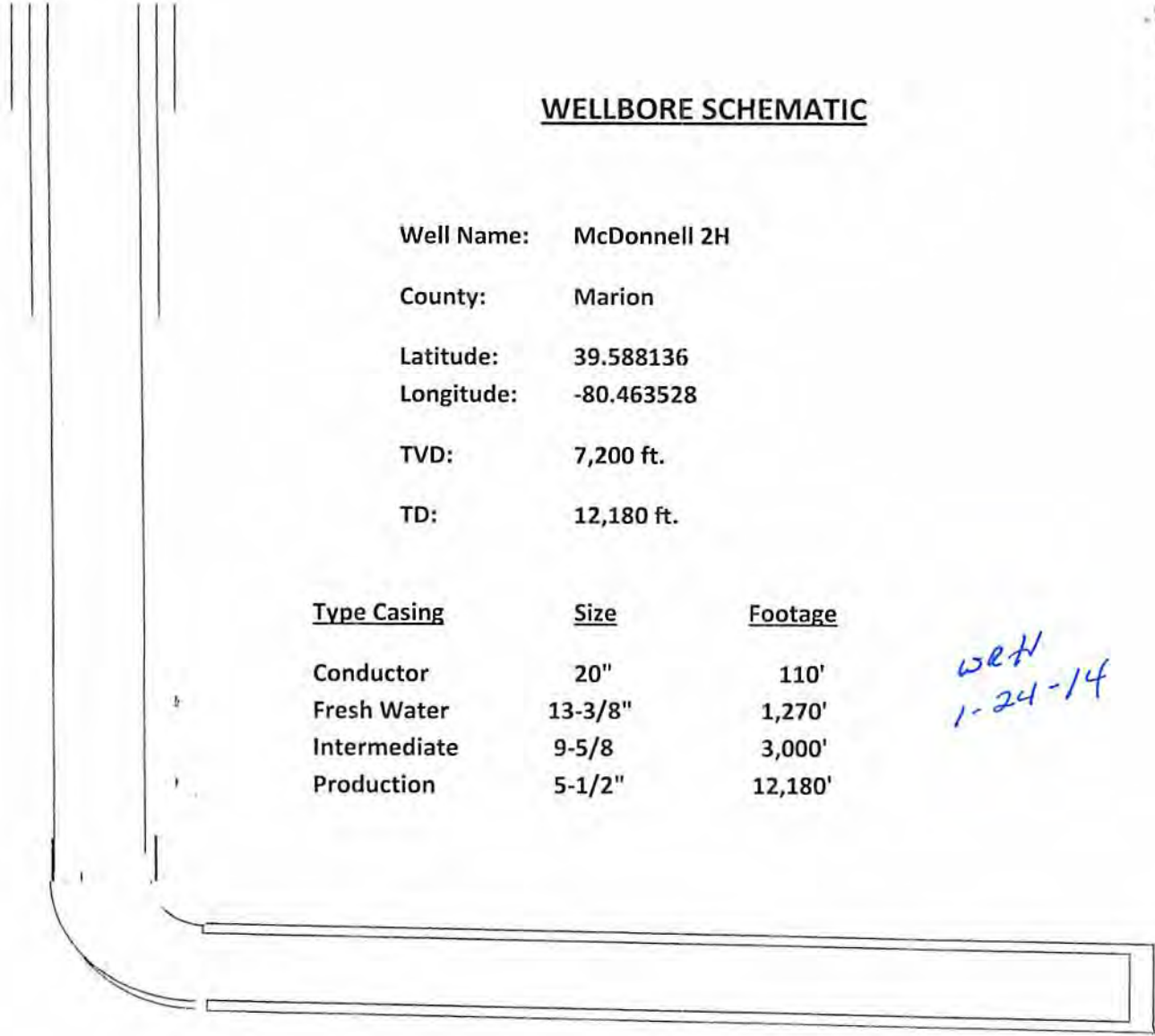
Standard Type 1 cement  
Type 1 = 2% CaCl<sub>2</sub> + Y4# Flake - Surface Cement mixed @ 15.6 ppg CaCl<sub>2</sub>, Flake (cellophane flake)  
Type 1 = 2% CaCl<sub>2</sub> + Y4# Flake - Intermediate Cement mix @ 15.6 ppg  
Class H in lateral - retarder and fluid loss and free water additive

25) Proposed borehole conditioning procedures:

Before cement casing mud will be thinned and all gas will be circulated out of the mud before cementing

\*Note: Attach additional sheets as needed.

