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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)

Thursday, March 15, 2018  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

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

Re: Permit Modification Approval for TEN HIGH 1N-4HM  
47-051-01945-00-00

Modified by 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 blue ink signature of James A. Martin, written in a cursive style.

James A. Martin  
Chief

Operator's Well Number: TEN HIGH 1N-4HM  
Farm Name: LAWRENCE & SHIRLEY CONKLE ESTS  
U.S. WELL NUMBER: 47-051-01945-00-00  
Horizontal 6A New Drill  
Date Modification Issued: March 15, 2018

Promoting a healthy environment.

03/16/2018

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 1N-4HM      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

*2/21/18*

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus is the target formation at a depth of 6713' - 6765', thickness of 52' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,865'

9) Formation at Total Vertical Depth: Onondoga

10) Proposed Total Measured Depth: 19,649'

11) Proposed Horizontal Leg Length: 12,344'

12) Approximate Fresh Water Strata Depths: 70', 1026'

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: 2180'

15) Approximate Coal Seam Depths: Sewickly Coal - 935' and Pittsburgh Coal - 1020'

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      RECEIVED  
Depth: 1020' TVD and 297' subsea level      Office of Oil and Gas  
Seam: Pittsburgh #8      FEB 23 2018  
Owner: Murray Energy / Consolidated Coal Co.

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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	H40	48#	1,175'	1,175'	1166ft^3(CTS)
Coal	13 3/8"	NEW	H40	48#	1,175'	1,175'	1166ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,983'	2,983'	977ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	19,649'	19,649'	5004ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,739'	
Liners	N/A						

*2/21/16*

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 1/2"	.33	1,730	1,384	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.33	1,730	1,384	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE#24	1.19
Production	5 1/2"	8 7/8_8 3/4	.361	12,640	10,112	SEE#24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8960		
Liners	N/A						

**PACKERS**

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

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WW-6B  
(10/14)

API NO. 47-051 - 01945 MOD  
OPERATOR WELL NO. Ten High 1N-4HM  
Well Pad Name: Ten High

*Handwritten signature*  
2/21/18

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

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

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

Well to be completed with approximately 30,860,000 lb proppant and 477,118 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

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 other joint. Production casing will have one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

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

\*See Attached

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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.

51-01945 MOD



Tug Hill Operating, LLC Casing and Cement Program

*Joe*  
2/21/18

Ten High 1N-4HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	H40	17 1/2"	1,175'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,983'	CTS
Production	5 1/2"	P110	8 7/8 x 8 3/4"	19,649'	CTS

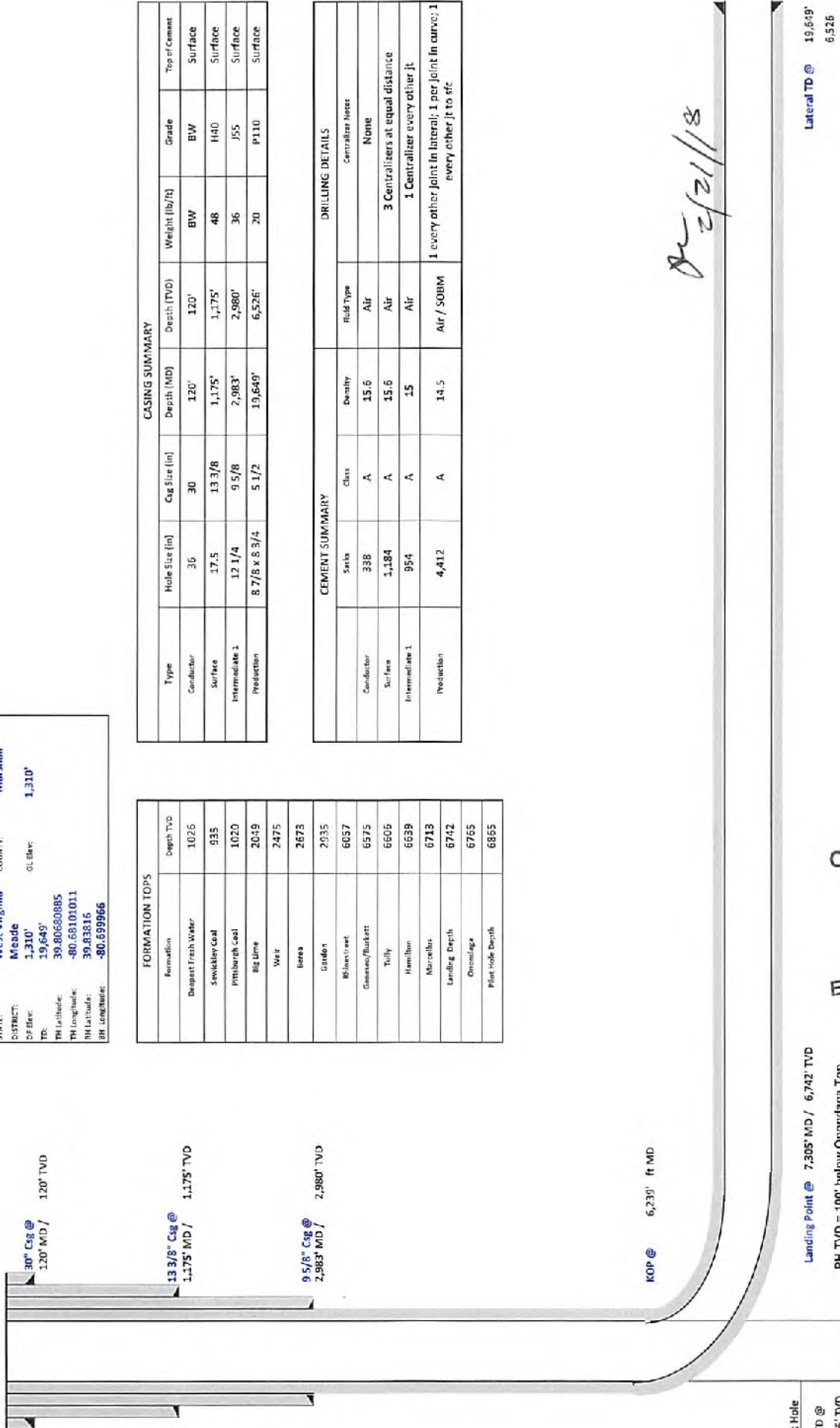
Cement

- 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

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**WELL NAME:** Ten High 1N-4HM  
**STATE:** West Virginia **COUNTY:** Marshall  
**DISTRICT:** Mesado  
**DF Elev:** 1,310' **GL Elev:** 1,310'  
**TD:** 19,649'  
**TH Latitude:** 39.80680885  
**TH Longitude:** -80.68101011  
**BH Latitude:** 39.83815  
**BH Longitude:** -80.699866



Formation	Depth TVD
Deepest Fresh Water	1026
Sawtooth Coal	935
Pittsburgh Coal	1020
Big Lime	2049
Weir	2475
Isere	2673
Gordon	2935
Blaine/vee	6057
Genesee/Burkett	6575
Tully	6605
Hamilton	6639
Marcellus	6713
Landing Depth	6742
Ontonaga	6765
Pilot Hole Depth	6865

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	1,175'	1,175'	48	H40	Surface
Intermediate 1	12 1/4	9 5/8	2,983'	2,980'	36	J55	Surface
Production	8 7/8 x 8.3/4	5 1/2	19,649'	6,526'	20	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
Sacks	Class	Density	Field Type	Centralizer	Notes
338	A	15.6	Air	None	
1,184	A	15.6	Air	3 Centralizers at equal distance	
954	A	15	Air	1 Centralizer every other jt	
4,412	A	14.5	Air / SOBIM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to etc	

*Dr 2/21/18*

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Lateral TD @ 19,649' ft MD  
6,526' ft TVD

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Landing Point @ 7,305' MD / 6,742' TVD  
 PH TVD = 100' below Ontonaga Top

Pilot Hole  
 PH TD @ 6,865' TVD  
 03/16/2018

51-01945 mo7

**Well:** Ten High 1N-04HM (A)  
**Site:** Ten High  
**Project:** Marshall County, West Virginia  
**Design:** rev5



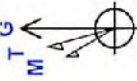
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Diag	VFace	VSetd	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1300.00	0.00	0.00	1300.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2'7100' build
3	1500.00	4.00	30.00	1469.84	6.34	3.49	2.00	33.00	3.88	Begin 2'7100' dropturn
4	1662.91	3.86	78.98	1662.40	12.01	11.71	2.00	116.70	5.88	Begin 3.88° tangent
5	3304.90	3.86	78.98	3600.00	37.00	140.00	0.00	0.00	-26.12	Begin 2'7100' buildturn
6	4800.96	3.86	78.98	4800.00	48.61	199.95	0.00	0.00	740.99	
7	6397.74	31.56	60.75	6102.87	62.59	272.62	2.00	13.23	503.16	
8	7203.04	81.00	329.98	6742.05	706.83	814.98	10.00	-118.41	264.81	
10	16648.92	81.00	329.98	6526.00	11396.40	-5961.84	0.00	0.00	2594.73	PBHLTD 19648.92 MD/6526.00 TVD

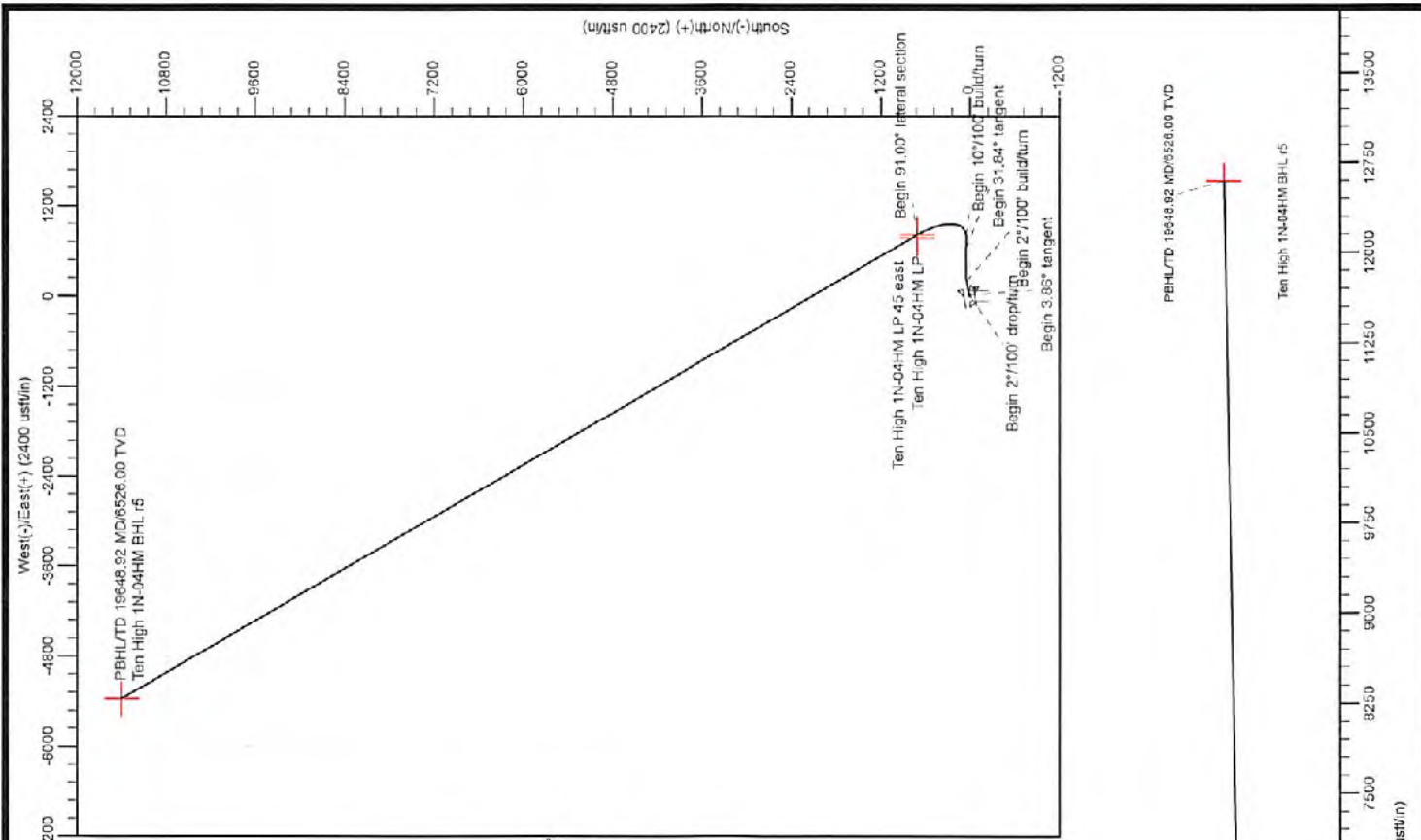
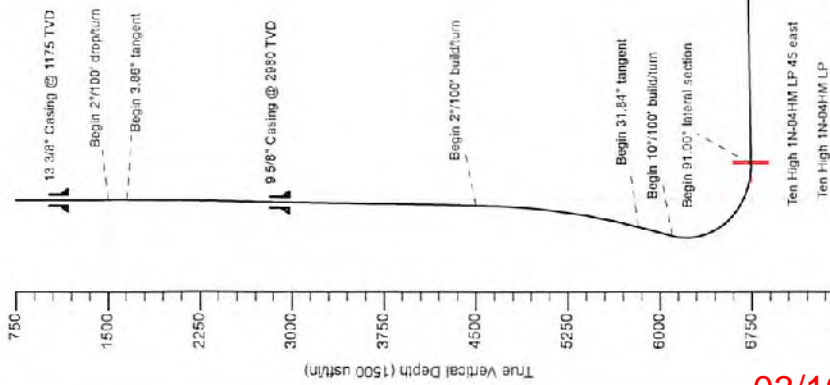
Geocentric System: Universal Transverse Mercator (US Survey Feet)  
 Datum: NAD83 West Virginia - HARN  
 Ellipsoid: GRS 1980  
 Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level  
 Depth Reference: GL=1310 @ 1310.00usft  
 Northing: 14455545.60  
 Easting: 1730001.42  
 Latitude: 39.80660865  
 Longitude: -80.58101311

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract: 8.92°



Azimuths to Grid North  
 True North: -0.20°  
 Magnetic North: -8.92°  
 Magnetic Field  
 Strength: 5215 Gauss  
 Dip Angle: 66.65°  
 Decl: 81.2017  
 Model: IGRF2015



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21-02, February 17 2018

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

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

## Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, [dducoeur@dpslandservices.com](mailto:dducoeur@dpslandservices.com) DPS GIS (12/19/2016) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

## Request maps for:

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

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

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

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51-01945  
MSD

Permit well - Ten High 1N-4HM

Wells within 500' Buffer

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705101934	Tug Hill Operating	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101944	Tug Hill Operating	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101945	Tug Hill Operating	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101943	Tug Hill Operating	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101964	Tug Hill Operating	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101973	Tug Hill Operating	6737' TVD planned	None	None	No, Permit submitted Marcellus well	Permit submitted Marcellus well. Not yet drilled
4705101974	Tug Hill Operating	6737' TVD planned	None	None	No, Permit submitted Marcellus well	Permit submitted Marcellus well. Not yet drilled
4705101975	Tug Hill Operating	6737' TVD planned	None	None	No, Permit submitted Marcellus well	Permit submitted Marcellus well. Not yet drilled
4705101976	Tug Hill Operating	6737' TVD planned	None	None	No, Permit submitted Marcellus well	Permit submitted Marcellus well. Not yet drilled
4705101960	Tug Hill Operating	11878' TVD planned	None	None	No, Permit submitted Utica well	Permit submitted Utica well. Not yet drilled
4705101961	Tug Hill Operating	11878' TVD planned	None	None	No, Permit submitted Utica well	Permit submitted Utica well. Not yet drilled
4705101965	Tug Hill Operating	11878' TVD planned	None	None	No, Permit submitted Utica well	Permit submitted Utica well. Not yet drilled
4705101966	Tug Hill Operating	11878' TVD planned	None	None	No, Permit submitted Utica well	Permit submitted Utica well. Not yet drilled
4705100839	Manufacturer's Light and Heat/McElroy Coal Co.	Unknown	Unknown	Unknown	Unknown but unlikely, Appears to be an old shallow well, now plugged	Well records are incomplete. Well plugged 1/20/1999. A field survey was conducted to locate this well and no evidence of this well was found.
4705100834	McElroy Coal Co.	Unknown	Unknown	Unknown	Unknown but unlikely, probably an old shallow well. Plugged back and reentered at least once. Now plugged	Well records incomplete. Listed as art of Orphan well program. Well plugged 8/6/1998. A field survey was conducted to locate this well and no evidence of this well was found.

