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west virginia department of environmental protection

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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)

Tuesday, October 20, 2020  
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 TEN HIGH 1S-17HU  
47-051-02033-00-00

**Modified deviation and added optional additional intermediate casing.**

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.

James A. Martin  
Chief

Operator's Well Number: TEN HIGH 1S-17HU  
Farm Name: LAWRENCE & SHIRLEY CONKLE ESTS  
U.S. WELL NUMBER: 47-051-02033-00-00  
Horizontal 6A New Drill  
Date Modification Issued: October 20, 2020

Promoting a healthy environment.



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west virginia department of environmental protection

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Oil and Gas Conservation Commission  
601 57<sup>th</sup> Street SE, Charleston, WV 25304  
304-414-1239

Randall M. Albert, Chairman  
dep.wv.gov

July 22, 2020

Department of Environmental Protection  
Office of Oil and Gas  
Charleston, WV 25304

RE: Application for Deep Well Permit – API #47-051-02033

COMPANY: Tug Hill Operating, LLC


FARM: Lawrence & Shirley Conkle Ests Ten High 1S-17HU

COUNTY: Marshall DISTRICT: Meade QUAD: Glen Easton

The deep well review of the application for the above company is Approved to drill to Trenton for Point Pleasant completion.

The applicant has complied with the provision of Chapter 22C-9, of the Code of West Virginia, nineteen hundred and thirty-one (1931), as amended, Oil and Gas Conservation Commission as follows:

1. Comments to Notice of Deviation filed? No.
2. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners? Yes
3. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells: \*\*yes
4. Provided a plat showing that the productive interval of the well meets the requirements of the Rules of the Commission W. Va. C.S.R. § 39-1-4.2.

Sincerely,  
  
Susan Rose  
Administrator

\*\*Heaven Hill 3N-10HU 47-051-02016; Heaven Hill 3-6HU 47-051-01968; Heaven Hill 3-7HU 47-051-01969; Heaven Hill 3-8HU 47-051-01967; Ten High 1N-11HU 47-051-01960; Ten High 1N-12HU 47-051-01961; Ten High 1N-13HU 47-051-01965; Ten High 1S-14HU 47-051-01966; Ten High 1S-15HU 47-051-02027; Ten High 1S-16HU 47-051-02028; Hudson S-12HU 47-051-02292; Hudson S-11HU 47-051-02296; Hudson S-13HU 47-051-02293; Ten High 1N-20HU 47-051-02021; Fitzgerald S-18HU 47-051-02325

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: Ten High 1S-17HU      Well Pad Name: Ten High

3) Farm Name/Surface Owner: Lawrence & Shirley Conkle, ests      Public Road Access: Shepherd Ridge Lane CR 21/9

4) Elevation, current ground: 1310'      Elevation, proposed post-construction: 1310'

5) Well Type (a) Gas  Oil  Underground Storage   
Other

(b) If Gas Shallow  Deep   
Horizontal

6) Existing Pad: Yes or No Yes JW 9/19/19

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Point Pleasant is the target formation at a depth of 11,638' - 11,777' thickness of 139' and anticipated pressure of approx. 9500 psi

8) Proposed Total Vertical Depth: 11,927'

9) Formation at Total Vertical Depth: Trenton

10) Proposed Total Measured Depth: 20,410'

11) Proposed Horizontal Leg Length: 7,424.05'

12) Approximate Fresh Water Strata Depths: 70', 1059'

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

14) Approximate Saltwater Depths: 2,167'

15) Approximate Coal Seam Depths: Sewickly Coal - 968' and Pittsburgh Coal - 1053'

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

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

(a) If Yes, provide Mine Info: Name: Marshall County Coal Co. / Marshall County Mine  
Depth: 1020' TVD and 290' subsea level  
Seam: Pittsburgh #8  
Owner: Murray Energy / Consolidated Coal Co.

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**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	100'	100'	216FT^3(CTS)
Fresh Water	24"	NEW	S60	125.45	1,126'	1,126'	1,309FT^3(CTS)
Coal	18.625"	NEW	J55	106	2,801'	2,801'	2,371FT^3(CTS)
*Intermediate #1	13.325"	NEW	P110	68	6,805'	6,805'	4,384FT^3(CTS)
Intermediate #2	9.625"	NEW	P110	47	11,271'	11,271'	3,681FT^3(CTS)
Production	5.5"	NEW	P110	23	20,410'	20,410'	4,867FT^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		11,908	
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"	38	1.0	2333	1866	CLASS A	1.2
Fresh Water	24"	28	0.75	2750	1330	SEE #24	1.2
Coal	18.625"	22	.531	2740	1140	SEE #24	1.2
*Intermediate #1	13.325"	17	0.455	6910	2340	SEE #24	1.99
Intermediate #2	9.625"	12.25	0.472	10730	7210	SEE #24	1.99
Production	5.5"	8.5	0.415	14530	10864	SEE #24	1.18
Tubing	2 7/8"						
Liners							

\*Intermediate #1: To run if needed.

*JW 9/19/18*

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WW-6B  
(10/14)

4705102033 MWB

API NO. 47- 051

OPERATOR WELL NO. Ten High 1S-17HU

Well Pad Name: Ten High

*9/16/19*

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

Drill through the Point Pleasant and TD Pilot Hole 150' into the Trenton. 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 18,557,500 lb proppant and 286,912 bbl of water. Max rate = 80 bpm; max psi = 12,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 16.2

22) Area to be disturbed for well pad only, less access road (acres): 5.92

23) Describe centralizer placement for each casing string:

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

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

\*See Attachment

25) Proposed borehole conditioning procedures:

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

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\*Note: Attach additional sheets as needed.



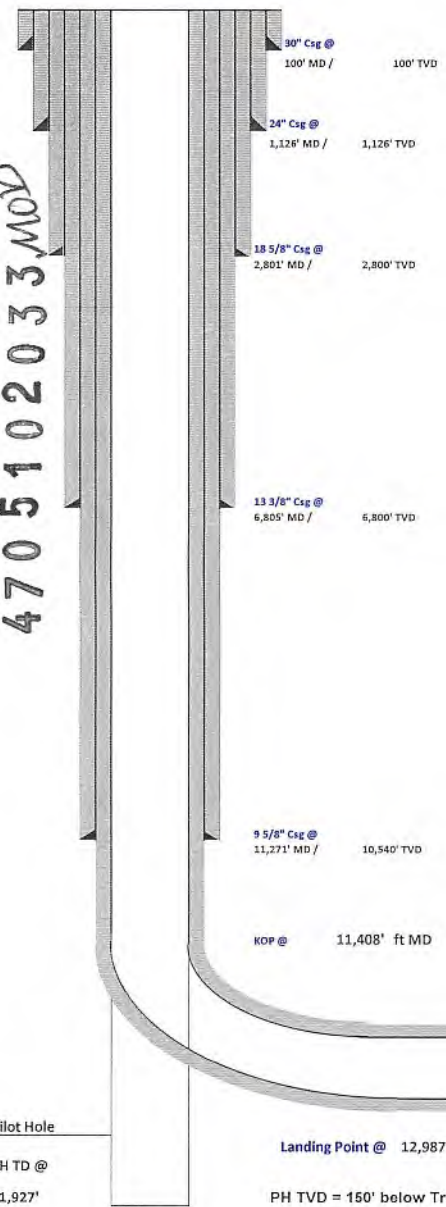
WELL NAME: Ten High 15-17HU  
 STATE: West Virginia COUNTY: Marshall  
 DISTRICT: Meade  
 DF Elev: 1,343' GL Elev: 1,310'  
 TD: 7,423'  
 TH Latitude: 39.80677792  
 TH Longitude: -80.68083671  
 BH Latitude: 39.7916  
 BH Longitude: -80.658607

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	1,059'
Sewickley Coal	968'
Pittsburgh Coal	1,053'
Big Lime	2,098'
Berea	2,722'
Tully	6,654'
Marcellus	6,762'
Onondaga	6,814'
Salina	7,546'
Lockport	8,611'
Utica	11,462'
Point Pleasant	11,638'
Landing Depth	11,688'
Trenton	11,777'
Pilot Hole TD	11,927'

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	100'	100'	BW	BW	Surface
Surface	28	24	1,126'	1,126'	125.45	S60	Surface
Intermediate 1	22	18 5/8	2,801'	2,800'	106	J55	Surface
Intermediate 2	17	13 3/8	6,805'	6,800'	68	P110	Surface
Intermediate 3	12 1/4	9 5/8	11,271'	10,540'	47	HP110	Surface
Production	8 1/2	5 1/2	20,410'	11,817'	23	HCP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	291	A	15.6	Air	None
Surface	1,478	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	2,345	A	15	Air	1 Centralizer every other jt
Intermediate 2	4,283	A	15	Air	1 Centralizer every other jt
Intermediate 3	2,760	A	14.5	Air	1 Centralizer every other jt
Production	4,270	A	15	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc

4705102033 MD



*Handwritten signature: Jg/10/18*

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Lateral TD @ 20,410' ft MD  
11,817' ft TVD

Landing Point @ 12,987' MD / 11,688' TVD  
PH TVD = 150' below Trenton Top

Pilot Hole  
PH TD @  
11,927'

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**Tug Hill Operating, LLC Casing and Cement Program**  
**Ten High 1S-17HU**

**Casing**

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	100'	CTS
Surface	24"	S60	28"	1,126'	CTS
Intermediate 1	18 5/8"	J55	22"	2,801'	CTS
Intermediate 2	13 3/8"	P110	17"	6,805'	CTS
Intermediate 3	9 5/8"	HP110	12 1/4"	11,271'	CTS
Production	5 1/2"	HCP110	8 1/2"	20,410'	CTS

**Cement**

- Surface: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2
- Intermediate 1: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.2
- Intermediate 2: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.2
- Intermediate 3: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.99
- 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 = 1.18

