



west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Wednesday, September 12, 2018
WELL WORK PERMIT
Horizontal 6A / New Drill

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

Re: Permit approval for TEN HIGH 1S-10HM
47-051-02074-00-00

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

Operator's Well Number: TEN HIGH 1S-10HM
Farm Name: LAWRENCE & SHIRLEY CON.
U.S. WELL NUMBER: 47-051-02074-00-00
Horizontal 6A New Drill
Date Issued: 9/12/2018

PERMIT CONDITIONS

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

CONDITIONS

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than one hundred (100) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. 24 hours prior to the initiation of the completion process the operator shall notify the Chief or his designee.
8. During the completion process the operator shall monitor annular pressures and report any anomaly noticed to the chief or his designee immediately.
9. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
10. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

PERMIT CONDITIONS

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

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

- 1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Meade Glen Easton 7.5'
Operator ID County District Quadrangle
- 2) Operator's Well Number: Ten High 1S-10HM 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 X Oil _____ Underground Storage _____
Other _____
(b) If Gas Shallow x _____ Deep _____
Horizontal X _____
- 6) Existing Pad: Yes or No Yes *JW 8/20/18*
- 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: 17,011'
- 11) Proposed Horizontal Leg Length: 9,101.67'
- 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 X No _____
- (a) If Yes, provide Mine Info: Name: Marshall County Coal Co. / Marshall County Mine
Depth: 1020' TVD and 290' subsea level
Seam: Pittsburgh #8
Owner: Murray Energy /Conso lidated Coal Co.

WW-6B
(04/15)

4705102074
 API NO. 47-1091
 OPERATOR WELL NO. Ten High 1S-10HM
 Well Pad Name: Ten High

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	54.5#	1,130'	1,130'	1135ft^3(CTS)
Coal	13 3/8"	NEW	H40	54.5#	1,130'	1,130'	1135ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,800'	2,800'	918ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	17,011'	17,011'	4348ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		7,413'	
Liners	N/A						

JN 8/20/18

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	2,740	2,192	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.33	2,740	2,192	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE#24	1.19
Production	5 1/2"	8 7/8_8 3/4	.361	12,640	8,000	SEE#24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners	N/A						

PACKERS

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

WW-6B
(10/14)

4705102074
API NO. 47-051 -
OPERATOR WELL NO. Ten High 1S-10HM
Well Pad Name: Ten High

JW 8/20/18

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 22,750,000 lb proppant and 351,732 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.

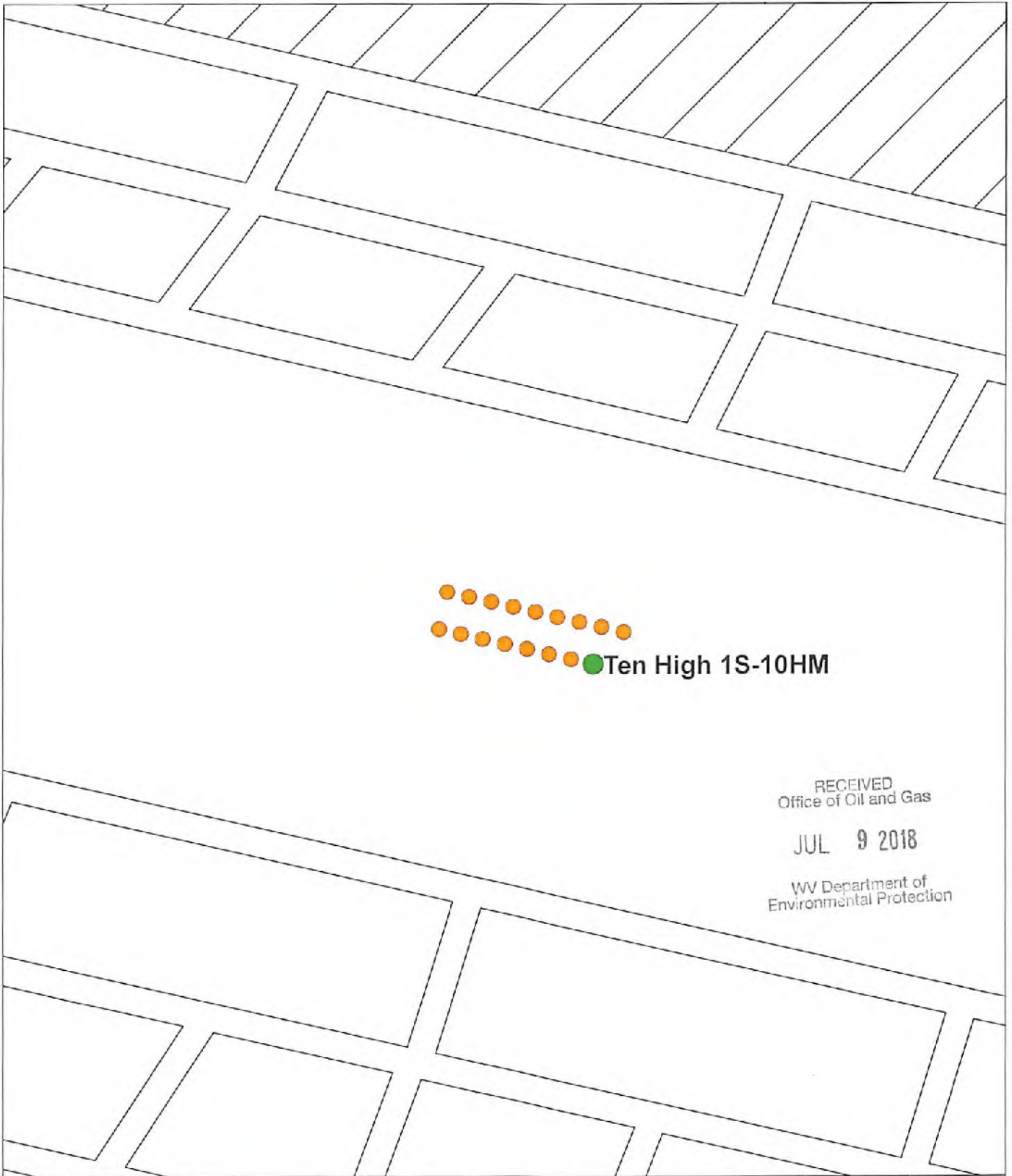
24) Describe all cement additives associated with each cement type:

*See Attached

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.



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CONFIDENTIAL

0 5 10 20 30 40 Feet

**Ten High Pad
Ten High 1S-10HM Well Location**

Surface Location
 Coal Mined Area



4705102074

WV Geologic & Economic Survey
Well: County = 51 Permit = 00834

Well Reassignment Information Reassigned From:
OLD COUNTY 51, PERMIT 00834, NEW PERMIT 51, 00834

Location Information: [View Map](#)
API: COUNTY PERMIT TAX DISTRICT SQID_75 SQID_41 LAT_50 LON_50 UTM_X UTM_Y
47202024 00834 51 00034 00034 51 00034 00034 51 00034 00034 51 00034 00034 51 00034 00034

There is no Bottom Hole Location data for this well.

Owner Information:
API DEP_ID SURF STATUS SURFACE_OWNER WELL_NUM DO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR AT_COMPLETION PROF_VG PROF_VG1
47202024 00834 00034

Completion Information:
API DEP_ID SURF STATUS SURFACE_OWNER WELL_NUM DO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR AT_COMPLETION PROF_VG PROF_VG1
47202024 00834 00034

There is no Pay data for this well.

There is no Production Gas data for this well.

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

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

There is no Production Water data for this well.

There is no Stratigraphy data for this well.

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

Plugging Information:
API DEP_ID SURF STATUS SURFACE_OWNER WELL_NUM DO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR AT_COMPLETION PROF_VG PROF_VG1
47202024 00834 00034

There is no Sample data for this well.

WV Geologic & Economic Survey
Well: County = 51 Permit = 40031

Location Information: [View Map](#)
API: COUNTY PERMIT TAX DISTRICT SQID_75 SQID_41 LAT_50 LON_50 UTM_X UTM_Y
400140031 00031 51 00031 00031 51 00031 00031 51 00031 00031 51 00031 00031 51 00031 00031 51 00031 00031 51 00031 00031

There is no Bottom Hole Location data for this well.

There is no Owner/Completion data for this well.

There is no Pay data for this well.

There is no Production Gas data for this well.

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

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

There is no Production Water data for this well.

Stratigraphy Information:
API DEP_ID SURF STATUS SURFACE_OWNER WELL_NUM DO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR AT_COMPLETION PROF_VG PROF_VG1
400140031 00031 51 00031 00031 51 00031 00031 51 00031 00031 51 00031 00031 51 00031 00031 51 00031 00031 51 00031 00031 51 00031 00031

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

There is no Plugging data for this well.

There is no Sample data for this well.

WV Geologic & Economic Survey
Well: County = 51 Permit = 00844

Well Reassignment Information Reassigned From:
OLD COUNTY 51, PERMIT 00844, NEW PERMIT 51, 00844

Location Information: [View Map](#)
API: COUNTY PERMIT TAX DISTRICT SQID_75 SQID_41 LAT_50 LON_50 UTM_X UTM_Y
400140044 00844 51 00844 00844 51 00844 00844 51 00844 00844 51 00844 00844 51 00844 00844 51 00844 00844 51 00844 00844 51 00844 00844

There is no Bottom Hole Location data for this well.

Owner Information:
API DEP_ID SURF STATUS SURFACE_OWNER WELL_NUM DO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR AT_COMPLETION PROF_VG PROF_VG1
400140044 00844

Completion Information:
API DEP_ID SURF STATUS SURFACE_OWNER WELL_NUM DO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR AT_COMPLETION PROF_VG PROF_VG1
400140044 00844

There is no Pay data for this well.

There is no Production Gas data for this well.

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

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

There is no Production Water data for this well.

Stratigraphy Information:
API DEP_ID SURF STATUS SURFACE_OWNER WELL_NUM DO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR AT_COMPLETION PROF_VG PROF_VG1
400140044 00844

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

Plugging Information:
API DEP_ID SURF STATUS SURFACE_OWNER WELL_NUM DO_NUM LEASE LEASE_NUM MINERAL_OWN OPERATOR AT_COMPLETION PROF_VG PROF_VG1
400140044 00844

There is no Sample data for this well.

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Permit well - Ten High 15-10HM