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**WVGES**  
"Pipeline"

Select County: (051) Marshall  
Enter Permit #: 00839  
Get Data    Reset

Select datatypes:  (Check All)  
 Location     Production     Plugging  
 Owner/Completion     Stratigraphy     Sample  
 Pay/ShowWater     Logs     Ben Hole Log

Table Descriptions  
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[Links Home](#)  
[Contact Information](#)  
[System](#)  
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[Feedback](#)

WV Geological & Economic Survey: **Well: County = 51 Permit = 00839**

Well Reassignment Information: Reassigned From  
 OLD\_COUNTY OLD\_PERMIT NEW\_COUNTY NEW\_PERMIT  
 51 00839 51 00839

Location Information: [View Map](#)  
 API COUNTY PERMIT TAX\_DISTRICT QUAD\_75 QUAD\_15 LAT\_DD LON\_DD UTM\_E UTM\_N  
 4705100839 Marshall 515 Meigs Oak Station Cameron 32 51942.0 30 501304 237027.6 4407481

There is no Bottom Hole Location data for this well

Owner Information:  
 API CMP\_DT SUFFIX STATUS SURFACE\_OWNER WELL\_NUM CO\_NUM LEASE LEASE\_NUM MINERAL\_OWN OPERATOR\_AT\_COMPLETION PROP\_VD PRO  
 4705100839 12/2/1999 12/1/1999 1146 Ground Lease 1 99-2 (10-34) Manufacture Light & Heat Co

Completion Information:  
 API CMP\_DT SPUD\_DT ELEV DATUM FIELD DEEPEST\_FW DEEPEST\_FMT INITIAL\_CLASS FINAL\_CLASS TYPE RIG CMP\_MTHD TVD TMD NEW  
 4705100839 12/2/1999 12/1/1999 1146 Ground Lease unclassified unclassified not available unknown unknown

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well \*\* some operators may have reported NGL under Oil

There is no Production NGL data for this well \*\* some operators may have reported NGL under Oil

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

Plugging Information:  
 API PLS\_DT DEPTH\_FBT  
 4705100839 1/25/1994 0

There is no Sample data for this well

**WVGES**  
"Pipeline"

Select County: (051) Marshall  
Enter Permit #: 00834  
Get Data    Reset

Select datatypes:  (Check All)  
 Location     Production     Plugging  
 Owner/Completion     Stratigraphy     Sample  
 Pay/ShowWater     Logs     Ben Hole Log

Table Descriptions  
[County Code Translations](#)  
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[Contact Information](#)  
[System](#)  
[WVGES Help](#)  
[Feedback](#)

WV Geological & Economic Survey: **Well: County = 51 Permit = 00834**

Well Reassignment Information: Reassigned From  
 OLD\_COUNTY OLD\_PERMIT NEW\_COUNTY NEW\_PERMIT  
 51 00834 51 00834

Location Information: [View Map](#)  
 API COUNTY PERMIT TAX\_DISTRICT QUAD\_75 QUAD\_15 LAT\_DD LON\_DD UTM\_E UTM\_N  
 4705100834 Marshall 524 Meigs Oak Station Cameron 32 50579.0 30 507238 227454.3 4400241.7

There is no Bottom Hole Location data for this well

Owner Information:  
 API CMP\_DT SUFFIX STATUS SURFACE\_OWNER WELL\_NUM CO\_NUM LEASE LEASE\_NUM MINERAL\_OWN OPERATOR\_AT\_COMPLETION PROP\_VD PRO  
 4705100834 1/1/1994 1/1/1994 Original Lease Completed Norma Wilson/Panola 1 OP-31 W Bland Operator in 100 permit file no code except O

Completion Information:  
 API CMP\_DT SPUD\_DT ELEV DATUM FIELD DEEPEST\_FW DEEPEST\_FMT INITIAL\_CLASS FINAL\_CLASS TYPE RIG CMP\_MTHD TVD TMD NEW  
 4705100834 1/1/1994 1/1/1994 1192 Ground Level unclassified unclassified gas unknown unknown

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well \*\* some operators may have reported NGL under Oil

There is no Production NGL data for this well \*\* some operators may have reported NGL under Oil

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

Plugging Information:  
 API PLS\_DT DEPTH\_FBT  
 4705100834 11/8/1994 0  
 4705100834 8/8/1998 0

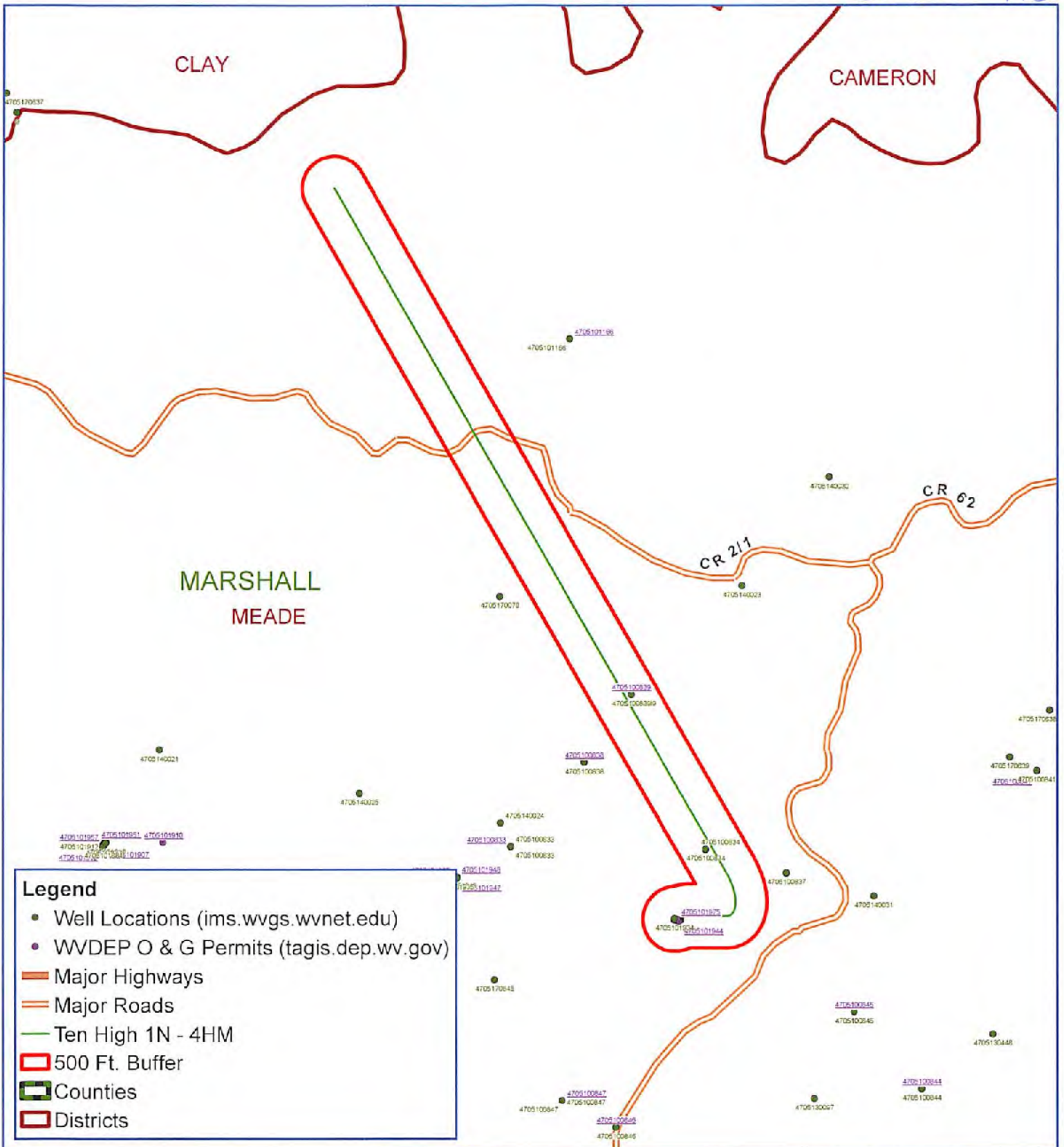
There is no Sample data for this well

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**Legend**

- Well Locations (ims.wvgs.wvnet.edu)
- WVDEP O & G Permits (tagis.dep.wv.gov)
- Major Highways
- Major Roads
- Ten High 1N - 4HM
- 500 Ft. Buffer
- Counties
- Districts



# Ten High 1N-4HM Meade District Marshall County, WV



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

Map Created: February 20, 2018  
Map Current As Of: February 20, 2018

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Map Prepared by:  
WV Department of  
Environmental Protection

03/16/2018  
LAND SERVICES

SI-01945MOD



Planning Report - Geographic

<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Ten High 1N-04HM (A)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=1310 @ 1310.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL=1310 @ 1310.00usft
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1N-04HM (A)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev5		

<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>	0.20 °

<b>Well</b>	Ten High 1N-04HM (A)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,456,545.60 usft	<b>Latitude:</b>	39.80680885
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,730,001.41 usft	<b>Longitude:</b>	-80.68101011
<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	9/1/2017	-6.71	66.95	52,156.48977617

<b>Design</b>	rev5			
<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	334.80

<b>Plan Survey Tool Program</b>	<b>Date</b>	2/17/2018		
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	19,648.92 rev5 (Original Hole)	MWD MWD - Standard	

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Planning Report - Geographic

<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Ten High 1N-04HM (A)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=1310 @ 1310.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL=1310 @ 1310.00usft
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1N-04HM (A)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev5		

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	0.00	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	4.00	30.00	1,499.84	6.04	3.49	2.00	2.00	0.00	30.00	
1,662.91	3.88	78.98	1,662.41	12.01	11.71	2.00	-0.09	30.07	116.70	
3,604.90	3.86	78.98	3,600.00	37.00	140.00	0.00	0.00	0.00	0.00	
4,506.95	3.88	78.98	4,500.00	48.61	199.59	0.00	0.00	0.00	0.00	
5,897.49	31.58	90.75	5,811.87	52.89	617.82	2.00	1.99	0.85	13.23	
6,238.78	31.58	90.75	6,102.62	50.55	796.53	0.00	0.00	0.00	0.00	
7,303.04	91.00	329.98	6,742.00	706.65	814.43	10.00	5.58	-11.35	-116.41	Ten High 1N-04HM LF
19,648.92	91.00	329.98	6,526.00	11,396.40	-5,361.84	0.00	0.00	0.00	0.00	Ten High 1N-04HM BI

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Planning Report - Geographic

<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Ten High 1N-04HM (A)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=1310 @ 1310.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL=1310 @ 1310.00usft
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1N-04HM (A)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev5		

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	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
100.00	0.00	0.00	100.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
200.00	0.00	0.00	200.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
300.00	0.00	0.00	300.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
400.00	0.00	0.00	400.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
500.00	0.00	0.00	500.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
600.00	0.00	0.00	600.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
700.00	0.00	0.00	700.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
800.00	0.00	0.00	800.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
900.00	0.00	0.00	900.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,456,545.60	1,730,001.41	39.80680885	-80.68101011	
<b>KOP Begin 2°/100' build</b>										
1,400.00	2.00	30.00	1,399.98	1.51	0.87	14,458,547.11	1,730,002.29	39.80681299	-80.68100698	
1,500.00	4.00	30.00	1,499.84	6.04	3.49	14,456,551.65	1,730,004.90	39.80682541	-80.68099761	
<b>Begin 2°/100' drop/turn</b>										
1,600.00	3.58	59.97	1,599.63	10.63	7.94	14,456,556.23	1,730,009.35	39.80683796	-80.68098172	
1,662.91	3.86	78.98	1,662.41	12.01	11.71	14,456,557.62	1,730,013.13	39.80684173	-80.68098625	
<b>Begin 3.86° tangent</b>										
1,700.00	3.86	78.98	1,699.41	12.49	14.16	14,456,558.09	1,730,015.58	39.80684302	-80.68095952	
1,800.00	3.86	78.98	1,799.19	13.78	20.77	14,456,559.38	1,730,022.18	39.80684649	-80.68093598	
1,900.00	3.86	78.98	1,898.96	15.06	27.38	14,456,560.67	1,730,028.79	39.80684995	-80.68091244	
2,000.00	3.86	78.98	1,998.73	16.35	33.98	14,456,561.95	1,730,035.40	39.80685342	-80.68088891	
2,100.00	3.86	78.98	2,098.51	17.64	40.59	14,456,563.24	1,730,042.00	39.80685689	-80.68086537	
2,200.00	3.86	78.98	2,198.28	18.92	47.19	14,456,564.53	1,730,048.61	39.80686036	-80.68084183	
2,300.00	3.86	78.98	2,298.05	20.21	53.80	14,456,565.81	1,730,055.21	39.80686383	-80.68081829	
2,400.00	3.86	78.98	2,397.83	21.50	60.40	14,456,567.10	1,730,061.82	39.80686730	-80.68079475	
2,500.00	3.86	78.98	2,497.60	22.78	67.01	14,456,568.39	1,730,068.43	39.80687077	-80.68077121	
2,600.00	3.86	78.98	2,597.37	24.07	73.62	14,456,569.67	1,730,075.03	39.80687423	-80.68074768	
2,700.00	3.86	78.98	2,697.15	25.36	80.22	14,456,570.96	1,730,081.64	39.80687770	-80.68072414	
2,800.00	3.86	78.98	2,796.92	26.64	86.83	14,456,572.25	1,730,088.24	39.80688117	-80.68070060	
2,900.00	3.86	78.98	2,896.69	27.93	93.43	14,456,573.53	1,730,094.85	39.80688464	-80.68067706	
3,000.00	3.86	78.98	2,996.47	29.22	100.04	14,456,574.82	1,730,101.46	39.80688811	-80.68065352	
3,100.00	3.86	78.98	3,096.24	30.50	106.65	14,456,576.11	1,730,108.06	39.80689158	-80.68062999	
3,200.00	3.86	78.98	3,196.01	31.79	113.25	14,456,577.39	1,730,114.67	39.80689505	-80.68060645	
3,300.00	3.86	78.98	3,295.79	33.08	119.86	14,456,578.68	1,730,121.27	39.80689852	-80.68058291	
3,400.00	3.86	78.98	3,395.56	34.36	126.46	14,456,579.97	1,730,127.88	39.80690198	-80.68055937	
3,500.00	3.86	78.98	3,495.33	35.65	133.07	14,456,581.25	1,730,134.49	39.80690545	-80.68053583	
3,600.00	3.86	78.98	3,595.11	36.94	139.68	14,456,582.54	1,730,141.09	39.80690892	-80.68051230	
3,604.90	3.86	78.98	3,600.00	37.00	140.00	14,456,582.60	1,730,141.42	39.80690909	-80.68051114	
3,700.00	3.86	78.98	3,694.88	38.22	146.28	14,456,583.83	1,730,147.70	39.80691239	-80.68048876	
3,800.00	3.86	78.98	3,794.65	39.51	152.89	14,456,585.11	1,730,154.30	39.80691586	-80.68046522	
3,900.00	3.86	78.98	3,894.43	40.80	159.49	14,456,586.40	1,730,160.91	39.80691933	-80.68044168	
4,000.00	3.86	78.98	3,994.20	42.08	166.10	14,456,587.69	1,730,167.51	39.80692280	-80.68041814	
4,100.00	3.86	78.98	4,093.97	43.37	172.71	14,456,588.97	1,730,174.12	39.80692626	-80.68039460	
4,200.00	3.86	78.98	4,193.75	44.66	179.31	14,456,590.26	1,730,180.73	39.80692973	-80.68037107	
4,300.00	3.86	78.98	4,293.52	45.94	185.92	14,456,591.55	1,730,187.33	39.80693320	-80.68034753	
4,400.00	3.86	78.98	4,393.29	47.23	192.52	14,456,592.83	1,730,193.94	39.80693667	-80.68032399	
4,500.00	3.86	78.98	4,493.07	48.52	199.13	14,456,594.12	1,730,200.54	39.80694014	-80.68030045	
4,506.95	3.86	78.98	4,500.00	48.61	199.59	14,456,594.21	1,730,201.00	39.80694038	-80.68029882	
<b>Begin 2°/100' build/turn</b>										
4,600.00	5.69	83.28	4,592.72	49.74	207.24	14,456,595.35	1,730,208.66	39.80694343	-80.68027155	

