



---

west virginia department of environmental protection

---

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

Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Wednesday, October 17, 2018  
WELL WORK PERMIT  
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC  
380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit approval for MICHTER S-5HM  
47-051-02067-00-00

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: MICHTER S-5HM  
Farm Name: LARRY W. DUNLAP & CHARI  
U.S. WELL NUMBER: 47-051-02067-00-00  
Horizontal 6A New Drill  
Date Issued: 10/17/2018

# PERMIT CONDITIONS

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

## CONDITIONS

---

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than 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

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](mailto:DEPOOGNotify@wv.gov).

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      New Martinsville 7  
Operator ID      County      District      Quadrangle

2) Operator's Well Number: Michter S-5HM      Well Pad Name: Michter

3) Farm Name/Surface Owner: Larry W. Dunlap & Charles Leroy Dunlap      Public Road Access: Rines Ridge Road (County Route 76)

4) Elevation, current ground: 1,136.0'      Elevation, proposed post-construction: 1,130.2'

5) Well Type    (a) Gas    X      Oil      \_\_\_\_\_      Underground Storage      \_\_\_\_\_  
Other      \_\_\_\_\_

(b) If Gas    Shallow    X      Deep      \_\_\_\_\_  
Horizontal    X      \_\_\_\_\_

6) Existing Pad: Yes or No Yes

*Handwritten signature and date: 8/1/18*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus is the target formation at a depth of 6266- 6317' thickness of 51' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,417'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 14,151'

11) Proposed Horizontal Leg Length: 7,226.93'

12) Approximate Fresh Water Strata Depths: 70', 700'

13) Method to Determine Fresh Water Depths: Use shallow offset wells to determine deepest freshwater. Or determine using predrill tests, testing while drilling or petrophysical evaluation of resistivity.

14) Approximate Saltwater Depths: 2,167'

15) Approximate Coal Seam Depths: Sewickly Coal - 596' and Pittsburgh Coal - 694'

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    X

(a) If Yes, provide Mine Info:    Name: \_\_\_\_\_  
Depth: \_\_\_\_\_  
Seam: \_\_\_\_\_  
Owner: \_\_\_\_\_

RECEIVED  
Office of Oil and Gas

AUG 6 2018

18)

**CASING AND TUBING PROGRAM**

<b>TYPE</b>	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</u>
Conductor	30"	NEW	BW	BW	120'	120'	259ft^3(CTS)
Fresh Water	13 3/8"	NEW	H40	48#	800'	800'	906ft^3(CTS)
Coal	13 3/8"	NEW	H40	48#	800'	800'	906ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,600'	2,600'	855ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	14,151'	14,151'	3610ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,278'	
Liners							

*JW  
8/1/18*

<b>TYPE</b>	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17 1/2"	.33	1,730	1,384	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.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	9,000	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			

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

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 18,063,950 lb proppant and 279,282 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 21.11 acres

22) Area to be disturbed for well pad only, less access road (acres): 6.49 acres

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

\*Note: Attach additional sheets as needed.

## 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](mailto:dducoeur@dpslandservices.com) DPS GIS (07/02/2018) 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

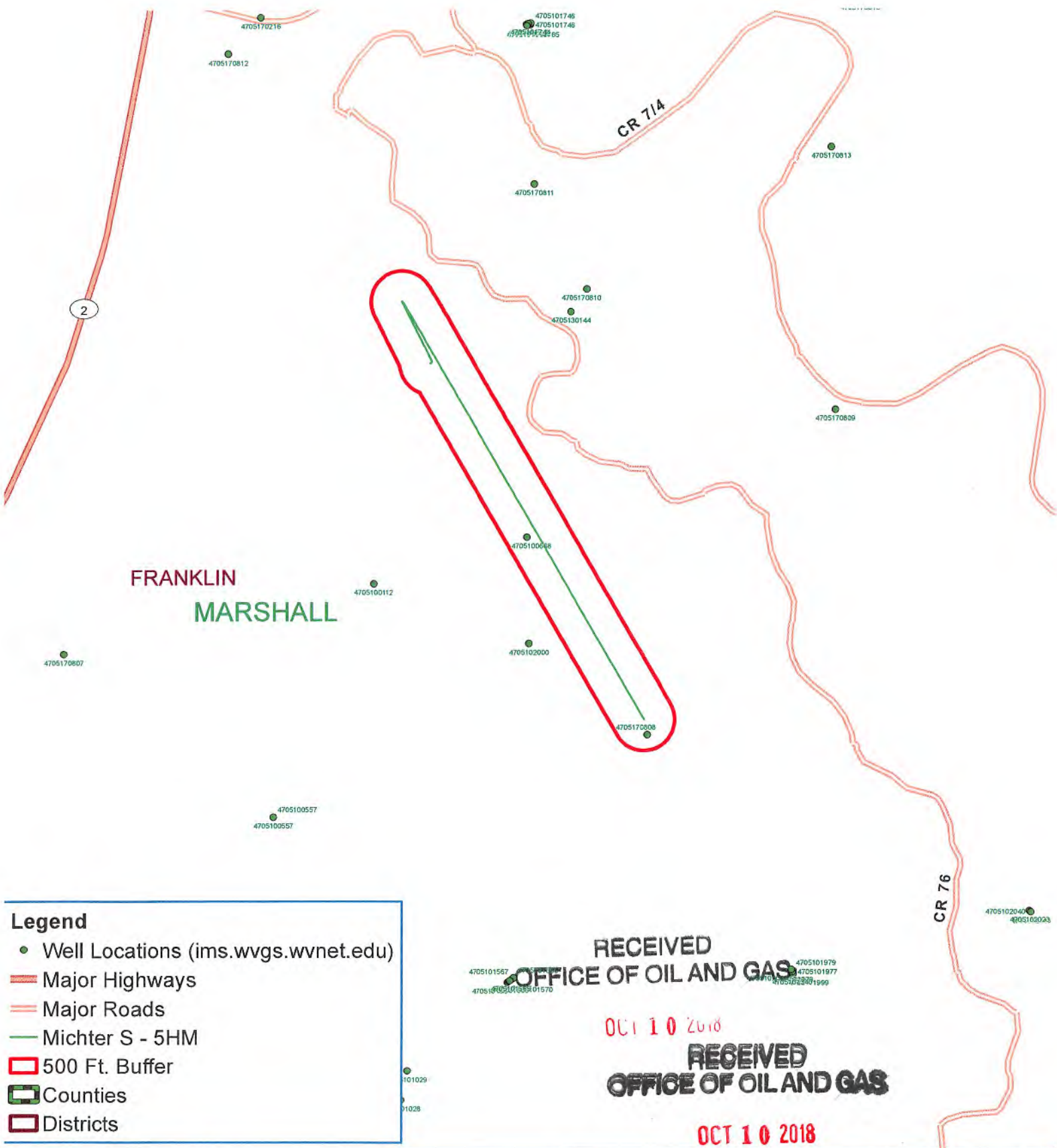
#### Discussion with Phil Dinterman WVGES GIS Department (7/15/2016)

- 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

RECEIVED  
Office of Oil and Gas

AUG 6 2018

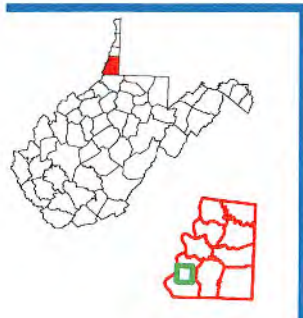
WV Department of  
Environmental Protection



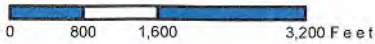
**Legend**

- Well Locations (ims.wvgs.wvnet.edu)
- Major Highways
- Major Roads
- Michter S - 5HM
- 500 Ft. Buffer
- Counties
- Districts

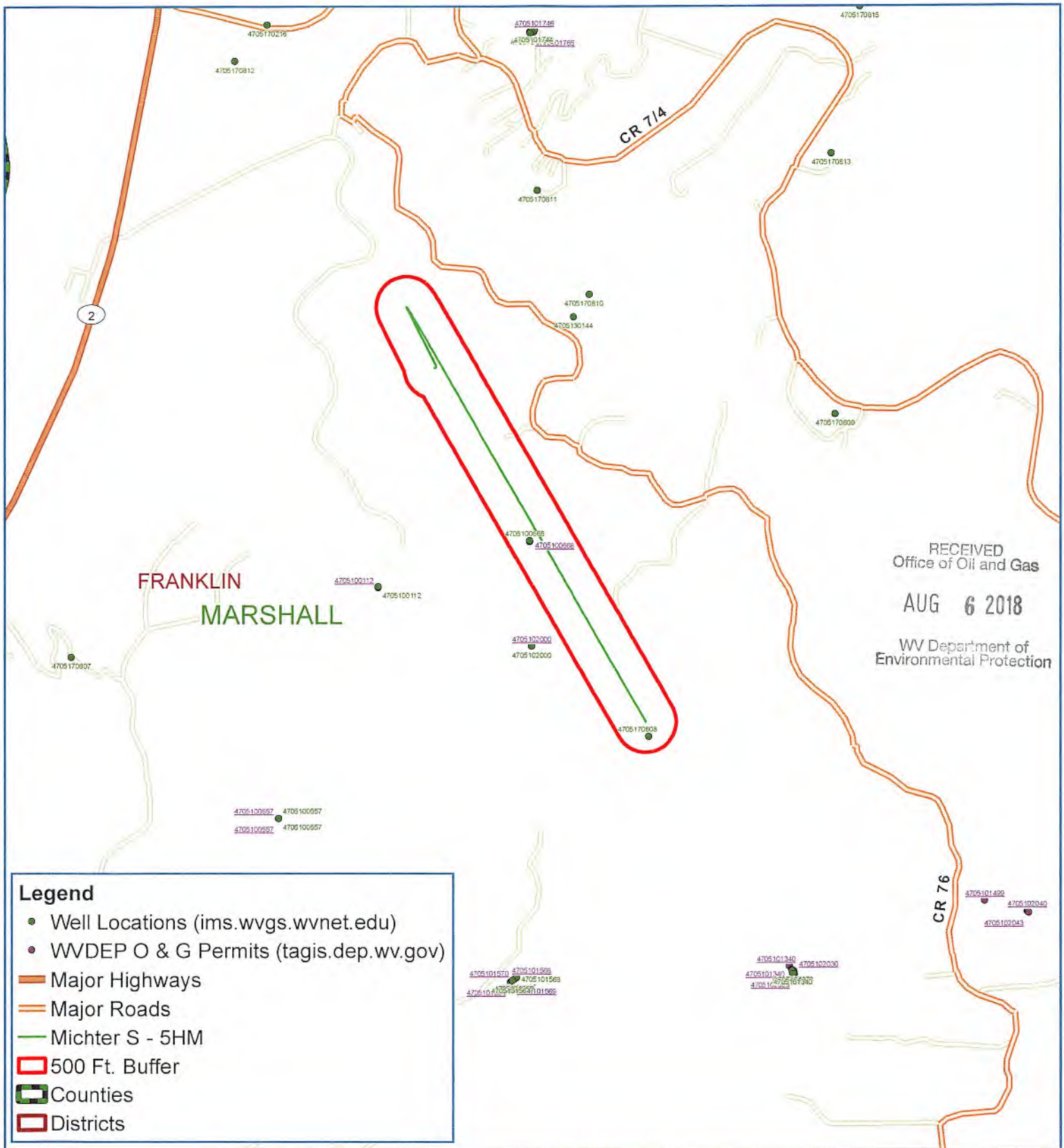
RECEIVED  
**OFFICE OF OIL AND GAS**  
 OCT 10 2018  
 RECEIVED  
**OFFICE OF OIL AND GAS**  
 OCT 10 2018



Michter S - 5HM  
 Franklin District  
 Marshall County, WV







# Michter S - 5HM Franklin District Marshall County, WV



Permit well - Michter S-5HM

Wells within 500' Buffer

Note: Well spots depicted on Area of Review map (page 3) are derived from State held coordinates. The spots may differ from those depicted on the Well Plat because the Plat locations represent actual field surveyed locations. Please refer to the Plat for surveyed well spots

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
4705100668	Consolidation Coal Co	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Marcellus well.	Plug date : 10/8/1990
4705170808	Manufacturers Light and Heat	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Marcellus well.	State records are incomplete

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

**WV Geological & Economic Survey** Well: County = 51 Permit = 00668

**"Pipeline"** Table Descriptions  
[County Code Translations](#)  
[Permit Numbering System](#)  
[Lease Logs](#)  
[Well Information](#)  
[Locations](#)  
[WVGS Map](#)  
[Pipeline List](#) [New](#)

Select County: (051) Marshall Select datatypes: (Check All)  
 Enter Permit #: 00668  Location  Production  Plugging  
 Owner/Completion  Stratigraphy  Sample  
 Pay/Show/View  Logs  Well Hole Log  
 Get Data

Location Information [View Map](#)  
 API# COUNTY PERMIT TAX DISTRICT QUAD\_75 QUAD\_75 LAT\_DD LONG\_DD UTIME UTIME  
 470410068 Marshall 00668 Payroll Payroll 36 752942 -82 72344 417842 4450001.8

There is no Bottom Hole Location data for this well

Owner Information  
 API# CMP\_DT SUFFIX STATUS SURFACE\_OWNER WELL\_NUM CO\_NUM LEASE LEASE\_NUM MINERAL\_OWN OPERATOR\_AY COMPLETION PRDP\_VO PRDP\_TNGT\_FM TRM\_EST\_FR  
 470410068 10/8/191 Plugging Completed Encl Furdas 14 M Encl Furdas Consolidated Coal Co

