



west virginia department of environmental protection

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

Jim Justice , Governor
Austin Caperton , Cabinet Secretary
www.dep.wv.gov

Monday, July 17, 2017
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
550 BAILEY AVENUE, SUITE 510

FORT WORTH, TX 76107

Re: Permit approval for YODER W-1HM
47-051-01924-00-00

This well work permit 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 any additional specific 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 of 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.

Per 35 CSR 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- 0450.



James A. Martin
Chief

Operator's Well Number: YODER W-1HM
Farm Name: NATHAN YODER, ET AL
U.S. WELL NUMBER: 47-051-01924-00-00
Horizontal 6A / New Drill
Date Issued: 7/17/2017

Promoting a healthy environment.

07/21/2017

PERMIT CONDITIONS

4705101926

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 one hundred (100) 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. 24 hours prior to the initiation of the completion process the operator shall notify the Chief or his designee.
8. During the completion process the operator shall monitor annular pressures and report any anomaly noticed to the chief or his designee immediately.
9. 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.
10. 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.

API Number: _____

PERMIT CONDITIONS 705101924

11. The operator shall provide to the Office of Oil and Gas the dates of each of the following within 30 days of their occurrence: completion of construction of the well pad, commencement of drilling, cessation of drilling, completion of any other permitted well work, and completion of the well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov.

07/21/2017

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

1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Franklin Powhatan Point 7
Operator ID County District Quadrangle

2) Operator's Well Number: Yoder W-1HM Well Pad Name: Yoder

3) Farm Name/Surface Owner: PPG Industries, Inc. Public Road Access: Waynes Ridge Rd. - County Route 78

4) Elevation, current ground: 1,090' Elevation, proposed post-construction: 1,084'

5) Well Type (a) Gas Oil Underground Storage

Other _____

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No No

4/12/17

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6,129' - 6,184', thickness of 55' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,284'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 15,550'

11) Proposed Horizontal Leg Length: 8,475'

470 = 01024

12) Approximate Fresh Water Strata Depths: 70', 661'

13) Method to Determine Fresh Water Depths: Offset well reports or noticeable flow at the flowline or when need to start soaping

14) Approximate Saltwater Depths: 1,740'

15) Approximate Coal Seam Depths: Sewickly Coal - 564' and Pittsburgh Coal - 654'

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

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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WV Department of
Environmental Protection

WW-6B
(04/15)

API NO. 47- 051 - _____
 OPERATOR WELL NO. Yoder W-1HM
 Well Pad Name: Yoder

18) CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	125'	120'	259FT^3(CTS)
Fresh Water	13 3/8"	NEW	H40	48#	810'	800'	906ft^3(CTS)
Coal	13 3/8"	NEW	H40	48#	810'	800'	906ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,614'	2,604'	844ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	15,560'	15,550'	3,971ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,281'	
Liners							

Ju
4/12/17

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17.5"	.33	1,730	1,384	SEE #24	1.2
Coal	13 3/8"	17.5"	.33	1,730	1,384	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE#24	1.19
Production	5 1/2"	8 7/8_8 3/4	.361	12,640	10,112	SEE#24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners							

PACKERS

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

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WW-6B
(10/14)

API NO. 47-051 - _____
OPERATOR WELL NO. Yoder W-1HM
Well Pad Name: Yoder

4/12/17

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

Drill through the Marcellus and TD Pilot Hole 100' into the Onondaga. Log vertical section and run a solid cement plug back to proposed KOP. Drill curve and lateral per proposed well plan, run and cement production casing. Perform CBL from 60 deg to surface, make cleanout run, and stimulate.

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

Well to be completed with approximately 21,375,000 lb proppant and 585,268 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

470570111

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 19.66

22) Area to be disturbed for well pad only, less access road (acres): 4.36

23) Describe centralizer placement for each casing string:

Will run 3 centralizers on surface casing at equal distance. Intermediate will have 1 centralizer every other joint. Production casing will have one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

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

*See Attachment

25) Proposed borehole conditioning procedures:

Will circulate a minimum of 3 hours at TD, short trip to curve, circulate bottoms up, check for flow, POOH

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*Note: Attach additional sheets as needed.

WW6B Attachment to #24 – YODER W-1HM

Conductor and Surface Casing Cement:

Premium NE-1 + 2% CaCl

- Premium NE-1 – Class A Portland API Spec
- CaCl – Calcium Chloride

Intermediate Casing:

Premium NE-1 + 2% bwoc CaCl₂ + 46.5% Fresh Water

- Premium NE-1 – Class A Portland API spec
- CaCl₂ – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

4708101127

Kick Off Plug:

Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L + 38% Fresh Water

- Class H – Increased Compressive Strength Cement
- Sodium Metasilicate – Free Water Control; Early Strength Additive
- R-3 – Cement Retarder
- FP-13L – Anti-Foaming Agent
- CaCl₂ – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

Production Casing Cement:

Lead: *50:50 (Poz:Premium NE-1) + .2% R-3 + .2% MPA-170 + .75 gal/100sk FP-13L*

Tail: *Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L*

- Poz – Fly Ash
- Premium NE-1 – Class A Portland API spec
- R-3 – Cement Retarder
- MPA-170 – Gelling Agent
- FP-13L – Anti-Foaming Agent
- ASA-301 – Free Water Control Agent
- BA-10A – Bonding Agent
- ASCA-1 – Solubility Additive

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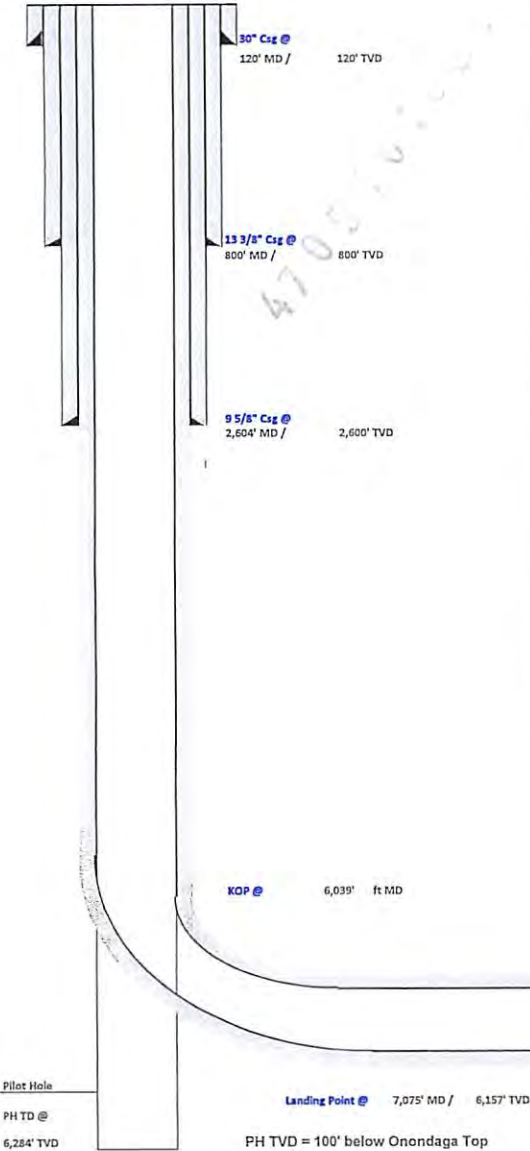


WELL NAME:	Yoder W-1HM	
STATE:	West Virginia	COUNTY: Marshall
DISTRICT:	Franklin	
KB Elev:		GL Elev: 1,084'
TD:	15,550'	
TH Latitude:	39.78054955	
TH Longitude:	-80.84004615	
BH Latitude:	39.75826186	
BH Longitude:	-80.83143976	

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	661
Sewickley Coal	564
Pittsburgh Coal	654
Big Lime	1790
Weir	2140
Berea	2330
Gordon	2675
Rhinestreet	5589
Genesee/Burkett	6072
Tully	6087
Hamilton	6100
Marcellus	6129
Landing Depth	6157
Onondaga	6184
Pilot Hole Depth	6284

CASING SUMMARY							
Type	Hole Size (in)	Csg. Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36"	30"	120'	120'	BW	BW	Surface
Surface	17 1/2"	13 3/8"	800'	800'	48	H40	Surface
Intermediate 1	12 1/4"	9 5/8"	2,604'	2,600'	36	J55	Surface
Production	8 7/8" x 8 3/4"	5 1/2"	15,550'	6,305'	20	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	901	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	842	A	15	Air	1 Centralizer every other jt
Production	3,503	A	14.5	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



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Jan 4/12/17

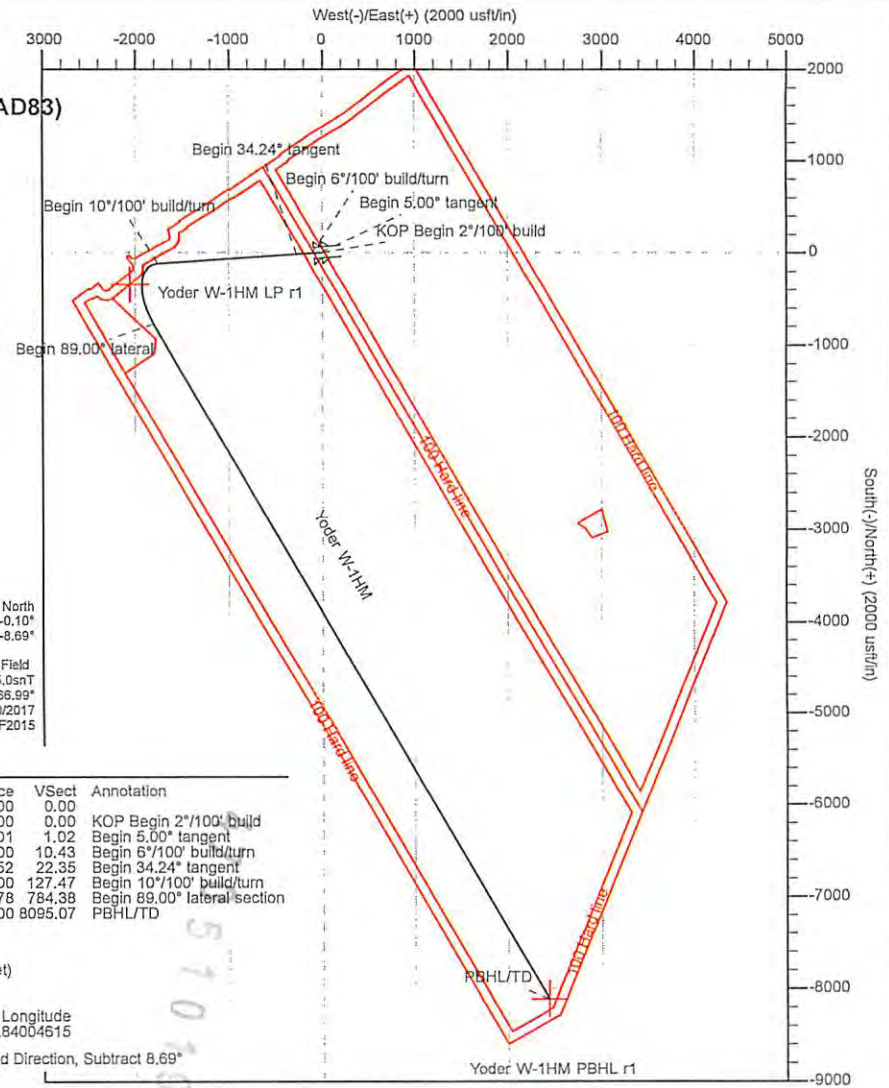
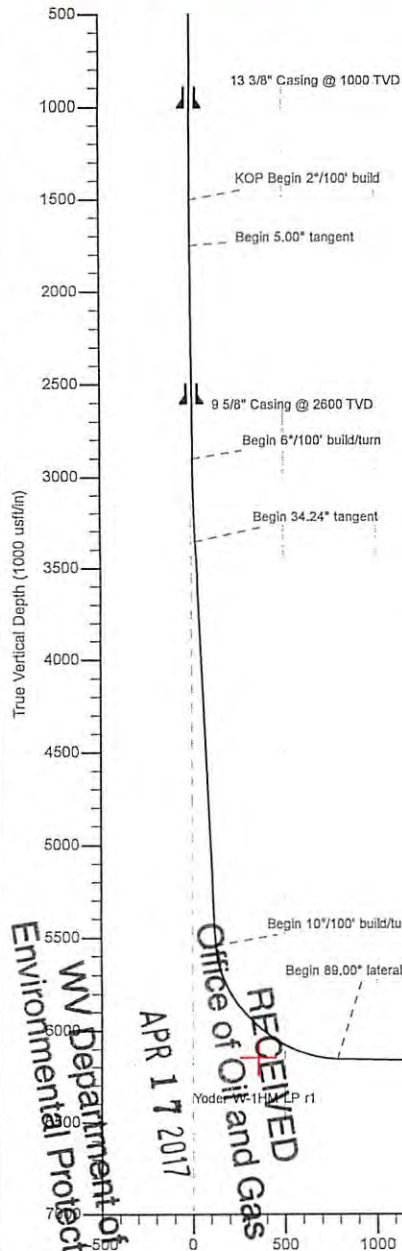
Pilot Hole
 PH TD @ 6,284' TVD
 PH TVD = 100' below Onondaga Top
 Landing Point @ 7,075' MD / 6,157' TVD

Lateral TD @ 15,550' ft MD
 6,305' ft TVD



TUG HILL
OPERATING

Tug Hill Operating LLC
Well: Yoder W-1HM
Site: Yoder
Project: Wetzel County, West Virginia (UTM17 NAD83)
Design: rev1



Azimuths to Grid North
True North: -0.10°
Magnetic North: -8.69°

Magnetic Field
Strength: 52215.0snT
Dip Angle: 68.99°
Date: 3/20/2017
Model: IGRF2015

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	1750.00	5.00	265.01	1749.68	-0.95	-10.86	2.00	265.01	1.02	Begin 5.00° tangent
4	2904.71	5.00	265.01	2900.00	-9.70	-111.12	0.00	0.00	10.43	Begin 6°/100' build/turn
5	3392.01	34.24	266.33	3354.05	-20.57	-272.59	6.00	1.52	22.35	Begin 34.24° tangent
6	6039.18	34.24	266.33	5542.52	-116.01	-1758.86	0.00	0.00	127.47	Begin 10°/100' build/turn
7	7075.12	89.00	150.00	6157.09	-772.65	-1803.65	10.00	-112.78	784.38	Begin 89.00° lateral section
8	15550.12	89.00	150.00	6305.00	-8111.10	2433.20	0.00	0.00	8095.07	PBHL/TD

Surface Location: GL @ 1086.00usft
Universal Transverse Mercator (US Survey Feet)
NAD83 West Virginia - HARN
Zone 17N (84 W to 78 W)

Northing: 14446864.35
Easting: 1685354.97
Latitude: 39.78054955
Longitude: -80.84004615

Total Correction (M => G) To convert a Magnetic Direction to a Grid Direction, Subtract 8.69°

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Area of Review

Sources of information to Support 35CSR8 - 5.11: 9.3 et seq.

Description of process to identify potential pathways for well communication during hydraulic fracturing activities.