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**TUG HILL**  
OPERATING

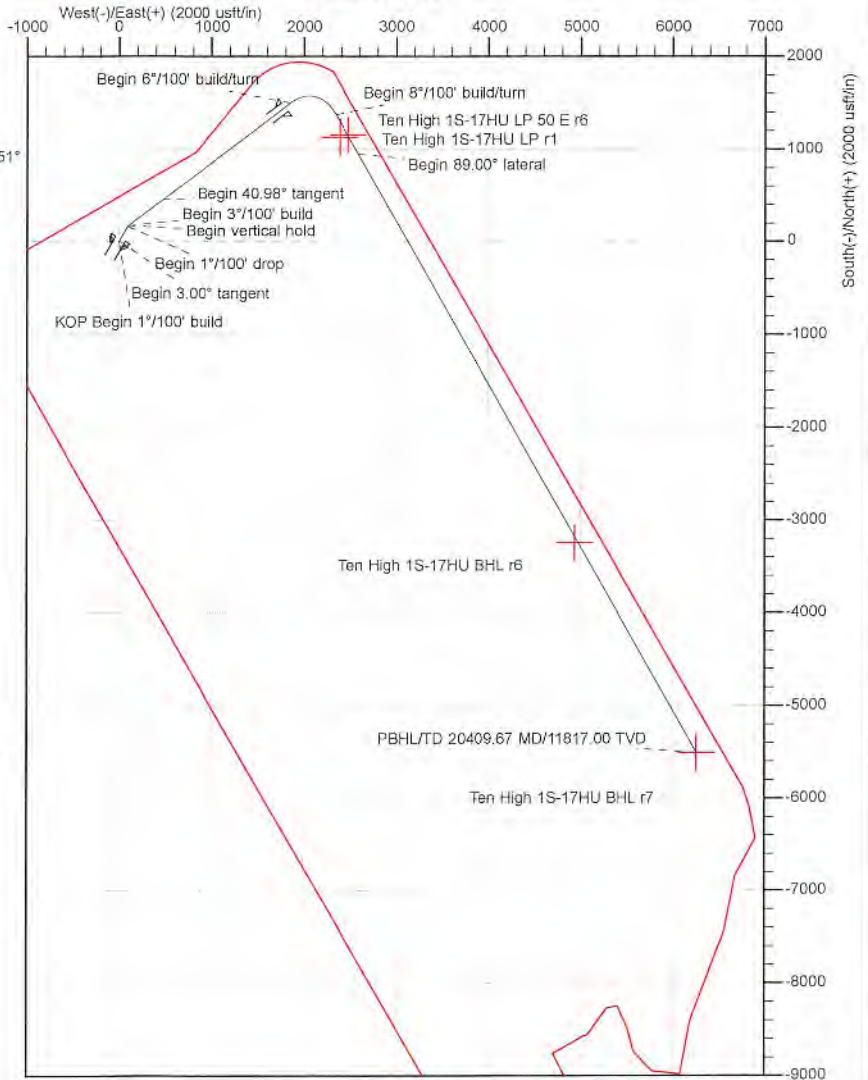
Well: Ten High 1S-17HU (E)  
Site: Ten High  
Project: Marshall County, West Virginia.  
Design: rev7  
Rig: Nabors X08

Geodetic System: Universal Transverse Mercator (US Survey Feet)  
Datum: NAD83 West Virginia - HARN  
Ellipsoid: GRS 1990  
Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level  
Depth Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)

Northing 14456534.51 Easting 1730050.15 Latitude 39.80677792 Longitude -80.68083671

To convert a Magnetic Direction to a Grid Direction, Subtract 8.951°



Total Corr (M->G):



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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	0.00	0.00	
2	2200.00	0.00	0.00	2200.00	0.00	0.00	0.00	0.00	0.00	KCP Begin 1°/100' build
3	2500.00	3.00	30.00	2499.86	6.80	3.93	1.00	30.000	-1.54	Begin 3.00° tangent
4	6004.94	3.00	30.00	6000.00	165.66	95.64	0.00	0.000	-37.49	Begin 1°/100' drop
5	6304.94	0.00	30.00	6299.86	172.46	99.57	1.00	180.000	-39.03	Begin vertical hold
6	7405.08	0.00	30.00	7400.00	172.46	99.57	0.00	30.000	-39.03	Begin 3°/100' build
7	8770.94	40.98	52.82	8652.37	455.23	472.41	3.00	52.823	54.42	Begin 40.98° tangent
8	11407.58	40.98	52.82	10643.00	1500.00	1850.00	0.00	0.000	399.72	Begin 6°/100' build/turn
9	12438.97	45.00	150.35	11478.00	1375.35	2348.18	6.00	127.278	856.22	Begin 8°/100' build/turn
10	12996.99	89.00	150.35	11887.66	948.08	2582.52	8.00	-0.001	1323.13	Begin 89.00° lateral
11	20409.68	89.00	150.35	11817.00	-5503.68	6264.06	0.00	0.000	8338.40	PBHL/TD 20409.67 MD/11817.00 TVD



Azimuths to Grid North  
True North: -0.20°  
Magnetic North: -8.95°  
  
Magnetic Field  
Strength: 52041.1snT  
Dip Angle: 66.87°  
Date: 9/1/2018  
Model: IGRF2015



PBHL/TD 20409.67 MD/11817.00 TVD

Ten High 1S-17HU LP 50 E r6  
Ten High 1S-17HU LP r1

Ten High 1S-17HU BHL r6

Ten High 1S-17HU BHL r7





<b>Database:</b>	DB_Aug1919_v14	<b>Local Co-ordinate Reference:</b>	Well Ten High 1S-17HU (E)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Project:</b>	Marshall County, West Virginia.	<b>MD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1S-17HU (E)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev7		

<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>	Ten High				
<b>Site Position:</b>		<b>Northing:</b>	14,456,545.60 usft	<b>Latitude:</b>	39.80680885
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,730,001.41 usft	<b>Longitude:</b>	-80.68101011
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.204 °

<b>Well</b>	Ten High 1S-17HU (E)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,456,534.51 usft	<b>Latitude:</b>	39.80677792
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,730,050.15 usft	<b>Longitude:</b>	-80.68083671
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	0.00 usft	<b>Ground Level:</b>	1,310.00 usft

<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	9/1/2018	-8.747	66.867	52,041.06763524

<b>Design</b>	rev7			
<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) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	131.30

<b>Plan Survey Tool Program</b>	<b>Date</b>	8/30/2019		
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	20,409.64 rev7 (Original Hole)	MWD	
			MWD - Standard	

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4705102033 Map



Planning Report - Geographic

<b>Database:</b>	DB_Aug1919_v14	<b>Local Co-ordinate Reference:</b>	Well Ten High 1S-17HU (E)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Project:</b>	Marshall County, West Virginia.	<b>MD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1S-17HU (E)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev7		

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	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.000	
2,500.00	3.00	30.00	2,499.86	6.80	3.93	1.00	1.00	0.00	30.000	
6,004.94	3.00	30.00	6,000.00	165.66	95.64	0.00	0.00	0.00	0.000	
6,304.94	0.00	30.00	6,299.86	172.46	99.57	1.00	-1.00	0.00	180.000	
7,405.08	0.00	30.00	7,400.00	172.46	99.57	0.00	0.00	0.00	30.000	
8,770.94	40.98	52.82	8,652.38	455.23	472.41	3.00	3.00	1.67	52.823	
11,407.58	40.98	52.82	10,643.00	1,500.00	1,850.00	0.00	0.00	0.00	0.000	
12,436.97	45.00	150.35	11,478.00	1,375.35	2,348.16	6.00	0.39	9.47	127.278	
12,986.99	89.00	150.35	11,687.66	946.08	2,592.52	8.00	8.00	0.00	-0.001	
20,409.68	89.00	150.35	11,817.00	-5,503.68	6,264.06	0.00	0.00	0.00	0.000	Ten High 1S-17HU Bf

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Planning Report - Geographic

<b>Database:</b>	DB_Aug1919_v14	<b>Local Co-ordinate Reference:</b>	Well Ten High 1S-17HU (E)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Project:</b>	Marshall County, West Virginia.	<b>MD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1S-17HU (E)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev7		