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

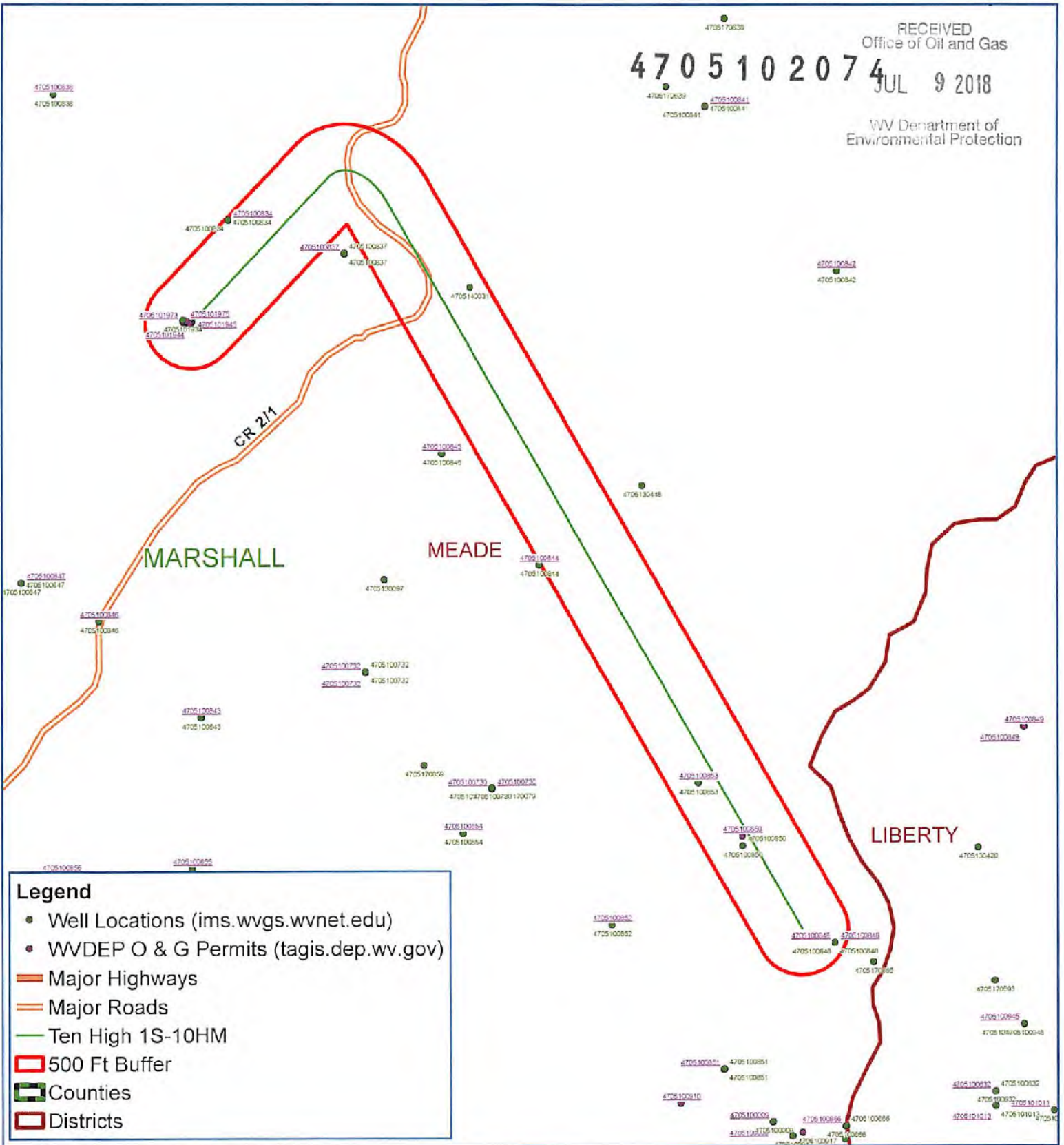
API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	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, Permit submitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101945	Tug Hill Operating	6737' TVD planned	None	None	No, Permit submitted 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
4705100834	McElroy Coal Company	Unknown	Unknown	Unknown	Unknown but unlikely, most likely an old shallow well	Well plugged in 11/6/1964 and then plugged again in 8/6/1998
4705140031	McElroy Coal Company	1060	Pittsburgh Coal?	None	No, Listed as a Pittsburgh coal CBM well. Hole is much too shallow to be affected by Marcellus induced fractures	Well was plugged 9/16/1998
4705100844	McElroy Coal Company	Unknown	Pittsburgh Coal?	Unknown	Unknown but unlikely, most likely an old shallow coal test bore, Pittsburgh Coal is listed as deepest FMT	Well was plugged 9/7/1999
4705100853	Consolidation Coal Co.	Unknown	Unknown	Unknown	Unknown but unlikely, most likely an old shallow well	Well was plugged 8/25/2000
4705100850	Consolidation Coal Co.	Unknown	Unknown	Unknown	Unknown but unlikely, most likely an old shallow well	Well was plugged 5/3/2000
4705100848	Consolidation Coal Co.	Unknown	Unknown	Unknown	Unknown but unlikely, most likely an old shallow well	Well was plugged 3/10/2000

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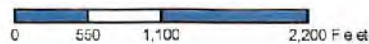
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Ten High 1S - 10HM Meade District Marshall County, WV



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





Tug Hill Operating, LLC Casing and Cement Program

Ten High 1S-10HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	1,130'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,803'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	17,011'	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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4705102074

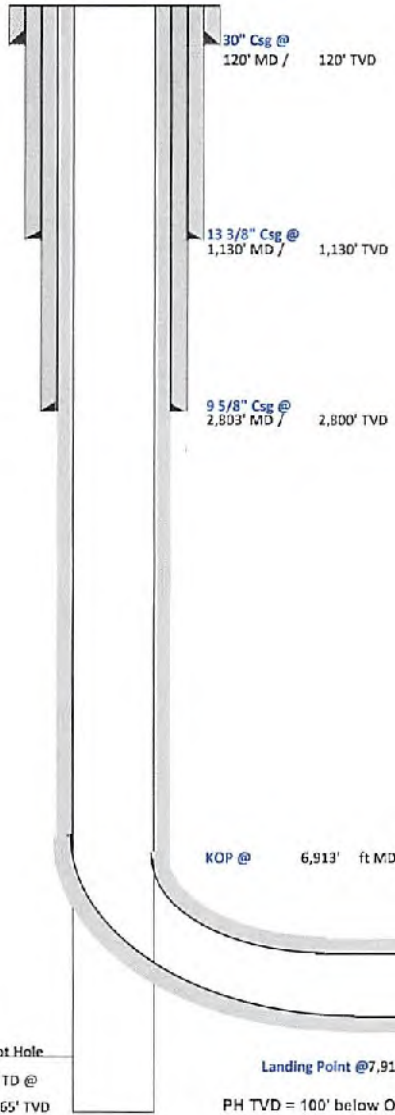


WELL NAME: Ten High 15-10HM
 STATE: West Virginia COUNTY: Marshall
 DISTRICT: Meade
 DF Elev: 1,310' GL Elev: 1,310'
 TD: 17,011'
 TH Latitude: 39.80675471
 TH Longitude: -80.68070666
 BH Latitude: -39.78855101
 BH Longitude: 80.56710661

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	1026
Sewickley Coal	935
Pittsburgh Coal	1020
Big Lime	2049
Welr	2475
Berea	2673
Gordon	2935
Rhinstreet	6057
Geneseo/Burkett	6575
Tully	6606
Hamilton	6639
Marcellus	6713
Landing Depth	6751
Onondaga	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	1,130'	1,130'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,803'	2,800'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	17,011'	6,910'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,150	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	896	A	15	Air	1 Centralizer every other jt
Production	3,837	A	14.5	Air / SOBMM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



Handwritten signature and date: 7/5/18

Pilot Hole
 PH TD @ 6,865' TVD
 Landing Point @ 7,911' MD / 6,751' TVD
 PH TVD = 100' below Onondaga Top

Lateral TD @ 17,011' ft MD
 6,910' ft TVD

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Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-10HM (H)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1310 @ 1310.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1310 @ 1310.00usft
Site:	Ten High	North Reference:	Grid
Well:	Ten High 1S-10HM (H)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

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

WV Department of Environmental Protection

Site	Ten High				
Site Position:		Northing:	14,456,545.60 usft	Latitude:	39.80680885
From:	Lat/Long	Easting:	1,730,001.41 usft	Longitude:	-80.68101011
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.20 °

Well	Ten High 1S-10HM (H)					
Well Position	+N/-S	0.00 usft	Northing:	14,456,526.19 usft	Latitude:	39.80675471
	+E/-W	0.00 usft	Easting:	1,730,086.71 usft	Longitude:	-80.68070666
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	1,310.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/1/2017	-8.72	66.95	52,156.42836195

Design	rev2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	134.79

Plan Survey Tool Program	Date	11/26/2017		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	17,011.02 rev2 (Original Hole)	MWD	MWD - Standard

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	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,600.00	4.00	45.00	1,599.84	4.93	4.93	2.00	2.00	0.00	45.00	
3,204.07	4.00	45.00	3,200.00	84.06	84.06	0.00	0.00	0.00	0.00	
4,402.60	39.95	43.58	4,293.29	402.93	388.98	3.00	3.00	-0.12	-1.55	
6,912.62	39.95	43.58	6,217.35	1,570.59	1,500.17	0.00	0.00	0.00	0.00	
7,911.02	89.00	150.26	6,751.18	1,296.22	2,139.33	10.00	4.91	10.68	103.57	
17,011.02	89.00	150.26	6,910.00	-6,603.98	6,652.83	0.00	0.00	0.00	0.00	Ten High 1S-10HM BI



Database: DB_Jul2216dt_v14
Company: Tug Hill Operating LLC
Project: Marshall County, West Virginia
Site: Ten High
Well: Ten High 1S-10HM (H)
Wellbore: Original Hole
Design: rev2

Local Co-ordinate Reference: Well Ten High 1S-10HM (H)
TVD Reference: GL=1310 @ 1310.00usft
MD Reference: GL=1310 @ 1310.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

RECEIVED
Office of Oil and Gas

JUL 9 2018

Planned Survey

WV Department of
Environmental Protection

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	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
100.00	0.00	0.00	100.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
200.00	0.00	0.00	200.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
300.00	0.00	0.00	300.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
400.00	0.00	0.00	400.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
500.00	0.00	0.00	500.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
600.00	0.00	0.00	600.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
700.00	0.00	0.00	700.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
800.00	0.00	0.00	800.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
900.00	0.00	0.00	900.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,456,526.19	1,730,086.71	39.80675471	-80.68070666
KOP Begin 2°/100' build									
1,500.00	2.00	45.00	1,499.98	1.23	1.23	14,456,527.43	1,730,087.94	39.80675809	-80.68070225
1,600.00	4.00	45.00	1,599.84	4.93	4.93	14,456,531.13	1,730,091.64	39.80676821	-80.68068903
Begin 4.00° tangent									
1,700.00	4.00	45.00	1,699.59	9.87	9.87	14,456,536.06	1,730,096.57	39.80678171	-80.68067140
1,800.00	4.00	45.00	1,799.35	14.80	14.80	14,456,540.99	1,730,101.51	39.80679521	-80.68065378
1,900.00	4.00	45.00	1,899.11	19.73	19.73	14,456,545.92	1,730,106.44	39.80680371	-80.68063615
2,000.00	4.00	45.00	1,998.86	24.66	24.66	14,456,550.86	1,730,111.37	39.80682221	-80.68061852
2,100.00	4.00	45.00	2,098.62	29.60	29.60	14,456,555.79	1,730,116.30	39.80683570	-80.68060090
2,200.00	4.00	45.00	2,198.38	34.53	34.53	14,456,560.72	1,730,121.24	39.80684920	-80.68058327
2,300.00	4.00	45.00	2,298.13	39.46	39.46	14,456,565.65	1,730,126.17	39.80686270	-80.68056565
2,400.00	4.00	45.00	2,397.89	44.39	44.39	14,456,570.59	1,730,131.10	39.80687620	-80.68054802
2,500.00	4.00	45.00	2,497.65	49.33	49.33	14,456,575.52	1,730,136.03	39.80688969	-80.68053039
2,600.00	4.00	45.00	2,597.40	54.26	54.26	14,456,580.45	1,730,140.97	39.80690319	-80.68051277
2,700.00	4.00	45.00	2,697.16	59.19	59.19	14,456,585.38	1,730,145.90	39.80691669	-80.68049514
2,800.00	4.00	45.00	2,796.91	64.12	64.12	14,456,590.32	1,730,150.83	39.80693019	-80.68047752
2,900.00	4.00	45.00	2,896.67	69.06	69.06	14,456,595.25	1,730,155.76	39.80694368	-80.68045989
3,000.00	4.00	45.00	2,996.43	73.99	73.99	14,456,600.18	1,730,160.70	39.80695718	-80.68044226
3,100.00	4.00	45.00	3,096.18	78.92	78.92	14,456,605.11	1,730,165.63	39.80697068	-80.68042464
3,200.00	4.00	45.00	3,195.94	83.85	83.85	14,456,610.05	1,730,170.56	39.80698418	-80.68040701
3,204.07	4.00	45.00	3,200.00	84.06	84.06	14,456,610.25	1,730,170.76	39.80698473	-80.68040629
Begin 3°/100' build/turn									
3,300.00	6.88	44.35	3,295.49	90.53	90.44	14,456,616.72	1,730,177.14	39.80700244	-80.68038349
3,400.00	9.88	44.07	3,394.41	100.98	100.59	14,456,627.17	1,730,187.30	39.80703103	-80.68034720
3,500.00	12.88	43.92	3,492.43	115.17	114.29	14,456,641.36	1,730,201.00	39.80706967	-80.68029824
3,600.00	15.88	43.83	3,589.29	133.06	131.50	14,456,659.26	1,730,218.20	39.80711885	-80.68023875
3,700.00	18.88	43.77	3,684.72	154.82	152.16	14,456,680.81	1,730,238.87	39.80717784	-80.68016288
3,800.00	21.88	43.72	3,778.45	179.77	176.24	14,456,705.96	1,730,262.94	39.80724668	-80.68007685
3,900.00	24.88	43.68	3,870.23	208.45	203.65	14,456,734.64	1,730,290.35	39.80732517	-80.67997888
4,000.00	27.88	43.66	3,959.81	240.58	234.32	14,456,766.78	1,730,321.03	39.80741311	-80.67986925
4,100.00	30.88	43.63	4,046.94	276.08	268.17	14,456,802.27	1,730,354.88	39.80751026	-80.67974826
4,200.00	33.88	43.61	4,131.38	314.84	305.11	14,456,841.03	1,730,391.82	39.80761634	-80.67961624
4,300.00	36.88	43.60	4,212.91	356.76	345.03	14,456,882.95	1,730,431.74	39.80773106	-80.67947355
4,400.00	39.88	43.58	4,291.30	401.72	387.83	14,456,927.91	1,730,474.54	39.80785412	-80.67932057
4,402.60	39.95	43.58	4,293.29	402.93	388.98	14,456,929.12	1,730,475.69	39.80785743	-80.67931846
Begin 39.95° tangent									
4,500.00	39.95	43.58	4,367.95	448.24	432.10	14,456,974.43	1,730,518.81	39.80798144	-80.67916235
4,600.00	39.95	43.58	4,444.61	494.76	476.37	14,457,020.95	1,730,563.08	39.80810876	-80.67900412
4,700.00	39.95	43.58	4,521.26	541.28	520.64	14,457,067.47	1,730,607.35	39.80823607	-80.67884589