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<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=1310 @ 1310.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL=1310 @ 1310.00usft
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1N-04HM (A)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev5		

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	7.67	85.81	4,692.04	50.83	218.81	14,456,596.44	1,730,220.23	39.80694631	-80.68023033
4,800.00	9.66	86.99	4,790.90	51.79	233.85	14,456,597.39	1,730,235.26	39.80694677	-80.68017680
4,900.00	11.65	87.90	4,889.17	52.60	252.31	14,456,598.20	1,730,253.73	39.80695082	-80.68011102
5,000.00	13.65	88.54	4,986.73	53.27	274.20	14,456,598.87	1,730,275.61	39.80695245	-80.68003309
5,100.00	15.64	89.03	5,083.48	53.79	299.47	14,456,599.40	1,730,300.89	39.80695365	-80.67994309
5,200.00	17.64	89.41	5,179.29	54.18	328.11	14,456,599.78	1,730,329.52	39.80695442	-80.67984113
5,300.00	19.64	89.71	5,274.04	54.42	360.05	14,456,600.02	1,730,361.48	39.80695478	-80.67972734
5,400.00	21.63	89.96	5,367.62	54.52	395.30	14,456,600.12	1,730,396.72	39.80695470	-80.67960188
5,500.00	23.63	90.17	5,459.91	54.48	433.79	14,456,600.08	1,730,435.20	39.80695420	-80.67946483
5,600.00	25.63	90.34	5,550.81	54.29	475.46	14,456,599.89	1,730,476.88	39.80695328	-80.67931643
5,700.00	27.63	90.50	5,640.19	53.96	520.28	14,456,599.56	1,730,521.70	39.80695193	-80.67915684
5,800.00	29.63	90.63	5,727.96	53.48	568.19	14,456,599.09	1,730,569.61	39.80695015	-80.67898625
5,897.49	31.58	90.75	5,811.87	52.89	617.82	14,456,598.49	1,730,619.24	39.80694802	-80.67880955
5,900.00	31.58	90.75	5,814.01	52.87	619.14	14,456,598.47	1,730,620.55	39.80694796	-80.67880487
5,910.62	31.58	90.75	5,823.05	52.80	624.70	14,456,598.40	1,730,626.11	39.80694771	-80.67878507
<b>Begin 31.84° tangent</b>									
6,000.00	31.58	90.75	5,899.20	52.19	671.50	14,456,597.79	1,730,672.91	39.80694557	-80.67861844
6,100.00	31.58	90.75	5,984.39	51.50	723.86	14,456,597.10	1,730,725.28	39.80694317	-80.67843200
6,200.00	31.58	90.75	6,069.58	50.82	776.22	14,456,596.42	1,730,777.64	39.80694078	-80.67824556
6,237.59	31.58	90.75	6,101.61	50.56	795.91	14,456,596.16	1,730,797.32	39.80693966	-80.67817548
<b>Begin 10°/100' build/turn</b>									
6,238.78	31.58	90.75	6,102.62	50.55	796.53	14,456,596.16	1,730,797.95	39.80693985	-80.67817325
6,300.00	29.32	79.50	6,155.44	53.08	827.32	14,456,598.68	1,730,826.74	39.80694648	-80.67806357
6,400.00	27.98	58.74	6,243.41	69.76	871.56	14,456,615.36	1,730,872.98	39.80699185	-80.67790583
6,500.00	29.64	38.32	6,331.16	101.53	907.13	14,456,647.13	1,730,908.55	39.80707875	-80.67778778
6,600.00	34.37	21.48	6,416.02	147.43	932.95	14,456,693.03	1,730,934.35	39.80720455	-80.67768627
6,700.00	40.68	8.67	6,495.41	206.06	948.22	14,456,751.67	1,730,949.64	39.80736542	-80.67763112
6,800.00	48.07	359.00	6,566.93	275.65	952.50	14,456,821.25	1,730,953.91	39.80755648	-80.67761500
6,900.00	56.09	351.42	6,628.39	354.07	945.64	14,456,899.68	1,730,947.06	39.80777192	-80.67763841
7,000.00	64.50	345.18	6,677.93	438.95	927.87	14,456,964.55	1,730,929.28	39.80800519	-80.67770062
7,100.00	73.14	339.77	6,714.04	527.71	899.70	14,457,073.31	1,730,901.12	39.80824921	-80.67779976
7,200.00	81.91	334.84	6,735.63	617.64	862.01	14,457,163.24	1,730,863.43	39.80849656	-80.67793281
7,300.00	90.73	330.12	6,742.05	706.02	815.94	14,457,251.62	1,730,817.36	39.80873973	-80.67809573
7,303.04	91.00	329.98	6,742.00	708.65	814.43	14,457,254.26	1,730,815.84	39.80874698	-80.67810110
7,304.90	91.00	329.98	6,741.97	710.26	813.50	14,457,255.87	1,730,814.91	39.80875141	-80.67810440
<b>Begin 91.00° lateral section</b>									
7,400.00	91.00	329.98	6,740.30	792.59	765.92	14,457,338.19	1,730,767.33	39.80897797	-80.67827275
7,500.00	91.00	329.98	6,738.55	879.16	715.89	14,457,424.76	1,730,717.31	39.80921620	-80.67844978
7,600.00	91.00	329.98	6,736.80	965.73	665.87	14,457,511.33	1,730,667.28	39.80945444	-80.67862681
7,700.00	91.00	329.98	6,735.06	1,052.30	615.84	14,457,597.90	1,730,617.25	39.80969267	-80.67880384
7,800.00	91.00	329.98	6,733.31	1,138.87	565.81	14,457,684.47	1,730,567.23	39.80993090	-80.67898087
7,900.00	91.00	329.98	6,731.56	1,225.44	515.78	14,457,771.04	1,730,517.20	39.81016914	-80.67915791
8,000.00	91.00	329.98	6,729.81	1,312.01	465.76	14,457,857.61	1,730,467.17	39.81040737	-80.67933494
8,100.00	91.00	329.98	6,728.06	1,398.58	415.73	14,457,944.18	1,730,417.15	39.81064560	-80.67951198
8,200.00	91.00	329.98	6,726.31	1,485.15	365.70	14,458,030.75	1,730,367.12	39.81088383	-80.67968902
8,300.00	91.00	329.98	6,724.56	1,571.71	315.68	14,458,117.32	1,730,317.09	39.81112208	-80.67986608
8,400.00	91.00	329.98	6,722.81	1,658.28	265.65	14,458,203.89	1,730,267.07	39.81136030	-80.68004310
8,500.00	91.00	329.98	6,721.06	1,744.85	215.62	14,458,290.46	1,730,217.04	39.81159853	-80.68022014
8,600.00	91.00	329.98	6,719.31	1,831.42	165.60	14,458,377.02	1,730,167.01	39.81183676	-80.68039718
8,700.00	91.00	329.98	6,717.56	1,917.99	115.57	14,458,463.59	1,730,116.98	39.81207499	-80.68057423
8,800.00	91.00	329.98	6,715.81	2,004.56	65.54	14,458,550.16	1,730,066.96	39.81231322	-80.68075127
8,900.00	91.00	329.98	6,714.06	2,091.13	15.52	14,458,636.73	1,730,016.93	39.81255145	-80.68092832
9,000.00	91.00	329.98	6,712.31	2,177.70	-34.51	14,458,723.30	1,729,966.90	39.81278968	-80.68110536
9,100.00	91.00	329.98	6,710.56	2,264.27	-84.54	14,458,809.87	1,729,916.88	39.81302791	-80.68128241

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<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Ten High 1N-04HM (A)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=1310 @ 1310.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL=1310 @ 1310.00usft
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1N-04HM (A)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev5		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,200.00	91.00	329.98	6,708.81	2,350.84	-134.57	14,459,896.44	1,729,866.85	39.81326614	-80.68145946
9,300.00	91.00	329.98	6,707.06	2,437.41	-184.59	14,458,983.01	1,729,816.82	39.81350437	-80.68163651
9,400.00	91.00	329.98	6,705.31	2,523.98	-234.62	14,459,069.58	1,729,766.80	39.81374260	-80.68181357
9,500.00	91.00	329.98	6,703.56	2,610.55	-284.65	14,459,156.15	1,729,716.77	39.81398082	-80.68199062
9,600.00	91.00	329.98	6,701.81	2,697.12	-334.67	14,459,242.72	1,729,666.74	39.81421905	-80.68216768
9,700.00	91.00	329.98	6,700.06	2,783.69	-384.70	14,459,329.29	1,729,616.71	39.81445728	-80.68234473
9,800.00	91.00	329.98	6,698.31	2,870.25	-434.73	14,459,415.86	1,729,566.69	39.81469551	-80.68252179
9,900.00	91.00	329.98	6,696.56	2,956.82	-484.75	14,459,502.43	1,729,516.66	39.81493373	-80.68269885
10,000.00	91.00	329.98	6,694.81	3,043.39	-534.78	14,459,589.00	1,729,466.63	39.81517196	-80.68287591
10,100.00	91.00	329.98	6,693.07	3,129.96	-584.81	14,459,675.56	1,729,416.61	39.81541019	-80.68305297
10,200.00	91.00	329.98	6,691.32	3,216.53	-634.83	14,459,762.13	1,729,366.58	39.81564841	-80.68323003
10,300.00	91.00	329.98	6,689.57	3,303.10	-684.86	14,459,848.70	1,729,316.55	39.81588664	-80.68340709
10,400.00	91.00	329.98	6,687.82	3,389.67	-734.89	14,459,935.27	1,729,266.53	39.81612487	-80.68358416
10,500.00	91.00	329.98	6,686.07	3,476.24	-784.92	14,460,021.84	1,729,216.50	39.81636309	-80.68376122
10,600.00	91.00	329.98	6,684.32	3,562.81	-834.94	14,460,108.41	1,729,166.47	39.81660132	-80.68393829
10,700.00	91.00	329.98	6,682.57	3,649.38	-884.97	14,460,194.98	1,729,116.45	39.81683954	-80.68411536
10,800.00	91.00	329.98	6,680.82	3,735.95	-935.00	14,460,281.55	1,729,066.42	39.81707777	-80.68429243
10,900.00	91.00	329.98	6,679.07	3,822.52	-985.02	14,460,368.12	1,729,016.39	39.81731599	-80.68446950
11,000.00	91.00	329.98	6,677.32	3,909.09	-1,035.05	14,460,454.69	1,728,966.36	39.81755422	-80.68464657
11,100.00	91.00	329.98	6,675.57	3,995.66	-1,085.08	14,460,541.26	1,728,916.34	39.81779244	-80.68482365
11,200.00	91.00	329.98	6,673.82	4,082.22	-1,135.10	14,460,627.83	1,728,866.31	39.81803066	-80.68500072
11,300.00	91.00	329.98	6,672.07	4,168.79	-1,185.13	14,460,714.40	1,728,816.28	39.81826889	-80.68517780
11,400.00	91.00	329.98	6,670.32	4,255.36	-1,235.16	14,460,800.97	1,728,766.26	39.81850711	-80.68535487
11,500.00	91.00	329.98	6,668.57	4,341.93	-1,285.19	14,460,887.53	1,728,716.23	39.81874533	-80.68553195
11,600.00	91.00	329.98	6,666.82	4,428.50	-1,335.21	14,460,974.10	1,728,666.20	39.81898356	-80.68570903
11,700.00	91.00	329.98	6,665.07	4,515.07	-1,385.24	14,461,060.67	1,728,616.18	39.81922178	-80.68588611
11,800.00	91.00	329.98	6,663.32	4,601.64	-1,435.27	14,461,147.24	1,728,566.15	39.81946000	-80.68606319
11,900.00	91.00	329.98	6,661.57	4,688.21	-1,485.29	14,461,233.81	1,728,516.12	39.81969822	-80.68624028
12,000.00	91.00	329.98	6,659.82	4,774.78	-1,535.32	14,461,320.38	1,728,466.10	39.81993644	-80.68641736
12,100.00	91.00	329.98	6,658.07	4,861.35	-1,585.35	14,461,406.95	1,728,416.07	39.82017467	-80.68659444
12,200.00	91.00	329.98	6,656.32	4,947.92	-1,635.37	14,461,493.52	1,728,366.04	39.82041289	-80.68677153
12,300.00	91.00	329.98	6,654.57	5,034.49	-1,685.40	14,461,580.09	1,728,316.01	39.82065111	-80.68694862
12,400.00	91.00	329.98	6,652.83	5,121.06	-1,735.43	14,461,666.66	1,728,265.99	39.82088933	-80.68712571
12,500.00	91.00	329.98	6,651.08	5,207.63	-1,785.45	14,461,753.23	1,728,215.96	39.82112755	-80.68730280
12,600.00	91.00	329.98	6,649.33	5,294.19	-1,835.48	14,461,839.80	1,728,165.93	39.82136577	-80.68747989
12,700.00	91.00	329.98	6,647.58	5,380.76	-1,885.51	14,461,926.37	1,728,115.91	39.82160399	-80.68765698
12,800.00	91.00	329.98	6,645.83	5,467.33	-1,935.54	14,462,012.94	1,728,065.88	39.82184221	-80.68783408
12,900.00	91.00	329.98	6,644.08	5,553.90	-1,985.56	14,462,099.51	1,728,015.85	39.82208043	-80.68801117
13,000.00	91.00	329.98	6,642.33	5,640.47	-2,035.59	14,462,186.07	1,727,965.83	39.82231865	-80.68818827
13,100.00	91.00	329.98	6,640.58	5,727.04	-2,085.62	14,462,272.64	1,727,915.80	39.82255686	-80.68836537
13,200.00	91.00	329.98	6,638.83	5,813.61	-2,135.64	14,462,359.21	1,727,865.77	39.82279508	-80.68854246
13,300.00	91.00	329.98	6,637.08	5,900.18	-2,185.67	14,462,445.78	1,727,815.74	39.82303330	-80.68871956
13,400.00	91.00	329.98	6,635.33	5,986.75	-2,235.70	14,462,532.35	1,727,765.72	39.82327152	-80.68889667
13,500.00	91.00	329.98	6,633.58	6,073.32	-2,285.72	14,462,618.92	1,727,715.69	39.82350974	-80.68907377
13,600.00	91.00	329.98	6,631.83	6,159.89	-2,335.75	14,462,705.49	1,727,665.66	39.82374795	-80.68925087
13,700.00	91.00	329.98	6,630.08	6,246.46	-2,385.78	14,462,792.06	1,727,615.64	39.82398617	-80.68942798
13,800.00	91.00	329.98	6,628.33	6,333.03	-2,435.80	14,462,878.63	1,727,565.61	39.82422439	-80.68960508
13,900.00	91.00	329.98	6,626.58	6,419.60	-2,485.83	14,462,965.20	1,727,515.58	39.82446260	-80.68978219
14,000.00	91.00	329.98	6,624.83	6,506.17	-2,535.86	14,463,051.77	1,727,465.56	39.82470082	-80.68995930
14,100.00	91.00	329.98	6,623.08	6,592.73	-2,585.89	14,463,138.34	1,727,415.53	39.82493903	-80.69013641
14,200.00	91.00	329.98	6,621.33	6,679.30	-2,635.91	14,463,224.91	1,727,365.50	39.82517725	-80.69031352
14,300.00	91.00	329.98	6,619.58	6,765.87	-2,685.94	14,463,311.48	1,727,315.48	39.82541546	-80.69049063
14,400.00	91.00	329.98	6,617.83	6,852.44	-2,735.97	14,463,398.04	1,727,265.45	39.82565368	-80.69066775
14,500.00	91.00	329.98	6,616.08	6,939.01	-2,785.99	14,463,484.61	1,727,215.42	39.82589189	-80.69084486
14,600.00	91.00	329.98	6,614.33	7,025.58	-2,836.02	14,463,571.18	1,727,165.39	39.82613011	-80.69102198