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	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
100.00	0.00	0.00	100.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
200.00	0.00	0.00	200.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
300.00	0.00	0.00	300.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
400.00	0.00	0.00	400.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
500.00	0.00	0.00	500.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
600.00	0.00	0.00	600.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
700.00	0.00	0.00	700.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
800.00	0.00	0.00	800.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
900.00	0.00	0.00	900.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
1,700.00	0.00	0.00	1,700.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
1,800.00	0.00	0.00	1,800.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
1,900.00	0.00	0.00	1,900.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
2,000.00	0.00	0.00	2,000.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
2,100.00	0.00	0.00	2,100.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
2,200.00	0.00	0.00	2,200.00	0.00	0.00	14,456,534.51	1,730,050.15	39.80677792	-80.68083671
<b>KOP Begin 1°/100' build</b>									
2,300.00	1.00	30.00	2,299.99	0.76	0.44	14,456,535.27	1,730,050.59	39.80677999	-80.68083515
2,400.00	2.00	30.00	2,399.95	3.02	1.75	14,456,537.54	1,730,051.90	39.80678621	-80.68083046
2,500.00	3.00	30.00	2,499.86	6.80	3.93	14,456,541.31	1,730,054.08	39.80679656	-80.68082264
2,500.00	3.00	30.00	2,499.86	6.80	3.93	14,456,541.31	1,730,054.08	39.80679656	-80.68082264
<b>Begin 3.00° tangent</b>									
2,599.99	3.00	30.00	2,599.72	11.33	6.54	14,456,545.85	1,730,056.70	39.80680898	-80.68081327
2,699.99	3.00	30.00	2,699.58	15.86	9.16	14,456,550.38	1,730,059.31	39.80682140	-80.68080389
2,799.99	3.00	30.00	2,799.45	20.40	11.78	14,456,554.91	1,730,061.93	39.80683382	-80.68079452
2,899.99	3.00	30.00	2,899.31	24.93	14.39	14,456,559.44	1,730,064.55	39.80684624	-80.68078514
2,999.99	3.00	30.00	2,999.17	29.46	17.01	14,456,563.98	1,730,067.16	39.80685867	-80.68077577
3,099.99	3.00	30.00	3,099.03	33.99	19.63	14,456,568.51	1,730,069.78	39.80687109	-80.68076639
3,199.99	3.00	30.00	3,198.90	38.53	22.24	14,456,573.04	1,730,072.40	39.80688351	-80.68075702
3,299.99	3.00	30.00	3,298.76	43.06	24.86	14,456,577.57	1,730,075.01	39.80689593	-80.68074764
3,399.99	3.00	30.00	3,398.62	47.59	27.48	14,456,582.10	1,730,077.63	39.80690835	-80.68073827
3,499.99	3.00	30.00	3,498.49	52.12	30.09	14,456,586.64	1,730,080.25	39.80692077	-80.68072889
3,599.99	3.00	30.00	3,598.35	56.66	32.71	14,456,591.17	1,730,082.86	39.80693319	-80.68071952
3,699.99	3.00	30.00	3,698.21	61.19	35.33	14,456,595.70	1,730,085.48	39.80694562	-80.68071014
3,799.99	3.00	30.00	3,798.07	65.72	37.94	14,456,600.23	1,730,088.10	39.80695804	-80.68070077
3,899.99	3.00	30.00	3,897.94	70.25	40.56	14,456,604.77	1,730,090.71	39.80697046	-80.68069139
3,999.99	3.00	30.00	3,997.80	74.79	43.18	14,456,609.30	1,730,093.33	39.80698288	-80.68068202
4,099.99	3.00	30.00	4,097.66	79.32	45.79	14,456,613.83	1,730,095.95	39.80699530	-80.68067264
4,199.99	3.00	30.00	4,197.52	83.85	48.41	14,456,618.36	1,730,098.56	39.80700772	-80.68066327
4,299.99	3.00	30.00	4,297.39	88.38	51.03	14,456,622.90	1,730,101.18	39.80702014	-80.68065389
4,399.99	3.00	30.00	4,397.25	92.92	53.65	14,456,627.43	1,730,103.80	39.80703257	-80.68064452
4,499.99	3.00	30.00	4,497.11	97.45	56.26	14,456,631.96	1,730,106.41	39.80704499	-80.68063514
4,599.99	3.00	30.00	4,596.98	101.98	58.88	14,456,636.49	1,730,109.03	39.80705741	-80.68062576
4,699.99	3.00	30.00	4,696.84	106.51	61.50	14,456,641.03	1,730,111.65	39.80706983	-80.68061639
4,799.99	3.00	30.00	4,796.70	111.05	64.11	14,456,645.56	1,730,114.26	39.80708225	-80.68060701
4,899.99	3.00	30.00	4,896.56	115.58	66.73	14,456,650.09	1,730,116.88	39.80709467	-80.68059764
4,999.99	3.00	30.00	4,996.43	120.11	69.35	14,456,654.62	1,730,119.50	39.80710709	-80.68058826



Planning Report - Geographic

<b>Database:</b>	DB_Aug1919_v14	<b>Local Co-ordinate Reference:</b>	Well Ten High 1S-17HU (E)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Project:</b>	Marshall County, West Virginia.	<b>MD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1S-17HU (E)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev7		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,099.99	3.00	30.00	5,096.29	124.64	71.96	14,456,659.16	1,730,122.12	39.80711952	-80.68057889	
5,199.99	3.00	30.00	5,196.15	129.18	74.58	14,456,663.69	1,730,124.73	39.80713194	-80.68056951	
5,299.99	3.00	30.00	5,296.02	133.71	77.20	14,456,668.22	1,730,127.35	39.80714436	-80.68056014	
5,399.99	3.00	30.00	5,395.88	138.24	79.81	14,456,672.75	1,730,129.97	39.80715678	-80.68055076	
5,499.99	3.00	30.00	5,495.74	142.77	82.43	14,456,677.29	1,730,132.58	39.80716920	-80.68054139	
5,599.99	3.00	30.00	5,595.60	147.30	85.05	14,456,681.82	1,730,135.20	39.80718162	-80.68053201	
5,699.99	3.00	30.00	5,695.47	151.84	87.66	14,456,686.35	1,730,137.82	39.80719405	-80.68052264	
5,799.99	3.00	30.00	5,795.33	156.37	90.28	14,456,690.88	1,730,140.43	39.80720647	-80.68051326	
5,899.99	3.00	30.00	5,895.19	160.90	92.90	14,456,695.42	1,730,143.05	39.80721889	-80.68050389	
5,999.99	3.00	30.00	5,995.05	165.43	95.51	14,456,699.95	1,730,145.67	39.80723131	-80.68049451	
6,004.94	3.00	30.00	6,000.00	165.66	95.64	14,456,700.17	1,730,145.80	39.80723192	-80.68049405	
<b>Begin 1°/100' drop</b>										
6,099.99	2.05	30.00	6,094.95	169.29	97.74	14,456,703.80	1,730,147.89	39.80724186	-80.68048655	
6,199.99	1.05	30.00	6,194.92	171.63	99.09	14,456,706.14	1,730,149.24	39.80724828	-80.68048170	
6,299.99	0.05	30.00	6,294.91	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
6,304.94	0.00	0.00	6,299.86	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
<b>Begin vertical hold</b>										
6,399.99	0.00	0.00	6,394.91	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
6,499.99	0.00	30.00	6,494.91	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
6,599.99	0.00	30.00	6,594.91	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
6,699.99	0.00	0.00	6,694.91	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
6,799.99	0.00	0.00	6,794.91	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
6,899.99	0.00	30.00	6,894.91	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
6,999.99	0.00	0.00	6,994.91	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
7,099.99	0.00	0.00	7,094.91	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
7,199.99	0.00	30.00	7,194.91	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
7,299.99	0.00	30.00	7,294.91	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
7,399.99	0.00	0.00	7,394.91	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
7,405.08	0.00	0.00	7,400.00	172.46	99.57	14,456,706.97	1,730,149.72	39.80725056	-80.68047998	
<b>Begin 3°/100' build</b>										
7,499.99	2.85	52.82	7,494.87	173.88	101.45	14,456,708.40	1,730,151.60	39.80725446	-80.68047327	
7,599.98	5.85	52.82	7,594.57	178.46	107.49	14,456,712.98	1,730,157.64	39.80726697	-80.68045171	
7,699.98	8.85	52.82	7,693.74	186.19	117.67	14,456,720.70	1,730,167.83	39.80728809	-80.68041534	
7,799.98	11.85	52.82	7,792.10	197.04	131.98	14,456,731.56	1,730,182.14	39.80731776	-80.68036425	
7,899.98	14.85	52.82	7,889.39	210.99	150.38	14,456,745.50	1,730,200.53	39.80735588	-80.68029858	
7,999.98	17.85	52.82	7,985.33	228.00	172.80	14,456,762.51	1,730,222.95	39.80740236	-80.68021852	
8,099.98	20.85	52.82	8,079.67	248.01	199.19	14,456,782.53	1,730,249.34	39.80745708	-80.68012429	
8,199.98	23.85	52.82	8,172.15	270.99	229.48	14,456,805.50	1,730,279.64	39.80751987	-80.68001614	
8,299.98	26.85	52.82	8,262.52	296.85	263.59	14,456,831.37	1,730,313.74	39.80759057	-80.67989436	
8,399.98	29.85	52.82	8,350.51	325.54	301.42	14,456,860.06	1,730,351.57	39.80766898	-80.67975931	
8,499.98	32.85	52.82	8,435.91	356.97	342.86	14,456,891.49	1,730,393.01	39.80775490	-80.67961133	
8,599.98	35.85	52.82	8,518.46	391.06	387.81	14,456,925.58	1,730,437.96	39.80784807	-80.67945084	
8,699.98	38.85	52.82	8,597.95	427.72	436.14	14,456,962.23	1,730,486.29	39.80794826	-80.67927828	
8,770.94	40.98	52.82	8,652.38	455.23	472.41	14,456,989.74	1,730,522.57	39.80802345	-80.67914877	
<b>Begin 40.98° tangent</b>										
8,799.98	40.98	52.82	8,674.30	466.74	487.59	14,457,001.25	1,730,537.74	39.80805490	-80.67909460	
8,899.98	40.98	52.82	8,749.80	506.36	539.84	14,457,040.87	1,730,589.99	39.80816321	-80.67890805	
8,999.98	40.98	52.82	8,825.30	545.99	592.08	14,457,080.50	1,730,642.24	39.80827151	-80.67872150	
9,099.98	40.98	52.82	8,900.80	585.61	644.33	14,457,120.12	1,730,694.48	39.80837982	-80.67853495	
9,199.98	40.98	52.82	8,976.29	625.24	696.58	14,457,159.75	1,730,746.73	39.80848812	-80.67834840	
9,299.98	40.98	52.82	9,051.79	664.86	748.83	14,457,199.37	1,730,798.98	39.80859642	-80.67816185	
9,399.98	40.98	52.82	9,127.29	704.49	801.07	14,457,239.00	1,730,851.23	39.80870473	-80.67797530	
9,499.98	40.98	52.82	9,202.79	744.11	853.32	14,457,278.62	1,730,903.47	39.80881303	-80.67778875	
9,599.98	40.98	52.82	9,278.29	783.74	905.57	14,457,318.25	1,730,955.72	39.80892133	-80.67760219	



