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

July 17, 2014

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-10302994, 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: DEWHURST II 301H
Farm Name: STATE OF WEST VIRGINIA
API Well Number: 47-10302994
Permit Type: Horizontal 6A Well
Date Issued: 07/17/2014

Promoting a healthy environment.

API Number: 103-02994

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 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.

103- 02994

WW-6B
(9/13)

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

		103	4	349
1) Well Operator: Trans Energy Inc.	494481575	Wetzel	Grant	Folsom
	Operator ID	County	District	Quadrangle

2) Operator's Well Number: Dewhurst 301H Well Pad Name: Dewhurst

3) Farm Name/Surface Owner: State of West Virginia Public Road Access: 84/1

4) Elevation, current ground: 1388' Elevation, proposed post-construction: 1346.50

5) Well Type (a) Gas ■ Oil ____ Underground Storage ____
Other ____
(b)If Gas Shallow ■ Deep ____
Horizontal ■

DMH
3-24-14

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Marcellus Shale 7500' 60' thick 4000 psi

8) Proposed Total Vertical Depth: 7500'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 12,500

11) Proposed Horizontal Leg Length: 5,000

12) Approximate Fresh Water Strata Depths: 50, 100

13) Method to Determine Fresh Water Depths: County Health Department

14) Approximate Saltwater Depths: 1525'

15) Approximate Coal Seam Depths: 900'

16) Approximate Depth to Possible Void (coal mine, karst, other): None

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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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	80	80	CTS
Fresh Water	13 3/8	new	J-55	54.5	400	400	CTS
Coal							
Intermediate	9 5/8	new	J-55	36	3300	3300	CTS
Production	5 1/2	new	P-110	20	12,500	12,500	CTS
Tubing							
Liners							

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						

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PACKERS

Kind:				
Sizes:				
Depths Set:				

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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 5,000' 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): 36.34 acres

22) Area to be disturbed for well pad only, less access road (acres): 3.84 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.

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CEMENTING ADDITIVES

Type		Product no.	Product properties						
			Usage	Properties	Application temperature	Salt resistance	Anti-freezing	Solubility	Specification
Multi-functional fluid loss additives	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.
		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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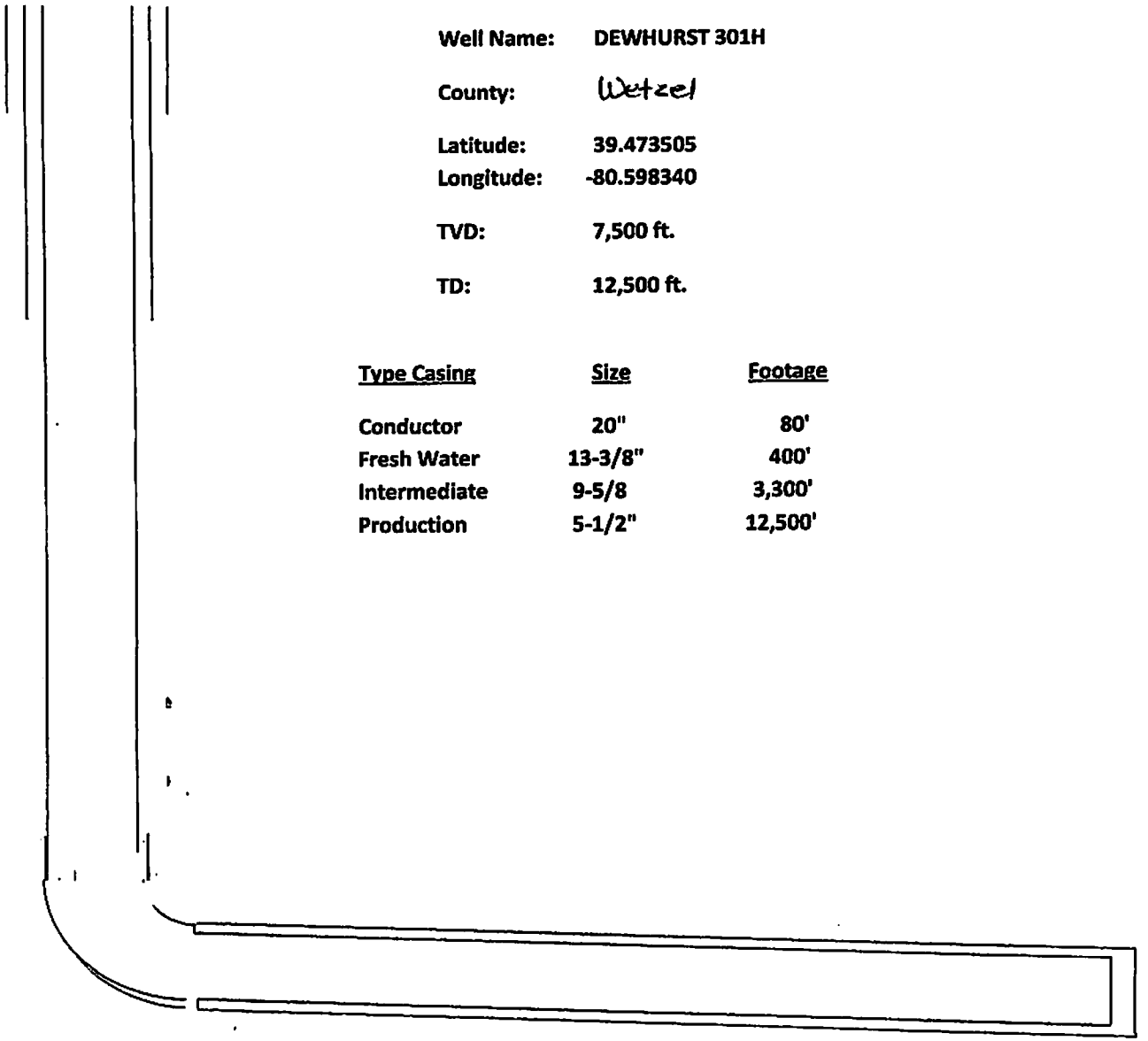
WELLBORE SCHEMATIC