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Planning Report - Geographic

<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Ten High 1N-04HM (A)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=1310 @ 1310.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL=1310 @ 1310.00usft
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1N-04HM (A)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev5		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
14,700.00	91.00	329.98	6,612.59	7,112.15	-2,886.05	14,463,657.75	1,727,115.37	39.82636832	-80.69119609	
14,800.00	91.00	329.98	6,610.84	7,196.72	-2,936.07	14,463,744.32	1,727,065.34	39.82660654	-80.69137621	
14,900.00	91.00	329.98	6,609.09	7,285.29	-2,986.10	14,463,830.89	1,727,015.31	39.82684475	-80.69155333	
15,000.00	91.00	329.98	6,607.34	7,371.86	-3,036.13	14,463,917.46	1,726,965.29	39.82708296	-80.69173045	
15,100.00	91.00	329.98	6,605.59	7,458.43	-3,086.15	14,464,004.03	1,726,915.26	39.82732118	-80.69190757	
15,200.00	91.00	329.98	6,603.84	7,545.00	-3,136.18	14,464,090.60	1,726,865.23	39.82755939	-80.69208470	
15,300.00	91.00	329.98	6,602.09	7,631.57	-3,186.21	14,464,177.17	1,726,815.21	39.82779760	-80.69226182	
15,400.00	91.00	329.98	6,600.34	7,718.14	-3,236.24	14,464,263.74	1,726,765.18	39.82803581	-80.69243895	
15,500.00	91.00	329.98	6,598.59	7,804.70	-3,286.26	14,464,350.31	1,726,715.15	39.82827403	-80.69261607	
15,600.00	91.00	329.98	6,596.84	7,891.27	-3,336.29	14,464,436.88	1,726,665.13	39.82851224	-80.69279320	
15,700.00	91.00	329.98	6,595.09	7,977.84	-3,386.32	14,464,523.45	1,726,615.10	39.82875045	-80.69297033	
15,800.00	91.00	329.98	6,593.34	8,064.41	-3,436.34	14,464,610.01	1,726,565.07	39.82898866	-80.69314746	
15,900.00	91.00	329.98	6,591.59	8,150.98	-3,486.37	14,464,696.58	1,726,515.04	39.82922687	-80.69332459	
16,000.00	91.00	329.98	6,589.84	8,237.55	-3,536.40	14,464,783.15	1,726,465.02	39.82946508	-80.69350173	
16,100.00	91.00	329.98	6,588.09	8,324.12	-3,586.42	14,464,869.72	1,726,414.99	39.82970329	-80.69367896	
16,200.00	91.00	329.98	6,586.34	8,410.69	-3,636.45	14,464,956.29	1,726,364.96	39.82994150	-80.69385600	
16,300.00	91.00	329.98	6,584.59	8,497.26	-3,686.48	14,465,042.86	1,726,314.94	39.83017971	-80.69403313	
16,400.00	91.00	329.98	6,582.84	8,583.83	-3,736.51	14,465,129.43	1,726,264.91	39.83041792	-80.69421027	
16,500.00	91.00	329.98	6,581.09	8,670.40	-3,786.53	14,465,216.00	1,726,214.88	39.83065613	-80.69438741	
16,600.00	91.00	329.98	6,579.34	8,756.97	-3,836.56	14,465,302.57	1,726,164.86	39.83089434	-80.69456455	
16,700.00	91.00	329.98	6,577.59	8,843.54	-3,886.59	14,465,389.14	1,726,114.83	39.83113255	-80.69474169	
16,800.00	91.00	329.98	6,575.84	8,930.11	-3,936.61	14,465,475.71	1,726,064.80	39.83137076	-80.69491883	
16,900.00	91.00	329.98	6,574.09	9,016.68	-3,986.64	14,465,562.28	1,726,014.78	39.83160896	-80.69509598	
17,000.00	91.00	329.98	6,572.34	9,103.24	-4,036.67	14,465,648.85	1,725,964.75	39.83184717	-80.69527312	
17,100.00	91.00	329.98	6,570.60	9,189.81	-4,086.69	14,465,735.42	1,725,914.72	39.83208538	-80.69545027	
17,200.00	91.00	329.98	6,568.85	9,276.38	-4,136.72	14,465,821.99	1,725,864.69	39.83232359	-80.69562742	
17,300.00	91.00	329.98	6,567.10	9,362.95	-4,186.75	14,465,908.55	1,725,814.67	39.83256179	-80.69580457	
17,400.00	91.00	329.98	6,565.35	9,449.52	-4,236.77	14,465,995.12	1,725,764.64	39.83280000	-80.69598172	
17,500.00	91.00	329.98	6,563.60	9,536.09	-4,286.80	14,466,081.69	1,725,714.61	39.83303821	-80.69615887	
17,600.00	91.00	329.98	6,561.85	9,622.66	-4,336.83	14,466,168.26	1,725,664.59	39.83327641	-80.69633602	
17,700.00	91.00	329.98	6,560.10	9,709.23	-4,386.86	14,466,254.83	1,725,614.56	39.83351462	-80.69651317	
17,800.00	91.00	329.98	6,558.35	9,795.80	-4,436.89	14,466,341.40	1,725,564.53	39.83375282	-80.69669033	
17,900.00	91.00	329.98	6,556.60	9,882.37	-4,486.91	14,466,427.97	1,725,514.51	39.83399103	-80.69686749	
18,000.00	91.00	329.98	6,554.85	9,968.94	-4,536.94	14,466,514.54	1,725,464.48	39.83422923	-80.69704464	
18,100.00	91.00	329.98	6,553.10	10,055.51	-4,586.96	14,466,601.11	1,725,414.45	39.83446744	-80.69722180	
18,200.00	91.00	329.98	6,551.35	10,142.08	-4,636.99	14,466,687.68	1,725,364.42	39.83470564	-80.69739896	
18,300.00	91.00	329.98	6,549.60	10,228.65	-4,687.02	14,466,774.25	1,725,314.40	39.83494385	-80.69757612	
18,400.00	91.00	329.98	6,547.85	10,315.21	-4,737.04	14,466,860.82	1,725,264.37	39.83518205	-80.69775328	
18,500.00	91.00	329.98	6,546.10	10,401.78	-4,787.07	14,466,947.39	1,725,214.34	39.83542025	-80.69793045	
18,600.00	91.00	329.98	6,544.35	10,488.35	-4,837.10	14,467,033.96	1,725,164.32	39.83565846	-80.69810761	
18,700.00	91.00	329.98	6,542.60	10,574.92	-4,887.12	14,467,120.52	1,725,114.29	39.83589666	-80.69828478	
18,800.00	91.00	329.98	6,540.85	10,661.49	-4,937.15	14,467,207.09	1,725,064.26	39.83613486	-80.69846195	
18,900.00	91.00	329.98	6,539.10	10,748.06	-4,987.18	14,467,293.66	1,725,014.24	39.83637307	-80.69863911	
19,000.00	91.00	329.98	6,537.35	10,834.63	-5,037.21	14,467,380.23	1,724,964.21	39.83661127	-80.69881628	
19,100.00	91.00	329.98	6,535.60	10,921.20	-5,087.23	14,467,466.80	1,724,914.18	39.83684947	-80.69899345	
19,200.00	91.00	329.98	6,533.85	11,007.77	-5,137.26	14,467,553.37	1,724,864.16	39.83708767	-80.69917063	
19,300.00	91.00	329.98	6,532.10	11,094.34	-5,187.29	14,467,639.94	1,724,814.13	39.83732587	-80.69934780	
19,400.00	91.00	329.98	6,530.35	11,180.91	-5,237.31	14,467,726.51	1,724,764.10	39.83756407	-80.69952497	
19,500.00	91.00	329.98	6,528.61	11,267.48	-5,287.34	14,467,813.08	1,724,714.07	39.83780228	-80.69970215	
19,600.00	91.00	329.98	6,526.86	11,354.05	-5,337.37	14,467,899.65	1,724,664.05	39.83804048	-80.69987933	
19,648.92	91.00	329.98	6,526.00	11,396.40	-5,381.84	14,467,942.00	1,724,639.57	39.83816700	-80.69996600	

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<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Ten High 1N-04HM (A)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	CL=1310 @ 1310.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	CL=1310 @ 1310.00usft
<b>Site:</b>	Ten High	<b>North Reference:</b>	Grid
<b>Well:</b>	Ten High 1N-04HM (A)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev5		

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Ten High 1N-04HM BHL - plan hits target center - Point	0.00	0.00	6,526.00	11,396.40	-5,361.84	14,467,942.00	1,724,639.57	39.83815700	-80.69996600
Ten High 1N-04HM LP 4 - plan hits target center - Point	0.00	0.00	6,742.00	708.65	814.43	14,457,254.26	1,730,815.84	39.80874698	-80.67810110
Ten High 1N-04HM LP - plan misses target center by 38.96usft at 7325.55usft MD (6741.61 TVD, 728.14 N, 803.16 E) - Point	0.00	0.00	6,742.00	708.65	769.43	14,457,254.26	1,730,770.84	39.80874742	-80.67826133

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,175.00	1,175.00	13 3/8" Casing @ 1175 TVD	13-3/8	17-1/2	
2,983.50	2,980.00	9 5/8" Casing @ 2980 TVD	9-5/8	12-1/4	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,300.00	1,300.00	0.00	0.00	KOP Begin 2"/100' build	
1,500.00	1,489.84	6.04	3.49	Begin 2"/100' drop/turn	
1,662.91	1,662.41	12.01	11.71	Begin 3.86° tangent	
3,604.90	3,600.00	37.00	140.00		
4,506.95	4,500.00	48.61	199.59	Begin 2"/100' build/turn	
5,910.62	5,823.05	52.80	624.70	Begin 31.84° tangent	
6,237.59	6,101.61	50.56	795.91	Begin 10"/100' build/turn	
7,304.90	6,741.97	710.26	813.50	Begin 91.00° lateral section	
19,648.92	6,526.00	11,396.40	-5,361.84	PBHL/TD 19648.92 MD/6526.00 TVD	

03/16/2018

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Office of Oil and Gas

MAR 23 2018

WV Department of  
Environmental Protection

WW-9  
(4/16)

API Number 47 - 051 - diag5 mod  
Operator's Well No. Ten High 1N-4HM

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

Watershed (HUC 10) Fish Creek Quadrangle Glen Easton 7.5'

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes  No

Will a pit be used? Yes  No

If so, please describe anticipated pit waste: AST Tanks with proper containment will be used for staging fresh water for frac and flow back water

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

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number UIC 2458, UIC 985, UIC 359, UIC 2D0732540, UIC 2D0732523 )
- Reuse (at API Number \_\_\_\_\_)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain \_\_\_\_\_)

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

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

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

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature \_\_\_\_\_

Company Official (Typed Name) Sean Gasser

Company Official Title Engineer

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Office of Oil and Gas

JAN 2 2013

Subscribed and sworn before me this 8th day of June, 20 13

Jennifer Lupl Notary Public

My commission expires March 12, 2018

WV Department of  
Environmental Protection

COMMONWEALTH OF PENNSYLVANIA  
NOTARIAL SEAL  
Jennifer Lupl, Notary Public  
Cecil Twp., Washington County  
My Commission Expires March 12, 2018  
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

Form WW-9

Operator's Well No. Ten High 1N-4HM

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 16.20 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Orchard Grass	12
Spring Oats	96	Ladino	3
		White Clover	2

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by:

*Jim Nicholas*

Comments:

Title: Oil + Gas Inspector

Date: 6/19/17

Field Reviewed?  Yes  No

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Office of Oil and Gas

JAN 2 2018

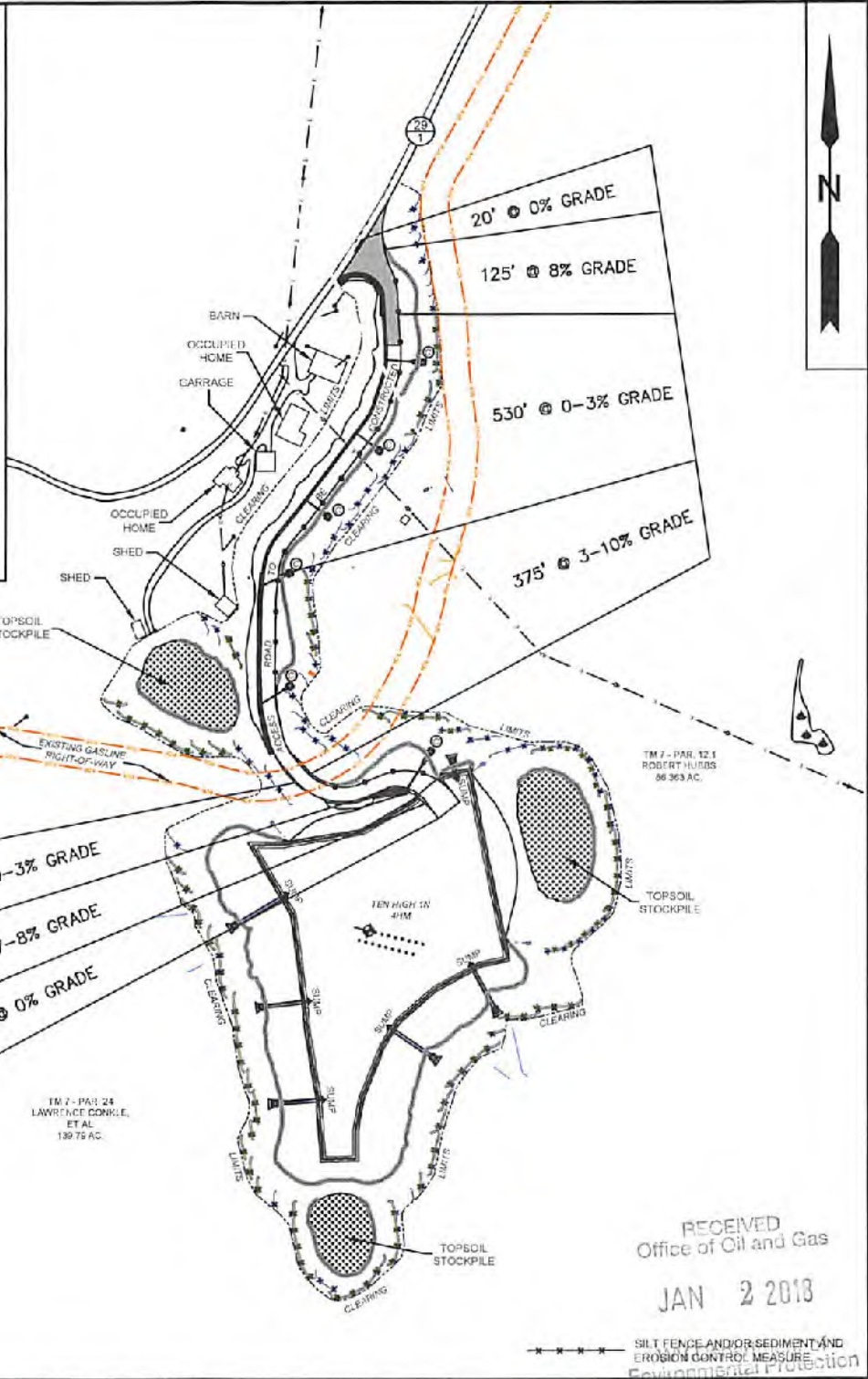
WV Department of  
Environmental Protection

03/16/2018

# PROPOSED TEN HIGH 1N - 4HM

**NOTES:**

1. - DENOTES INSTALL 18" PVC CULVERT AND APPLY APPROPRIATE SEDIMENT OUTLET CONTROL (RIP RAP SPLASH PAD)
2. DRAWING NOT TO SCALE
3. REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS "EROSION AND SEDIMENT CONTROL FIELD MANUAL," FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.
4. INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.
5. ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.
6. TEMPORARILY SEED AND MULCH ALL SLOPS UPON CONSTRUCTION OF LOCATION.
7. ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.
8. ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO BE UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.
9. SEE HEAVEN HILL 3 SITE PLAN PREPARED BY KELLEY SURVEYING, DATED 2/24/2017 FOR COMPLETE CONSTRUCTION & EROSION AND SEDIMENT CONTROL DETAILS.