4704902288



WELLBORE SCHEMATIC

Well Name: McDonnell 2H

County: Marion

Latitude: 39.588136

Longitude: -80.463528

TVD: 7,200 ft.

TD: 12,180 ft.

<u>Type Casing</u>	<u>Size</u>	<u>Footage</u>
Conductor	20"	110'
Fresh Water	13-3/8"	1,270'
Intermediate	9-5/8"	3,000'
Production	5-1/2"	12,180'

*wrt  
1-24-14*

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Office of Oil and Gas  
WV Dept. of Environmental Protection

4704902288

## Attachment V - Planned Additives to be used in Fracturing or Stimulations

Product Name	Product Use	Chemical Name	CAS Number
ALPHA 1427	Biocide	Didecyl Dimethyl Ammonium Chloride	007173-61-1
		Ethanol	000064-17-5
		Glutaraldehyde (Pentanediol)	000111-30-8
		Quaternary Ammonium Compound	068424-85-1
		Water	007732-18-5
BF-7L	Buffer	Potassium Carbonate	000584-08-7
ClayCare	Clay Stabilizer	Choline Chloride	000067-48-1
		Water	007732-18-5
Enzyme G-I	Breaker	No Hazardous Components	NONE
ENZYME G-NE	Breaker	No Hazardous Components	NONE
FRW-18	Friction Reducer	Petroleum Distillate Hydrotreated Light	064742-47-8
GW-3LDF	Gel	Petroleum Distillate Blend	N/A-014
		Polysaccharide Blend	N/A-021
SCALETROL 720	Scale Inhibitor	Diethylene Glycol	000111-46-6
		Ethylene Glycol	000107-21-1
XLW-32	Crosslinker	Boric Acid	010043-35-3
		Methanol (Methyl Alcohol)	000067-56-1
APB01 (AMMONIUM PERSULFATE BREAKER)	Breaker	Ammonium Persulfate	007727-54-0
B05 (LOW PH BUFFER)	Buffer	Acetic acid	000064-19-7
BXL03 Borate XL Delayed High Temp.	Crosslinker	No Hazardous Components	NONE
FRW-200	Friction Reducer	No Hazardous Components	NONE
HVG01 (TURQUOISE-1 BULK)	Gelling Agent	Petroleum Distillate Hydrotreated Light	064742-47-8
KCLS-4	Clay Stabilizer	No Hazardous Components	NONE
LTB-1	Breaker	Ammonium Persulfate	N/A
		Ethanol	000064-17-5

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 JUL 8 2014  
 Office of Oil and Gas  
 WV Dept. of Environmental Protection