Data Sources Reviewed:

1. IHS Well Data service: Public nationwide data service that pulls directly from State agency Oil and Gas databases
2. Farm Maps
3. Topo Maps: Recent and older (contact WVGES)
4. Check with DPS

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (7/15/2016) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

1. Wellbore with IHS All Wells Layer
2. Map with Farm lines overlain and any well spots identified on Farm Maps
3. More recent (1970s vintage) topos and older topos

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Discussion with Phil Dinterman WVGES GIS Department (7/15/2016)

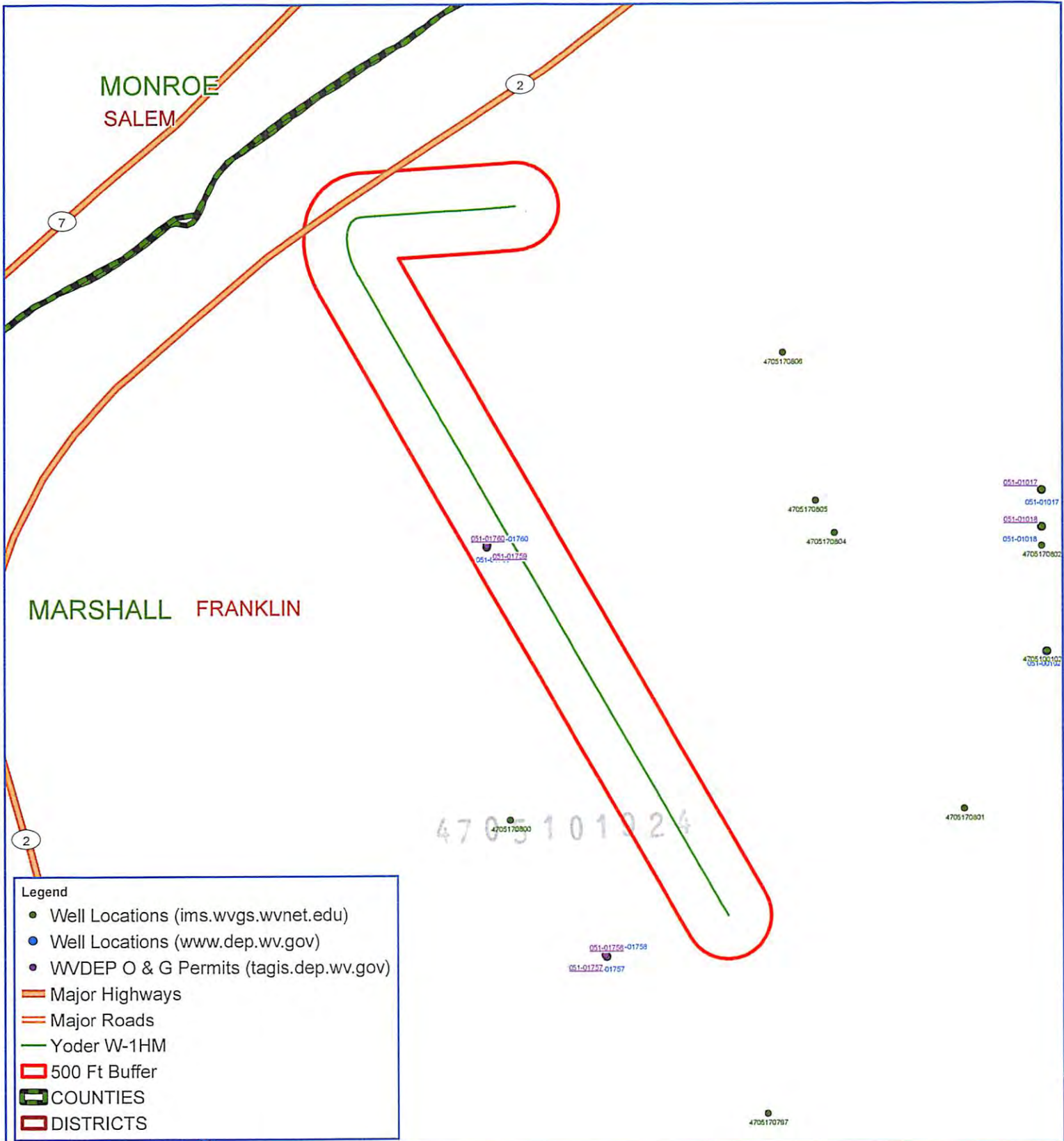
- WVGES has plotted every well spot they have access to and are aware of with that contains a coordinate. 30000, 70000, and 90000 series wells are available via the WVGES online map. Some locations aren't great due to vintage and manipulation of maps through time
- 30000 series – any well drilled prior to 1929 – APIs were not assigned to original wells
- 70000 series – Well spots pulled from old Farm line maps that the WVGES has access to
- 90000 series – Any sources that the WVGES has access that shows a well spot but has no additional supporting information. DEP does not have 90000 series on their maps.
- There can be duplication between wells in the 3 series
- Phil indicated that other Operators are providing a screenshot of the WVGES map with their planned well and using that for permits

Permit well - Yoder W-1HM
 Wells within 500' Buffer

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705101759	Gastar	N/A	N/A	N/A	NO	Permitted Marcellus well, never drilled
4705101760	Gastar	N/A	N/A	N/A	NO	Permitted Marcellus well, never drilled

4705101921

5.11. Area of Review-- The permittee shall review the area surrounding the proposed well pad so as to identify and evaluate potential conduits for unintended fracture propagation, a report of which the permittee shall provide to the Office with the application for well work. All existing active, plugged, abandoned, and undocumented wells within a five hundred feet (500') radius of the surface location of the well that is the subject of the new application and within a five hundred feet (500') radius of the lateral section of the wellbore shall be considered for the potential of unintended fracture propagation. The report shall detail those wells that are known or reasonably expected to penetrate a depth that could be within the range of the fracture propagation. The detail shall include at a minimum the API number, operator name, total depth, perforated formation(s) and producing zones not perforated.

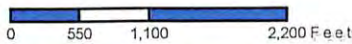


Legend

- Well Locations (ims.wvgs.wvnet.edu)
- Well Locations (www.dep.wv.gov)
- WVDEP O & G Permits (tagis.dep.wv.gov)
- Major Highways
- Major Roads
- Yoder W-1HM
- ▭ 500 Ft Buffer
- ▭ COUNTIES
- ▭ DISTRICTS



Yoder W-1HM Franklin District Marshall County, WV



Map Created: March 22, 2017
Map Current As Of: March 22, 2017

Notes:
All locations are approximate and are for visualization purposes only.

Map Prepared by:

Page 3 of 3



Planning Report - Geographic

Database:	DB Jul2216dt	Local Co-ordinate Reference:	Well Yoder W-1HM
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1086.00usft
Project:	Wetzel County, West Virginia (UTM17 NAD83)	MD Reference:	GL @ 1086.00usft
Site:	Yoder	North Reference:	Grid
Well:	Yoder W-1HM	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Project	Wetzel County, West Virginia (UTM17 NAD83)		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD83 West Virginia - HARN		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	Yoder				
Site Position:		Northing:	14,446,864.35 usft	Latitude:	39.78054955
From:	Lat/Long	Easting:	1,685,354.97 usft	Longitude:	-80.84004615
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.10 °

Well	Yoder W-1HM					
Well Position	+N/-S	0.00 usft	Northing:	14,446,864.35 usft	Latitude:	39.78054955
	+E/-W	0.00 usft	Easting:	1,685,354.97 usft	Longitude:	-80.84004615
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	1,086.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/20/2017	-8.59	66.99	52,215

Design	rev1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	180.37	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,750.00	5.00	265.01	1,749.68	-0.95	-10.86	2.00	2.00	0.00	265.01	
2,904.71	5.00	265.01	2,900.00	-9.70	-111.12	0.00	0.00	0.00	0.00	
3,392.01	34.24	266.33	3,354.05	-20.57	-272.59	6.00	6.00	0.27	1.52	
6,039.18	34.24	266.33	5,542.52	-116.01	-1,758.86	0.00	0.00	0.00	0.00	
7,075.12	89.00	150.00	6,157.09	-772.65	-1,803.65	10.00	5.29	-11.23	-112.78	
15,550.12	89.00	150.00	6,305.00	-8,111.10	2,433.20	0.00	0.00	0.00	0.00	Yoder W-1HM PBHL r

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 COMPASS 5000.1 Build 81B
 07/21/2017



Planning Report - Geographic

Database: DB Jul216dt
 Company: Tug Hill Operating LLC
 Project: Wetzel County, West Virginia (UTM17 NAD83)
 Site: Yoder
 Well: Yoder W-1HM
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Yoder W-1HM
 TVD Reference: GL @ 1086.00usft
 MD Reference: GL @ 1086.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
100.00	0.00	0.00	100.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
200.00	0.00	0.00	200.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
300.00	0.00	0.00	300.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
400.00	0.00	0.00	400.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
500.00	0.00	0.00	500.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
600.00	0.00	0.00	600.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
700.00	0.00	0.00	700.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
800.00	0.00	0.00	800.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
900.00	0.00	0.00	900.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,446,864.35	1,685,354.97	39.78054955	-80.84004615
KOP Begin 2°/100' build									
1,600.00	2.00	265.01	1,599.98	-0.15	-1.74	14,446,864.20	1,685,353.23	39.78054914	-80.84005234
1,700.00	4.00	265.01	1,699.84	-0.61	-6.95	14,446,863.75	1,685,348.02	39.78054792	-80.84007090
1,750.00	5.00	265.01	1,749.68	-0.95	-10.86	14,446,863.41	1,685,344.11	39.78054700	-80.84008481
Begin 5.00° tangent									
1,800.00	5.00	265.01	1,799.49	-1.33	-15.20	14,446,863.03	1,685,339.77	39.78054598	-80.84010027
1,900.00	5.00	265.01	1,899.11	-2.09	-23.88	14,446,862.27	1,685,331.09	39.78054394	-80.84013118
2,000.00	5.00	265.01	1,998.73	-2.84	-32.57	14,446,861.51	1,685,322.40	39.78054190	-80.84016209
2,100.00	5.00	265.01	2,098.35	-3.60	-41.25	14,446,860.75	1,685,313.72	39.78053986	-80.84019300
2,200.00	5.00	265.01	2,197.97	-4.36	-49.93	14,446,859.99	1,685,305.04	39.78053782	-80.84022391
2,300.00	5.00	265.01	2,297.59	-5.12	-58.61	14,446,859.24	1,685,296.36	39.78053578	-80.84025481
2,400.00	5.00	265.01	2,397.21	-5.88	-67.30	14,446,858.48	1,685,287.67	39.78053374	-80.84028572
2,500.00	5.00	265.01	2,496.83	-6.63	-75.98	14,446,857.72	1,685,278.99	39.78053171	-80.84031663
2,600.00	5.00	265.01	2,596.45	-7.39	-84.66	14,446,856.96	1,685,270.31	39.78052967	-80.84034754
2,700.00	5.00	265.01	2,696.07	-8.15	-93.34	14,446,856.20	1,685,261.63	39.78052763	-80.84037845
2,800.00	5.00	265.01	2,795.69	-8.91	-102.03	14,446,855.45	1,685,252.94	39.78052559	-80.84040936
2,900.00	5.00	265.01	2,895.31	-9.67	-110.71	14,446,854.69	1,685,244.26	39.78052355	-80.84044027
2,904.71	5.00	265.01	2,900.00	-9.70	-111.12	14,446,854.65	1,685,243.85	39.78052345	-80.84044173
Begin 6°/100' build/tum									
3,000.00	10.72	265.82	2,994.35	-10.71	-124.10	14,446,853.64	1,685,230.87	39.78052075	-80.84048795
3,100.00	16.72	266.08	3,091.46	-12.37	-147.74	14,446,851.98	1,685,207.23	39.78051630	-80.84057211
3,200.00	22.72	266.20	3,185.55	-14.64	-181.39	14,446,849.72	1,685,173.58	39.78051025	-80.84069188
3,300.00	28.72	266.28	3,275.61	-17.47	-224.67	14,446,846.88	1,685,130.30	39.78050266	-80.84084594
3,392.01	34.24	266.33	3,354.05	-20.57	-272.59	14,446,843.78	1,685,082.38	39.78049439	-80.84101654
Begin 34.24° tangent									
3,400.00	34.24	266.33	3,360.65	-20.86	-277.08	14,446,843.50	1,685,077.89	39.78049362	-80.84103251
3,500.00	34.24	266.33	3,443.33	-24.46	-333.22	14,446,839.89	1,685,021.75	39.78048399	-80.84123237
3,600.00	34.24	266.33	3,526.00	-28.07	-389.37	14,446,836.28	1,684,965.60	39.78047437	-80.84143224
3,700.00	34.24	266.33	3,608.67	-31.68	-445.51	14,446,832.68	1,684,909.46	39.78046474	-80.84163211
3,800.00	34.24	266.33	3,691.34	-35.28	-501.66	14,446,829.07	1,684,853.31	39.78045511	-80.84183198
3,900.00	34.24	266.33	3,774.01	-38.89	-557.80	14,446,825.47	1,684,797.17	39.78044548	-80.84203185
4,000.00	34.24	266.33	3,856.69	-42.49	-613.95	14,446,821.86	1,684,741.02	39.78043585	-80.84223171
4,100.00	34.24	266.33	3,939.36	-46.10	-670.10	14,446,818.26	1,684,684.88	39.78042622	-80.84243158
4,200.00	34.24	266.33	4,022.03	-49.70	-726.24	14,446,814.65	1,684,628.73	39.78041659	-80.84263144
4,300.00	34.24	266.33	4,104.70	-53.31	-782.39	14,446,811.05	1,684,572.58	39.78040696	-80.84283131
4,400.00	34.24	266.33	4,187.38	-56.91	-838.53	14,446,807.44	1,684,516.44	39.78039733	-80.84303118
4,500.00	34.24	266.33	4,270.05	-60.52	-894.68	14,446,803.84	1,684,460.29	39.78038769	-80.84323104

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Planning Report - Geographic

Database: DB Jul2216dt
 Company: Tug Hill Operating LLC
 Project: Wetzel County, West Virginia (UTM17 NAD83)
 Site: Yoder
 Well: Yoder W-1HM
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Yoder W-1HM
 TVD Reference: GL @ 1086.00usft
 MD Reference: GL @ 1086.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,600.00	34.24	266.33	4,352.72	-64.12	-950.82	14,446,800.23	1,684,404.15	39.78037806	-80.84343091
4,700.00	34.24	266.33	4,435.39	-67.73	-1,006.97	14,446,796.62	1,684,348.00	39.78036843	-80.84363077
4,800.00	34.24	266.33	4,518.06	-71.34	-1,063.11	14,446,793.02	1,684,291.86	39.78035880	-80.84383064
4,900.00	34.24	266.33	4,600.74	-74.94	-1,119.26	14,446,789.41	1,684,235.71	39.78034917	-80.84403051
5,000.00	34.24	266.33	4,683.41	-78.55	-1,175.41	14,446,785.81	1,684,179.56	39.78033953	-80.84423037
5,100.00	34.24	266.33	4,766.08	-82.15	-1,231.55	14,446,782.20	1,684,123.42	39.78032990	-80.84443024
5,200.00	34.24	266.33	4,848.75	-85.76	-1,287.70	14,446,778.60	1,684,067.27	39.78032026	-80.84463011
5,300.00	34.24	266.33	4,931.42	-89.36	-1,343.84	14,446,774.99	1,684,011.13	39.78031063	-80.84482997
5,400.00	34.24	266.33	5,014.10	-92.97	-1,399.99	14,446,771.39	1,683,954.98	39.78030100	-80.84502984
5,500.00	34.24	266.33	5,096.77	-96.57	-1,456.13	14,446,767.78	1,683,898.84	39.78029136	-80.84522970
5,600.00	34.24	266.33	5,179.44	-100.18	-1,512.28	14,446,764.18	1,683,842.69	39.78028173	-80.84542957
5,700.00	34.24	266.33	5,262.11	-103.78	-1,568.42	14,446,760.57	1,683,786.55	39.78027209	-80.84562944
5,800.00	34.24	266.33	5,344.78	-107.39	-1,624.57	14,446,756.96	1,683,730.40	39.78026245	-80.84582930
5,900.00	34.24	266.33	5,427.46	-111.00	-1,680.72	14,446,753.36	1,683,674.25	39.78025282	-80.84602917
6,000.00	34.24	266.33	5,510.13	-114.60	-1,736.86	14,446,749.75	1,683,618.11	39.78024318	-80.84622903
6,039.18	34.24	266.33	5,542.52	-116.01	-1,758.86	14,446,748.34	1,683,596.11	39.78023940	-80.84630734
Begin 10°/100° build/turn									
6,100.00	32.31	255.80	5,593.41	-121.10	-1,791.72	14,446,743.25	1,683,563.25	39.78022558	-80.84642434
6,200.00	31.27	236.85	5,678.62	-141.91	-1,839.48	14,446,722.45	1,683,515.49	39.78016867	-80.84659447
6,300.00	33.04	218.29	5,763.49	-177.58	-1,878.20	14,446,686.77	1,683,476.77	39.78007088	-80.84673251
6,400.00	37.21	202.44	5,845.43	-227.05	-1,906.71	14,446,637.30	1,683,448.26	39.77993516	-80.84683427
6,500.00	43.08	189.84	5,921.97	-288.80	-1,924.13	14,446,575.55	1,683,430.84	39.77976565	-80.84689665
6,600.00	50.05	179.94	5,990.77	-360.97	-1,929.94	14,446,503.39	1,683,425.03	39.77956749	-80.84691777
6,700.00	57.70	171.95	6,049.74	-441.35	-1,923.96	14,446,423.00	1,683,431.01	39.77934671	-80.84689697
6,800.00	65.78	165.24	6,097.09	-527.51	-1,906.37	14,446,336.85	1,683,448.60	39.77911002	-80.84683490
6,900.00	74.11	159.34	6,131.39	-616.82	-1,877.71	14,446,247.53	1,683,477.26	39.77886460	-80.84673344
7,000.00	82.59	153.92	6,151.58	-706.58	-1,838.85	14,446,157.77	1,683,516.12	39.77861791	-80.84659567
7,075.12	89.00	150.00	6,157.09	-772.65	-1,803.65	14,446,091.70	1,683,551.32	39.77843630	-80.84647078
Begin 89.00° lateral section									
7,100.00	89.00	150.00	6,157.53	-794.20	-1,791.21	14,446,070.16	1,683,563.76	39.77837707	-80.84642664
7,200.00	89.00	150.00	6,159.27	-880.79	-1,741.22	14,445,983.57	1,683,613.75	39.77813904	-80.84624923
7,300.00	89.00	150.00	6,161.02	-967.37	-1,691.23	14,445,896.98	1,683,663.74	39.77790100	-80.84607183
7,400.00	89.00	150.00	6,162.76	-1,053.96	-1,641.24	14,445,810.39	1,683,713.73	39.77766297	-80.84589442
7,500.00	89.00	150.00	6,164.51	-1,140.55	-1,591.24	14,445,723.80	1,683,763.73	39.77742493	-80.84571702
7,600.00	89.00	150.00	6,166.25	-1,227.14	-1,541.25	14,445,637.21	1,683,813.72	39.77718689	-80.84553961
7,700.00	89.00	150.00	6,168.00	-1,313.73	-1,491.26	14,445,550.62	1,683,863.71	39.77694886	-80.84536221
7,800.00	89.00	150.00	6,169.74	-1,400.32	-1,441.27	14,445,464.03	1,683,913.70	39.77671082	-80.84518481
7,900.00	89.00	150.00	6,171.49	-1,486.91	-1,391.27	14,445,377.44	1,683,963.70	39.77647278	-80.84500741
8,000.00	89.00	150.00	6,173.23	-1,573.50	-1,341.28	14,445,290.85	1,684,013.69	39.77623475	-80.84483001
8,100.00	89.00	150.00	6,174.98	-1,660.09	-1,291.29	14,445,204.26	1,684,063.68	39.77599671	-80.84465262
8,200.00	89.00	150.00	6,176.72	-1,746.68	-1,241.30	14,445,117.68	1,684,113.67	39.77575867	-80.84447522
8,300.00	89.00	150.00	6,178.47	-1,833.27	-1,191.31	14,445,031.09	1,684,163.67	39.77552063	-80.84429783
8,400.00	89.00	150.00	6,180.21	-1,919.86	-1,141.31	14,444,944.50	1,684,213.66	39.77528260	-80.84412043
8,500.00	89.00	150.00	6,181.96	-2,006.45	-1,091.32	14,444,857.91	1,684,263.65	39.77504456	-80.84394304
8,600.00	89.00	150.00	6,183.70	-2,093.04	-1,041.33	14,444,771.32	1,684,313.64	39.77480652	-80.84376565
8,700.00	89.00	150.00	6,185.45	-2,179.63	-991.34	14,444,684.73	1,684,363.63	39.77456848	-80.84358825
8,800.00	89.00	150.00	6,187.19	-2,266.22	-941.34	14,444,598.14	1,684,413.63	39.77433044	-80.84341087
8,900.00	89.00	150.00	6,188.94	-2,352.80	-891.35	14,444,511.55	1,684,463.62	39.77409240	-80.84323348
9,000.00	89.00	150.00	6,190.68	-2,439.39	-841.36	14,444,424.96	1,684,513.61	39.77385436	-80.84305610
9,100.00	89.00	150.00	6,192.43	-2,525.98	-791.37	14,444,338.37	1,684,563.60	39.77361632	-80.84287871
9,200.00	89.00	150.00	6,194.18	-2,612.57	-741.37	14,444,251.78	1,684,613.60	39.77337828	-80.84270133
9,300.00	89.00	150.00	6,195.92	-2,699.16	-691.38	14,444,165.19	1,684,663.59	39.77314024	-80.84252395
9,400.00	89.00	150.00	6,197.67	-2,785.75	-641.39	14,444,078.60	1,684,713.58	39.77290220	-80.84234656