Completion Information  
 API# CMP\_DT SPUO\_DT ELEV DATUM FIELD DEEPEST\_FM DEEPEST\_FHT INITIAL\_CLASS FINAL\_CLASS TYPE RWG CMP\_MTRD TVD TMD NEW\_FTH ROD O\_BEF O\_AFT O\_BEF O\_AFT NGL\_BEF NGL  
 470410068 10/8/191 1193 Ground Level 102883582 102883582 no 8192828 unknown Location

There is no Pay data for this well  
 There is no Production Gas data for this well  
 There is no Production Oil data for this well \*\* some operators may have reported NGL under Oil  
 There is no Production NGL data for this well \*\* some operators may have reported NGL under Oil  
 There is no Production Water data for this well  
 There is no Stratigraphy data for this well  
 There is no Wireline (E-Log) data for this well

Plugging Information  
 API# PCL\_DT DEPTH\_PBT  
 470410068 10/8/191 0

There is no Sample data for this well

**WV Geological & Economic Survey** Well: County = 51 Permit = 70808

**"Pipeline"** Table Descriptions  
[County Code Translations](#)  
[Permit Numbering System](#)  
[Lease Logs](#)  
[Well Information](#)  
[Locations](#)  
[WVGS Map](#)  
[Pipeline List](#) [New](#)

Select County: (051) Marshall Select datatypes: (Check All)  
 Enter Permit #: 70808  Location  Production  Plugging  
 Owner/Completion  Stratigraphy  Sample  
 Pay/Show/View  Logs  Well Hole Log  
 Get Data

Location Information [View Map](#)  
 API# COUNTY PERMIT TAX DISTRICT QUAD\_75 QUAD\_75 LAT\_DD LONG\_DD UTIME UTIME  
 470410088 Marshall 70808 Payroll Payroll 36 752942 -82 72344 417842 4450001.8

There is no Bottom Hole Location data for this well

Owner Information  
 API# CMP\_DT SUFFIX STATUS SURFACE\_OWNER WELL\_NUM CO\_NUM LEASE LEASE\_NUM MINERAL\_OWN OPERATOR\_AY COMPLETION PRDP\_VO PRDP\_TNGT\_FM TRM\_EST\_FR  
 470410088 10/8/191 Plugging Completed Encl Furdas 14 M Encl Furdas Consolidated Coal Co

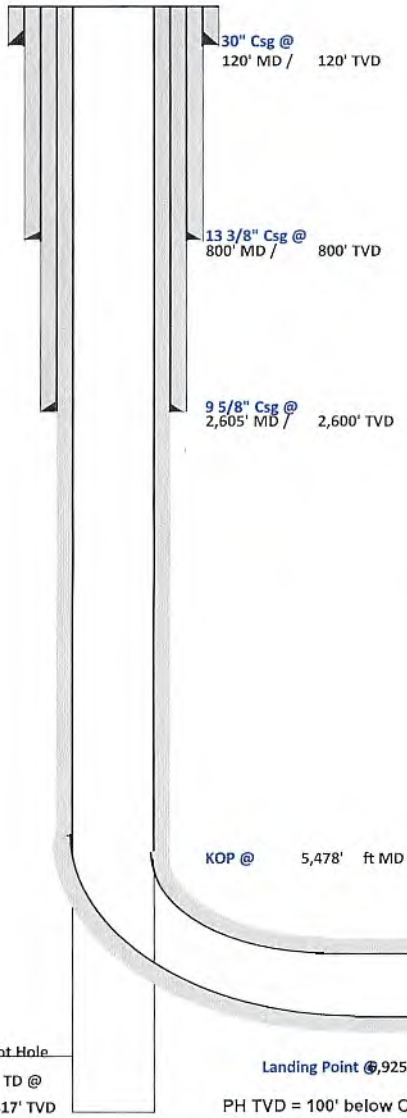
Completion Information  
 API# CMP\_DT SPUO\_DT ELEV DATUM FIELD DEEPEST\_FM DEEPEST\_FHT INITIAL\_CLASS FINAL\_CLASS TYPE RWG CMP\_MTRD TVD TMD NEW\_FTH ROD O\_BEF O\_AFT O\_BEF O\_AFT NGL\_BEF NGL  
 470410088 10/8/191 1193 Ground Level 102883582 102883582 no 8192828 unknown Location

There is no Pay data for this well  
 There is no Production Gas data for this well  
 There is no Production Oil data for this well \*\* some operators may have reported NGL under Oil  
 There is no Production NGL data for this well \*\* some operators may have reported NGL under Oil  
 There is no Production Water data for this well  
 There is no Stratigraphy data for this well  
 There is no Wireline (E-Log) data for this well  
 There is no Plugging data for this well  
 There is no Sample data for this well

RECEIVED  
 Office of Oil and Gas  
  
 AUG 6 2018  
  
 WV Department of  
 Environmental Protection



**WELL NAME:** Michter S-5HM  
**STATE:** WV **COUNTY:** Marshall  
**DISTRICT:** Franklin  
**DF Elev:** 1,130' **GL Elev:** 1,130'  
**TD:** 14,151'  
**TH Latitude:** 39.80292765  
**TH Longitude:** -80.79732422  
**BH Latitude:** 39.78691357  
**BH Longitude:** -80.78515265



FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	700
Sewickley Coal	596
Pittsburgh Coal	694
Big Lime	2015
Weir	2403
Berea	2529
Gordon	2752
Rhinestreet	5721
Geneseo/Burkett	6102
Tully	6187
Hamilton	6212
Marcellus	6266
Landing Depth	6301
Onondaga	6317
Pilot Hole Depth	6417

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	17.5	13 3/8	800'	800'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,605'	2,600'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	14,151'	6,427'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	902	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	852	A	15	Air	1 Centralizer every other jt
Production	3,183	A	14.5	Air / SOBMM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc

*JH*  
8/1/18

Pilot Hole  
 PH TD @ 6,417' TVD  
 Landing Point @ 9,925' MD / 6,301' TVD  
 PH TVD = 100' below Onondaga Top

Lateral TD @ 14,151' ft MD  
 6,427' ft TVD

RECEIVED  
 Office of Oil and Gas

AUG 6 2018

WV Department of  
 Environmental Protection



**Tug Hill Operating, LLC Casing and Cement Program**

**Michter S-5HM**

**Casing**

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	800'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,605'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	14,151'	CTS

**Cement**

Conductor: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2

Surface: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2

Intermediate: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.19

Kick Off Plug: Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L - KOP Plug

Production: 50:50 Poz: 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 – Production Cement mixed at 15.2ppg, Y = 1.19

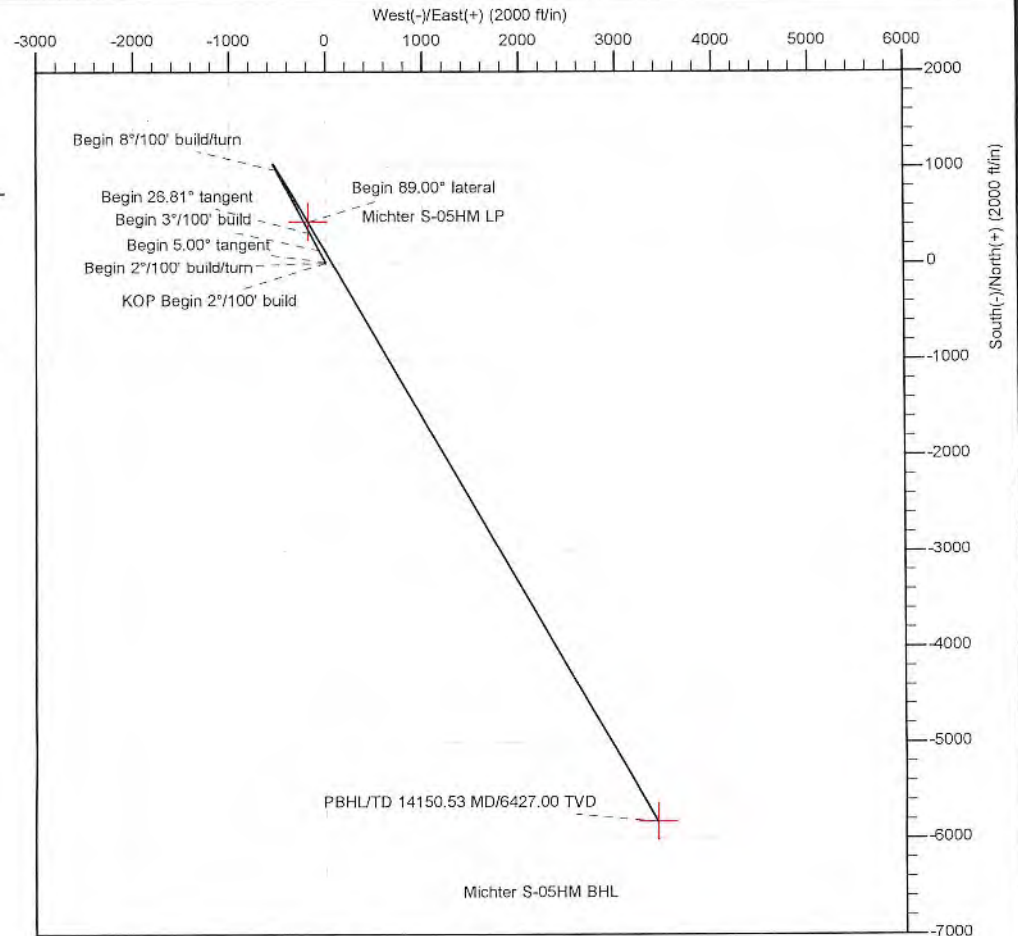
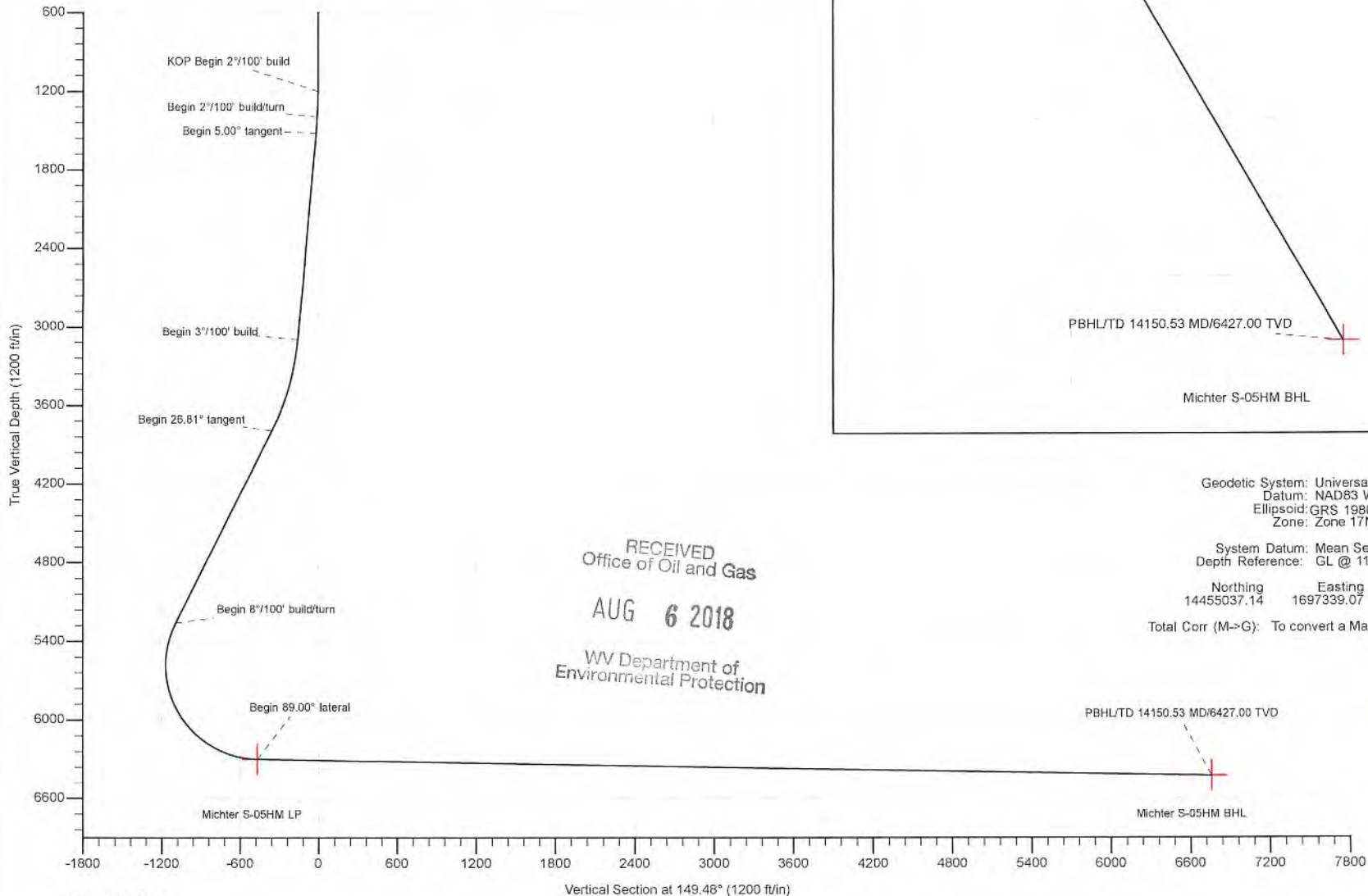
RECEIVED  
Office of Oil and Gas  
AUG 6 2018  
WV Department of  
Environmental Protection



Well: Michter S-05HM (A)  
 Site: Michter  
 Project: Marshall County, West Virginia.  
 Design: rev1

