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, 2015

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-4902366, 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: MINGER 1H
Farm Name: HIBBS, NATHANIEL C.
API Well Number: 47-4902366
Permit Type: Horizontal 6A Well
Date Issued: 03/13/2015

Promoting a healthy environment.

API Number: 49-02366

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. This proposed activity will require permit coverage from the United States Army Corps of Engineers (USACE) and WV DEP Department of Water and Waste Management (DWWM). No activity authorized under this permit shall be commenced until all necessary permits from USACE and DWWM are obtained.

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.

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Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
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ORDER
ISSUED UNDER
WEST VIRGINIA CODE, CHAPTER 22, ARTICLE 6A

TO: Trans Energy, Inc.
210 Second Street
St. Mary's, WV 26170

DATE: March 12, 2015
ORDER NO.: 2015-W-1

INTRODUCTION

This Order (hereinafter "Order") is issued by the Office of Oil and Gas (hereinafter "OOG"), by and through its Chief, pursuant to the authority of W. Va. Code §§ 22-1-1, 22-6-1 and 22-6A-1 *et seq*. to Trans Energy, Inc. (hereinafter "Trans Energy" or "Operator"), collectively the "Parties."

FINDINGS OF THE CHIEF

In support of this Order, the Chief hereby finds the following:

1. OOG, an office within the West Virginia Department of Environmental Protection, is the agency with the duty and authority to execute and enforce W. Va. Code §22-6-1 and §22-6A-1 *et seq*., and the rules and regulations promulgated thereunder.

2. Trans Energy is a "person" as defined by W. Va. Code §22-6-1(n), with a corporate address as 210 Second Street St. Mary's, WV 26170.

3. On November 13, 2014, Trans Energy submitted applications for gas wells identified as API# 47-049-02366 and 47-049-02367, located on the Minger Pad in Mannington District of Marion County, West Virginia.

4. On March 03, 2015, Trans Energy requested a waiver for Wetland #1, outlined in Exhibit 1, from well location restriction requirements in W. Va. Code §22-6A-12(b) for gas well permit applications identified as 47-049-02366 and 47-049-02367, located on the Minger Pad in Mannington District of Marion County, West Virginia.

CONCLUSIONS OF LAW

1. West Virginia Code §22-1-6(d) requires, in part, that "[i]n addition to other powers, duties and responsibilities granted and assigned to the secretary by this chapter, the secretary is authorized and empowered to...(3) Enter private lands to make surveys and inspections for environmental protection purposes; to investigate for violations of statutes or rules which the Office of Oil and Gas is charged with enforcing; to serve and execute warrants and processes; to make arrests; issue orders, which for the purposes of this chapter include consent agreements; and to otherwise enforce the statutes or rules which the Office of Oil and Gas is charged with enforcing."

2. West Virginia Code §22-6A-2(a)(6) requires, in part, that "Concomitant with the broad powers to condition the issuance of well work permits, the secretary should also have broad authority to waive certain minimum requirements of this article when, in his or her discretion, such waiver is appropriate: *Provided*, That the secretary shall submit a written report of the number of waivers granted to the Legislature commencing January 1, 2013, and each year thereafter."

3. West Virginia Code §22-6A-12(b) requires, in part, that "[n]o well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the Office of Oil and Gas shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The Office of Oil and Gas may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary."

ORDER

Therefore, the Office of Oil and Gas grants Trans Energy, Inc. a waiver for Wetland #1 from well location restriction requirements in W. Va. Code §22-6A-12(b) for gas well permit applications identified as API# 47-049-02366 and 47-049-02367, located on the Minger Pad in Mannington Disctrict of Marion County, West Virginia. The Office of Oil and Gas hereby **ORDERS** that Trans Energy, Inc. shall meet the following site construction and operational requirements for the Minger well pad:

a. A berm shall be constructed around the perimeter of the pad to contain any potential spills and storm water runoff. Berm is to be at least two feet (2') in height;
b. Filter/silt socks and erosion control blankets shall be installed on all slopes and down gradient locations of the pad and topsoil pile areas as erosion and sediment controlling BMPs;
c. Wetland #1 shall have a triple compost filter sock stack installed adjacent to the wetland;
d. Disturbed areas not used for operations shall be seeded and mulched per the seeding tables in the WVDEP-OOG Erosion and Sediment Control Manual;
e. Drill cuttings and associated drilling mud shall be disposed of in a permitted landfill;
f. Waste generated by the flowback treatment systems shall be sent to offsite disposal at a permitted landfill;
g. Weekly site inspections shall be conducted to monitor and maintain the integrity of the BMP storm water controls;
h. Weekly storm water and spill prevention inspections shall be conducted focusing on storm water and spill prevention BMPs and maintenance of these BMPs;
i. Inspections of the storm water and spill prevention measures shall be conducted after any major storm event defined as a half inch (½") rain within any twenty-four (24) hour period;
j. Pad inspections shall be conducted no less than once a week to identify and mitigate potential deficiencies;
k. All records from inspections shall be maintained on site for the life of the project and be available upon request.