06/13/2014

EC6110A	Biocide	Glutaraldehyde (Pentanediol)	000111-30-8
		Quaternary Ammonium Compounds	N/A-063
EC6629A	Biocide	No Hazardous Components	NONE
WBK-133 OXIDIZER	Breaker	Ammonium Persulfate	007727-54-0
WBK-134	Breaker	Ammonium Persulfate	007727-54-0
		Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7
WCS-631LC	Clay Stabilizer	Proprietary Non Hazardous Salt	N/A-229
		Water	007732-18-5
WFR-55LA	Friction Reducer	No Hazardous Components	NONE
WGA-15L	Gel	Petroleum Distillate Hydrotreated Light	064742-47-8
WPB-584-L	Buffer	Potassium Carbonate	000584-08-7
		Potassium Hydroxide	001310-58-3
WXL-101LE	Crosslinker	No Hazardous Components	NONE
WXL-101LM	Crosslinker	Petroleum Distillate Hydrotreated Light	064742-47-8
WXL-105L	Crosslinker	Water	007732-18-5
		Ethylene Glycol	000107-21-1
		Boric Acid	010043-35-3
		Ethanolamine	000141-43-5
B244 Green-Cide 25G	Biocide	Glutaraldehyde	111-30-8
L071 Temporary Clay Stabilizer	Clay Stabilizer	Cholinium Chloride	67-48-1
Breaker J218	Breaker	Diammonium Peroxidisulphate	7727-54-0
EB-Clean* J475 Breaker		Diammonium Peroxidisulphate	7727-54-0
Friction Reducer B315	Friction Reducer	Distillates (petroleum), Hydrotreated light Aliphatic Alcohol Glycol Ether	64742-47-8 Proprietary
Friction Reducer J609		Ammonium Sulfate	7783-20-2
Water Gelling Agent J580	Gel	Carbohydrate Polymer	Proprietary
Scale Inhibitor B317	Scale Inhibitor	Trisodium ortho phosphate Ethane-1, 2-diol	7601-54-9 107-21-1
Borate Crosslinker J532	Crosslinker	Aliphatic polyol Sodium tetraborate decahydrate	Proprietary 1303 95-4
Crosslinker J610		Aliphatic polyol Potassium hydroxide	Proprietary 1310 58-3

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JAN 3

Office of Oil and Gas  
WV Dept. of Environmental Protection

06/13/2014



WW-9  
(9/13)

API Number 47 - 4704902288  
Operator's Well No. McDonnell 2H

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Trans Energy Inc OP Code 494481575

Watershed (HUC 10) Bartholomew Fork Quadrangle Glover Gap

Elevation 1432' County Marion District Mannington

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes  No

Will a pit be used? Yes  No

If so, please describe anticipated pit waste: \_\_\_\_\_

Will a synthetic liner be used in the pit? Yes  No  If so, what ml.? \_\_\_\_\_

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number \_\_\_\_\_ )
- Reuse (at API Number \_\_\_\_\_ )
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain \_\_\_\_\_)

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

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Freshwater (no oil reaching Marcellus then synthetic)

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

Additives to be used in drilling medium? None

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. All cuttings will be hauled to approved landfill

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

-Landfill or offsite name/permit number? Short Creek Landfill SWF - 1034

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 Leslie Gearhart  
Company Official (Typed Name) Leslie Gearhart  
Company Official Title VP - Operations

Subscribed and sworn before me this 20 day of January 2014  
Debra A Martin  
My commission expires 11/29/2010

Office of Oil and Gas  
WV Dept. of Environmental Protection

OFFICIAL SEAL  
STATE OF WEST VIRGINIA  
NOTARY PUBLIC  
Debra A. Martin  
Trans Energy Incorporated  
210 2nd Street  
St. Mary's, WV 26170  
My Commission Expires Nov. 29, 2020

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JAN 30

06/13/2014

4704902288

Form WW-9

Operator's Well No. McDonnell 2H

Trans Energy Inc

Proposed Revegetation Treatment: Acres Disturbed Total 2.1 Well 5.37 acres Prevegetation pH \_\_\_\_\_

Lime 2 Tons/acre or to correct to pH 65

Fertilizer type \_\_\_\_\_

Fertilizer amount 600 lbs/acre

Mulch 90 Bales Tons/acre

Seed Mixtures

**Temporary**

**Permanent**

Seed Type	lbs/acre
Meadow Mix	100
Oats or Rye	50

Seed Type	lbs/acre
Meadow Mix	100
Oats or Rye	50

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]