**SLS**  
Land & Energy Development  
Solutions from the ground up.  
P.O. Box 150 • 112 Vanhorn Drive • Glenville, WV 26351 • (304) 462-3634  
www.slsurveys.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT	DATE	SCALE
MARSHALL	MEADE	12-28-17	1" = 300'
DRAWN BY	JOB NO.		
K.G.M.	8655		

**TUG HILL**  
OPERATING

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Office of Oil and Gas  
JAN 2 2018

\*\*\*\*\* SILT FENCE AND/OR SEDIMENT AND EROSION CONTROL MEASURES Environmental Protection

03/16/2018

WW-9

# PROPOSED TEN HIGH 1N - 4HM

SUPPLEMENT PG. 2



NOTE: CLOSEST WATER PURVEYOR  
GRANDVIEW - DOOLIN PUBLIC SERVICE DISTRICT  
PROCTOR, WV

LAT: 39.7137712  
LON: -80.8258327  
LOCATED: S 51°01'33" W AT 52,972' FROM TEN HIGH 1N - 4HM SURFACE LOCATION

*Handwritten signature and date: 6/19/17*

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P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26031 • (304) 462-5234  
www.slsurveys.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT	DATE	SCALE
MARSHALL	MEADE	06/15/2017	1" = 2000'
DRAWN BY	JOB NO.		
K.G.M.	8655		



**TUG HILL**  
OPERATING  
Gas

IAN 2 2018



# Well Site Safety Plan

## Tug Hill Operating, LLC

*12/29/17*

Well Name: Ten High 1N-4HM

Pad Location: Ten High

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing-4,406,363.91

Easting-527,305.49

December 2017

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JAN 2 2018

WV Department of  
Environmental Protection

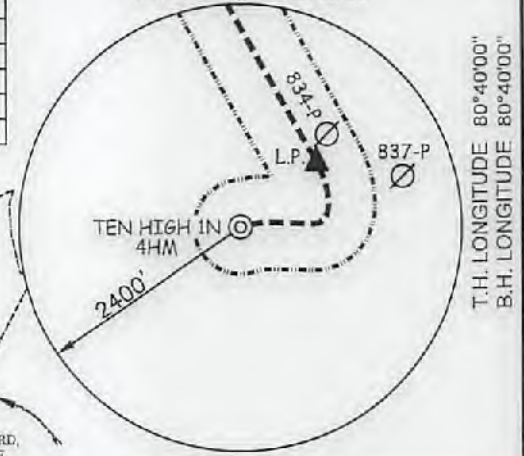
9,351' B.H.

4,030' T.H.

**TEN HIGH 1N LEASE  
WELL 4HM  
TUG HILL OPERATING**

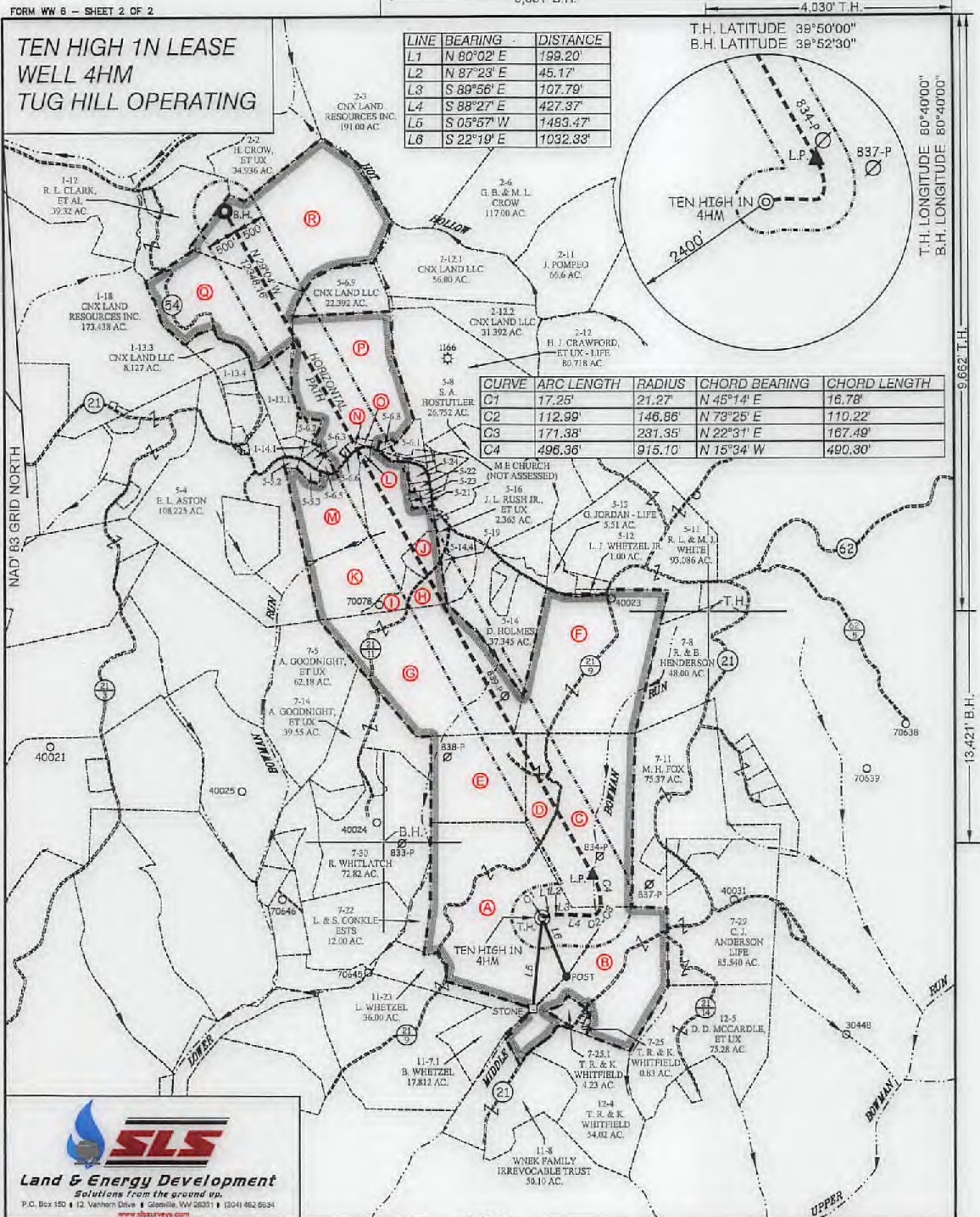
LINE	BEARING	DISTANCE
L1	N 80°02' E	199.20'
L2	N 87°23' E	45.17'
L3	S 89°56' E	107.79'
L4	S 88°27' E	427.37'
L5	S 05°57' W	1483.47'
L6	S 22°19' E	1032.33'

T.H. LATITUDE 39°50'00"  
B.H. LATITUDE 39°52'30"



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

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	17.25'	21.27'	N 45°14' E	16.78'
C2	112.99'	146.86'	N 73°25' E	110.22'
C3	171.38'	231.35'	N 22°31' E	167.49'
C4	496.36'	915.10'	N 15°34' W	490.30'



9,662' T.H.  
13,421' B.H.

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www.slsurveys.com

**GREGORY A. SMITH**  
LICENSED  
No. 677  
STATE OF  
WEST VIRGINIA  
PROFESSIONAL SURVEYOR

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

P.S. 677  
*Gregory A. Smith*

**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)

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

NAD83 S.P.C.(FT)	N. 478,161.74	E. 1,638,721.88
NAD83 GEO.	LAT-(N) 39.806609	LONG-(W) 80.981010
NAD83 UTM (M)	N. 4,408,383.91	E. 527,308.49

**LANDING POINT**

NAD83 S.P.C.(FT)	N. 478,856.9	E. 1,637,548.1
NAD83 GEO.	LAT-(N) 39.808747	LONG-(W) 80.978101
NAD83 UTM (M)	N. 4,406,579.9	E. 527,553.7

**BOTTOM HOLE**

NAD83 S.P.C.(FT)	N. 499,650.0	E. 1,631,549.3
NAD83 GEO.	LAT-(N) 39.838157	LONG-(W) 80.989966
NAD83 UTM (M)	N. 4,409,837.5	E. 525,971.2

SCALE 1" = 2000' FILE NO. 8655P4HMR5.dwg

DATE JUNE 15, 20 17

REVISED 09/12/2017, 12/28/2017 & 02/20/18

OPERATORS WELL NO. TEN HIGH 1N-4HM

API WELL NO. 47 - 051 - 01945 MOD

STATE COUNTY PERMIT

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

COUNTY NAME PERMIT

03/16/2018

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



9,351' B.H.

4,030' T.H.

TEN HIGH 1N LEASE  
WELL 4HM  
TUG HILL OPERATING

T.H. LATITUDE 39°50'00"  
B.H. LATITUDE 39°52'30"

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)  
NAD83 S.P.C.(FT) N. 478,161.74 E. 1,636,721.66  
NAD83 GEO. LAT:(N) 39.808809 LONG-(W) 80.681010  
NAD83 UTM (M) N. 4,406,363.91 E. 527,905.49

LANDING POINT  
NAD83 S.P.C.(FT) N. 478,858.9 E. 1,637,548.1  
NAD83 GEO. LAT:(N) 39.808747 LONG-(W) 80.678101  
NAD83 UTM (M) N. 4,406,579.9 E. 527,559.7

BOTTOM HOLE  
NAD83 S.P.C.(FT) N. 489,650.0 E. 1,631,548.3  
NAD83 GEO. LAT:(N) 39.638157 LONG-(W) 80.699996  
NAD83 UTM (M) N. 4,409,837.5 E. 525,671.2

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

TAG	SURFACE OWNER	PARCEL	ACRES
A	LAWRENCE & SHIRLEY CONKLE ESTS	9-7-24	139.79
B	THOMAS R. & KIMBERLY WHITFIELD	9-7-25.2	76.40
C	ROBERT G. & SCARLETT HUBBS	9-7-12.1	86.363
D	RONALD MOORE, ET UX	9-7-12	16.587
E	RONALD MOORE, ET UX	9-7-13	51.49
F	ROBERT GLENN HUBBS, ET AL	9-7-7	108.61
G	TERESA L. HORNER WITH JERRY G. & CAROLYN K. FLETCHER (LIFE ESTATE)	9-7-6	103.30
H	CARLA SUE CROW	9-5-17	6.341
I	KELLY WILSON WITH DONLD E. LEACH (LIFE ESTATE)	9-5-18	5.807
J	KELLY WILSON WITH DONLD E. LEACH (LIFE ESTATE)	9-5-20	6.924
K	MICHAEL JOSEPH SNYDER	9-5-5.4	64.00
L	DAVID M. TOLER	9-5-5.1	0.985
M	MICHAEL JOSEPH SNYDER	9-5-5	35.02
N	NANCY L. SNYDER	9-5-6.4	0.694
O	NANCY L. SNYDER	9-5-6.7	0.678
P	NANCY L. SNYDER (LIFE ESTATE)	9-5-6	82.858
Q	ROBERT A. & CHERYL L. WILLIAMS	9-1-13	80.897
R	CLARA I. CROW	9-2-1	106.00

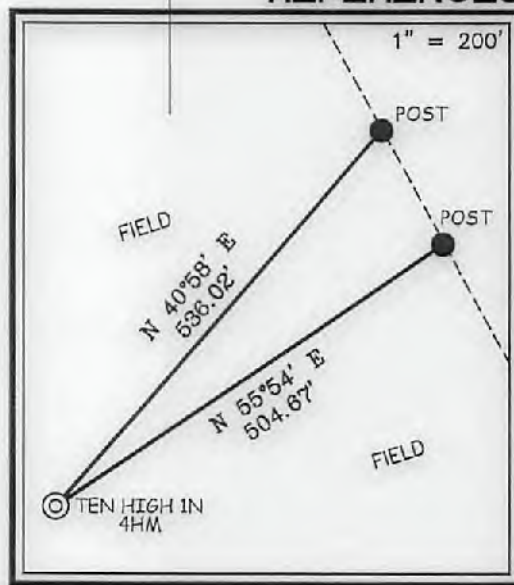
MAP/PARCEL	ADJOINING SURFACE OWNER LIST (SEE SHEET 2)	ACRES
9-1-13.1	BURDETTE L. BEUCKE	14.256
9-1-13.4	MACK L. CROW	4.273
9-1-14.1	ALICE J. & DOUGLAS J. MARTIN	0.903
9-5-5.2	PETER PARKER	0.873
9-5-5.3	MICHAEL JOSEPH BAUM, ET AL	1.870
9-5-6.1	JON E. CRAWFORD	4.079
9-5-6.2	MICHAEL JOSEPH SNYDER	2.82
9-5-6.3	DEUTSCHE BANK NATL TR CO	1.391
9-5-6.5	LINDA GORBY DELBERT	1.087
9-5-6.6	NANCY L. SNYDER	0.420
9-5-6.8	NANCY L. SNYDER	0.691
9-5-14.4	BETTY R. OTT	10.501
9-5-19	BETTY R. OTT	0.933
9-5-21	RALPH E. WELLMAN, ET UX	1.00
9-5-22	RALPH E. WELLMAN, ET UX	0.5
9-5-23	RALPH E. WELLMAN, ET UX	1.00
9-5-24	ALVIE & MARCELLA DARRAH	1.986

NOTES ON SURVEY

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 825' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'

B.H.

REFERENCES



9,662' T.H.

13,421' B.H.



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. 677 Gregory A. Smith



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
DATE JUNE 15, 20 17

REVISED 09/12/2017, 12/28/2017 & 02/20/18

OPERATORS WELL NO. TEN HIGH 1N-4HM

API WELL NO. 47-051-01945 MOD  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8655P4HMR5.dwg  
SCALE 1" = 2000'

HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK)

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: GROUND = 1,322.70'  
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 WW-6A1 ACREAGE 139.79±

PROPOSED WORK: 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: 6,865' / TMD: 19,621'

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

COUNTY NAME

PERMIT

03/16/2018

WW-6A1  
(5/13)

Operator's Well No. Ten High 1N-4HM

**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 sheets

**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 Miller *Amy Miller*

Its: Permit Specialist - Appalachia

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Office of Oil and Gas

FEB 23 2018

**COPY**

AFFIDAVIT

STATE OF TEXAS §  
§ SS  
COUNTY OF TARRANT §

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

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

FURTHER, AFFIANT SAITH NOT.