Planning Report - Geographic

<b>Database:</b>	DB_Aug1919_v14	<b>Local Co-ordinate Reference:</b>	Well Ten High 1S-17HU (E)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Project:</b>	Marshall County, West Virginia.	<b>MD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1S-17HU (E)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev7		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,699.98	40.98	52.82	9,353.79	823.36	957.82	14,457,357.87	1,731,007.97	39.80902964	-80.67741564	
9,799.98	40.98	52.82	9,429.28	862.99	1,010.06	14,457,397.50	1,731,060.22	39.80913794	-80.67722909	
9,899.98	40.98	52.82	9,504.78	902.61	1,062.31	14,457,437.12	1,731,112.46	39.80924624	-80.67704253	
9,999.98	40.98	52.82	9,580.28	942.24	1,114.56	14,457,476.75	1,731,164.71	39.80935454	-80.67685598	
10,099.98	40.98	52.82	9,655.78	981.86	1,166.81	14,457,516.37	1,731,216.96	39.80946285	-80.67666942	
10,199.98	40.98	52.82	9,731.28	1,021.49	1,219.05	14,457,556.00	1,731,269.21	39.80957115	-80.67648287	
10,299.98	40.98	52.82	9,806.78	1,061.11	1,271.30	14,457,595.62	1,731,321.45	39.80967945	-80.67629631	
10,399.98	40.98	52.82	9,882.27	1,100.74	1,323.55	14,457,635.25	1,731,373.70	39.80978775	-80.67610975	
10,499.98	40.98	52.82	9,957.77	1,140.36	1,375.80	14,457,674.87	1,731,425.95	39.80989605	-80.67592320	
10,599.98	40.98	52.82	10,033.27	1,179.99	1,428.04	14,457,714.50	1,731,478.20	39.81000435	-80.67573664	
10,699.98	40.98	52.82	10,108.77	1,219.61	1,480.29	14,457,754.12	1,731,530.45	39.81011265	-80.67555008	
10,799.98	40.98	52.82	10,184.27	1,259.24	1,532.54	14,457,793.75	1,731,582.69	39.81022095	-80.67536352	
10,899.98	40.98	52.82	10,259.77	1,298.86	1,584.79	14,457,833.37	1,731,634.94	39.81032925	-80.67517696	
10,999.98	40.98	52.82	10,335.26	1,338.49	1,637.04	14,457,873.00	1,731,687.19	39.81043755	-80.67499040	
11,099.98	40.98	52.82	10,410.76	1,378.11	1,689.28	14,457,912.62	1,731,739.44	39.81054584	-80.67480384	
11,199.98	40.98	52.82	10,486.26	1,417.74	1,741.53	14,457,952.25	1,731,791.68	39.81065414	-80.67461728	
11,299.98	40.98	52.82	10,561.76	1,457.36	1,793.78	14,457,991.87	1,731,843.93	39.81076244	-80.67443072	
11,399.98	40.98	52.82	10,637.26	1,496.99	1,846.03	14,458,031.50	1,731,896.18	39.81087074	-80.67424415	
11,407.58	40.98	52.82	10,643.00	1,500.00	1,850.00	14,458,034.51	1,731,900.15	39.81087898	-80.67422996	
<b>Begin 6°/100' build/turn</b>										
11,499.98	37.83	60.02	10,714.42	1,532.49	1,898.72	14,458,067.00	1,731,948.87	39.81096771	-80.67405606	
11,599.98	35.00	68.94	10,794.95	1,558.14	1,952.09	14,458,092.65	1,732,002.24	39.81103762	-80.67386567	
11,699.98	32.90	79.02	10,877.96	1,573.63	2,005.57	14,458,108.14	1,732,055.72	39.81107962	-80.67367505	
11,799.98	31.70	90.04	10,962.56	1,578.78	2,058.55	14,458,113.30	1,732,108.71	39.81109325	-80.67348629	
11,899.98	31.50	101.50	11,047.81	1,573.55	2,110.48	14,458,108.07	1,732,160.63	39.81107837	-80.67330147	
11,999.98	32.31	112.76	11,132.78	1,558.00	2,160.76	14,458,092.51	1,732,210.92	39.81103513	-80.67312261	
12,099.98	34.06	123.26	11,216.54	1,532.28	2,208.86	14,458,066.79	1,732,259.02	39.81096402	-80.67295166	
12,199.98	36.61	132.66	11,298.17	1,496.68	2,254.25	14,458,031.19	1,732,304.40	39.81086581	-80.67279051	
12,299.98	39.82	140.87	11,376.78	1,451.60	2,296.43	14,457,986.11	1,732,346.58	39.81074157	-80.67264091	
12,399.98	43.53	147.97	11,451.50	1,397.52	2,334.93	14,457,932.03	1,732,385.08	39.81059267	-80.67250450	
12,436.97	45.00	150.35	11,478.00	1,375.35	2,348.16	14,457,909.86	1,732,398.31	39.81053166	-80.67245769	
<b>Begin 8°/100' build/turn</b>										
12,499.98	50.04	150.35	11,520.53	1,334.98	2,371.14	14,457,869.49	1,732,421.29	39.81042056	-80.67237638	
12,599.98	58.04	150.35	11,579.21	1,264.69	2,411.15	14,457,799.20	1,732,461.30	39.81022713	-80.67223483	
12,699.97	66.04	150.35	11,626.05	1,187.99	2,454.81	14,457,722.50	1,732,504.96	39.81001606	-80.67208036	
12,799.97	74.04	150.35	11,660.16	1,106.37	2,501.27	14,457,640.88	1,732,551.42	39.80979144	-80.67191598	
12,899.97	82.04	150.35	11,680.87	1,021.42	2,549.63	14,457,555.93	1,732,599.78	39.80955766	-80.67174489	
12,986.99	89.00	150.35	11,687.66	946.08	2,592.52	14,457,480.59	1,732,642.67	39.80935032	-80.67159315	
<b>Begin 89.00° lateral</b>										
12,999.97	89.00	150.35	11,687.88	934.79	2,598.94	14,457,469.31	1,732,649.09	39.80931927	-80.67157043	
13,099.97	89.00	150.35	11,689.63	847.90	2,648.40	14,457,382.42	1,732,698.56	39.80908014	-80.67139544	
13,199.97	89.00	150.35	11,691.37	761.01	2,697.87	14,457,295.52	1,732,748.02	39.80884102	-80.67122044	
13,299.97	89.00	150.35	11,693.11	674.12	2,747.33	14,457,208.63	1,732,797.48	39.80860189	-80.67104545	
13,399.97	89.00	150.35	11,694.85	587.23	2,796.80	14,457,121.74	1,732,846.95	39.80836276	-80.67087046	
13,499.97	89.00	150.35	11,696.60	500.33	2,846.26	14,457,034.85	1,732,896.41	39.80812364	-80.67069546	
13,599.97	89.00	150.35	11,698.34	413.44	2,895.72	14,456,947.95	1,732,945.88	39.80788451	-80.67052048	
13,699.97	89.00	150.35	11,700.08	326.55	2,945.19	14,456,861.06	1,732,995.34	39.80764538	-80.67034549	
13,799.97	89.00	150.35	11,701.82	239.66	2,994.65	14,456,774.17	1,733,044.80	39.80740626	-80.67017050	
13,899.97	89.00	150.35	11,703.57	152.76	3,044.11	14,456,687.28	1,733,094.27	39.80716713	-80.66995551	
13,999.97	89.00	150.35	11,705.31	65.87	3,093.58	14,456,600.38	1,733,143.73	39.80692800	-80.66982053	
14,099.97	89.00	150.35	11,707.05	-21.02	3,143.04	14,456,513.49	1,733,193.19	39.80668887	-80.66964554	
14,199.97	89.00	150.35	11,708.79	-107.91	3,192.51	14,456,426.60	1,733,242.66	39.80644974	-80.66947056	
14,299.97	89.00	150.35	11,710.54	-194.81	3,241.97	14,456,339.71	1,733,292.12	39.80621062	-80.66929558	
14,399.97	89.00	150.35	11,712.28	-281.70	3,291.43	14,456,252.82	1,733,341.59	39.80597149	-80.66912060	