Database:	DB_Jul2216ct_v14	Local Co-ordinate Reference:	Well Ten High 1S-10HM (H)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1310 @ 1310.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1310 @ 1310.00usft
Site:	Ten High	North Reference:	Grid
Well:	Ten High 1S-10HM (H)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole	RECEIVED Office of Oil and Gas	
Design:	rev2	JUL 9 2018	

Planned Survey									
WV Department of Environmental Protection									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,800.00	39.95	43.58	4,597.92	587.80	564.91	14,457,113.99	1,730,651.62	39.80836339	-80.67868766
4,900.00	39.95	43.58	4,674.58	634.32	609.18	14,457,160.51	1,730,695.89	39.80849071	-80.67852943
5,000.00	39.95	43.58	4,751.23	680.84	653.45	14,457,207.03	1,730,740.16	39.80861803	-80.67837119
5,100.00	39.95	43.58	4,827.89	727.36	697.72	14,457,253.55	1,730,784.43	39.80874535	-80.67821298
5,200.00	39.95	43.58	4,904.54	773.88	741.99	14,457,300.07	1,730,828.70	39.80887267	-80.67805473
5,300.00	39.95	43.58	4,981.20	820.40	786.26	14,457,346.59	1,730,872.97	39.80899998	-80.67789649
5,400.00	39.95	43.58	5,057.85	866.92	830.53	14,457,393.11	1,730,917.24	39.80912730	-80.67773826
5,500.00	39.95	43.58	5,134.51	913.44	874.80	14,457,439.63	1,730,961.51	39.80925462	-80.67758002
5,600.00	39.95	43.58	5,211.16	959.96	919.07	14,457,486.15	1,731,005.78	39.80938194	-80.67742179
5,700.00	39.95	43.58	5,287.82	1,006.48	963.34	14,457,532.67	1,731,050.05	39.80950925	-80.67726355
5,800.00	39.95	43.58	5,364.47	1,053.00	1,007.61	14,457,579.19	1,731,094.32	39.80963657	-80.67710531
5,900.00	39.95	43.58	5,441.13	1,099.52	1,051.88	14,457,625.71	1,731,138.59	39.80976389	-80.67694708
6,000.00	39.95	43.58	5,517.78	1,146.04	1,096.15	14,457,672.23	1,731,182.86	39.80989120	-80.67678884
6,100.00	39.95	43.58	5,594.44	1,192.56	1,140.42	14,457,718.75	1,731,227.13	39.81001852	-80.67663060
6,200.00	39.95	43.58	5,671.09	1,239.08	1,184.70	14,457,765.27	1,731,271.40	39.81014583	-80.67647238
6,300.00	39.95	43.58	5,747.75	1,285.60	1,228.97	14,457,811.79	1,731,315.67	39.81027315	-80.67631412
6,400.00	39.95	43.58	5,824.41	1,332.12	1,273.24	14,457,858.31	1,731,359.94	39.81040047	-80.67615588
6,500.00	39.95	43.58	5,901.06	1,378.64	1,317.51	14,457,904.83	1,731,404.21	39.81052778	-80.67599764
6,600.00	39.95	43.58	5,977.72	1,425.16	1,361.78	14,457,951.35	1,731,448.48	39.81065510	-80.67583940
6,700.00	39.95	43.58	6,054.37	1,471.68	1,406.05	14,457,997.87	1,731,492.75	39.81078241	-80.67568116
6,800.00	39.95	43.58	6,131.03	1,518.20	1,450.32	14,458,044.39	1,731,537.02	39.81090972	-80.67552291
6,900.00	39.95	43.58	6,207.68	1,564.72	1,494.59	14,458,090.91	1,731,581.29	39.81103704	-80.67536467
6,912.62	39.95	43.58	6,217.35	1,570.59	1,500.17	14,458,096.78	1,731,586.88	39.81105310	-80.67534471
Begin 10°/100' build/turn									
7,000.00	38.69	57.25	6,285.08	1,605.76	1,542.57	14,458,131.95	1,731,629.27	39.81114926	-80.67519329
7,100.00	39.26	73.15	6,363.02	1,631.90	1,599.28	14,458,158.10	1,731,685.98	39.81122050	-80.67499101
7,200.00	41.88	88.02	6,439.16	1,642.25	1,663.08	14,458,188.45	1,731,749.78	39.81124829	-80.67476369
7,300.00	46.19	101.03	6,511.18	1,636.49	1,732.03	14,458,162.68	1,731,818.73	39.81123177	-80.67451623
7,400.00	51.77	112.05	6,576.90	1,614.79	1,804.03	14,458,140.98	1,731,890.74	39.81117146	-80.67426211
7,500.00	58.22	121.39	6,634.32	1,577.81	1,876.91	14,458,104.00	1,731,963.61	39.81106918	-80.67400309
7,600.00	65.27	129.46	6,681.69	1,526.68	1,948.43	14,458,052.87	1,732,035.14	39.81092804	-80.67374905
7,700.00	72.69	136.64	6,717.57	1,462.95	2,016.44	14,457,989.14	1,732,103.15	39.81075234	-80.67350770
7,800.00	80.36	143.26	6,740.88	1,386.55	2,078.66	14,457,914.74	1,732,165.57	39.81054740	-80.67328639
7,900.00	88.14	149.57	6,750.91	1,305.75	2,133.80	14,457,831.94	1,732,220.51	39.81031946	-80.67309183
7,911.02	89.00	150.26	6,751.18	1,296.22	2,139.33	14,457,822.41	1,732,226.03	39.81029322	-80.67307229
Begin 89.00° lateral section									
8,000.00	89.00	150.26	6,752.74	1,218.97	2,183.46	14,457,745.16	1,732,270.16	39.81008065	-80.67291615
8,100.00	89.00	150.26	6,754.48	1,132.16	2,233.06	14,457,658.35	1,732,319.76	39.80984173	-80.67274066
8,200.00	89.00	150.26	6,756.23	1,045.34	2,282.66	14,457,571.53	1,732,369.36	39.80960282	-80.67256518
8,300.00	89.00	150.26	6,757.97	958.53	2,332.26	14,457,484.72	1,732,418.96	39.80936390	-80.67238970
8,400.00	89.00	150.26	6,759.72	871.71	2,381.85	14,457,397.90	1,732,468.56	39.80912499	-80.67221421
8,500.00	89.00	150.26	6,761.46	784.89	2,431.45	14,457,311.09	1,732,518.16	39.80888608	-80.67203873
8,600.00	89.00	150.26	6,763.21	698.08	2,481.05	14,457,224.27	1,732,567.76	39.80864716	-80.67186325
8,700.00	89.00	150.26	6,764.95	611.26	2,530.65	14,457,137.46	1,732,617.36	39.80840825	-80.67168778
8,800.00	89.00	150.26	6,766.70	524.45	2,580.25	14,457,050.64	1,732,666.96	39.80816933	-80.67151230
8,900.00	89.00	150.26	6,768.44	437.63	2,629.85	14,456,963.83	1,732,716.55	39.80793041	-80.67133682
9,000.00	89.00	150.26	6,770.19	350.82	2,679.45	14,456,877.01	1,732,766.15	39.80769150	-80.67116135
9,100.00	89.00	150.26	6,771.93	264.00	2,729.05	14,456,790.19	1,732,815.75	39.80745258	-80.67098588
9,200.00	89.00	150.26	6,773.68	177.19	2,778.65	14,456,703.38	1,732,865.35	39.80721367	-80.67081041
9,300.00	89.00	150.26	6,775.42	90.37	2,828.24	14,456,616.56	1,732,914.95	39.80697475	-80.67063493
9,400.00	89.00	150.26	6,777.17	3.56	2,877.84	14,456,529.75	1,732,964.55	39.80673583	-80.67045947
9,500.00	89.00	150.26	6,778.91	-83.26	2,927.44	14,456,442.93	1,733,014.15	39.80649691	-80.67028400
9,600.00	89.00	150.26	6,780.66	-170.07	2,977.04	14,456,356.12	1,733,063.75	39.80625800	-80.67010853
9,700.00	89.00	150.26	6,782.41	-256.89	3,026.64	14,456,269.30	1,733,113.35	39.80601908	-80.66993306



Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Ten High
 Well: Ten High 1S-10HM (H)
 Wellbore: Original Hole
 Design: rev2

Local Co-ordinate Reference: Well Ten High 1S-10HM (H)
 TVD Reference: GL=1310 @ 1310.00usft
 MD Reference: GL=1310 @ 1310.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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 Office of Oil and Gas