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 COMPASS 5000.1 Build 81B
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Planning Report - Geographic

Database: DB Jul2216dt
 Company: Tug Hill Operating LLC
 Project: Wetzel County, West Virginia (UTM17 NAD83)
 Site: Yoder
 Well: Yoder W-1HM
 Wellbore: Original Hole
 Design: rev1

Local Co-ordinate Reference: Well Yoder W-1HM
 TVD Reference: GL @ 1086.00usft
 MD Reference: GL @ 1086.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,500.00	89.00	150.00	6,199.41	-2,872.34	-591.40	14,443,992.01	1,684,763.57	39.77266416	-80.84216918
9,600.00	89.00	150.00	6,201.16	-2,958.93	-541.40	14,443,905.42	1,684,813.57	39.77242611	-80.84199181
9,700.00	89.00	150.00	6,202.90	-3,045.52	-491.41	14,443,818.83	1,684,863.56	39.77218807	-80.84181443
9,800.00	89.00	150.00	6,204.65	-3,132.11	-441.42	14,443,732.25	1,684,913.55	39.77195003	-80.84163705
9,900.00	89.00	150.00	6,206.39	-3,218.70	-391.43	14,443,645.66	1,684,963.54	39.77171199	-80.84145968
10,000.00	89.00	150.00	6,208.14	-3,305.29	-341.43	14,443,559.07	1,685,013.54	39.77147395	-80.84128230
10,100.00	89.00	150.00	6,209.88	-3,391.88	-291.44	14,443,472.48	1,685,063.53	39.77123590	-80.84110493
10,200.00	89.00	150.00	6,211.63	-3,478.47	-241.45	14,443,385.89	1,685,113.52	39.77099786	-80.84092756
10,300.00	89.00	150.00	6,213.37	-3,565.06	-191.46	14,443,299.30	1,685,163.51	39.77075982	-80.84075019
10,400.00	89.00	150.00	6,215.12	-3,651.64	-141.46	14,443,212.71	1,685,213.51	39.77052177	-80.84057282
10,500.00	89.00	150.00	6,216.86	-3,738.23	-91.47	14,443,126.12	1,685,263.50	39.77028373	-80.84039545
10,600.00	89.00	150.00	6,218.61	-3,824.82	-41.48	14,443,039.53	1,685,313.49	39.77004568	-80.84021809
10,700.00	89.00	150.00	6,220.35	-3,911.41	8.51	14,442,952.94	1,685,363.48	39.76980764	-80.84004072
10,800.00	89.00	150.00	6,222.10	-3,998.00	58.50	14,442,866.35	1,685,413.47	39.76956959	-80.83986336
10,900.00	89.00	150.00	6,223.84	-4,084.59	108.50	14,442,779.76	1,685,463.47	39.76933155	-80.83968599
11,000.00	89.00	150.00	6,225.59	-4,171.18	158.49	14,442,693.17	1,685,513.46	39.76909350	-80.83950863
11,100.00	89.00	150.00	6,227.33	-4,257.77	208.48	14,442,606.58	1,685,563.45	39.76885546	-80.83933127
11,200.00	89.00	150.00	6,229.08	-4,344.36	258.47	14,442,519.99	1,685,613.44	39.76861741	-80.83915391
11,300.00	89.00	150.00	6,230.83	-4,430.95	308.47	14,442,433.41	1,685,663.44	39.76837936	-80.83897655
11,400.00	89.00	150.00	6,232.57	-4,517.54	358.46	14,442,346.82	1,685,713.43	39.76814132	-80.83879920
11,500.00	89.00	150.00	6,234.32	-4,604.13	408.45	14,442,260.23	1,685,763.42	39.76790327	-80.83862184
11,600.00	89.00	150.00	6,236.06	-4,690.72	458.44	14,442,173.64	1,685,813.41	39.76766522	-80.83844449
11,700.00	89.00	150.00	6,237.81	-4,777.31	508.44	14,442,087.05	1,685,863.41	39.76742718	-80.83826713
11,800.00	89.00	150.00	6,239.55	-4,863.90	558.43	14,442,000.46	1,685,913.40	39.76718913	-80.83808978
11,900.00	89.00	150.00	6,241.30	-4,950.49	608.42	14,441,913.87	1,685,963.39	39.76695108	-80.83791243
12,000.00	89.00	150.00	6,243.04	-5,037.07	658.41	14,441,827.28	1,686,013.38	39.76671303	-80.83773508
12,100.00	89.00	150.00	6,244.79	-5,123.66	708.41	14,441,740.69	1,686,063.38	39.76647498	-80.83755773
12,200.00	89.00	150.00	6,246.53	-5,210.25	758.40	14,441,654.10	1,686,113.37	39.76623693	-80.83738039
12,300.00	89.00	150.00	6,248.28	-5,296.84	808.39	14,441,567.51	1,686,163.36	39.76599889	-80.83720304
12,400.00	89.00	150.00	6,250.02	-5,383.43	858.38	14,441,480.92	1,686,213.35	39.76576084	-80.83702570
12,500.00	89.00	150.00	6,251.77	-5,470.02	908.38	14,441,394.33	1,686,263.35	39.76552279	-80.83684835
12,600.00	89.00	150.00	6,253.51	-5,556.61	958.37	14,441,307.74	1,686,313.34	39.76528474	-80.83667101
12,700.00	89.00	150.00	6,255.26	-5,643.20	1,008.36	14,441,221.15	1,686,363.33	39.76504669	-80.83649367
12,800.00	89.00	150.00	6,257.00	-5,729.79	1,058.35	14,441,134.56	1,686,413.32	39.76480864	-80.83631633
12,900.00	89.00	150.00	6,258.75	-5,816.38	1,108.34	14,441,047.97	1,686,463.32	39.76457058	-80.83613899
13,000.00	89.00	150.00	6,260.49	-5,902.97	1,158.34	14,440,961.39	1,686,513.31	39.76433253	-80.83596165
13,100.00	89.00	150.00	6,262.24	-5,989.56	1,208.33	14,440,874.80	1,686,563.30	39.76409448	-80.83578432
13,200.00	89.00	150.00	6,263.98	-6,076.15	1,258.32	14,440,788.21	1,686,613.29	39.76385643	-80.83560698
13,300.00	89.00	150.00	6,265.73	-6,162.74	1,308.31	14,440,701.62	1,686,663.28	39.76361838	-80.83542964
13,400.00	89.00	150.00	6,267.48	-6,249.33	1,358.31	14,440,615.03	1,686,713.28	39.76338033	-80.83525232
13,500.00	89.00	150.00	6,269.22	-6,335.91	1,408.30	14,440,528.44	1,686,763.27	39.76314227	-80.83507499
13,600.00	89.00	150.00	6,270.97	-6,422.50	1,458.29	14,440,441.85	1,686,813.26	39.76290422	-80.83489766
13,700.00	89.00	150.00	6,272.71	-6,509.09	1,508.28	14,440,355.26	1,686,863.25	39.76266617	-80.83472033
13,800.00	89.00	150.00	6,274.46	-6,595.68	1,558.28	14,440,268.67	1,686,913.25	39.76242811	-80.83454300
13,900.00	89.00	150.00	6,276.20	-6,682.27	1,608.27	14,440,182.08	1,686,963.24	39.76219006	-80.83436567
14,000.00	89.00	150.00	6,277.95	-6,768.86	1,658.26	14,440,095.49	1,687,013.23	39.76195201	-80.83418834
14,100.00	89.00	150.00	6,279.69	-6,855.45	1,708.25	14,440,008.90	1,687,063.22	39.76171395	-80.83401102
14,200.00	89.00	150.00	6,281.44	-6,942.04	1,758.25	14,439,922.31	1,687,113.22	39.76147590	-80.83383370
14,300.00	89.00	150.00	6,283.18	-7,028.63	1,808.24	14,439,835.72	1,687,163.21	39.76123784	-80.83365638
14,400.00	89.00	150.00	6,284.93	-7,115.22	1,858.23	14,439,749.14	1,687,213.20	39.76099979	-80.83347906
14,500.00	89.00	150.00	6,286.67	-7,201.81	1,908.22	14,439,662.55	1,687,263.19	39.76076174	-80.83330174
14,600.00	89.00	150.00	6,288.42	-7,288.40	1,958.22	14,439,575.96	1,687,313.19	39.76052368	-80.83312442
14,700.00	89.00	150.00	6,290.16	-7,374.99	2,008.21	14,439,489.37	1,687,363.18	39.76028562	-80.83294711
14,800.00	89.00	150.00	6,291.91	-7,461.58	2,058.20	14,439,402.78	1,687,413.17	39.76004757	-80.83276979

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 COMPASS 5000.1 Build 81B
 07/21/2017



Planning Report - Geographic

Database:	DB Jul2216dt	Local Co-ordinate Reference:	Well Yoder W-1HM
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1086.00usft
Project:	Wetzel County, West Virginia (UTM17 NAD83)	MD Reference:	GL @ 1086.00usft
Site:	Yoder	North Reference:	Grid
Well:	Yoder W-1HM	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,900.00	89.00	150.00	6,293.65	-7,548.17	2,108.19	14,439,316.19	1,687,463.16	39.75980951	-80.83259248
15,000.00	89.00	150.00	6,295.40	-7,634.76	2,158.18	14,439,229.60	1,687,513.16	39.75957145	-80.83241516
15,100.00	89.00	150.00	6,297.14	-7,721.34	2,208.18	14,439,143.01	1,687,563.15	39.75933340	-80.83223785
15,200.00	89.00	150.00	6,298.89	-7,807.93	2,258.17	14,439,056.42	1,687,613.14	39.75909534	-80.83206054
15,300.00	89.00	150.00	6,300.64	-7,894.52	2,308.16	14,438,969.83	1,687,663.13	39.75885728	-80.83188323
15,400.00	89.00	150.00	6,302.38	-7,981.11	2,358.15	14,438,883.24	1,687,713.12	39.75861922	-80.83170593
15,500.00	89.00	150.00	6,304.13	-8,067.70	2,408.15	14,438,796.65	1,687,763.12	39.75838117	-80.83152862
15,550.11	89.00	150.00	6,305.00	-8,111.09	2,433.20	14,438,753.26	1,687,788.17	39.75826187	-80.83143977
PBHL/TD									
15,550.12	89.00	150.00	6,305.00	-8,111.10	2,433.20	14,438,753.26	1,687,788.17	39.75826186	-80.83143976

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Yoder W-1HM LP r1 - hit/miss target - Shape - Point	0.00	359.14	6,149.00	-342.37	-2,052.08	14,446,521.99	1,683,302.89	39.77961915	-80.84735238
- plan misses target center by 185.93usft at 6671.24usft MD (6033.89 TVD, -417.53 N, -1926.88 E)									
Yoder W-1HM PBHL r1 - plan hits target center - Point	0.00	359.15	6,305.00	-8,111.10	2,433.20	14,438,753.26	1,687,788.17	39.75826186	-80.83143976

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
120.00	120.00	Conductor @ 120 TVD	20	24	
1,000.00	1,000.00	13 3/8" Casing @ 1000 TVD	13-3/8	17-1/2	
2,603.57	2,600.00	9 5/8" Casing @ 2600 TVD	9-5/8	12-1/4	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
1,500.00	1,500.00	0.00	0.00	KOP Begin 2°/100' build
1,750.00	1,749.68	-0.95	-10.86	Begin 5.00° tangent
2,904.71	2,900.00	-9.70	-111.12	Begin 6°/100' build/turn
3,392.01	3,354.05	-20.57	-272.59	Begin 34.24° tangent
6,039.18	5,542.52	-116.01	-1,758.86	Begin 10°/100' build/turn
7,075.12	6,157.09	-772.65	-1,803.65	Begin 89.00° lateral section
15,550.11	6,305.00	-8,111.09	2,433.20	PBHL/TD

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 WV Department of
 Environmental Protection
 07/21/2017

WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Yoder W-1HM

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

Watershed (HUC 10) Fish Creek - Ohio River Quadrangle Powhatan Point 7.5'

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: AST Tanks with proper containment will be used for staging fresh water for frac and flow back water

Will a synthetic liner be used in the pit? Yes No If so, what ml.? AST Tanks will be used with proper containment

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number UIC 2459, UIC 965, UIC 359, UIC 2D0732540, UIC 2D0732523)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain _____)

Will closed loop system be used? If so, describe: Yes - For Vertical and Horizontal Drilling

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Air for vertical / Oil for Horizontal

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

Additives to be used in drilling medium? Barite for weight

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. All drill cuttings to be disposed of in a Landfill

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1386426)

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

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) Sean Gasser

Company Official Title Engineer

Subscribed and sworn before me this 10th day of April, 2017

Robin Bock

Notary

My commission expires 10-05-2020



Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 19.66 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	<u>26</u>	Tall Fescue	<u>40</u>
Spring Oats	<u>64</u>	Ladino Clover	<u>5</u>

Attach:

Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, include dimensions (L x W x D) of the pit, and dimensions (L x W), and area in acreage, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Jim Nicholas

Comments: _____

Title: Oil + Gas Inspector

Date: 4/12/17

Field Reviewed? () Yes () No

4705101924

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PROPOSED YODER W-1HM

REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

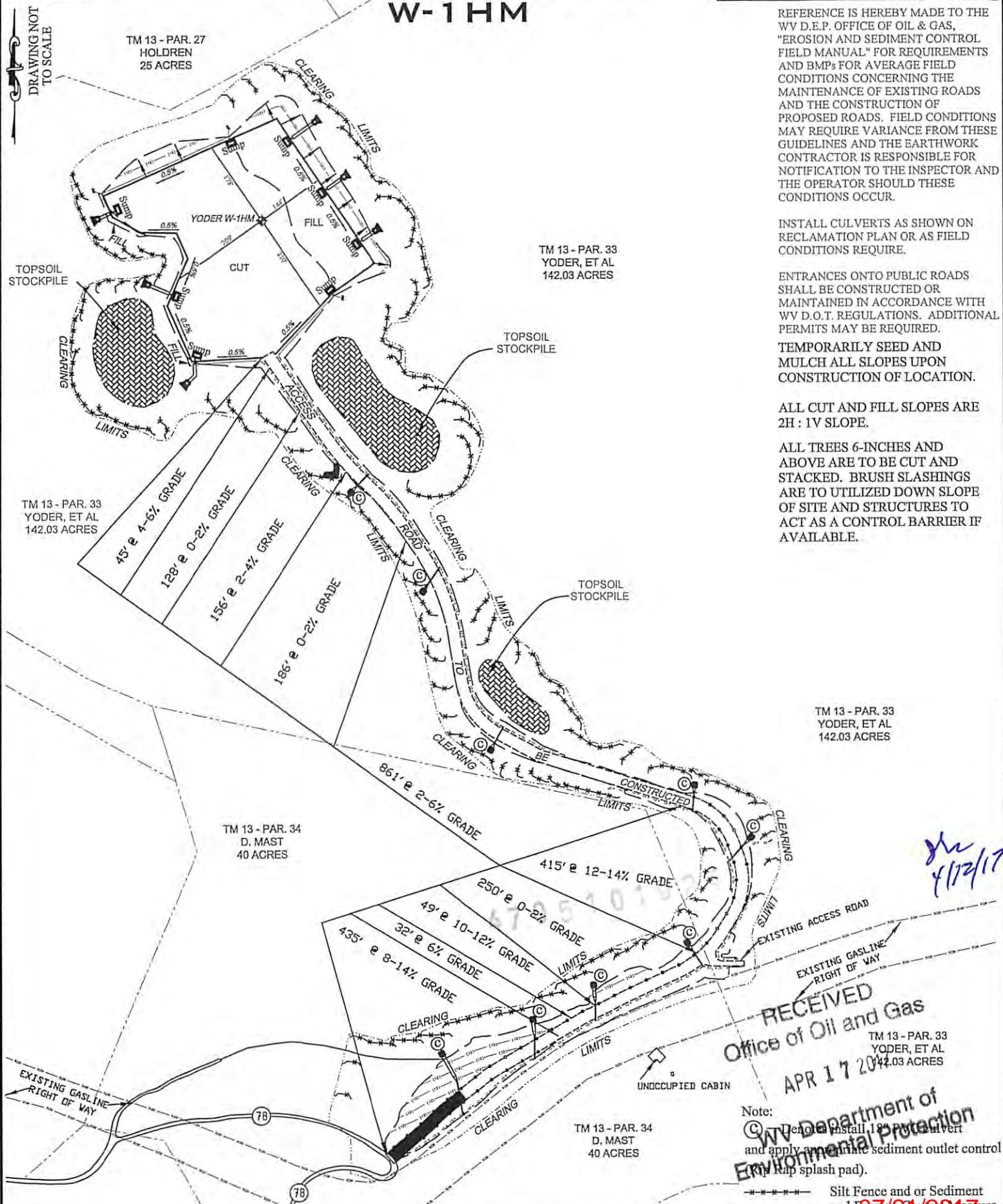
INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.

ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.



TM 13 - PAR. 33
YODER, ET AL
142.03 ACRES

TM 13 - PAR. 34
D. MAST
40 ACRES

TM 13 - PAR. 34
D. MAST
40 ACRES

JM
4/12/17

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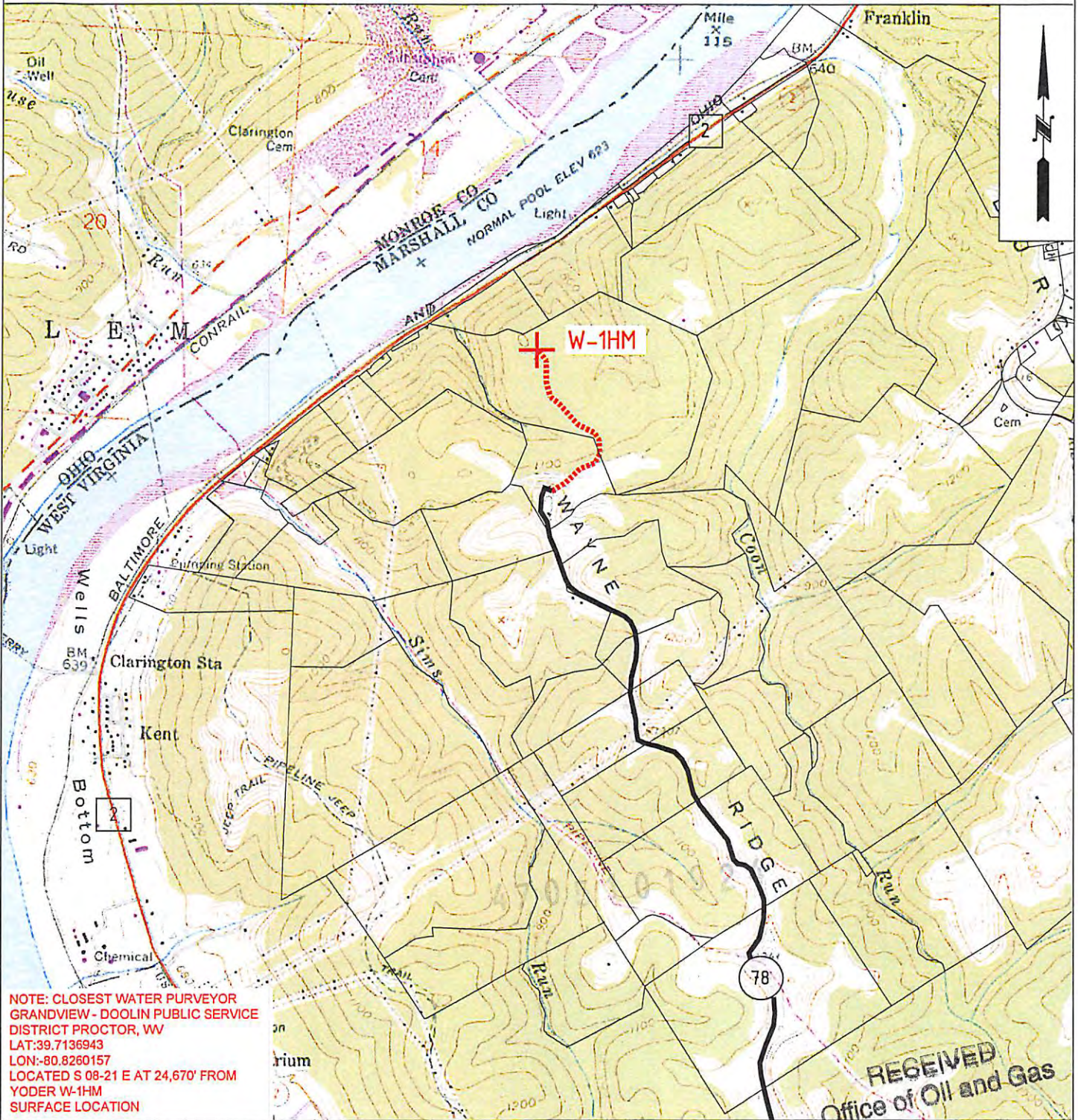
TM 13 - PAR. 33
YODER, ET AL
142.03 ACRES

Note:
 (C) - Operator to install 18" pipe culvert and apply silt fence and sediment outlet control (rap splash pad).

***** Silt Fence and or Sediment and Erosion Control Measure.

07/27/2017

PROPOSED YODER W-1HM



NOTE: CLOSEST WATER PURVEYOR
 GRANDVIEW - DOOLIN PUBLIC SERVICE
 DISTRICT PROCTOR, WV
 LAT: 39.7136943
 LON: -80.8260157
 LOCATED S 08-21 E AT 24,670' FROM
 YODER W-1HM
 SURFACE LOCATION

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 TUG HILL OPERATING	OPERATOR 163-697(CEC) TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	TOPO SECTION POWHATAN POINT 7.5' SCALE: 1" = 2000'	LEASE NAME 2017 YODER DATE: 07/09/2017
	RECEIVED Office of Oil and Gas		
	RECEIVED West Virginia Department of Environmental Protection DATE: 07/09/2017		



TUG HILL
OPERATING

Well Site Safety Plan

Tug Hill Operating, LLC

jmw
4/12/17

Well Name: Yoder W-1HM

Pad Location: Yoder Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing-4,403,413.06

Easting -513,697.22

March 2017

4705101924

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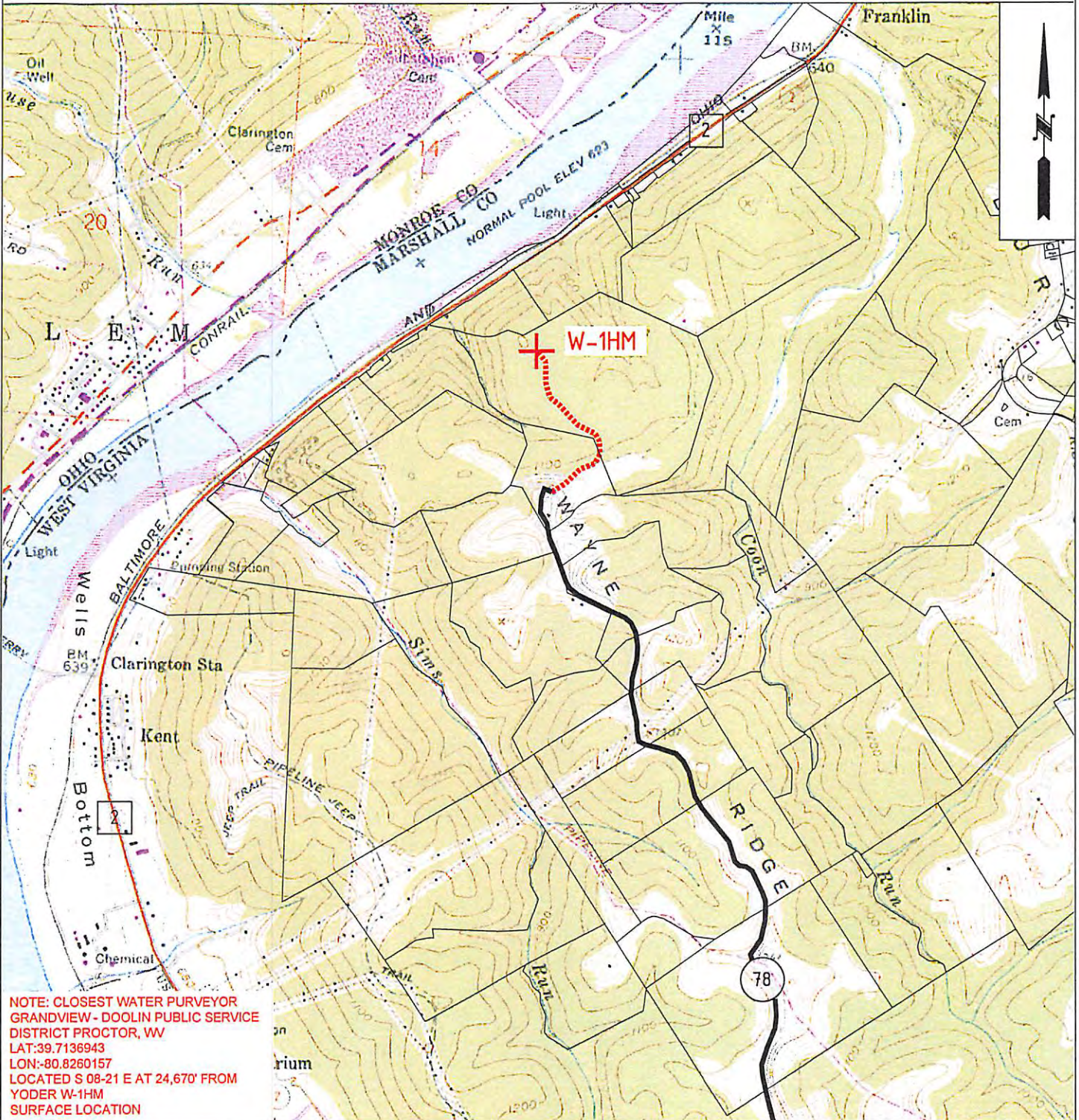
APR 17 2017

WV Department of
Environmental Protection

07/21/2017

PROPOSED YODER W-1HM

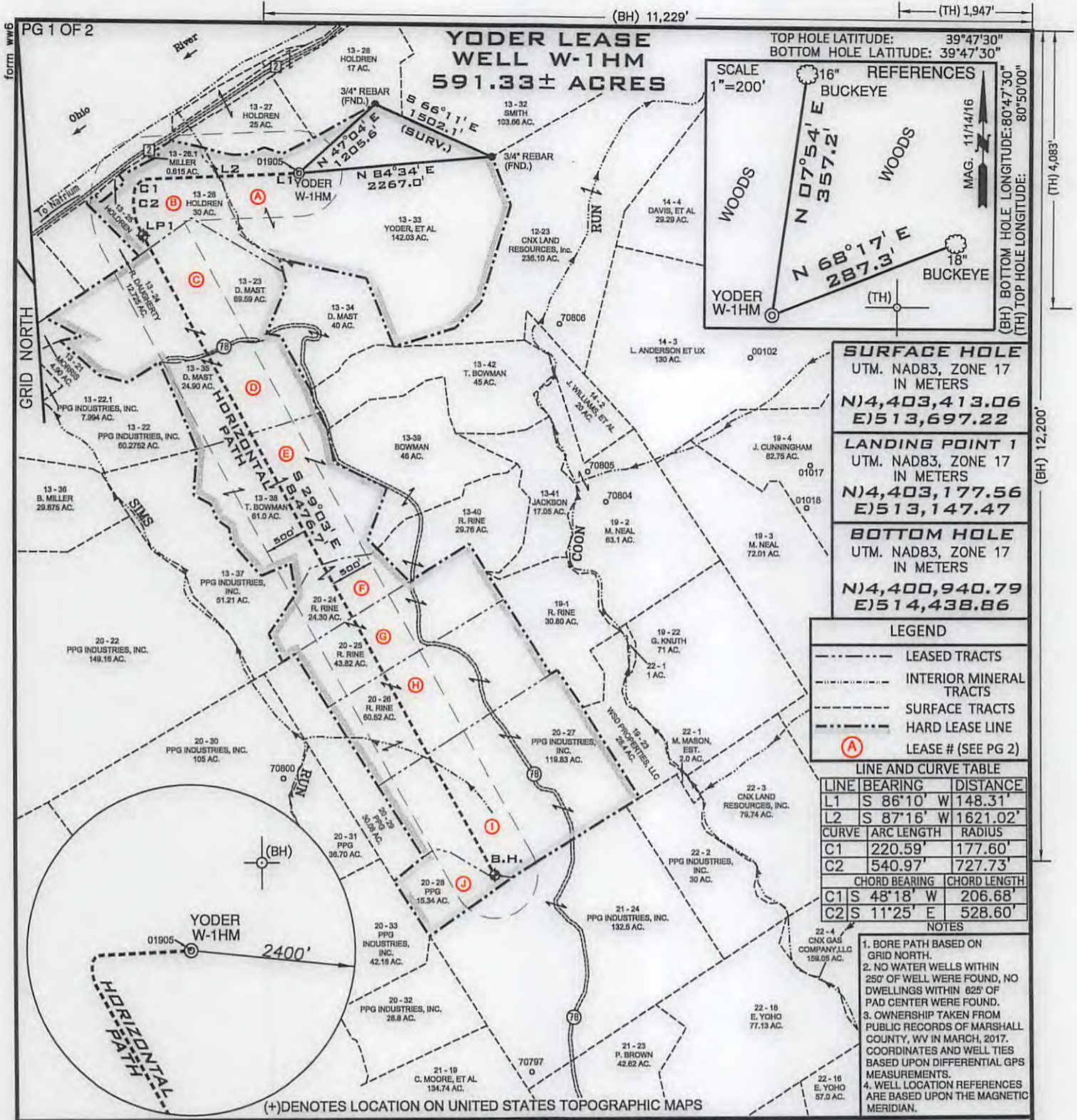
Jan 4/12/17



NOTE: CLOSEST WATER PURVEYOR
GRANDVIEW - DOOLIN PUBLIC SERVICE
DISTRICT PROCTOR, WV
LAT:39.7136943
LON:-80.8260157
LOCATED S 08-21 E AT 24,670' FROM
YODER W-1HM
SURFACE LOCATION



OPERATOR	163-697(CEC)	TOPO SECTION	LEASE NAME
TUG HILL OPERATING, LLC 380 SOUTHPONTE BLVD SUITE 200 CANONSBURG, PA 15317		POWHATAN POINT 7.5'	YODER
		SCALE:	DATE:
		1" = 2000'	DATE: 04/12/2017



FILE NUMBER YODER
 DRAWING NUMBER YODER_WP_W-1HM
 SCALE 1" = 1600'
 MINIMUM DEGREE OF ACCURACY 1/2500
 PROVEN SOURCE OF ELEVATION SUBMETER MAPPING
GRADE GPS

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 RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

P.S. Jonathan N. White
 2122



WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET, SE
 CHARLESTON, WV 25304



WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
 LOCATION ELEVATION 1084' WATERSHED (HUC 10) FRENCH CREEK - OHIO RIVER
 DISTRICT FRANKLIN COUNTY MARSHALL
 QUADRANGLE POWHATAN POINT 7.5' LEASE NUMBER SEE ATTACHED PG 2 OF 2

SURFACE OWNER NATHAN D. YODER, et al ACREAGE 142.03
 OIL & GAS ROYALTY OWNER SEE PAGE 2 LEASE ACREAGE 591.33
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE (SPECIFY) _____
 PLUG & ABANDON CLEAN OUT & REPLUG
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD 6,284' TMD:15,550'
 WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER
 ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD
FORT WORTH, TX 76107 CHARLESTON, WV 25313