Thus ORDERED, the 12th day of March, 2015.

IN THE NAME OF THE STATE OF WEST VIRGINIA:

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

By: _____
JAMES A. MARTIN, CHIEF

Wetland Waiver Request

API Number 47-049-023666 Well Number 1H

Operator Trans Energy, Inc. Pad Name Minger

Submit a conclusive demonstration to justify the proposed activity by addressing the following:

1. **Demonstrate that there is not a practical alternative to impact the Waters of the U.S. by including other alternatives that were considered but eliminated.**
   a. Include a No-Action Alternative as to show "the future without the project"
   If the pad is unable to be built there would be no chance to provide the natural gas to market for the citizens of the United States.

   b. Location Alternatives must be shown
   No alternatives exist without adding significant wetland impacts to Wetland 1. This location has wetlands on both sides of the pad. The proposed location is the only practical, environmentally friendly option.

   c. Must demonstrate why a 100' buffer cannot be maintained
   This wetland is located off of Warrior Fork as well as the access road and provides filtration to a tributary of the local system. Therefore, the additional E&S controls taken will enable the wetland to continue to function in its natural way while being protected.

2. **Show that treatment facilities (Erosion and Sediment Control Features) will be located as close as practical to the source(s) with which it is associated.**
   The proposed E&S BMPs are located as close as possible to the proposed earthwork area. No additional wetland impacts will result from the additional grading required to construct the pad location.

3. **Demonstrate that all proposed activity will not impact Waters of the U.S. more than is necessary to accommodate the proper construction and operation of the facility.**

   a. Specify and identify wetlands using unique identification and/or perennial streams located within 100' of the pad's limit of disturbance (including erosion and sediment controls).

Wetland-1, Wetland 1 is a spring seep fed PEM which hydrology adds to S-3. This wetland has been created as a result of the existing oil and gas wells. The wetland encompasses a large area just above the tree line. Wetland 1 contains primarily emergent herbaceous vegetation with upland scrub/shrub species. The shagbark hickory only provides cover for the wetland but does not root in the wetland it only provides canopy cover from beyond the border. The tree stratum contains *Carya ovata* (shagbark hickory) and *Platanus occidentalis* (American sycamore). The scrub/shrub stratum contains *Rubus allegheniensis* (Allegheny blackberry) and *Rubus occidentalis* (black raspberry). The herbaceous layer is comprised of *Carex lurida* (shallow sedge), *Carex vulpinoidea* (fox sedge), *Juncus effusus* (common rush), *Microstegium vimineum* (Nepalese browntop), *Calamagrostis canadensis* (blue joint), *Polygonum hydropiper* (marshpepper knotweed), *Dicanthelium clandestinum* (deer

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tongue), *Trifolium pratense* (red clover) and *Leucanthemum vulgare* (Oxeye daisy). The soil sample is comprised of one distinct layer. The first layer consisted of a clay loam with a matrix color of 10YR 6/1 at 85% and two redox feature colors of 10YR 6/8 at 10% and 10YR 5/6 at 5% for the first 8 inches. At 8 inches the auger was met with an impenetrable layer of rock. Wetland data forms W-1 and UPL-1 describe this wetland and adjacent upland. (0.14 Acres within the AOI)

b. Is the proposed project the least environmentally damaging practicable alternative to the waters of the United States, so long as the alternative does not have other environmental consequences.
The proposed pad location is located within 100' of and Wetland 1. However, the proposed pad location will not be environmentally damaging and is the only practical location.

4. **Provide mapping, plans, specifications and design analysis for the preferred alternative to the project.**
   a. Specify in writing what additional controls, measures, devices, monitoring, etc will be utilized to protect these wetlands and/or perennial streams.

Below are a list of BMPs that may be utilized to protect adjacent wetlands.

ROCK CONSTRUCTION ENTRANCE

A rock construction entrance will be provided at the location shown on the plans and in accordance with the standard detail provided in the Erosion and Sediment Control Plan. This measure proves effective removing sediment from vehicles before entering onto State, and county roads. The rock construction entrance thickness shall be constantly maintained to the specified dimensions by adding rock. A stockpile shall be maintained onsite for this purpose. At the end of each construction day, all sediment deposited on paved roadways shall be removed and returned to the construction site. If the crushed stone does not adequately remove sediment from vehicle tires, the tires should be hosed off before the vehicle enters a public street. The washings should be done on an area covered with crushed stone, and the water wash should drain to a sediment control device.

DIVERSION DITCHES

A channel will be used to convey storm water runoff in a stable manner from the pad site construction area. The channel will be lined with erosion control matting to help keep seed in place once final grades are established. Channels shall be inspected twice a month until a uniform 70% perennial vegetative cover is established. Any damage to the channel or erosion control blanket shall be fixed immediately. The contractor is to place seed on all bare spots and areas not establishing ground cover.