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	1400.00	4.00	0.00	1399.84	6.98	0.00	2.00	0.00	-6.01	Begin 2°/100' build/turn
4	1519.13	5.00	331.99	1518.61	15.72	-2.44	2.00	-79.93	-14.78	Begin 5.00° tangent
5	3106.56	5.00	331.99	3100.00	137.87	-67.41	0.00	0.00	-153.00	Begin 3°/100' build
6	3833.52	26.81	331.99	3794.92	312.68	-160.41	3.00	0.00	-350.82	Begin 26.81° tangent
7	5477.55	26.81	331.99	5262.24	967.29	-508.67	0.00	0.00	-1091.60	Begin 8°/100' build/turn
8	6924.95	89.00	150.00	6301.00	433.37	-179.79	8.00	177.79	-464.63	Begin 89.00° lateral
9	14150.53	89.00	150.00	6427.00	-5823.22	3432.45	0.00	0.00	6759.55	PBHL/TD 14150.53 MD/6427.00 TVD



Geodetic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: NAD83 West Virginia - HARN  
 Ellipsoid: GRS 1980  
 Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level  
 Depth Reference: GL @ 1130.00ft

Northing 14455037.14 Easting 1697339.07 Latitude 39.80292765 Longitude -80.79732422

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.79

RECEIVED  
 Office of Oil and Gas  
 AUG 6 2018  
 WV Department of  
 Environmental Protection



Azimuths to Grid North  
 True North: -0.13°  
 Magnetic North: -8.79°

Magnetic Field  
 Strength: 52088.9snT  
 Dip Angle: 66.91°  
 Date: 5/12/2018  
 Model: IGRF2015





Planning Report - Geographic

<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Michter S-05HM (A)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1130.00ft
<b>Project:</b>	Marshall County, West Virginia.	<b>MD Reference:</b>	GL @ 1130.00ft
<b>Site:</b>	Michter	<b>North Reference:</b>	Grid
<b>Well:</b>	Michter S-05HM (A)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev1		

<b>Project</b>	Marshall County, West Virginia.		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	Michter				
<b>Site Position:</b>		<b>Northing:</b>	14,454,962.42 usft	<b>Latitude:</b>	39.80272253
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,697,325.45 usft	<b>Longitude:</b>	-80.79737330
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.13 °

<b>Well</b>	Michter S-05HM (A)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	14,455,037.14 usft	<b>Latitude:</b>	39.80292765
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	1,697,339.06 usft	<b>Longitude:</b>	-80.79732422
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b>	1,130.00 ft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	5/12/2018	-8.66	66.91	52,088.92757758

<b>Design</b>	rev1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	149.48

<b>Plan Survey Tool Program</b>	Date 7/20/2018			
<b>Depth From (ft)</b>	<b>Depth To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	14,150.53 rev1 (Original Hole)	MWD	MWD - Standard

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,400.00	4.00	0.00	1,399.84	6.98	0.00	2.00	2.00	0.00	0.00	
1,519.13	5.00	331.99	1,518.61	15.72	-2.44	2.00	0.84	-23.51	-79.93	
3,106.56	5.00	331.99	3,100.00	137.87	-67.41	0.00	0.00	0.00	0.00	
3,833.52	26.81	331.99	3,794.92	312.68	-160.41	3.00	3.00	0.00	0.00	
5,477.55	26.81	331.99	5,262.24	967.29	-508.67	0.00	0.00	0.00	0.00	
6,924.95	89.00	150.00	6,301.00	433.37	-179.79	8.00	4.30	12.30	177.79	Michter S-05HM LP
14,150.53	89.00	150.00	6,427.00	-5,823.22	3,432.45	0.00	0.00	0.00	0.00	Michter S-05HM BHL



Planning Report - Geographic

Database: DB\_Jul2216dt\_v14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia.  
 Site: Michter  
 Well: Michter S-05HM (A)  
 Wellbore: Original Hole  
 Design: rev1

Local Co-ordinate Reference: Well Michter S-05HM (A)  
 TVD Reference: GL @ 1130.00ft  
 MD Reference: GL @ 1130.00ft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

RECEIVED  
 Office of Oil and Gas  
 AUG 6 2018

WV Department of  
 Environmental Protection

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
100.00	0.00	0.00	100.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
200.00	0.00	0.00	200.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
300.00	0.00	0.00	300.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
400.00	0.00	0.00	400.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
500.00	0.00	0.00	500.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
600.00	0.00	0.00	600.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
700.00	0.00	0.00	700.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
800.00	0.00	0.00	800.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
900.00	0.00	0.00	900.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,455,037.14	1,697,339.06	39.80292765	-80.79732422
<b>KOP Begin 2°/100' build</b>									
1,300.00	2.00	0.00	1,299.98	1.75	0.00	14,455,038.89	1,697,339.06	39.80293244	-80.79732421
1,400.00	4.00	0.00	1,399.84	6.98	0.00	14,455,044.12	1,697,339.06	39.80294682	-80.79732416
<b>Begin 2°/100' build/turn</b>									
1,500.00	4.77	335.61	1,499.55	14.26	-1.72	14,455,051.40	1,697,337.34	39.80296682	-80.79733022
1,519.13	5.00	331.99	1,518.61	15.72	-2.44	14,455,052.86	1,697,336.62	39.80297083	-80.79733278
<b>Begin 5.00° tangent</b>									
1,600.00	5.00	331.99	1,599.18	21.94	-5.75	14,455,059.08	1,697,333.31	39.80298794	-80.79734451
1,700.00	5.00	331.99	1,698.79	29.64	-9.84	14,455,066.78	1,697,329.22	39.80300910	-80.79735902
1,800.00	5.00	331.99	1,798.41	37.33	-13.93	14,455,074.47	1,697,325.13	39.80303026	-80.79737353
1,900.00	5.00	331.99	1,898.03	45.02	-18.03	14,455,082.17	1,697,321.04	39.80305141	-80.79738805
2,000.00	5.00	331.99	1,997.65	52.72	-22.12	14,455,089.86	1,697,316.94	39.80307257	-80.79740256
2,100.00	5.00	331.99	2,097.27	60.41	-26.21	14,455,097.56	1,697,312.85	39.80309373	-80.79741707
2,200.00	5.00	331.99	2,196.89	68.11	-30.31	14,455,105.25	1,697,308.76	39.80311489	-80.79743158
2,300.00	5.00	331.99	2,296.51	75.80	-34.40	14,455,112.95	1,697,304.66	39.80313604	-80.79744609
2,400.00	5.00	331.99	2,396.13	83.50	-38.49	14,455,120.64	1,697,300.57	39.80315720	-80.79746060
2,500.00	5.00	331.99	2,495.75	91.19	-42.59	14,455,128.34	1,697,296.48	39.80317836	-80.79747512
2,600.00	5.00	331.99	2,595.37	98.89	-46.68	14,455,136.03	1,697,292.38	39.80319951	-80.79748963
2,700.00	5.00	331.99	2,694.99	106.58	-50.77	14,455,143.73	1,697,288.29	39.80322067	-80.79750414
2,800.00	5.00	331.99	2,794.61	114.28	-54.87	14,455,151.42	1,697,284.20	39.80324183	-80.79751865
2,900.00	5.00	331.99	2,894.23	121.97	-58.96	14,455,159.12	1,697,280.11	39.80326298	-80.79753316
3,000.00	5.00	331.99	2,993.85	129.67	-63.05	14,455,166.81	1,697,276.01	39.80328414	-80.79754767
3,100.00	5.00	331.99	3,093.47	137.36	-67.14	14,455,174.50	1,697,271.92	39.80330530	-80.79756218
3,106.56	5.00	331.99	3,100.00	137.87	-67.41	14,455,175.01	1,697,271.65	39.80330669	-80.79756314
<b>Begin 3°/100' build</b>									
3,200.00	7.80	331.99	3,192.85	147.06	-72.31	14,455,184.21	1,697,266.76	39.80333197	-80.79758048
3,300.00	10.80	331.99	3,291.52	161.33	-79.90	14,455,198.48	1,697,259.17	39.80337121	-80.79760740
3,400.00	13.80	331.99	3,389.22	180.14	-89.90	14,455,217.29	1,697,249.16	39.80342293	-80.79764288
3,500.00	16.80	331.99	3,485.66	203.44	-102.30	14,455,240.58	1,697,236.77	39.80348699	-80.79768682
3,600.00	19.80	331.99	3,580.59	231.16	-117.05	14,455,268.31	1,697,222.02	39.80356322	-80.79773911
3,700.00	22.80	331.99	3,673.75	263.23	-134.11	14,455,300.38	1,697,204.96	39.80365140	-80.79779960
3,800.00	25.80	331.99	3,764.87	299.56	-153.43	14,455,336.71	1,697,185.63	39.80375129	-80.79786812
3,833.52	26.81	331.99	3,794.92	312.68	-160.41	14,455,349.82	1,697,178.65	39.80378735	-80.79789286
<b>Begin 26.81° tangent</b>									
3,900.00	26.81	331.99	3,854.26	339.15	-174.49	14,455,376.29	1,697,164.57	39.80386013	-80.79794279
4,000.00	26.81	331.99	3,943.51	378.97	-195.68	14,455,416.11	1,697,143.39	39.80396961	-80.79801789
4,100.00	26.81	331.99	4,032.76	418.79	-216.86	14,455,455.93	1,697,122.20	39.80407909	-80.79809300
4,200.00	26.81	331.99	4,122.01	458.60	-238.04	14,455,495.75	1,697,101.02	39.80418857	-80.79816810
4,300.00	26.81	331.99	4,211.26	498.42	-259.23	14,455,535.56	1,697,079.84	39.80429805	-80.79824320
4,400.00	26.81	331.99	4,300.51	538.24	-280.41	14,455,575.38	1,697,058.65	39.80440753	-80.79831831
4,500.00	26.81	331.99	4,389.77	578.06	-301.59	14,455,615.20	1,697,037.47	39.80451702	-80.79839341





Planning Report - Geographic

Database: DB\_Jul2216dt\_v14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia.  
 Site: Michter  
 Well: Michter S-05HM (A)  
 Wellbore: Original Hole  
 Design: rev1

Local Co-ordinate Reference: Well Michter S-05HM (A)  
 TVD Reference: GL @ 1130.00ft  
 MD Reference: GL @ 1130.00ft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