07/21/2017

COPY NAME PERMIT

**YODER WELL W-1HM
WELL PLAT LEASE INFORMATION**

Lease No.	TAG	Parcel	Oil & Gas Royalty Owner	Deed Book / Pg	
10*14702	A	5-13-33	NATHAN D. YODER	708	71
10*14701	A	5-13-33	ROSEITA THORNTON	885	600
10*14754	B	5-13-26	BERNARD KNOLLINGER	794	472
10*14763	B	5-13-26	BETTY J. MCKINLEY	815	240
10*14768	B	5-13-26	BONNIE DGINTO	844	77
10*14752	B	5-13-26	CHARLES BOWEN	792	648
10*14757	B	5-13-26	DOUGLAS W. KNOLLINGER	794	487
10*14771	B	5-13-26	ERIC W THORNGATE	846	464
10*14758	B	5-13-26	GARY R. KNOLLINGER	795	154
10*14759	B	5-13-26	GLORIA J. LUIKART BY MARK LUIK	804	245
10*14751	B	5-13-26	GRACE E. LUIKART	792	642
10*14772	B	5-13-26	GREG E THORNGATE	846	436
10*14749	B	5-13-26	JANICE E. FUTEY	792	116
10*14766	B	5-13-26	JANICE M. SANDERS	827	527
10*14769	B	5-13-26	JAYNE S KISSEL	844	79
10*14760	B	5-13-26	JEFFREY M. BROWN	809	535
10*14753	B	5-13-26	JERRY SMOYER	794	474
10*14755	B	5-13-26	JUDITH A. MCGRAIL	794	517
10*14773	B	5-13-26	JUSTIN J ANTHONY	846	438
10*14776	B	5-13-26	KAREN M SMOYER	876	457
10*14748	B	5-13-26	MARJORIE K. NIGHTENGALE	790	541
10*14764	B	5-13-26	MARY B. KNOLLINGER	821	40
10*14770	B	5-13-26	MARY M HALL	846	413
10*14750	B	5-13-26	MARY SUE ANTHONY	792	114
10*14549	B	5-13-26	REBECCA PAUKNER	829	603
10*14761	B	5-13-26	RONALD E CLARK	809	571
10*14765	B	5-13-26	RUTH A. KINNEY	821	42
10*14774	B	5-13-26	THOMAS R KNOLLINGER	846	406
10*14775	B	5-13-26	TODD HANNIG	849	522
10*14762	B	5-13-26	WILLIAM CARL KNOLLINGER	815	238
10*14767	B	5-13-26	WILLIAM J. SMOYER	829	332
10*14756	B	5-13-26	WOODROW J. KNOLLINGER	794	515
10*14700	C	5-13-23	DAVID J MAST AND MIRIAM A MAST	708	239
10*14701	C	5-13-23	ROSEITA THORNTON	885	600
10*14618	D	5-13-35	DAVID J MAST AND MIRIAM A MAST	707	645
10*14701	D	5-13-35	ROSEITA THORNTON	885	600
10*14526	E	5-13-38	THOMAS WILLIAM BOWMAN	761	432
10*14527	E	5-13-38	VICTORIA BOWMAN	761	434
10*14615	F	5-20-24	ROBERT E RINE	708	251
10*14685	G	5-20-25	ROBERT E RINE AND DONNA M RINE	708	253
10*14616	H	5-20-26	ROBERT E RINE AND DONNA M RINE	708	250
10*14325	I	5-20-27	ELIZABETH ANN STRAUSBAUGH	792	104
10*14326	I	5-20-27	JANET LEA BLANKENSHIP	792	580
10*14310	I	5-20-27	JEAN C. THOMAS	781	614
10*14308	I	5-20-27	MARY E. BASSETT	779	492
10*14300	I	5-20-27	PPG INDUSTRIES, INC.	725	123
10*14309	I	5-20-27	ROBERT B. THOMAS	779	484
10*14324	I	5-20-27	RUTH E. BASSETT MEADOWS	792	100
10*14307	I	5-20-27	SALLY CYNTHIA HOPKINS	777	572
10*14325	J	5-20-28	ELIZABETH ANN STRAUSBAUGH	792	104
10*14326	J	5-20-28	JANET LEA BLANKENSHIP	792	580
10*14310	J	5-20-28	JEAN C. THOMAS	781	614
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07/21/2017

WELL OPERATOR TUG HILL OPERATING, LLC
 ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500
 FORT WORTH, TX 76107

DESIGNATED AGENT DIANNA STAMPER
 CT CORPORATION SYSTEM
 ADDRESS 5400 D BIG TYLER ROAD
 CHARLESTON, WV 25313

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
See Attached				

**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

4705107926

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Well Operator: Tug Hill Operating, LLC **Office of Oil and Gas**

By: Jonathan White *Jonathan White*

Its: Regulatory Analyst - Appalachia Region

**WV Department of
Environmental Protection**
Page 1 of 3

LEASE NAME OR NUMBER	TAG	PARCEL	GRANTOR, LESSOR, ETC.	GRANTEE, LESSEE, ETC.	ROYALTY	BOOK	PG	ASSIGNMENT	ASSIGNMENT	ASSIGNMENT
10*14702	A	5-13-33	NATHAN D. YODER	CHESAPEAKE APPALACHIA LLC	1/8+	708	71	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc. to Gastar Exploration USA, Inc	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14701	A	5-13-33	ROSEITA THORNTON	GASTAR EXPLORATION INC	1/8+	885	600	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14754	B	5-13-26	BERNARD KNOLLINGER	GASTAR EXPLORATION USA INC	1/8+	794	472	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14763	B	5-13-26	BETTY J. MCKINLEY	GASTAR EXPLORATION USA INC	1/8+	815	240	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14768	B	5-13-26	BONNIE DGINTO	GASTAR EXPLORATION INC	1/8+	844	77	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14752	B	5-13-26	CHARLES BOWEN	GASTAR EXPLORATION USA INC	1/8+	792	648	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14757	B	5-13-26	DOUGLAS W. KNOLLINGER	GASTAR EXPLORATION USA INC	1/8+	794	487	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14771	B	5-13-26	ERIC W THORNGATE	GASTAR EXPLORATION INC	1/8+	846	464	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14758	B	5-13-26	GARY R. KNOLLINGER	GASTAR EXPLORATION USA INC	1/8+	795	154	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14759	B	5-13-26	GLORIA J. LUIKART BY MARK LUIK	GASTAR EXPLORATION USA INC	1/8+	804	245	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14751	B	5-13-26	GRACE E. LUIKART	GASTAR EXPLORATION USA INC	1/8+	792	642	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14772	B	5-13-26	GREG E THORNGATE	GASTAR EXPLORATION INC	1/8+	846	436	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14749	B	5-13-26	JANICE E. FUTEY	GASTAR EXPLORATION USA INC	1/8+	792	116	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14766	B	5-13-26	JANICE M. SANDERS	GASTAR EXPLORATION INC	1/8+	827	527	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14769	B	5-13-26	JAYNE S KISSEL	GASTAR EXPLORATION INC	1/8+	844	79	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14760	B	5-13-26	JEFFREY M. BROWN	GASTAR EXPLORATION USA INC	1/8+	809	535	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14753	B	5-13-26	JERRY SMOYER	GASTAR EXPLORATION USA INC	1/8+	794	474	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14755	B	5-13-26	JUDITH A. MCGRAIL	GASTAR EXPLORATION USA INC	1/8+	794	517	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14773	B	5-13-26	JUSTIN J ANTHONY	GASTAR EXPLORATION INC	1/8+	846	438	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14776	B	5-13-26	KAREN M SMOYER	GASTAR EXPLORATION INC	1/8+	876	457	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14748	B	5-13-26	MARJORIE K. NIGHTENGALE	GASTAR EXPLORATION USA INC	1/8+	790	541	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14764	B	5-13-26	MARY B. KNOLLINGER	GASTAR EXPLORATION USA INC	1/8+	821	40	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14770	B	5-13-26	MARY M HALL	GASTAR EXPLORATION INC	1/8+	846	413	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14750	B	5-13-26	MARY SUE ANTHONY	GASTAR EXPLORATION USA INC	1/8+	792	114	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14549	B	5-13-26	REBECCA PAUKNER	GASTAR EXPLORATION INC	1/8+	829	603	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14761	B	5-13-26	RONALD E CLARK	GASTAR EXPLORATION USA INC	1/8+	809	571	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14765	B	5-13-26	RUTH A. KINNEY	GASTAR EXPLORATION USA INC	1/8+	821	42	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14774	B	5-13-26	THOMAS R KNOLLINGER	GASTAR EXPLORATION INC	1/8+	846	406	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14775	B	5-13-26	TODD HANNIG	GASTAR EXPLORATION INC	1/8+	849	522	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14762	B	5-13-26	WILLIAM CARL KNOLLINGER	GASTAR EXPLORATION USA INC	1/8+	815	238	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14767	B	5-13-26	WILLIAM J. SMOYER	GASTAR EXPLORATION INC	1/8+	829	332	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14756	B	5-13-26	WOODROW J. KNOLLINGER	GASTAR EXPLORATION USA INC	1/8+	794	515	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14700	C	5-13-23	DAVID J MAST AND MIRIAM A MAST	CHESAPEAKE APPALACHIA LLC	1/8+	708	239	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc. to Gastar Exploration USA, Inc	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14701	C	5-13-23	ROSEITA THORNTON	GASTAR EXPLORATION INC	1/8+	885	600	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A

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LEASE NAME OR NUMBER	TAG	PARCEL	GRANTOR, LESSOR, ETC.	GRANTEE, LESSEE, ETC.	ROYALTY	BOOK	PG	ASSIGNMENT	ASSIGNMENT	ASSIGNMENT
10*14618	D	5-13-35	DAVID J MAST AND MIRIAM A MAST	CHESAPEAKE APPALACHIA LLC	1/8+	707	645	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc. to Gastar Exploration USA, Inc	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14701	D	5-13-35	ROSEITA THORNTON	GASTAR EXPLORATION INC	1/8+	885	600	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A	N/A
10*14526	E	5-13-38	THOMAS WILLIAM BOWMAN	GASTAR EXPLORATION USA INC	1/8+	761	432	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14527	E	5-13-38	VICTORIA BOWMAN	GASTAR EXPLORATION USA INC	1/8+	761	434	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14615	F	5-20-24	ROBERT E RINE	CHESAPEAKE APPALACHIA LLC	1/8+	708	251	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc. to Gastar Exploration USA, Inc	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14685	G	5-20-25	ROBERT E RINE AND DONNA M RINE	CHESAPEAKE APPALACHIA LLC	1/8+	708	253	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc. to Gastar Exploration USA, Inc	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14616	H	5-20-26	ROBERT E RINE AND DONNA M RINE	CHESAPEAKE APPALACHIA LLC	1/8+	708	250	27/321 Chesapeake Appalachia, LLC and Statoil USA Onshore Properties Inc. to Gastar Exploration USA, Inc	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC
10*14325	I	5-20-27	ELIZABETH ANN STRAUSBAUGH	GASTAR EXPLORATION USA INC	1/8+	792	104	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14326	I	5-20-27	JANET LEA BLANKENSHIP	GASTAR EXPLORATION USA INC	1/8+	792	580	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14310	I	5-20-27	JEAN C. THOMAS	GASTAR EXPLORATION USA INC	1/8+	781	614	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14308	I	5-20-27	MARY E. BASSETT	GASTAR EXPLORATION USA INC	1/8+	779	492	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14300	I	5-20-27	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA INC	1/8+	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14309	I	5-20-27	ROBERT B. THOMAS	GASTAR EXPLORATION USA INC	1/8+	779	484	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14324	I	5-20-27	RUTH E. BASSETT MEADOWS	GASTAR EXPLORATION USA INC	1/8+	792	100	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14307	I	5-20-27	SALLY CYNTHIA HOPKINS	GASTAR EXPLORATION USA INC	1/8+	777	572	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14325	J	5-20-28	ELIZABETH ANN STRAUSBAUGH	GASTAR EXPLORATION USA INC	1/8+	792	104	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14326	J	5-20-28	JANET LEA BLANKENSHIP	GASTAR EXPLORATION USA INC	1/8+	792	580	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14310	J	5-20-28	JEAN C. THOMAS	GASTAR EXPLORATION USA INC	1/8+	781	614	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14308	J	5-20-28	MARY E. BASSETT	GASTAR EXPLORATION USA INC	1/8+	779	492	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14300	J	5-20-28	PPG INDUSTRIES, INC.	GASTAR EXPLORATION USA INC	1/8+	725	123	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14309	J	5-20-28	ROBERT B. THOMAS	GASTAR EXPLORATION USA INC	1/8+	779	484	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14324	J	5-20-28	RUTH E. BASSETT MEADOWS	GASTAR EXPLORATION USA INC	1/8+	792	100	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A
10*14307	J	5-20-28	SALLY CYNTHIA HOPKINS	GASTAR EXPLORATION USA INC	1/8+	777	572	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	36/009 Gastar Exploration Inc to TH Exploration II, LLC	N/A

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WV Department of Environmental Protection
07/21/2017 Page 3 of 3

AFFIDAVIT

COPY

STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

On this 18th day of October, 2016, before me, the undersigned authority, personally appeared David D. Kalish ("Affiant") who being first duly sworn under oath, deposes and saith:

1. TH Exploration, LLC, TH Exploration II, LLC and TH Exploration III, LLC are wholly owned subsidiaries of THQ Appalachia I, LLC.
2. Tug Hill Operating, LLC provides oil and gas operations services to THQ Appalachia I, LLC under an Operating Services Agreement dated July 23, 2014.
3. David D. Kalish, the Affiant, is the Vice President of Tug Hill Operating, LLC, THQ Appalachia I, LLC, TH Exploration, LLC, TH Exploration II, LLC and TH Exploration III, LLC, and;
3. Tug Hill Operating, LLC is authorized to operate and maintain the assets owned by THQ Appalachia I, LLC, including, as referenced above, TH Exploration, LLC, TH Exploration II, LLC, and TH Exploration III, LLC, including oil and gas leases, wells, pipelines, surface facilities, and other all other assets that support the business of THQ Appalachia I, LLC, and;
4. Specifically, Tug Hill Operating, LLC is authorized to submit and obtain well work permits and carry out all activities pursuant to such work permits for assets owned by TH Exploration, LLC, TH Exploration II, LLC, TH Exploration III, LLC.

FURTHER, AFFIANT SAITH NOT.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this 18th day of October, 2016.

David D. Kalish
Affiant: David D. Kalish

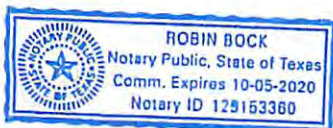
JURAT

47 Jan Fest
MARSHALL County 03:44:28 PM
Instrument No 1416299
Date Recorded 10/19/2016
Document Type NIS
Pages Recorded 1
Book-Page 28-62
Recording Fee \$5.00
Additional \$5.00

STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

Sworn and subscribed to (or affirmed) before me on this, the 18th day of October, 2016, by David D. Kalish

IN WITNESS WHEREOF, I hereunto set my hand and official seal.



My Commission Expires: 10-05-2020
Signature/Notary Public: Robin Bock
Name/Notary Public (Print): Robin Bock

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Office of Oil and Gas
APR 17 2017
WV Department of Environmental Protection
07/21/2017



April 10, 2017

WV Department of Environmental Protection
Office of Oil & Gas
601 57th Street, SE
Charleston, WV 25304
Attention: Laura Adkins

RE: Yoder W-1HM

Subject: Marshall County Route 78 Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 78 in the area reflected on the Yoder W-1HM well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Route and is not currently aware of any recorded document that would suggest an ownership other than THO.

If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact me directly at 304-689-7676, or by email at jwhite@tug-hillop.com.

Sincerely,

Jonathan White
Regulatory Analyst – Appalachia Region
Cell 304-689-7676
Email: jwhite@tug-hillop.com

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APR 17 2017

**STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE CERTIFICATION**

Date of Notice Certification: 04/13/2017

API No. 47- 051 - _____
Operator's Well No. Yoder W-1HM
Well Pad Name: Yoder

Notice has been given:

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

State: <u>West Virginia</u>	UTM NAD 83 Easting: <u>513,697.22</u>
County: <u>Marshall</u>	Northing: <u>4,403,413.06</u>
District: <u>Franklin</u>	Public Road Access: <u>Wayne Ridge Road (County Route 78)</u>
Quadrangle: <u>Powhatan Point 7.5'</u>	Generally used farm name: <u>Nathan D. Yoder</u>
Watershed: <u>(HUC 10) French Creek - Ohio River</u>	

Pursuant to West Virginia Code § 22-6A-7(b), every permit application filed under this section shall be on a form as may be prescribed by the secretary, shall be verified and shall contain the following information: (14) A certification from the operator that (i) it has provided the owners of the surface described in subdivisions (1), (2) and (4), subsection (b), section ten of this article, the information required by subsections (b) and (c), section sixteen of this article; (ii) that the requirement was deemed satisfied as a result of giving the surface owner notice of entry to survey pursuant to subsection (a), section ten of this article six-a; or (iii) the notice requirements of subsection (b), section sixteen of this article were waived in writing by the surface owner; and Pursuant to West Virginia Code § 22-6A-11(b), the applicant shall tender proof of and certify to the secretary that the notice requirements of section ten of this article have been completed by the applicant.