ROCK CHECK DAMS

Rock check dams are to be installed in each channel to reduce the velocity of storm water flows, thereby reducing erosion of the channel and trapping sediment. Rock check dams are to be installed every 100 linear feet in any channel conveying sediment laden runoff. Inspect each check dam at a minimum once every seven (7) calendar days and within 24 hours after and storm event greater than 0.5 inches of rain per 24 hour period. Check to see if water has flowed around the edges of the structure. Replace stone and repair dams as necessary to maintain the correct height and configuration.

RIP RAP OUTLET PROTECTION

Rock Aprons will be used at storm sewer outfalls to dissipate the velocity coming from storm pipes, helping prevent erosion/scour of existing drainage ways and features.

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The rock aprons shall be inspected weekly until a uniform 70% perennial vegetation has established. Any visible damage shall be fixed by the end of the working day by placing additional riprap in the damaged area with a layer of geotextile. Place additional stone as necessary to prevent further erosion.

COMPOST FILTER SOCK

Silt sock shall be installed in the locations shown on the plans and in accordance with the standard detail provided in the ESCP. Accumulated sediments shall be removed in all cases where accumulations have reached half the above ground height of the sock. If the sock has been damaged, it shall be repaired or replaced if beyond repair. The filter media will be dispersed on site once the disturbed area has been permanently stabilized. Adhere to manufacturer's recommendations.

EROSION CONTROL MATTING

The specified products or approved equivalent erosion control matting will be installed within all permanent channels and on all slopes 3:1 or greater. The erosion control matting shall be inspected weekly and after every rainfall event to look for scour/washout areas. Any scoured areas shall be fixed immediately by compacting soil in the washout area and placing seed. Any damaged erosion control matting shall be replaced immediately. Matting shall be maintained until a uniform 70% perennial vegetation has been established.

TEMPORARY VEGETATIVE STABALIZATION

Fertilizing, seeding, and mulching will be used as a temporary E&S control measure on all disturbed areas as needed. Exposed soils not subject to construction traffic shall not remain unseeded or covered by mulch for more than twenty-one (21) days, including stockpiled soil materials. Refer to the seeding mixtures provided on the erosion and sedimentation control general notes drawing of the Erosion and Sediment Control Plan for temporary seed mixtures.

The contractor shall vegetate all disturbed areas at the earliest appropriate times for establishment of temporary or permanent seed mixtures, respectively. When site development staging or season will not permit timely sowing of the permanent seed mixture(s), prepare soils as for permanent seeding, seed with temporary seed mixture and mulch, and then over-sow the perennial seed mixture into the stubble of temporary vegetation at the next appropriate seeding season.

PERMANENT VEGETATIVE STABALIZATION

Fertilizing, seeding, and mulching will be used as a permanent E&S control measure on all disturbed areas. Refer to the permanent seed mixture provided on the erosion and sediment control plan's general notes drawing. The contractor shall inspect the site twice a week until a 70% perennial vegetative cover is established. The contractor is to place seed on all bare spots and disturbed areas not establishing ground cover.

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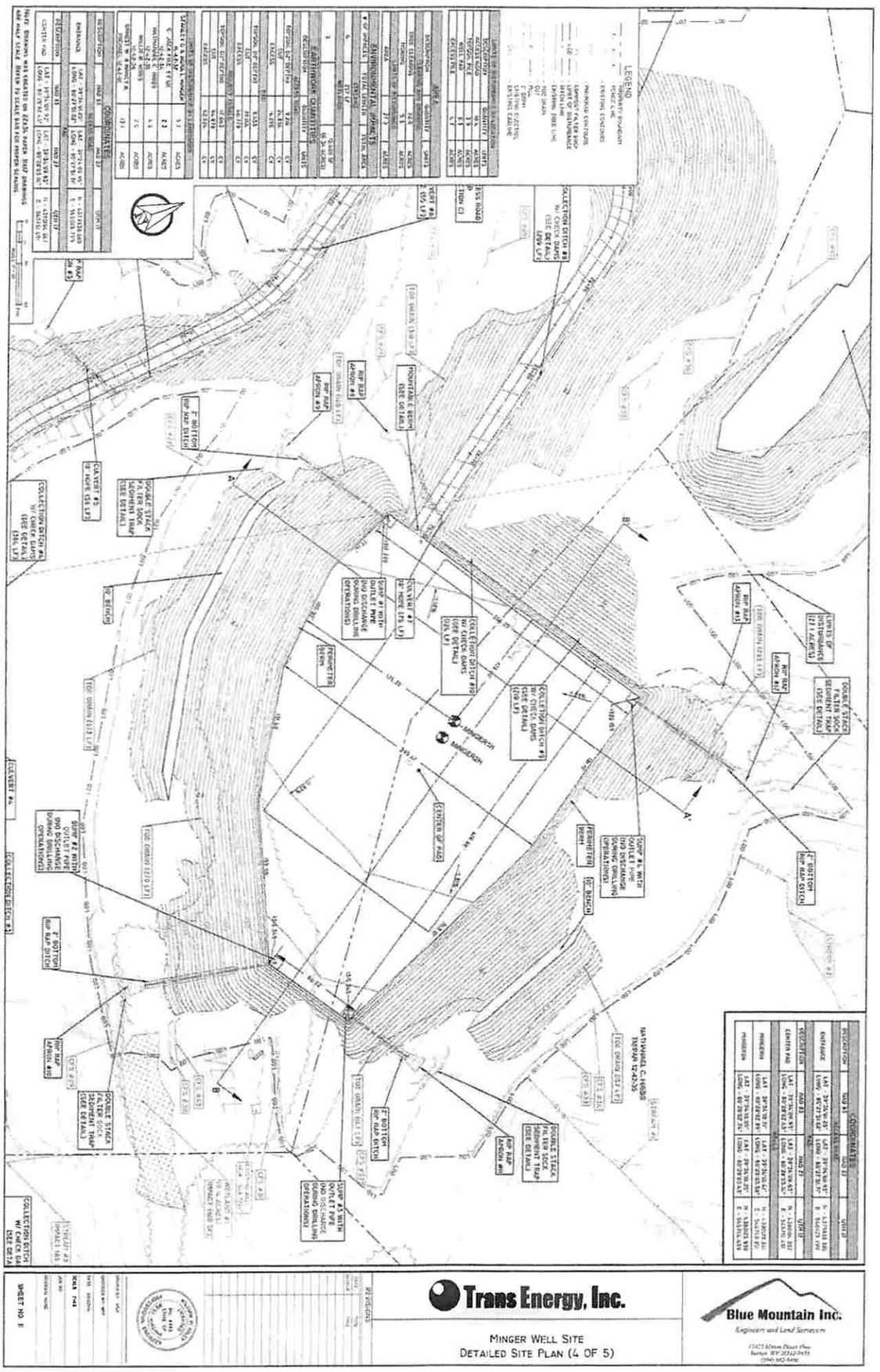
Exhibit 1