RECEIVED  
 Office of Oil and Gas

AUG 6 2018

WV Department of  
 Environmental Protection

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,600.00	26.81	331.99	4,479.02	617.87	-322.77	14,455,655.02	1,697,016.29	39.80462650	-80.79846852
4,700.00	26.81	331.99	4,568.27	657.69	-343.96	14,455,694.83	1,696,995.11	39.80473598	-80.79854362
4,800.00	26.81	331.99	4,657.52	697.51	-365.14	14,455,734.65	1,696,973.92	39.80484546	-80.79861873
4,900.00	26.81	331.99	4,746.77	737.33	-386.32	14,455,774.47	1,696,952.74	39.80495494	-80.79869383
5,000.00	26.81	331.99	4,836.02	777.14	-407.51	14,455,814.29	1,696,931.56	39.80506442	-80.79876894
5,100.00	26.81	331.99	4,925.27	816.96	-428.69	14,455,854.10	1,696,910.37	39.80517390	-80.79884405
5,200.00	26.81	331.99	5,014.53	856.78	-449.87	14,455,893.92	1,696,889.19	39.80528338	-80.79891915
5,300.00	26.81	331.99	5,103.78	896.60	-471.06	14,455,933.74	1,696,868.01	39.80539286	-80.79899426
5,400.00	26.81	331.99	5,193.03	936.41	-492.24	14,455,973.56	1,696,846.83	39.80550234	-80.79906937
5,477.55	26.81	331.99	5,262.24	967.29	-508.67	14,456,004.43	1,696,830.40	39.80558724	-80.79912761
<b>Begin 8"/100' build/turn</b>									
5,500.00	25.01	332.15	5,282.44	975.96	-513.26	14,456,013.10	1,696,825.80	39.80561107	-80.79914391
5,600.00	17.02	333.27	5,375.71	1,007.78	-529.75	14,456,044.92	1,696,809.32	39.80569856	-80.79920236
5,700.00	9.05	336.28	5,473.05	1,028.09	-539.51	14,456,065.23	1,696,799.55	39.80575439	-80.79923697
5,800.00	1.41	14.99	5,572.58	1,036.49	-542.36	14,456,073.63	1,696,796.70	39.80577747	-80.79924705
5,900.00	7.07	141.97	5,672.34	1,032.82	-538.25	14,456,069.96	1,696,800.82	39.80576737	-80.79923242
6,000.00	15.04	146.31	5,770.41	1,017.15	-527.24	14,456,054.29	1,696,811.82	39.80572427	-80.79919335
6,100.00	23.02	147.68	5,864.87	989.78	-509.56	14,456,026.93	1,696,829.51	39.80564901	-80.79913061
6,200.00	31.02	148.36	5,953.88	951.26	-485.55	14,455,988.40	1,696,853.52	39.80554307	-80.79904542
6,300.00	39.01	148.79	6,035.71	902.32	-455.67	14,455,939.46	1,696,883.39	39.80540849	-80.79893944
6,400.00	47.01	149.09	6,108.77	843.93	-420.52	14,455,881.07	1,696,918.55	39.80524790	-80.79881473
6,500.00	55.01	149.32	6,171.64	777.21	-380.76	14,455,814.35	1,696,958.30	39.80506443	-80.79867371
6,600.00	63.01	149.51	6,223.08	703.47	-337.19	14,455,740.61	1,697,001.88	39.80486164	-80.79851914
6,700.00	71.01	149.67	6,262.11	624.13	-290.63	14,455,661.28	1,697,048.43	39.80464349	-80.79835402
6,800.00	79.01	149.82	6,287.96	540.76	-242.01	14,455,577.90	1,697,097.05	39.80441422	-80.79818157
6,900.00	87.00	149.97	6,300.13	454.96	-192.27	14,455,492.10	1,697,146.80	39.80417829	-80.79800514
6,924.95	89.00	150.00	6,301.00	433.37	-179.79	14,455,470.51	1,697,159.27	39.80411892	-80.79796090
<b>Begin 89.00° lateral</b>									
7,000.00	89.00	150.00	6,302.31	368.39	-142.27	14,455,405.53	1,697,196.79	39.80394022	-80.79782783
7,100.00	89.00	150.00	6,304.05	281.80	-92.28	14,455,318.94	1,697,246.78	39.80370212	-80.79765053
7,200.00	89.00	150.00	6,305.80	195.21	-42.29	14,455,232.35	1,697,296.77	39.80346401	-80.79747322
7,300.00	89.00	150.00	6,307.54	108.62	7.70	14,455,145.76	1,697,346.77	39.80322590	-80.79729592
7,400.00	89.00	150.00	6,309.28	22.03	57.70	14,455,059.17	1,697,396.76	39.80298779	-80.79711862
7,500.00	89.00	150.00	6,311.03	-64.56	107.69	14,454,972.58	1,697,446.75	39.80274968	-80.79694132
7,600.00	89.00	150.00	6,312.77	-151.15	157.68	14,454,885.99	1,697,496.74	39.80251157	-80.79676402
7,700.00	89.00	150.00	6,314.52	-237.74	207.67	14,454,799.41	1,697,546.74	39.80227346	-80.79658672
7,800.00	89.00	150.00	6,316.26	-324.33	257.66	14,454,712.82	1,697,596.73	39.80203535	-80.79640942
7,900.00	89.00	150.00	6,318.00	-410.92	307.66	14,454,626.23	1,697,646.72	39.80179724	-80.79623213
8,000.00	89.00	150.00	6,319.75	-497.51	357.65	14,454,539.64	1,697,696.71	39.80155913	-80.79605483
8,100.00	89.00	150.00	6,321.49	-584.10	407.64	14,454,453.05	1,697,746.70	39.80132102	-80.79587754
8,200.00	89.00	150.00	6,323.23	-670.69	457.63	14,454,366.46	1,697,796.70	39.80108291	-80.79570025
8,300.00	89.00	150.00	6,324.98	-757.28	507.63	14,454,279.87	1,697,846.69	39.80084480	-80.79552296
8,400.00	89.00	150.00	6,326.72	-843.86	557.62	14,454,193.28	1,697,896.68	39.80060669	-80.79534567
8,500.00	89.00	150.00	6,328.47	-930.45	607.61	14,454,106.69	1,697,946.67	39.80036858	-80.79516838
8,600.00	89.00	150.00	6,330.21	-1,017.04	657.60	14,454,020.10	1,697,996.67	39.80013047	-80.79499109
8,700.00	89.00	150.00	6,331.95	-1,103.63	707.60	14,453,933.51	1,698,046.66	39.79989236	-80.79481381
8,800.00	89.00	150.00	6,333.70	-1,190.22	757.59	14,453,846.92	1,698,096.65	39.79965424	-80.79463652
8,900.00	89.00	150.00	6,335.44	-1,276.81	807.58	14,453,760.33	1,698,146.64	39.79941613	-80.79445924
9,000.00	89.00	150.00	6,337.18	-1,363.40	857.57	14,453,673.75	1,698,196.63	39.79917802	-80.79428196
9,100.00	89.00	150.00	6,338.93	-1,449.99	907.57	14,453,587.16	1,698,246.63	39.79893991	-80.79410468
9,200.00	89.00	150.00	6,340.67	-1,536.58	957.56	14,453,500.57	1,698,296.62	39.79870179	-80.79392740
9,300.00	89.00	150.00	6,342.42	-1,623.17	1,007.55	14,453,413.98	1,698,346.61	39.79846368	-80.79375012
9,400.00	89.00	150.00	6,344.16	-1,709.76	1,057.54	14,453,327.39	1,698,396.60	39.79822556	-80.79357284
9,500.00	89.00	150.00	6,345.90	-1,796.35	1,107.54	14,453,240.80	1,698,446.60	39.79798745	-80.79339557



Planning Report - Geographic

Database: DB\_Jul2216dt\_v14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia.  
 Site: Michter  
 Well: Michter S-05HM (A)  
 Wellbore: Original Hole  
 Design: rev1

Local Co-ordinate Reference: Well Michter S-05HM (A)  
 TVD Reference: GL @ 1130.00ft  
 MD Reference: GL @ 1130.00ft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

RECEIVED  
 Office of Oil and Gas

AUG 6 2018

WV Department of  
 Environmental Protection

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,600.00	89.00	150.00	6,347.65	-1,882.94	1,157.53	14,453,154.21	1,698,496.59	39.79774934	-80.79321829
9,700.00	89.00	150.00	6,349.39	-1,969.53	1,207.52	14,453,067.62	1,698,546.58	39.79751122	-80.79304102
9,800.00	89.00	150.00	6,351.14	-2,056.12	1,257.51	14,452,981.03	1,698,596.57	39.79727311	-80.79286375
9,900.00	89.00	150.00	6,352.88	-2,142.71	1,307.50	14,452,894.44	1,698,646.57	39.79703499	-80.79268648
10,000.00	89.00	150.00	6,354.62	-2,229.29	1,357.50	14,452,807.85	1,698,696.56	39.79679688	-80.79250921
10,100.00	89.00	150.00	6,356.37	-2,315.88	1,407.49	14,452,721.26	1,698,746.55	39.79655876	-80.79233194
10,200.00	89.00	150.00	6,358.11	-2,402.47	1,457.48	14,452,634.67	1,698,796.54	39.79632064	-80.79215467
10,300.00	89.00	150.00	6,359.85	-2,489.06	1,507.47	14,452,548.09	1,698,846.53	39.79608253	-80.79197740
10,400.00	89.00	150.00	6,361.60	-2,575.65	1,557.47	14,452,461.50	1,698,896.53	39.79584441	-80.79180014
10,500.00	89.00	150.00	6,363.34	-2,662.24	1,607.46	14,452,374.91	1,698,946.52	39.79560629	-80.79162288
10,600.00	89.00	150.00	6,365.09	-2,748.83	1,657.45	14,452,288.32	1,698,996.51	39.79536818	-80.79144561
10,700.00	89.00	150.00	6,366.83	-2,835.42	1,707.44	14,452,201.73	1,699,046.50	39.79513006	-80.79126835
10,800.00	89.00	150.00	6,368.57	-2,922.01	1,757.44	14,452,115.14	1,699,096.50	39.79489194	-80.79109109
10,900.00	89.00	150.00	6,370.32	-3,008.60	1,807.43	14,452,028.55	1,699,146.49	39.79465382	-80.79091383
11,000.00	89.00	150.00	6,372.06	-3,095.19	1,857.42	14,451,941.96	1,699,196.48	39.79441570	-80.79073658
11,100.00	89.00	150.00	6,373.80	-3,181.78	1,907.41	14,451,855.37	1,699,246.47	39.79417758	-80.79055932
11,200.00	89.00	150.00	6,375.55	-3,268.37	1,957.41	14,451,768.78	1,699,296.46	39.79393947	-80.79038206
11,300.00	89.00	150.00	6,377.29	-3,354.96	2,007.40	14,451,682.19	1,699,346.46	39.79370135	-80.79020481
11,400.00	89.00	150.00	6,379.04	-3,441.55	2,057.39	14,451,595.60	1,699,396.45	39.79346323	-80.79002756
11,500.00	89.00	150.00	6,380.78	-3,528.14	2,107.38	14,451,509.02	1,699,446.44	39.79322511	-80.78985031
11,600.00	89.00	150.00	6,382.52	-3,614.73	2,157.38	14,451,422.43	1,699,496.43	39.79298699	-80.78967306
11,700.00	89.00	150.00	6,384.27	-3,701.31	2,207.37	14,451,335.84	1,699,546.43	39.79274887	-80.78949581
11,800.00	89.00	150.00	6,386.01	-3,787.90	2,257.36	14,451,249.25	1,699,596.42	39.79251075	-80.78931856
11,900.00	89.00	150.00	6,387.76	-3,874.49	2,307.35	14,451,162.66	1,699,646.41	39.79227263	-80.78914131
12,000.00	89.00	150.00	6,389.50	-3,961.08	2,357.34	14,451,076.07	1,699,696.40	39.79203450	-80.78896407
12,100.00	89.00	150.00	6,391.24	-4,047.67	2,407.34	14,450,989.48	1,699,746.40	39.79179638	-80.78878682
12,200.00	89.00	150.00	6,392.99	-4,134.26	2,457.33	14,450,902.89	1,699,796.39	39.79155826	-80.78860958
12,300.00	89.00	150.00	6,394.73	-4,220.85	2,507.32	14,450,816.30	1,699,846.38	39.79132014	-80.78843234
12,400.00	89.00	150.00	6,396.47	-4,307.44	2,557.31	14,450,729.71	1,699,896.37	39.79108202	-80.78825510
12,500.00	89.00	150.00	6,398.22	-4,394.03	2,607.31	14,450,643.12	1,699,946.36	39.79084389	-80.78807786
12,600.00	89.00	150.00	6,399.96	-4,480.62	2,657.30	14,450,556.53	1,699,996.36	39.79060577	-80.78790062
12,700.00	89.00	150.00	6,401.71	-4,567.21	2,707.29	14,450,469.94	1,700,046.35	39.79036765	-80.78772338
12,800.00	89.00	150.00	6,403.45	-4,653.80	2,757.28	14,450,383.36	1,700,096.34	39.79012953	-80.78754615
12,900.00	89.00	150.00	6,405.19	-4,740.39	2,807.28	14,450,296.77	1,700,146.33	39.78989140	-80.78736891
13,000.00	89.00	150.00	6,406.94	-4,826.98	2,857.27	14,450,210.18	1,700,196.33	39.78965328	-80.78719168
13,100.00	89.00	150.00	6,408.68	-4,913.57	2,907.26	14,450,123.59	1,700,246.32	39.78941515	-80.78701445
13,200.00	89.00	150.00	6,410.42	-5,000.16	2,957.25	14,450,037.00	1,700,296.31	39.78917703	-80.78683722
13,300.00	89.00	150.00	6,412.17	-5,086.74	3,007.25	14,449,950.41	1,700,346.30	39.78893890	-80.78665999
13,400.00	89.00	150.00	6,413.91	-5,173.33	3,057.24	14,449,863.82	1,700,396.30	39.78870078	-80.78648276
13,500.00	89.00	150.00	6,415.66	-5,259.92	3,107.23	14,449,777.23	1,700,446.29	39.78846265	-80.78630553
13,600.00	89.00	150.00	6,417.40	-5,346.51	3,157.22	14,449,690.64	1,700,496.28	39.78822453	-80.78612831
13,700.00	89.00	150.00	6,419.14	-5,433.10	3,207.22	14,449,604.05	1,700,546.27	39.78798640	-80.78595108
13,800.00	89.00	150.00	6,420.89	-5,519.69	3,257.21	14,449,517.46	1,700,596.26	39.78774828	-80.78577386
13,900.00	89.00	150.00	6,422.63	-5,606.28	3,307.20	14,449,430.87	1,700,646.26	39.78751015	-80.78559664
14,000.00	89.00	150.00	6,424.38	-5,692.87	3,357.19	14,449,344.28	1,700,696.25	39.78727202	-80.78541942
14,100.00	89.00	150.00	6,426.12	-5,779.46	3,407.18	14,449,257.70	1,700,746.24	39.78703390	-80.78524220
14,150.53	89.00	150.00	6,427.00	-5,823.21	3,432.45	14,449,213.94	1,700,771.50	39.78691357	-80.78515265

PBHL/TD 14150.53 MD/6427.00 TVD



Planning Report - Geographic

<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Michter S-05HM (A)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1130.00ft
<b>Project:</b>	Marshall County, West Virginia.	<b>MD Reference:</b>	GL @ 1130.00ft
<b>Site:</b>	Michter	<b>North Reference:</b>	Grid
<b>Well:</b>	Michter S-05HM (A)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev1		

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Michter S-05HM LP - plan hits target center - Point	0.00	0.00	6,301.00	433.37	-179.79	14,455,470.51	1,697,159.27	39.80411891	-80.79796089
Michter S-05HM BHL - plan hits target center - Point	0.00	0.01	6,427.00	-5,823.22	3,432.45	14,449,213.94	1,700,771.50	39.78691356	-80.78515264

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,200.00	1,200.00	0.00	0.00	KOP Begin 2°/100' build	
1,400.00	1,399.84	6.98	0.00	Begin 2°/100' build/turn	
1,519.13	1,518.61	15.72	-2.44	Begin 5.00° tangent	
3,106.56	3,100.00	137.87	-67.41	Begin 3°/100' build	
3,833.52	3,794.92	312.68	-160.41	Begin 26.81° tangent	
5,477.55	5,262.24	967.29	-508.67	Begin 8°/100' build/turn	
6,924.95	6,301.00	433.37	-179.79	Begin 89.00° lateral	
14,150.53	6,427.00	-5,823.21	3,432.45	PBHL/TD 14150.53 MD/6427.00 TVD	

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

WW-9  
(4/16)

API Number 47 - 051 - \_\_\_\_\_

Operator's Well No. Michter S-5HM

**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 Quadrangle New Martinsville 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 contai 

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 James A. Pancake

Company Official (Typed Name) Jim Pancake

Company Official Title VP Geosciences

RECEIVED  
Office of Oil and Gas

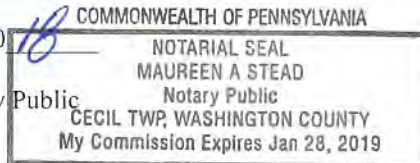
AUG 6 2018

WV Department of  
Environmental Protection

Subscribed and sworn before me this 2 day of AVG., 2018

Maureen A Stead

Notary Public



My commission expires 1/28/19

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 21.11 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	40	Orchard Grass	12
Spring Oats	96	Ladino	3
		White Clover	2