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

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JAN 31 2014

Title: Environmental Inspector

Date: 1-24-14

Office of Oil and Gas  
WV Dept. of Environmental Protection

Field Reviewed? (  ) Yes (  ) No

06/13/2014

4704902288

WRH  
1-24-14

MCDONNELL 2H



# TRANS ENERGY INC.



WELL SITE SAFETY PLAN

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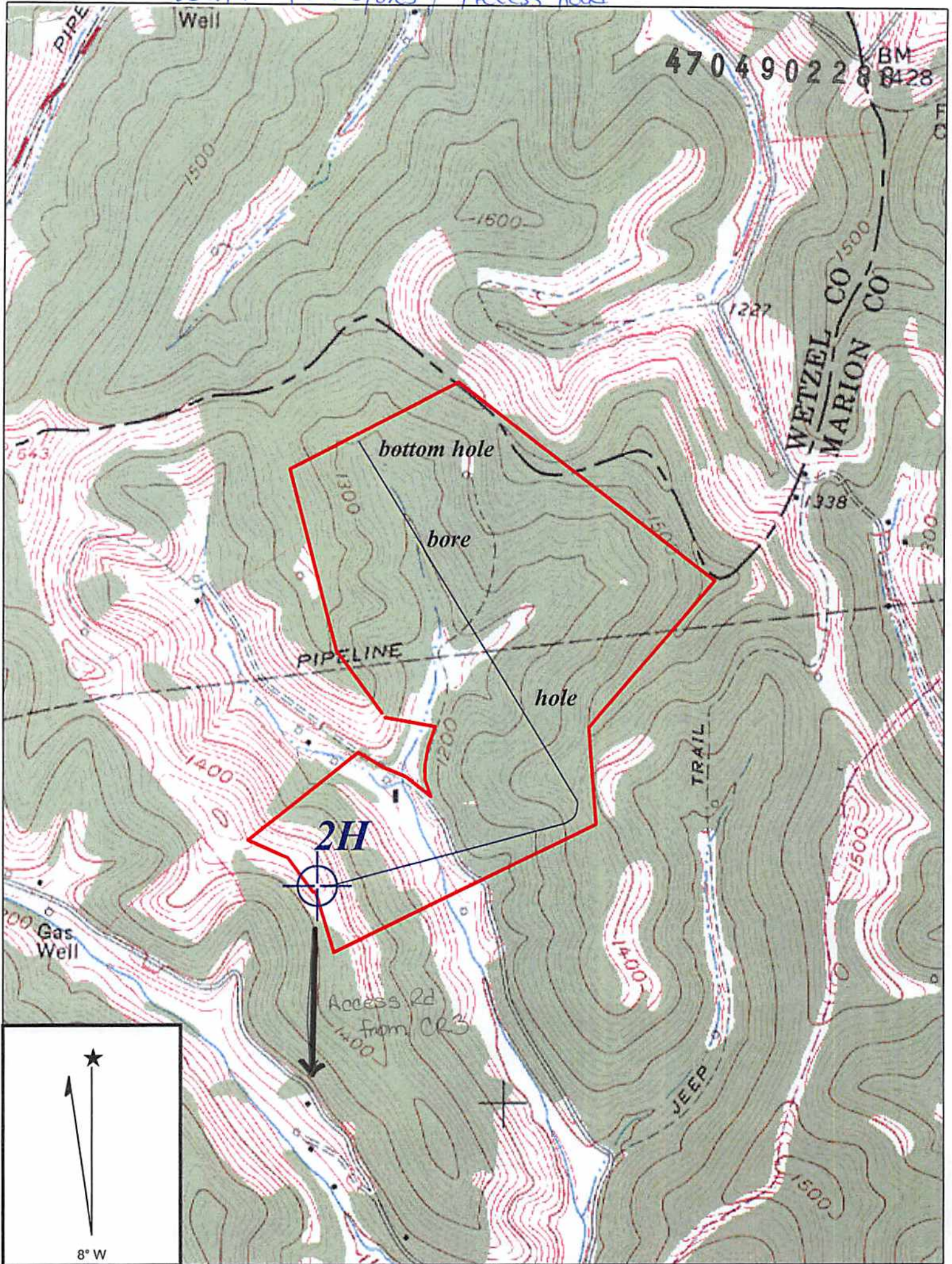
JUN 30 2014

06/13/2014

Attention



Water Purveyors / Access Road



Copyright (C) 1997, Maptech, Inc.