Trans Energy, Inc.
Blue Mountain Inc.
Engineers and Land Surveyors
MINGER WELL SITE
DETAILED SITE PLAN (4 OF 5)
SHEET NO. 5
LEGEND
COLLECTION DITCH #1 W/ CHECK DAMS (SEE DETAIL) (696 LF)
COLLECTION DITCH #2 W/ CHECK DAMS (SEE DETAIL) (1,010 LF)
COLLECTION DITCH #3 W/ CHECK DAMS (SEE DETAIL) (1,124 LF)
COLLECTION DITCH #4 W/ CHECK DAMS (SEE DETAIL) (1,124 LF)
COLLECTION DITCH #5 W/ CHECK DAMS (SEE DETAIL) (1,124 LF)
DOUBLE STACK FILTER SOCK SEDIMENT TRAP (SEE DETAIL)
RIP RAP APRON #1
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RIP RAP APRON #3
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WW-6B
(9/13)

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

4 374

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

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

3) Farm Name/Surface Owner: Nathanael C Hibbs Public Road Access: Co Rd 1/3

4) Elevation, current ground: 1340' Elevation, proposed post-construction: 1317'

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: 13,288

11) Proposed Horizontal Leg Length: 6,088

12) Approximate Fresh Water Strata Depths: 50' 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: 900'

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: Proposed Mason-Dixon Mine
Depth:
Seam:
Owner:

Received
Office of Oil & Gas
NOV 13 2014

WRH
11-7-14

WW-6B
(9/13)

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18) **CASING AND TUBING PROGRAM**

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor	20	new	J-55	94	100'	100' ✓	CTS
Fresh Water	13-3/8	new	J-55	54.5	1000'	1000' ✓	CTS
Coal							
Intermediate	9-5/8	new	J-55	36	3000'	3000' ✓	CTS
Production	5-1/2	new	P-110	20	13,288	13,288	CTS
Tubing							
Liners							

WRH
11-7-14

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
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)

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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 6,088 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 100 bbl/min

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 27.1 acres

22) Area to be disturbed for well pad only, less access road (acres): 8.1 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% $CaCl_2$+ Y4# Flake - Surface Cement mixed @ 15.6 ppg $CaCl_2$ Flake (cellophane flake)
Type 1 = 2% $CaCl_2$+ 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.

CEMENTING ADDITIVES'