4705102033 Mon



Planning Report - Geographic

Database:	DB_Aug1919_v14	Local Co-ordinate Reference:	Well Ten High 1S-17HU (E)
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1310+33 @ 1343.00usft (Nabors X08)
Project:	Marshall County, West Virginia.	MD Reference:	RKB=1310+33 @ 1343.00usft (Nabors X08)
Site:	Ten High	North Reference:	Grid
Well:	Ten High 1S-17HU (E)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev7		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
14,499.97	89.00	150.35	11,714.02	-368.59	3,340.90	14,456,165.92	1,733,391.05	39.80573236	-80.66894562	
14,599.97	89.00	150.35	11,715.76	-455.48	3,390.36	14,456,079.03	1,733,440.51	39.80549323	-80.66877064	
14,699.97	89.00	150.35	11,717.51	-542.37	3,439.82	14,455,992.14	1,733,489.98	39.80525410	-80.66859567	
14,799.97	89.00	150.35	11,719.25	-629.27	3,489.29	14,455,905.25	1,733,539.44	39.80501497	-80.66842069	
14,899.97	89.00	150.35	11,720.99	-716.16	3,538.75	14,455,818.35	1,733,588.90	39.80477584	-80.66824572	
14,999.97	89.00	150.35	11,722.73	-803.05	3,588.21	14,455,731.46	1,733,638.37	39.80453671	-80.66807074	
15,099.97	89.00	150.35	11,724.48	-889.94	3,637.68	14,455,644.57	1,733,687.83	39.80429757	-80.66789577	
15,199.97	89.00	150.35	11,726.22	-976.84	3,687.14	14,455,557.68	1,733,737.29	39.80405844	-80.66772080	
15,299.97	89.00	150.35	11,727.96	-1,063.73	3,736.61	14,455,470.79	1,733,786.76	39.80381931	-80.66754583	
15,399.97	89.00	150.35	11,729.70	-1,150.62	3,786.07	14,455,383.89	1,733,836.22	39.80358018	-80.66737086	
15,499.97	89.00	150.35	11,731.45	-1,237.51	3,835.53	14,455,297.00	1,733,885.69	39.80334105	-80.66719590	
15,599.97	89.00	150.35	11,733.19	-1,324.40	3,885.00	14,455,210.11	1,733,935.15	39.80310192	-80.66702093	
15,699.97	89.00	150.35	11,734.93	-1,411.30	3,934.46	14,455,123.22	1,733,984.61	39.80286278	-80.66684597	
15,799.97	89.00	150.35	11,736.67	-1,498.19	3,983.92	14,455,036.32	1,734,034.08	39.80262365	-80.66667100	
15,899.97	89.00	150.35	11,738.42	-1,585.08	4,033.39	14,454,949.43	1,734,083.54	39.80238452	-80.66649604	
15,999.97	89.00	150.35	11,740.16	-1,671.97	4,082.85	14,454,862.54	1,734,133.00	39.80214538	-80.66632108	
16,099.97	89.00	150.35	11,741.90	-1,758.87	4,132.31	14,454,775.65	1,734,182.47	39.80190625	-80.66614612	
16,199.97	89.00	150.35	11,743.64	-1,845.76	4,181.78	14,454,688.75	1,734,231.93	39.80166712	-80.66597116	
16,299.97	89.00	150.35	11,745.39	-1,932.65	4,231.24	14,454,601.86	1,734,281.40	39.80142798	-80.66579621	
16,399.97	89.00	150.35	11,747.13	-2,019.54	4,280.71	14,454,514.97	1,734,330.86	39.80118885	-80.66562125	
16,499.97	89.00	150.35	11,748.87	-2,106.44	4,330.17	14,454,428.08	1,734,380.32	39.80094971	-80.66544630	
16,599.97	89.00	150.35	11,750.61	-2,193.33	4,379.63	14,454,341.19	1,734,429.79	39.80071058	-80.66527134	
16,699.97	89.00	150.35	11,752.36	-2,280.22	4,429.10	14,454,254.29	1,734,479.25	39.80047144	-80.66509639	
16,799.97	89.00	150.35	11,754.10	-2,367.11	4,478.56	14,454,167.40	1,734,528.71	39.80023231	-80.66492144	
16,899.97	89.00	150.35	11,755.84	-2,454.00	4,528.02	14,454,080.51	1,734,578.18	39.79999317	-80.66474649	
16,999.97	89.00	150.35	11,757.59	-2,540.90	4,577.49	14,453,993.62	1,734,627.64	39.79975403	-80.66457154	
17,099.97	89.00	150.35	11,759.33	-2,627.79	4,626.95	14,453,906.72	1,734,677.10	39.79951490	-80.66439659	
17,199.97	89.00	150.35	11,761.07	-2,714.68	4,676.42	14,453,819.83	1,734,726.57	39.79927576	-80.66422165	
17,299.97	89.00	150.35	11,762.81	-2,801.57	4,725.88	14,453,732.94	1,734,776.03	39.79903662	-80.66404670	
17,399.97	89.00	150.35	11,764.56	-2,888.47	4,775.34	14,453,646.05	1,734,825.50	39.79879749	-80.66387176	
17,499.97	89.00	150.35	11,766.30	-2,975.36	4,824.81	14,453,559.15	1,734,874.96	39.79855835	-80.66369681	
17,599.97	89.00	150.35	11,768.04	-3,062.25	4,874.27	14,453,472.26	1,734,924.42	39.79831921	-80.66352187	
17,699.96	89.00	150.35	11,769.78	-3,149.14	4,923.73	14,453,385.37	1,734,973.89	39.79808007	-80.66334693	
17,799.96	89.00	150.35	11,771.53	-3,236.04	4,973.20	14,453,298.48	1,735,023.35	39.79784094	-80.66317199	
17,899.96	89.00	150.35	11,773.27	-3,322.93	5,022.66	14,453,211.59	1,735,072.81	39.79760180	-80.66299706	
17,999.96	89.00	150.35	11,775.01	-3,409.82	5,072.12	14,453,124.69	1,735,122.28	39.79736266	-80.66282212	
18,099.96	89.00	150.35	11,776.75	-3,496.71	5,121.59	14,453,037.80	1,735,171.74	39.79712352	-80.66264718	
18,199.96	89.00	150.35	11,778.50	-3,583.60	5,171.05	14,452,950.91	1,735,221.20	39.79688438	-80.66247225	
18,299.96	89.00	150.35	11,780.24	-3,670.50	5,220.52	14,452,864.02	1,735,270.67	39.79664524	-80.66229732	
18,399.96	89.00	150.35	11,781.98	-3,757.39	5,269.98	14,452,777.12	1,735,320.13	39.79640610	-80.66212238	
18,499.96	89.00	150.35	11,783.72	-3,844.28	5,319.44	14,452,690.23	1,735,369.60	39.79616696	-80.66194745	
18,599.96	89.00	150.35	11,785.47	-3,931.17	5,368.91	14,452,603.34	1,735,419.06	39.79592782	-80.66177252	
18,699.96	89.00	150.35	11,787.21	-4,018.07	5,418.37	14,452,516.45	1,735,468.52	39.79568868	-80.66159760	
18,799.96	89.00	150.35	11,788.95	-4,104.96	5,467.83	14,452,429.56	1,735,517.99	39.79544954	-80.66142267	
18,899.96	89.00	150.35	11,790.69	-4,191.85	5,517.30	14,452,342.66	1,735,567.45	39.79521040	-80.66124774	
18,999.96	89.00	150.35	11,792.44	-4,278.74	5,566.76	14,452,255.77	1,735,616.91	39.79497126	-80.66107282	
19,099.96	89.00	150.35	11,794.18	-4,365.63	5,616.23	14,452,168.88	1,735,666.38	39.79473211	-80.66089790	
19,199.96	89.00	150.35	11,795.92	-4,452.53	5,665.69	14,452,081.99	1,735,715.84	39.79449297	-80.66072297	
19,299.96	89.00	150.35	11,797.66	-4,539.42	5,715.15	14,451,995.09	1,735,765.31	39.79425383	-80.66054805	
19,399.96	89.00	150.35	11,799.41	-4,626.31	5,764.62	14,451,908.20	1,735,814.77	39.79401469	-80.66037313	
19,499.96	89.00	150.35	11,801.15	-4,713.20	5,814.08	14,451,821.31	1,735,864.23	39.79377554	-80.66019821	
19,599.96	89.00	150.35	11,802.89	-4,800.10	5,863.54	14,451,734.42	1,735,913.70	39.79353640	-80.66002330	
19,699.96	89.00	150.35	11,804.63	-4,886.99	5,913.01	14,451,647.52	1,735,963.16	39.79329726	-80.65984838	
19,799.96	89.00	150.35	11,806.38	-4,973.88	5,962.47	14,451,560.63	1,736,012.62	39.79305811	-80.65967347	
19,899.96	89.00	150.35	11,808.12	-5,060.77	6,011.93	14,451,473.74	1,736,062.09	39.79281897	-80.65949855	



Planning Report - Geographic

4705102033 MD

<b>Database:</b>	DB_Aug1919_v14	<b>Local Co-ordinate Reference:</b>	Well Ten High 1S-17HU (E)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Project:</b>	Marshall County, West Virginia.	<b>MD Reference:</b>	RKB=1310+33 @ 1343.00usft (Nabors X08)
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1S-17HU (E)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev7		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
19,999.96	89.00	150.35	11,809.86	-5,147.67	6,061.40	14,451,386.85	1,736,111.55	39.79257983	-80.65932364
20,099.96	89.00	150.35	11,811.60	-5,234.56	6,110.86	14,451,299.96	1,736,161.01	39.79234068	-80.65914873
20,199.96	89.00	150.35	11,813.35	-5,321.45	6,160.33	14,451,213.06	1,736,210.48	39.79210154	-80.65897382
20,299.96	89.00	150.35	11,815.09	-5,408.34	6,209.79	14,451,126.17	1,736,259.94	39.79186239	-80.65879891
20,399.96	89.00	150.35	11,816.83	-5,495.23	6,259.25	14,451,039.28	1,736,309.41	39.79162325	-80.65862400
20,409.67	89.00	150.35	11,817.00	-5,503.67	6,264.06	14,451,030.84	1,736,314.21	39.79160002	-80.65860702
<b>PBHL/TD 20409.67 MD/11817.00 TVD</b>									
20,409.68	89.00	150.35	11,817.00	-5,503.68	6,264.06	14,451,030.83	1,736,314.21	39.79160000	-80.65860700

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Ten High 1S-17HU LP 5i - hit/miss target - Shape - Point	0.00	0.00	11,686.00	1,158.73	2,479.45	14,457,693.25	1,732,529.60	39.80993546	-80.67199300
- plan misses target center by 42.36usft at 12755.84usft MD (11646.73 TVD, 1142.90 N, 2480.48 E)									
Ten High 1S-17HU LP r1 - Point	0.00	0.00	11,686.00	1,134.19	2,386.87	14,457,668.71	1,732,437.02	39.80986900	-80.67232300
- plan misses target center by 99.35usft at 12732.82usft MD (11638.70 TVD, 1161.65 N, 2469.80 E)									
Ten High 1S-17HU BHL - Point	0.00	0.00	11,774.00	-3,243.04	4,943.45	14,453,291.47	1,734,993.60	39.79782200	-80.66327800
- plan misses target center by 29.44usft at 17791.38usft MD (11771.38 TVD, -3228.58 N, 4968.95 E)									
Ten High 1S-17HU BHL - Point	0.00	0.00	11,817.00	-5,503.68	6,264.06	14,451,030.83	1,736,314.21	39.79160000	-80.65860700
- plan hits target center									

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,208.00	1,208.00		20	24
3,013.84	3,013.00		13-3/8	17-1/2
11,295.00	10,558.00		9-5/8	12-1/4

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,200.00	2,200.00	0.00	0.00	KOP Begin 1°/100' build
2,500.00	2,499.86	6.80	3.93	Begin 3.00° tangent
6,004.94	6,000.00	165.66	95.64	Begin 1°/100' drop
6,304.94	6,299.86	172.46	99.57	Begin vertical hold
7,405.08	7,400.00	172.46	99.57	Begin 3°/100' build
8,770.94	8,652.38	455.23	472.41	Begin 40.98° tangent
11,407.58	10,643.00	1,500.00	1,850.00	Begin 6°/100' build/turn
12,436.97	11,478.00	1,375.35	2,348.16	Begin 8°/100' build/turn
12,986.99	11,687.66	946.08	2,592.52	Begin 89.00° lateral
20,409.67	11,817.00	-5,503.67	6,264.06	PBHL/TD 20409.67 MD/11817.00 TVD

470,510,2033 MOD



# Well Site Safety Plan

## Tug Hill Operating, LLC

*DM*  
*9/16/19*

Well Name: Ten High 1S-17HU

Pad Location: Ten High Pad

Wetzel County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,406,360.53

Easting: 527,320.34

September 2019

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Office of Oil and Gas

NOV 14 2019

WV Department of  
Environmental Protection



**TEN HIGH 1S LEASE  
UTICA UNIT - 303.40 AC±  
WELL 17HU  
TUG HILL OPERATING**

B.H.

9,443' B.H.