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 Nuland*

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

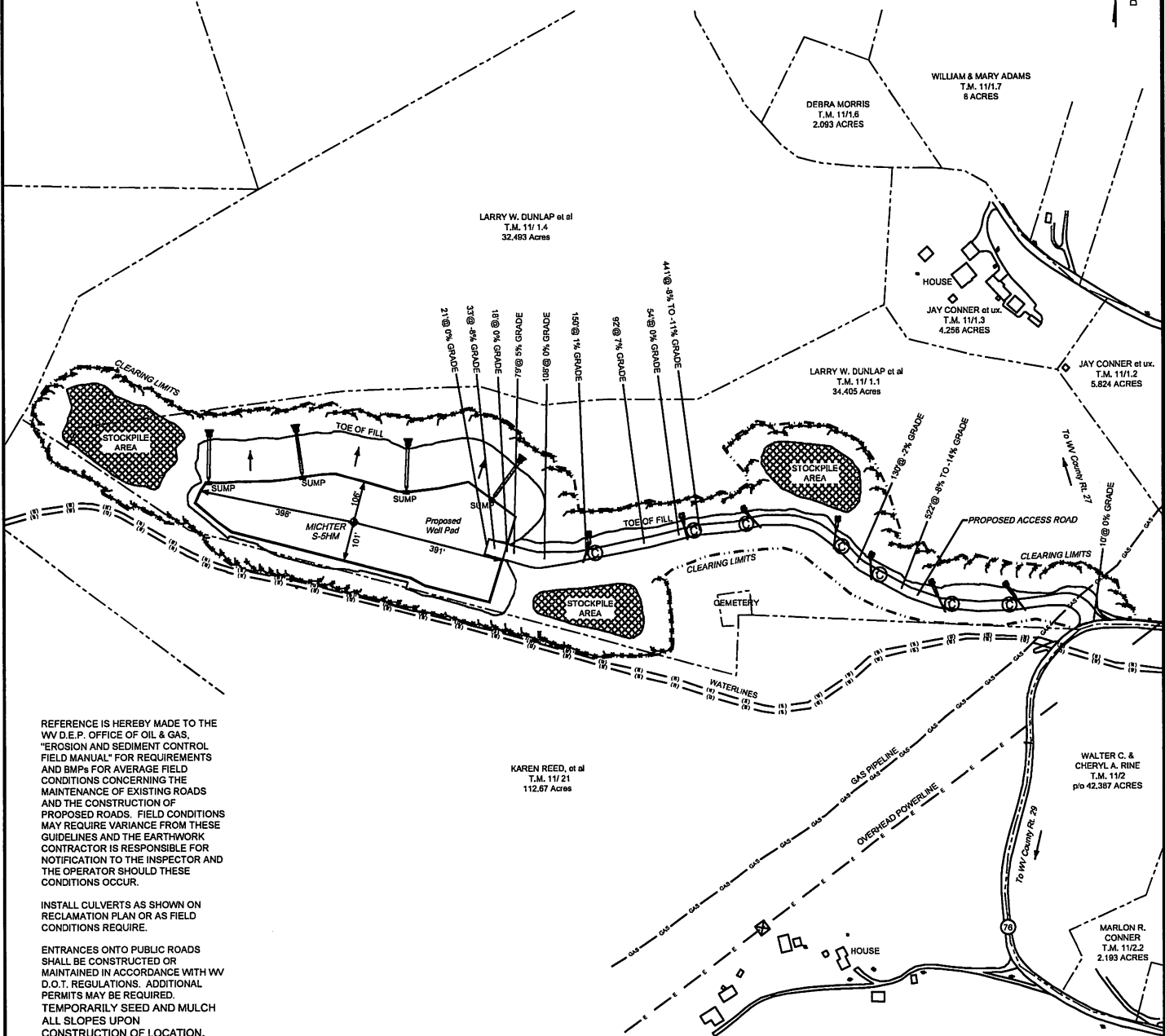
Title: Oil and Gas Inspector

Date: 8/1/18

Field Reviewed?  Yes  No

RECEIVED  
Office of Oil and Gas  
AUG 6 2018  
WV Department of  
Environmental Protection

# PROPOSED MICTHER S-5HM



REFERENCE IS HEREBY MADE TO THE WW 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 WW 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.

KAREN REED, et al  
T.M. 11/ 21  
112.67 Acres

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WW Department of  
Environmental Protection

**LEGEND**

- Note:
- ⊙ — Denotes proposed culvert with appropriate sediment outlet control (Rip Rap splash pad).
  - Silt Fence and or Sediment and Erosion Control Measure.
  - - - - - Surface Boundary



**Well Site Safety Plan**  
**Tug Hill Operating, LLC**

*JM*  
*6/28/18*

Well Name: Michter S-5HM

Pad Location: Michter Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,406,881.41

Easting: 517,345.82

June 2018

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

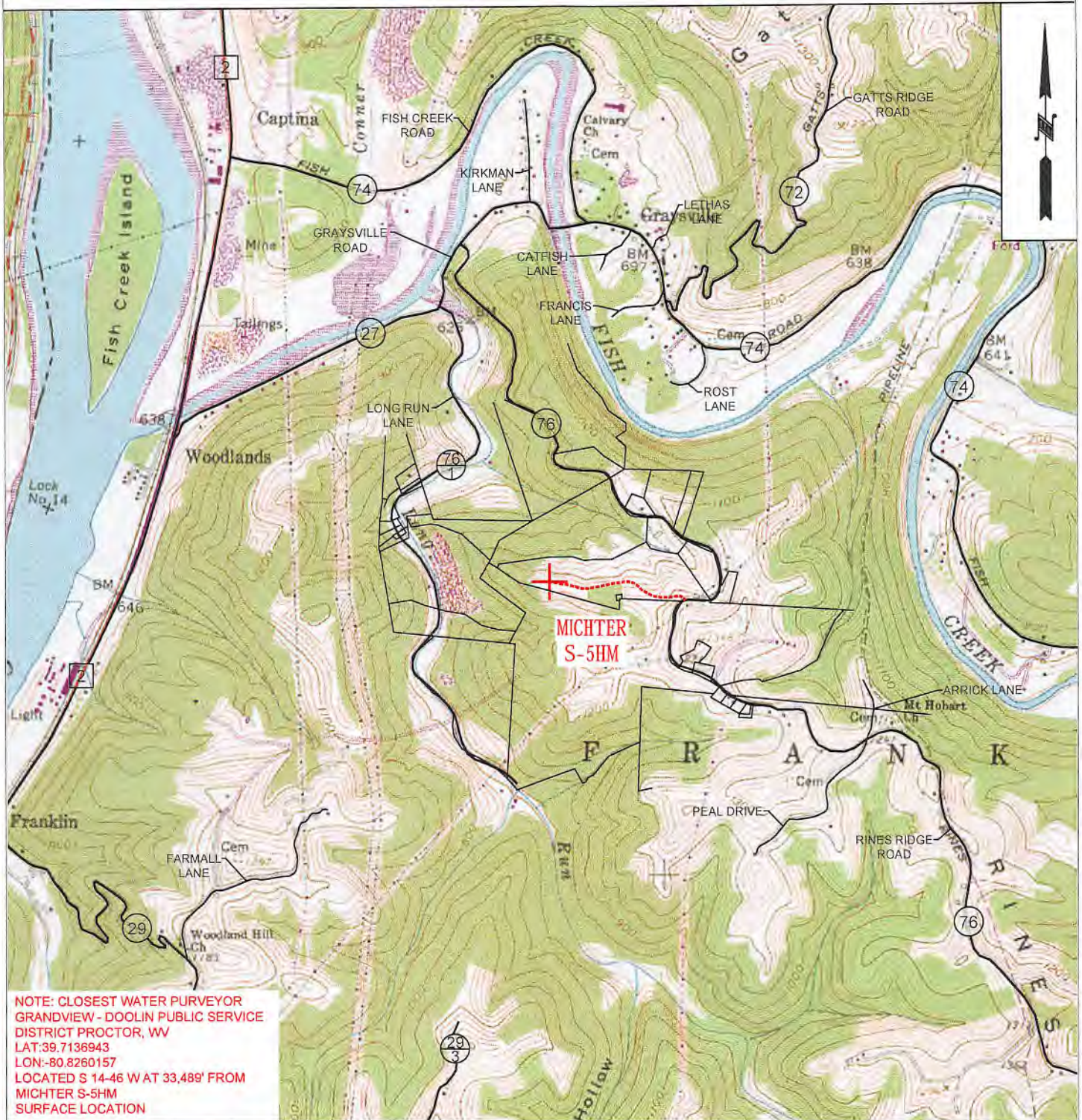
WW-9

AUG 6 2018


**PROPOSED  
MIGHTER S-5HM**

SUPPLEMENT PG 2

WV Department of  
Environmental Protection



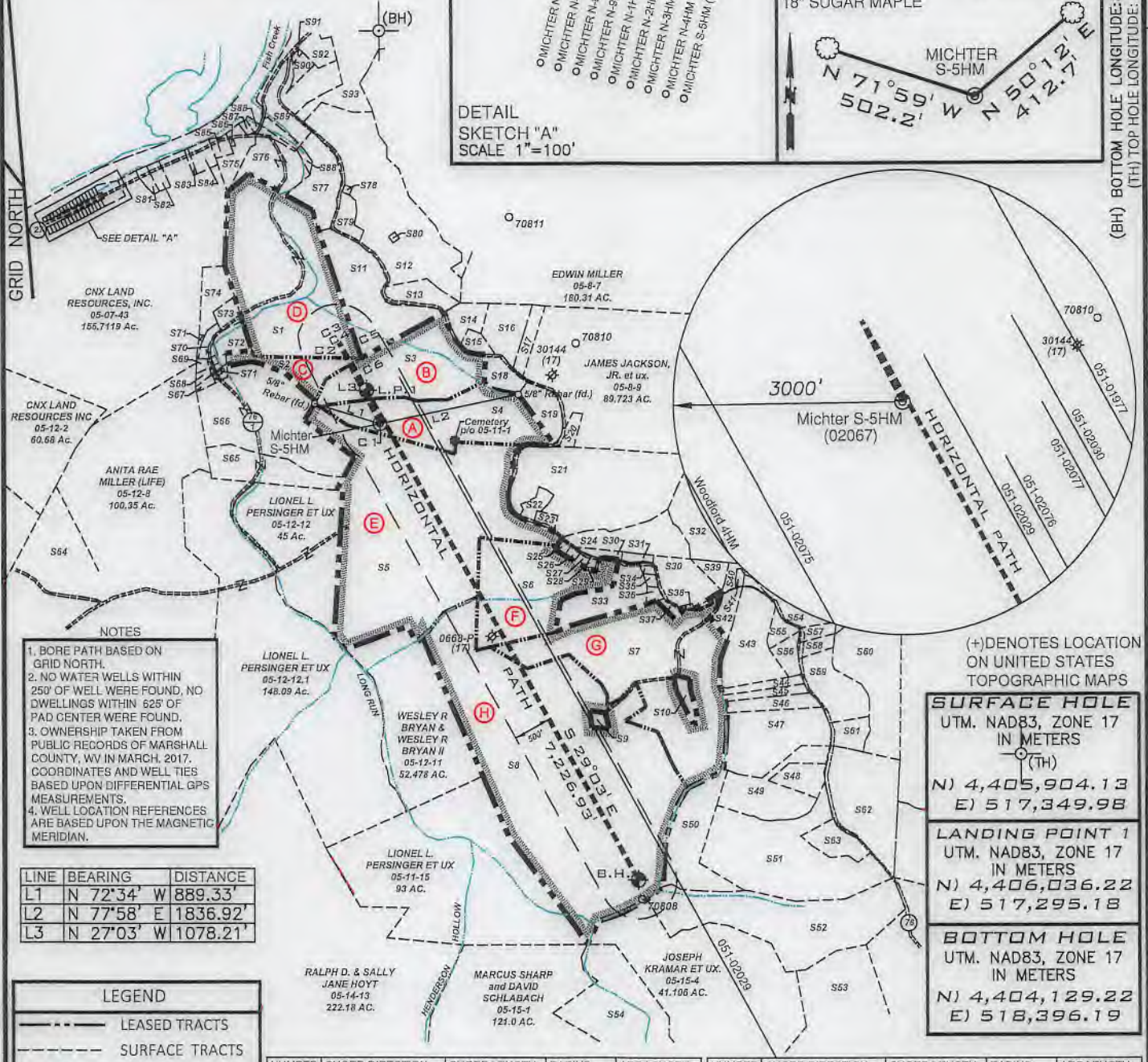
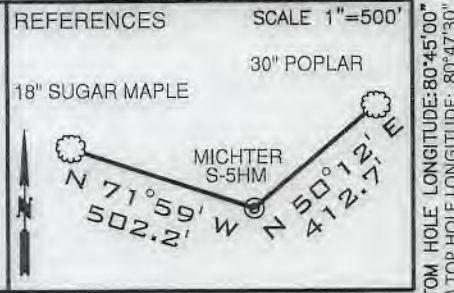
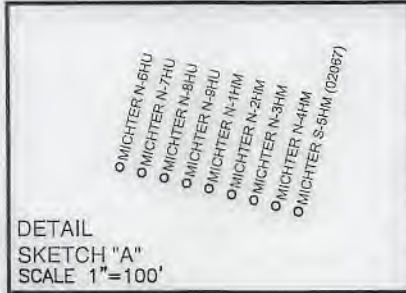
NOTE: CLOSEST WATER PURVEYOR  
GRANDVIEW - DOOLIN PUBLIC SERVICE  
DISTRICT PROCTOR, WV  
LAT: 39.7136943  
LON: -80.8260157  
LOCATED S 14-46 W AT 33,489' FROM  
MIGHTER S-5HM  
SURFACE LOCATION