470490366

Type	Product no.	Product properties						
		Usage	Properties	Application temperature	Salt resistance	Anti-freezing	Solubility	Specification
AMPS quadripolymer	CG610L Liquid	Water mixed	White or faint yellow viscous liquid	≤180℃	Saturated salt water	-15℃	Soluble in cold water	Cement slurry has good fluidity, and it is not extended.
	CG610S-P Powder	Dry & water mixed dual purpose	White or faint yellow powder	≤180℃	Saturated salt water	—	Soluble in cold water	High purity, small dosage, good slurry fluidity and not extended.
	CG610S-D High purity powder	Dry mixed	Pray powder	≤180℃	Saturated salt water	—	Partly water soluble	Easy storage, long durability good slurry fluidity and not extended.
Multi-functional fluid loss additives	CG610S-T Powder	Dry & water mixed dual purpose	White powder	≤180℃	Saturated salt water	—	Soluble in cold water	Using flexibly and conveniently, slurry's fluidity is good and not extended.
AMPS terpolymer	CG510L Liquid	Water mixed	White or faint yellow viscous liquid	≤150℃	18% salt water	-15℃	Soluble in cold water	Slurry's fluidity is good, slight extend.
	CG510S-P High purity powder	Dry & water mixed dual purpose	White or faint yellow powder	≤150℃	18% salt water	—	Soluble in cold water	High purity, small dosage, good slurry fluidity and slight extended.
	CF510S Powder	water mixed dual purpose	faint yellow powder	≤150℃	18% salt water	—	Partly Soluble in cold water	Easy storage, long compatibility with all kinds cement and it has the properties of fluid loss controlling. Cement slurry with it is slight extended.
Moderate temperature retarder	CH210L Liquid	Water mixed	Colorless liquid	55-110℃	18% salt water	-2℃	Soluble in cold water	—
	CH210S-P High purity powder	Dry & water mixed dual purpose	White powder	55-110℃	18% salt water	—	Soluble in cold water	High purity and low dosage.
	CH210S-D Powder	Dry mixed	Gray powder	55-110℃	18% salt water	—	Partly water soluble	Easy storage and long durability.
	CH210S-T Powder	Dry & water mixed dual purpose	White powder	55-110℃	18% salt water	—	Soluble in cold water	Using flexibly and conveniently.
High temperature retarder	CH310L Liquid	Water mixed	Brownish black liquid	90-150℃	18% salt water	-12℃	Soluble in cold water	Have certain dispersion.
	CH410L Liquid	Water mixed	Brown liquid	90-150℃	18% salt water	-9℃	Soluble in cold water	Have certain dispersion.
	CH510S-D Powder	Dry mixed	Gray powder	90-150℃	18% salt water	—	Partly water soluble	Easy storage, long durability, strengthen grow is rapid.

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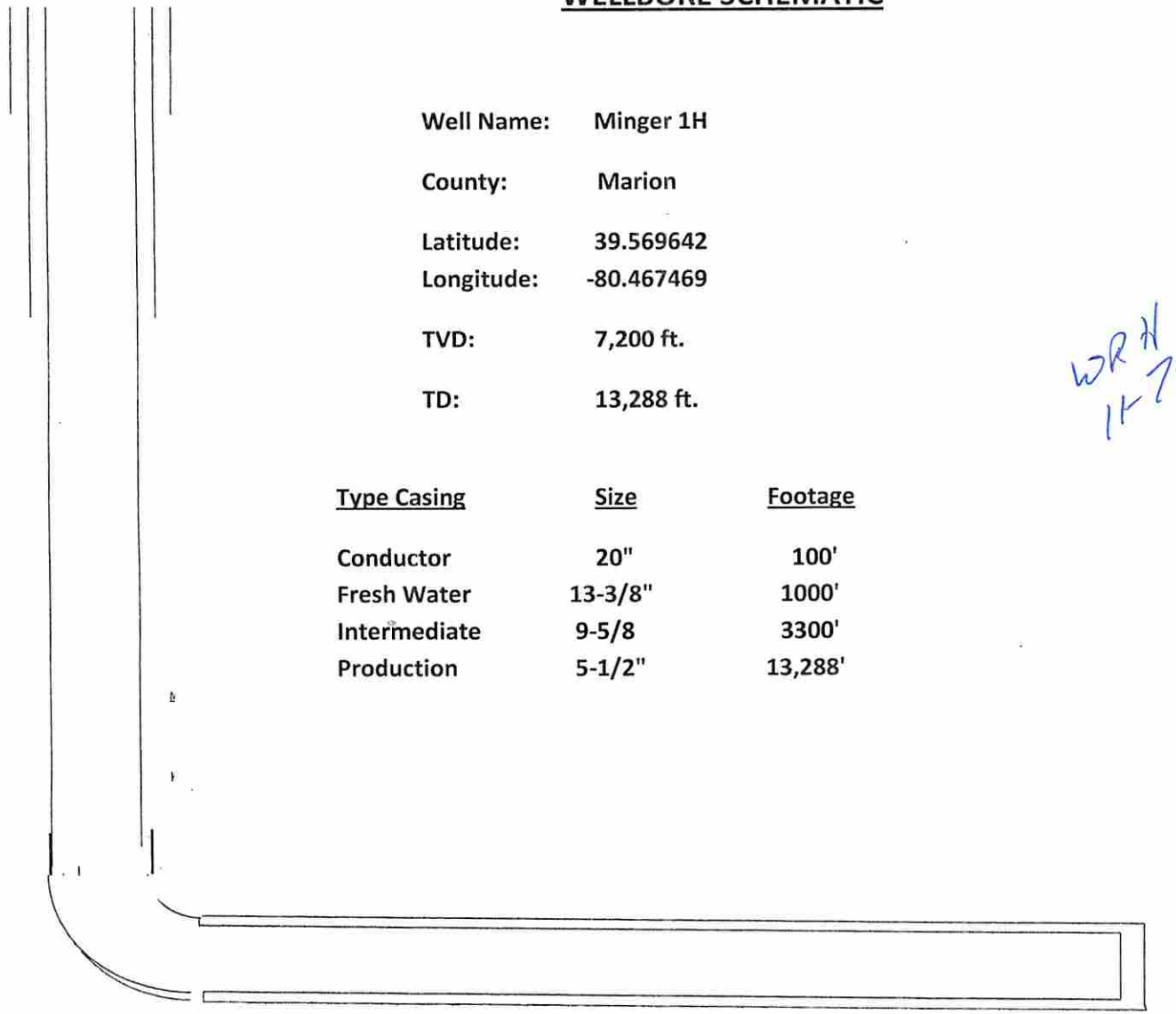
WELLBORE SCHEMATIC



