September 09, 2013

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-5101672, 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: WOODRUFF 2H
Farm Name: MATTHEWS, VIOLETTA
API Well Number: 47-5101672
Permit Type: Horizontal 6A Well
Date Issued: 09/09/2013

Promoting a healthy environment.
PERMIT CONDITIONS

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

CONDITIONS

1. 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.

2. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the fill material shall be within plus or minus 2% (unless soil test results show a greater range of moisture content is appropriate and 95% compaction can still be achieved) of the optimum moisture content as determined by the standard proctor density test, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. Each lift must meet 95% compaction of the optimum density based on results from the standard proctor density test of the actual soils used in specific engineered fill sites. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.
STATE OF WEST VIRGINA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Trans Energy Inc. 494481575 Marshall Cameron Cameron
Operator ID  County District Quadrangle

2) Operator’s Well Number: Woodruff 2H Well Pad Name: Woodruff

3) Elevation, current ground: 1484 Elevation, proposed post-construction: 1460'

4) Well Type: (a) Gas Oil Underground Storage
(b) If Gas: Shallow Deep Horizontal ■

5) Existing Pad? Yes or No: Yes - Building the Pad under the Woodruff 2H

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
   Marcellus Shale - 7200' 60' thick 3000 psi

7) Proposed Total Vertical Depth: 7200'
8) Formation at Total Vertical Depth: Marcellus Shale
9) Proposed Total Measured Depth: 14,860'
10) Approximate Fresh Water Strata Depths: 50'-150'
11) Method to Determine Fresh Water Depth: Water Wells drilled in the County, information provided by Health Dept.
12) Approximate Saltwater Depths: 1525'
13) Approximate Coal Seam Depths: 900'
14) Approximate Depth to Possible Void (coal mine, karst, other): Bailey 940'
15) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? If so, indicate name and depth of mine: Yes Bailey 940'
16) Describe proposed well work:
   Drill and Complete horizontal well in the Marcellus Shale. Lateral to be approximately 7600' in length.

17) Describe fracturing/stimulating methods in detail:
   A water fracture treatment is proposed a mixture of sand and water will be used to stimulate the Marcellus Shale

18) Total area to be disturbed, including roads, stockpile area, pits, etc. (acres): 12.78 acres
19) Area to be disturbed for well pad only, less access road (acres): 5.37 acres

Page 1 of 3
July 11, 2013

Ms. Laura Cooper  
West Virginia DEP  
601 57th Street  
Charleston, WV 25304

Re: Void Encounter  
Woodruff 2H

Dear Laura,

If a Mine Void would be encountered we will run casing no deeper than 50' beyond the void and set a basket as the ceiling and at the bottom and grout/cement, and we will notify the inspector immediately.

We are also adding additional language as per the state; that we will go at least 30' beyond. (§22-6-20 “When a well is drilled through the horizon of a coal bed from which the coal has been removed, the hole shall be drilled at least thirty feet below the coal bed...”)

Once you have reviewed and would have any questions regarding this permit please feel free contact me at 304-684-7053 ext. 26 or Leslie Gearhart at ext. 32.

As always thank you for your help in these matters.

Sincerely yours,

Trans Energy Incorporated

Debra A. Martin  
Land Administrator

DM/dm
### CASING AND TUBING PROGRAM

<table>
<thead>
<tr>
<th>TYPE</th>
<th>Size</th>
<th>New or Used</th>
<th>Grade</th>
<th>Weight per ft.</th>
<th>FOOTAGE: For Drilling</th>
<th>INTERVALS: Left in Well</th>
<th>CEMENT: Fill-up (Cu. Ft.)</th>
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<th>Burst Pressure</th>
<th>Cement Type</th>
<th>Cement Yield</th>
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<td>Pos H Class H</td>
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### PACKERS

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<tr>
<td>Sizes:</td>
<td></td>
</tr>
<tr>
<td>Depths Set:</td>
<td></td>
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</table>

WV Department of Environmental Protection
WELLBORE SCHEMATIC

Well Name: Woodruff 2H
County: Marshall
Latitude: 39.856568
Longitude: -80.526488
TVD: 7,200 ft.
TD: 14,860 ft.

<table>
<thead>
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<th>Type Casing</th>
<th>Size</th>
<th>Footage</th>
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<tr>
<td>Conductor</td>
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<td>13-3/8&quot;</td>
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<td>Intermediate</td>
<td>9-5/8&quot;</td>
<td>3,000'</td>
</tr>
<tr>
<td>Production</td>
<td>5-1/2&quot;</td>
<td>14,860'</td>
</tr>
</tbody>
</table>
21) 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')

22) Describe all cement additives associated with each cement type.

