



west virginia department of environmental protection

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

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Monday, March 15, 2021
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BOULEVARD, PLAZA II
SUITE 200
CANONSBURG, PA 15317

Re: Permit Modification Approval for KNOB CREEK S-10HM
47-051-02286-00-00

Lateral Extension

TUG HILL OPERATING, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

A handwritten signature in blue ink, appearing to read 'James A. Martin', is written over a light blue circular stamp.

James A. Martin
Chief

Operator's Well Number: KNOB CREEK S-10HM
Farm Name: DAVID LEE FRANKLIN
U.S. WELL NUMBER: 47-051-02286-00-00
Horizontal 6A New Drill
Date Modification Issued: 3/15/2021

Promoting a healthy environment.

03/19/2021



February 17, 2021

WADE STANSBERRY
WV DEP OFFICE OF OIL & GAS
601 57TH STREET SE
CHARLESTON, WV 25304-2345

VIA USPS

**RE: Knob Creek S-10HM API # 47-051-02286 (H6A Permit Modification)
Meade District, Marshall County, WV**

Dear Wade:

Tug Hill Operating, LLC is submitting a permit modification for its permitted well, Knob Creek S-10HM to add 8,099.73' to the lateral length. Therefore, enclosed please find the following:

- Modified WW-6B with changes highlighted in yellow
- Updated well plat
- Updated WW-6A1 information
- Updated Site Safety Plan (The only information that has changed is the contact information for the Inspector at the contact list at the end of the Plan).

If you have any questions or need any additional information, please do not hesitate to call me on (304) 376-0111. Thank you for attention to this matter, it is greatly appreciated.

Sincerely,

AMY MORRIS
PERMIT SPECIALIST-APPALACHIA REGION
TUG HILL OPERATING, LLC

RECEIVED
Office of Oil & Gas
FEB 25 2021
WV Department of
Environmental Protection

Enclosures

Modification

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	Meade	Glen Easton 7.5'
-----------	----------	-------	------------------

Operator ID County District Quadrangle

2) Operator's Well Number: Knob Creek S-10HM Well Pad Name: Knob Creek

3) Farm Name/Surface Owner: David Lee Franklin Public Road Access: St. Joseph Road - CR 21

4) Elevation, current ground: 737' Elevation, proposed post-construction: 737'

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

*pu
01/29/2020*

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6231' - 6282', thickness of 51' and an anticipated approximate pressure of 3800 psi.

8) Proposed Total Vertical Depth: 6,382'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 16,440'

11) Proposed Horizontal Leg Length: 9,489.53'

12) Approximate Fresh Water Strata Depths: 70'; 380'

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

14) Approximate Saltwater Depths: 1,740'

15) Approximate Coal Seam Depths: Sewickley Coal - 292' and Pittsburgh Coal - 374'

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

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes _____ No

RECEIVED
Office of Oil and Gas
FEB 25 2021
WV Department of
Environmental Protection

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

18) **CASING AND TUBING PROGRAM**

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	120'	120'	259ft^3(CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	480'	480'	683ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	480'	480'	683ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,302'	2,302'	745ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	16,440'	16,440'	4,199ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#	6,060'		
Liners							

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17.5"	.33	2,740	2,192	SEE #24	1.2
Coal	13 3/8"	17.5"	.33	2,740	2,192	SEE #24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE #24	1.19
Production	5 1/2"	8 7/8" _ 8 3/4"	.361	12,640	10,112	SEE #24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners							

PACKERS

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

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

Drill through the Marcellus tagging less than 100' from the top of the Onondaga to get depths and log data. Plug back to proposed kick off point. Drill the horizontal section to planned and proposed TD. Run casing and cement to surface. Run Bond Log from app. 60 deg to surface. Make clean out run and stimulate.

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

Well to completed with approximately 24,000,000 lb. proppant and 425,000 barrels of water. Max rate = 80bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 12.93 acres

22) Area to be disturbed for well pad only, less access road (acres): 5.55 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.

RECEIVED
Office of Oil and Gas

FEB 25 2021

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

Sfc - Premium NE-1 + 2% CaCl; Int1 - Premium NE-1 + 1.5% CaCL + Flake; Int2 - Lead: Premium NE-1 + 5% BA-90 + 3% KCl + .75 gals/100sk FP-13L + 1% MPA-170 Tail: Premium NE-1 + .1% R-3 + 5% KCl + 1% CD-32 + .4% FL-52 + .2% ASA-301 + .6% Sodium Metasilicate; Kick Plug - Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L; Prod - Lead: 50:50 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .75 gal/100sk FP-13L Tail: 25:75 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .375 gal/100sk FP-13L

WV Department of
Environmental Protection

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.

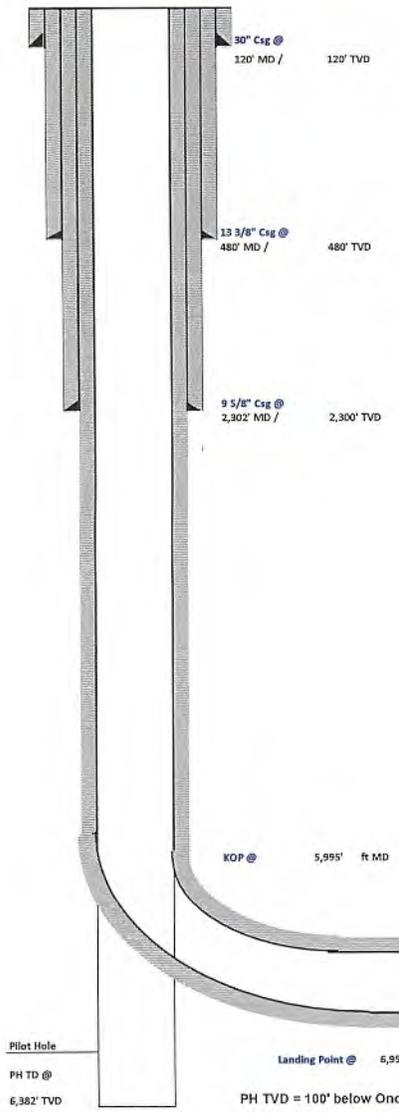


WELL NAME: Knob Creek 5-10HM
 STATE: WV COUNTY: Marshall
 DISTRICT: Meade
 DF Elev: 737' GL Elev: 737'
 TD: 16,440'
 TH Latitude: 39.77015977
 TH Longitude: -80.70539698
 BH Latitude: 39.74795568
 BH Longitude: -80.68217398

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	380
Sewickley Coal	292
Pittsburgh Coal	374
Big Lime	1726
Weir	2027
Berea	2211
Gordon	2474
Rhinestreet	5588
Genesee/Burkett	6100
Tully	6130
Hamilton	6163
Marcellus	6231
Landing Depth	6266
Onondaga	6282
Pilot Hole Depth	6382

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	480'	480'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,302'	2,300'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	16,440'	6,431'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	661	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	784	A	15	Air	1 Centralizer every other ft
Production	3,860	A	14.5	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other ft to sfc



Handwritten signature and date: 10/29/2020

Pilot Hole
 PH TD @ 6,382' TVD
 Landing Point @ 6,952' MD / 6,266' TVD
 PH TVD = 100' below Onondaga Top

Lateral TD @ 16,440' ft MD
 6,431' ft TVD

RECEIVED
 Office of Oil and Gas
 FEB 25 2021
 WV Department of Environmental Protection



Tug Hill Operating, LLC Casing and Cement Program

Knob Creek S-10HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	480'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,302'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	16,440'	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

FEB 25 2021

WV Department of
Environmental Protection

03/19/2021



TUG HILL
OPERATING

Well: Knob Creek S-10HM (slot H)
Site: Knob Creek
Project: Marshall County, West Virginia.
Design: rev3



Azimuths to Grid North
True North: -0.19°
Magnetic North: -8.88°

Magnetic Field
Strength: 52139.75nT
Dip Angle: 66.82°
Date: 9/19/2017
Model: IGRF2015



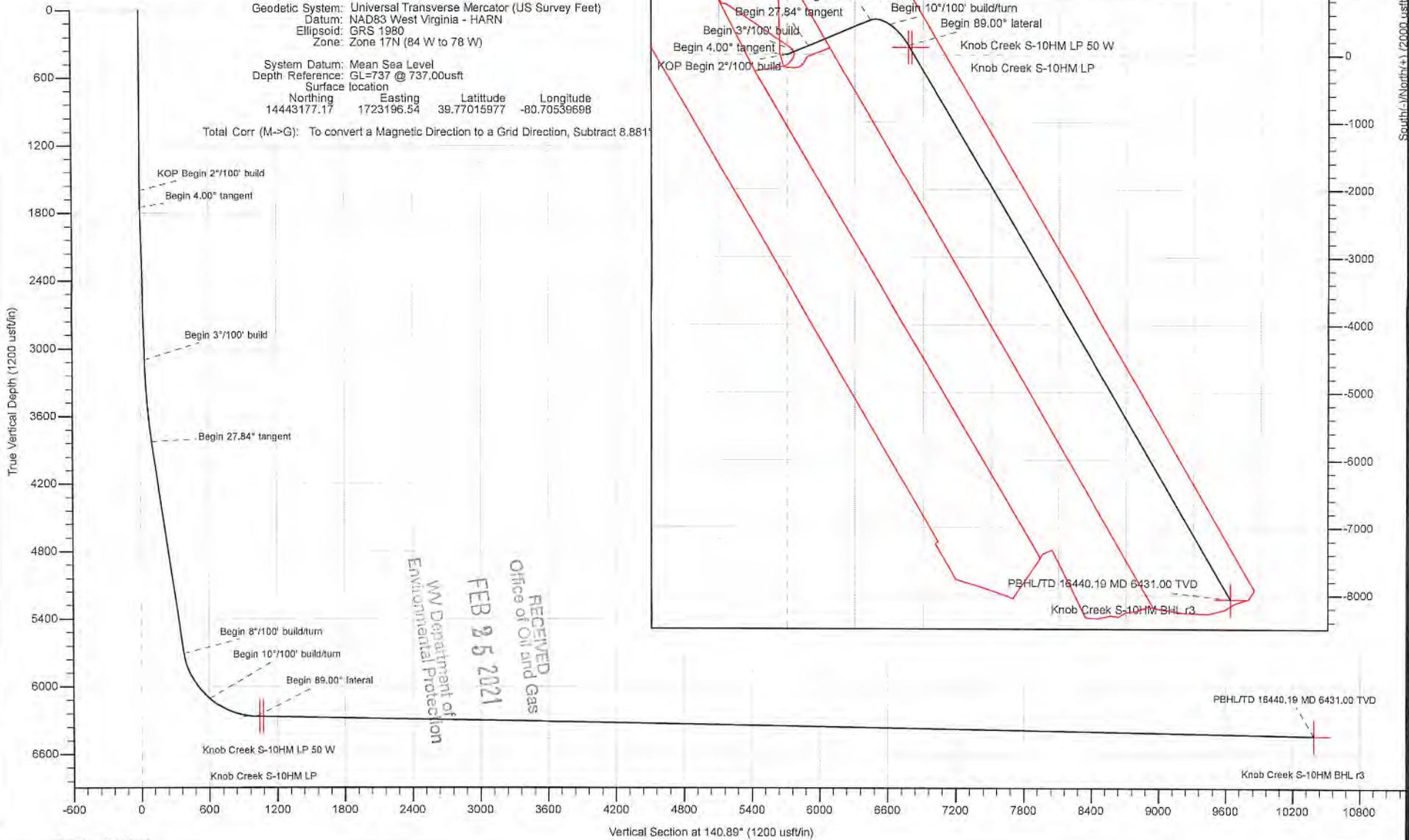
Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD83 West Virginia - HARN
Ellipsoid: GRS 1980
Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level
Depth Reference: GL=737 @ 737.00usft
Surface location
Northing Easting Latitude Longitude
14443177.17 1723196.54 39.77015977 -80.70539698