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 100px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p>OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p>
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Required Attachments:

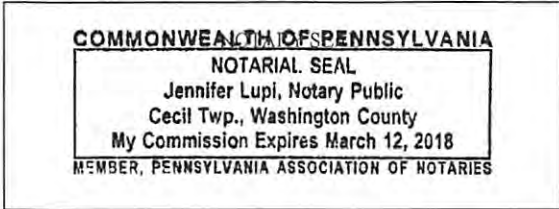
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication date verification or the associated Affidavit of Publication. The attached Notice Forms and Certifications of Notice shall serve as proof that the required parties have been noticed as required under West Virginia Code § 22-6A-11(b). Pursuant to West Virginia Code § 22-6A-11(b), the Certification of Notice to the person may be made by affidavit of personal service, the return receipt card or other postal receipt for certified mailing.

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Certification of Notice is hereby given:

THEREFORE, I Jonathan White, have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, 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 and imprisonment.

Well Operator:	<u>Tug Hill Operating, LLC</u>	Address:	<u>380 Southpointe Blvd, Southpointe Plaza II, Suite 200</u>
By:	<u>Jonathan White</u> <i>Jonathan White</i>		<u>Canonsburg, PA 15317</u>
Its:	<u>Regulatory Analyst - Appalachia</u>	Facsimile:	<u>724-338-2030</u>
Telephone:	<u>(724) 749-8388</u>	Email:	<u>jwhite@tug-hill.com</u>



Subscribed and sworn before me this 13th day of April 2017.
Jennifer Lupi Notary Public
 My Commission Expires March 12, 2018

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

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 Office of Oil and Gas
 APR 17 2017
 WV Department of
 Environmental Protection

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF APPLICATION

Notice Time Requirement: notice shall be provided no later than the filing date of permit application.

Date of Notice: April 13, 2017 **Date Permit Application Filed:** April 17, 2017

Notice of:

- PERMIT FOR ANY WELL WORK CERTIFICATE OF APPROVAL FOR THE CONSTRUCTION OF AN IMPOUNDMENT OR PIT

Delivery method pursuant to West Virginia Code § 22-6A-10(b)

- PERSONAL SERVICE REGISTERED MAIL METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to W. Va. Code § 22-6A-10(b) no later than the filing date of the application, the applicant for a permit for any well work or for a certificate of approval for the construction of an impoundment or pit as required by this article shall deliver, by personal service or by registered mail or by any method of delivery that requires a receipt or signature confirmation, copies of the application, the erosion and sediment control plan required by section seven of this article, and the well plat to each of the following persons: (1) The owners of record of the surface of the tract on which the well is or is proposed to be located; (2) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for roads or other land disturbance as described in the erosion and sediment control plan submitted pursuant to subsection (c), section seven of this article; (3) The coal owner, operator or lessee, in the event the tract of land on which the well proposed to be drilled is located [sic] is known to be underlain by one or more coal seams; (4) The owners of record of the surface tract or tracts overlying the oil and gas leasehold being developed by the proposed well work, if the surface tract is to be used for the placement, construction, enlargement, alteration, repair, removal or abandonment of any impoundment or pit as described in section nine of this article; (5) Any surface owner or water purveyor who is known to the applicant to have a water well, spring or water supply source located within one thousand five hundred feet of the center of the well pad which is used to provide water for consumption by humans or domestic animals; and (6) The operator of any natural gas storage field within which the proposed well work activity is to take place. (c)(1) If more than three tenants in common or other co-owners of interests described in subsection (b) of this section hold interests in the lands, the applicant may serve the documents required upon the person described in the records of the sheriff required to be maintained pursuant to section eight, article one, chapter eleven-a of this code. (2) Notwithstanding any provision of this article to the contrary, notice to a lien holder is not notice to a landowner, unless the lien holder is the landowner. W. Va. Code R. § 35-8-5.7.a requires, in part, that the operator shall also provide the Well Site Safety Plan ("WSSP") to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Application Notice WSSP Notice E&S Plan Notice Well Plat Notice is hereby provided to:

SURFACE OWNER(s)
Name: Nathan D. Yoder
Address: 2150 County Road 150
Millersburg, OH 44654

Name: Roseita Thornton
Address: 2550 State Road 580, Lot 392
Clearwater, FL 33761

SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: David J. Mast and Miriam A. Mast
Address: 7271 TR 664
Dundee, OH 44625

Name: NONE
Address: _____

SURFACE OWNER(s) (Impoundments or Pits)
Name: NONE
Address: _____

COAL OWNER OR LESSEE
Name: Appalachia Power Company
Address: 1 Riverside Place
Columbus, OH 43215 **SEE SUPPLEMENT PAGE**

COAL OPERATOR
Name: NONE
Address: _____

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
Name: David J. Mast and Miriam A. Mast
Address: 271 TR 664
Dundee, OH 44625 **SEE SUPPLEMENT PAGE**

OPERATOR OF ANY NATURAL GAS STORAGE FIELD
Name: NONE
Address: _____

*Please attach additional forms if necessary

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WV Department of Environmental Protection
07/21/2017

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(b), notice is hereby given that the undersigned well operator has applied for a permit for well work or for a certificate of approval for the construction of an impoundment or pit.

This Notice Shall Include:

Pursuant to W. Va. Code § 22-6A-10(b), this notice shall include: (1) copies of the application; (2) the erosion and sediment control plan required by section seven of this article; and (3) the well plat.

Pursuant to W. Va. Code § 22-6A-10(f), this notice shall include: (1) a statement of the time limits for filing written comments; (2) who may file written comments; (3) the name and address of the secretary for the purpose of filing the comments and obtaining additional information; and (4) a statement that the persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

Pursuant to W. Va. Code R. § 35-8-5.7.a, the operator shall provide the Well Site Safety Plan to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule.

Pursuant to W. Va. Code R. § 35-8-15.2.c, this notice shall: (1) contain a statement of the surface owner's and water purveyor's right to request sampling and analysis; (2) advise the surface owner and water purveyor of the rebuttable presumption for contamination or deprivation of a fresh water source or supply; advise the surface owner and water purveyor that refusal to allow the operator to conduct a pre-drilling water well test constitutes a method to rebut the presumption of liability; (3) advise the surface owner and water purveyor of his or her independent right to sample and analyze any water supply at his or her own expense; advise the surface owner and water purveyor whether or not the operator will utilize an independent laboratory to analyze any sample; and (4) advise the surface owner and or water purveyor that he or she can obtain from the Chief a list of water testing laboratories in the subject area capable of and qualified to test water supplies in accordance with standard acceptable methods.

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Well Location Restrictions

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No 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 department 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 springhead. The department 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. If granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2017, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the issues

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examined in the study required by this subsection, the secretary shall have the authority to propose for promulgation legislative rules establishing guidelines and procedures regarding reasonable levels of noise, light, dust and volatile organic compounds relating to drilling horizontal wells, including reasonable means of mitigating such factors, if necessary.

Water Well Testing:

Pursuant to West Virginia Code § 22-6A-10(d), notification shall be made, with respect to surface landowners identified in subsection (b) or water purveyors identified in subdivision (5), subsection (b) of this section, of the opportunity for testing their water well. The operator shall provide an analysis to such surface landowner or water purveyor at their request.

Water Testing Laboratories:

Pursuant to West Virginia Code § 22-6A-10(i), persons entitled to notice pursuant to subsection (b) of this section may contact the department to ascertain the names and locations of water testing laboratories in the subject area capable and qualified to test water supplies in accordance with standard accepted methods. In compiling that list of names the department shall consult with the state Bureau for Public Health and local health departments. A surface owner and water purveyor has an independent right to sample and analyze any water supply at his or her own expense. The laboratory utilized by the operator shall be approved by the agency as being certified and capable of performing sample analyses in accordance with this section.

Rebuttable Presumption for Contamination or Deprivation of a Fresh Water Source or Supply:

W. Va. Code § 22-6A-18 requires that (b) unless rebutted by one of the defenses established in subsection (c) of this section, in any action for contamination or deprivation of a fresh water source or supply within one thousand five hundred feet of the center of the well pad for horizontal well, there is a rebuttable presumption that the drilling and the oil or gas well or either was the proximate cause of the contamination or deprivation of the fresh water source or supply. (c) In order to rebut the presumption of liability established in subsection (b) of this section, the operator must prove by a preponderance of the evidence one of the following defenses: (1) The pollution existed prior to the drilling or alteration activity as determined by a predrilling or prealteration water well test. (2) The landowner or water purveyor refused to allow the operator access to the property to conduct a predrilling or prealteration water well test. (3) The water supply is not within one thousand five hundred feet of the well. (4) The pollution occurred more than six months after completion of drilling or alteration activities. (5) The pollution occurred as the result of some cause other than the drilling or alteration activity. (d) Any operator electing to preserve its defenses under subdivision (1), subsection (c) of this section shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration water well test. A copy of the results of the test shall be submitted to the department and the surface owner or water purveyor in a manner prescribed by the secretary. (e) Any operator shall replace the water supply of an owner of interest in real property who obtains all or part of that owner's supply of water for domestic, agricultural, industrial or other legitimate use from an underground or surface source with a comparable water supply where the secretary determines that the water supply has been affected by contamination, diminution or interruption proximately caused by the oil or gas operation, unless waived in writing by that owner. (f) The secretary may order the operator conducting the oil or gas operation to: (1) Provide an emergency drinking water supply within twenty-four hours; (2) Provide temporary water supply within seventy-two hours; (3) Within thirty days begin activities to establish a permanent water supply or submit a proposal to the secretary outlining the measures and timetables to be used in establishing a permanent supply. The total time in providing a permanent water supply may not exceed two years. If the operator demonstrates that providing a permanent replacement water supply cannot be completed within two years, the secretary may extend the time frame on case-by-case basis; and (4) Pay all reasonable costs incurred by the real property owner in securing a water supply. (g) A person as described in subsection (b) of this section aggrieved under the provisions of subsections (b), (e) or (f) of this section may seek relief in court... (i) Notwithstanding the denial of the operator of responsibility for the damage to the real property owner's water supply or the status of any appeal on determination of liability for the damage to the real property owner's water supply, the operator may not discontinue providing the required water service until authorized to do so by the secretary or a court of competent jurisdiction.

Written Comment:

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well within thirty days after the application is filed with the secretary. All persons described in West Virginia Code § 22-6A-10(b) may file written comments as to the location or construction of the applicant's proposed well work to the Secretary at:

Chief, Office of Oil and Gas
Department of Environmental Protection
601 57th St. SE
Charleston, WV 25304
(304) 926-0450

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Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. **NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.**

Time Limits and Methods for Filing Comments.

The law requires these materials to be served on or before the date the operator files its Application. You have **THIRTY (30) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Pursuant to West Virginia Code § 22-6A-11(c)(2), Any objections of the affected coal operators and coal seam owners and lessees shall be addressed through the processes and procedures that exist under sections fifteen, seventeen and forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article. The written comments filed by the parties entitled to notice under subdivisions (1), (2), (4), (5) and (6), subsection (b), section ten of this article shall be considered by the secretary in the permit issuance process, but the parties are not entitled to participate in the processes and proceedings that exist under sections fifteen, seventeen or forty, article six of this chapter, as applicable and as incorporated into this article by section five of this article.

Comment Requirements

Your comments must be in writing and include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

Disclaimer: All comments received will be placed on our web site <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/Pages/default.aspx> and the applicant will automatically be forwarded an email notice that such comments have been submitted. The applicant will be expected to provide a response to comments submitted by any surface owner, water purveyor or natural gas storage operator noticed within the application.

Permit Denial or Condition

The Chief has the power to deny or condition a well work permit. Pursuant to West Virginia Code § 22-6A-8(d), the permit may not be issued or be conditioned, including conditions with respect to the location of the well and access roads prior to issuance if the director determines that:

- (1) The proposed well work will constitute a hazard to the safety of persons;
- (2) The plan for soil erosion and sediment control is not adequate or effective;
- (3) Damage would occur to publicly owned lands or resources; or
- (4) The proposed well work fails to protect fresh water sources or supplies.

A permit may also be denied under West Virginia Code § 22-6A-7(k), the secretary shall deny the issuance of a permit if the secretary determines that the applicant has committed a substantial violation of a previously issued permit for a horizontal well, including the applicable erosion and sediment control plan associated with the previously issued permit, or a substantial violation of one or more of the rules promulgated under this article, and in each instance has failed to abate or seek review of the violation within the time prescribed by the secretary pursuant to the provisions of subdivisions (1) and (2), subsection (a), section five of this article and the rules promulgated hereunder, which time may not be unreasonable.

Pursuant to West Virginia Code § 22-6A-10(g), any person entitled to submit written comments to the secretary pursuant to subsection (a), section eleven of this article, shall also be entitled to receive from the secretary a copy of the permit as issued or a copy of the order modifying or denying the permit if the person requests receipt of them as a part of the written comments submitted concerning the permit application. Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water.

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07/21/2017

WW-6A
(8-13)

API NO. 47- 051 -
OPERATOR WELL NO. Yoder W-1HM
Well Pad Name: Yoder

Notice is hereby given by:

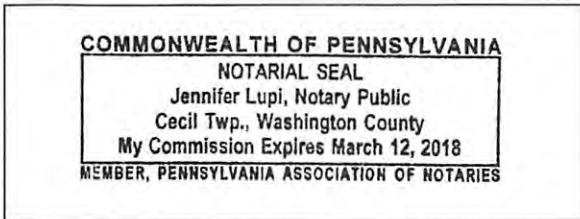
Well Operator: Tug Hill Operating, LLC
Telephone: 724-338-2026
Email: jwhite@tug-hilltop.com

Address: 380 Southpointe Blvd, Southpointe Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-338-2030

Oil and Gas Privacy Notice:

Jonathan N. White

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.



Subscribed and sworn before me this 13th day of April, 2017.

Jennifer Lupi Notary Public

My Commission Expires March 12, 2018

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07/21/2017

WW-6A Notice of ApplicationOperator Well No. Yoder W-1HM
Supplement Page

Coal Owner(s):

Name: CNX Land, LLC
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(S):

Name: Aaron Paul Holdren, et ux
110 Ridgemont Drive
Mars, PA 16066-5402

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WW-6A

Supplement Pg. 1A

April 09, 2017
Tug Hill Operating, LLC
380 Southpointe BLVD
Suite 200
Canonsburg, PA 15317

WATER WELL REPORT

Well: Yoder W-1HM
District: Franklin
County: Marshall
State: WV

There appears to be three (3) possible water sources within 2,000 feet of the above referenced well location.

House 1 TM 13 Par. 34 (Camp) David Mast Phone 330-359-5622 7271 TR 664 Dundee, OH 44626	House 2 TM 13 Par. 26 (Old House Foundation) Aaron Paul Holdren, et ux Phone Unisted 110 Ridgemont Drive Mars, PA 16066-5402	House 3 TM 13 Par. 27 (Old House Foundation) Aaron Paul Holdren, et ux Phone Unisted 110 Ridgemont Drive Mars, PA 16066-5402
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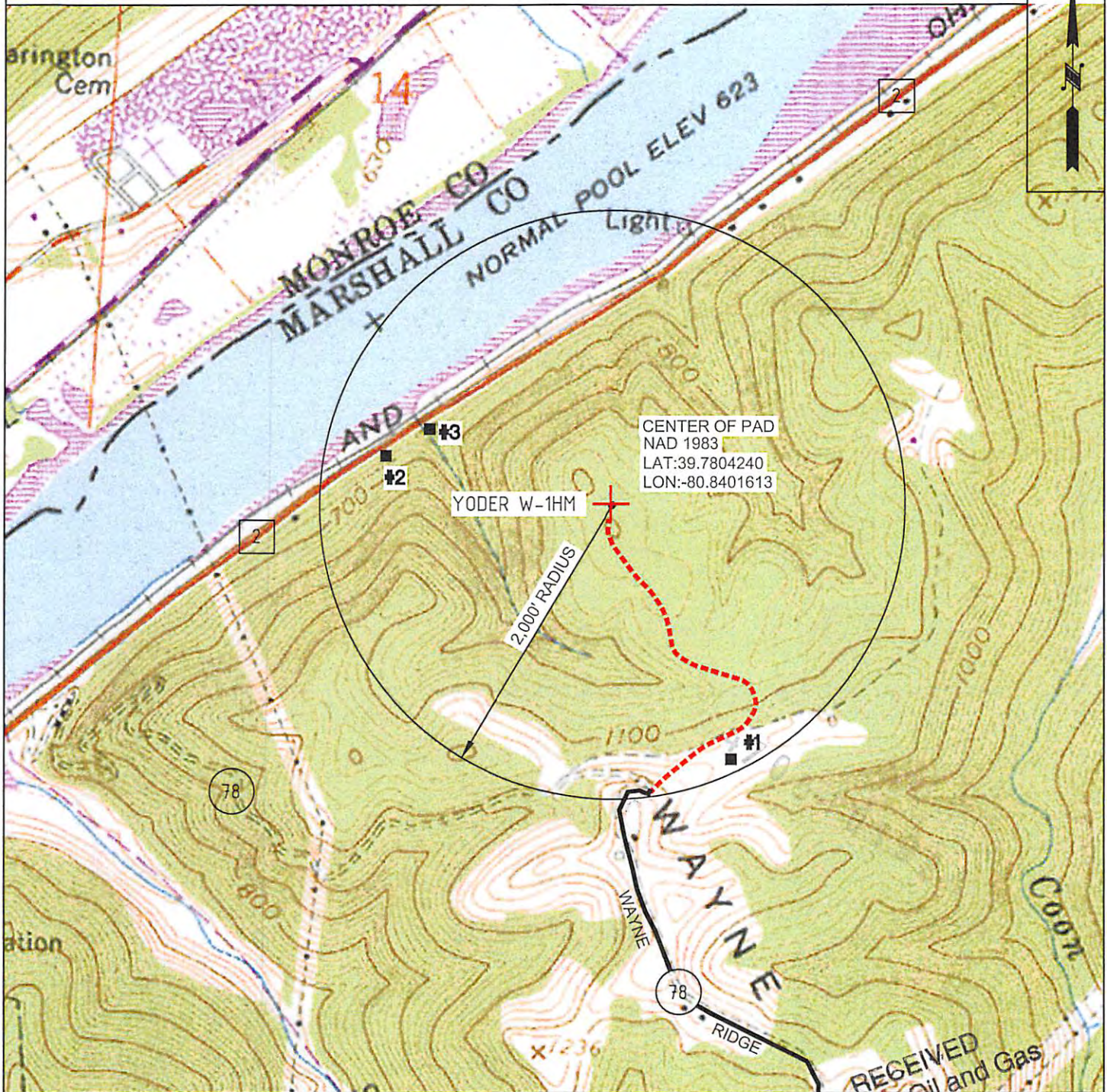
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PROPOSED YODER W-1HM

There appears to be Three (3) possible water source within 2,000'.