Well Name: Minger 1H

County: Marion

Latitude: 39.569642
Longitude: -80.467469

TVD: 7,200 ft.

TD: 13,288 ft.

WR #
1K 7-14

Type Casing	Size	Footage
Conductor	20"	100'
Fresh Water	13-3/8"	1000'
Intermediate	9-5/8	3300'
Production	5-1/2"	13,288'

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WW-9
(9/13)

API Number 47 - _____ - _____
Operator's Well No. Minger 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) Bartholomew Fork Quadrangle Glover Gap

Elevation 1340' 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 Buckeye 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 until reaching Marcellus then synthetic

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

Additives to be used in drilling medium? ~~None~~ 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.

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Company Official Signature Leslie Gearhart

Company Official (Typed Name) Leslie Gearhart

Company Official Title VP-Operations

Subscribed and sworn before me this 6th day of November, 2014

Debra A Martin Notary Public

My commission expires November 29, 2020

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

4704902366

Form WW-9 Additives Attachment

SURFACE INTERVAL

1. Fresh Water
2. Soap –Foamer AC
3. Air

INTERMEDIATE INTERVAL

STIFF FOAM RECIPE:

1) 1 ppb Soda Ash / Sodium Carbonate-Alkalinity Control Agent
2) 1 ppb Conqor 404 (11.76 ppg) / Corrosion Inhibitor
3) 4 ppb KLA-Gard (9.17 ppg) / Amine Acid Complex-Shale Stabilizer
4) 1ppb Mil Pac R / Sodium Carboxymethylcellulose-Filtration Control Agent
5) 12 ppb KCL / Potassium Chloride-inorganic Salt
6) Fresh Water 80 bbls
7) Air

PRODUCTION INTERVAL

1. Alpha 1655
   Salt Inhibitor
2. Mil-Carb
   Calcium Carbonate
3. Cottonseed Hulls
   Cellulose-Cottonseed Pellets – LCM
4. Mil-Seal
   Vegetable, Cotton & Cellulose-Based Fiber Blend – LCM
5. Clay-Trol
   Amine Acid Complex – Shale Stabilizer
6. Xan-Plex
   Viscosifier For Water Based Muds
7. Mil-Pac (All Grades)
   Sodium Carboxymethylcellulose – Filtration Control Agent
8. New Drill
   Anionic Polyacrylamide Copolymer Emulsion – Shale Stabilizer
9. Caustic Soda
   Sodium Hydroxide – Alkalinity Control
10. Mil-Lime
    Calcium Hydroxide – Lime
11. LD-9
    Polyether Polyol – Drilling Fluid Defoamer
12. Mil Mica
    Hydro-Biotite Mica – LCM

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13. Escaid 110
    Drilling Fluild Solvent – Aliphatic Hydrocarbon
14. Ligco
    Highly Oxidized Leonardite – Filteration Control Agent
15. Super Sweep
    Polypropylene – Hole Cleaning Agent
16. Sulfatrol K
    Drilling Fluid Additive – Sulfonated Asphalt Residuum
17. Sodium Chloride, Anhydrous
    Inorganic Salt
18. D-D
    Drilling Detergent – Surfactant
19. Terra-Rate
    Organic Surfactant Blend
20. W.O. Defoam
    Alcohol-Based Defoamer
21. Perma-Lose HT
    Fluid Loss Reducer For Water-Based Muds
22. Xan-Plex D
    Polysaccharide Polymer – Drilling Fluid Viscosifier
23. Walnut Shells
    Ground Cellulosic Material – Ground Walnut Shells – LCM
24. Mil-Graphite
    Natural Graphite – LCM
25. Mil Bar
    Barite – Weighting Agent
26. X-Cide 102
    Biocide
27. Soda Ash
    Sodium Carbonate – Alkalinity Control Agent
28. Clay Trol
    Amine Acid complex – Shale Stabilizer
29. Sulfatrol
    Sulfonated Asphalt – Shale Control Additive
30. Xanvis
    Viscosifier For Water-Based Muds
31. Milstarch
    Starch – Fluid Loss Reducer For Water Based Muds
32. Mil-Lube
    Drilling Fluid Lubricant

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Form WW-9

Operator's Well No. Minger 1H

Trans Energy Inc

Proposed Revegetation Treatment: Acres Disturbed 27.1 acres total 8.1Well 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	Seed Type	lbs/acre
Meadow Mix	100	Meadow Mix	100
Oats or Rye	50	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: William Hackwelder

Comments: _____

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Title: Enviromental Inspector Date: 11-7-14

Field Reviewed? (✓) Yes ( ) No

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WRN
11-7-14

TRANS ENERGY, INC.