JUL 9 2018

WV Department of
 Environmental Protection

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,800.00	89.00	150.26	6,784.15	-343.70	3,076.24	14,456,182.49	1,733,162.85	39.80578016	-80.66975760
9,900.00	89.00	150.26	6,785.90	-430.52	3,125.84	14,456,095.67	1,733,212.54	39.80554124	-80.66958214
10,000.00	89.00	150.26	6,787.64	-517.33	3,175.44	14,456,008.86	1,733,262.14	39.80530232	-80.66940667
10,100.00	89.00	150.26	6,789.39	-604.15	3,225.04	14,455,922.04	1,733,311.74	39.80506340	-80.66923121
10,200.00	89.00	150.26	6,791.13	-690.97	3,274.64	14,455,835.23	1,733,361.34	39.80482448	-80.66905575
10,300.00	89.00	150.26	6,792.88	-777.78	3,324.23	14,455,748.41	1,733,410.94	39.80458557	-80.66888030
10,400.00	89.00	150.26	6,794.62	-864.60	3,373.83	14,455,661.60	1,733,460.54	39.80434665	-80.66870484
10,500.00	89.00	150.26	6,796.37	-951.41	3,423.43	14,455,574.78	1,733,510.14	39.80410773	-80.66852938
10,600.00	89.00	150.26	6,798.11	-1,038.23	3,473.03	14,455,487.97	1,733,559.74	39.80388881	-80.66835383
10,700.00	89.00	150.26	6,799.86	-1,125.04	3,522.63	14,455,401.15	1,733,609.34	39.80366988	-80.66817847
10,800.00	89.00	150.26	6,801.60	-1,211.86	3,572.23	14,455,314.33	1,733,658.93	39.80345096	-80.66800302
10,900.00	89.00	150.26	6,803.35	-1,298.67	3,621.83	14,455,227.52	1,733,708.53	39.80323204	-80.66782757
11,000.00	89.00	150.26	6,805.09	-1,385.49	3,671.43	14,455,140.70	1,733,758.13	39.80291312	-80.66765212
11,100.00	89.00	150.26	6,806.84	-1,472.30	3,721.03	14,455,053.89	1,733,807.73	39.80269420	-80.66747667
11,200.00	89.00	150.26	6,808.58	-1,559.12	3,770.62	14,454,967.07	1,733,857.33	39.80247528	-80.66730122
11,300.00	89.00	150.26	6,810.33	-1,645.93	3,820.22	14,454,880.26	1,733,906.93	39.80225636	-80.66712578
11,400.00	89.00	150.26	6,812.07	-1,732.75	3,869.82	14,454,793.44	1,733,956.53	39.80193743	-80.66695033
11,500.00	89.00	150.26	6,813.82	-1,819.56	3,919.42	14,454,706.63	1,734,006.13	39.80171851	-80.66677489
11,600.00	89.00	150.26	6,815.56	-1,906.38	3,969.02	14,454,619.81	1,734,055.73	39.80149959	-80.66659945
11,700.00	89.00	150.26	6,817.31	-1,993.20	4,018.62	14,454,533.00	1,734,105.33	39.80128066	-80.66642400
11,800.00	89.00	150.26	6,819.06	-2,080.01	4,068.22	14,454,446.18	1,734,154.92	39.80106174	-80.66624855
11,900.00	89.00	150.26	6,820.80	-2,166.83	4,117.82	14,454,359.37	1,734,204.52	39.80084282	-80.66607312
12,000.00	89.00	150.26	6,822.55	-2,253.64	4,167.42	14,454,272.55	1,734,254.12	39.80062390	-80.66589769
12,100.00	89.00	150.26	6,824.29	-2,340.46	4,217.02	14,454,185.74	1,734,303.72	39.80040497	-80.66572225
12,200.00	89.00	150.26	6,826.04	-2,427.27	4,266.61	14,454,098.92	1,734,353.32	39.80018604	-80.66554681
12,300.00	89.00	150.26	6,827.78	-2,514.09	4,316.21	14,454,012.10	1,734,402.92	39.79996712	-80.66537138
12,400.00	89.00	150.26	6,829.53	-2,600.90	4,365.81	14,453,925.29	1,734,452.52	39.79974819	-80.66519595
12,500.00	89.00	150.26	6,831.27	-2,687.72	4,415.41	14,453,838.47	1,734,502.12	39.79952927	-80.66502052
12,600.00	89.00	150.26	6,833.02	-2,774.53	4,465.01	14,453,751.66	1,734,551.72	39.79931034	-80.66484508
12,700.00	89.00	150.26	6,834.76	-2,861.35	4,514.61	14,453,664.84	1,734,601.31	39.79909142	-80.66466963
12,800.00	89.00	150.26	6,836.51	-2,948.16	4,564.21	14,453,578.03	1,734,650.91	39.79887249	-80.66449423
12,900.00	89.00	150.26	6,838.25	-3,034.98	4,613.81	14,453,491.21	1,734,700.51	39.79865356	-80.66431880
13,000.00	89.00	150.26	6,840.00	-3,121.79	4,663.41	14,453,404.40	1,734,750.11	39.79843464	-80.66414337
13,100.00	89.00	150.26	6,841.74	-3,208.61	4,713.00	14,453,317.58	1,734,799.71	39.79821571	-80.66396795
13,200.00	89.00	150.26	6,843.49	-3,295.43	4,762.60	14,453,230.77	1,734,849.31	39.79799678	-80.66379253
13,300.00	89.00	150.26	6,845.23	-3,382.24	4,812.20	14,453,143.95	1,734,898.91	39.79777785	-80.66361710
13,400.00	89.00	150.26	6,846.98	-3,469.06	4,861.80	14,453,057.14	1,734,948.51	39.79755892	-80.66344168
13,500.00	89.00	150.26	6,848.72	-3,555.87	4,911.40	14,452,970.32	1,734,998.11	39.79734000	-80.66326626
13,600.00	89.00	150.26	6,850.47	-3,642.69	4,961.00	14,452,883.51	1,735,047.71	39.79712107	-80.66309084
13,700.00	89.00	150.26	6,852.21	-3,729.50	5,010.60	14,452,796.69	1,735,097.30	39.79690214	-80.66291543
13,800.00	89.00	150.26	6,853.96	-3,816.32	5,060.20	14,452,709.87	1,735,146.90	39.79668321	-80.66274001
13,900.00	89.00	150.26	6,855.71	-3,903.13	5,109.80	14,452,623.06	1,735,196.50	39.79646428	-80.66256460
14,000.00	89.00	150.26	6,857.45	-3,989.95	5,159.39	14,452,536.24	1,735,246.10	39.79624535	-80.66238918
14,100.00	89.00	150.26	6,859.20	-4,076.76	5,208.99	14,452,449.43	1,735,295.70	39.79602642	-80.66221377
14,200.00	89.00	150.26	6,860.94	-4,163.58	5,258.59	14,452,362.61	1,735,345.30	39.79580749	-80.66203836
14,300.00	89.00	150.26	6,862.69	-4,250.39	5,308.19	14,452,275.80	1,735,394.90	39.79558856	-80.66186295
14,400.00	89.00	150.26	6,864.43	-4,337.21	5,357.79	14,452,188.98	1,735,444.50	39.79536963	-80.66168754
14,500.00	89.00	150.26	6,866.18	-4,424.02	5,407.39	14,452,102.17	1,735,494.10	39.79515070	-80.66151213
14,600.00	89.00	150.26	6,867.92	-4,510.84	5,456.99	14,452,015.35	1,735,543.69	39.79493177	-80.66133673
14,700.00	89.00	150.26	6,869.67	-4,597.65	5,506.59	14,451,928.54	1,735,593.29	39.79471284	-80.66116132
14,800.00	89.00	150.26	6,871.41	-4,684.47	5,556.19	14,451,841.72	1,735,642.89	39.79449391	-80.66098592
14,900.00	89.00	150.26	6,873.16	-4,771.29	5,605.79	14,451,754.91	1,735,692.49	39.79427498	-80.66081051
15,000.00	89.00	150.26	6,874.90	-4,858.10	5,655.38	14,451,668.09	1,735,742.09	39.79405604	-80.66063511
15,100.00	89.00	150.26	6,876.65	-4,944.92	5,704.98	14,451,581.28	1,735,791.69	39.79383711	-80.66045971
15,200.00	89.00	150.26	6,878.39	-5,031.73	5,754.58	14,451,494.46	1,735,841.29	39.79361818	-80.66028431



Planning Report - Geographic

4705102074



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-10HM (H)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1310 @ 1310.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1310 @ 1310.00usft
Site:	Ten High	North Reference:	Grid
Well:	Ten High 1S-10HM (H)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,300.00	89.00	150.26	6,880.14	-5,118.55	5,804.18	14,451,407.65	1,735,890.89	39.79263924	-80.66010891
15,400.00	89.00	150.26	6,881.88	-5,205.36	5,853.78	14,451,320.83	1,735,940.49	39.79240031	-80.65933352
15,500.00	89.00	150.26	6,883.63	-5,292.18	5,903.38	14,451,234.01	1,735,990.09	39.79216138	-80.65975812
15,600.00	89.00	150.26	6,885.37	-5,378.99	5,952.98	14,451,147.20	1,736,039.68	39.79192244	-80.65958273
15,700.00	89.00	150.26	6,887.12	-5,465.81	6,002.58	14,451,060.38	1,736,089.28	39.79168351	-80.65940733
15,800.00	89.00	150.26	6,888.86	-5,552.62	6,052.18	14,450,973.57	1,736,138.88	39.79144458	-80.65923194
15,900.00	89.00	150.26	6,890.61	-5,639.44	6,101.77	14,450,886.75	1,736,188.48	39.79120564	-80.65905655
16,000.00	89.00	150.26	6,892.36	-5,726.25	6,151.37	14,450,799.94	1,736,238.08	39.79096671	-80.65888116
16,100.00	89.00	150.26	6,894.10	-5,813.07	6,200.97	14,450,713.12	1,736,287.68	39.79072777	-80.65870577
16,200.00	89.00	150.26	6,895.85	-5,899.88	6,250.57	14,450,626.31	1,736,337.28	39.79048884	-80.65853039
16,300.00	89.00	150.26	6,897.59	-5,986.70	6,300.17	14,450,539.49	1,736,386.88	39.79024990	-80.65835500
16,400.00	89.00	150.26	6,899.34	-6,073.52	6,349.77	14,450,452.68	1,736,436.48	39.79001096	-80.65817962
16,500.00	89.00	150.26	6,901.08	-6,160.33	6,399.37	14,450,365.86	1,736,486.07	39.78977203	-80.65800423
16,600.00	89.00	150.26	6,902.83	-6,247.15	6,448.97	14,450,279.05	1,736,535.67	39.78953309	-80.65782885
16,700.00	89.00	150.26	6,904.57	-6,333.96	6,498.57	14,450,192.23	1,736,585.27	39.78929415	-80.65765347
16,800.00	89.00	150.26	6,906.32	-6,420.78	6,548.17	14,450,105.42	1,736,634.87	39.78905522	-80.65747809
16,900.00	89.00	150.26	6,908.06	-6,507.59	6,597.76	14,450,018.60	1,736,684.47	39.78881628	-80.65730271
17,000.00	89.00	150.26	6,909.81	-6,594.41	6,647.36	14,449,931.78	1,736,734.07	39.78857734	-80.65712733
17,011.02	89.00	150.26	6,910.00	-6,603.98	6,652.83	14,449,922.21	1,736,739.54	39.78855100	-80.65710800

PBHL/TD 17011.02 MD/6910.00 TVD

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Ten High 1S-10HM LP r - hit/miss target - Shape - Point	0.00	0.00	6,745.00	1,571.40	1,932.56	14,458,097.59	1,732,019.28	39.81105100	-80.67380500
- plan misses target center by 78.69usft at 7595.76usft MD (6679.90 TVD, 1529.12 N, 1945.46 E)									
Ten High 1S-10HM LP 5 - plan misses target center by 81.62usft at 7617.47usft MD (6688.82 TVD, 1516.40 N, 1960.63 E) - Point	0.00	0.00	6,745.00	1,571.40	1,982.56	14,458,097.59	1,732,069.27	39.81105050	-80.67362694
Ten High 1S-10HM BHL - plan hits target center - Point	0.00	0.00	6,910.00	-6,603.98	6,652.83	14,449,922.21	1,736,739.54	39.78855100	-80.65710800

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	
2,983.53	2,980.00	9 5/8" Casing @ 2980 TVD	9-5/8	12-1/4	

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Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Ten High 1S-10HM (H)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1310 @ 1310.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1310 @ 1310.00usft
Site:	Ten High	North Reference:	Grid
Well:	Ten High 1S-10HM (H)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,400.00	1,400.00	0.00	0.00	KOP Begin 2°/100' build
1,500.00	1,599.84	4.93	4.93	Begin 4.00° tangent
3,204.07	3,200.00	84.06	84.06	Begin 3°/100' build/turn
4,402.60	4,293.29	402.93	388.98	Begin 39.95° tangent
6,912.62	6,217.35	1,570.59	1,500.17	Begin 10°/100' build/turn
7,911.02	6,751.18	1,295.22	2,139.33	Begin 89.00° lateral section
17,011.02	6,910.00	-6,603.98	6,652.83	PBHL/TD 17011.02 MD/6910.00 TVD

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 Environmental Protection

WW-9
(4/16)

API Number 47 - 051 **4705102074**
Operator's Well No. Ten High 1S-10HM

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WVC109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EG#1388428)

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

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

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

Company Official Signature James A. Pankake

Company Official (Typed Name) Jim Pancake

Company Official Title Vice President - Geoscience

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WV Department of
Environmental Protection

Subscribed and sworn before me this 6th day of July, 20 18

[Signature]

Notary Public **COMMONWEALTH OF PENNSYLVANIA**

My commission expires 6-30-2019

NOTARIAL SEAL
Matthew W. Reese, Notary Public
Cranberry Twp., Butler County
My Commission Expires June 30, 2019
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

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
Annual Ryegrass	40
Spring Oats	96

Seed Type	lbs/acre
Orchard Grass	12
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:

Jane Thibodeau

Comments:

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WV Department of
Environmental Protection