 TUG HILL OPERATING	OPERATOR 163-697(CEC) TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	TOPO SECTION POWHATAN POINT 7.5' SCALE: 1" = 1000'	LEASE NAME YODER DATE: 07/21/2017
	Office of Oil and Gas RECEIVED APR 17 2017 WV Department of Environmental Protection		07/21/2017

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF ENTRY FOR PLAT SURVEY

Notice Time Requirement: Notice shall be provided at least **SEVEN (7)** days but no more than **FORTY-FIVE (45)** days prior to entry

Date of Notice: November 2, 2016 **Date of Planned Entry:** November 9, 2016

Delivery method pursuant to West Virginia Code § 22-6A-10a

- PERSONAL SERVICE
 REGISTERED MAIL
 METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION

Pursuant to West Virginia Code § 22-6A-10(a), Prior to filing a permit application, the operator shall provide notice of planned entry on to the surface tract to conduct any plat surveys required pursuant to this article. Such notice shall be provided at least seven days but no more than forty-five days prior to such entry to: (1) The surface owner of such tract; (2) to any owner or lessee of coal seams beneath such tract that has filed a declaration pursuant to section thirty-six, article six, chapter twenty-two of this code; and (3) any owner of minerals underlying such tract in the county tax records. The notice shall include a statement that copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, which statement shall include contact information, including the address for a web page on the Secretary's web site, to enable the surface owner to obtain copies from the secretary.

Notice is hereby provided to:

SURFACE OWNER(s)

Name: Nathan D. Yoder
Address: 2150 County Road 150
Millersburg, OH 44654

Name: Roseita Thornton
Address: 2550 State Road 580, Lot 392
Clearwater, FL 33761

Name: David J. Mast and Miriam A. Mast
Address: 7271 TR 664
Dundee, OH 44624

COAL OWNER OR LESSEE

Name: Appalachia Power Company
Address: 1 Riverside Place
Columbus, OH 43215 *See Attached

MINERAL OWNER(s)

Name: Nathan D. Yoder
Address: 2150 County Road 150
Millersburg, OH 44654 *See Attached

*please attach additional forms if necessary

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-10(a), notice is hereby given that the undersigned well operator is planning entry to conduct a plat survey on the tract of land as follows:

State:	<u>WEST VIRGINIA</u>	Approx. Latitude & Longitude:	<u>LAT: 39.7805495, LONG: -80.8400462</u>
County:	<u>MARSHALL</u>	Public Road Access:	<u>WAYNE RIDGE ROAD (COUNTY ROUTE 78)</u>
District:	<u>FRANKLIN</u>	Watershed:	<u>(HUC 10) FRENCH CREEK- OHIO RIVER</u>
Quadrangle:	<u>POWHATAN POINT 7.5'</u>	Generally used farm name:	<u>Nathan Yoder</u>

Copies of the state Erosion and Sediment Control Manual and the statutes and rules related to oil and gas exploration and production may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator: TUG HILL OPERATING, LLC
Telephone: 724-749-8388
Email: JWHITE@TUG-HILLOP.COM

Address: 380 SOUTHPOINTE BLVD, SOUTHPOINTE PLAZA II, SUITE 200
CANONSBURG, PA 15317
Facsimile: 724-338-2030

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Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

**WW-6A3 Notice of Entry for Plat Survey
Supplement Page**

Operator Well No. Yoder W-1HM

Mineral Owner(s):

Name: Bounty Minerals, LLC
Address: 777 Main Street, Suite 850
Fort Worth, TX 76102

Name: Roseita Thornton
Address: 2550 State Road 580, Lot 392
Clearwater, FL 33761

Name: David J. Mast and Miriam A. Mast
Address: 7271 TR 664
Dundee, OH 44624

Coal Owner(s):

Name: CNX Land LLC
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

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STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF PLANNED OPERATION

Notice Time Requirement: notice shall be provided no later than the **filing date of permit application.**

Date of Notice: 04/13/2017 **Date Permit Application Filed:** 04/17/2017

Delivery method pursuant to West Virginia Code § 22-6A-16(c)

- CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

Pursuant to W. Va. Code § 22-6A-16(c), no later than the date for filing the permit application, an operator shall, by certified mail return receipt requested or hand delivery, give the surface owner whose land will be used for the drilling of a horizontal well notice of the planned operation. The notice required by this subsection shall include: (1) A copy of this code section; (2) The information required to be provided by subsection (b), section ten of this article to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. (d) The notices required by this section shall be given to the surface owner at the address listed in the records of the sheriff at the time of notice.

Notice is hereby provided to the SURFACE OWNER(s)
(at the address listed in the records of the sheriff at the time of notice):

Name: Nathan D. Yoder
Address: 2150 County Road 150
Millersburg, OH 44654

Name: Roseita Thornton
Address: 2550 State Road 580, Lot 392
Clearwater, FL 33761 ****SEE ATTACHED PAGE****

Notice is hereby given:

Pursuant to West Virginia Code § 22-6A-16(c), notice is hereby given that the undersigned well operator has developed a planned operation on the surface owner's land for the purpose of drilling a horizontal well on the tract of land as follows:

State:	<u>WEST VIRGINIA</u>	UTM NAD 83	Eastings:	<u>513,697.22</u>
County:	<u>MARSHALL</u>		Northing:	<u>4,403,413.06</u>
District:	<u>FRANKLIN</u>	Public Road Access:	<u>WAYNE RIDGE ROAD (COUNTY ROUTE 78)</u>	
Quadrangle:	<u>POWHATAN POINT 7.5'</u>	Generally used farm name:	<u>NATHAN D. YODER</u>	
Watershed:	<u>(HUC 10) FRENCH CREEK - OHIO RIVER</u>			

This Notice Shall Include:

Pursuant to West Virginia Code § 22-6A-16(c), this notice shall include: (1) A copy of this code section; (2) The information required to be provided by **W. Va. Code § 22-6A-10(b)** to a surface owner whose land will be used in conjunction with the drilling of a horizontal well; and (3) A proposed surface use and compensation agreement containing an offer of compensation for damages to the surface affected by oil and gas operations to the extent the damages are compensable under article six-b of this chapter. Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Well Operator: TUG HILL OPERATING, LLC
Telephone: (724) 749-8388
Email: JWHITE@TUG-HILLOP.COM

Address: 380 SOUTHPOINTE BLVD., SOUTEPOINTE PLAZA II, SUITE 200
CANONSBURG, PA 15317
Facsimile: (724) 338-2030

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our records will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

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APR 17 2017
WV Department of
Environmental Protection
07/21/2017

WW-6A5 Notice of Planned OperationsOperator Well No. Yoder W-1HM
Supplement Page

Surface Owner(s):

Name: David J. Mast and Miriam A. Mast
Address: 7271 TR 664
Dundee, OH 44624



17003702023

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APR 17 2017
WV Department of
Environmental Protection



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Earl Ray Tomblin
Governor

Paul A. Mattox, Jr., P. E.
Secretary of Transportation/
Commissioner of Highways

November 21, 2016

James A. Martin, Chief
Office of Oil and Gas
Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

Subject: DOH Permit for the Yoder Pad, Marshall County
Yoder W-1HM Well site

47-051-01924

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2016-0506 which has been issued to Tug Hill Operating, LLC for access to the State Road for a well site located off of Marshall County Route 78 SLS.

The operator has signed a DISTRICT WIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated January 3, 2012.

Very Truly Yours,

Gary K. Clayton, P.E.
Regional Maintenance Engineer
Central Office O&G Coordinator

Cc: Jonathan White
Tug Hill Operating, LLC
CH, OM, D-6
File

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APR 17 2017
WV Department of
Environmental Protection



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Yoder W-1HM

PRODUCT NAME:	CHEMICAL DESCRIPTION:	PRODUCT USE:	HAZARDOUS COMPONENT:
GBW-20C	Hemicellulase Breaker	Breaker - Water	None
ALPHA 1427		Biocide	Glutaraldehyde – CAS#000111-30-8 Quaternary ammonium chloride CAS# 007173-51-5 Alky dimethyl benzyl ammonium Chloride (C12-16) – CAS#068424-85-1 Ethanol – CAS# 000064-17-5 Water – CAS# 007732-18-5
FRAC SAND	Silica Sand (various Mesh sizes)	Proppant	Crystalline silica (quartz) CAS# 14808-60-7
S-8C, Sand	Silica Sand (100 mesh)	Sand	Silica – CAS# 14808-60-7
GW-3LDF		Gellant - Water	Petroleum Distillate Blend – Proprietary, (Not Associated with Diesel Fuel) Guar gum – CAS# 009000-30-0
FRW-18		Friction Reducer	Hydrotreated light distillate CAS# 064742-47-8
Scaletrol		Scale Inhibitor	Ethylene glycol – CAS# 000107-21-1 Diethylene glycol – CAS# 000111-46-6

470510192

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Office of Oil and Gas
APR 17 2017
WV Department of
Environmental Protection

Site Design, C
Erosion and Se
Tug H
Marsh
Frank
Latitude
Longitude
Stillhouse Run -

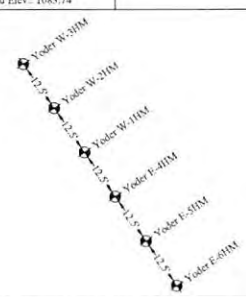
APPROVED WVDEP OOG

WJS 2/24/2017

WEST VIRGINIA COUNTY MAP

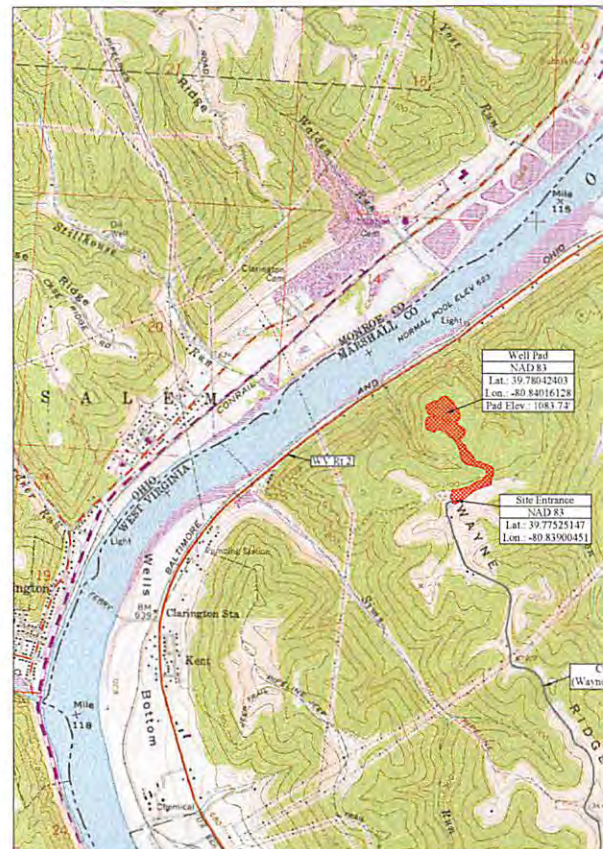


Site Entrance	Center of Well Pad
WV-N NAD 83 N: 462390.66	WV-N NAD 83 N: 469179.41
WV-N NAD 83 E: 1592168.44	WV-N NAD 83 E: 1591897.45
WV-N NAD 27 N: 467254.85	WV-N NAD 27 N: 469143.60
WV-N NAD 27 E: 1623606.29	WV-N NAD 27 E: 1623369.29
Lat. NAD 83: 39.77525147	Lat. NAD 83: 39.78042403
Lon. NAD 83: -80.83900451	Lon. NAD 83: -80.84016128
Lat. NAD 27: 39.77517556	Lat. NAD 27: 39.78034821
Lon. NAD 27: -80.83918919	Lon. NAD 27: -80.84034601
UTM 17 NAD 83 N: 4402825.21	UTM 17 NAD 83 N: 4403399.11
UTM 17 NAD 83 E: 513787.48	UTM 17 NAD 83 E: 513687.39
	Pad Elev.: 1083.74



Well Table		
Yoder W-HM	Yoder W-2HM	Yoder W-1HM
WV-N NAD 83 N: 469245.18	WV-N NAD 83 N: 469234.91	WV-N NAD 83 N: 469224.64
WV-N NAD 83 E: 1591890.23	WV-N NAD 83 E: 1591897.36	WV-N NAD 83 E: 1591904.49
WV-N NAD 27 N: 460299.17	WV-N NAD 27 N: 469199.10	WV-N NAD 27 N: 469188.83
WV-N NAD 27 E: 162328.07	WV-N NAD 27 E: 162335.19	WV-N NAD 27 E: 162342.32
Lat. NAD 83: 39.78060334	Lat. NAD 83: 39.78057744	Lat. NAD 83: 39.78054954
Lon. NAD 83: -80.84009795	Lon. NAD 83: -80.84007205	Lon. NAD 83: -80.84004615
Lat. NAD 27: 39.78052952	Lat. NAD 27: 39.78050162	Lat. NAD 27: 39.78047372
Lon. NAD 27: -80.84022609	Lon. NAD 27: -80.84025679	Lon. NAD 27: -80.84023089
UTM 17 NAD 83 (m) N: 4403419.24	UTM 17 NAD 83 (m) N: 4403416.15	UTM 17 NAD 83 (m) N: 4403413.06
UTM 17 NAD 83 (m) E: 513692.78	UTM 17 NAD 83 (m) E: 513695.00	UTM 17 NAD 83 (m) E: 513697.22
Yoder E-HM	Yoder E-SHM	Yoder E-1HM
WV-N NAD 83 N: 469214.37	WV-N NAD 83 N: 469204.11	WV-N NAD 83 N: 469193.84
WV-N NAD 83 E: 1591911.61	WV-N NAD 83 E: 1591918.74	WV-N NAD 83 E: 1591925.87
WV-N NAD 27 N: 469178.56	WV-N NAD 27 N: 469168.29	WV-N NAD 27 N: 469158.02
WV-N NAD 27 E: 1623349.45	WV-N NAD 27 E: 1623356.57	WV-N NAD 27 E: 1623363.70
Lat. NAD 83: 39.78052164	Lat. NAD 83: 39.78049374	Lat. NAD 83: 39.78046585
Lon. NAD 83: -80.84002023	Lon. NAD 83: -80.83999455	Lon. NAD 83: -80.83996845
Lat. NAD 27: 39.78044582	Lat. NAD 27: 39.78041793	Lat. NAD 27: 39.78039063
Lon. NAD 27: -80.84020499	Lon. NAD 27: -80.84017909	Lon. NAD 27: -80.84015319
UTM 17 NAD 83 (m) N: 4403409.97	UTM 17 NAD 83 (m) N: 4403406.88	UTM 17 NAD 83 (m) N: 4403403.78
UTM 17 NAD 83 (m) E: 513699.43	UTM 17 NAD 83 (m) E: 513701.67	UTM 17 NAD 83 (m) E: 513703.89

Exhibit A: Final Des



Project Contacts

Tug Hill Operating	Survey and Engineer
Jonathan White - Regulatory Analyst 724-485-2000 Off. 304-689-7676 Cell	Kenneth Kelly 304-338-6985 Off.
Geoff Radler - V.P. Production 817-632-5200 Off.	John P. See 304-442-0220 Off.
	Zackary Summerfield 304-338-6987 Off.
	Geotechnical Engineer
Tug Hill Operating, LLC 380 Southpointe Blvd. Southpointe Plaza II, Suite 200 Cannonsburg, PA 15317	American Geotech, Inc. Kantl Paul 304-340-4277 Off.