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.881

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.000	0.00	
3	1750.00	5.00	68.86	1749.68	3.93	10.17	2.00	68.860	3.36	Begin 4.00° tangent
4	3105.48	5.00	68.86	3100.00	46.54	120.35	0.00	0.000	39.80	Begin 3°/100' build
5	3866.91	27.84	67.18	3825.55	128.55	317.81	3.00	-2.023	100.71	Begin 27.84° tangent
6	5994.96	27.84	67.18	5707.29	514.01	1233.83	0.00	0.000	379.41	Begin 8°/100' build/turn
7	6497.57	50.00	124.09	6107.61	448.94	1512.99	8.00	83.809	605.99	Begin 10°/100' build/turn
8	6952.41	89.00	149.83	6266.16	138.23	1786.04	10.00	37.509	1019.32	Begin 89.00° lateral
9	16440.19	89.00	149.83	6431.00	-8062.78	6554.08	0.00	0.000	0390.59	PBHL/TD 16440.19 MD 6431.00 TVD



RECEIVED
Office of Oil and Gas
FEB 25 2021
WV Department of
Environmental Protection



Planning Report - Geographic

Database:	DB_Jul2216dt_v14 It	Local Co-ordinate Reference:	Well Knob Creek S-10HM (slot H)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=737 @ 737.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL=737 @ 737.00usft
Site:	Knob Creek	North Reference:	Grid
Well:	Knob Creek S-10HM (slot H)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

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

Site	Knob Creek				
Site Position:		Northing:	14,443,053.74 usft	Latitude:	39.76982148
From:	Lat/Long	Easting:	1,723,120.29 usft	Longitude:	-80.70566975
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.188 °

Well	Knob Creek S-10HM (slot H)					
Well Position	+N/-S	0.00 usft	Northing:	14,443,177.17 usft	Latitude:	39.77015977
	+E/-W	0.00 usft	Easting:	1,723,196.54 usft	Longitude:	-80.70539698
Position Uncertainty	0.00 usft	Wellhead Elevation:		Ground Level:	737.00 usft	

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/19/2017	-8.693	66.922	52,139.65048256

Design	rev3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	140.89

Plan Survey Tool Program	Date	8/11/2019		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	16,440.19 rev3 (Original Hole)	MWD	MWD - Standard

RECEIVED
Office of Oil and Gas
FEB 25 2021
WV Department of Environmental Protection

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,750.00	5.00	68.86	1,749.68	3.93	10.17	2.00	2.00	0.00	68.860	
3,105.48	5.00	68.86	3,100.00	46.54	120.35	0.00	0.00	0.00	0.000	
3,866.91	27.84	67.18	3,825.55	128.55	317.81	3.00	3.00	-0.22	-2.023	
5,994.96	27.84	67.18	5,707.29	514.01	1,233.83	0.00	0.00	0.00	0.000	
6,497.58	50.00	124.09	6,107.61	448.94	1,512.99	8.00	4.41	11.32	83.809	
6,952.41	89.00	149.83	6,266.16	138.23	1,786.04	10.00	8.58	5.66	37.509	
16,440.19	89.00	149.83	6,431.00	-8,062.78	6,554.08	0.00	0.00	0.00	0.000	Knob Creek S-10HM



Planning Report - Geographic

Database:	DB_Jul2216dt_v14 lt	Local Co-ordinate Reference:	Well Knob Creek S-10HM (slot H)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=737 @ 737.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL=737 @ 737.00usft
Site:	Knob Creek	North Reference:	Grid
Well:	Knob Creek S-10HM (slot H)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

RECEIVED
Office of Oil and Gas
FEB 25 2021

WV Department of
Environmental Protection

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
100.00	0.00	0.00	100.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
200.00	0.00	0.00	200.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
300.00	0.00	0.00	300.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
400.00	0.00	0.00	400.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
500.00	0.00	0.00	500.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
600.00	0.00	0.00	600.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
700.00	0.00	0.00	700.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
800.00	0.00	0.00	800.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
900.00	0.00	0.00	900.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,443,177.17	1,723,196.54	39.77015977	-80.70539698
1,600.00	2.00	68.86	1,599.98	0.63	1.63	14,443,177.80	1,723,198.16	39.77016149	-80.70539118
KOP Begin 2°/100' build									
1,700.00	4.00	68.86	1,699.84	2.52	6.51	14,443,179.69	1,723,203.04	39.77016662	-80.70537379
1,750.00	5.00	68.86	1,749.68	3.93	10.17	14,443,181.10	1,723,206.70	39.77017048	-80.70536075
Begin 4.00° tangent									
1,800.00	5.00	68.86	1,799.49	5.50	14.23	14,443,182.67	1,723,210.77	39.77017476	-80.70534627
1,900.00	5.00	68.86	1,899.11	8.65	22.36	14,443,185.82	1,723,218.90	39.77018332	-80.70531730
2,000.00	5.00	68.86	1,998.73	11.79	30.49	14,443,188.96	1,723,227.03	39.77019187	-80.70528833
2,100.00	5.00	68.86	2,098.35	14.93	38.62	14,443,192.10	1,723,235.15	39.77020043	-80.70525937
2,200.00	5.00	68.86	2,197.97	18.08	46.75	14,443,195.24	1,723,243.28	39.77020899	-80.70523040
2,300.00	5.00	68.86	2,297.59	21.22	54.88	14,443,198.39	1,723,251.41	39.77021755	-80.70520143
2,400.00	5.00	68.86	2,397.21	24.36	63.01	14,443,201.53	1,723,259.54	39.77022611	-80.70517247
2,500.00	5.00	68.86	2,496.83	27.51	71.14	14,443,204.67	1,723,267.67	39.77023467	-80.70514350
2,600.00	5.00	68.86	2,596.45	30.65	79.26	14,443,207.82	1,723,275.80	39.77024323	-80.70511453
2,700.00	5.00	68.86	2,696.07	33.79	87.39	14,443,210.96	1,723,283.93	39.77025178	-80.70508556
2,800.00	5.00	68.86	2,795.69	36.94	95.52	14,443,214.10	1,723,292.06	39.77026034	-80.70505660
2,900.00	5.00	68.86	2,895.31	40.08	103.65	14,443,217.25	1,723,300.19	39.77026890	-80.70502763
3,000.00	5.00	68.86	2,994.93	43.22	111.78	14,443,220.39	1,723,308.32	39.77027746	-80.70499867
3,100.00	5.00	68.86	3,094.55	46.37	119.91	14,443,223.53	1,723,316.45	39.77028602	-80.70496970
3,105.48	5.00	68.86	3,100.00	46.54	120.35	14,443,223.71	1,723,316.89	39.77028649	-80.70496811
Begin 3°/100' build									
3,200.00	7.83	68.13	3,193.92	50.42	130.18	14,443,227.59	1,723,326.71	39.77029707	-80.70493311
3,300.00	10.83	67.77	3,292.59	56.52	145.21	14,443,233.69	1,723,341.74	39.77031368	-80.70487956
3,400.00	13.83	67.56	3,390.27	64.64	164.96	14,443,241.81	1,723,361.49	39.77033581	-80.70480916
3,500.00	16.83	67.43	3,486.70	74.77	189.39	14,443,251.93	1,723,385.92	39.77036339	-80.70472211
3,600.00	19.83	67.33	3,581.61	86.86	218.42	14,443,264.03	1,723,414.95	39.77039635	-80.70461865
3,700.00	22.83	67.26	3,674.75	100.90	251.97	14,443,278.07	1,723,448.51	39.77043460	-80.70449907
3,800.00	25.83	67.21	3,765.85	116.85	289.96	14,443,294.01	1,723,486.50	39.77047804	-80.70436368
3,866.91	27.84	67.18	3,825.55	128.55	317.81	14,443,305.72	1,723,514.34	39.77050994	-80.70426445
Begin 27.84° tangent									
3,900.00	27.84	67.18	3,854.81	134.55	332.05	14,443,311.72	1,723,528.59	39.77052627	-80.70421369
4,000.00	27.84	67.18	3,943.24	152.66	375.10	14,443,329.83	1,723,571.63	39.77057562	-80.70406028
4,100.00	27.84	67.18	4,031.67	170.77	418.14	14,443,347.94	1,723,614.68	39.77062498	-80.70390688
4,200.00	27.84	67.18	4,120.09	188.89	461.19	14,443,366.06	1,723,657.72	39.77067433	-80.70375347
4,300.00	27.84	67.18	4,208.52	207.00	504.23	14,443,384.17	1,723,700.77	39.77072368	-80.70360007
4,400.00	27.84	67.18	4,296.94	225.11	547.28	14,443,402.28	1,723,743.81	39.77077304	-80.70344666
4,500.00	27.84	67.18	4,385.37	243.23	590.32	14,443,420.40	1,723,786.86	39.77082239	-80.70329326
4,600.00	27.84	67.18	4,473.79	261.34	633.37	14,443,438.51	1,723,829.90	39.77087174	-80.70313985



Planning Report - Geographic

Database: DB_Jul2216dt_v14 lt
Company: Tug Hill Operating LLC
Project: Marshall County, West Virginia.
Site: Knob Creek
Well: Knob Creek S-10HM (slot H)
Wellbore: Original Hole
Design: rev3

Local Co-ordinate Reference: Well Knob Creek S-10HM (slot H)
TVD Reference: GL=737 @ 737.00usft
MD Reference: GL=737 @ 737.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