Well Name: DEWHURST 301H

County: Wetzel

Latitude: 39.473505
Longitude: -80.598340

TVD: 7,500 ft.

TD: 12,500 ft.

Type Casing	Size	Footage
Conductor	20"	80'
Fresh Water	13-3/8"	400'
Intermediate	9-5/8	3,300'
Production	5-1/2"	12,500'

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WW-9
(9/13)

API Number 47 - 103 - 02994
Operator's Well No. Dewhurst 301H

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) Arches Fork & Horse Run Quadrangle Folsom

Elevation 1388' County Wetzel District Grant

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:

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_____ 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

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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? 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 _____

Company Official (Typed Name) Leslie Gearhart

Company Official Title VP Operations

Subscribed and sworn before me this 13 day of March, 20 14

Debra A Martin

Notary Public

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

My commission expires 03/29/2020

103-02994

Form WW-9

Operator's Well No. Dewhurst 301H

Trans Energy Inc.

Pad = 3.84 acres

Proposed Revegetation Treatment: Acres Disturbed 36.34 acres Prevegetation pH

Lime 2 Tons/acre or to correct to pH 65

Fertilizer type

Fertilizer amount lbs/acre

Mulch 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:

Comments:

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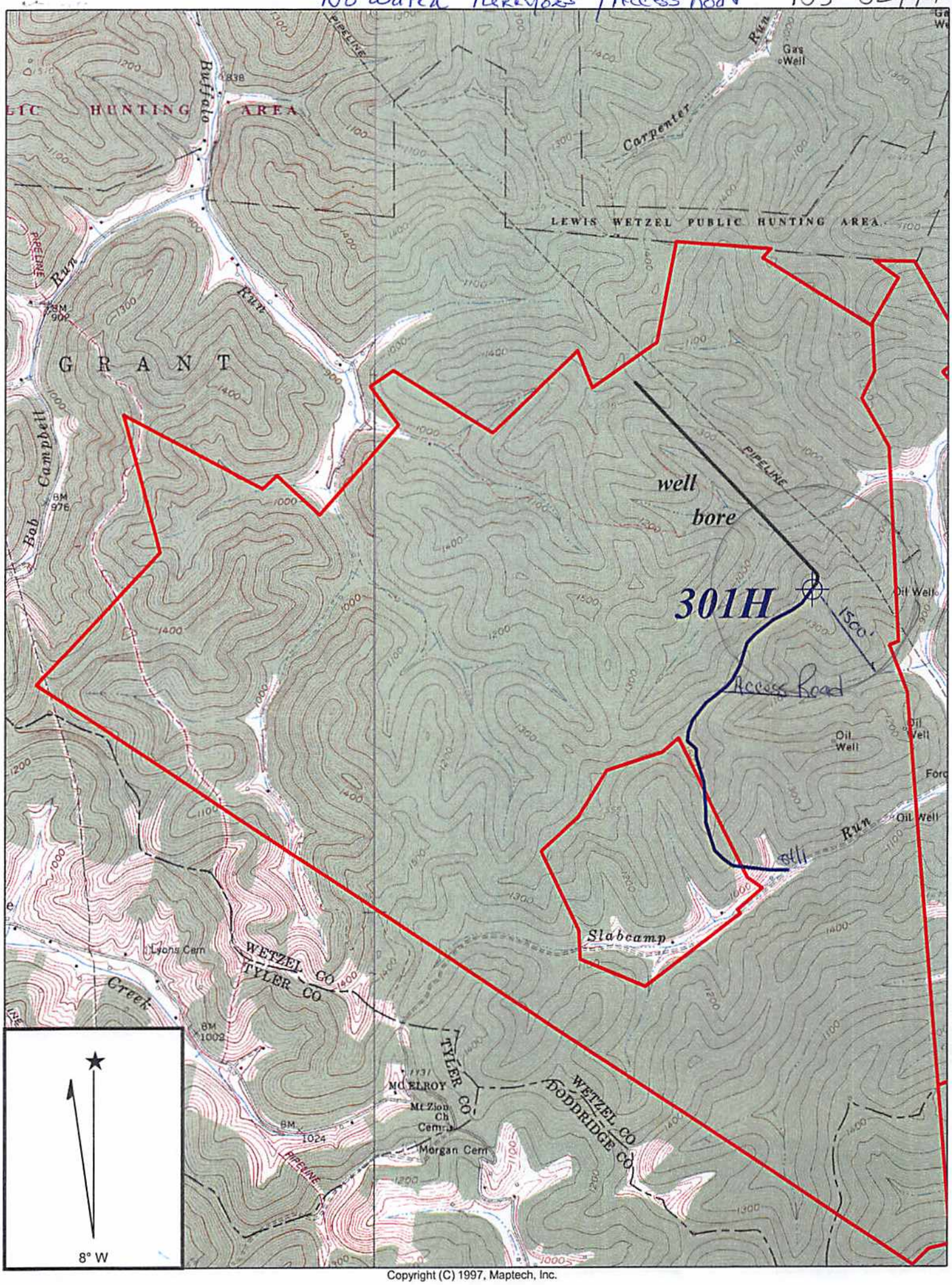
Office of Oil and Gas
WV Dept. of Environmental Protection