Title: Oil + Gas Inspector

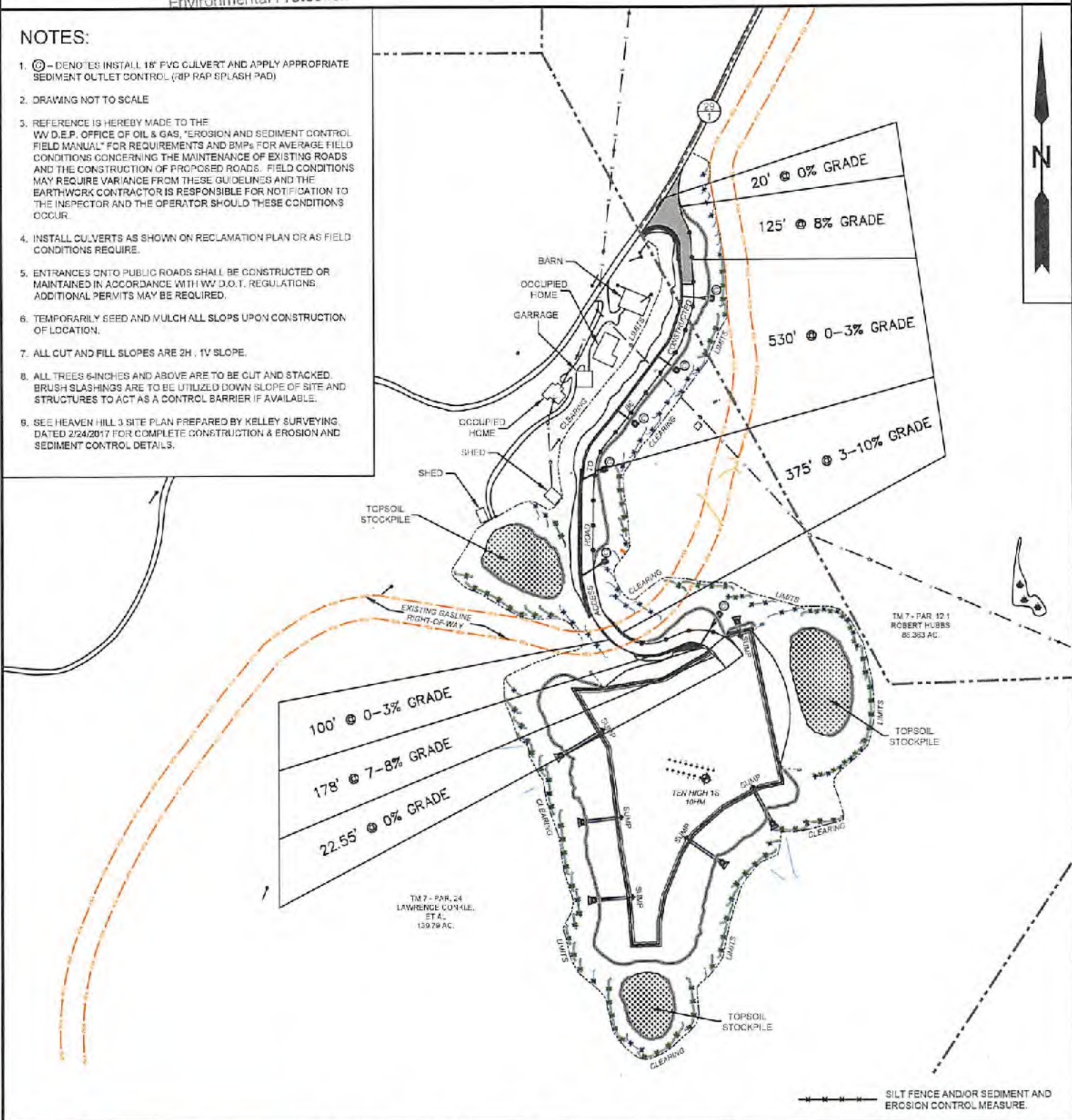
Date: 7/5/18

Field Reviewed? () Yes () No

PROPOSED TEM HIGH 1S - 10HM

NOTES:

1. - DENOTES INSTALL 18" PVC CULVERT AND APPLY APPROPRIATE SEDIMENT OUTLET CONTROL (8P 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.



--- SILT FENCE AND/OR SEDIMENT AND EROSION CONTROL MEASURE.

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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	09-13-17	1" = 300'

TUG HILL
OPERATING



TUG HILL
OPERATING

Well Site Safety Plan
Tug Hill Operating, LLC

Joe
7/5/18

Well Name: Ten High 1S-10HM

Pad Location: Ten High

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing-4,406,358.00

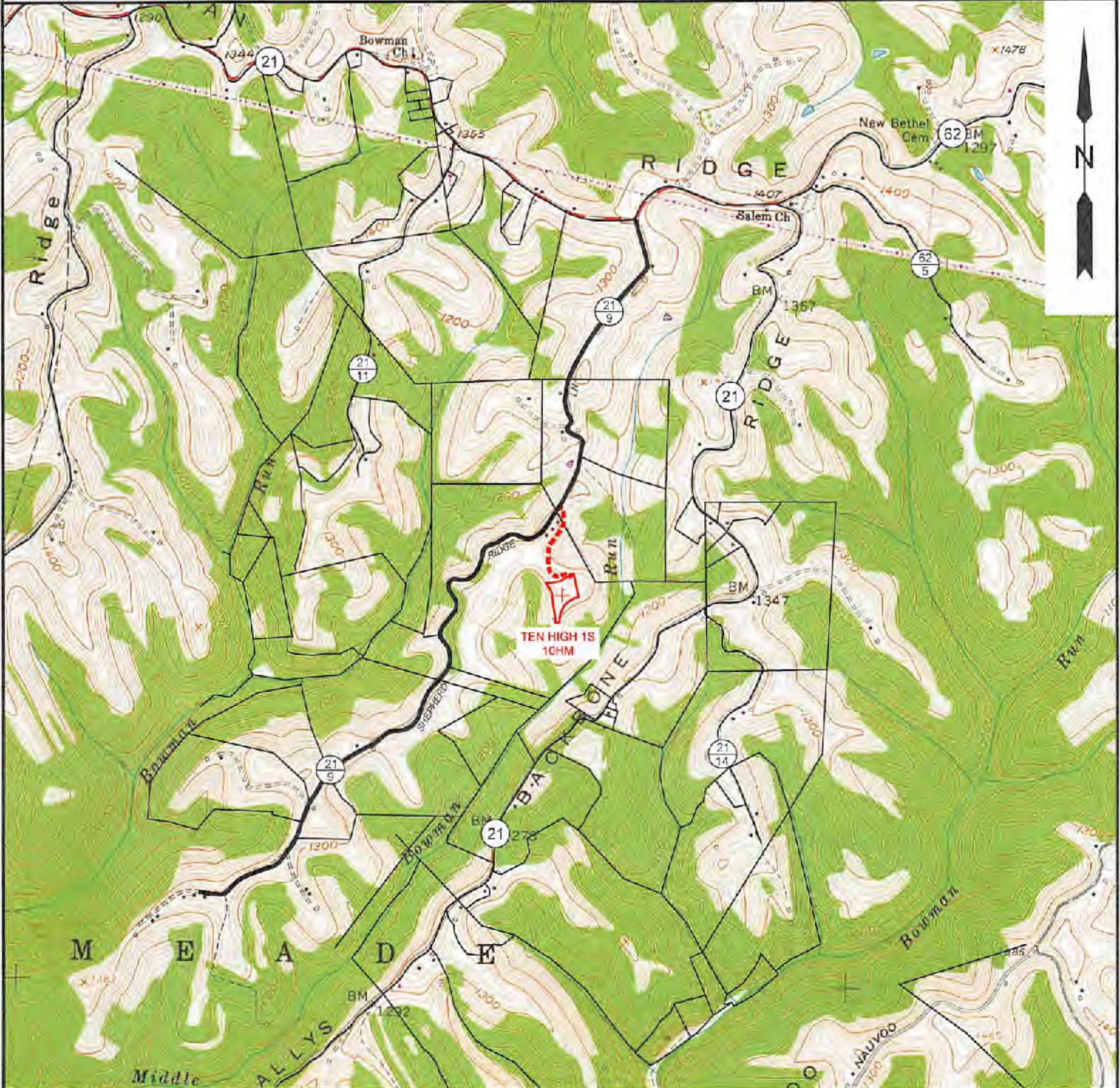
Easting -527,331.48

July 2018

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JUL 9 2018

WV Department of
Environmental Protection



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

LAT: 39.7137712
LON: -80.8258327
LOCATED: S 51°03'40" W AT 52.970' FROM TEN HIGH 1S - 10HM SURFACE LOCATION

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TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
DRAWN BY		DATE	SCALE
K.G.M.		09-13-17	1" = 2000'



TUG HILL
OPERATING

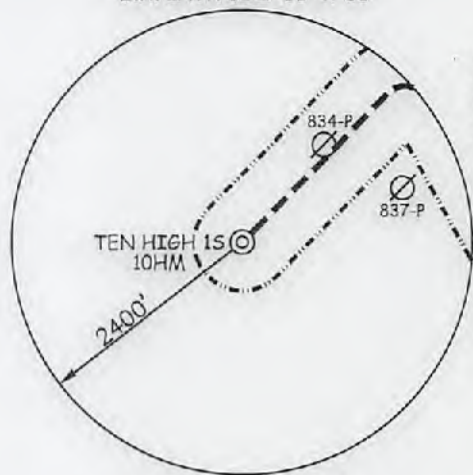
TEN HIGH 1S LEASE
WELL 10HM
TUG HILL OPERATING

B.H.

9,023' B.H.

3,944' T.H.

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



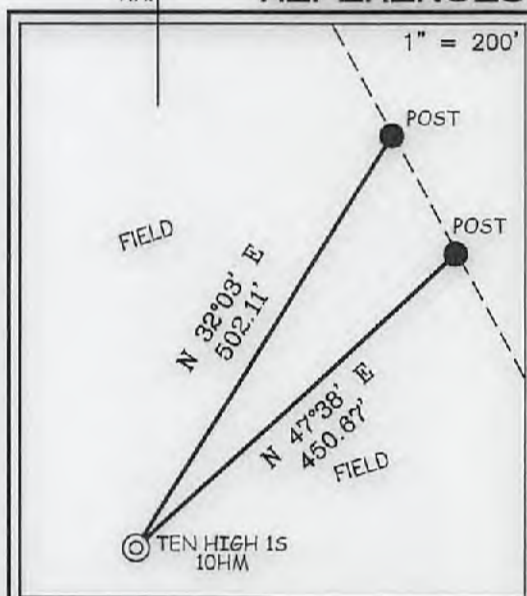
T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°37'30"

9,682' T.H.

1,135' B.H.

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)		
NAD'83 S.P.C.(FT)	N. 478,140.90	E. 1,658,806.64
NAD'83 GEO.	LAT-(N) 39.808755	LONG-(W) 80.880707
NAD'83 UTM (M)	N. 4,406,953.00	E. 527,331.48
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 479,401.6	E. 1,638,968.1
NAD'83 GEO.	LAT-(N) 39.810293	LONG-(W) 80.873072
NAD'83 UTM (M)	N. 4,406,753.1	E. 527,983.6
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 471,424.4	E. 1,643,350.4
NAD'83 GEO.	LAT-(N) 39.788551	LONG-(W) 80.857108
NAD'83 UTM (M)	N. 4,404,345.1	E. 529,359.3

REFERENCES



NOTES ON SURVEY

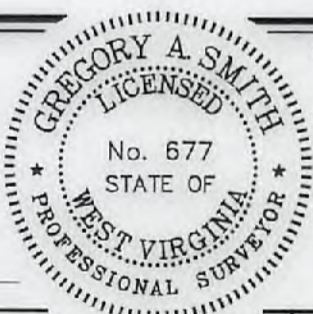
1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
2. WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'

P.O. Box 150 • 12 Vanham Drive • Glenville, WV 26031 • (304) 462-5634
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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 SEPTEMBER 13, 20 17
REVISED DECEMBER 18, 20 17
OPERATORS WELL NO. TEN HIGH 1S-10HM
API WELL NO. 47 - 051 - 02074 *H6A*
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8655P10HMR.dwg
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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

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

LOCATION: GROUND = 1,318.60' 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 - WW-6A1 ACREAGE 139.79±

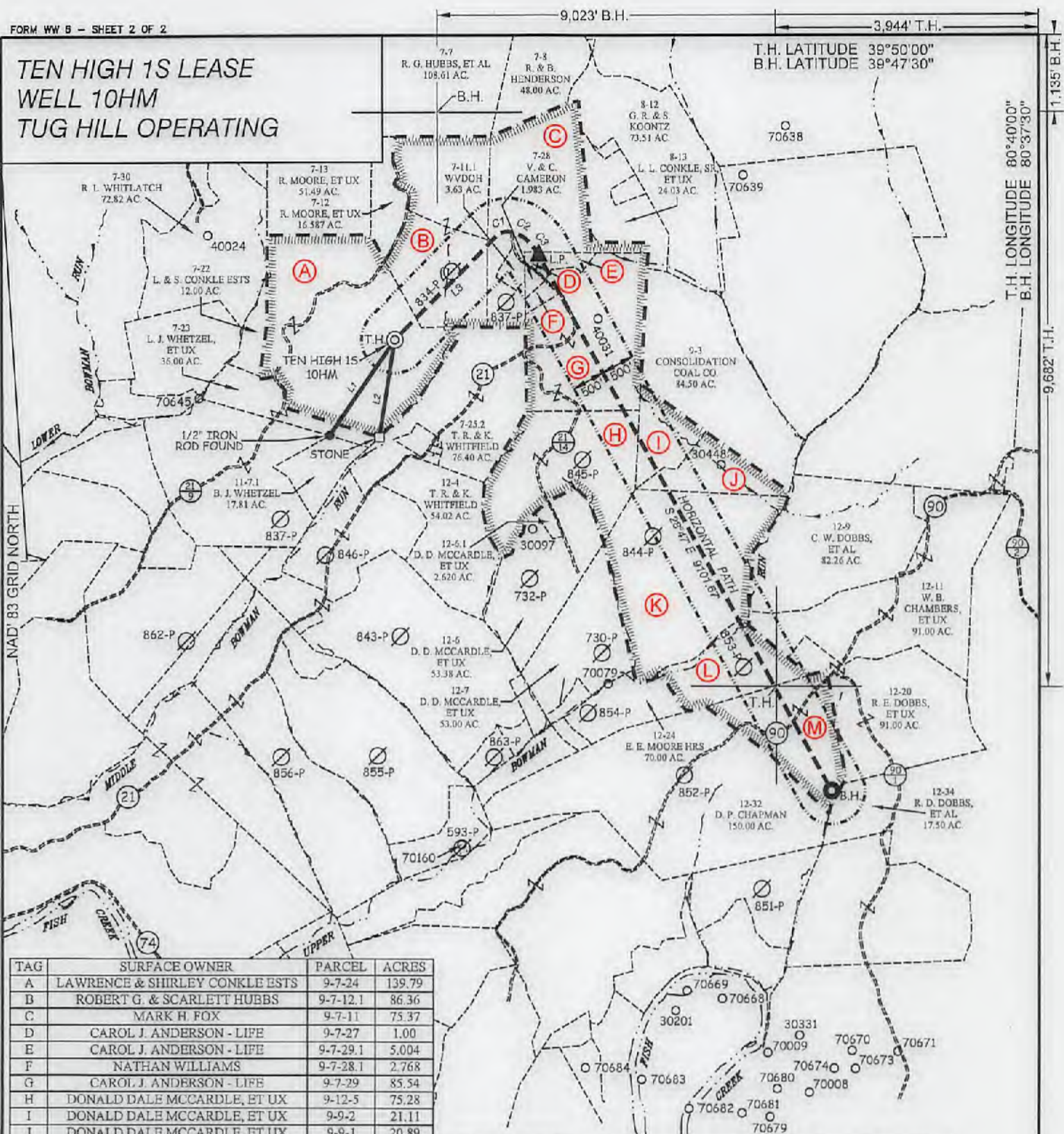
PROPOSED WORK: LEASE NO. SEE WW-6A1
DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER
PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION MARCELLUS
ESTIMATED DEPTH TVD: 6,865' / TMD: 17,011'