RECEIVED
 Office of Oil and Gas
 FEB 25 2021

WV Department of
 Environmental Protection

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,700.00	27.84	67.18	4,562.22	279.45	676.41	14,443,456.62	1,723,872.95	39.77092109	-80.70298645	
4,800.00	27.84	67.18	4,650.64	297.57	719.46	14,443,474.74	1,723,915.99	39.77097044	-80.70283304	
4,900.00	27.84	67.18	4,739.07	315.68	762.50	14,443,492.85	1,723,959.04	39.77101980	-80.70267963	
5,000.00	27.84	67.18	4,827.49	333.79	805.55	14,443,510.96	1,724,002.08	39.77106915	-80.70252623	
5,100.00	27.84	67.18	4,915.92	351.91	848.59	14,443,529.08	1,724,045.13	39.77111850	-80.70237282	
5,200.00	27.84	67.18	5,004.34	370.02	891.64	14,443,547.19	1,724,088.17	39.77116785	-80.70221941	
5,300.00	27.84	67.18	5,092.77	388.13	934.68	14,443,565.30	1,724,131.22	39.77121720	-80.70206601	
5,400.00	27.84	67.18	5,181.19	406.25	977.73	14,443,583.42	1,724,174.26	39.77126655	-80.70191260	
5,500.00	27.84	67.18	5,269.62	424.36	1,020.77	14,443,601.53	1,724,217.31	39.77131590	-80.70175919	
5,600.00	27.84	67.18	5,358.04	442.47	1,063.82	14,443,619.64	1,724,260.36	39.77136525	-80.70160578	
5,700.00	27.84	67.18	5,446.47	460.59	1,106.87	14,443,637.76	1,724,303.40	39.77141460	-80.70145237	
5,800.00	27.84	67.18	5,534.89	478.70	1,149.91	14,443,655.87	1,724,346.45	39.77146395	-80.70129897	
5,900.00	27.84	67.18	5,623.32	496.81	1,192.96	14,443,673.98	1,724,389.49	39.77151330	-80.70114556	
5,994.96	27.84	67.18	5,707.29	514.01	1,233.83	14,443,691.18	1,724,430.37	39.77156016	-80.70099988	
Begin 8°/100' build/turn										
6,000.00	27.89	68.04	5,711.74	514.91	1,236.01	14,443,692.08	1,724,432.54	39.77156261	-80.70099212	
6,100.00	29.84	84.15	5,799.45	526.21	1,282.52	14,443,703.38	1,724,479.06	39.77159321	-80.70082644	
6,200.00	33.48	97.77	5,884.66	525.02	1,334.69	14,443,702.18	1,724,531.23	39.77158945	-80.70064079	
6,300.00	38.33	108.65	5,965.72	511.35	1,391.50	14,443,688.52	1,724,588.03	39.77155139	-80.70043879	
6,400.00	43.98	117.28	6,041.04	485.47	1,451.83	14,443,662.64	1,724,648.37	39.77147978	-80.70022437	
6,497.57	50.00	124.09	6,107.61	448.94	1,512.99	14,443,626.11	1,724,709.52	39.77137889	-80.70000717	
Begin 10°/100' build/turn										
6,500.00	50.19	124.28	6,109.17	447.89	1,514.53	14,443,625.06	1,724,711.06	39.77137600	-80.70000169	
6,600.00	58.37	131.40	6,167.55	397.98	1,578.36	14,443,575.15	1,724,774.90	39.77123834	-80.69977511	
6,700.00	66.87	137.33	6,213.53	335.86	1,641.62	14,443,513.03	1,724,838.16	39.77106717	-80.69955073	
6,800.00	75.57	142.55	6,245.72	263.43	1,702.38	14,443,440.60	1,724,898.92	39.77086768	-80.69933536	
6,900.00	84.37	147.37	6,263.13	182.88	1,758.80	14,443,360.04	1,724,955.33	39.77064594	-80.69913555	
6,952.41	89.00	149.83	6,266.16	138.23	1,786.04	14,443,315.40	1,724,982.58	39.77052308	-80.69903910	
Begin 89.00° lateral										
7,000.00	89.00	149.83	6,266.98	97.09	1,809.96	14,443,274.26	1,725,006.50	39.77040989	-80.69895448	
7,100.00	89.00	149.83	6,268.72	10.66	1,860.22	14,443,187.83	1,725,056.75	39.77017204	-80.69877667	
7,200.00	89.00	149.83	6,270.46	-75.78	1,910.47	14,443,101.39	1,725,107.00	39.76993420	-80.69859886	
7,300.00	89.00	149.83	6,272.20	-162.22	1,960.72	14,443,014.95	1,725,157.26	39.76969635	-80.69842105	
7,400.00	89.00	149.83	6,273.93	-248.66	2,010.98	14,442,928.51	1,725,207.51	39.76945851	-80.69824324	
7,500.00	89.00	149.83	6,275.67	-335.09	2,061.23	14,442,842.07	1,725,257.77	39.76922066	-80.69806543	
7,600.00	89.00	149.83	6,277.41	-421.53	2,111.49	14,442,755.64	1,725,308.02	39.76898282	-80.69788762	
7,700.00	89.00	149.83	6,279.15	-507.97	2,161.74	14,442,669.20	1,725,358.28	39.76874497	-80.69770982	
7,800.00	89.00	149.83	6,280.88	-594.41	2,212.00	14,442,582.76	1,725,408.53	39.76850712	-80.69753201	
7,900.00	89.00	149.83	6,282.62	-680.84	2,262.25	14,442,496.32	1,725,458.79	39.76826928	-80.69735421	
8,000.00	89.00	149.83	6,284.36	-767.28	2,312.51	14,442,409.89	1,725,509.04	39.76803143	-80.69717641	
8,100.00	89.00	149.83	6,286.10	-853.72	2,362.76	14,442,323.45	1,725,559.30	39.76779358	-80.69699861	
8,200.00	89.00	149.83	6,287.83	-940.16	2,413.01	14,442,237.01	1,725,609.55	39.76755573	-80.69682081	
8,300.00	89.00	149.83	6,289.57	-1,026.60	2,463.27	14,442,150.57	1,725,659.80	39.76731789	-80.69664301	
8,400.00	89.00	149.83	6,291.31	-1,113.03	2,513.52	14,442,064.14	1,725,710.06	39.76708004	-80.69646521	
8,500.00	89.00	149.83	6,293.04	-1,199.47	2,563.78	14,441,977.70	1,725,760.31	39.76684219	-80.69628742	
8,600.00	89.00	149.83	6,294.78	-1,285.91	2,614.03	14,441,891.26	1,725,810.57	39.76660434	-80.69610962	
8,700.00	89.00	149.83	6,296.52	-1,372.35	2,664.29	14,441,804.82	1,725,860.82	39.76636649	-80.69593183	
8,800.00	89.00	149.83	6,298.26	-1,458.78	2,714.54	14,441,718.38	1,725,911.08	39.76612864	-80.69575404	
8,900.00	89.00	149.83	6,299.99	-1,545.22	2,764.80	14,441,631.95	1,725,961.33	39.76589079	-80.69557624	
9,000.00	89.00	149.83	6,301.73	-1,631.66	2,815.05	14,441,545.51	1,726,011.59	39.76565294	-80.69539845	
9,100.00	89.00	149.83	6,303.47	-1,718.10	2,865.30	14,441,459.07	1,726,061.84	39.76541509	-80.69522067	
9,200.00	89.00	149.83	6,305.21	-1,804.53	2,915.56	14,441,372.63	1,726,112.09	39.76517724	-80.69504288	
9,300.00	89.00	149.83	6,306.94	-1,890.97	2,965.81	14,441,286.20	1,726,162.35	39.76493939	-80.69486509	
9,400.00	89.00	149.83	6,308.68	-1,977.41	3,016.07	14,441,199.76	1,726,212.60	39.76470154	-80.69468731	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14 It	Local Co-ordinate Reference:	Well Knob Creek S-10HM (slot H)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=737 @ 737.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL=737 @ 737.00usft
Site:	Knob Creek	North Reference:	Grid
Well:	Knob Creek S-10HM (slot H)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

RECEIVED
Office of Oil and Gas

FEB 25 2021

WV Department of
Environmental Protection

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,500.00	89.00	149.83	6,310.42	-2,063.85	3,066.32	14,441,113.32	1,726,262.86	39.76446369	-80.69450952
9,600.00	89.00	149.83	6,312.16	-2,150.29	3,116.58	14,441,026.88	1,726,313.11	39.76422584	-80.69433174
9,700.00	89.00	149.83	6,313.89	-2,236.72	3,166.83	14,440,940.45	1,726,363.37	39.76398798	-80.69415396
9,800.00	89.00	149.83	6,315.63	-2,323.16	3,217.09	14,440,854.01	1,726,413.62	39.76375013	-80.69397618
9,900.00	89.00	149.83	6,317.37	-2,409.60	3,267.34	14,440,767.57	1,726,463.88	39.76351228	-80.69379840
10,000.00	89.00	149.83	6,319.11	-2,496.04	3,317.59	14,440,681.13	1,726,514.13	39.76327443	-80.69362062
10,100.00	89.00	149.83	6,320.84	-2,582.47	3,367.85	14,440,594.70	1,726,564.38	39.76303657	-80.69344285
10,200.00	89.00	149.83	6,322.58	-2,668.91	3,418.10	14,440,508.26	1,726,614.64	39.76279872	-80.69326507
10,300.00	89.00	149.83	6,324.32	-2,755.35	3,468.36	14,440,421.82	1,726,664.89	39.76256087	-80.69308730
10,400.00	89.00	149.83	6,326.06	-2,841.79	3,518.61	14,440,335.38	1,726,715.15	39.76232301	-80.69290952
10,500.00	89.00	149.83	6,327.79	-2,928.22	3,568.87	14,440,248.94	1,726,765.40	39.76208516	-80.69273175
10,600.00	89.00	149.83	6,329.53	-3,014.66	3,619.12	14,440,162.51	1,726,815.66	39.76184730	-80.69255398
10,700.00	89.00	149.83	6,331.27	-3,101.10	3,669.38	14,440,076.07	1,726,865.91	39.76160945	-80.69237621
10,800.00	89.00	149.83	6,333.01	-3,187.54	3,719.63	14,439,989.63	1,726,916.17	39.76137160	-80.69219845
10,900.00	89.00	149.83	6,334.74	-3,273.97	3,769.89	14,439,903.19	1,726,966.42	39.76113374	-80.69202068
11,000.00	89.00	149.83	6,336.48	-3,360.41	3,820.14	14,439,816.76	1,727,016.67	39.76089588	-80.69184291
11,100.00	89.00	149.83	6,338.22	-3,446.85	3,870.39	14,439,730.32	1,727,066.93	39.76065803	-80.69166515
11,200.00	89.00	149.83	6,339.96	-3,533.29	3,920.65	14,439,643.88	1,727,117.18	39.76042017	-80.69148739
11,300.00	89.00	149.83	6,341.69	-3,619.73	3,970.90	14,439,557.44	1,727,167.44	39.76018232	-80.69130963
11,400.00	89.00	149.83	6,343.43	-3,706.16	4,021.16	14,439,471.01	1,727,217.69	39.75994446	-80.69113186
11,500.00	89.00	149.83	6,345.17	-3,792.60	4,071.41	14,439,384.57	1,727,267.95	39.75970660	-80.69095411
11,600.00	89.00	149.83	6,346.91	-3,879.04	4,121.67	14,439,298.13	1,727,318.20	39.75946875	-80.69077635
11,700.00	89.00	149.83	6,348.64	-3,965.48	4,171.92	14,439,211.69	1,727,368.46	39.75923089	-80.69059859
11,800.00	89.00	149.83	6,350.38	-4,051.91	4,222.18	14,439,125.25	1,727,418.71	39.75899303	-80.69042083
11,900.00	89.00	149.83	6,352.12	-4,138.35	4,272.43	14,439,038.82	1,727,468.97	39.75875517	-80.69024308
12,000.00	89.00	149.83	6,353.85	-4,224.79	4,322.68	14,438,952.38	1,727,519.22	39.75851731	-80.69006533
12,100.00	89.00	149.83	6,355.59	-4,311.23	4,372.94	14,438,865.94	1,727,569.47	39.75827946	-80.68988757
12,200.00	89.00	149.83	6,357.33	-4,397.66	4,423.19	14,438,779.50	1,727,619.73	39.75804160	-80.68970982
12,300.00	89.00	149.83	6,359.07	-4,484.10	4,473.45	14,438,693.07	1,727,669.98	39.75780374	-80.68953207
12,400.00	89.00	149.83	6,360.80	-4,570.54	4,523.70	14,438,606.63	1,727,720.24	39.75756588	-80.68935433
12,500.00	89.00	149.83	6,362.54	-4,656.98	4,573.96	14,438,520.19	1,727,770.49	39.75732802	-80.68917658
12,600.00	89.00	149.83	6,364.28	-4,743.42	4,624.21	14,438,433.75	1,727,820.75	39.75709016	-80.68899883
12,700.00	89.00	149.83	6,366.02	-4,829.85	4,674.47	14,438,347.32	1,727,871.00	39.75685230	-80.68882109
12,800.00	89.00	149.83	6,367.75	-4,916.29	4,724.72	14,438,260.88	1,727,921.26	39.75661444	-80.68864334
12,900.00	89.00	149.83	6,369.49	-5,002.73	4,774.97	14,438,174.44	1,727,971.51	39.75637658	-80.68846560
13,000.00	89.00	149.83	6,371.23	-5,089.17	4,825.23	14,438,088.00	1,728,021.76	39.75613872	-80.68828786
13,100.00	89.00	149.83	6,372.97	-5,175.60	4,875.48	14,438,001.57	1,728,072.02	39.75590085	-80.68811012
13,200.00	89.00	149.83	6,374.70	-5,262.04	4,925.74	14,437,915.13	1,728,122.27	39.75566299	-80.68793238
13,300.00	89.00	149.83	6,376.44	-5,348.48	4,975.99	14,437,828.69	1,728,172.53	39.75542513	-80.68775465
13,400.00	89.00	149.83	6,378.18	-5,434.92	5,026.25	14,437,742.25	1,728,222.78	39.75518727	-80.68757691
13,500.00	89.00	149.83	6,379.92	-5,521.35	5,076.50	14,437,655.81	1,728,273.04	39.75494941	-80.68739917
13,600.00	89.00	149.83	6,381.65	-5,607.79	5,126.76	14,437,569.38	1,728,323.29	39.75471154	-80.68722144
13,700.00	89.00	149.83	6,383.39	-5,694.23	5,177.01	14,437,482.94	1,728,373.55	39.75447368	-80.68704371
13,800.00	89.00	149.83	6,385.13	-5,780.67	5,227.26	14,437,396.50	1,728,423.80	39.75423582	-80.68686598
13,900.00	89.00	149.83	6,386.87	-5,867.10	5,277.52	14,437,310.06	1,728,474.05	39.75399795	-80.68668825
14,000.00	89.00	149.83	6,388.60	-5,953.54	5,327.77	14,437,223.63	1,728,524.31	39.75376009	-80.68651052
14,100.00	89.00	149.83	6,390.34	-6,039.98	5,378.03	14,437,137.19	1,728,574.56	39.75352223	-80.68633279
14,200.00	89.00	149.83	6,392.08	-6,126.42	5,428.28	14,437,050.75	1,728,624.82	39.75328436	-80.68615506
14,300.00	89.00	149.83	6,393.82	-6,212.86	5,478.54	14,436,964.31	1,728,675.07	39.75304650	-80.68597734
14,400.00	89.00	149.83	6,395.55	-6,299.29	5,528.79	14,436,877.88	1,728,725.33	39.75280863	-80.68579962
14,500.00	89.00	149.83	6,397.29	-6,385.73	5,579.05	14,436,791.44	1,728,775.58	39.75257077	-80.68562189
14,600.00	89.00	149.83	6,399.03	-6,472.17	5,629.30	14,436,705.00	1,728,825.84	39.75233292	-80.68544417
14,700.00	89.00	149.83	6,400.77	-6,558.61	5,679.56	14,436,618.56	1,728,876.09	39.75209503	-80.68526645
14,800.00	89.00	149.83	6,402.50	-6,645.04	5,729.81	14,436,532.12	1,728,926.34	39.75185717	-80.68508873
14,900.00	89.00	149.83	6,404.24	-6,731.48	5,780.06	14,436,445.69	1,728,976.60	39.75161930	-80.68491101