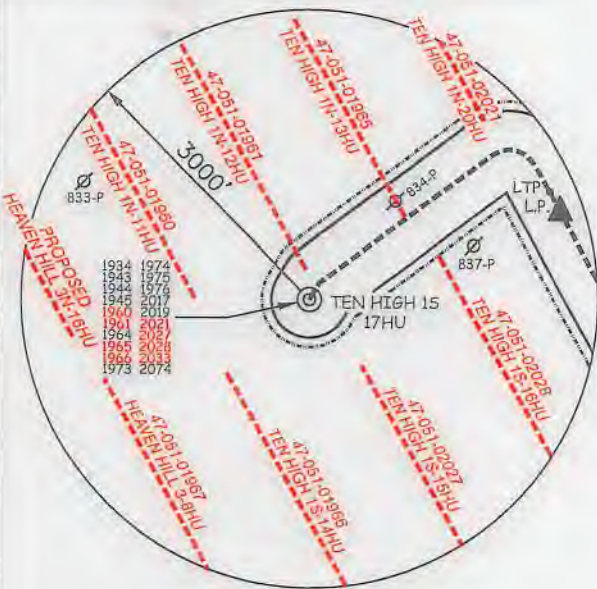
3,981' T.H.

T.H. LATITUDE 39°50'00"  
B.H. LATITUDE 39°47'30"

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)			
NAD'83 S.P.C.(FT)	N. 478,149.83	E. 1,636,770.22	
NAD'83 GEO.	LAT-(N) 39.806778	LONG-(W) 80.680837	
NAD'83 UTM (M)	N. 4,406,360.53	E. 527,320.34	
<u>LANDING POINT</u>			
NAD'83 S.P.C.(FT)	N. 479,052.8	E. 1,639,379.1	
NAD'83 GEO.	LAT-(N) 39.809350	LONG-(W) 80.671593	
NAD'83 UTM (M)	N. 4,406,648.9	E. 528,110.5	
<u>BOTTOM HOLE</u>			
NAD'83 S.P.C.(FT)	N. 472,540.4	E. 1,642,943.5	
NAD'83 GEO.	LAT-(N) 39.791600	LONG-(W) 80.658607	
NAD'83 UTM (M)	N. 4,404,683.0	E. 529,229.6	

T.H. LONGITUDE 80°40'00"  
B.H. LONGITUDE 80°37'30"

9,674' T.H.



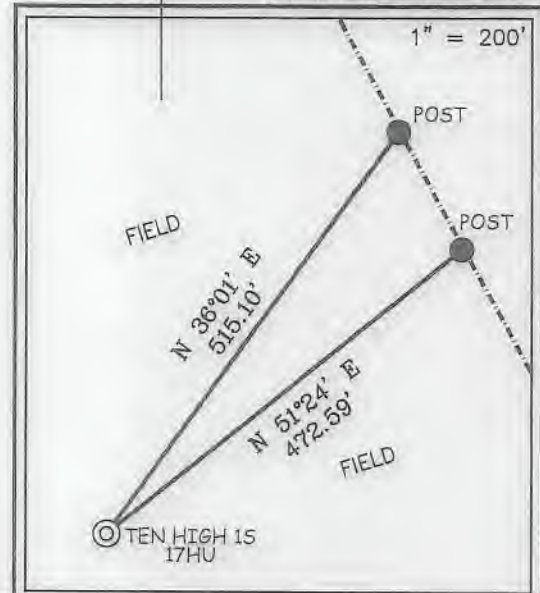
**NOTES ON SURVEY**

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. WERE FOUND WITHIN 825' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'.
- PROPOSED LATERAL OR TOP HOLE OF TEN HIGH 1S-17HU (47-051-02033) IS WITHIN 3000' OF THE TOP HOLES OR LATERALS OF THE FOLLOWING:  
HEAVEN HILL 3-8HU (47-051-01967),  
PROPOSED HEAVEN HILL 3N-16HU,  
TEN HIGH 1N-11HU (47-051-01960),  
TEN HIGH 1N-12HU (47-051-01961),  
TEN HIGH 1N-13HU (47-051-01965),  
TEN HIGH 1S-14HU (47-051-01966),  
TEN HIGH 1S-15HU (47-051-02027),  
TEN HIGH 1S-16HU (47-051-02028),  
TEN HIGH 1N-20HU (47-051-02021),  
PROPOSED HUDSON S-11HU,  
PROPOSED HUDSON S-12HU.



12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5554  
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952  
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296  
sllsv.com

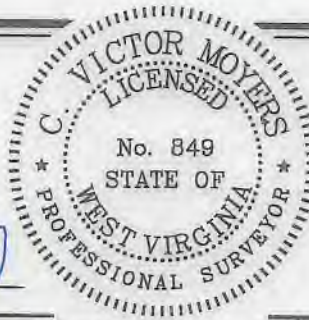
**REFERENCES**



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 AUGUST 29, 20 17  
REVISED 01/15/18, 02/15/19, 09/18/19, 11/12/19, 07/08/20  
OPERATORS WELL NO. TEN HIGH 1S-17HU  
API WELL NO. 47 - 051 - 02033  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8655P17HUR6.dwg  
TEN HIGH 1S-17HU Rev7  
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  INJECTION  WASTE DISPOSAL  IF "GAS" PRODUCTION  STORAGE  DEEP  SHALLOW

LOCATION: GROUND = 1,322.30' ELEVATION PROPOSED = 1,310.06' WATERSHED MIDDLE BOWMAN RUN OF FISH CREEK (HUC 10)  
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER LAWRENCE & SHIRLEY CONKLE ESTS ACREAGE 139.79±  
ROYALTY OWNER ANDY PAUL & JACKIE KUHN, ET AL - SEE ADDITIONAL SHEETS ACREAGE 139.79±

PROPOSED WORK: LEASE NO. SEE ADDITIONAL SHEETS  
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 POINT PLEASANT  
ESTIMATED DEPTH TVD: 11,927' / TMD: 20,410'

COUNTY NAME

PERMIT

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

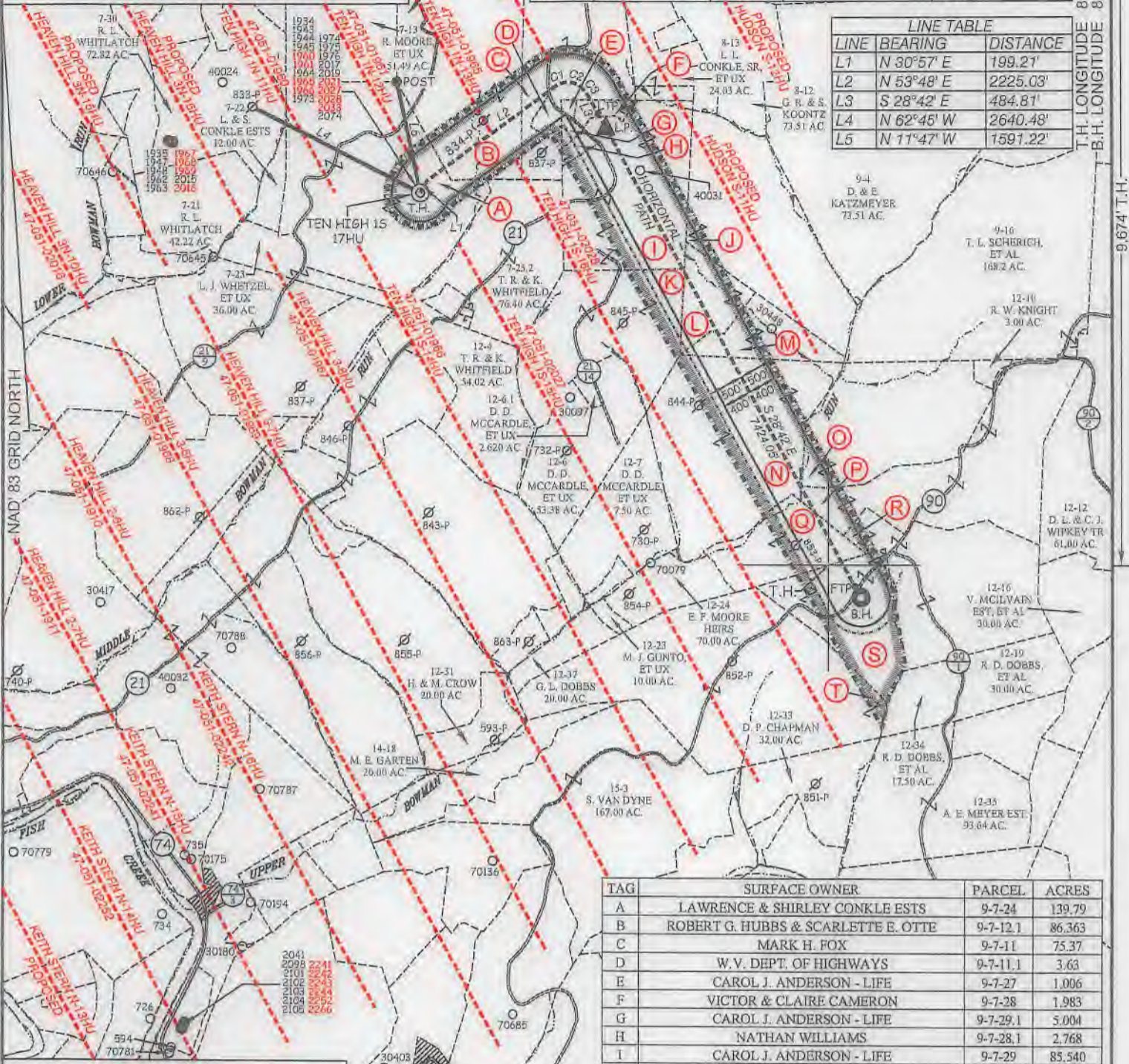
**TEN HIGH 1S LEASE  
UTICA UNIT - 303.40 AC±  
WELL 17HU  
TUG HILL OPERATING**

9,443' B.H. 3,981' T.H.