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

COUNTY NAME

PERMIT

TEN HIGH 1S LEASE
WELL 10HM
TUG HILL OPERATING



TAG	SURFACE OWNER	PARCEL	ACRES
A	LAWRENCE & SHIRLEY CONKLE ESTS	9-7-24	139.79
B	ROBERT G. & SCARLETT HUBBS	9-7-12.1	86.36
C	MARK H. FOX	9-7-11	75.37
D	CAROL J. ANDERSON - LIFE	9-7-27	1.00
E	CAROL J. ANDERSON - LIFE	9-7-29.1	5,004
F	NATHAN WILLIAMS	9-7-28.1	2,768
G	CAROL J. ANDERSON - LIFE	9-7-29	85.54
H	DONALD DALE MCCARDLE, ET UX	9-12-5	75.28
I	DONALD DALE MCCARDLE, ET UX	9-9-2	21.11
J	DONALD DALE MCCARDLE, ET UX	9-9-1	20.89
K	DONALD DALE MCCARDLE, ET UX	9-12-8	117.85
L	OLIVER CROW	9-12-22	38.58
M	DAVID P. CHAPMAN	9-12-21	50.00

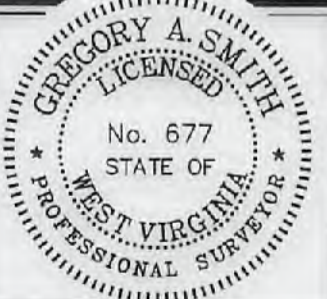
CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	224.63'	240.52'	N 70°13' E	216.55'
C2	280.35'	482.44'	S 64°31' E	276.43'
C3	300.91'	863.76'	S 38°41' E	299.35'

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LINE	BEARING	DISTANCE
L1	S 34°23' W	1734.88'
L2	S 09°19' W	1474.10'
L3	N 44°39' E	2164.55'

P.S.
677
Gregory A. Smith

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'83 S.P.C.(FT) N. 478,140.90 E. 1,636,808.64
 NAD'83 GEO. LAT-(N) 39.806755 LONG-(W) 80.680707
 NAD'83 UTM (M) N. 4,406,359.00 E. 527,391.40
LANDING POINT
 NAD'83 S.P.C.(FT) N. 479,401.6 E. 1,636,969.1
 NAD'83 GEO. LAT-(N) 39.810298 LONG-(W) 80.673072
 NAD'83 UTM (M) N. 4,406,753.1 E. 527,983.6
BOTTOM HOLE
 NAD'83 S.P.C.(FT) N. 471,424.4 E. 1,643,350.4
 NAD'83 GEO. LAT-(N) 39.788551 LONG-(W) 80.657108
 NAD'83 UTM (M) N. 4,404,345.1 E. 529,359.3



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

SCALE 1" = 2000' FILE NO. 8655P10HMR.dwg
 DATE SEPTEMBER 13, 20 17
 REVISED DECEMBER 18, 20 17
 OPERATORS WELL NO. TEN HIGH 1S-10HM
 API WELL NO. 47 - 051 - 02074 H6A
 NO. STATE COUNTY PERMIT

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

LEGEND

- LEASE LINE
- SURFACE LINE
- WELL LATERAL
- OFFSET LINE
- THE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- TAX MAP-PARCEL 00-00
- SURFACE OWNER (SEE TABLE) (A)
- LEASE # (SEE WW-6A1)

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

COUNTY NAME PERMIT

WW-6A1
(5/13)

Operator's Well No. Ten High 1S-10HM

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

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

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

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

*See attached pages

RECEIVED
Office of Oil and Gas

JUL 9 2018

WV Department of
Environmental Protection

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

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

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

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

Well Operator: Tug Hill Operating, LLC

By: Amy L. Miller 

Its: Permitting Specialist

WW - 6A1 Supplement

RECEIVED
Office of Oil and Gas

4705102074

Operator's Well No. Ten High 1S - 10HM

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book & Page	Assignment	Assignment	Assignment
10*15662	A	9-7-24	LARRY LEE CONKLE	CHEVRON U.S.A. INC.	1/8+	863 354	N/A	N/A	Chevron to Tug Hill: 36/148
10*15663	A	9-7-24	ROY A CONKLE SR	CHEVRON USA INC	1/8+	863 311	N/A	N/A	Chevron to Tug Hill: 36/148
10*15664	A	9-7-24	THERESA ANNE HUGHES	CHEVRON USA INC	1/8+	863 343	N/A	N/A	Chevron to Tug Hill: 36/148
10*15666	A	9-7-24	BRENDA J WHETZEL	CHEVRON USA INC	1/8+	863 635	N/A	N/A	Chevron to Tug Hill: 36/148
10*16049	A	9-7-24	DANNY SHAWN KERNS AND AMY LYNN KERNS	TH EXPLORATION LLC	1/8+	905 518	N/A	N/A	N/A
10*16138	A	9-7-24	LARRY W KUHN AND VICKIE B KUHN, HUSBAND AND WIFE	TH EXPLORATION LLC	1/8+	905 522	N/A	N/A	N/A
10*16139	A	9-7-24	HUBERT DEAN KUHN AND ANDREA KUHN	TH EXPLORATION LLC	1/8+	905 524	N/A	N/A	N/A
10*16140	A	9-7-24	ANDY PAUL & JACKIE KUHN	TH EXPLORATION LLC	1/8+	905 526	N/A	N/A	N/A
10*16141	A	9-7-24	HOWARD L KUHN AND MARY L KUHN	TH EXPLORATION LLC	1/8+	905 528	N/A	N/A	N/A
10*16820	A	9-7-24	ROBERTA ANN AND DAVID S GIBB	TH EXPLORATION LLC	1/8+	919 237	N/A	N/A	N/A
10*17365	A	9-7-24	MYSTI JOANNE GOODMAN	TH EXPLORATION LLC	1/8+	927 268	N/A	N/A	N/A
10*17370	A	9-7-24	KELLY JUNE GOODMAN	TH EXPLORATION LLC	1/8+	927 470	N/A	N/A	N/A
10*18256	A	9-7-24	JEFFREY STEPHEN GOODMAN	TH EXPLORATION LLC	1/8+	929 1	N/A	N/A	N/A
10*47051.295.10	A	9-7-24	DEENA J PALOMO	TH EXPLORATION LLC	1/8+	905 470	N/A	N/A	N/A
10*47051.295.11	A	9-7-24	REGINA D FIGUEROA AND DAVID FIGUEROA	TH EXPLORATION LLC	1/8+	905 435	N/A	N/A	N/A
10*47051.295.12	A	9-7-24	EARL D WELLMAN	TH EXPLORATION LLC	1/8+	905 432	N/A	N/A	N/A
10*47051.295.13	A	9-7-24	THE DOLLYE F WOOD REVOCABLE TRUST BY NICHOLAS CHARLES WOOD AS TRUSTEE	TH EXPLORATION LLC	1/8+	904 641	N/A	N/A	N/A
10*47051.295.3	A	9-7-24	HAZEL ARIZONA MOORE REYNOLDS	TH EXPLORATION LLC	1/8+	904 632	N/A	N/A	N/A
10*47051.295.4	A	9-7-24	LLOYD D MOORE	TH EXPLORATION LLC	1/8+	904 459	N/A	N/A	N/A
10*47051.295.5	A	9-7-24	DALE R MOORE	TH EXPLORATION LLC	1/8+	904 635	N/A	N/A	N/A
10*47051.295.6	A	9-7-24	MARY I BURKHART	TH EXPLORATION LLC	1/8+	904 638	N/A	N/A	N/A
10*47051.295.7	A	9-7-24	JEANNE V MELCHIORI	TH EXPLORATION LLC	1/8+	904 462	N/A	N/A	N/A
10*47051.295.9	A	9-7-24	JAMES E HIMELRICK JR AND KAREN HIMELRICK	TH EXPLORATION LLC	1/8+	904 465	N/A	N/A	N/A
10*15501	B	9-7-12.1	RONALD AND EDNA MOORE	TRIENERGY INC	1/8+	661 449	N/A	N/A	Chevron to Tug Hill: 36/148
	C	9-7-11	MARK H. FOX	TH EXPLORATION LLC - SEE ATTACHED DOCUMENT	1/8+	864 163	N/A	N/A	Tug Hill to Chevron: 36/168
	D	9-7-27	CAROL J ANDERSON ET AL	CHEVRON U.S.A. INC. - SEE ATTACHED DOCUMENT	1/8+	772 228	N/A	N/A	N/A
	E	9-7-29.1	CAROL J ANDERSON ET AL	CHEVRON U.S.A. INC. - SEE ATTACHED DOCUMENT	1/8+	772 228	N/A	N/A	N/A
	F	9-7-28.1	EVELYN M WILLIAMS	TRIENERGY HOLDINGS LLC - SEE ATTACHED DOCUMENT	1/8+	720 180	N/A	TRIENERGY TO NPAR: 24/430	NPAR TO CHEVRON: 756/332
	G	9-7-29	CAROL J ANDERSON ET AL	CHEVRON U.S.A. INC. - SEE ATTACHED DOCUMENT	1/8+	772 228	N/A	N/A	N/A
10*47051.222.1	H	9-12-5	DONALD D MCCARDLE AND LUCY MCCARDLE	TH EXPLORATION LLC	1/8+	879 314	N/A	N/A	N/A
10*16707	I	9-9-2	STEVEN D AND CAROLYN R CAREY - MINERAL DEED	TH EXPLORATION LLC	1/8+	909 68	N/A	N/A	N/A
10*16707	J	9-9-1	STEVEN D AND CAROLYN R CAREY - MINERAL DEED	TH EXPLORATION LLC	1/8+	909 68	N/A	N/A	N/A
10*47051.289.1	K	9-12-8	JANICE M HIXSON AND HARRY C HIXSON	TH EXPLORATION LLC	1/8+	898 461	N/A	N/A	N/A
10*47051.289.2	K	9-12-8	KENNETH D MCMECHEN	TH EXPLORATION LLC	1/8+	898 463	N/A	N/A	N/A
10*15474	L	9-12-22	CLARK C SAMPSON	TH EXPLORATION LLC	1/8+	907 495	N/A	N/A	N/A
10*15480	L	9-12-22	DOTTIE HERSMAN	TH EXPLORATION LLC	1/8+	907 497	N/A	N/A	N/A
10*15491	L	9-12-22	NORMAN L WOOD	TH EXPLORATION LLC	1/8+	907 507	N/A	N/A	N/A
10*15691	L	9-12-22	ALLIETTA J RUCKER AND RONALD R RUCKER	TH EXPLORATION LLC	1/8+	907 509	N/A	N/A	N/A
10*15692	L	9-12-22	EVA A COULTER	TH EXPLORATION LLC	1/8+	907 511	N/A	N/A	N/A
10*15693	L	9-12-22	EVERETT A WOOD	TH EXPLORATION LLC	1/8+	907 513	N/A	N/A	N/A
10*15732	L	9-12-22	JOAN R CUNNINGHAM AND MARK A CUNNINGHAM	TH EXPLORATION LLC	1/8+	907 515	N/A	N/A	N/A
10*15745	L	9-12-22	BRENDA L KING	TH EXPLORATION LLC	1/8+	907 517	N/A	N/A	N/A
10*16010	L	9-12-22	DONNA M RIGGS AND ROBERT H RIGGS	TH EXPLORATION LLC	1/8+	907 519	N/A	N/A	N/A
10*16012	L	9-12-22	PAULA K PAGE AND PHILLIP G PAGE	TH EXPLORATION LLC	1/8+	907 522	N/A	N/A	N/A