03/19/2021



Planning Report - Geographic

Database:	DB_Jul2216dt_v14 It	Local Co-ordinate Reference:	Well Knob Creek S-10HM (slot H)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=737 @ 737.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL=737 @ 737.00usft
Site:	Knob Creek	North Reference:	Grid
Well:	Knob Creek S-10HM (slot H)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

RECEIVED
Office of Oil and Gas
FEB 25 2021

WV Department of
Environmental Protection

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,000.00	89.00	149.83	6,405.98	-6,817.92	5,830.32	14,436,359.25	1,729,026.85	39.75138144	-80.68473330
15,100.00	89.00	149.83	6,407.72	-6,904.36	5,880.57	14,436,272.81	1,729,077.11	39.75114357	-80.68455558
15,200.00	89.00	149.83	6,409.45	-6,990.79	5,930.83	14,436,186.37	1,729,127.36	39.75090570	-80.68437787
15,300.00	89.00	149.83	6,411.19	-7,077.23	5,981.08	14,436,099.94	1,729,177.62	39.75066783	-80.68420015
15,400.00	89.00	149.83	6,412.93	-7,163.67	6,031.34	14,436,013.50	1,729,227.87	39.75042997	-80.68402244
15,500.00	89.00	149.83	6,414.67	-7,250.11	6,081.59	14,435,927.06	1,729,278.13	39.75019210	-80.68384473
15,600.00	89.00	149.83	6,416.40	-7,336.54	6,131.85	14,435,840.62	1,729,328.38	39.74995423	-80.68366702
15,700.00	89.00	149.83	6,418.14	-7,422.98	6,182.10	14,435,754.19	1,729,378.64	39.74971636	-80.68348931
15,800.00	89.00	149.83	6,419.88	-7,509.42	6,232.35	14,435,667.75	1,729,428.89	39.74947849	-80.68331161
15,900.00	89.00	149.83	6,421.61	-7,595.86	6,282.61	14,435,581.31	1,729,479.14	39.74924062	-80.68313390
16,000.00	89.00	149.83	6,423.35	-7,682.30	6,332.86	14,435,494.87	1,729,529.40	39.74900275	-80.68295620
16,100.00	89.00	149.83	6,425.09	-7,768.73	6,383.12	14,435,408.44	1,729,579.65	39.74876488	-80.68277849
16,200.00	89.00	149.83	6,426.83	-7,855.17	6,433.37	14,435,322.00	1,729,629.91	39.74852701	-80.68260079
16,300.00	89.00	149.83	6,428.56	-7,941.61	6,483.63	14,435,235.56	1,729,680.16	39.74828914	-80.68242309
16,400.00	89.00	149.83	6,430.30	-8,028.05	6,533.88	14,435,149.12	1,729,730.42	39.74805127	-80.68224539
16,440.19	89.00	149.83	6,431.00	-8,062.78	6,554.08	14,435,114.39	1,729,750.61	39.74795568	-80.68217398

PBHL/TD 16440.19 MD 6431.00 TVD

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Knob Creek S-10HM LP - hit/miss target - Shape	0.00	0.00	6,266.00	106.90	1,787.32	14,443,284.07	1,724,983.86	39.77043702	-80.69903493
- plan misses target center by 14.66usft at 6980.13usft MD (6266.64 TVD, 114.27 N, 1799.98 E)									
- Point									
Knob Creek S-10HM LP - plan misses target center by 28.60usft at 7005.26usft MD (6267.07 TVD, 92.55 N, 1812.60 E)	0.00	0.00	6,266.00	106.90	1,837.32	14,443,284.07	1,725,033.85	39.77043656	-80.69885700
- Point									
Knob Creek S-10HM BH - plan hits target center - Point	0.00	0.00	6,431.00	-8,062.78	6,554.08	14,435,114.39	1,729,750.61	39.74795568	-80.68217398

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,600.00	1,599.98	0.63	1.63	KOP Begin 2°/100' build
1,750.00	1,749.68	3.93	10.17	Begin 4.00° tangent
3,105.48	3,100.00	46.54	120.35	Begin 3°/100' build
3,866.91	3,825.55	128.55	317.81	Begin 27.84° tangent
5,994.96	5,707.29	514.01	1,233.83	Begin 8°/100' build/turn
6,497.57	6,107.61	448.94	1,512.99	Begin 10°/100' build/turn
6,952.41	6,266.16	138.23	1,786.04	Begin 89.00° lateral
16,440.19	6,431.00	-8,062.78	6,554.08	PBHL/TD 16440.19 MD 6431.00 TVD



Well Site Safety Plan

Tug Hill Operating, LLC

MW
10/29/2020

Well Name: Knob Creek S-10HM
Pad Location: Knob Creek Pad
Marshall County, West Virginia
UTM (meters), NAD83, Zone 17:

Northing: 4,402,289.21
Easting: 525,231.35

RECEIVED
Office of Oil and Gas
October 2020
FEB 25 2021
WV Department of
Environmental Protection

03/19/2021

**KNOB CREEK S LEASE
WELL 10HM
TUG HILL OPERATING**

T.H. LATITUDE 39°47'30"
B.H. LATITUDE 39°45'00"

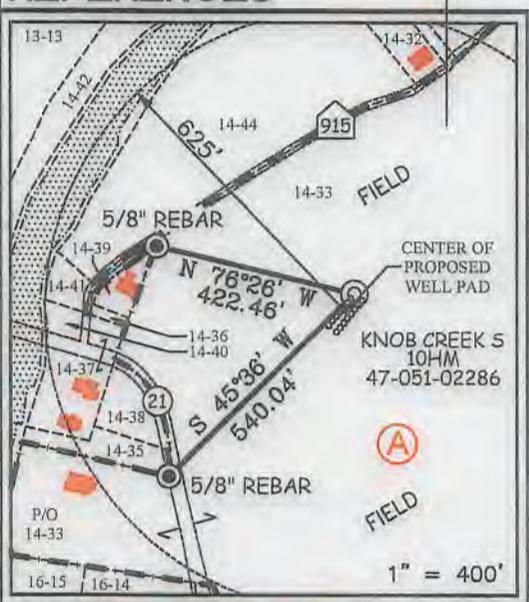
(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'83 S.P.C.(FT)	N. 464,904.41	E. 1,629,692.01
NAD'83 GEO.	LAT-(N) 39.770160	LONG-(W) 80.705397
NAD'83 UTM (M)	N. 4,402,289.21	E. 525,231.36
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 465,012.8	E. 1,631,480.7
NAD'83 GEO.	LAT-(N) 39.770523	LONG-(W) 80.699039
NAD'83 UTM (M)	N. 4,402,331.3	E. 525,775.7
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 456,730.5	E. 1,636,112.6
NAD'83 GEO.	LAT-(N) 39.747956	LONG-(W) 80.682174
NAD'83 UTM (M)	N. 4,399,831.7	E. 527,229.0

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°40'00"
745' B.H.
7,834' T.H.

MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
9-13-13	MARGARET K. FOX - LIFE	15.513
9-14-28	CHARLES R. SCHELLHASE, ET UX	3.029
9-14-29	ANDREW FASOULETOS, ET UX	0.209
9-14-29.1	ANDREW FASOULETOS, ET UX	1.171
9-14-30	WILLIAM C. GROFT, ET UX	0.33
9-14-31	WILFORD E. NELSON, JR., ET UX	0.954
9-14-32	TWILA C. COFFIELD	0.583
9-14-32.1	TWILA C. COFFIELD	0.184
9-14-35	PAUL G. FOX	0.338
9-14-36	MARGARET FOX - LIFE	1600 SQ. FT.
9-14-37	MARGARET FOX - LIFE	LOT (ASSD)
9-14-38	MARGARET FOX - LIFE	0.631
9-14-39	MARGARET FOX - LIFE	8675 SQ. FT.
9-14-40	MARGARET FOX - LIFE	19,560 SQ. FT.
9-14-41	MARGARET FOX - LIFE	9165 SQ. FT.
9-14-42	JOHN C. LAGOS, ET UX	1.87
9-14-44	DAVID LEE FRANKLIN	2.913
9-14-54	RICHARD L. HARVETH, ET UX	1.649
9-16-14	LYNN CAMP METHODIST CHURCH	0.762
9-16-15.1	ERIC J. YOUNG	1.98

REFERENCES



12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.2295
sfsww.com

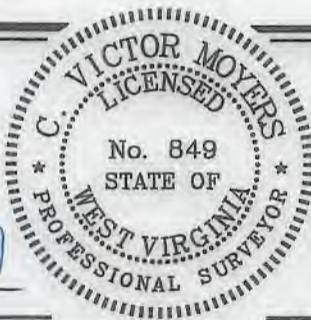
NOTES ON SURVEY

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- SEE REFERENCES FOR DWELLINGS LOCATED WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'.
- BASED ON WV DOT COUNTY ROUTE 74 IS A 40' STRIP OF LAND ACQUIRED IN NUMEROUS DEEDS.