**GLOVER GAP QUADRANGLE**

SCALE 1" = 1000'

**TRANS ENERGY, INC.**

**WELL: MCDONNELL 2H  
MCDONNELL, ET AL 248.477 ACRE UNIT**

**MANNINGTON DISTRICT    MARION COUNTY    WEST VIRGINIA**

WRN  
1-24-14  
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JAN 30 2014  
06/13/2014

Office of Oil and Gas  
WV Dept. of Environmental Protection

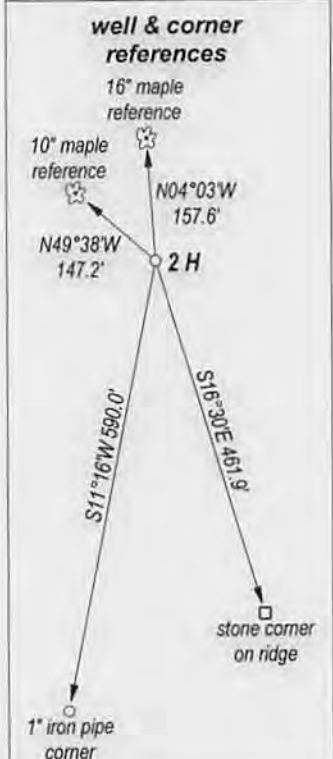
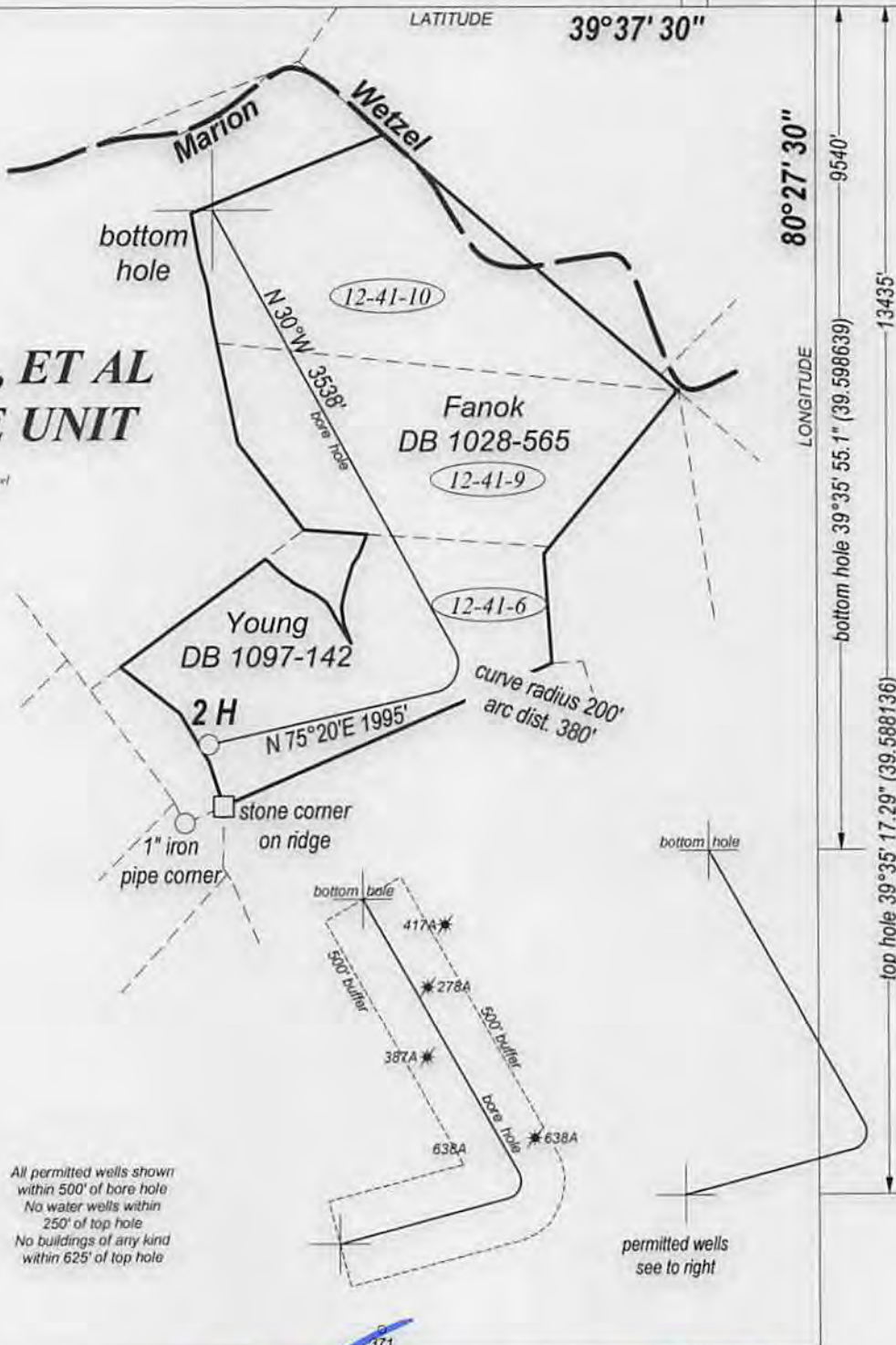


