



**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

March 13, 2014

**WELL WORK PERMIT**

**Horizontal 6A Well**

This permit, API Well Number: 47-4902278, 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: MICHAEL 1H  
Farm Name: MICHAEL, WILLIAM J. & JUANI  
**API Well Number: 47-4902278**  
**Permit Type: Horizontal 6A Well**  
Date Issued: 03/13/2014

Promoting a healthy environment.

03/14/2014

## 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.

### CONDITIONS

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1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACOE). Through this permit, you are hereby being advised to consult with USACOE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the 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.

WW-6B  
(9/13)

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

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

2) Operator's Well Number: Michael 1H Well Pad Name: Michael

3) Farm Name/Surface Owner: Juanita O Michael & William J Michael Public Road Access: Co Rd 3/3

4) Elevation, current ground: 1397' Elevation, proposed post-construction: 1390'

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: 12,200

11) Proposed Horizontal Leg Length: 5000'

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: 1200'

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: \_\_\_\_\_

Depth: \_\_\_\_\_

Seam: \_\_\_\_\_

Owner: \_\_\_\_\_

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WRH  
10-17-13  
2-28-14



WW-6B  
(9/13)

18)

**CASING AND TUBING PROGRAM**

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill-up (Cu. Ft.)</u>
Conductor	20	new	J-55	94	110'	110'	CTS
Fresh Water	13-3/8	new	J-55	54.5	1250'	1250'	CTS
Coal							
Intermediate	9-5/8	new	J-55	36	3000'	3000'	CTS
Production	5-1/2	new	P-110	20		12200'	CTS
Tubing							
Liners							

WRP  
2-28-14

<u>TYPE</u>	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	20	26	0.438	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:				

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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 5000' in length.

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

Fracture 17-21 stages with Proppant: 150,000 of 100 mesh sand 80,000 of 20/40 white sand, 169,998 of 40/70 white sand.  
Fluid summary: 1,500 of 15% HCL, 412,665 of Slickwater I, 11,000 Slickwater II,

Max Pressure = 10,000 psi  
Max Rate = 100 bbl/min

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 10.85 acres

22) Area to be disturbed for well pad only, less access road (acres): 2.24 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 - retarder and fluid loss (surface and interm)  
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 mixed @ 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

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\*Note: Attach additional sheets as needed.

**WELLBORE SCHEMATIC****Well Name: Michael 2H****County: Marion****Latitude: 39.555285****Longitude: -80.413743****TVD: 7,200 ft.****TD: 12,200 ft.**

<b><u>Type Casing</u></b>	<b><u>Size</u></b>	<b><u>Footage</u></b>
<b>Conductor</b>	<b>20"</b>	<b>110'</b>
<b>Fresh Water</b>	<b>13-3/8"</b>	<b>1250'</b>
<b>Intermediate</b>	<b>9-5/8"</b>	<b>3,000'</b>
<b>Production</b>	<b>5-1/2"</b>	<b>12,200'</b>

RECEIVED  
Office of Oil and Gas  
OCT 22 2013  
WV Department of  
Environmental Protection

03/14/2014

WW-9  
(9/13)

API Number 47 - 49 - 02278  
Operator's Well No. Michael 1H

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) Dents Run & Bartholomew Fork Quadrangle Glover Gap

Elevation 1397' 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 All frac fluids will be flowed back into storage containers and Fluidkeys Water Service Company will haul to an approved water disposal facilities) \_\_\_\_\_

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 mud and reaching Marcellus than 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

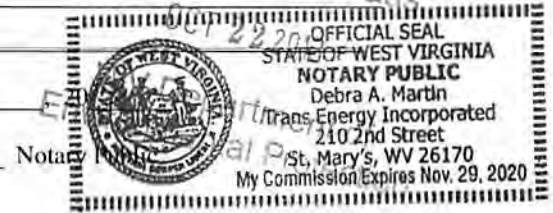
Company Official Title VP-Operations

Subscribed and sworn before me this 7th day of October

Debra A. Martin

My commission expires November 29, 2020

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Office of Oil and Gas



03/14/2014

Form WW-9

Operator's Well No. Michael 1H

**Trans Energy Inc**

Proposed Revegetation Treatment: Acres Disturbed 10.85 Total - 2.24 Well Pad 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: Bill Hendricks

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

Title: Environmental Inspector Date: 10-17-13

Field Reviewed?  Yes  No

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WRH  
2-28-14

07/10/2012



# TRANS ENERGY INC.

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Office of Oil and Gas  
WV Dept. of Environmental Protection



WELL SITE SAFETY PLAN  
Michael 1H, 2H

✓ 10/23



## Water Management Plan: Primary Water Sources



WMP-01650

API/ID Number

047-049-02278

Operator:

Trans Energy Inc.