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S.
849

C. Victor Moyers



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE JULY 27, 20 18

REVISED 09-30-2019, 08-28-2020, 10-29-2020

OPERATORS WELL NO. KNOB CREEK S-10HM
API WELL NO. 47 - 051 - 02286
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8789P10HMR3.dwg
KNOB CREEK S-10HM-REV3

HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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



WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW

LOCATION: ELEVATION 737.50' WATERSHED FISH CREEK (HUC 10)

DISTRICT MEADE COUNTY MARSHALL QUADRANGLE B.H. - WILEYVILLE 7.5' T.H. - GLEN EASTON 7.5'

SURFACE OWNER DAVID LEE FRANKLIN ACREAGE 65.824±

ROYALTY OWNER DAVID LEE FRANKLIN, ET AL - SEE WW-6A1 ACREAGE 63.719/2021

PROPOSED WORK: LEASE NO. SEE WW-6A1

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD

FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER

PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION MARCELLUS

ESTIMATED DEPTH TVD: 6,382' / TMD: 16,440'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS CT CORPORATION SYSTEM
FORT WORTH, TX 76107 ADDRESS 5400 D BIG TYLER ROAD
CHARLESTON, WV 25313

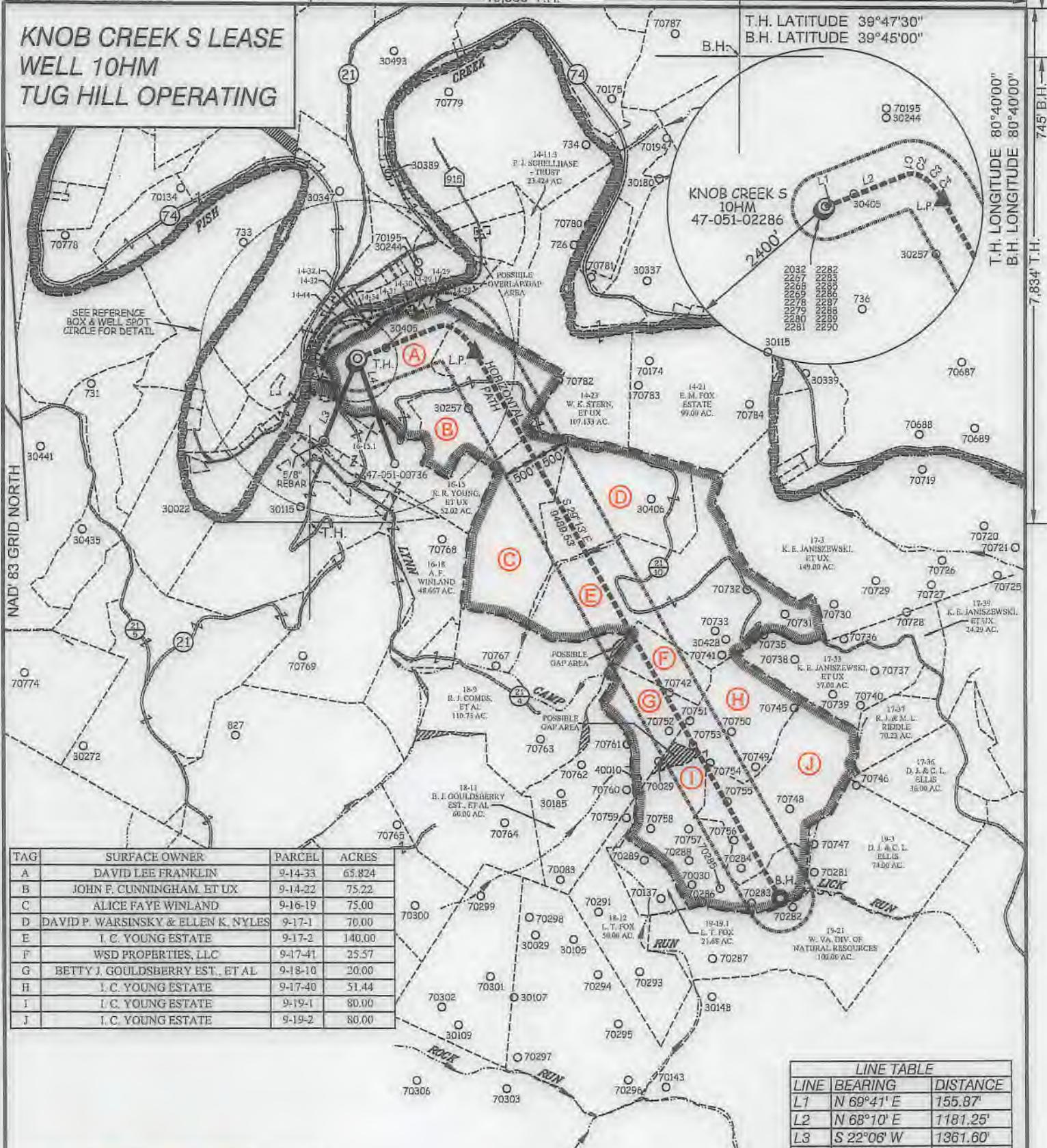
COUNTY NAME
PERMIT

**KNOB CREEK S LEASE
WELL 10HM
TUG HILL OPERATING**

T.H. LATITUDE 39°47'30"
B.H. LATITUDE 39°45'00"

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°40'00"

NAD'83 GRID NORTH



TAG	SURFACE OWNER	PARCEL	ACRES
A	DAVID LEE FRANKLIN	9-14-33	65.824
B	JOHN F. CUNNINGHAM, ET UX	9-14-22	75.22
C	ALICE FAYE WINLAND	9-16-19	75.00
D	DAVID P. WARSINSKY & ELLEN K. NYLES	9-17-1	70.00
E	I. C. YOUNG ESTATE	9-17-2	140.00
F	WSD PROPERTIES, LLC	9-17-41	25.57
G	BETTY J. GOULDSBERRY EST., ET AL	9-18-10	20.00
H	I. C. YOUNG ESTATE	9-17-40	51.44
I	I. C. YOUNG ESTATE	9-19-1	80.00
J	I. C. YOUNG ESTATE	9-19-2	80.00

LINE	BEARING	DISTANCE
L1	N 69°41' E	155.87'
L2	N 68°10' E	1181.25'
L3	S 22°06' W	1361.60'
L4	S 19°37' E	1691.35'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	102.68'	194.20'	N 84°44' E	101.49'
C2	124.23'	380.34'	S 70°23' E	123.68'
C3	242.95'	702.85'	S 50°48' E	241.75'
C4	245.30'	1184.19'	S 85°12' E	244.86'



12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slsw.com

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'83 S.P.C.(FT)	N. 464,904.41	E. 1,629,692.01
NAD'83 GEO.	LAT-(N) 39.770180	LONG-(W) 80.705397
NAD'83 UTM (M)	N. 4,402,289.21	E. 525,231.36
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 465,012.8	E. 1,631,480.7
NAD'83 GEO.	LAT-(N) 39.770523	LONG-(W) 80.699039
NAD'83 UTM (M)	N. 4,402,331.3	E. 525,775.7
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 466,730.5	E. 1,636,112.6
NAD'83 GEO.	LAT-(N) 39.747956	LONG-(W) 80.682174
NAD'83 UTM (M)	N. 4,399,831.7	E. 527,229.0



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

P.S. 849 *C. Victor Moyers*

LEGEND

- LEASE LINE
- SURFACE LINE
- WELL LATERAL
- OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- TAX MAP-PARCEL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE WW-6A1)

SCALE 1" = 2000' FILE NO. 8789P10HMR3.dwg
KNOB CREEK S-10HM-REV3
DATE JULY 27, 20 18
REVISED 09-30-2019, 08-28-2020, 10-29-2020
OPERATORS WELL NO. KNOB CREEK S-10HM
API WELL NO. 47 - 051 - 02286
NO. STATE COUNTY PERMIT

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



MOD

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

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

COUNTY NAME

PERMIT

03/19/2021

**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

**Co-tenancy utilization – At least 7 mineral owners in tract. At least 75% of the royalty owners have executed a lease on the tract. The interests of the remaining co-tenants were acquired pursuant to the Co-tenancy Modernization and Majority Protection Act.*

**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. Morris *Amy L. Morris*
 Its: Permitting Specialist - Appalachia Region