- Standard Type I cement additives associated with each cement type.
- Type 1 + 2% CaC12 + Y4# Flake - Surface Cement mixed @ 15.6 ppg CaC12, Flake (cellophane flake)
- Type 1 + 1% CaC12 + Y4# Flake - Intermediate Cement mixed @ 15.6 ppg
- Class H in lateral - retarder and fluid loss and dree water additive

23) 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.
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): North Fork of Grave Creek Quadrangle: Cameron

Elevation: 1484' County: Marshall District: Cameron

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

Will a pit be used for drill cuttings?  Yes ______ No x 

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 Buckeye Water Service Company will haul to an approved water disposal facilities

Will closed loop system be used?  Yes

Drilling medium anticipated for this well? Air, freshwater, oil based, etc.  Freshwater mud until reaching Marcellus then synthetic

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

Additives to be used in drilling medium? See attached

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) No Pit

- 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 day of .

Debra A Martin
Notary Public
My commission expires December 29, 2020
Form WW-9

Trans Energy Inc.

Proposed Revegetation Treatment: Acres Disturbed ____________ Prevegetation pH ____________

Lime ____________ Tons/acre or to correct to pH 65

Fertilizer (10-20-20 or equivalent) 600 lbs/acre (500 lbs minimum)

Mulch ____________ Tons/acre

Seed Mixtures

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<tr>
<th>Seed Type</th>
<th>Area I</th>
<th>Area II</th>
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</thead>
<tbody>
<tr>
<td>Meadow Mix</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Oats or Rye</td>
<td>50</td>
<td>50</td>
</tr>
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</table>

Attach:
Drawing(s) of road, location, pit and proposed area for land application.

Photocopy section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]

Comments:


Title: [Signature] Inspector Date: 7-12-13

Field Reviewed? ( ) Yes ( ) No

09/13/2013
Water Management Plan:
Primary Water Sources

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 pass-by 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.

APPROVED AUG 23 2013

09/13/2013
Source Summary

WMP-01376

API Number: 047-051-01672
Operator: Trans Energy Inc.
Woodruff 2H

Stream/River

- Source: Ohio River @ J&R Excavating
- Marshall Owner: J&R Excavating
- Start Date: 11/1/2013
- End Date: 11/1/2014
- Total Volume (gal): 6,300,000
- Max. daily purchase (gal):
- Intake Latitude: 39.998509
- Intake Longitude: -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

09/13/2013
Source ID: 22418  Source Name: Ohio River @ J&R Excavating
J&R Excavating

HUC-8 Code: 5030106
Drainage Area (sq. mi.): 25000  County: Marshall

☐ Endangered Species?  ☑ Mussel Stream?
☐ Trout Stream?  ☐ Tier 3?
☑ Regulated Stream?  Ohio River Min. Flow
☐ Proximate PSD?
☑ Gauged Stream?

Source Latitude: 39.998509  Source Longitude: -80.737736

Anticipated withdrawal start date: 11/1/2013  Anticipated withdrawal end date: 11/1/2014
Total Volume from Source (gal): 6,300,000
Max. Pump rate (gpm): 2,940
Max. Simultaneous Trucks: 0
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

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<tr>
<th>Month</th>
<th>Median monthly flow (cfs)</th>
<th>Threshold (+ pump)</th>
<th>Estimated Available water (cfs)</th>
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<tbody>
<tr>
<td>1</td>
<td>45,700.00</td>
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<td>-</td>
</tr>
<tr>
<td>2</td>
<td>49,200.00</td>
<td>-</td>
<td>-</td>
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<tr>
<td>3</td>
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<td>4</td>
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<td>12</td>
<td>41,300.00</td>
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</table>

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.

09/13/2013
Water Management Plan:
Secondary Water Sources

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

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<tr>
<th>Source ID</th>
<th>Source Name</th>
<th>Source start date</th>
<th>Source end date</th>
<th>Source Lat</th>
<th>Source Long</th>
<th>County</th>
<th>Total Volume from Source (gal)</th>
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<td>11/1/2013</td>
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<td>-80.572528</td>
<td>Marshall</td>
<td>6,300,000</td>
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DEP Comments:
Important:

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

• For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.

• For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

---

Multi-site impoundment

Source ID: 22420  Source Name: Stout Centralized Freshwater Impoundment  Source start date: 11/1/2013  Source end date: 11/1/2014


DEP Comments:

The intake identified above has been defined in a previous water management plan. The thresholds established in that plan govern this water management plan unless otherwise noted. Reference: WMP-971