Environmental:

Wetland Delineations as provided by Allstar Ecology dated December 7, 2016

Topographic Information:

The topographic information shown herein is based on aerial photography by Blue Mountain Aerial Mapping, Burton, WV

MISS UTILITY OF
WEST VIRGINIA
1-800-245-4348
West Virginia State Law
Section 24-C Chapter 24-C requires
that you call two business days
before
how dig in the state of West Virginia.
IT'S THE LAW



Tug Hill Operating will obtain an Encroachment Permit (Form MM-109) from the WV Department of Transportation, Division of Highways, prior to the commencement of any construction activities

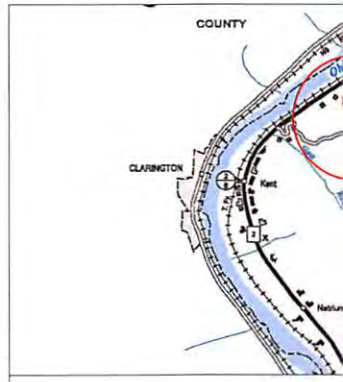
The WV Mines Website was consulted. Previous (Current) mining activities are not within the AOI.

WVDEP Website files show that there are no active and/or abandoned gas wells within the AOI

Approach Routes:

From the intersection of WV Rt 2 and OH Rt 7 near New Martinsville, WV. Follow WV Rt 2 North for 6.1 mi. Turn Right onto Co Rt 2/2 (Wells Hill Rd). Follow Co Rt 2/2 for 2.4 mi. Turn Left onto Co Rt 78 (Waynes Ridge Rd). Follow Co Rt 78 for 3.4 mi. The site entrance will be on the Right (Northeast) side of the road.

Site Locations (NAD 27)		
Structure	Latitude (DD)	Longitude (DD)
Site Entrance	39.77517556	-80.83918919
Center of Well Pad	39.78034821	-80.84034601



Floodplain Conditions	
Do site construction activities take place in a floodplain	NO
Permit needed from county floodplain coordinator	NO
Flood Hazard Zone	X
HFC-RAS Study completed	N/A
Floodplain shown on drawings	N/A
FIRM Map Number(s) for site	54051C 0140E
Acres of construction in floodplain	N/A

07/21/2017

Well Site

Construction Plan, &
 Erosion Control Plans
 All Operating
 Marshall County
 Franklin District
 39.78042403°
 -80.84016128°
 Ohio River Watershed

Pertinent Site Information
 Yoder Well Site
 Emergency Number: 304-845-1920
 Franklin District, Marshall County, WV
 Watershed: Stillhouse Run - Ohio River Watershed
 Tug Hill Contact Number: 1-817-632-3400

Design: Issue for Permitting



WV State Plane Coordinate System
 North Zone, NAD 83
 Elevations Based on NAV88
 Established by Survey Grade GPS
 and OPUS Post-Processing

Property Owner Information - Yoder Well Site

Franklin District - Marshall County						
Owner	TM - Parcel	Well Pad	Access Road	Topsoil Excess	Add. Clearing	Total Disturbed
David Mast	13-34	0.08	1.39	0.00	2.29	3.66
Yoder	13-33	4.36	1.63	1.67	8.14	16.00
Site Totals (Ac)		4.36	3.02	1.67	10.61	19.66

Access Road

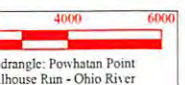
Surface Owner	TM - Parcel	Road Length	Type
David Mast	13-34	805.24	New Access Road Construction
Yoder	13-33	1,846.92	New Access Road Construction

Disturbed Area

Well Pad Construction	4.36 Ac
Access Road Construction	3.02 Ac
Topsoil / Excess Material	1.67 Ac
Additional Clearing	10.61 Ac
Total Disturbed Area	19.66 Ac
Additional Information	
Total Wooded Acres Disturbed	19.39 Ac
Total Linear Feet of Access Road	2,652.16'

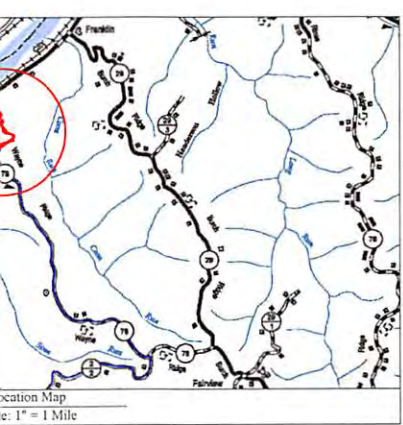
Yoder Well Site Quantities

Description	Cut (CY)	Fill (CY)	Spoil (CY)	Borrow (CY)	Max. Slope	Length of Slope
Well Pad	37,069.10	13,069.13	23,999.97	N/A	N/A	N/A
Well Pad Access Road	2,278.10	16,451.93		14,073.83	14.00%	428.38'
Access Road Tie	259.31	1.32	257.99		10.00%	50.13'
Topsoil Excess Material Stockpile	0.00	14,009.95			N/A	N/A
Totals	39,706.51	43,532.13	24,257.96	28,083.58		
Total Spoil (CY) =			-3,825.62		(Excess Spoil Capacity)	



Site Locations (NAD 83)

Structure	Latitude (DD)	Longitude (DD)
Site Entrance	39.77525147	-80.83900451
Center of Well Pad	39.78042403	-80.84016128



- Well Location Restrictions**
- All Pad construction complies with the following restrictions:
- *250' from an existing well or developed spring used for human or domestic animals.
 - *625' from an occupied dwelling or barn greater than 2,500 SF used for poultry or dairy measured from the center of the pad.
 - *100' from the edge of disturbance to wetlands, perennial streams, natural or artificial lake, pond or reservoir.
 - *300' from the edge of disturbance to a naturally reproducing trout stream.
 - *1,000' of a surface or ground water intake to a public water supply.
- (Well Location Restrictions of WV Code 22-6A-12)



Design Certification
 The drawings, construction notes and reference diagrams attached hereto have been prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection, Office of Oil and Gas 19CSR08.
 All Plans, Sheets, and/or Reference Diagrams included in this design constitute a complete set of plans. A complete set of plans is necessary to construct the site in accordance with the design.
 John P. See RJE 6051
 Kelly Surveying PLLC
 CNA 03423240
 Date: 11/29/2016

Sheet	Description
1	Cover Sheet
V1	Schedule of Quantities
NI-N3	Site Notes
2	Pre-Construction Site Conditions
3	Site Soil Map
4	Clearing Exhibit
5	Overall Plan View
7	E&S Plan View
8	Toe Key Exhibit
9	Plan View
10	Cross Sections - Well Pad
11	Cross Sections - Tank Pad
12	Cross Sections - Access Road
G1-G4	Geotechnical Exhibit
L1	Landowner Disturbed Area Exhibit
S1	Site Reclamation
M1-M3	Production Exhibit
D1-D2	Erosion and Sediment Control Details
R1	Access Road Details
P1	Pad Details

Revision
 Design
 Date
 11-29-2016



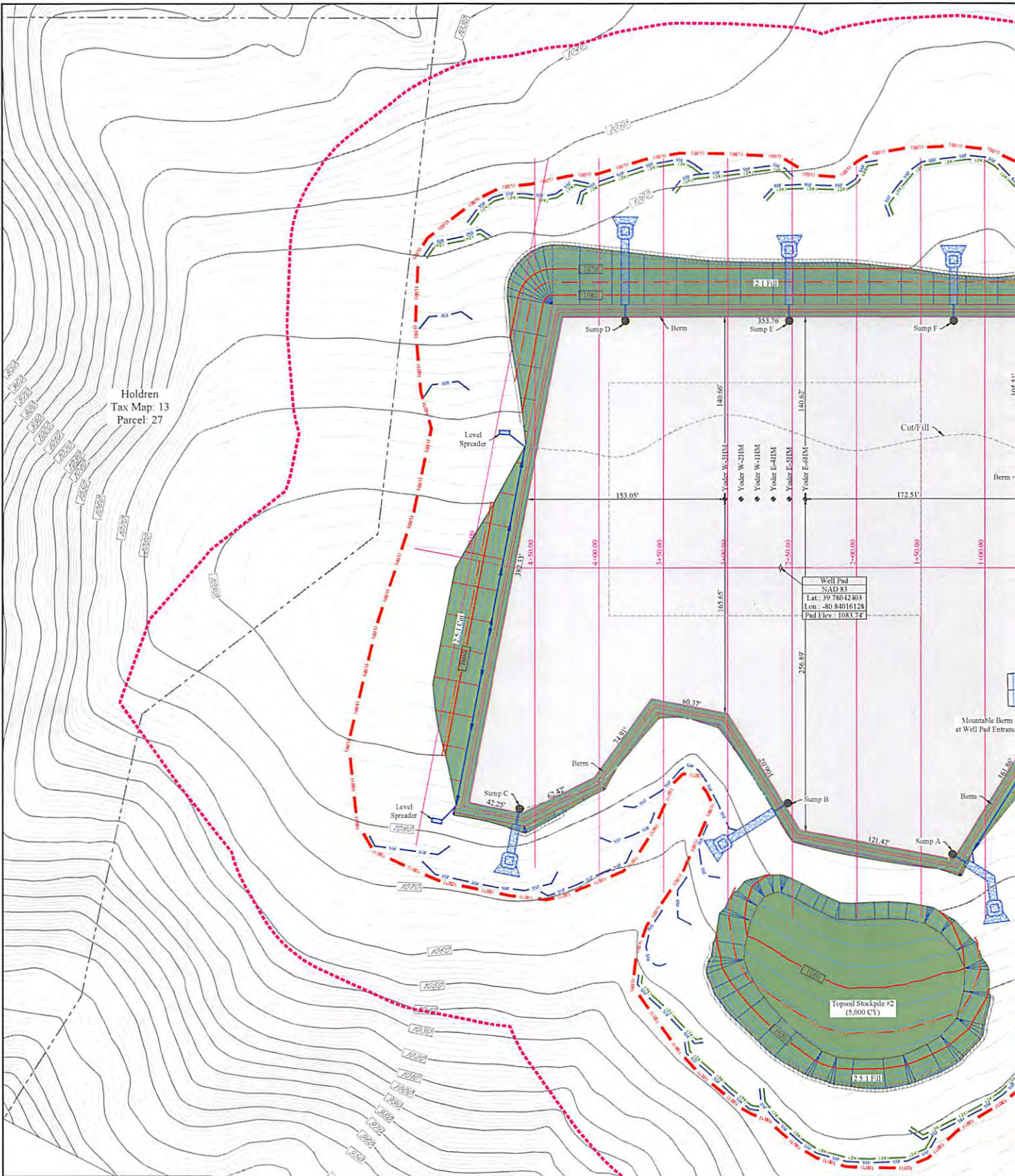
THIS DOCUMENT
 PREPARED FOR
 TUG HILL
 OPERATING

Kelly Surveying
 P.O. Box 216
 Packer, WV 26029
 204-338-6997

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 Office of Oil and Gas
 MAR 30 2017
 WV Department of Environmental Protection
 Franklin District
 Marshall County, WV

Cover Sheet
 Yoder Well Site
 Franklin District
 Marshall County, WV

Date: 11/29/2016
 Scale: As Shown
 Designed By: ZS
 07/21/2017



NOTE:
 All surface boundary lines shown hereon are based on boundary evidence collected with mapping grade GPS receivers.



Legend	
	Original Ground 2' Contour
	Original Ground 10' Contour
	Pad Design 2' Contour
	Access Road Design 2' Contour
	Access Road Design 10' Contour
	Center of Structure
	Guard Rail
	12' Wattle
	24' Compost Filter Sock
	Super Silt Fence
	Limits of Disturbance
	Area of Interest
	Existing Gas Line
	Existing Utility Pole Line
	Rock Lined Ditch
	Erosion Control Blanket Lined Ditch
	Blue Racer Pipeline
	Blue Racer Pipeline ROW
	PEM Wetland
	POW Wetland
	PSS Wetland
	Perennial Stream
	Intermittent Stream
	Ephemeral Stream
	Tee Key
	Erosion Control Blanket Slope Area
	Stone Check Dam
	EQT Pipeline
	EQT Pipeline ROW

Disturbed Area	
Well Pad Construction	4.86 Ac
Access Road Construction	3.02 Ac
Topsoil Excess Material	1.67 Ac
Additional Clearing	10.61 Ac
Total Disturbed Area	19.56 Ac

Access Road	
Surface Owner	IM - Parcel Road Length Type
David Mast	13-34 292.50' 10' Right of Way Construction
Yoder	13-23 132.33' 10' Right of Way Construction

Additional Information	
Total Wooded Acres Undisturbed	19.39 Ac
Total Linear Feet of Access Road	2,652.10'

07/21/2017

**Yoder Well Site
Tug Hill Operating**

Exhibit A: Final Design: Issue for Permitting



Yoder
Tax Map: 13
Parcel: 33

Revision
Design

Date
11-29-2016

**TUG HILL
OPERATING**



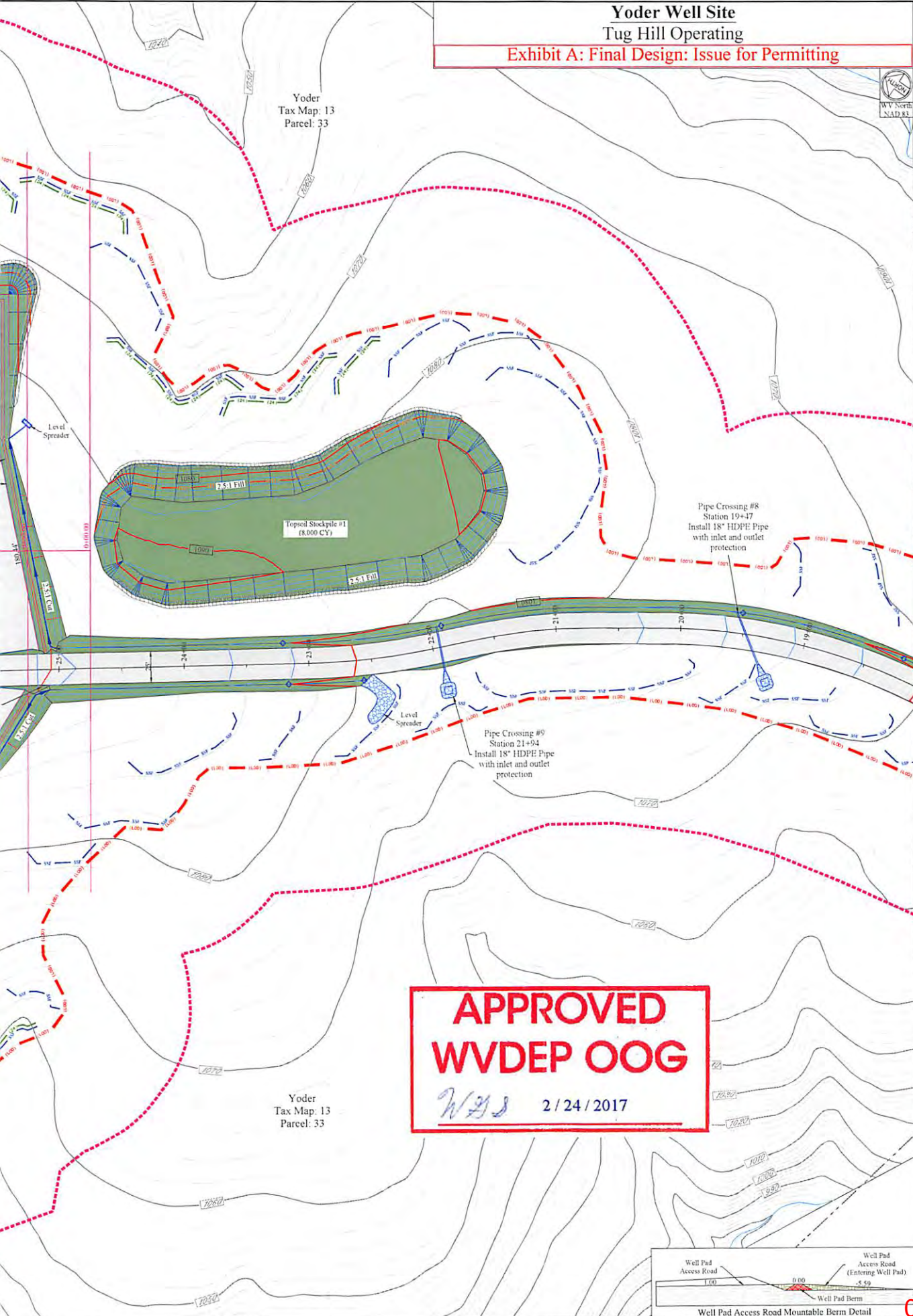
THIS DOCUMENT
PREPARED FOR
TUG HILL
OPERATING

Kelly Surveying
P.O. Box 204
Delroy, WV 26239
004338-6987

Site Plan
Yoder Well Site
Franklin District
Marshall County, WV

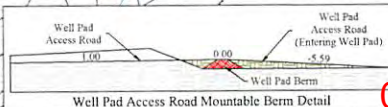
Date: 11/29/2016
Scale: As Shown
Designed By: ZS

07/21/2017



**APPROVED
WVDEP OOG**
ZS 2/24/2017

Yoder
Tax Map: 13
Parcel: 33



Well Pad Access Road Mountable Berm Detail