Well Site Safety Plan

MINGER PAD

Marion County

11/4/14

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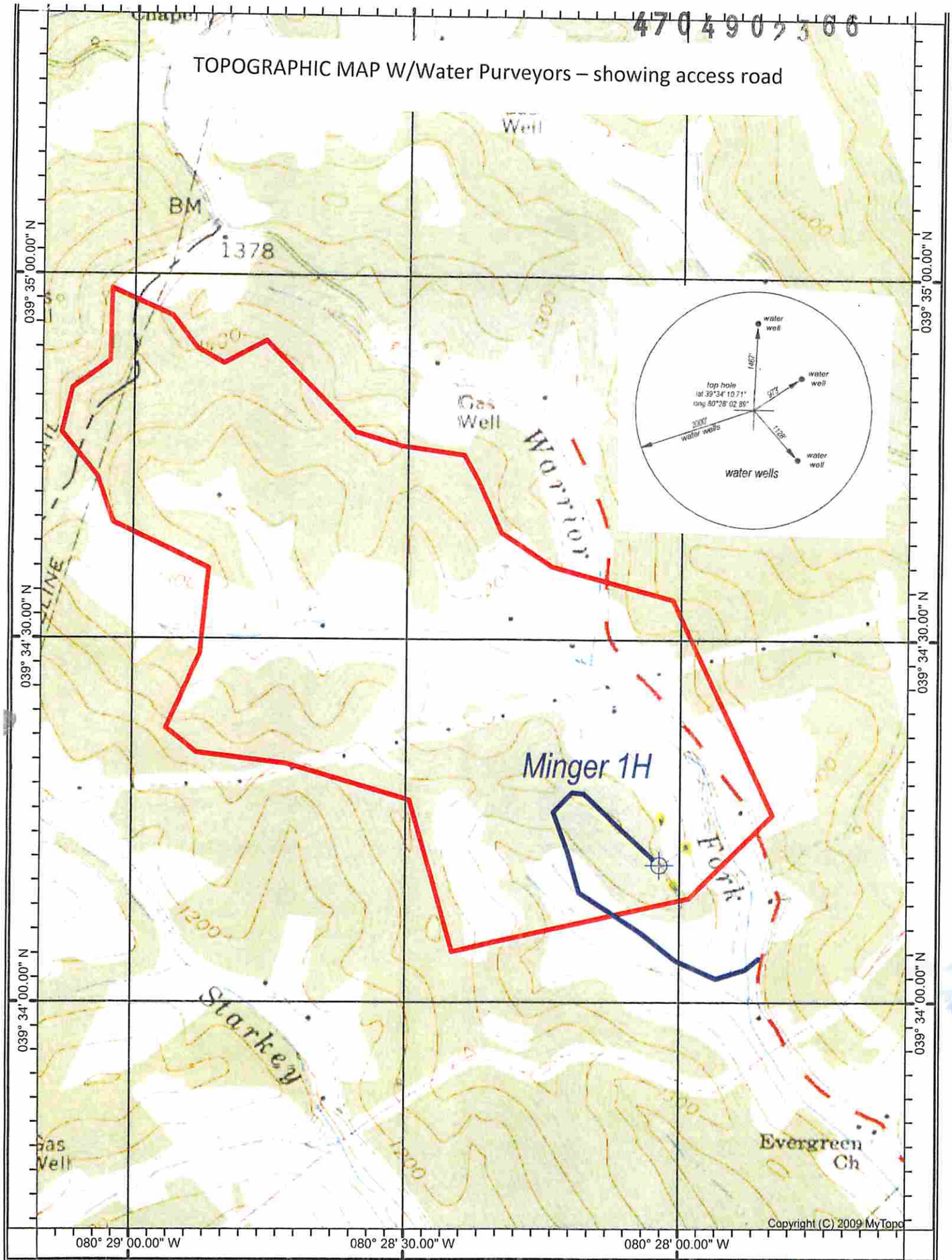
TOPOGRAPHIC MAP W/Water Purveyors – showing access road



WRA 11-7-14

GLOVER GAPQUADRANGLE

SCALE 1" = 1000'