Lease ID	Parcel	Tags	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment															
10*18167	9-17-2	E	NEIL CALL AND MELINDA CALL	TH EXPLORATION LLC	1/8-	927 492	N/A	N/A														
10*18168	9-17-2	E	SANDRA YANAGAWA	TH EXPLORATION LLC	1/8-	927 498	N/A	N/A														
10*18169	9-17-2	E	KAREN K WILLIAMS	TH EXPLORATION LLC	1/8-	927 628	N/A	N/A														
10*18192	9-17-2	E	STEPHEN S MASON AND CAROLE K MASON	TH EXPLORATION LLC	1/8-	928 625	N/A	N/A														
10*18193	9-17-2	E	CAROLYN LEE FUREY AND MARTIN J FUREY	TH EXPLORATION LLC	1/8-	949 158	N/A	N/A														
10*18194	9-17-2	E	PAMELA BEYLER AND CHAD R BEYLER	TH EXPLORATION LLC	1/8-	928 630	N/A	N/A														
10*18195	9-17-2	E	MARY TERESA SOLEAU AND THOMAS SOLEAU	TH EXPLORATION LLC	1/8-	928 643	N/A	N/A														
10*18199	9-17-2	E	LAWRENCE W VAUGHN AND GAIL L VAUGHN	TH EXPLORATION LLC	1/8-	928 532	N/A	N/A														
10*18259	9-17-2	E	JENNIFER WHEATON	TH EXPLORATION LLC	1/8-	929 3	N/A	N/A														
10*18260	9-17-2	E	GEMMA RUDY AND TIMOTHY RUDY	TH EXPLORATION LLC	1/8-	928 584	N/A	N/A														
10*18261	9-17-2	E	TIMOTHY MCDOWELL AND CYNTHIA MCDOWELL	TH EXPLORATION LLC	1/8-	928 553	N/A	N/A														
10*18262	9-17-2	E	KAREN MCDOWELL CECIL AND JAMES E CECIL	TH EXPLORATION LLC	1/8-	928 555	N/A	N/A														
10*18263	9-17-2	E	LISA ANN MCDOWELL AND ROBERT JOSEPH HILL	TH EXPLORATION LLC	1/8-	928 551	N/A	N/A														
10*18264	9-17-2	E	DAVID MCDOWELL AND CRYSTAL MCDOWELL	TH EXPLORATION LLC	1/8-	928 549	N/A	N/A														
10*18295	9-17-2	F	THOMAS R BAKER AND VICKIE L BAKER	TH EXPLORATION LLC	1/8-	929 262	N/A	N/A														
10*18417	9-17-2	E	CHEMEL H HILL	TH EXPLORATION LLC	1/8-	932 577	N/A	N/A														
10*18487	9-17-2	E	NANCY L STANGEL AND JOHN I STANGEL	TH EXPLORATION LLC	1/8-	933 113	N/A	N/A														
10*18488	9-17-2	E	CHARLINE M ENGLE AND KEVIN F ENGLE	TH EXPLORATION LLC	1/8-	933 118	N/A	N/A														
10*18508	9-17-2	E	PATRICIA LUANNE BONAR	TH EXPLORATION LLC	1/8-	925 251	N/A	N/A														
10*18517	9-17-2	E	LORI SHANAHAN AND PATRICK SHANAHAN	TH EXPLORATION LLC	1/8-	933 575	N/A	N/A														
10*18555	9-17-2	E	PATRICIA L LEHN	TH EXPLORATION LLC	1/8-	936 95	N/A	N/A														
10*18556	9-17-2	E	PAMELIA CALL	TH EXPLORATION LLC	1/8-	936 100	N/A	N/A														
10*18558	9-17-2	E	ELIZABETH JANE KELLER	TH EXPLORATION LLC	1/8-	936 107	N/A	N/A														
10*18262	9-17-2	F	TRACY L BARNBY	TH EXPLORATION LLC	1/8-	938 481	N/A	N/A														
10*19277	9-17-2	E	KESSICA WRIGHT OH	TH EXPLORATION LLC	1/8-	941 411	N/A	N/A														
10*19508	9-17-2	E	STONE HILL MINERALS HOLDINGS LLC	TH EXPLORATION LLC	1/8-	941 446	N/A	N/A														
10*19532	9-17-2	E	CYNTHIA K KIRCHHOFF	TH EXPLORATION LLC	1/8-	942 637	N/A	N/A														
10*19624	9-17-2	E	JOHN T YINGLING	TH EXPLORATION LLC	1/8-	944 209	N/A	N/A														
10*19713	9-17-2	E	MARSHA BERISFORD	TH EXPLORATION LLC	1/8-	944 452	N/A	N/A														
10*19879	9-17-2	E	MARY V GILSON AND WALTER M GILSON	TH EXPLORATION LLC	1/8-	945 588	N/A	N/A														
10*19933	9-17-2	E	MARY ANN GRIFFITH	TH EXPLORATION LLC	1/8-	948 555	N/A	N/A														
10*21400	9-17-2	E	DENNIS REASBECK AND BARBARA REASBECK	TH EXPLORATION LLC	1/8-	956 645	N/A	N/A														
10*21487	9-17-2	E	FLOYD D ANDERSON & CAROLYN SUE ANDERSON	TH EXPLORATION LLC	1/8-	957 294	N/A	N/A														
10*21842	9-17-2	E	JOSEPH M KOVOVICH	TH EXPLORATION LLC	1/8-	959 635	N/A	N/A														
10*21844	9-17-2	E	ROBERTA YOUNG	TH EXPLORATION LLC	1/8-	959 639	N/A	N/A														
10*21927	9-17-2	E	BLACK GOLD GROUP LTD	TH EXPLORATION LLC	1/8-	964 474	N/A	N/A														
10*21928	9-17-2	E	JOHN D COX AND CONNIE I COX	TH EXPLORATION LLC	1/8-	953 511	N/A	N/A														
10*21940	9-17-2	E	ALYSSA JORDAN & TERRY M JORDAN	TH EXPLORATION LLC	1/8-	953 346	N/A	N/A														
10*21967	9-17-2	E	ROGER G ALLEN AND DONNA KAY ALLEN	TH EXPLORATION LLC	1/8-	960 571	N/A	N/A														
10*21970	9-17-2	E	CHRISTOPHER DAUGHERTY & JENNIFER R DAUGHERTY	TH EXPLORATION LLC	1/8-	960 578	N/A	N/A														
10*21971	9-17-2	E	MARY LOU KITTELBERGER AND FREDERICK W KITTELBERGER	TH EXPLORATION LLC	1/8-	960 580	N/A	N/A														
10*21975	9-17-2	E	KAYMONA A KUDERSKI AND KELLY J KUDERSKI	TH EXPLORATION LLC	1/8-	960 582	N/A	N/A														
10*21984	9-17-2	E	SANDROR METZ	TH EXPLORATION LLC	1/8-	960 586	N/A	N/A														
10*21986	9-17-2	E	RONALD D KOONITZ & BETTI ANN KOONITZ	TH EXPLORATION LLC	1/8-	960 569	N/A	N/A														
10*22088	9-17-2	E	BRANNEN DAUGHERTY	TH EXPLORATION LLC	1/8-	961 345	N/A	N/A														
10*22154	9-17-2	E	DONALD EUGENE ANDERSON	TH EXPLORATION LLC	1/8-	953 509	N/A	N/A														
10*22599	9-17-2	E	BRYANT R SWIFT AND KATHY SWIFT	TH EXPLORATION LLC	1/8-	966 456	N/A	N/A														
10*22600	9-17-2	E	AIDEN BOYD YOUNG JENNIFER A YOUNG, PE WILSON	TH EXPLORATION LLC	1/8-	966 462	N/A	N/A														
10*22726	9-17-2	E	JAMES ROBERT WELLS	TH EXPLORATION LLC	1/8-	970 19	N/A	N/A														
10*22849	9-17-2	E	NEIL MCELROY AND SUE MASON MCELROY	TH EXPLORATION LLC	1/8-	977 44	N/A	N/A														
10*22851	9-17-2	E	JOHN J HELSTERN AND LYNN D HELSTERN	TH EXPLORATION LLC	1/8-	977 39	N/A	N/A														
10*22853	9-17-2	E	RONALD LEE HENSLEY AND MARY ANN HENSLEY	TH EXPLORATION LLC	1/8-	977 34	N/A	N/A														
10*23076	9-17-2	E	JACK H BERISFORD AKA RANDY BERISFORD	TH EXPLORATION LLC	1/8-	984 43	N/A	N/A														
10*23260	9-17-2	E	IDA M TRAVIS ET AL DAVID C WHITE AS SPECIAL COMMISS	TH EXPLORATION LLC	1/8-	988 73	N/A	N/A														
10*23533	9-17-2	E	STONE HILL MINERALS HOLDINGS LLC	TH EXPLORATION LLC	1/8-	1010 224	N/A	N/A														
10*23668	9-17-2	E	THE ESTATE OF RUTH N LUTHER SUZANNE I WOZNIAK EX	TH EXPLORATION LLC	1/8-	1009 286	N/A	N/A														
10*23947	9-17-2	E	STONE HILL MINERALS HOLDINGS LLC	TH EXPLORATION LLC	1/8-	1063 568	N/A	N/A														
10*28489	9-17-2	E	CAROLYN J YOUNG	TH EXPLORATION LLC	1/8-	1073 384	N/A	N/A														
10*28658	9-17-2	E	HOLLY A YOUNG	TH EXPLORATION LLC	1/8-	1076 99	N/A	N/A														
10*28658	9-17-2	F	CRYSTAL BAYN YOUNG	TH EXPLORATION LLC	1/8-	1076 63	N/A	N/A														
10*28657	9-17-2	E	PENNY YODER AND KEVIN LYNN YODER	TH EXPLORATION LLC	1/8-	1076 53	N/A	N/A														
10*28659	9-17-2	E	MELISSA D FLETCHER & SCOTT A FLETCHER	TH EXPLORATION LLC	1/8-	1076 56	N/A	N/A														
10*28762	9-17-2	E	ALEXA B YOUNG	TH EXPLORATION LLC	1/8-	1076 404	N/A	N/A														
10*28813	9-17-2	E	CLARA SUE YOUNG	TH EXPLORATION LLC	1/8-	1077 465	N/A	N/A														
10*28815	9-17-2	E	LELAND SINCLAIR YOUNG	TH EXPLORATION LLC	1/8-	1077 462	N/A	N/A														
10*28816	9-17-2	E	LOIS ELAINE WICKHAM	TH EXPLORATION LLC	1/8-	1078 10	N/A	N/A														
10*28817	9-17-2	E	NEIL ROBERT YOUNG	TH EXPLORATION LLC	1/8-	1078 15	N/A	N/A														
10*28819	9-17-2	E	MARK A WALKER	TH EXPLORATION LLC	1/8-	1077 35	N/A	N/A														
10*28820	9-17-2	E	MICHAEL A WALKER	TH EXPLORATION LLC	1																	

Lease ID	Parcel	Tags	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment					
10*27877	9-17-41	F	JOHN T GALLAHER AND EMILY J GALLAHER	THE SUN OIL COMPANY	1/8+	68 471	N/A	The Sun Oil Company to The Wheeling Natural Gas Company; 150/34	The Wheeling Natural Gas Company to The Manufacturers Light & Heat Company; 148/389	The Manufacturers Light & Heat Company to A M Snider & Duane M Snider, dba Hundred	A M Snider, Duane M Snider & Kathleen Rinehart, partners of Hundred Gas Company to Hundred Gas Company; 620/630	Hundred Gas Company to Carl D Perkins; 451/132	Hundred Gas Company to Carl D Perkins; 451/418	Carl D Perkins to Perkins Oil & Gas Inc; 583/72	Perkins Oil & Gas Inc to Stone Energy Corporation; 267/322	Stone Energy Corp to EQT Production Company; 38/75	Perkins Oil & Gas Inc. to TH Exploration, LLC; 44/506
10*15938	9-18-10	G	MARK W YOHO	CHESAPEAKE APPALACHIA LLC	1/8+	695 157	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 23/512	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15940	9-18-10	G	JANICE N HAUDENSCHILT	CHESAPEAKE APPALACHIA LLC	1/8+	695 166	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 23/512	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15941	9-18-10	G	NICOLETTA MILICIA BLOODWORTH	CHESAPEAKE APPALACHIA LLC	1/8+	698 370	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 23/512	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15942	9-18-10	G	CLARA YOHO	CHESAPEAKE APPALACHIA LLC	1/8+	698 197	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 23/512	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15943	9-18-10	G	DANA MILICIA HUMPHREYS	CHESAPEAKE APPALACHIA LLC	1/8+	700 90	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 23/512	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15944	9-18-10	G	DEWEY A MILICIA AND ROBIN MILICIA	CHESAPEAKE APPALACHIA LLC	1/8+	700 109	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 23/512	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15945	9-18-10	G	HELEN V MCMASTERS AND KENNETH MCMASTERS	CHESAPEAKE APPALACHIA LLC	1/8+	707 148	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 23/512	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15946	9-18-10	G	JOSEPH M EMERY	CHESAPEAKE APPALACHIA LLC	1/8+	707 150	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 29/325	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15947	9-18-10	G	GERALD ARTHUR EBERT	CHESAPEAKE APPALACHIA LLC	1/8+	703 588	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 23/512	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15948	9-18-10	G	GERALD ALLEN EBERT	CHESAPEAKE APPALACHIA LLC	1/8+	707 152	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 29/325	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15949	9-18-10	G	CLARENCE W EMERY	CHESAPEAKE APPALACHIA LLC	1/8+	703 590	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 23/512	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15950	9-18-10	G	KAREN S GIBSON	CHESAPEAKE APPALACHIA LLC	1/8+	707 154	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 29/325	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15951	9-18-10	G	GEORGE R FINNEGAN	CHESAPEAKE APPALACHIA LLC	1/8+	707 156	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 29/325	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				
10*15952	9-18-10	G	TOM A FINNEGAN	CHESAPEAKE APPALACHIA LLC	1/8+	707 135	N/A	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc; 23/512	Chesapeake Appalachia LLC to SWN Production Company; 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC; 33/424	Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC; 19/624	SWN Production Company LLC to TH Exploration LLC; 36/431	Statoil USA Onshore Properties Inc to TH Exploration LLC; 36/455				