JUL 9 2018

WV Department of
Environmental Protection

WW - 6A1 Supplement

Operator's Well No. Ten High 1S - 10HM

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book & Page	Assignment	Assignment	Assignment
10*16013	L	9-12-22	HERBERT H BURKHART AND BETTY J BURKHART	TH EXPLORATION LLC	1/8+	907 524	N/A	N/A	N/A
10*16014	L	9-12-22	MARY KAY KESSLER AND ROY LEE KESSLER	TH EXPLORATION LLC	1/8+	907 526	N/A	N/A	N/A
10*16022	L	9-12-22	ALBERT D BURKHART	TH EXPLORATION LLC	1/8+	907 528	N/A	N/A	N/A
10*16023	L	9-12-22	BARBARA J BROWN	TH EXPLORATION LLC	1/8+	907 530	N/A	N/A	N/A
10*16057	L	9-12-22	CORA ALICE DAUBE	TH EXPLORATION LLC	1/8+	907 532	N/A	N/A	N/A
10*16119	L	9-12-22	JEFFREY L EWASKEY	TH EXPLORATION LLC	1/8+	907 569	N/A	N/A	N/A
10*16151	L	9-12-22	JOHN HARRIS AND HELEN VIRGINIA HARRIS	TH EXPLORATION LLC	1/8+	907 573	N/A	N/A	N/A
10*16193	L	9-12-22	NANCY L WOLFE	TH EXPLORATION LLC	1/8+	907 575	N/A	N/A	N/A
10*16195	L	9-12-22	DAVID P NIERATKO AND JUDY C NIERATKO	TH EXPLORATION LLC	1/8+	929 344	N/A	N/A	N/A
10*16245	L	9-12-22	MARGARET D STRAUSSER AND GREGORY L STRAUSSER	TH EXPLORATION LLC	1/8+	907 577	N/A	N/A	N/A
10*16293	L	9-12-22	DANIEL LEE AND DIANA M WEST	TH EXPLORATION LLC	1/8+	907 579	N/A	N/A	N/A
10*16294	L	9-12-22	DONNA G AND PAUL L CHMELYSKI	TH EXPLORATION LLC	1/8+	907 581	N/A	N/A	N/A
10*16296	L	9-12-22	DOUGLAS E COURTWRIGHT AND JESSAMINE L COURTWRIGHT	TH EXPLORATION LLC	1/8+	907 583	N/A	N/A	N/A
10*16361	L	9-12-22	ROBERT M WOOD AND CAROL ANN WOOD	TH EXPLORATION LLC	1/8+	907 499	N/A	N/A	N/A
10*16371	L	9-12-22	VERA L APPLGARTH	TH EXPLORATION LLC	1/8+	907 503	N/A	N/A	N/A
10*16411	L	9-12-22	BONNIE L WOOD	TH EXPLORATION LLC	1/8+	907 501	N/A	N/A	N/A
10*16419	L	9-12-22	MELVIN B WOOD	TH EXPLORATION LLC	1/8+	907 505	N/A	N/A	N/A
10*16427	L	9-12-22	LURIA ALWANDA COOLEY	TH EXPLORATION LLC	1/8+	907 585	N/A	N/A	N/A
10*16430	L	9-12-22	EULELAH V RIDDLE	TH EXPLORATION LLC	1/8+	907 587	N/A	N/A	N/A
10*16449	L	9-12-22	BILLIE ALBERTA MIDDLETON	TH EXPLORATION LLC	1/8+	907 613	N/A	N/A	N/A
10*16450	L	9-12-22	JAMES D RAYNER AND PATRICIA ANN RAYNER	TH EXPLORATION LLC	1/8+	907 615	N/A	N/A	N/A
10*16451	L	9-12-22	JAMIE A SMITH AND JOSHUA C SMITH	TH EXPLORATION LLC	1/8+	907 617	N/A	N/A	N/A
10*16466	L	9-12-22	KAREN J AND MICHAEL E BRUGGEMAN	TH EXPLORATION LLC	1/8+	907 619	N/A	N/A	N/A
10*16467	L	9-12-22	CHARLES A AND GARY LYNN ECKHARDT	TH EXPLORATION LLC	1/8+	907 621	N/A	N/A	N/A
10*16542	L	9-12-22	CAROL ANN YEATER AND RICKEY A YEATER	TH EXPLORATION LLC	1/8+	907 623	N/A	N/A	N/A
10*16543	L	9-12-22	JERRY R AND JACQUELYNN E RUTHERS	TH EXPLORATION LLC	1/8+	907 625	N/A	N/A	N/A
10*16544	L	9-12-22	NORMA JEAN ROGERS AND DONALD L ROGERS SR	TH EXPLORATION LLC	1/8+	907 627	N/A	N/A	N/A
10*16681	L	9-12-22	BRENDA S THOMPSON	TH EXPLORATION LLC	1/8+	929 350	N/A	N/A	N/A
10*16682	L	9-12-22	CYNTHIA A AND WILLIAM D FETTY	TH EXPLORATION LLC	1/8+	929 616	N/A	N/A	N/A
10*16683	L	9-12-22	FRANKLIN CLARK PATRICIA FENSTERMACHER	TH EXPLORATION LLC	1/8+	929 346	N/A	N/A	N/A
10*16846	L	9-12-22	PAMELA SUE BURGE	TH EXPLORATION LLC	1/8+	929 348	N/A	N/A	N/A
10*16847	L	9-12-22	WILLIAM L AND JENNIFER R EWASKEY	TH EXPLORATION LLC	1/8+	929 352	N/A	N/A	N/A
10*16889	L	9-12-22	HAROLD H CLARK JR	TH EXPLORATION LLC	1/8+	929 354	N/A	N/A	N/A
10*16921	L	9-12-22	HAZEL CLARK ROSEN LUND	TH EXPLORATION LLC	1/8+	929 356	N/A	N/A	N/A
10*16974	L	9-12-22	BRANDY L WOOD	TH EXPLORATION LLC	1/8+	929 360	N/A	N/A	N/A
10*16975	L	9-12-22	TIMOTHY J WOOD	TH EXPLORATION LLC	1/8+	929 358	N/A	N/A	N/A
10*16988	L	9-12-22	CHAD ERIC BENNETT AND MARY A BENNETT	TH EXPLORATION LLC	1/8+	929 584	N/A	N/A	N/A
10*16998	L	9-12-22	MISTY JO WOOD AND GARY A MORRIS	TH EXPLORATION LLC	1/8+	929 362	N/A	N/A	N/A
10*17183	L	9-12-22	TARA E BENNETT	TH EXPLORATION LLC	1/8+	929 586	N/A	N/A	N/A
10*17277	L	9-12-22	GUY C ANDO AND WENDY PYLES ANDO	TH EXPLORATION LLC	1/8+	929 594	N/A	N/A	N/A
10*17280	L	9-12-22	BONNIE M KIDD AND CHARLES R KIDD	TH EXPLORATION LLC	1/8+	929 592	N/A	N/A	N/A
10*17281	L	9-12-22	STACY R BENNETT	TH EXPLORATION LLC	1/8+	929 590	N/A	N/A	N/A
10*17282	L	9-12-22	CARLIS LEON CLARK	TH EXPLORATION LLC	1/8+	929 588	N/A	N/A	N/A
10*17423	L	9-12-22	LORI ANN WEST	TH EXPLORATION LLC	1/8+	929 596	N/A	N/A	N/A
10*17424	L	9-12-22	CAROL A CLARK	TH EXPLORATION LLC	1/8+	929 598	N/A	N/A	N/A
10*17446	L	9-12-22	GREGORY DEAN CLARK AND MARY ANN CLARK	TH EXPLORATION LLC	1/8+	929 600	N/A	N/A	N/A
10*17488	L	9-12-22	SUSANNA M DENIS	TH EXPLORATION LLC	1/8+	929 604	N/A	N/A	N/A
10*17495	L	9-12-22	KEVIN R CLARK AND NANCY G CLARK	TH EXPLORATION LLC	1/8+	929 608	N/A	N/A	N/A
10*17498	L	9-12-22	MICHAEL R DODD AND LISA M DODD	TH EXPLORATION LLC	1/8+	929 614	N/A	N/A	N/A

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WW - 6A1 Supplement

Operator's Well No. Ten High 1S - 10HM

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book & Page	Assignment	Assignment	Assignment
10*17521	L	9-12-22	BETTY LOU MCMILLAN AND WILLIAM A MCMILLAN	TH EXPLORATION LLC	1/8+	929 610	N/A	N/A	N/A
10*17522	L	9-12-22	RONALD D CLARK AND TAMMY C CLARK	TH EXPLORATION LLC	1/8+	929 612	N/A	N/A	N/A
10*17523	L	9-12-22	ROBERT R CLARK II	TH EXPLORATION LLC	1/8+	929 620	N/A	N/A	N/A
10*17529	L	9-12-22	HARRY C BURGE JR AND CAROL S BURGE	TH EXPLORATION LLC	1/8+	929 602	N/A	N/A	N/A
10*17558	L	9-12-22	SHIRLEY IRENE VANOVER	TH EXPLORATION LLC	1/8+	929 618	N/A	N/A	N/A
10*17585	L	9-12-22	DEBORAH L LUGO AND RONALD J LUGO	TH EXPLORATION LLC	1/8+	929 622	N/A	N/A	N/A
10*17587	L	9-12-22	DONNA SUE BEVERIDGE AND EARL P BEVERIDGE	TH EXPLORATION LLC	1/8+	929 626	N/A	N/A	N/A
10*17624	L	9-12-22	SHIRLEY E ELKINS	TH EXPLORATION LLC	1/8+	928 557	N/A	N/A	N/A
10*17704	L	9-12-22	BETTY L & ROY S PEARCE	TH EXPLORATION LLC	1/8+	929 628	N/A	N/A	N/A
10*17714	L	9-12-22	RUSSELL A CLARK AND CATHERINE CLARK	TH EXPLORATION LLC	1/8+	929 630	N/A	N/A	N/A
10*18106	L	9-12-22	TIMOTHY HEWITT	TH EXPLORATION, LLC	1/8+	929 628	N/A	N/A	N/A
10*18237	L	9-12-22	CLARENCE LEE CLARK	TH EXPLORATION, LLC	1/8+	930 3	N/A	N/A	N/A
10*18238	L	9-12-22	KATHRYN L ATWELL	TH EXPLORATION LLC	1/8+	930 1	N/A	N/A	N/A
10*18239	L	9-12-22	VERA S CAIN	TH EXPLORATION LLC	1/8+	929 649	N/A	N/A	N/A
10*18240	L	9-12-22	JODY CLARK ELLIOTT	TH EXPLORATION LLC	1/8+	929 647	N/A	N/A	N/A
10*18242	L	9-12-22	WILLIAM R DODD AND NANCY DODD	TH EXPLORATION LLC	1/8+	929 645	N/A	N/A	N/A
10*47051.289.1	L	9-12-22	JANICE M HIXSON AND HARRY C HIXSON	TH EXPLORATION LLC	1/8+	898 461	N/A	N/A	N/A
10*47051.289.2	L	9-12-22	KENNETH D MCMECHEN	TH EXPLORATION LLC	1/8+	898 463	N/A	N/A	N/A
10*47051.289.3	L	9-12-22	NELLIE JOANN CLARK	TH EXPLORATION LLC	1/8+	907 493	N/A	N/A	N/A
10*47051.140.1	M	9-12-21	DAVID P CHAPMAN & DEBORAH BORCK-CHAPMAN	TH EXPLORATION LLC	1/8+	866 318	N/A	N/A	N/A
10*47051.140.2	M	9-12-21	DOROTHY SULLIVAN POA JAMES REID SULLIVAN	TH EXPLORATION LLC	1/8+	873 501	N/A	N/A	N/A

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STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

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

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

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FURTHER, AFFIANT SAITH NOT.