 <p><b>TUG HILL OPERATING</b></p>	OPERATOR	494510851	TOPO SECTION	LEASE NAME
	TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		POWHATAN POINT 7.5'	MIGHTER
			SCALE:	DATE:
			1" = 2000'	DATE: 07-26-2018



# MICHTER LEASE WELL S-5HM 524.576± ACRES

TOP HOLE LATITUDE: 39°50'00"  
BOTTOM HOLE LATITUDE: 39°47'30"



- NOTES
1. BORE PATH BASED ON GRID NORTH.
  2. NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 825' OF PAD CENTER WERE FOUND.
  3. OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN MARCH, 2017. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
  4. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

LINE	BEARING	DISTANCE
L1	N 72°34' W	889.33'
L2	N 77°58' E	1836.92'
L3	N 27°03' W	1078.21'

LEGEND

- LEASED TRACTS
- - - SURFACE TRACTS
- ▬ UNIT BOUNDARY
- (A) LEASE # (SEE 6A1 FORM)

NUMBER	CHORD DIRECTION	CHORD LENGTH	RADIUS	ARC LENGTH	NUMBER	CHORD DIRECTION	CHORD LENGTH	RADIUS	ARC LENGTH
C1	N 07°51' W	15.91	29.59	16.11	C4	S 32°18' E	43.88	1113.89	43.88
C2	N 25°00' W	77.00	583.35	77.05	C5	S 30°16' E	248.63	7483.87	248.64
C3	S 40°14' E	13.32	31.87	13.42	C6	S 29°21' E	388.40	33755.20	388.40

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

**SURFACE HOLE**  
UTM. NAD83, ZONE 17  
IN METERS  
N) 4,405,904.13  
E) 517,349.98

**LANDING POINT 1**  
UTM. NAD83, ZONE 17  
IN METERS  
N) 4,406,036.22  
E) 517,295.18

**BOTTOM HOLE**  
UTM. NAD83, ZONE 17  
IN METERS  
N) 4,404,129.22  
E) 518,396.19

FILE NUMBER \_\_\_\_\_

DRAWING NUMBER MICHTER\_WP\_S-5HM

SCALE 1" = 2000'

MINIMUM DEGREE OF ACCURACY 1/200

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

*David L Jackson*



JACKSON SURVEYING INC.  
P.O. Box 1460  
Clarksburg, WV 26302  
304-623-5851

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

DATE: JUNE 28, 2018

REVISED: JULY 27, 2018

OPERATORS WELL NO. MICHTER S-5HM

API WELL NO. 47-051-02067

STATE WV COUNTY MARSHALL PERMIT 6A

LOCATION ELEVATION 1130.2' WATERSHED (HUC 10) FISH CREEK

DISTRICT FRANKLIN COUNTY MARSHALL

QUADRANGLE POWHATAN POINT 7.5' LEASE NUMBER SEE WW-6A1 FORM

SURFACE OWNER LARRY W. DUNLAP & CHARLES LEROY DUNLAP ACREAGE 34.405

OIL & GAS ROYALTY OWNER LARRY W. DUNLAP & CHARLES LEROY DUNLAP LEASE ACREAGE 34.405

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 6,417' TMD: 14,151'

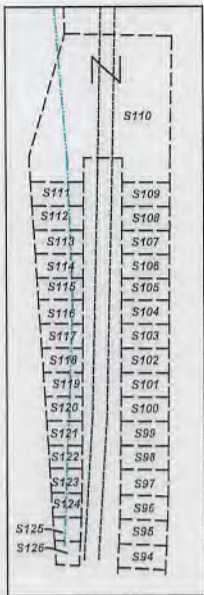
WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER  
CT CORPORATION SYSTEM

ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD  
FORT WORTH, TX 76107 CHARLESTON, WV 25313

47 051 02067 H6A

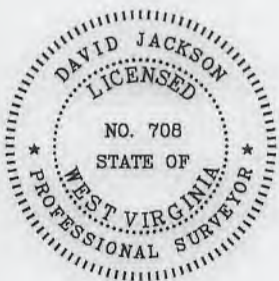
form wv6

PG 2 OF 2 MICTHER LEASE  
WELL S-5HM  
524.576± ACRES



DETAIL "A"  
SCALE: 1"=400'

Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES
S1	05-07-39	Lionel L. Persinger, et ux	57.0
S2	05-12-09	Lionel & Mary Lee Persinger	10.15
S3	05-11-1.4	Larry W. Dunlap, et al	32.493
S4	05-11-1.1	Larry W. Dunlap & Charles Leroy Dunlap	34.405
S5	05-11-21	Karen Reed, et al	112.67
S6	05-11-17	Kevin R. Corley, et ux	36.13
S7	05-11-16	Keith E. Haught, et al	83.674
S8	05-11-14	Hiram's Est. Family Ltd LLP	158.054
S9	05-11-14.1	Dennis F. Moore, et ux	1.056
S10	05-11-16.2	Joseph Haught	2.181
S11	05-07-33	William N. Roupe	24.60
S12	05-07-31	William N. Roupe, et ux	43.147
S13	05-07-32	William N. & Virginia A. Roupe	4.2
S14	05-11-01	William N. & Virginia A. Roupe	4.527
S15	05-11-1.6	Debra Morris	2.093
S16	05-11-1.7	William S. & Mary K. Adams	8.0
S17	05-11-1.5	Paul & Sandy Whitt	3.507
S18	05-11-1.3	Jay A. Conner, et ux	4.256
S19	05-11-1.2	Jay A. Conner, et ux	5.824
S20	05-08-9.1	Scott E. Jackson, Tammy S. South & Marion Jackson	1.957
S21	05-11-02	Walter & Cheryl Rine	42.367
S22	05-11-2.2	Joshua A. Myers	2.193
S23	05-11-2.1	Walter C. & Cheryl A. Rine	1.19
S24	05-11-03	Kevin R. Corley, et ux	13.18
S25	05-11-20	David E. Gray	0.569
S26	05-11-19	David E. Gray	0.532
S27	05-11-18	David E. Gray	0.569
S28	05-11-22	David Gray	0.353
S29	05-11-17	Kevin R. Corley, et ux	36.13
S30	05-11-05	Kevin R. Corley, et ux	10.36
S31	05-11-5.2	Rickey & Victoria Cross	1.0
S32	05-11-04	David H. Arrick, et ux	31.5
S33	05-11-17.2	Brenda & Micheal Bryan	11.504
S34	05-11-24	Charles Edward Furbee, et ux	0.603
S35	05-11-23	Owen Micheal Barr	0.845
S36	05-11-25	Owen Micheal Barr	0.598
S37	05-11-16.1	Susan Smith, L.E.	0.876
S38	05-11-5.1	James R. Anderson, et ux	0.205
S39	05-11-5.3	Robert Arrick, et ux	3.0
S40	05-11-06	Robert Arrick, et ux	1.29
S41	05-11-07	Mt. Hobart Baptist Cemetery	1.0
S42	05-11-16.3	Kegan Haught, LE	3.265
S43	05-11-9.3	Joseph M. & Steven Haught	16.3
S44	05-11-9.5	Southern Country Farms, Inc.	2.559
S45	05-11-9.6	Southern Country Farms, Inc.	2.488
S46	05-11-9.9	Leonard L. Parsons, et ux	5.89
S47	05-11-09	Southern Country Farms, Inc.	54.625
S48	05-11-11	Brad M. & Amanda J. Blake	5.0
S49	05-11-11.4	Brad M. & Amanda J. Blake	15.193
S50	05-11-13	Joy D. Gartman & Arlin Gatts	12.29
S51	05-11-11.3	Herman D. Lantz	43.96
S52	05-11-12	Joseph J. Kramer, et ux	43.2188
S53	05-15-06	Joseph J. Kramer, et ux	42.5
S54	05-15-03	Joseph J. Kramer, et ux	36.10
S55	05-11-9.10	John A. & Janet L. Beucte	2.348
S56	05-11-9.2	Michael R. Bryan	3.143
S57	05-11-9.8	Sean F. Moore	2.070
S58	05-11-9.7	Sean F. Moore	2.026
S59	05-11-9.1	Jack Shepard Higgins, et al	10.92
S60	05-11-10	Alvin Yoder	31.91
S61	05-11-9.4	Jack S. Higgins, et al	4.129
S62	05-11-11.2	Wesley R. Bryan & Wesley R. Bryan, II	25.031
S63	05-11-11.1	Nellie & Robert W. Spencer	5.813
S64	05-12-07	Robert Wm. Riggerback, et ex	104.231
S65	05-12-10	Consolidation Coal Company/ Murray Energy	13.76
S66	05-12-10.1	Consolidation Coal Company/ Murray Energy	38.48
S67	05-07-42.4	Jason Reed Hartley	0.94
S68	05-07-42.3	Joshua David Hartley	0.886
S69	05-07-42.2	Steven & Rhonda Lloyd	0.85
S70	05-07-44	Crystal B. Darrah	1.726
S71	05-07-42	Tracy M. Kesterson	0.53
S72	05-07-42.5	Matthew V. Conner, et al	3.791
S73	05-07-41	James A. Wade	1.0
S74	05-07-42.1	Holly Rice	5.99
S75	05-07-36	John Persinger	4.329
S76	05-07-35	Samuel L. Persinger	10.708
S77	05-07-34	WVA Dept of Highways	10.88
S78	05-07-31.3	William N. & Virginia A. Roupe	0.230
S79	05-07-31.2	William N. Roupe, et ux	3.304
S80	05-07-31.4	Grandview - Doolin PSD	0.23



P.S. 708 *David L Jackson*



**TUG HILL**  
OPERATING

OPERATOR'S  
WELL #: Michter S-5HM  
DISTRICT: Franklin  
COUNTY: Marshall  
STATE: WV

WELL PLAT  
PAGE 2 OF 2  
DATE: 06/28/2018  
REVISED: 07/27/2018

**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 pages

RECEIVED  
Office of Oil and Gas  
  
AUG 6 2018  
  
WV Department of  
Environmental Protection

**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.

Well Operator: Tug Hill Operating, LLC  
 By: Amy L. Miller *Amy Miller*  
 Its: Permitting Specialist

Lease ID	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Deed Book/Page		Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*47051.089.0	A	5-11-1.1	LARRY W DUNLAP AND BARBARA E DUNLAP	TH EXPLORATION LLC	864	148	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.089.0	B	5-11-1.4	LARRY W DUNLAP AND BARBARA E DUNLAP	TH EXPLORATION LLC	864	148	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19154	C	5-12-9	ROBERT H FISH PATSY C FISH	TRIENERGY HOLDINGS, LLC	706	631	TriEnergy Holdings LLC to NPAR LLC: 24/180	AB Resources LLC & NPAR LLC to Chief Explor. & Devel. LLC, etc (50%): 24/466	Chief Explor. & Devel. LLC, etc to Chevron U.S.A Inc (ARTI): 25/1	NPAR LLC to Chevron U.S.A Inc (ARTI): 756/332	Chief Explor. & Devel. LLC, etc to Chevron U.S.A Inc (ARTI): 25/105	TriEnergy Holdings LLC & TriEnergy Inc to Chevron U.S.A Inc (ARTI): 28/356	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*16914	D	5-7-39	LIONEL L AND MARY LEE PERSINGER	TH EXPLORATION LLC	910	54	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22667	E	5-11-21	REBEKAH DRAYER ELDRIDGE AND CHRISTOPHER ELDRIDGE	NOBLE ENERGY INC	850	157	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II appalachia LLC: 39/1	HG Energy II Appalachia LLC to TH Exploration LLC: 41/398
10*22773	E	5-11-21	CHRISTA DRAYER STALEY AND JOSHUA STALEY	NOBLE ENERGY INC	851	3	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II appalachia LLC: 39/1	HG Energy II Appalachia LLC to TH Exploration LLC: 41/398
10*22777	E	5-11-21	BOYD BUESKING	NOBLE ENERGY INC	850	159	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II appalachia LLC: 39/1	HG Energy II Appalachia LLC to TH Exploration LLC: 41/398
10*22780	E	5-11-21	BRENDA FAYE THOMAS PETRACK	NOBLE ENERGY INC	850	161	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II appalachia LLC: 39/1	HG Energy II Appalachia LLC to TH Exploration LLC: 41/398
10*22786	E	5-11-21	GUY YATES	NOBLE ENERGY INC	848	206	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II appalachia LLC: 39/1	HG Energy II Appalachia LLC to TH Exploration LLC: 41/398
10*22787	E	5-11-21	GAIL ANN YATES WOOD AND WESLEY J WOOD	NOBLE ENERGY INC	848	208	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II appalachia LLC: 39/1	HG Energy II Appalachia LLC to TH Exploration LLC: 41/398
10*22788	E	5-11-21	GENIE SUE THOMAS HOLMES AND JOHN L HOLMES	NOBLE ENERGY INC	848	204	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II appalachia LLC: 39/1	HG Energy II Appalachia LLC to TH Exploration LLC: 41/398
10*22801	E	5-11-21	BOYD DAIL YATES JR AND MARLA YATES	NOBLE ENERGY INC	848	210	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II appalachia LLC: 39/1	HG Energy II Appalachia LLC to TH Exploration LLC: 41/398
10*22808	E	5-11-21	SHIRLEY YATES HARTSELL AND FREDDIE LEE HARTSELL	NOBLE ENERGY INC	848	212	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II appalachia LLC: 39/1	HG Energy II Appalachia LLC to TH Exploration LLC: 41/398
10*22810	E	5-11-21	CLYDE V. & KAREN S REED	NOBLE ENERGY INC	864	190	N/A	N/A	N/A	N/A	N/A	Noble Energy Inc to HG Energy II appalachia LLC: 39/1	HG Energy II Appalachia LLC to TH Exploration LLC: 41/398
10*19126	F	5-11-17	KEVIN R. CORLEY AND ANITA L. CORLEY, HUSBAND AND WIFE	CHEVRON USA INC	859	44	N/A	N/A	N/A	N/A	N/A	N/A	Chevron U.S.A Inc to TH Exploration LLC: 40/127