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

David D. Kalish  
Affiant: David D. Kalish

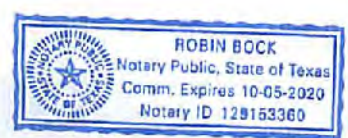
Jan Pest  
MARSHALL County 03:44:28 PM  
Instrument No 1416299  
Date Recorded 10/19/2016  
Document Type MIS  
Pages Recorded 1  
Book-Page 28-62  
Recording Fee \$5.00  
Additional \$6.00

JURAT

STATE OF TEXAS §  
§ SS  
COUNTY OF TARRANT §

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

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



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

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Office of Oil and Gas

FEB 23 2018

WV Department of  
Environmental Protection

**MEMORANDUM OF AGREEMENT**

This Memorandum of Agreement is entered into this 16<sup>th</sup> day of February, 2018, between **TUG HILL OPERATING, LLC (THQ)**, a Texas limited liability company, whose address is 1320 S. University Blvd., Suite 500, Fort Worth, TX 76107 and **CHEVRON U.S.A., INC. (Chevron)**, a Pennsylvania corporation, whose address is 700 Cherrington Parkway, Coraopolis, PA 15108.

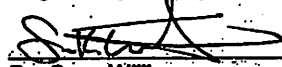
**PARTIES AND AGREEMENT REFERENCE:** THQ and Chevron entered into a letter agreement ("Letter Agreement") dated February 16<sup>th</sup>, 2018 (the "Commencement Date") outlining pursuit of definitive agreements to allow THQ the right to permit, drill, extract, produce and market oil and gas from those certain oil and gas interests controlled by Chevron in the Meade District of Marshall County, West Virginia, as more fully described in Exhibit A attached hereto, made a part hereof, and incorporated herein by reference.

1. **TERM:** The rights granted in the Letter Agreement will terminate upon the earlier of (i) one hundred eighty (180) days from the Commencement Date, (ii) Chevron's revocation of the rights granted in the Letter Agreement, or (iii) the parties entering into the definitive agreement described in the Letter Agreement. Upon termination of the Letter Agreement under subsection (i) or (ii) of the immediately preceding sentence, THQ will record a surrender of this Memorandum and withdraw any related well work permit requests.

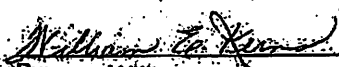
2. **MEMORANDUM FOR RECORDING PURPOSES ONLY:** This Memorandum is for recording purposes only and does not supplement or supersede the parties' respective rights set forth in the Letter Agreement or other agreements.

**IN WITNESS WHEREOF**, the parties have signed their names hereto as of the date first above written.

**Tug Hill Operating, LLC**

  
By: Sean Willis  
Its: VP, Engineering &  
Development Manager – Appalachia

**Chevron U.S.A., Inc.**

  
By: William E. Kerns  
Its: Attorney-in-Fact

Marshall County  
Jan Pest, Clerk  
Instrument 1436705  
02/16/2018 @ 02:16:57 PM  
AGREEMENT  
Book 960 @ Page 409  
Pages Recorded 2  
Recording Cost \$ 11.00

RECEIVED  
Office of Oil and Gas

FEB 23 2018

WV Department of  
Environmental Protection

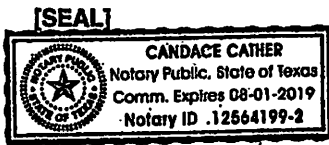
03/16/2018

Prepared by Tug Hill Operating, LLC  
1320 S. University Dr., Suite 500, Fort Worth, TX 76107

STATE OF Texas ;

COUNTY OF Tarrant ; <sup>cc</sup>

Before me, Sean Willis Cardace Cather, a Notary Public, on this day personally appeared Sean Willis, known to me to be the VP, Engineering & Development Manager Tug Hill Operating LLC, subscribed to the foregoing instrument, and acknowledged to me that he/she executed the instrument for the purposes and consideration therein expressed as his/her free act and deed. Given under my hand and seal of office this 4<sup>th</sup> day of February, 2018. My Commission expires: 08/01/2019.

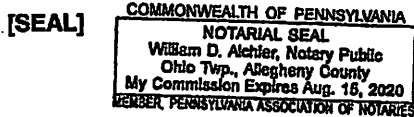


Candace Cather  
Notary Public

STATE OF Pennsylvania ;

COUNTY OF Allegheny ;

Before me, William D. Alchier, a Notary Public, on this day personally appeared William F. Korus, known to me to be the Attorney-in-Fact of Chevron U.S.A. Inc., subscribed to the foregoing instrument, and acknowledged to me that he/she executed the instrument for the purposes and consideration therein expressed as his/her free act and deed. Given under my hand and seal of office this 12<sup>th</sup> day of February, 2018. My Commission expires: 8-15-2020.



William D. Alchier  
Notary Public

STATE OF WEST VIRGINIA, MARSHALL COUNTY, SCT.:

I, JAN PEST, Clerk of the County Commission of said County, do hereby certify that the annexed writing, bearing date on the 14<sup>th</sup> day of February, 2018, was presented for and by me, admitted to record in my office upon the above certificate as to the parties therein named this 16<sup>th</sup> day of February, 2018 at 2:10 o'clock P. M.

TESTE: Jan Pest

Clerk.  
RECEIVED  
Office of Oil and Gas

FEB 23 2018

WV Department of  
Environmental Protection

03/16/2018

STATE OF WEST VIRGINIA §  
  §  
COUNTY OF MARSHALL §

Jan Pest  
MARSHALL County 12:43:01 PM  
Instrument No 1404876  
Date Recorded 05/20/2016  
Document Type ASH  
Pages Recorded 20  
Book-Page 36-148  
Recording Fee \$20.00  
Additional \$8.00

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

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Office of Oil and Gas

FEB 23 2016

WV Department of  
Natural Resources

03/16/2018



February 22, 2018

WVDEP Office of Oil & Gas  
Attn: Laura Adkins  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304-2345

Subject: **Permit Modification Request** for Ten High 1N-4HM API 47-051-01945 located in Meade District; Marshall County, WV  
**Changes to Permit: Lateral extension**

Dear Laura:

As the result of a recent acreage trade, Tug Hill is requesting a modification to the above-mentioned permit that will allow us to extend the bottom hole location of this lateral. Enclosed please find the following:

- Revised WW-6B (approved by Jim Nicholson)
- Revised Well Site Safety Plan (prevailing wind map update, updated plat section, updated casing information and updated spider plot map) (Approved by Jim Nicholson)
- Revised Mylar Well Plat (Approved by Jim Nicholson)
- Updated Area of Review for Communication
- Updated WW-6A1 Information

If you have any question or need any additional information please feel free to call me at 304-376-0111.  
Thank you for your consideration in this matter.

Sincerely,

Amy L. Miller  
Permitting Specialist – Appalachia Region

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Office of Oil and Gas  
FEB 23 2018  
WV Department of  
Environmental Protection





**COPY**

AFFIDAVIT

STATE OF TEXAS §  
  § SS  
COUNTY OF TARRANT §

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

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

FURTHER, AFFIANT SAITH NOT.

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

David D. Kalish  
Affiant: David D. Kalish

JURAT

Jan Past  
MARSHALL County 03:44:28 PM  
Instrument No 1416299  
Date Recorded 10/19/2016  
Document Type NIS  
Pages Recorded 1  
Book-Page 28-62  
Recording Fee \$5.00  
Additional \$5.00  
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Oil and Gas  
JAN 2 2018

STATE OF TEXAS §  
  § SS  
COUNTY OF TARRANT §

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

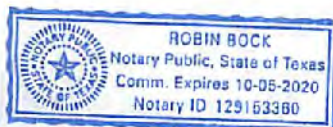
WV Department of Environmental Protection

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

My Commission Expires: 10-05-2020

Signature/Notary Public: Robin Bock

Name/Notary Public (Print): Robin Bock





June 21, 2017

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

RE: Ten High 1N-4HM

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 21/9 and 21/11 in the area reflected on the Ten High 1N-4HM well plat. THO has conducted a full title search in the relevant Court House to confirm its' ownership under said County Routes and is not currently aware of any recorded document that would suggest an ownership other than THO.

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

Sincerely,

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

Amy L. Miller  
Permit Specialist – Appalachia

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Office of Oil and Gas  
JAN 2 2018  
WV Department of  
Environmental Protection

WW-PN  
(11-18-2015)

**Horizontal Natural Gas Well Work Permit  
Application Notice By Publication**

**Notice is hereby given:**

Pursuant to West Virginia Code 22-6A-10(c) prior to filing an application for a permit for a horizontal well the applicant shall publish in the county in which the well is located or is proposed to be located a Class II legal advertisement.

**Paper:** Moundsville Daily Echo

**Public Notice Date:** May 26 & June 02, 2017

The following applicant intends to apply for a horizontal natural well work permit which disturbs three acres or more of surface excluding pipelines, gathering lines and roads **or** utilizes more than two hundred ten thousand gallons of water in any thirty day period.

**Applicant:** Tug Hill Operating, LLC

**Well Number:** TEN HIGH 1N-4HM

**Address:** 380 Southpointe Blvd, Southpointe Plaza II, Suite 200  
Canonsburg, PA 15317

**Business Conducted:** Natural gas production.

**Location –**

State:	<u>West Virginia</u>	County:	<u>Marshall</u>
District:	<u>Meade</u>	Quadrangle:	<u>Glen Easton 7.5'</u>
UTM Coordinate NAD83 Northing:	<u>4,406,357.15</u>		
UTM coordinate NAD83 Easting:	<u>527,335.20</u>		
Watershed:	<u>(HUC-10) Fish Creek</u>		

**Coordinate Conversion:**

To convert the coordinates above into longitude and latitude, visit: [http://tagis.dep.wv.gov/convert/llutm\\_conus.php](http://tagis.dep.wv.gov/convert/llutm_conus.php)

**Electronic notification:**

To receive an email when applications have been received or issued by the Office of Oil and Gas, visit <http://www.dep.wv.gov/insidedep/Pages/DEPMailingLists.aspx> to sign up.

RECEIVED  
Office of Oil and Gas  
JAN 2 2018

**Reviewing Applications:**

Copies of the proposed permit application may be reviewed at the WV Department of Environmental Protection headquarters, located at 601 57<sup>th</sup> Street, SE Charleston, WV 25304 (304-926-0450). Full copies or scans of the proposed permit application will cost \$15, whether mailed or obtained at DEP headquarters. Copies may be requested by calling the office or by sending an email to [DEP.comments@wv.gov](mailto:DEP.comments@wv.gov).

WV Department of  
Environmental Protection

**Submitting Comments:**

Comments may be submitted online at <https://apps.dep.wv.gov/oog/comments/comments.cfm>, or by letter to Permit Review, Office of Oil and Gas, 601 57<sup>th</sup> Street, SE Charleston, WV 25304. Please reference the county, well number, and operator when using this option.

Regardless of format for comment submissions, they must be received no later than thirty days after the permit application is received by the Office of Oil and Gas.

For information related to horizontal drilling visit: [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx)

03/16/2018



(304) 845-2660  
P.O. BOX 389  
MOUNDSVILLE  
WEST VIRGINIA  
26041

AFFIDAVIT OF PUBLICATION

STATE OF WEST VIRGINIA,  
COUNTY OF MARSHALL, to wit

I, Melanie S. Murdock being first duly sworn upon my oath, do depose and say:

- that I am Legal Advertising Manager of the MOUNDSVILLE DAILY ECHO, a Republican newspaper;
- that I have been duly authorized to execute this affidavit;
- that such newspaper has been published for over 119 years, is regularly published afternoons daily except Saturdays and Sundays, for at least fifty weeks during the calendar year, in the municipality of Moundsville, Marshall County, West Virginia;
- that such newspaper is a newspaper of "general circulation" as defined in Art. 3, Chap. 59 of the Code of West Virginia 1931 as amended, within Moundsville and Marshall County;
- that such newspaper averages in length four or more pages, exclusive of any cover, per issue;
- that such newspaper is circulated to the general public at a definite price or consideration;
- that such newspaper is a newspaper to which the general public resorts for passing events of a political, religious, commercial and social nature and for current happenings, announcements, miscellaneous reading matters, advertisements and other notices;
- and that the annexed notice described as follows:

Legal Advertisement

PARTY(ies)

Gas Well Permit / TEN HIGH 1N-4HM

NATURE (and agency if heard before one)

CERTIF-BILL TO

Tug Hill Operating, LLC  
380 Southpointe Blvd.  
Southpointe Plaza II, Suite 200  
Canonsburg, PA 15317

WAS PUBLISHED IN SAID NEWSPAPER AS FOLLOWS

Times	Dates
2	May 26, June 2, 2017
BY WORDS	PUBLICATION CHARGES
512.5	\$103.12

(signed) Melanie S. Murdock

NOTARIZATION

Take and cause to be subscribed before me this 2nd day of January 2017

Amy M. Murphy Notary Public

My Comm. Expires August 19, 2022

LEGAL ADVERTISEMENT

Horizontal Natural Gas Well Work Permit

Application Notice By Publication  
Notice is hereby given:  
Pursuant to West Virginia Code 22-6A-10(e) prior to filing an application for a permit for a horizontal well the applicant shall publish in the county in which the well is located or is proposed to be located a Class II legal advertisement.

Paper: Moundsville Daily Echo  
Public Notice Date: May 26 & June 2, 2017.

The following applicant intends to apply for a horizontal natural well work permit which disturbs three acres or more of surface excluding pipelines, gathering lines and roads or utilizes more than two hundred ten thousand gallons of water in any thirty day period.

Applicant: Tug Hill Operating, LLC  
Address: 380 Southpointe Blvd., Southpointe Plaza II, Suite 200, Canonsburg, PA 15317

Well Number: TEN HIGH 1N-4HM  
Business Conducted: Natural gas production.

Location -  
State: West Virginia  
County: Marshall  
District: Meade  
Quadrangle: Glen Easton 7.5'  
UTM Coordinate NAD83 North-ing: 4,406,357.15  
UTM coordinate NAD83 Easting: 527,335.20

Watershed: (HUC-10) Fish Creek  
Coordinate Conversion:  
To convert the coordinates above into longitude and latitude, visit: [http://tagsis.dep.wv.gov/convert/lutm\\_conus.php](http://tagsis.dep.wv.gov/convert/lutm_conus.php)

Electronic notification:  
To receive an email when applications have been received or issued by the Office of Oil and Gas, visit <http://www.dep.wv.gov/insidedep/Pages/DEPMailingLists.aspx> to sign up.

Reviewing Applications:  
Copies of the proposed permit application may be reviewed at the WV Department of Environmental Protection headquarters, located at 601 57th Street, SE Charleston, WV 25304 (304-926-0450). Full copies or scans of the proposed permit application will cost \$15, whether mailed or obtained at DEP headquarters. Copies may be requested by calling the office or by sending an email to [DEP.comments@wv.gov](mailto:DEP.comments@wv.gov).

Submitting Comments:  
Comments may be submitted online at <https://apps.dep.wv.gov/oog/comments/comments.cfm>, or by letter to Permit Review, Office of Oil and Gas, 601 57th Street, SE Charleston, WV 25304. Please reference the county, well number, and operator when using this option.

Regardless of format for comment submissions, they must be received no later than thirty days after the permit application is received by the Office of Oil and Gas.

For information related to horizontal drilling visit: [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

PUBLISH: May 26, June 2, 2017.