Michael 1H

### Important:

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

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

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

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

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

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

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

APPROVED DEC 03 2013

03/14/2014

## Source Summary

WMP- 01650

API Number:

047-049-02278

Operator:

Trans Energy Inc.

Michael 1H

## Stream/River

● Source **Ohio River @ J&R Excavating** Marshall Owner: **J&R Excavating**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
6/15/2014	6/15/2015	6,300,000		39.998509	-80.737336

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

Max. Pump rate (gpm): **2,940** Min. Gauge Reading (cfs): **6,468.00** Min. Passby (cfs)

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

03/14/2014



## Source Detail

WMP-01650

API/ID Number: 047-049-02278

Operator:

Trans Energy Inc.

Michael 1H

Source ID: 30519    Source Name: Ohio River @ J&R Excavating  
J&R Excavating

Source Latitude: 39.998509

Source Longitude: -80.737336

HUC-8 Code: 5030106

Drainage Area (sq. mi.): 25000    County: Marshall

Anticipated withdrawal start date: 6/15/2014

Anticipated withdrawal end date: 6/15/2015

Endangered Species?     Mussel Stream?

Total Volume from Source (gal): 6,300,000

Trout Stream?     Tier 3?

Regulated Stream?    Ohio River Min. Flow

Max. Pump rate (gpm): 2,940

Proximate PSD?

Max. Simultaneous Trucks: 0

Gauged Stream?

Max. Truck pump rate (gpm)

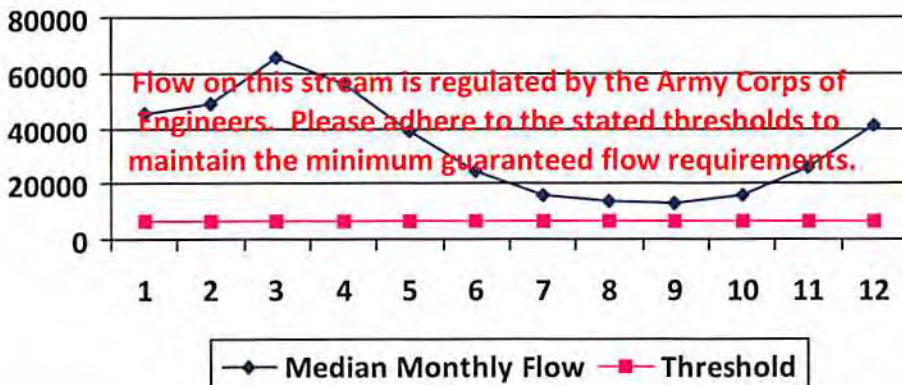
Reference Gaug: 9999999    Ohio River Station: Willow Island Lock & Dam

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

Gauge Threshold (cfs): 6468

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

### Water Availability Profile



### Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	0.00
Downstream Demand (cfs):	0.00
Pump rate (cfs):	6.55
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00

Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

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

03/14/2014





# Water Management Plan: Secondary Water Sources



WMP-01650

API/ID Number 047-049-02278

Operator:

Trans Energy Inc.

Michael 1H

### Important:

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

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

### Lake/Reservoir

Source ID:	30521	Source Name	Mannington Water Supply Dam (WV04921)	Source start date:	6/15/2014
			City of Mannington	Source end date:	6/15/2015
Source Lat:	39.532404	Source Long:	-80.36676	County	Marion
Max. Daily Purchase (gal)		Total Volume from Source (gal):			6,300,000

DEP Comments:

Michael 1H

**Important:**

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

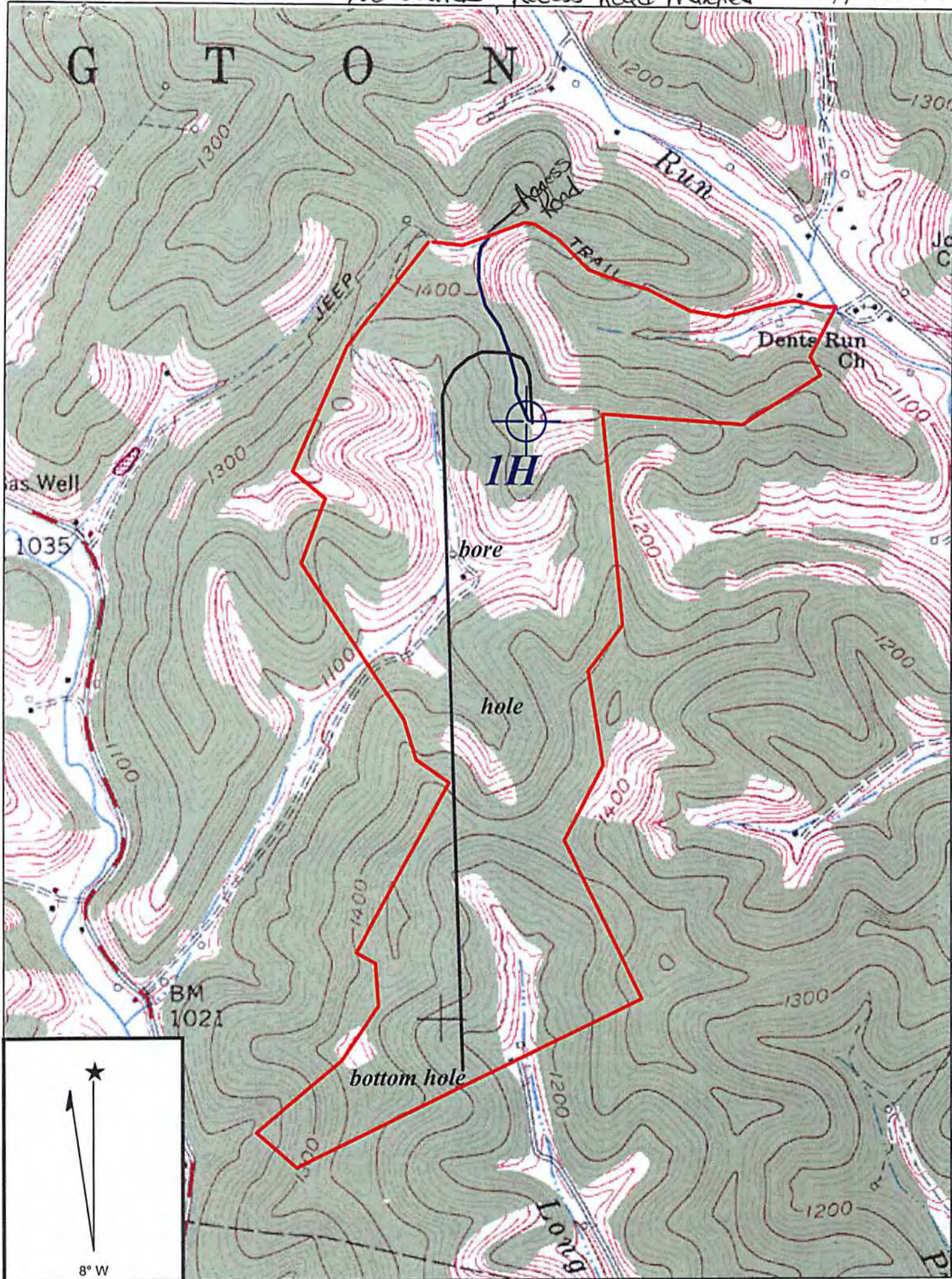
- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the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

Source ID:	30523	Source Name	Upper Buffalo No. 16 Dam (WV04928)		Source start date:	6/15/2014	
					Source end date:	6/15/2015	
		Source Lat:	39.545545	Source Long:	-80.387961	County	Marion
		Max. Daily Purchase (gal)		Total Volume from Source (gal):		6,300,000	
DEP Comments:	Also known as Dent's Run Dam						



No Water. Access Road Marked

49-02278



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**GLOVER GAP QUADRANGLE**

SCALE 1" = 1000'

**TRANS ENERGY, INC.**

WELL: MICHAEL 1 H  
MICHAEL, ET AL +/- 386.5 ACRE UNIT

MANNINGTON DISTRICT    MARION COUNTY    WEST VIRGINIA

wrh  
10-17-13

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