| Lease ID | Parcel | Taxs | Grantor, Lessor, Etc. | Grantee, Lessee, Etc. | Royalty | Deed Book/Page | Assignment | |
|----------|--------|------|---|-----------------------|---------|----------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----|
| 10*28657 | 9-19-1 | I | PENNY YODER AND KEVIN LYNN YODER | TH EXPLORATION LLC | 1/8+ | 1076 53 | N/A | N/A |
| 10*28659 | 9-19-1 | I | MELISSA O FLETCHER & SCOTT A FLETCHER | TH EXPLORATION LLC | 1/8+ | 1076 56 | N/A | N/A |
| 10*28762 | 9-19-1 | I | ALEXA B YOUNG | TH EXPLORATION LLC | 1/8+ | 1076 404 | N/A | N/A |
| 10*28813 | 9-19-1 | I | CLARA SUE YOUNG | TH EXPLORATION LLC | 1/8+ | 1077 465 | N/A | N/A |
| 10*28815 | 9-19-1 | I | LELAND SINCLAIR YOUNG | TH EXPLORATION LLC | 1/8+ | 1077 462 | N/A | N/A |
| 10*28816 | 9-19-1 | I | LOIS ELAINE WICKHAM | TH EXPLORATION LLC | 1/8+ | 1078 30 | N/A | N/A |
| 10*28817 | 9-19-1 | I | NEIL ROBERT YOUNG | TH EXPLORATION LLC | 1/8+ | 1078 35 | N/A | N/A |
| 10*28819 | 9-19-1 | I | MARK A WALKER | TH EXPLORATION LLC | 1/8+ | 1077 35 | N/A | N/A |
| 10*28820 | 9-19-1 | I | MICHAEL A WALKER | TH EXPLORATION LLC | 1/8+ | 1077 39 | N/A | N/A |
| 10*28821 | 9-19-1 | I | CHAD A YOUNG | TH EXPLORATION LLC | 1/8+ | 1077 37 | N/A | N/A |
| 10*29010 | 9-19-1 | I | LARRY R BONAR AND DEBRA L BONAR | TH EXPLORATION LLC | 1/8+ | 1083 555 | N/A | N/A |
| 10*29011 | 9-19-1 | I | MICHAEL S OTT AND SYBIL OTT | TH EXPLORATION LLC | 1/8+ | 1083 559 | N/A | N/A |
| 10*29012 | 9-19-1 | I | GRANT D RICHARDS AND KERRI S RICHARDS | TH EXPLORATION LLC | 1/8+ | 1083 551 | N/A | N/A |
| 10*29014 | 9-19-1 | I | CARLA J SIMMS | TH EXPLORATION LLC | 1/8+ | 1084 194 | N/A | N/A |
| 10*29015 | 9-19-1 | I | SUSAN C YOUNG | TH EXPLORATION LLC | 1/8+ | 1083 374 | N/A | N/A |
| 10*29176 | 9-19-1 | I | RONALD W YOUNG | TH EXPLORATION LLC | 1/8+ | 1085 188 | N/A | N/A |
| 10*29177 | 9-19-1 | I | ERIC J YOUNG | TH EXPLORATION LLC | 1/8+ | 1085 187 | N/A | N/A |
| 10*29178 | 9-19-1 | I | RONALD R YOUNG AND GERALDINE YOUNG | TH EXPLORATION LLC | 1/8+ | 1085 185 | N/A | N/A |
| 10*29237 | 9-19-1 | I | RONALD R YOUNG | TH EXPLORATION LLC | 1/8+ | 1090 212 | N/A | N/A |
| 10*29383 | 9-19-1 | I | *ALICE F WINLAND | TH EXPLORATION LLC | 1/8+ | 1090 159 | N/A | N/A |
| 10*18610 | 9-19-2 | I | NEIL ROBERT YOUNG | TH EXPLORATION LLC | 1/8+ | 934 636 | N/A | N/A |
| 10*18614 | 9-19-2 | I | MICHAEL A WALKER | TH EXPLORATION LLC | 1/8+ | 934 607 | N/A | N/A |
| 10*18615 | 9-19-2 | I | MARK A WALKER | TH EXPLORATION LLC | 1/8+ | 934 609 | N/A | N/A |
| 10*18616 | 9-19-2 | I | CHAD A YOUNG | TH EXPLORATION LLC | 1/8+ | 934 611 | N/A | N/A |
| 10*18625 | 9-19-2 | I | LOIS ELAINE WICKHAM | TH EXPLORATION LLC | 1/8+ | 934 637 | N/A | N/A |
| 10*18626 | 9-19-2 | I | CLARA SUE YOUNG | TH EXPLORATION LLC | 1/8+ | 934 634 | N/A | N/A |
| 10*19409 | 9-19-2 | J | CAROLYN J YOUNG | TH EXPLORATION LLC | 1/8+ | 939 291 | N/A | N/A |
| 10*19667 | 9-19-2 | J | ERIC J YOUNG | TH EXPLORATION LLC | 1/8+ | 937 375 | N/A | N/A |
| 10*19669 | 9-19-2 | J | RONALD W YOUNG | TH EXPLORATION LLC | 1/8+ | 937 373 | N/A | N/A |
| 10*19670 | 9-19-2 | J | RONALD R YOUNG AND GERALDINE YOUNG | TH EXPLORATION LLC | 1/8+ | 937 368 | N/A | N/A |
| 10*19671 | 9-19-2 | J | MELISSA D FLETCHER & SCOTT A FLETCHER | TH EXPLORATION LLC | 1/8+ | 938 316 | N/A | N/A |
| 10*21343 | 9-19-2 | J | LELAND SINCLAIR YOUNG | TH EXPLORATION LLC | 1/8+ | 945 649 | N/A | N/A |
| 10*21489 | 9-19-2 | I | ALEXA B YOUNG | TH EXPLORATION LLC | 1/8+ | 957 299 | N/A | N/A |
| 10*21518 | 9-19-2 | I | SUSAN C YOUNG | TH EXPLORATION LLC | 1/8+ | 949 203 | N/A | N/A |
| 10*21568 | 9-19-2 | J | LARRY R BONAR AND DEBRA L BONAR | TH EXPLORATION LLC | 1/8+ | 952 359 | N/A | N/A |
| 10*21573 | 9-19-2 | J | CARLA J SIMMS | TH EXPLORATION LLC | 1/8+ | 957 392 | N/A | N/A |
| 10*21576 | 9-19-2 | J | ALICE F WINLAND | TH EXPLORATION LLC | 1/8+ | 957 395 | N/A | N/A |
| 10*21577 | 9-19-2 | I | MICHAEL S OTT AND SYBIL OTT | TH EXPLORATION LLC | 1/8+ | 957 446 | N/A | N/A |
| 10*21739 | 9-19-2 | J | CRYSTAL DAWN YOUNG | TH EXPLORATION LLC | 1/8+ | 957 413 | N/A | N/A |
| 10*21740 | 9-19-2 | J | HOLLY A YOUNG | TH EXPLORATION LLC | 1/8+ | 957 415 | N/A | N/A |
| 10*21742 | 9-19-2 | J | GRANT D RICHARDS AND KERRI S RICHARDS | TH EXPLORATION LLC | 1/8+ | 957 456 | N/A | N/A |
| 10*21743 | 9-19-2 | J | SHIRLEY KOONTZ PDA KELLI KOONTZ BENJAMINE | TH EXPLORATION LLC | 1/8+ | 957 454 | N/A | N/A |
| 10*22022 | 9-19-2 | J | PENNY YODER AND KEVIN LYNN YODER | TH EXPLORATION LLC | 1/8+ | 952 356 | N/A | N/A |
| 10*22057 | 9-19-2 | J | RONALD R YOUNG | TH EXPLORATION LLC | 1/8+ | 960 584 | N/A | N/A |
| 10*22600 | 9-19-2 | J | AIDEN BOYD YOUNG JENNIFER A YOUNG, PETITIONER | TH EXPLORATION LLC | 1/8+ | 966 462 | N/A | N/A |

*Co-tenancy utilization - At least 7 mineral owners in tract. At least 75% of the royalty owners have executed a lease on the tract. The interests of the remaining co-tenants were acquired pursuant to the Co-tenancy Modernization and Majority Protection Act.

STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

Jan Pest
MARSHALL County 02:05:39 PM
Instrument No 1415451
Date Recorded 10/04/2016
Document Type ASN
Pages Recorded 7
Book-Page 36-535
Recording Fee \$7.00
Additional \$6.00

ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "*Assignment*") is from **GULFPORT ENERGY CORPORATION**, a Delaware corporation ("*Gulfport*"), and **FOSSIL CREEK OHIO, LLC**, a Delaware limited liability company ("*Fossil Creek*") and, together with Gulfport, "*Assignors*", to **TH Exploration, LLC**, a Texas limited liability company ("*Assignee*"), and is executed on September 23, 2016 (the "*Effective Date*"). Assignors and Assignee may be referred to herein collectively as the "*Parties*," or individually as a "*Party*." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignors and the Assignee dated June 24, 2016 (the "*Acreage Trade Agreement*").

**ARTICLE 1
ASSIGNMENT OF ASSETS**

Section 1.1 Assignment. For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, each Assignor hereby **GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS** unto Assignee its right, title and interest in and to the oil and gas leases described in more detail on Exhibit A attached hereto (the "*Leases*") and any surface use agreements that relate to such Leases insofar as such surface use agreements relate to the portion of lands covered by such Leases (collectively with the Leases, the "*Conveyed Assets*").

TO HAVE AND TO HOLD the Conveyed Assets, together with all and singular the rights, privileges, contracts and appurtenances, in any way appertaining or belonging thereto, unto Assignee, its successors and assigns, forever, subject, to the terms and conditions of this Assignment.

Section 1.4 Assignment Subject to Acreage Trade Agreement. This Assignment is made in accordance with and is subject to the terms, covenants and conditions contained in that certain Acreage Trade Agreement. In the event of a conflict between the provisions of the Acreage Trade Agreement and this Assignment, the provisions of the Acreage Trade Agreement shall control. The execution and delivery of this Assignment by Assignors, and the execution and acceptance of this Assignment by Assignee, shall not operate to release or impair any surviving rights or obligations of either Party with respect to the other under the Acreage Trade Agreement.

**ARTICLE 2
SPECIAL WARRANTY OF TITLE AND DISCLAIMERS**

Section 2.1 Special Warranty of Title. Each Assignor hereby agrees to warrant and defend Defensible Title to the Leases unto Assignee, its successors and assigns, against every Person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Assignors or any of their respective Affiliates, but not otherwise.

Section 2.2 Disclaimers of Warranties and Representations.

(a) EXCEPT AS EXPRESSLY REPRESENTED OTHERWISE IN SECTION VI AND VII OF THE ACREAGE TRADE AGREEMENT OR THIS ASSIGNMENT, ASSIGNORS MAKE NO, AND HEREBY EXPRESSLY DISCLAIM, ANY

RECEIVED
Office of Oil and Gas

FEB 25 2021

WV Department of
Environmental Protection

03/19/2021

ASSIGNMENT AND BILL OF SALE

This ASSIGNMENT AND BILL OF SALE (this "Assignment") dated as of December 1, 2020 (the "Execution Date"), is made by and between EQT PRODUCTION COMPANY, a Pennsylvania corporation, with an address at 625 Liberty Avenue, Suite 1700, Pittsburgh, Pennsylvania 15222 ("EQT"), and TH EXPLORATION, LLC, a Texas limited liability company, with an address at 1320 S. University Drive, Suite 500, Fort Worth, Texas 76107 ("TH") pursuant to the terms of that certain Acreage Trade Agreement by and among BQT, TH and TH Exploration II, LLC ("TH II"), dated July 8, 2020 (the "Agreement"). EQT and TH may be referred to herein together as the "Parties", and each individually as a "Party".

RECITALS

WHEREAS, EQT desires to transfer, convey and assign to TH certain of EQT's oil and gas leasehold interests located in Marshall County, West Virginia set forth on Exhibit A attached hereto and incorporated herein ("EQT Leases") in accordance with this Assignment and the Agreement; and

WHEREAS, TH desires to receive from EQT, all of EQT's right, title and interest in and to the EQT Leases in accordance with this Assignment and the Agreement.

NOW, THEREFORE, for and in consideration of the mutual promises contained herein and in the Agreement, the benefits to be derived by each Party hereunder and under the Agreement, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

ARTICLE I
DEFINED TERMS

1.1 *Definitions.* Capitalized terms used herein and not otherwise defined throughout this Assignment shall have the meanings given such terms in the Agreement.