RECEIVED  
Office of Oil and Gas  
JAN 2 2018  
WV Department of Environmental Protection

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

Date of Notice Certification: 12/29/2017

API No. 47- 051 - 01945 MDD  
 Operator's Well No. Ten High 1N-4HM  
 Well Pad Name: Ten High

**Notice has been given:**

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>527,305.49</u>
County:	<u>Marshall</u>		Northing:	<u>4,406,363.91</u>
District:	<u>Meade</u>	Public Road Access:	<u>Shepherd Ridge Lane (Co. Rt. 21/9)</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>LAWRENCE &amp; SHIRLEY CONKLE, ESTS</u>	
Watershed:	<u>(HUC 10) Fish Creek</u>			

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

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

RECEIVED  
Office of Oil and Gas  
JAN 2 2018  
WV Department of  
Environmental Protection

**Required Attachments:**

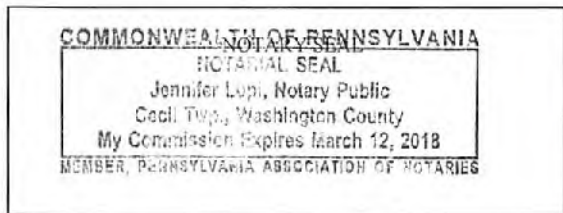
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

**Certification of Notice is hereby given:**

THEREFORE, I Amy Miller *Amy Miller* have read and understand the notice requirements within West Virginia Code § 22-6A. I certify that as required under West Virginia Code § 22-6A, I have served the attached copies of the Notice Forms, identified above, to the required parties through personal service, by registered mail or by any method of delivery that requires a receipt or signature confirmation. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this Notice Certification and all attachments, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Well Operator: Tug Hill Operating, LLC  
By: Amy Miller  
Its: Permit Specialist - Appalachia  
Telephone: 724-749-8388

Address: 380 Southpointe Blvd, Southpointe Plaza II, Suite 200  
Canonsburg, PA 15317  
Facsimile: 724-338-2030  
Email: amiller@tug-hillop.com



Subscribed and sworn before me this 29th day of Dec. 2017.  
*Jennifer Lupi* Notary Public  
My Commission Expires March 12, 2018

**Oil and Gas Privacy Notice:**

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

RECEIVED  
Office of Oil and Gas  
JAN 2 2018  
WV Department of  
Environmental Protection

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

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

**Date of Notice:** 12/29/2017 **Date Permit Application Filed:** 12/29/2017

**Notice of:**

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

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

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

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

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

SURFACE OWNER(s)  
 Name: Estate of Lawrence & Shirley Mae Conkle c/o Roy Conkle  
 Address: 75 Arlington Avenue  
 Moundsville, WV 26041  
 Name: Roy A. Conkle, Sr., and Lorie A.  
 Address: 75 Arlington Avenue  
 Moundsville, WV 26041 \*See Attached\*

SURFACE OWNER(s) (Road and/or Other Disturbance)  
 Name: Robert G. Hubbs and Scarlett E. Otte  
 Address: 132 Shepherds Ridge Lane  
 Glen Easton, WV 26039  
 Name: None  
 Address:

SURFACE OWNER(s) (Impoundments or Pits)  
 Name: None  
 Address:

COAL OWNER OR LESSEE  
 Name: Murray Energy Corporation  
 Address: 46226 National Road  
 St. Clairsville, OH 43950

COAL OPERATOR  
 Name: Same as above coal owner  
 Address:

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)  
 Name: \*See supplement page 1A attached  
 Address:

OPERATOR OF ANY NATURAL GAS STORAGE FIELD  
 Name: None  
 Address:

\*Please attach additional forms if necessary

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WV Department of Environmental Protection

WW-6A  
(8-13)

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Office of Oil and Gas

JAN 3 2018

WV Department of  
Environmental Protection

API NO. 47-051 - 01945 mod  
OPERATOR WELL NO. Ten High 1N-41M  
Well Pad Name: Ten High

**Notice is hereby given:**

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

**This Notice Shall Include:**

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

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

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

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

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

**Well Location Restrictions**

Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing water well or developed spring used for human or domestic animal consumption. The center of well pads may not be located within six hundred twenty-five feet of an occupied dwelling structure, or a building two thousand five hundred square feet or larger used to house or shelter dairy cattle or poultry husbandry. This limitation is applicable to those wells, developed springs, dwellings or agricultural buildings that existed on the date a notice to the surface owner of planned entry for surveying or staking as provided in section ten of this article or a notice of intent to drill a horizontal well as provided in subsection (b), section sixteen of this article was provided, whichever occurs first, and to any dwelling under construction prior to that date. This limitation may be waived by written consent of the surface owner transmitted to the department and recorded in the real property records maintained by the clerk of the county commission for the county in which such property is located. Furthermore, the well operator may be granted a variance by the secretary from these distance restrictions upon submission of a plan which identifies the sufficient measures, facilities or practices to be employed during well site construction, drilling and operations. The variance, if granted, shall include terms and conditions the department requires to ensure the safety and protection of affected persons and property. The terms and conditions may include insurance, bonding and indemnification, as well as technical requirements. (b) No well pad may be prepared or well drilled within one hundred feet measured horizontally from any perennial stream, natural or artificial lake, pond or reservoir, or a wetland, or within three hundred feet of a naturally reproducing trout stream. No well pad may be located within one thousand feet of a surface or ground water intake of a public water supply. The distance from the public water supply as identified by the department shall be measured as follows: (1) For a surface water intake on a lake or reservoir, the distance shall be measured from the boundary of the lake or reservoir. (2) For a surface water intake on a flowing stream, the distance shall be measured from a semicircular radius extending upstream of the surface water intake. (3) For a groundwater source, the distance shall be measured from the wellhead or spring. The department may, in its discretion, waive these distance restrictions upon submission of a plan identifying sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. A waiver, if granted, shall impose any permit conditions as the secretary considers necessary. (c) Notwithstanding the foregoing provisions of this section, nothing contained in this section prevents an operator from conducting the activities permitted or authorized by a Clean Water Act Section 404 permit or other approval from the United States Army Corps of Engineers within any waters of the state or within the restricted areas referenced in this section. (d) The well location restrictions set forth in this section shall not apply to any well on a multiple well pad if at least one of the wells was permitted prior to the effective date of this article. (e) The secretary shall, by December 31, 2012, report to the Legislature on the noise, light, dust and volatile organic compounds generated by the drilling of horizontal wells as they relate to the well location restrictions regarding occupied dwelling structures pursuant to this section. Upon a finding, if any, by the secretary that the well location restrictions regarding occupied dwelling structures are inadequate or otherwise require alteration to address the items

03/16/2018



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

**Water Well Testing:**

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

**Water Testing Laboratories:**

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

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

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

**Written Comment:**

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

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

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

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WV Department of  
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**Time Limits and Methods for Filing Comments.**

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

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

**Comment Requirements**

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

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

**Permit Denial or Condition**

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

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

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

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

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WV Department of  
Environmental Protection

WW-6A  
(8-13)

API NO. 47- 051 - 01945 mod  
OPERATOR WELL NO. Ten High 1N-4HM  
Well Pad Name: Ten High

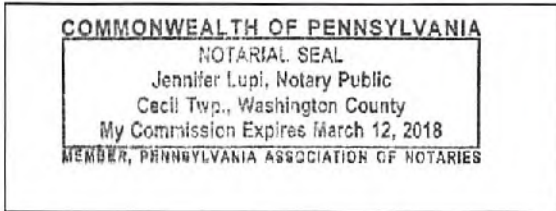
**Notice is hereby given by:**

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

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

**Oil and Gas Privacy Notice:**

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



Subscribed and sworn before me this *29th* day of *Dec*, *2017*.  
*Jennifer Lupi* Notary Public  
My Commission Expires *March 12, 2018*

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JAN 2 2018  
WV Department of  
Environmental Protection

03/16/2018

**WW-6A Notice of Application ..... Attachment 1 of 1**

**Surface Owner(s):**

**Name:** Teresa Anne Hughes and Michael J.  
**Address:** 252 Conkle Drive  
Glen Easton, WV 26039

Brenda Joyce Whetzel  
1863 Shepherds Ridge Lane  
Glen Easton, WV 26039

Robert G. Hubbs and Scarlett E. Otte  
132 Shepherds Ridge Lane  
Glen Easton, WV 26039

**Mineral Owner(s):**

**Name:** Roy A. Conkle, Sr. and Lorie A.  
75 Arlington Avenue  
Moundsville, WV 26041

Larry Lee Conkle and Donna D.  
154 Conkle Drive  
Glen Easton, WV 26039

Teresa Anne Hughes and Michael J.  
252 Conkle Drive  
Glen Easton, WV 26039

Brenda Joyce Whetzel  
1863 Shepherds Ridge Lane  
Glen Easton, WV 26039

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Environmental Protection

**Exhibit WW-6A**

Supplement Pg. 1A

Tug Hill Operating, LLC  
 380 Southpointe Blvd, Suite 200  
 Cannonsburg, PA 15137

**Residences within Two-Thousand Feet (2,000')**

Well: Ten High 1N – 4HM  
 District: Meade (House #'s 1-3)  
 State: WV

There are three (3) residences, no businesses, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

<p><b>House 1</b>                  TM 7 Pcl. 24                  Lawrence &amp; Shirley Conkle Ests                  Phone: 304-845-1808; 304-848-1808  <b>Physical Address:</b>                  77B Shepards Lane                  932 Shepherd Ridge Ln.                  Glen Easton, WV 26039  <b>Tax Address:</b>                  75 Arlington Ave.                  Moundsville, WV 26041</p>	<p><b>House 2</b>                  TM 7 Pcl. 25                  Thomas R. &amp; Kimberly Whitfield                  Phone: 304-843-1753  <b>Physical Address:</b>                  53 Sallys Backbone Rd.                  1834 Sally's Backbone Rd.                  Glen Easton, WV 26039  <b>Tax Address:</b>                  1838 Sallys Backbone Rd.                  Glen Easton, WV 26039</p>	<p><b>House 3</b>                  TM 7 Pcl. 25                  Thomas R. &amp; Kimberly Whitfield                  Phone: 304-843-1753  <b>Physical Address:</b>                  53 Sallys Backbone Rd.                  1838 Sally's Backbone Rd.                  Glen Easton, WV 26039  <b>Tax Address:</b>                  Same</p>
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 WV Department of  
 Environmental Protection

# PROPOSED TEN HIGH 1N - 4HM



NOTE: THERE APPEARS TO BE THREE (3) POSSIBLE WATER SOURCES WITHIN 2,000'.

WV Department of Environmental Protection

**SLS**  
Land & Energy Development  
Solutions from the ground up.  
P.O. Box 150 • 112 Venhorn Drive • Glenville, WV 26351 • (304) 462-5634  
www.slsurveys.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8655	05/15/2017	1" = 1000'

**TUG HILL**  
OPERATING

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7017 2400 0000 1188 5855

Teresa Anne & Michael J. Hughes  
 252 Conkle Drive  
 Glen Easton, WV 26039

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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Adult Signature Restricted Delivery \$ \_\_\_\_\_

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7017 2400 0000 1188 5846

Larry Lee & Donna D. Conkle  
 154 Conkle Drive  
 Glen Easton, WV 26039

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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7017 2400 0000 1188 5817

Roy A. Conkle, Sr. & Lorie A. Conkle  
 75 Arlington Avenue  
 Moundsville, WV 26041

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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Adult Signature Restricted Delivery \$ \_\_\_\_\_

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7017 2400 0000 1188 5831

Brenda Joyce Whetzel  
 1863 Shepherds Ridge Lane  
 Glen Easton, WV 26039

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Certified Mail Restricted Delivery \$ \_\_\_\_\_

Adult Signature Required \$ \_\_\_\_\_

Adult Signature Restricted Delivery \$ \_\_\_\_\_

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7017 2400 0000 1188 5824

Robert G. Hubbs & Scarlett E. Otte  
 132 Shepherds Ridge Lane  
 Glen Easton, WV 26039

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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Return Receipt (hardcopy) \$ \_\_\_\_\_

Return Receipt (electronic) \$ \_\_\_\_\_

Certified Mail Restricted Delivery \$ \_\_\_\_\_

Adult Signature Required \$ \_\_\_\_\_

Adult Signature Restricted Delivery \$ \_\_\_\_\_

Postage  
 \$ \_\_\_\_\_

Postmark Here

7017 2400 0000 1188 5800

Estate of Lawrence & Shirley Conkle  
 c/o Roy Conkle  
 75 Arlington Avenue  
 Moundsville, WV 26041

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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Certified Mail Fee  
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Extra Services & Fees (check box, add fee as appropriate)

Return Receipt (hardcopy) \$ \_\_\_\_\_

Return Receipt (electronic) \$ \_\_\_\_\_

Certified Mail Restricted Delivery \$ \_\_\_\_\_

Adult Signature Required \$ \_\_\_\_\_

Adult Signature Restricted Delivery \$ \_\_\_\_\_

Postage  
 \$ \_\_\_\_\_

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7017 2400 0000 1188 5862

Murray Energy Corporation  
 46226 National Road  
 St. Clairsville, OH 43950

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

WW-6A Receipts for:  
Ten High 1N-1HM, 1N-2HM, 1N-3HM and  
1N-4HM

03/16/2018

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

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

**Date of Notice:** February 9, 2017      **Date of Planned Entry:** February 17, 2017

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

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

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

**Notice is hereby provided to:**

**SURFACE OWNER(s)**

Name: Estate of Lawrence & Shirley Mae Conkle c/o Roy Conkle  
Address: 75 Arlington Avenue  
Moundsville, WV 26041

Name: Roy A. Conkle, Sr., and Lorie A.  
Address: 75 Arlington Avenue  
Moundsville, WV 26041

Name: Larry Lee Conkle and Denna D.  
Address: 154 Conkle Drive  
Glen Eason, WV 26039      \*See Attached

**COAL OWNER OR LESSEE**

Name: Murray Energy Corporation  
Address: 46226 National Road  
St. Clairsville, OH 43950      \*See Attached

**MINERAL OWNER(s)**

Name: Estate of Lawrence & Shirley Mae Conkle c/o Roy Conkle  
Address: 75 Arlington Avenue  
Glen Eason, WV 26039      \*See Attached

\*please attach additional forms if necessary

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WV Department of  
Environmental Protection

**Notice is hereby given:**

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

State: <u>WEST VIRGINIA</u>	Approx. Latitude & Longitude: <u>LAT 39.8067775 LONG -80.8809192</u>
County: <u>MARSHALL</u>	Public Road Access: <u>SHEPHERD RIDGE LANE (Co. RT. 21/9)</u>
District: <u>MEADE</u>	Watershed: <u>HUC-10 FISH CREEK</u>
Quadrangle: <u>GLEN EASTON 7.5'</u>	Generally used farm name: <u>LAWRENCE &amp; SHIRLEY CONKLE, ESTS</u>

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

**Notice is hereby given by:**

Well Operator: <u>TUG HILL OPERATING, LLC</u>	Address: <u>380 SOUTHPOINTE BLVD, SOUTHPOINTE PLAZA II, SUITE 200</u>
Telephone: <u>724-749-8388</u>	<u>CANONSBURG, PA 15317</u>
Email: <u>JWHITE@TUG-HILLOP.COM</u>	Facsimile: <u>724-338-2030</u>

**Oil and Gas Privacy Notice:**

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



~~SI-01945~~  
SI-01945 mod

Operator Well Nos. TEN HIGH 1N-4HM

**WW-6A3 Notice of Entry for Plat Survey ..... Attachment 1 of 1**

**Surface Owner(s):**

**Name:** Teresa Anne Hughes and Michael J.  
**Address:** 252 Conkle Drive  
Glen Easton, WV 26039

Brenda Joyce Whetzel  
1863 Shepherds Ridge Lane  
Glen Easton, WV 26039

Robert G. Hubbs and Scarlett E. Otte  
132 Shepherds Ridge Lane  
Glen Easton, WV 26039