top hole 80°27' 48.70" (80.463528) — 1535'  
 bottom hole 80°27' 44.9" (80.462472) — 1240'

UTM NAD 83  
 top hole  
 N: 4382183.349  
 E: 546067.140  
 bottom hole  
 N: 4383350  
 E: 546150

**MCDONNELL, ET AL**  
**248.477 ACRE UNIT**

D-M-P = District-Map-Parcel



All permitted wells shown within 500' of bore hole  
 No water wells within 250' of top hole  
 No buildings of any kind within 625' of top hole

permitted wells see to right

FILE NO. \_\_\_\_\_  
 DRAWING NO. \_\_\_\_\_  
 SCALE 1" = 1250'  
 MINIMUM DEGREE OF ACCURACY 1 : 200  
 PROVEN SOURCE OF ELEVATION GPS  
 OBSERVATION

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENERGY

(SIGNED) \_\_\_\_\_  
 PROFESSIONAL SURVEYOR: 551



**STATE OF WEST VIRGINIA**  
**DEPARTMENT OF ENERGY**  
**DIVISION OF OIL AND GAS**

DATE APRIL 25TH, 2014  
 OPERATORS WELL NO. MCDONNELL 2H

**API 47 - 049 - 02288 H6A**  
 STATE COUNTY PERMIT

WELL TYPE: OIL XX GAS XX LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_  
 (IF GAS) PRODUCTION XX STORAGE \_\_\_ DEEP \_\_\_ SHALLOW XX

LOATION: ELEVATION 1432' WATER SHED BARTHOLOMEW FORK  
 DISTRICT MANNINGTON COUNTY MARION QUADRANGLE GLOVER GAP

SURFACE OWNER MAX K. YOUNG & JAQUELINE K. YOUNG ACREAGE 74.827  
 OIL & GAS ROYALTY MCDONNELL, ET AL LEASE AC. 248.477

PROPOSED WORK: DRILL XX CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_  
 FRACTURE OR STIMULATE \_\_\_ PLUG OFF OLD FORMATION \_\_\_  
 PERFORATE NEW FORMATION \_\_\_  
 OTHER PHYSICAL CHANGE IN WELL \_\_\_  
 PLUG AND ABANDON \_\_\_ CLEAN OUT AND REPLUG \_\_\_

TARGET FORMATION MARCELLUS SHALE ESTIMATED DEPTH 7200'

WELL OPERATOR TRANS ENERGY, INC. DESIGNATED AGENT LOREN BAGLEY  
 ADDRESS P. O. BOX 393 ADDRESS P. O. BOX 393  
ST. MARYS, WV 26170 ST. MARYS, WV 26170

FORM WW - 6

COUNTY NAME  
 PREMIT

06/13/2014