ARTICLE II
ASSIGNMENT OF ASSETS

2.1 *Assignment.* Subject to the terms and conditions of this Assignment and the Agreement, EQT does hereby assign, convey and transfer to TH all of the right, title and interest of EQT in and to the following (collectively for purposes of this Assignment, the "EQT Assets"):

(a) Subject to the conveyance of the Wells Assets from EQT to TH II as described in the Agreement, the EQT Leases and appurtenances thereto (including rights of access and to install facilities), all Hydrocarbons within, produced from, derived from, or sold from the EQT Leases (and all proceeds related thereto), on and after the Valuation Date, and all Surface Contracts including but not limited to those set forth on Exhibit B attached hereto and incorporated herein (the "EQT Surface Contracts") related to the BQT Leases and such Hydrocarbons; and

(b) Copies of deeds, files and all other ownership information directly related to the acquisition, operations and maintenance of the BQT Leases, lease files for the BQT Leases

RECEIVED
Office of Oil and Gas

FEB 25 2021

WV Department of
Environmental Protection

03/19/2021

ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "Assignment") is from STATOIL USA ONSHORE PROPERTIES INC., a Delaware corporation ("Assignor"), to TH Exploration, LLC, a Texas limited liability company ("Assignee"), and is executed on August 22, 2016 (the "Effective Date"). Assignor and Assignee may be referred to herein collectively as the "Parties," or individually as a "Party." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignor and the Assignee dated June 19, 2016 (the "Acreage Trade Agreement").

ARTICLE 1
ASSIGNMENT OF ASSETS

Section 1.1 Assignment. For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor hereby GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS unto Assignee all of Assignor's right, title and interest in and to (i) the oil and gas leases described in more detail on Exhibit A attached hereto (the "Leases") INSOFAR AND ONLY INSOFAR as they cover the Target Formations and INSOFAR AND ONLY INSOFAR as they cover those lands described on Exhibit A (the "Leasehold Rights") and (ii) any surface use agreements that relate to such Leasehold Rights (collectively with the Leasehold Rights, the "Conveyed Assets"). Assignor does hereby reserve unto itself the right and subsurface easement to drill through the Leasehold Rights to access the those depths and formations in the Leases other than the Target Formations and (y) to shoot seismic, sonic, or other energy or waves through the Leasehold Rights and to receive, record and evaluate such energy or waves, including those reflected from or in any way pertaining to the reserved depths, and to utilize any and all other exploration technologies that image the subsurface of the leasehold including the reserved depths and to receive, record and evaluate all images resulting therefrom.

TO HAVE AND TO HOLD the Conveyed Assets, together with all and singular the rights, privileges, contracts and appurtenances, in any way appertaining or belonging thereto, unto Assignee, its successors and assigns, forever, subject, to the terms and conditions of this Assignment.

Section 1.4 Assignment Subject to Acreage Trade Agreement. This Assignment is made in accordance with and is subject to the terms, covenants and conditions contained in that certain Acreage Trade Agreement. In the event of a conflict between the provisions of the Acreage Trade Agreement and this Assignment, the provisions of the Acreage Trade Agreement shall control. The execution and delivery of this Assignment by Assignor, and the execution and acceptance of this Assignment by Assignee, shall not operate to release or impair any surviving rights or obligations of either Party with respect to the other under the Acreage Trade Agreement.

ARTICLE 2
SPECIAL WARRANTY OF TITLE AND DISCLAIMERS

Section 2.1 Special Warranty of Title. Assignor hereby agrees to warrant and defend Defensible Title to the Leases unto Assignee, its successors and assigns, against every Person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Assignor or any of its Affiliates, but not otherwise.

Section 2.2 Disclaimers of Warranties and Representations.

(a) EXCEPT AS EXPRESSLY REPRESENTED OTHERWISE IN SECTION VI OF THE ACREAGE TRADE AGREEMENT OR THIS ASSIGNMENT, ASSIGNOR MAKES NO, AND HEREBY EXPRESSLY DISCLAIMS, ANY REPRESENTATION OR WARRANTY, EXPRESS, IMPLIED OR STATUTORY, INCLUDING AS TO (I) TITLE TO THE LEASEHOLD RIGHTS, (II) THE CONTENTS, CHARACTER OR NATURE OF ANY

RECEIVED
Office of Oil and Gas

FEB 25 2021

WV Department of
Environmental Protection

ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "*Assignment*") is from SWN PRODUCTION COMPANY, LLC, a Texas limited liability company ("*Assignor*"), to TH Exploration, LLC, a Texas limited liability company ("*Assignee*"), and is executed on December 18, 2017 (the "*Effective Date*"). Assignor and Assignee may be referred to herein collectively as the "*Parties*," or individually as a "*Party*." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignor and the Assignee dated August 24, 2017 (the "*Acreage Trade Agreement*").

ARTICLE 1
ASSIGNMENT OF ASSETS

Section 1.1 Assignment. For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor hereby GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS unto Assignee all of Assignor's right, title and interest in and to (i) the oil and gas leases described in more detail on Exhibit A attached hereto (the "*Leases*") IN SO FAR AND ONLY IN SO FAR as they cover those lands described on Exhibit A (the "*Leasehold Rights*") and (ii) any surface use agreements that relate to such Leasehold Rights (collectively with the Leasehold Rights, the "*Conveyed Assets*").

TO HAVE AND TO HOLD the Conveyed Assets, together with all and singular the rights, privileges, contracts and appurtenances, in any way appertaining or belonging thereto, unto Assignee, its successors and assigns, forever, subject, to the terms and conditions of this Assignment.

Section 1.2 Assignment Subject to Acreage Trade Agreement. This Assignment is made in accordance with and is subject to the terms, covenants and conditions contained in that certain Acreage Trade Agreement. In the event of a conflict between the provisions of the Acreage Trade Agreement and this Assignment, the provisions of the Acreage Trade Agreement shall control. The execution and delivery of this Assignment by Assignor, and the execution and acceptance of this Assignment by Assignee, shall not operate to release or impair any surviving rights or obligations of either Party with respect to the other under the Acreage Trade Agreement.

ARTICLE 2
SPECIAL WARRANTY OF TITLE AND DISCLAIMERS

Section 2.1 Special Warranty of Title. Assignor hereby agrees to warrant and defend Defensible Title to the Leases unto Assignee, its successors and assigns, against every Person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Assignor or any of its Affiliates, but not otherwise.

Section 2.2 Disclaimers of Warranties and Representations.

(a) EXCEPT AS EXPRESSLY REPRESENTED OTHERWISE IN SECTION VI OF THE ACREAGE TRADE AGREEMENT OR THIS ASSIGNMENT, ASSIGNOR MAKES NO, AND HEREBY EXPRESSLY DISCLAIMS, ANY REPRESENTATION OR

RECEIVED
Office of Oil and Gas

FEB 25 2021

WV Department of
Environmental Protection

BOOK 0044 PAGE 0506

MEMORANDUM OF PARTIAL ASSIGNMENT OF OIL AND GAS LEASES

STATE OF WEST VIRGINIA

COUNTY OF MARSHALL

§
§
§

This **MEMORANDUM OF PARTIAL ASSIGNMENT OF OIL AND GAS LEASES** (hereinafter, the "Memorandum") has been executed by and between **PERKINS OIL & GAS, INC.**, a West Virginia corporation, whose address is 2966 Northwest Turnpike, Pennsboro, West Virginia 26415 (hereinafter the "Assignor"), and **TH EXPLORATION, LLC**, a Texas limited liability company (hereinafter the "Assignee") whose address is 1320 South University Drive, Suite 500, Fort Worth, Texas 76107. Assignor and Assignee are sometimes referred to herein, collectively, as the "Parties" and, individually, as a "Party." This Memorandum is being executed for the purpose of providing notice to third parties of the execution of a certain Partial Assignment of Oil and Gas Leases (hereinafter, the "Assignment"), by and between the Parties.

WHEREAS, Assignor is the current owner and lessee of certain oil and gas leases located in Marshall County, West Virginia, covering specific parcels and being more particularly described on **Exhibit "A"** attached hereto and made a part hereof (collectively, the "Oil and Gas Leases").

In the Assignment dated effective as of the 1st day of November, 2019 (hereinafter, the "Effective Date") and this Memorandum, Assignor does hereby **GRANT, BARGAIN, SELL, CONVEY, TRANSFER and ASSIGN** unto Assignee, all right, title and interest in and to the Oil and Gas Leases **INSOFAR AND ONLY INSOFAR** as each lease and parcel covers those formations lying between two hundred (200) feet above and two hundred (200) feet below the formations commonly known to as the Utica/Point Pleasant Shale formations, or the stratigraphic equivalent thereof (such depths and formations being referred to as the "Assigned Formations"). The Assigned Formations are included with and part of the Assigned Rights as defined in the Assignment.

EXCLUDING THEREFROM AND EXCEPTING AND RESERVING UNTO THE ASSIGNOR, ITS SUCCESSORS AND ASSIGNS, THE OVERRIDING ROYALTY INTEREST, as defined in the Assignment.

The Assignment contains various other terms, provisions and conditions, all of which are incorporated herein by reference, and made a part hereof in all respects as though the same were fully set forth herein. To the extent that there are any inconsistencies between this Memorandum and the Assignment, the terms and provisions of the Assignment shall prevail.

Assignor does hereby bind itself and its successors and assigns to warrant and forever defend all and singular title to the Assigned Formations unto Assignee and Assignee's successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof, by through, or under Assignor, but not otherwise.

This Memorandum is made expressly subject to the terms and conditions of the Purchase and Sale Agreement dated September 23, 2019, by and between the Parties, all of which are fully incorporated herein by reference (the "Purchase Agreement").

This Memorandum may be executed in multiple counterparts, each of which shall be deemed an original instrument, but all such counterparts together shall constitute but one agreement.

[TWO SIGNATURE PAGES TO FOLLOW]

RECEIVED
Office of Oil and Gas

FEB 25 2021

WV Department of
Environmental Protection

PARTIAL QUITCLAIM ASSIGNMENT OF OIL AND GAS LEASE

This **PARTIAL QUITCLAIM ASSIGNMENT OF OIL AND GAS LEASE** (this "**Assignment**"), made the 31 day of May, 2018 (hereinafter, "**Effective Date**"), is by and between **CNX GAS COMPANY LLC**, a Virginia limited liability company, whose address is 1000 CONSOL Energy Drive, Suite 400, Canonsburg, Pennsylvania 15317 (hereinafter "**Assignor**") and **TH EXPLORATION, LLC**, a Texas limited liability company, whose address is 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "**Assignee**"). All references in this Assignment to "**Party**" or "**Parties**" shall be deemed at all times to mean Assignor or Assignee or both. Capitalized terms used but not defined herein shall have the meaning given such terms in the Acreage Trade Agreement, by and between Assignor and Assignee dated April 9, 2018.

WHEREAS, Assignor desires to assign to Assignee, and Assignee desires to receive from Assignor, all of Assignor's right, title and interest in and to that Oil & Gas Lease(s) as same may have been previously or will in the future be modified, extended, or amended (hereinafter, "**Lease**"), covering certain tracts of land (hereinafter, "**Lands**") located in Marshall County, West Virginia; such Lease and Lands covered thereby being more particularly described on Exhibit "A" attached hereto and made a part hereof insofar and only insofar as such Lease covers the Target Formations (as defined below).

NOW, THEREFORE, for and in consideration of TEN AND NO/100 DOLLARS (\$10.00) and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Assignor does hereby **ASSIGN and TRANSFER** to Assignee, without warranty of any kind or nature, the following "**Assigned Rights**":

- (a) all of Assignor's right, title and interest, if any, in and to the to the Lease set forth on Exhibit A attached hereto **INSOFAR AND ONLY INSOFAR** as to the particular Target Formation(s) (defined below) described and delineated on Exhibit A:
- (i) "**Target Formation(s)**" means, with respect to the Lease, two hundred feet (200') above the top and two hundred feet (200') below the base of the Marcellus Formation or the Utica Formation or both, as specified on the Lease on Exhibit A. For the purposes of this Assignment, the Marcellus Formation shall be defined as the formation

RECEIVED
Office of Oil and Gas

FEB 25 2021

WV Department of Environmental Protection