T.H. LATITUDE 39°50'00"  
B.H. LATITUDE 39°47'30"

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	173.12'	354.47'	N 69°54' E	171.40'
C2	214.51'	276.77'	S 71°51' E	209.18'
C3	192.66'	493.63'	S 38°11' E	191.44'

LINE	BEARING	DISTANCE
L1	N 30°57' E	199.21'
L2	N 53°48' E	2225.03'
L3	S 28°42' E	484.81'
L4	N 62°45' W	2640.48'
L5	N 11°47' W	1591.22'



TAG	SURFACE OWNER	PARCEL	ACRES
A	LAWRENCE & SHIRLEY CONKLE ESTS	9-7-24	139.79
B	ROBERT G. HUBBS & SCARLETTE E. OTTE	9-7-12.1	86.363
C	MARK H. FOX	9-7-11	75.37
D	W.V. DEPT. OF HIGHWAYS	9-7-11.1	3.63
E	CAROL J. ANDERSON - LIFE	9-7-27	1.006
F	VICTOR & CLAIRE CAMERON	9-7-28	1.983
G	CAROL J. ANDERSON - LIFE	9-7-29.1	5.004
H	NATHAN WILLIAMS	9-7-28.1	2.768
I	CAROL J. ANDERSON - LIFE	9-7-29	85.540
J	CONSOLIDATION COAL COMPANY	9-9-3	84.50
K	DONALD DALE MCCARDLE, ET UX	9-9-2	21.11
L	DONALD DALE MCCARDLE, ET UX	9-12-5	75.28
M	DONALD DALE MCCARDLE, ET UX	9-9-1	20.89
N	DONALD DALE MCCARDLE, ET UX	9-12-8	117.85
O	CHARLES WILLIAM DOBBE, ET AL.	9-12-9	82.26
P	WARREN B. CHAMBERS, ET UX	9-12-11	91.00
Q	OLIVER CROW	9-12-22	38.58
R	RONALD EUGENE DOBBES, ET UX	9-12-20	91.00
S	DAVID P. CHAPMAN	9-12-21	50.00
T	DAVID P. CHAPMAN	9-12-32	150.00

**SLS**  
FROM THE GROUND UP

12 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304-462-5634  
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304-346-2952  
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296  
slsvv.com

P.S. 849 *C. Victor Moyers*

(S.P.C. NORTH ZONE) (UTM(M)) ZONE 17 NORTH			
NAD83 S.P.C.(FT)	N. 478,149.83	E. 1,636,770.22	
NAD83 GEO.	LAT-(N) 39.606778	LONG-(W) 80.680837	
NAD83 UTM (M)	N. 4,406,980.53	E. 527,320.34	
LANDING POINT			
NAD83 S.P.C.(FT)	N. 479,052.8	E. 1,638,379.1	
NAD83 GEO.	LAT-(N) 39.609350	LONG-(W) 80.671593	
NAD83 UTM (M)	N. 4,406,646.9	E. 528,110.5	
BOTTOM HOLE			
NAD83 S.P.C.(FT)	N. 472,540.4	E. 1,642,943.5	
NAD83 GEO.	LAT-(N) 39.791600	LONG-(W) 80.658607	
NAD83 UTM (M)	N. 4,404,683.0	E. 529,229.6	



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

**LEGEND**

- UNIT BOUNDARY
- LEASED TRACTS INSIDE
- UNIT BOUNDARY
- SURFACE LINE
- PROPOSED UTICA
- WELL LATERAL
- 400' OFFSET LINE
- 500' OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- PROPOSED FIRST TAKE POINT
- PROPOSED LAST TAKE POINT
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE ADDITIONAL SHEETS)

SCALE 1" = 2000' FILE NO. 8656P17HUR6.dwg  
TEN HIGH 1S-17HU Rev7

DATE AUGUST 29, 2017  
REVISED 01/15/18, 02/15/19, 09/18/19, 11/12/19, 07/08/20

OPERATORS WELL NO. TEN HIGH 1S-17HU

API WELL NO. 47-051-02033 MOD

STATE COUNTY PERMIT

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

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

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

25' B.H. 9,674' T.H. T.H. LONGITUDE 80°40'00" B.H. LONGITUDE 80°37'30"

TEN HIGH 1S LEASE  
 UTICA UNIT - 303.40 AC ±  
 WELL 17HU  
 TUG HILL OPERATING



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  
 slsvv.com

No.	Lease Name or No.	Tag	Parcel	Grantors, Lessors, etc.	Deed Book/Page
1	10*15662	A	9-7-24	LARRY LEE CONKLE, ET AL	863 354
2	10*15501	B	9-7-12.1	RONALD AND EDNA MOORE	661 449
3	10*47051.094.0	C	9-7-11	MARK H FOX	864 163
4	10*19565	D	9-7-11.1	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS	947 566
5	10*15524	E	9-7-27	CAROL J ANDERSON ETAL	901 563
6	10*19143	F	9-7-28	VICTOR CAMERON CLAIRE CAMERON	872 171
7	10*15524	G	9-7-29.1	CAROL J ANDERSON ETAL	901 563
8	10*19183	H	9-7-28.1	EVELYN M WILLIAM	720 180
9	10*15524	I	9-7-29	CAROL J ANDERSON ETAL	901 563
10	10*47051.304.0	J	9-9-3	UNITED BANK INC	905 5
11	10*23386	K	9-9-2	UNK HEIRS OF EDITH CARMICHAEL BY HERMAN LANTZ, ESQ AS SPEC COMMISSIONER	1008 68
12	10*47051.222.1	L	9-12-5	DONALD D MCCARDLE AND LUCY MCCARDLE	879 314
13	10*23386	M	9-9-1	UNK HEIRS OF EDITH CARMICHAEL BY HERMAN LANTZ, ESQ AS SPEC COMMISSIONER	1008 68
14	10*47051.289.1	N	9-12-8	JANICE M HIXSON AND HARRY C HIXSON	898 461
15	10*47051.289.2	N	9-12-8	KENNETH D MCMECHEN	898 463
16	10*15999	O	9-12-9	CHARLES W DOBBS AND JUDITH M DOBBS	702 171
17	10*16000	O	9-12-9	DAVID J KLUKAS ET UX	702 175
18	10*16001	O	9-12-9	MARLENE D GARIN	702 173
19	10*15494	P	9-12-11	CHRISTOPHER SINGER AND SHEREA SINGER, ET AL	898 433
20	10*15474	Q	9-12-22	CLARK C SAMPSON, ET AL	907 495
21	10*24679	R	9-12-20	PIKEWOOD ENERGY CORPORATION AN OHIO CORPORATION, ET AL	1026 149
22	10*47051.140.1	S	9-12-21	DAVID P CHAPMAN & DEBORAH BORCK-CHAPMAN, ET AL	866 318
23	10*47051.140.1	T	9-12-32	DAVID P CHAPMAN & DEBORAH BORCK-CHAPMAN, ET AL	866 318

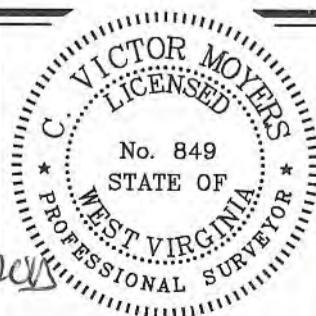
FILE NO. 8655P17HUR6.dwg  
 TEN HIGH 1S-17HU Rev7

DATE AUGUST 29, 20 17

REVISED 01/15/18, 02/15/19, 09/18/19, 11/12/19, 07/08/20

OPERATORS WELL NO. TEN HIGH 1S-17HU

API WELL NO. 47 — 051 — 02033  
 STATE COUNTY PERMIT



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



P.S. 849 *C. Victor Moyers*

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

4705102033 M07

WW-6A1  
(5/13)

Operator's Well No. Ten High 1S-17HU

**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
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\*See attached pages