Title: Oil + Gas Inspector Date: 3-24-14

Field Reviewed? (✓) Yes ( ) No

No Water Pipelines / Access Road 103-02994



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FOLSOM QUADRANGLE

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3-24-14

SCALE 1" = 2000'

TRANS ENERGY, INC.

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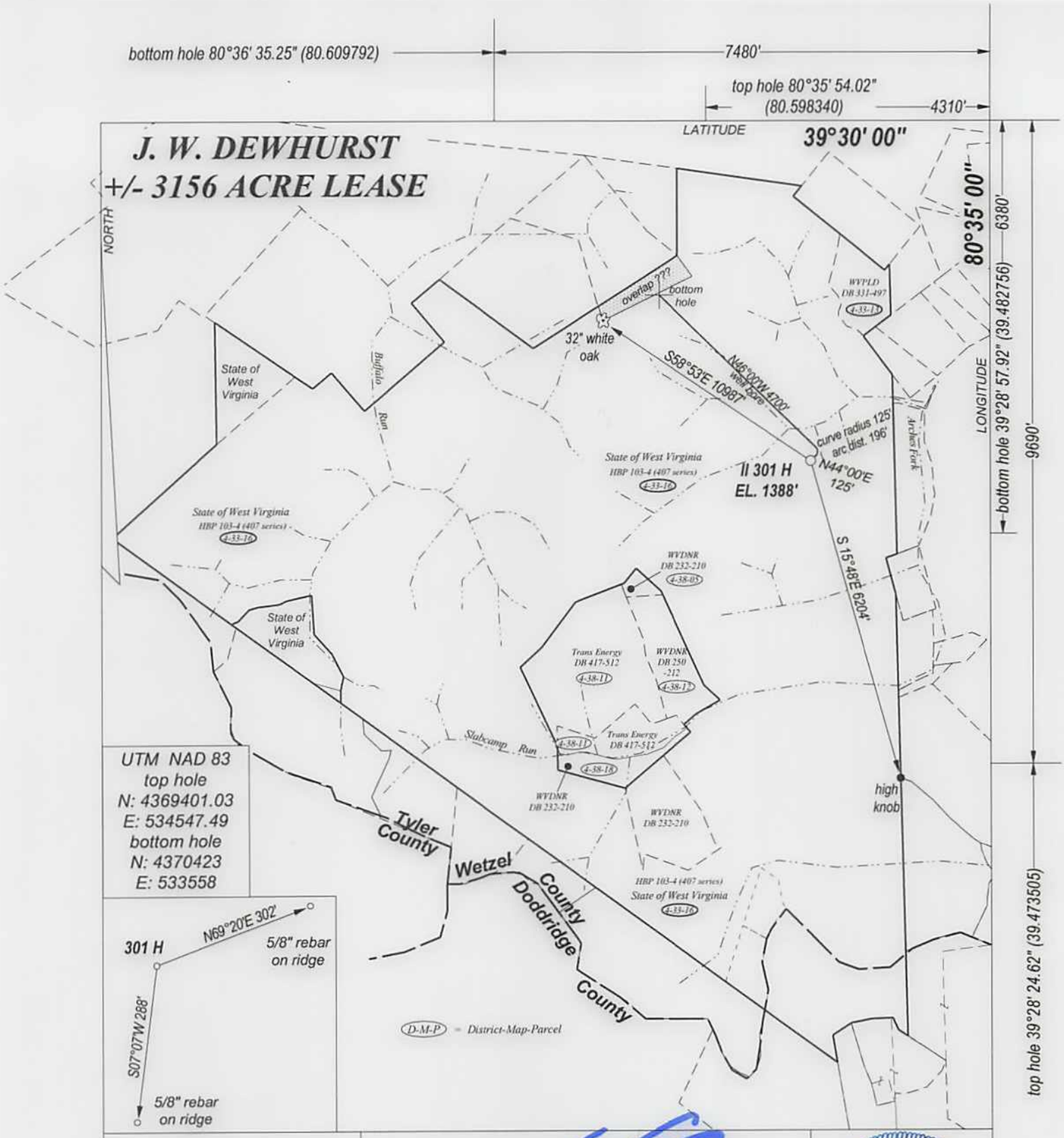
WELL: DEWHURST 301H
J. W. DEWHURST, ET AL +/- 3156ACRE UNIT