**Mineral Owner(s):**

**Name:** Roy A. Conkle, Sr. and Lorie A.  
75 Arlington Avenue  
Moundsville, WV 26041

Larry Lee Conkle and Donna D.  
154 Conkle Drive  
Glen Easton, WV 26039

Teresa Anne Hughes and Michael J.  
252 Conkle Drive  
Glen Easton, WV 26039

Brenda Joyce Whetzel  
1863 Shepherds Ridge Lane  
Glen Easton, WV 26039

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51-01495mod

Ten High 1N-1HM  
Ten High 1N-2HM  
Ten High 1N-3HM  
Ten High 1N-4HM  
Ten High 1N-11HU  
Ten High 1N-12HU  
Ten High 1N-13HU  
WW-A63

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**OFFICIAL USE**

Certified Mail Fee	\$3.35	0518
\$	\$2.75	17
Extra Services & Fees (check box, add fee as appropriate)		
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00	
<input type="checkbox"/> Return Receipt (electronic)	\$0.00	
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00	
<input type="checkbox"/> Adult Signature Required	\$0.00	
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00	
Postage	\$1.40	
Total Postage and Fees	\$7.50	
ESTATE OF LAWRENCE & SHIRLEY MAE CONKLE		
Sent To C/O ROY CONKLE		
75 ARLINGTON AVENUE		
MOUNDSVILLE WV 26041		
City, State, ZIP+4®		

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 2140 0000 9580 5345

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**MOUNDSVILLE WV 26041**

**OFFICIAL USE**

Certified Mail Fee	\$3.35	0518
\$	\$2.75	17
Extra Services & Fees (check box, add fee as appropriate)		
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00	
<input type="checkbox"/> Return Receipt (electronic)	\$0.00	
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00	
<input type="checkbox"/> Adult Signature Required	\$0.00	
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00	
Postage	\$1.40	
Total Postage and Fees	\$7.50	
ROY A CONKLE SR AND LORIE A		
Sent To 75 ARLINGTON AVENUE		
MOUNDSVILLE WV 26041		
City, State, ZIP+4®		

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**GLEN EASTON WV 26039**

**OFFICIAL USE**

Certified Mail Fee	\$3.35	0518
\$	\$2.75	17
Extra Services & Fees (check box, add fee as appropriate)		
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00	
<input type="checkbox"/> Return Receipt (electronic)	\$0.00	
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00	
<input type="checkbox"/> Adult Signature Required	\$0.00	
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00	
Postage	\$1.40	
Total Postage and Fees	\$7.50	
LARRY LEE CONKLE AND DONNA D		
Sent To 154 CONKLE DRIVE		
GLEN EASTON WV 26039		
City, State, ZIP+4®		

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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**SAINT CLAIRSVILLE OH 43950**

**OFFICIAL USE**

Certified Mail Fee	\$3.35	0518
\$	\$2.75	17
Extra Services & Fees (check box, add fee as appropriate)		
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00	
<input type="checkbox"/> Return Receipt (electronic)	\$0.00	
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00	
<input type="checkbox"/> Adult Signature Required	\$0.00	
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00	
Postage	\$1.40	
Total Postage and Fees	\$7.50	
MURRAY ENERGY CORPORATION		
Sent To 46226 NATIONAL ROAD		
ST CLAIRSVILLE OH 43950		
City, State, ZIP+4®		

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**GLEN EASTON WV 26039**

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Certified Mail Fee	\$3.35	0518
\$	\$2.75	17
Extra Services & Fees (check box, add fee as appropriate)		
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00	
<input type="checkbox"/> Return Receipt (electronic)	\$0.00	
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00	
<input type="checkbox"/> Adult Signature Required	\$0.00	
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00	
Postage	\$1.40	
Total Postage and Fees	\$7.50	
TERESA ANNE HUGHES AND MICHAEL J		
Sent To 252 CONKLE DRIVE		
GLEN EASTON WV 26039		
City, State, ZIP+4®		

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- Ten High 1N-1HM
- Ten High 1N-2HM
- Ten High 1N-3HM
- Ten High 1N-4HM
- Ten High 1N-11HU
- Ten High 1N-12HU
- Ten High 1N-13HU
- WW-A63

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**OFFICIAL USE**

Certified Mail Fee	\$3.35	
Extra Services & Fees (check box, add fee as appropriate)	\$2.75	0518
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00	17
<input type="checkbox"/> Return Receipt (electronic)	\$0.00	
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00	
<input type="checkbox"/> Adult Signature Required	\$0.00	
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00	
Postage	\$1.40	
<b>Total Postage and Fees</b>	<b>\$7.50</b>	

Postmark Here  
02/09/2017

Sent To: BRENDA JOYCE WHETZEL  
 1853 SHEPHERDS RIDGE LANE  
 GLEN EASTON WV 26039

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Certified Mail Fee	\$3.35	
Extra Services & Fees (check box, add fee as appropriate)	\$2.75	0518
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00	17
<input type="checkbox"/> Return Receipt (electronic)	\$0.00	
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00	
<input type="checkbox"/> Adult Signature Required	\$0.00	
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00	
Postage	\$1.40	
<b>Total Postage and Fees</b>	<b>\$7.50</b>	

Postmark Here  
02/09/2017

Sent To: ROBERT G HUBBS AND SCARLETT OTTE  
 132 SHEPHERDS RIDGE LANE  
 GLEN EASTON WV 26039

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03/16/2018

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

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

**Date of Notice:** 06/21/2017      **Date Permit Application Filed:** 06/22/2017

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

- CERTIFIED MAIL                                       HAND
- RETURN RECEIPT REQUESTED                                      DELIVERY

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

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

**Name:** Estate of Lawrence & Shirley Mae Conkle c/o Roy Conkle  
**Address:** 75 Arlington Avenue  
Moundsville, WV 26041

**Name:** Roy A. Conkle, Sr., and Lorie A.  
**Address:** 75 Arlington Avenue  
Moundsville, WV 26041      **\*\*See Attached\*\***

**Notice is hereby given:**

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>527,335.20</u>
County:	<u>Marshall</u>		Northing:	<u>4,406,357.15</u>
District:	<u>Meade</u>	Public Road Access:	<u>Shepherd Ridge Lane (Co. Rt. 21/9)</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>LAWRENCE &amp; SHIRLEY CONKLE, ESTS</u>	
Watershed:	<u>(HUC 10) Fish Creek</u>			

**This Notice Shall Include:**

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

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

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

**Oil and Gas Privacy Notice:**

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

JAN 2 2018  
WV Department of  
Environmental Protection

Operator Well Nos. TEN HIGH 1N-4HM

**WW-6A5 Notice of Planned Operation..... Attachment 1 of 1**

**Surface Owner(s):**

**Name:** Teresa Anne Hughes and Michael J.  
**Address:** 252 Conkle Drive  
Glen Easton, WV 26039

Brenda Joyce Whetzel  
1863 Shepherds Ridge Lane  
Glen Easton, WV 26039

Larry Lee Conkle and Donna D.  
154 Conkle Drive  
Glen Easton, WV 26039

Robert G. Hubbs and Scarlett E. Otte  
132 Shepherds Ridge Lane  
Glen Easton, WV 26039

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Certified Mail Receipts for WW-6A5  
 Ten High 1N-1HM  
 1N-3HM  
 1N-4HM

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SAINT CLAIRSVILLE, OH 43950	
Certified Mail Fee	\$3.35
Extra Services & Fees (check box, add fee as appropriate)	\$2.75
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$8.50
Total Postage and Fees	\$14.60
Sent To	Murray Energy Corporation
Street	46226 National Road
City, St	St. Clairsville, OH 43950
PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions	



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MOUNDSVILLE, WV 26041	
Certified Mail Fee	\$3.35
Extra Services & Fees (check box, add fee as appropriate)	\$2.75
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$8.50
Total	\$14.60
Sent To	Estate of Lawrence & Shirley Conkle
Street	c/o Roy Conkle
City, St	75 Arlington Avenue Moundsville, WV 26041
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GLEN EASTON, WV 26039	
Certified Mail Fee	\$3.35
Extra Services & Fees (check box, add fee as appropriate)	\$2.75
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$7.80
Total Postage and Fees	\$13.90
Sent To	Robert G. Hubbs & Scarlett E. Otte
Street	132 Shepherds Ridge Lane
City, St	Glen Easton, WV 26039
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MOUNDSVILLE, WV 26041	
Certified Mail Fee	\$3.35
Extra Services & Fees (check box, add fee as appropriate)	\$2.75
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$8.50
Total Postage and Fees	\$14.60
Sent To	Roy A. Conkle, Sr. & Lorie A. Conkle
Street	75 Arlington Avenue
City, St	Moundsville, WV 26041
PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions	



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GLEN EASTON WV 26039

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Extra Services & Fees (check box, add fee as appropriate)	\$2.75
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$8.50
<b>Total Postage and Fees</b>	<b>\$14.60</b>

0518  
06  
06/21/2017  
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Sent To: Larry Lee & Donna D. Conkle  
 Street and Apt. No.: 154 Conkle Drive  
 City, State, ZIP+4®: Glen Easton, WV 26039

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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GLEN EASTON WV 26039

**OFFICIAL USE**

Certified Mail Fee	\$3.35
Extra Services & Fees (check box, add fee as appropriate)	\$2.75
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$8.50
<b>Total Postage and Fees</b>	<b>\$14.60</b>

0518  
06  
06/21/2017  
Postmark Here

Sent To: Brenda Joyce Whetzel  
 Street and Apt. No.: 1863 Shepherds Ridge Lane  
 City, State, ZIP+4®: Glen Easton, WV 26039

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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GLEN EASTON WV 26039

**OFFICIAL USE**

Certified Mail Fee	\$3.35
Extra Services & Fees (check box, add fee as appropriate)	\$2.75
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$8.50
<b>Total Postage and Fees</b>	<b>\$14.60</b>

0518  
06  
06/21/2017  
Postmark Here

Sent To: Teresa Anne & Michael J. Hughes  
 Street and Apt. No.: 252 Conkle Drive  
 City, State, ZIP+4®: Glen Easton, WV 26039

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## WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

## Division of Highways

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

Jim Justice  
Governor

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

May 16, 2017

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

Subject: DOH Permit for the Ten High 1N Pad, Marshall County  
Ten High 1N Unit-4HM Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2017-0127 which has been issued to Tug Hill Operating, LLC for access to the State Road for a well site located off of Marshall County Route 21/9 SLS.

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

Very Truly Yours,

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

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

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03/16/2018





PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

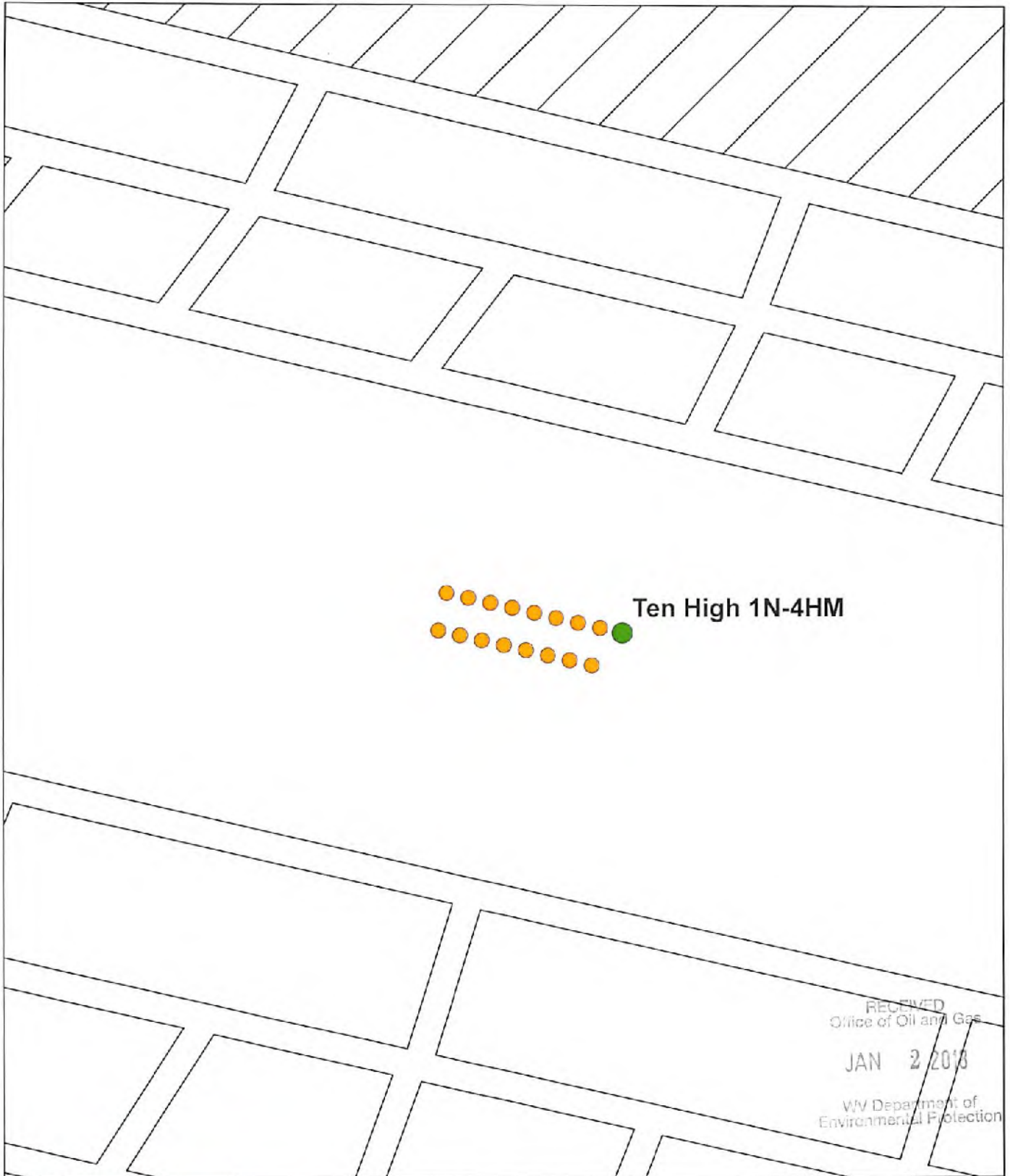
Well No. Ten High 1N-3HM

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

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**CONFIDENTIAL**

0 5 10 20 30 40 Feet

**Ten High Pad  
Ten High 1N-4HM Well Location**

- Surface Location
- Coal Mined Area



# National Flood Hazard Layer FIRMette

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U.S. Department of Homeland Security  
Environmental Protection Agency



Date: 4/18/2017 Time: 4:46:05 PM



## Legend

- Cross-Sections
- ~ Base Flood Elevations
- Flood Hazard Zones
  - 1% Annual Chance Flood
  - Regulatory Floodway
  - Special Floodway
  - Area of Undetermined Flood Hazard
  - 0.2% Annual Chance Flood
  - Future Conditions 1% Annual Chance Flood Hazard
  - Area with Reduced Risk Due to Levee
- LOMRS
  - Effective
- Map Panels
  - Digital Data
  - Unmodernized Maps
  - Unmapped



This map complies with FEMA's standards for the use of digital flood maps. The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. The base map shown complies with FEMA's base map accuracy standards.

The NFHL is a living database, updated daily, and this map represents a snapshot of information at a specific time.

Flood risks are dynamic and can change frequently due to a variety of factors, including weather patterns, erosion, and new development. FEMA flood maps are continually updated through a variety of processes. Users should always verify through the Map Service Center (<http://mhc.fema.gov>) or the Community Map Repository that they have the current effective information.

NFHL maps should not be created for unmapped or unmodernized areas.

80°40'32.01\"/>

USCS The National Map: Orthoimagery

39°48'10.28\"/>

Feet



03/16/2018

39°48'59.03\"/>

80°41'10.98\"/>