**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	Granor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*15745	9-12-22	Q	BRENDA L KING	TH EXPLORATION LLC	1/8+	907 517	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16010	9-12-22	Q	DONNA M RIGGS AND ROBERT H RIGGS	TH EXPLORATION LLC	1/8+	907 519	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16012	9-12-22	Q	PAULA K PAGE AND PHILLIP G PAGE	TH EXPLORATION LLC	1/8+	907 522	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16013	9-12-22	Q	HERBERT H BURKHART AND BETTY J BURKHART	TH EXPLORATION LLC	1/8+	907 524	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16014	9-12-22	Q	MARY KAY KESSLER AND ROY LEE KESSLER	TH EXPLORATION LLC	1/8+	907 526	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16022	9-12-22	Q	ALBERT D BURKHART	TH EXPLORATION LLC	1/8+	907 528	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16023	9-12-22	Q	BARBARA J BROWN	TH EXPLORATION LLC	1/8+	907 530	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16057	9-12-22	Q	CORA ALICE DAUBE	TH EXPLORATION LLC	1/8+	907 532	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16119	9-12-22	Q	JEFFREY L EWASKEY	TH EXPLORATION LLC	1/8+	907 569	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16150	9-12-22	Q	JAMES B MATTHEWS	TH EXPLORATION LLC	1/8+	907 571	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16151	9-12-22	Q	JOHN HARRIS AND HELEN VIRGINIA HARRIS	TH EXPLORATION LLC	1/8+	907 573	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16193	9-12-22	Q	NANCY L WOLFE	TH EXPLORATION LLC	1/8+	907 575	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16195	9-12-22	Q	DAVID P NIERATKO AND JUDY C NIERATKO	TH EXPLORATION LLC	1/8+	929 344	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16245	9-12-22	Q	MARGARET D STRAUSSER AND GREGORY L STRAUSSER	TH EXPLORATION LLC	1/8+	907 577	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16293	9-12-22	Q	DANIEL LEE AND DIANA M WEST	TH EXPLORATION LLC	1/8+	907 579	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16294	9-12-22	Q	DONNA G AND PAUL L CHEMEYNSKI	TH EXPLORATION LLC	1/8+	907 581	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16296	9-12-22	Q	DOUGLAS E COURTWRIGHT AND JESSAMINE L COURTWRIGHT	TH EXPLORATION LLC	1/8+	907 583	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16361	9-12-22	Q	ROBERT M WOOD AND CAROL ANN WOOD	TH EXPLORATION LLC	1/8+	907 499	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16371	9-12-22	Q	VERA L APPELGARTH	TH EXPLORATION LLC	1/8+	907 503	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16411	9-12-22	Q	BONNIE L WOOD	TH EXPLORATION LLC	1/8+	907 501	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16419	9-12-22	Q	MELVIN B WOOD	TH EXPLORATION LLC	1/8+	907 505	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16427	9-12-22	Q	LURIA ALWANDA COOLEY	TH EXPLORATION LLC	1/8+	907 585	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16430	9-12-22	Q	EULELAH V RIDDLE	TH EXPLORATION LLC	1/8+	907 587	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16449	9-12-22	Q	BILLIE ALBERTA MIDDLETON	TH EXPLORATION LLC	1/8+	907 613	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16450	9-12-22	Q	JAMES D RAYNER AND PATRICIA ANN RAYNER	TH EXPLORATION LLC	1/8+	907 615	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16451	9-12-22	Q	JAMIE A SMITH AND JOSHUA C SMITH	TH EXPLORATION LLC	1/8+	907 617	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16466	9-12-22	Q	KAREN J AND MICHAEL E BRUGGEMAN	TH EXPLORATION LLC	1/8+	907 619	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16467	9-12-22	Q	CHARLES A AND GARY LYNN ECKHARDT	TH EXPLORATION LLC	1/8+	907 621	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16542	9-12-22	Q	CAROL ANN YEATER AND RICKEY A YEATER	TH EXPLORATION LLC	1/8+	907 623	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16543	9-12-22	Q	JERRY R RUTHERS AND JACQUELYNN E RUTHERS	TH EXPLORATION LLC	1/8+	907 625	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16544	9-12-22	Q	NORMA JEAN ROGERS AND DONALD L ROGERS SR	TH EXPLORATION LLC	1/8+	907 627	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16681	9-12-22	Q	BRENDA S THOMPSON	TH EXPLORATION LLC	1/8+	929 350	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16682	9-12-22	Q	CYNTHIA A FETTY AND WILLIAM D FETTY	TH EXPLORATION LLC	1/8+	929 616	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16683	9-12-22	Q	FRANKLIN R CLARK & PATRICIA E FENSTERMACHER	TH EXPLORATION LLC	1/8+	929 346	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16846	9-12-22	Q	PAMELA SUE BURGE	TH EXPLORATION LLC	1/8+	929 348	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16847	9-12-22	Q	WILLIAM L AND JENNIFER R EWASKEY	TH EXPLORATION LLC	1/8+	929 352	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16889	9-12-22	Q	HAROLD H CLARK JR	TH EXPLORATION LLC	1/8+	929 354	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16921	9-12-22	Q	HAZEL CLARK ROSENLUND	TH EXPLORATION LLC	1/8+	929 356	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16974	9-12-22	Q	BRANDY L WOOD	TH EXPLORATION LLC	1/8+	929 360	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16975	9-12-22	Q	TIMOTHY J WOOD	TH EXPLORATION LLC	1/8+	929 358	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16988	9-12-22	Q	CHAD ERIC BENNETT AND MARY A BENNETT	TH EXPLORATION LLC	1/8+	929 584	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*16998	9-12-22	Q	MISTY JO WOOD AND GARY A MORRIS	TH EXPLORATION LLC	1/8+	929 362	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17183	9-12-22	Q	TARA E BENNETT	TH EXPLORATION LLC	1/8+	929 586	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17277	9-12-22	Q	GUY C ANDO AND WENDY PYLES ANDO	TH EXPLORATION LLC	1/8+	929 594	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17280	9-12-22	Q	BONNIE M KIDD AND CHARLES R KIDD	TH EXPLORATION LLC	1/8+	929 592	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17281	9-12-22	Q	STACY R BENNETT	TH EXPLORATION LLC	1/8+	929 590	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17282	9-12-22	Q	CARLIS LEON CLARK	TH EXPLORATION LLC	1/8+	929 588	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17423	9-12-22	Q	LORI ANN WEST	TH EXPLORATION LLC	1/8+	929 596	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17424	9-12-22	Q	CAROL A CLARK	TH EXPLORATION LLC	1/8+	929 598	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17446	9-12-22	Q	GREGORY DEAN CLARK AND MARY ANN CLARK	TH EXPLORATION LLC	1/8+	929 600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17474	9-12-22	Q	THE ESTATE OF MARY P DAVIS TERI L DAVIS EXECUTRIX	TH EXPLORATION LLC	1/8+	929 606	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17488	9-12-22	Q	SUSANNA M DENIS	TH EXPLORATION LLC	1/8+	929 604	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17495	9-12-22	Q	KEVIN R CLARK AND NANCY G CLARK	TH EXPLORATION LLC	1/8+	929 608	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17498	9-12-22	Q	MICHAEL R DODD AND LISA M DODD	TH EXPLORATION LLC	1/8+	929 614	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17521	9-12-22	Q	BETTY LOU MCMILLAN AND WILLIAM A MCMILLAN	TH EXPLORATION LLC	1/8+	929 610	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17522	9-12-22	Q	RONALD D CLARK AND TAMMY C CLARK	TH EXPLORATION LLC	1/8+	929 612	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17523	9-12-22	Q	ROBERT R CLARK II	TH EXPLORATION LLC	1/8+	929 620	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17529	9-12-22	Q	HARRY C BURGE JR AND CAROL S BURGE	TH EXPLORATION LLC	1/8+	929 602	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17553	9-12-22	Q	TAMI M DECKER	TH EXPLORATION LLC	1/8+	951 584	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17558	9-12-22	Q	SHIRLEY IRENE VANOVER	TH EXPLORATION LLC	1/8+	929 618	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17585	9-12-22	Q	DEBORAH L LUGO AND RONALD J LUGO	TH EXPLORATION LLC	1/8+	929 622	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17587	9-12-22	Q	DONNA SUE BEVERIDGE AND EARL P BEVERIDGE	TH EXPLORATION LLC	1/8+	929 626	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17624	9-12-22	Q	SHIRLEY E ELKINS	TH EXPLORATION LLC	1/8+	928 557	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17704	9-12-22	Q	BETTY LEIGH PEARCE AND ROY S PEARCE	TH EXPLORATION LLC	1/8+	929 628	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17714	9-12-22	Q	RUSSELL A CLARK AND CATHERINE CLARK	TH EXPLORATION LLC	1/8+	929 630	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18106	9-12-22	Q	TIMOTHY HEWITT	TH EXPLORATION LLC	1/8+	927 259	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18237	9-12-22	Q	CLARENCE LEE CLARK	TH EXPLORATION LLC	1/8+	930 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18238	9-12-22	Q	KATHRYN L ATWELL	TH EXPLORATION LLC	1/8+	930 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18239	9-12-22	Q	VERA S CAIN	TH EXPLORATION LLC	1/8+	929 649	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18240	9-12-22	Q	JODY CLARK ELLIOTT	TH EXPLORATION LLC	1/8+	929 647	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18241	9-12-22	Q	VENCON E DAVIS C/O RACHEL A TUCKER	TH EXPLORATION LLC	1/8+	934 596	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18242	9-12-22	Q	WILLIAM R DODD AND NANCY DODD	TH EXPLORATION LLC	1/8+	929 645	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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STATE OF WEST VIRGINIA §  
  §  
COUNTY OF MARSHALL §

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Book-Page 36-148  
Recording Fee \$20.00  
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**ASSIGNMENT AND CONVEYANCE**

**THIS ASSIGNMENT AND CONVEYANCE** (the "**Assignment**") is made and entered into this 17th day of May, 2016 (the "**Effective Date**"), by and between **CHEVRON U.S.A. INC.** (hereinafter "**Assignor**") and **TH EXPLORATION, LLC** (hereinafter "**Assignee**") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated May 2, 2016 (the "**Acreage Trade Agreement**"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade 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"**, and as depicted in **Exhibits "A-1"** and **"A-2"**, 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, except that Assignor accepts and reserves from this Assignment the Chevron ORRI previously conveyed to Assignor and as described in that certain Memorandum of Assignment of Oil and Gas Lease Interests dated November 6, 2012 by and between Cornell Holdings Incorporated and Chevron U.S.A. Inc., which is recorded at Book 0028, Page 0239 in the Office of the County Clerk of Marshall County, West Virginia.

**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 Conveyed Interests since the time that Assignor obtained its interests in the Leases. Assignor does covenant, promise and agree, to and with the Assignee, its respective successors and assigns, to forever specially warrant and defend the title to the Leases or portions thereof included under this Assignment, unto the Assignee and its respective successors and assigns, against the lawful claims of Assignor, and all persons claiming, or to claim, the same or any part thereof, by, through or under Assignor.

*# 217  
for now*



MICHAEL MORAN  
BRIGHTON RESOURCES  
5851 ELLSWORTH AVENUE, #1  
PITTSBURGH PA 15232-1707

BOOK 0040 PAGE 0127

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STATE OF WEST VIRGINIA §  
§  
COUNTY OF MARSHALL §

Marshall County  
Jan Pest, Clerk  
Instrument 1428356  
08/16/2017 @ 12:08:49 PM  
ASSIGNMENTS  
Book 40 @ Page 127  
Pages Recorded 25  
Recording Cost \$ 33.00

**ASSIGNMENT AND CONVEYANCE**

**THIS ASSIGNMENT AND CONVEYANCE** (the "**Assignment**") is made and entered into this 1 day of August, 2017 (the "**Effective Date**"), by and between **CHEVRON U.S.A. INC.** (hereinafter "**Assignor**") and **TH EXPLORATION, LLC** (hereinafter "**Assignee**") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated the 1st day of August, 2017 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade 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**"), less and except certain overriding royalty interests and exclusions; 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, subject to certain overriding royalty interests and less and except certain exclusions.

**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, except that Assignor excepts and reserves from this Assignment the following:

A. The Chevron ORRI previously conveyed to Assignor and as described in that certain Memorandum of Assignment of Oil and Gas Lease Interests dated November 6, 2012 by and between Cornell Holdings Incorporated and Chevron U.S.A. Inc., which is recorded at Book 0028, Page 0239 in the Office of the County Clerk of Marshall County, West Virginia, and

B. As to each of the Leases and all oil, gas, and associated hydrocarbons produced, saved and sold thereunder, an overriding royalty interest equal to the difference between 82% and the