Office of Oil and Gas

AUG 6 2018

WV Department of Environmental Protection

Lease ID	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Deed Book/Page		Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
10*19176	F	5-11-17	MAUNA MAXINE BEYSER	GASTAR EXPLORATION USA INC	710	602	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19177	F	5-11-17	NINA L KOVACS	GASTAR EXPLORATION USA INC	710	594	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19185	F	5-11-17	HARRIETT LODUTH FOLEY	GASTAR EXPLORATION USA INC	710	598	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19186	F	5-11-17	JOEL GLOVER	GASTAR EXPLORATION USA INC	710	600	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19189	F	5-11-17	SHERRY ANN MCPHERON	GASTAR EXPLORATION USA INC	710	606	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19190	F	5-11-17	SALLY LEE RIVERA	GASTAR EXPLORATION USA INC	710	590	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19191	F	5-11-17	SHARLA BETH WEAVER	GASTAR EXPLORATION USA INC	710	608	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19192	F	5-11-17	JAMES E YOHO	GASTAR EXPLORATION USA INC	714	129	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19201	F	5-11-17	DANIEL K YOHO	GASTAR EXPLORATION USA INC	714	125	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19202	F	5-11-17	DEBORAH L WOOLEY	GASTAR EXPLORATION USA INC	714	131	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

Lease ID	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Deed Book/Page		Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*19203	F	5-11-17	CAROL M YOHO	GASTAR EXPLORATION USA INC	713	205	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19204	F	5-11-17	DAYNA MARLENE YOHO	GASTAR EXPLORATION USA INC	714	127	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19205	F	5-11-17	JEFFREY C YOHO	GASTAR EXPLORATION USA INC	713	203	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19251	F	5-11-17	RAE SUZETTE BAKER	GASTAR EXPLORATION USA INC	748	315	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19252	F	5-11-17	JOHN WILSON	GASTAR EXPLORATION USA INC	749	522	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19502	F	5-11-17	SUSAN BLANCHE BEYSER	TH EXPLORATION LLC	942	623	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19893	F	5-11-17	WINIFRED G TURNER AND EDDIE G TURNER	TH EXPLORATION LLC	948	277	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21041	F	5-11-17	SHERY RITCHEA AND RANDEN D RITCHEA	TH EXPLORATION LLC	949	365	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22001	F	5-11-17	GREGORY K GLOVER	TH EXPLORATION LLC	953	271	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19139	G	5-11-16	HIRAM V MOORE	GASTAR EXPLORATION USA INC	699	53	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19178	G	5-11-16	JOSEPH HAUGHT	GASTAR EXPLORATION USA INC	710	69	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 24/335	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19179	G	5-11-16	KEITH HAUGHT BEVERLY HAUGHT	GASTAR EXPLORATION USA INC	710	587	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 735/263	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127
10*19180	G	5-11-16	STEVEN HAUGHT	TRIENERGY, INC.	710	67	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 24/335	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

Lease ID	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Deed Book/Page		Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
10*19139	H	5-11-14	HIRAM V MOORE	GASTAR EXPLORATION USA INC	699	53	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Cert. of Merger of Gastar Exploration USA Inc to Gastar Exploration Inc: 21/41	Gastar Exploration Inc & Atinum Marcellus I LLC to Chevron U.S.A Inc: 32/362	Chevron U.S.A Inc to TH Exploration LLC: 40/127

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

AFFIDAVIT

**COPY**

STATE OF TEXAS §  
§ SS  
COUNTY OF TARRANT §

On this 18<sup>th</sup> 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 18<sup>th</sup> day of October, 2016.

David D. Kalish  
Affiant: David D. Kalish

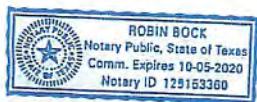
JURAT

Jan Pest  
MARSHALL County 03:44:28 PM  
Instrument No 1416299  
Date Recorded 10/19/2016  
Document Type HIS  
Pages Recorded 1  
Book-Page 26-62  
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 18<sup>th</sup> 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

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection





STATE OF WEST VIRGINIA §  
§  
COUNTY OF MARSHALL §

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 29<sup>th</sup> day of March, 2018 (the "Effective Date"), by and between HG ENERGY II APPALACHIA, LLC, (hereinafter "Assignor") and TH EXPLORATION, LLC (hereinafter "Assignee") pursuant to the terms of that certain Exchange Agreement between the Assignor and the Assignee dated November 1<sup>st</sup>, 2017 (the "Exchange Agreement"). Capitalized terms used but not defined herein and defined in the Exchange Agreement shall have the meanings given to such terms in the Exchange Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in Exhibit "A", attached hereto and made a part hereof (hereinafter the "Leases"); and

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to the Leases as described below.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and subject to the limited warranties, restrictions and conditions hereinafter mentioned, the parties hereto, intending to be legally bound, do covenant and agree as follows:

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon.

TO HAVE AND TO HOLD such right, title and interest in and to the Leases unto Assignee or its designee, and their respective successors and assigns, forever, in accordance with the provisions of this Assignment.

2. Special Warranty. Assignor represents and warrants that Assignor has not conveyed or otherwise encumbered (other than Permitted Encumbrances) its interest in the Leases since the time that Assignor obtained its interests in the Leases. Assignor does

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

4705102067



June 29, 2018

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

RE: Michter S-5HM

Subject: Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Michter S-5HM well plat.

If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact me directly at 304-376-0111, or by email at [amiller@tug-hilop.com](mailto:amiller@tug-hilop.com).

Sincerely,

A handwritten signature in black ink that reads "Amy L. Miller".

Amy L. Miller  
Permitting Specialist – Appalachia Region

RECEIVED  
Office of Oil and Gas

JUL 2 2018

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:** 6/29/2018 **Date Permit Application Filed:** 6/29/2018

**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: Larry W. and Barbara E. Dunlap (Pad and Access Road)  
 Address: 1549 Irish Ridge Road  
Cameron, WV 26033

Name: Karen Sue Reed and Clyde Reed (Well Pad)  
 Address: RR 4 Box 237  
Moundsville, WV 26041

SURFACE OWNER(s) (Road and/or Other Disturbance)  
 Name: Charles Leroy Dunlap (Pad and Access Road)  
 Address: 2500 Ohio St. Lot #10  
Moundsville, WV 26041

Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

SURFACE OWNER(s) (Impoundments or Pits)  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

COAL OWNER OR LESSEE  
 Name: CNX Resources, LLC - Attn: Casey Saunders  
 Address: 1000 CONSOL Energy Drive  
Canonsburg, PA 15317

COAL OPERATOR  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

OPERATOR OF ANY NATURAL GAS STORAGE FIELD  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

RECEIVED  
Office of Oil and Gas

JUL 2 2018

WV Department of  
Environmental Protection

\*Please attach additional forms if necessary

WW-6A  
(8-13)

AUG 6 2018

API NO. 47- 051 -  
OPERATOR WELL NO. Michter S-5HM  
Well Pad Name: Michter

WV Department of  
Environmental Protection

**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 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://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 spring. 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. A waiver, 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, 2012, 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 items

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 work 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 57<sup>th</sup> St. SE  
Charleston, WV 25304  
(304) 926-0450

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

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.

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

WW-6A  
(8-13)

API NO. 47-051 -  
OPERATOR WELL NO. Michter S-5HM  
Well Pad Name: Michter

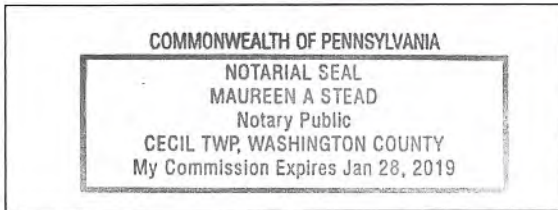
**Notice is hereby given by:**

Well Operator: Tug Hill Operating, LLC  
Telephone: 724-749-8388  
Email: amiller@tug-hilltop.com *amiller*

Address: 380 Southpointe Boulevard, 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 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 [deprivacyofficer@wv.gov](mailto:deprivacyofficer@wv.gov).



Subscribed and sworn before me this 2 day of Aug. 2018.  
Maureen A Stead Notary Public  
My Commission Expires 1/28/19

RECEIVED  
Office of Oil and Gas  
AUG 6 2018  
WV Department of  
Environmental Protection



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

**WATER WELL REPORT**

Well: MICHTER S-5HM  
 District: Franklin  
 County: Marshall  
 State: WV

There appears to be Five ( 5 ) possible water sources within 2,000 feet of the above referenced well location.

Topo Spot # 1 TM 11 Par. 1.6 Debra Morris 304-810-0813 1082 Rines Ridge Rd. Proctor, WV 26055	Topo Spot # 2 TM 11 Par. 1.6 Debra Morris 304-810-0813 1082 Rines Ridge Rd. Proctor, WV 26055	Topo Spot # 3 TM 11 Par. 1.7 William S. & Mary K. Adams 330-718-0404 P.O. Box 303 Canfield, OH 44406
Topo Spot # 4 TM 11 Par. 1.3 Jay A. Conner, et ux 304-845-0641 1117 Rine Ridge Rd. Proctor, WV 26055	Topo Spot # 5 TM 11 Par. 21 Karen Sue Reed and Clyde Reed 304-845-7536 100 Orchard Ln. Moundsville, WV 26041	

RECEIVED  
 Office of Oil and Gas

AUG 6 2018

WV Department of  
 Environmental Protection

WW-6A

AUG 6 2018

SUPPLEMENT PG 1

WV Department of  
Environmental Protection

# PROPOSED MICHTER S-5HM

*There appears to be Five ( 5 ) possible water sources within 2,000'.*



<b>OPERATOR</b>	494510851	<b>TOPO SECTION</b>	<b>LEASE NAME</b>
TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317		POWHATAN POINT 7.5'	MICHTER
<b>SCALE:</b>		<b>DATE:</b>	
1" = 1000'		DATE: 07-26-2018	

**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:** 5/8/2018      **Date of Planned Entry:** 5/15/2018

**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: Larry W. and Barbara E. Dunlap (Pad and Access Road)  
Address: 1549 Irish Ridge Road  
Cameron, WV 26033

Name: Charles Leroy Dunlap (Pad and Access Road)  
Address: 2500 Ohio St. Lot # 10  
Moundsville, WV 26041

Name: Karen Sue Reed and Clyde Reed (Well Pad)  
Address: RR 4 Box 237  
Moundsville, WV 26041

COAL OWNER OR LESSEE

Name: CNX Land Resources, LLC Attn: Casey Saunders  
Address: 1000 CONSOL Energy Drive  
Canonsburg, PA 15317

MINERAL OWNER(s)

Name: Larry W. and Barbara E. Dunlap (see attached list)  
Address: 1549 Irish Ridge Road  
Cameron, WV 26033  
\*please attach additional forms if necessary

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

**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>39.8027785; -80.7973528</u>
County:	<u>Marshall</u>	Public Road Access:	<u>Rines Ridge Road (County Route 76)</u>
District:	<u>Franklin</u>	Watershed:	<u>Fish Creek (HUC 10)</u>
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>Larry Dunlap, et al</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 57<sup>th</sup> 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](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Notice is hereby given by:**

Well Operator:	<u>Tug Hill Operating, LLC</u>	Address:	<u>380 Southpointe Boulevard, Plaza II, Suite 200</u>
Telephone:	<u>724-749-8388</u>		<u>Canonsburg, PA 15317</u>
Email:	<u>amiller@tug-hill.com</u>	Facsimile:	<u>724-338-2030</u>

**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](mailto:depprivacyofficer@wv.gov).

**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:** 08/03/2018      **Date Permit Application Filed:** 08/03/2018

**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: Larry W. and Barbara E. Dunlap  
Address: 4549 Irish Ridge Road  
Cameron, WV 26033

Name: Karen Sue Ree and Clyde Reed (See attached list)  
Address: 100 Orchard Lane  
Moundsville, WV 26041

**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	Easting:	<u>517,345.82</u>
County:	<u>Marshall</u>		Northing:	<u>4,406,881.41</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Rines Ridge Road (County Route 76)</u>	
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>Larry W. Dunlap and Charles Leroy Dunlap</u>	
Watershed:	<u>Fish Creek (HUC 10)</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 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

Well Operator: Tug Hill Operating, LLV  
Telephone: 724-749-8388  
Email: amiller@tug-hillop.com

Address: 380 Southpointe Boulevard, 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 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](mailto:depprivacyofficer@wv.gov).

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

**WW-6A5 Attachment  
Michter S-5HM**

**Additional Landowner**

Charles Leroy Dunlap  
21 Gypsy Drive  
Moundsville, WV 26041

RECEIVED  
Office of Oil and Gas

**AUG 6 2018**

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

Thomas J. Smith, P. E.  
Secretary of Transportation/  
Commissioner of Highways

June 19, 2018

Jill M. Newman  
Deputy Commissioner

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

Subject: DOH Permits for the Michter Well Pad, Marshall County

Michter S-5HM

Dear Mr. Martin,

This well site will be accessed from Permit #06-2018-0480 issued to Tug Hill Operating for access to the State Road for a well site located off of Marshall County Route 76 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,

A handwritten signature in blue ink that reads "Gary K. Clayton".