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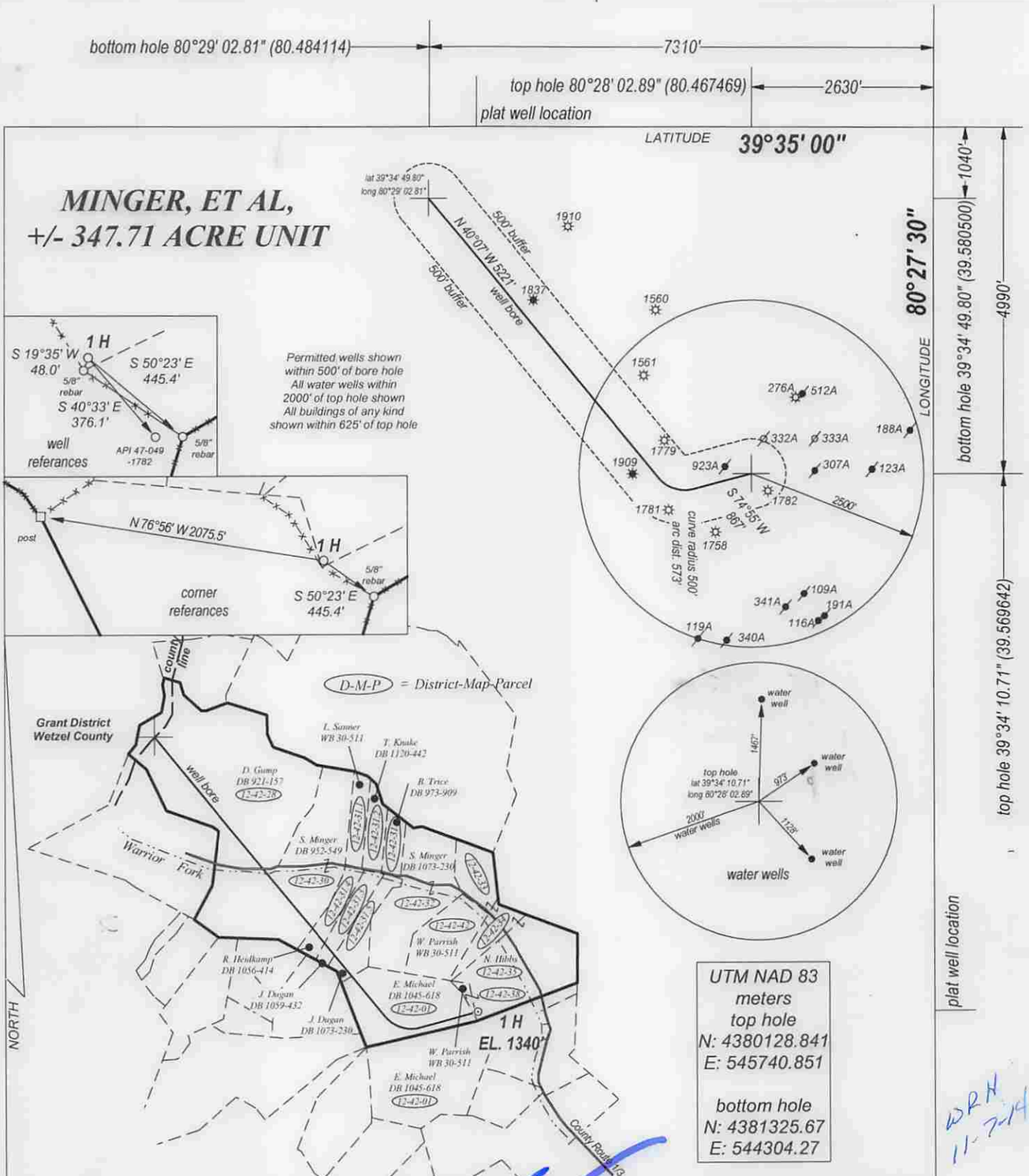
TRANS ENERGY, INC.

WELL: MINGER 1H
MINGER, ET AL +/- 347.71 ACRE UNIT

MANNINGTON DISTRICT MARION COUNTY WEST VIRGINIA



UTM NAD 83
meters
top hole
N: 4380128.841
E: 545740.851

bottom hole
N: 4381325.67
E: 544304.27

WRH
11-7-14

FILE NO.
DRAWING NO.
SCALE 1" = 2000'
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

WILLIAM R. MOSSOR
LICENSED
No. 551
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

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

DATE OCTOBER 6TH, 2014
OPERATORS WELL NO. MINGER 1H

H6A

API 47 - 049 -02360
STATE COUNTY PERMIT

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

LOATION: ELEVATION 1340' WATER SHED BARTHOLOMEW FORK
DISTRICT MANNINGTON COUNTY MARION QUADRANGLE GLOVER GAP

SURFACE OWNER NATHANAEL C. HIBBS ACREAGE 51.75
OIL & GAS ROYALTY MINGER, ET AL LEASE AC +/- 347.71

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.
ADDRESS P. 0. BOX 393
ST. MARYS, WV 26170

DESIGNATED AGENT LOREN BAGLEY
ADDRESS P. 0. BOX 393
ST. MARYS, WV 26170

FORM WW - 6
COUNTY NAME
PERMIT