GRANT DISTRICT WETZEL COUNTY WEST VIRGINIA



FILE NO. _____
DRAWING NO. _____
SCALE 1" = 2500'
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 JUNE 30TH, 2014
OPERATORS WELL NO. DEWHURST II 301H

API 47 - 103 -02994 H6A
STATE COUNTY PERMIT

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

LOATION: ELEVATION 1388' WATER SHED ARCHES FORK & HORSE RUN
DISTRICT GRANT COUNTY WETZEL QUADRANGLE FOLSOM

SURFACE OWNER STATE OF WEST VIRGINIA ACREAGE +/- 3156
OIL & GAS ROYALTY J. W. DEWHURST,ET AL LEASE AC. +/- 3156

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 7500'

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

PREMIT

bottom hole 80°36' 35.25" (80.609792) — 7480' — top hole 80°35' 54.02" (80.598340) — 4310'

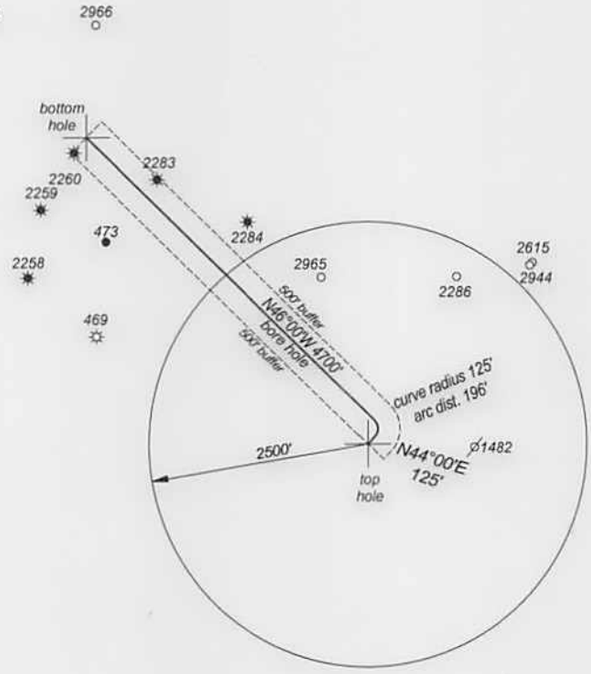
J. W. DEWHURST
+/- 3156 ACRE LEASE

80°35' 00"

LONGITUDE

bottom hole 39°28' 57.92" (39.482756) — 6380'

9690'



All wells within
500' of bore hole are shown
No water wells within
2000' of top hole
No buildings of any kind
within 625' of top hole

top hole 39°28' 24.62" (39.473505)

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 JUNE 30TH, 2014
OPERATORS WELL NO. DEWHURST II 301H

API 47 - 103 - 02994 H6A
STATE COUNTY PERMIT

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

LOATION: ELEVATION 1388' WATER SHED ARCHES FORK & HORSE RUN
DISTRICT GRANT COUNTY WETZEL QUADRANGLE FOLSOM

SURFACE OWNER STATE OF WEST VIRGINIA ACREAGE +/- 3156
OIL & GAS ROYALTY J. W. DEWHURST,ET AL LEASE AC. +/- 3156

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 7500'

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

PREMIT