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

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

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection



**PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION**

Well No. Michter S-5HM

<b>PRODUCT NAME:</b>	<b>CHEMICAL DESCRIPTION:</b>	<b>PRODUCT USE:</b>	<b>HAZARDOUS COMPONENT:</b>
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

RECEIVED  
Office of Oil and Gas

AUG 6 2018

WV Department of  
Environmental Protection

OPERATOR: Tug Hill Operating, LLC WELL NO: Michter S-5HM

PAD NAME: Michter

REVIEWED BY: Amy L. Miller SIGNATURE: *Amy Miller*

## WELL RESTRICTIONS CHECKLIST

### HORIZONTAL 6A WELL

#### Well Restrictions

- At Least 100 Feet from Pad and LOD (including any E&S Control Feature) to any Perennial Stream, Lake, Pond, Reservoir or Wetland; OR  
 \_\_\_\_\_ DEP Waiver and Permit Conditions
- At Least 300 Feet from Pad and LOD (including any E&S Control Feature) to any Naturally Producing Trout Stream; OR  
 DEP Waiver and Permit Conditions
- At Least 1000 Feet from Pad and LOD (including any E&S Control Feature) to any Groundwater Intake or Public Water Supply; OR  
 DEP Waiver and Permit Conditions
- At Least 250 Feet from an Existing Water Well or Developed Spring to Well Being Drilled; OR  
 Surface Owner Waiver and Recorded with County Clerk, OR  
 DEP Variance and Permit Conditions
- At Least 625 Feet from an Occupied Dwelling Structure to Center of the Pad; OR  
 Surface Owner Waiver and Recorded with County Clerk, OR  
 DEP Variance and Permit Conditions
- At Least 625 Feet from Agricultural Buildings Larger than 2500 Square Feet to the Center of the Pad; OR  
 Surface Owner Waiver and Recorded with County Clerk, OR  
 DEP Variance and Permit Conditions

RECEIVED  
Office of Oil and Gas

AUG 6 2018





**APPROVED**  
**WVDEP OOG**  
10/12/2018

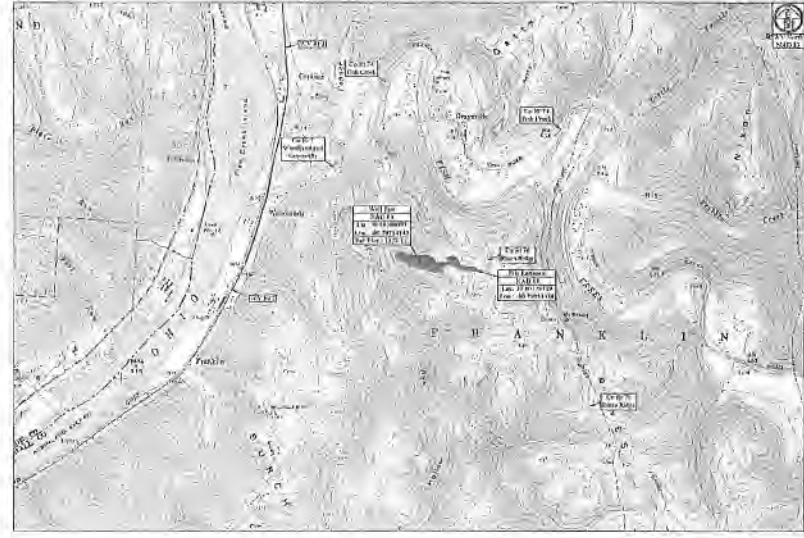
**Michter Well Site**  
Site Design, Construction Plan, &  
Erosion and Sediment Control Plans  
Tug Hill Operating  
Marshall County  
Franklin District  
Latitude 39.80290097°  
Longitude -80.79714143°  
Lower Fish Creek Watershed

**Pertinent Site Information**  
Michter Well Site  
Emergency Number: 304-845-1920  
Franklin District, Marshall County, WV  
Watershed: Lower Fish Creek Watershed  
Tug Hill Contact Number: 1-817-632-1400

**Property Owner Information - Michter Well Site**

Year	Acres	Value	Owner	Address	City	County	State
2018	1.00	1,000.00	TUG HILL OPERATING	1000 TUG HILL RD	FRANKLIN	WV	26034
2017	1.00	1,000.00	TUG HILL OPERATING	1000 TUG HILL RD	FRANKLIN	WV	26034
2016	1.00	1,000.00	TUG HILL OPERATING	1000 TUG HILL RD	FRANKLIN	WV	26034

**Exhibit A: Final Design: Issue for Permitting**



**Well Data**

Well ID	Well Name	Well Type	Well Depth	Well Diameter	Well Status
WV-001	...	...	...	...	...
WV-002	...	...	...	...	...
WV-003	...	...	...	...	...
WV-004	...	...	...	...	...
WV-005	...	...	...	...	...
WV-006	...	...	...	...	...
WV-007	...	...	...	...	...
WV-008	...	...	...	...	...
WV-009	...	...	...	...	...
WV-010	...	...	...	...	...
WV-011	...	...	...	...	...
WV-012	...	...	...	...	...
WV-013	...	...	...	...	...
WV-014	...	...	...	...	...
WV-015	...	...	...	...	...
WV-016	...	...	...	...	...
WV-017	...	...	...	...	...
WV-018	...	...	...	...	...
WV-019	...	...	...	...	...
WV-020	...	...	...	...	...

**Project Contacts**

**The Hill Operator:**  
Tug Hill Operating  
1000 Tug Hill Rd  
Franklin, WV 26034

**The Hill Operator, LLC:**  
2000 Mountain View Dr  
Martinsburg, WV 26151

**Environmental:**  
Michter Well Site  
1000 Tug Hill Rd  
Franklin, WV 26034

**MISE UTILITY OF WEST VIRGINIA:**  
1000 Tug Hill Rd  
Franklin, WV 26034

**811**

How to use 811: Call before you dig.

The Hill Operator will obtain an Environmental Permit (Form MMS-1005) from the WV Department of Transportation, Division of Highways, prior to the commencement of any construction activity.

The WV Motor Vehicle was registered. Taxation (Current) and title are within the ACS.

WVDEP Website like this that there are no active notices associated per well within the ACS.

**Flowplan Confirms:**  
The flowplan was reviewed and confirmed by the following parties:  
TUG HILL OPERATING  
MICHTER WELL SITE  
WVDEP

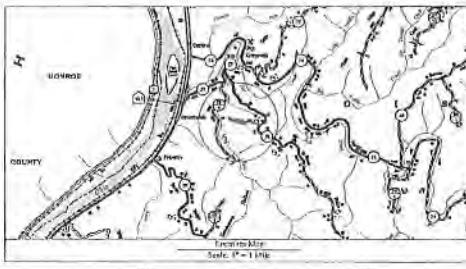
**Site Locations (MAD 25)**

Location	Latitude	Longitude
Well 1	39.80290097	-80.79714143
Well 2	39.80290097	-80.79714143
Well 3	39.80290097	-80.79714143

**Site Locations (SAD 43)**

Location	Latitude	Longitude
Well 1	39.80290097	-80.79714143
Well 2	39.80290097	-80.79714143
Well 3	39.80290097	-80.79714143

**Approach Route:**  
From the intersection of OH Rt 1 and WV Rt 7 road SW, drive on the WV Rt 7 road SW for 1.0 mi. Turn Right onto Cr Rt 11 (Wayline and Gravel Rd). Follow Cr Rt 11 for 1.0 mi. Turn Right onto Cr Rt 7 (Horse Ridge). Drive Cr Rt 7 for 1.0 mi. The site location will be on the left (West side of road).



**Well Location:**  
The well location is shown on the site plan. The well is located on the left side of the site plan, near the intersection of Cr Rt 11 and Cr Rt 7.

**Site Location:**  
The site location is shown on the site plan. The site is located on the right side of the site plan, near the intersection of Cr Rt 11 and Cr Rt 7.

**Scale:** 1" = 100'

**North Arrow:** Indicated by the arrow pointing upwards.

**Area Data**

Area Type	Area (Acres)
Well Pad	0.10
Access Road	0.10
Drainage Area	0.10
Other	0.10
<b>Total</b>	<b>0.40</b>

**District Areas**

District	Area (Acres)
Franklin District	0.40
Marshall County	0.40
Franklin District	0.40
Marshall County	0.40
<b>Total</b>	<b>0.40</b>

**Additional Information**

The well is located on the left side of the site plan, near the intersection of Cr Rt 11 and Cr Rt 7.

**Michter Well Site Quantities**

Item	Quantity	Unit
Well Pad	0.10	Acres
Access Road	0.10	Acres
Drainage Area	0.10	Acres
Other	0.10	Acres
<b>Total</b>	<b>0.40</b>	<b>Acres</b>

**Sheet Description**

Sheet	Description
1	Cover Sheet
2	Schedule of Quantities
3	Site Map
4	Pre-Construction Site Assessment
5	Site Soil Map
6	Clearing E-Plan
7	Drainage Plan View
8	GIS Site View
9	The Key Well
10	Plan View
11-12	Construction - Well Pad
13	Construction - Access Road
14-15	Construction - Erosion and Sediment Control
16	Construction - Well Pad
17	Construction - Access Road
18	Construction - Erosion and Sediment Control
19	Construction - Well Pad
20	Construction - Access Road
21	Construction - Erosion and Sediment Control
22	Construction - Well Pad
23	Construction - Access Road
24	Construction - Erosion and Sediment Control

**TUG HILL OPERATING**

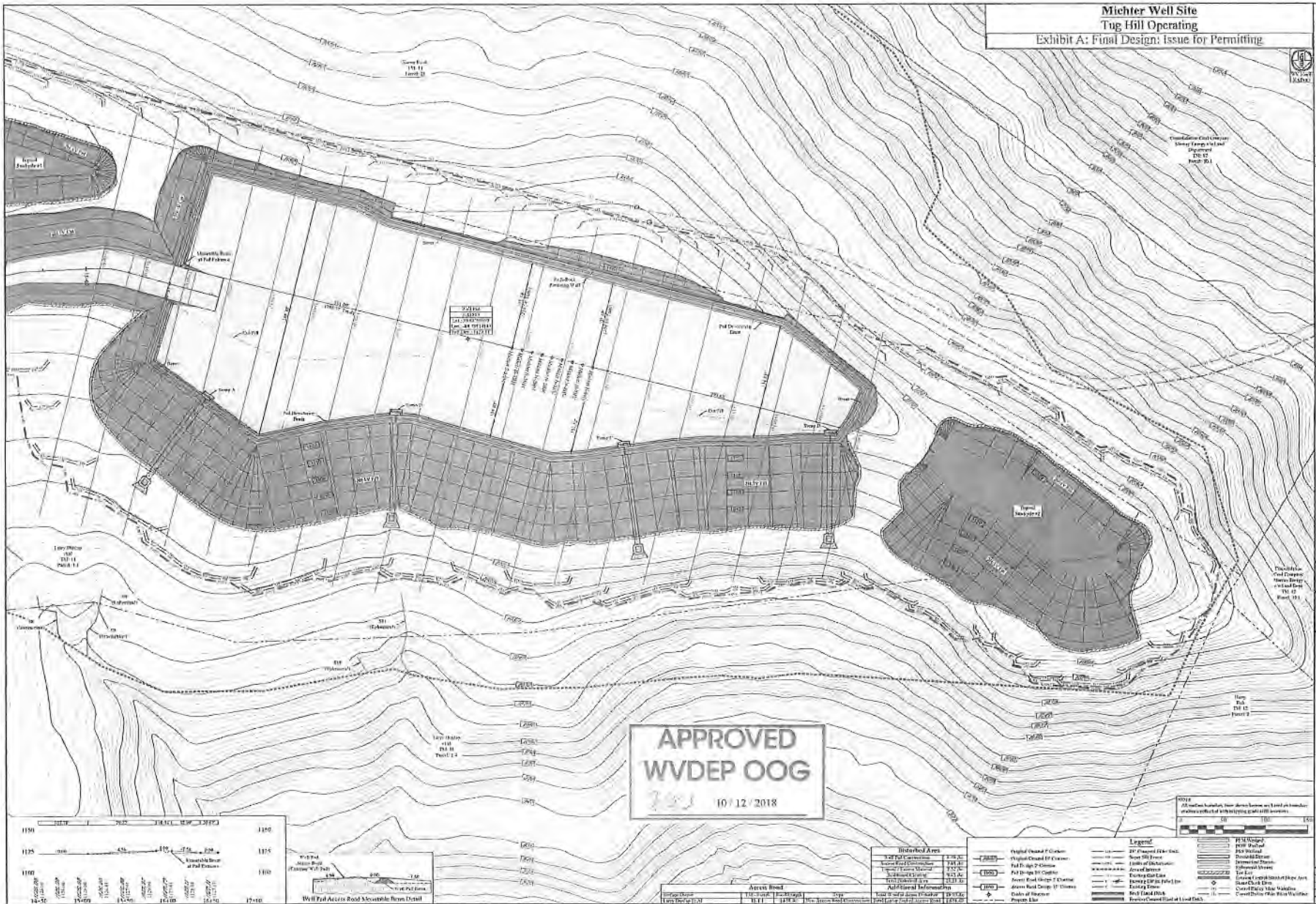
THIS DOCUMENT PREPARED FOR TUG HILL OPERATING

**K&S**

Cover Sheet  
**Michter Well Site**  
Franklin District  
Marshall County, WV

Date: 09/12/2018  
Scale: As Shown  
Drawn By: JLS  
Job No:  
Sheet 1 of 23

Michter Well Site  
Tug Hill Operating  
Exhibit A: Final Design: Issue for Permitting



**APPROVED**  
**WVDEP OOG**  
10/12/2018

TUG HILL  
OPERATING

THIS DRAWING IS PREPARED FOR TUG HILL OPERATING

K&S SURVEYING  
INCORPORATED

Site Plan  
Michter Well Site  
Franklin District  
Marshall County, WV

Date: 07/18/18  
Scale: As Shown  
Prepared by: J.S.  
Title: Site  
Sheet 1 of 13