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

David D. Kalish
Affiant: David D. Kalish

JURAT

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

STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

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

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



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



July 6, 2018

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

RE: Ten High 1S-10HM

Subject: Marshall County Route 21/9 and 21/11 Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 21/9 and 21/11 in the area reflected on the Ten High 1S-10HM 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 directly at 304-376-0111, or by email at amiller@tug-hill.com.

Sincerely,

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

Amy L. Miller
Permitting Specialist – Appalachia Region

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

Date of Notice Certification: 07/06/2018

API No. 47- 051 - _____
Operator's Well No. Ten High 1S-10HM
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>527,331.48</u>
County: <u>Marshall</u>		Northing: <u>4,406,358.00</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 & 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		OOG OFFICE USE ONLY <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 JUL 9 2018 WV Department of Environmental Protection		

Required Attachments:

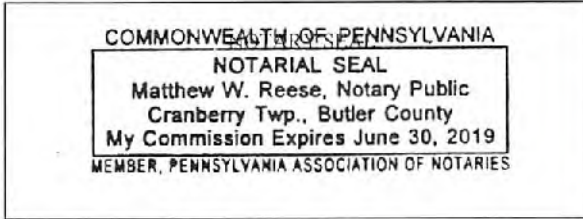
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication 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 L. 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 L. Miller *Amy Miller*
Its: Permitting 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 6th day of July 2018.
Matthew W. Reese Notary Public
My Commission Expires June 30, 2019

Oil and Gas Privacy Notice:

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

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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: 7/6/2018 Date Permit Application Filed: 7/7/2018

Notice of:

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

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

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

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

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

SURFACE OWNER(s)
Name: 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:
Address:

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

*Please attach additional forms if necessary

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Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

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Environmental Protection

WW-6A
(8-13)

API NO. 47-051 -
OPERATOR WELL NO. Ten High 1S-10HM
Well Pad Name: Ten High

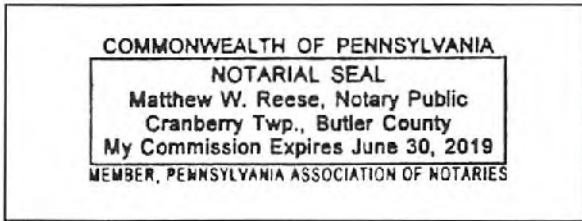
Notice is hereby given by:

Well Operator: Tug Hill Operating, LLC
Telephone: 724-749-8368
Email: amiller@tug-hill.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.



Subscribed and sworn before me this 6th day of Jul., 2018.

Matthew W. Reese
Notary Public

My Commission Expires June 30, 2019

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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

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

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Exhibit WW-6A

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

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

Well: Ten High 1S – 10HM
District: Meade (House #'s 1-3)
State: WV

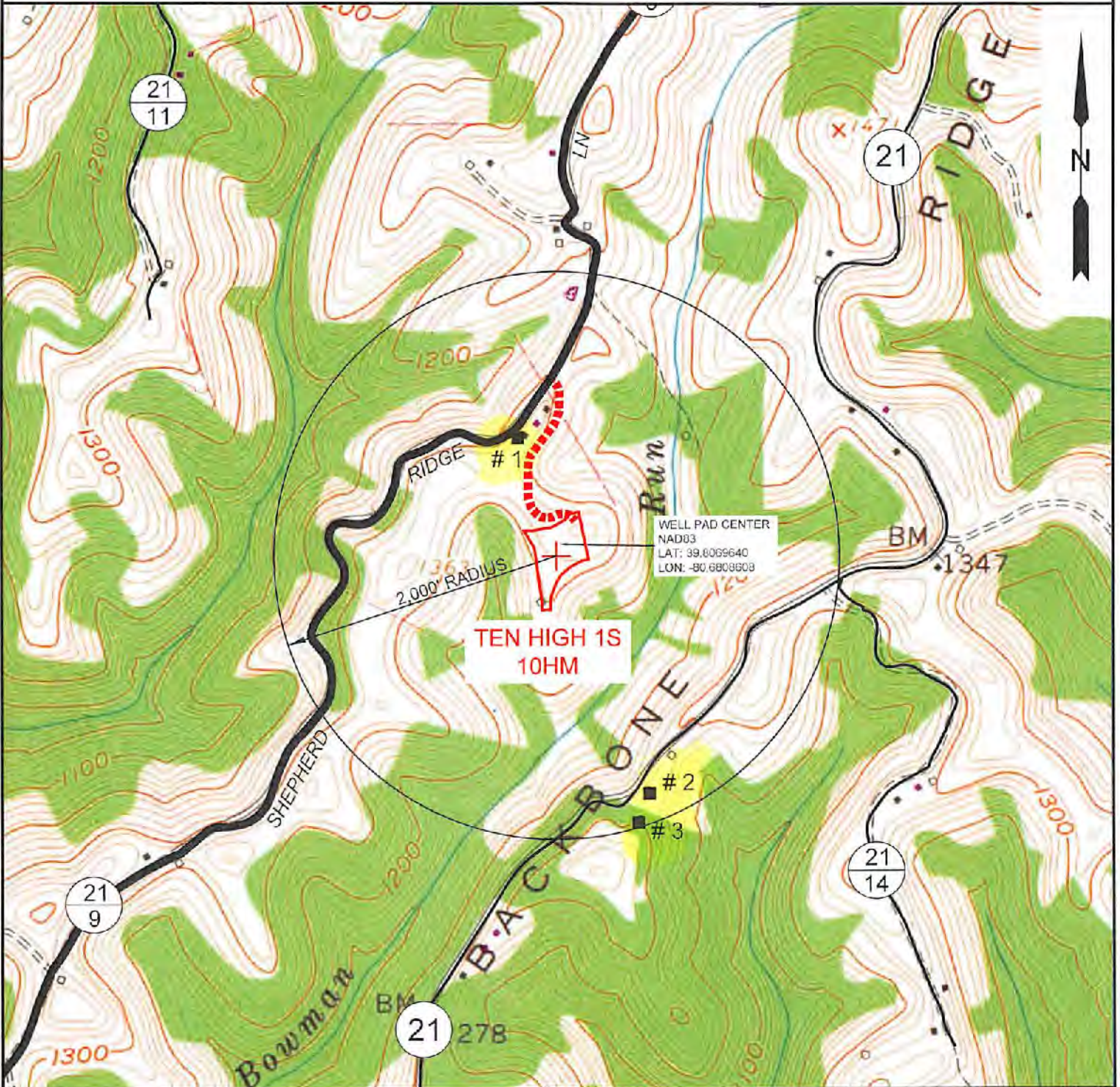
There are three (3) residences, no businesses, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

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



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

 <p>SLS Land & Energy Development <i>Solutions from the ground up.</i> P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26031 • (304) 462-5934 www.slsurveys.com</p>	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	09-13-17	1" = 1000'	



WW-6A3
(1/12)

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: December 9, 2016 **Date of Planned Entry:** December 20, 2016

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

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

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

Notice is hereby provided to:

SURFACE OWNER(s)

Name: ESTATE OF LAWRENCE & SHIRLEY MAE CONKLE c/o Roy Conkle
 Address: 75 ARLINGTON AVENUE
MOUNDSVILLE, WV 26041

Name: ROY A CONKLE, SR.
 Address: 75 ARLINGTON AVENUE
MOUNDSVILLE, WV 26041

Name: LARRY CONKLE
 Address: 154 CONKLE DRIVE
GLEN EASTON, WV 26039 **SEE ATTACHED**

COAL OWNER OR LESSEE

Name: MURRAY ENERGY CORPORATION
 Address: 46226 NATIONAL ROAD
ST. CLAIRSVILLE, OH 43950

MINERAL OWNER(s)

Name: ESTATE OF LAWRENCE & SHIRLEY MAE CONKLE c/o Roy Conkle
 Address: 75 ARLINGTON AVENUE
MOUNDSVILLE, WV 26041 **SEE ATTACHED**

*please attach additional forms if necessary

RECEIVED
Office of Oil and Gas

JUL 9 2018

WV Department of
Environmental Protection

Notice is hereby given:

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

State: <u>WEST VIRGINIA</u>	Approx. Latitude & Longitude: <u>LAT 39.8087775 LONG -80.6809192</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 CONKLE, SR.</u>

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

Notice is hereby given by:

Well Operator: <u>TUG HILL OPERATING, LLC</u>	Address: <u>360 SOUTHPOINTE BLVD., SOUTHPOINTE PLAZA II, SUITE 200</u>
Telephone: <u>(724) 749-8388</u>	<u>CANONSBURG, PA 15317</u>
Email: <u>jwhite@tug-hilltop.com</u>	Facsimile: <u>(724) 368-2030</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.

Operator Well No. TEN HIGH 1S-10HM

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

Surface Owner(s):

Name: Teresa Hughes
Address: 252 Conkle Drive
Glen Easton, WV 26039

Brenda Joyce Wetzel
RD 1, Box 79
Glen Easton, WV 26039

Surface Owner(s) Access Road:

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

Mineral Owner(s):

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

Larry Conkle
154 Conkle Drive
Glen Easton, WV 26039

Teresa Hughes
252 Conkle Drive
Glen Easton, WV 26039

Brenda Joyce Wetzel
RD 1, Box 79
Glen Easton, WV 26039

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WW-6A5
(1/12)

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: 07/06/2018 **Date Permit Application Filed:** 07/09/2018

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

CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

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

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

Name: 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>527,331.48</u>
County:	<u>Marshall</u>		Northing:	<u>4,406,358.00</u>
District:	<u>Maade</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 & 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 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

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

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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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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 57th Street, SE
Charleston, WV 25304

Subject: DOH Permit for the Ten High 1N Pad, Marshall County
Ten High 1S Unit-10HM 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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PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Ten High 1S-10HM

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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h Well Site

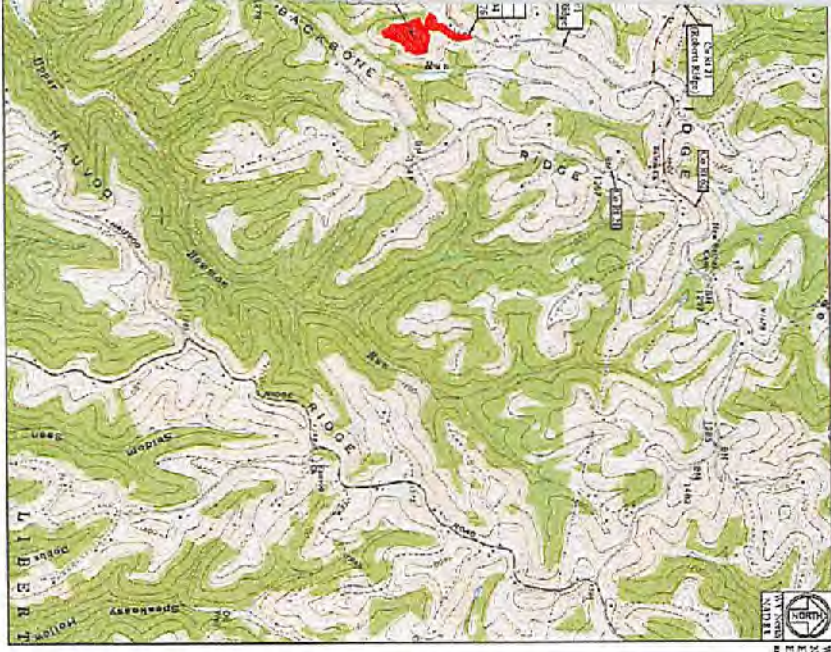
Construction Plan, &
 Erosion Control Plans
 Operating
 all County
 le District
 39.80696402°
 -80.68086081°
 Creek Watershed

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 WV Department of
 Environmental Protection

Pertinent Site Information
 Ten High Well Site
 Emergency Number: 304-845-1920
 Meade District, Marshall County, WV
 Watershed: Middle Fish Creek Watershed
 Tug Hill Contact Number: 1-817-632-3400

WVDEP 00G
ACCEPTED AS-BUILT
 1/9/2018

A: As-Built



WV State Plane Coordinate System
 North Carolina
 Elevation Based on NAVD83
 Established by Survey Field GPS
 and GPRS Positioning

Property Owner Information - Ten High Well Site
 Meade District - Marshall County

Owner	LINE	Feet	Acres	Front	Side	Back	Area	Use
EMERY BROTHERS, LLC	75.11'	0.00	0.04	0.00	0.00	0.00	0.08	AG
LAURENCE COWLEY, JR.	75.8'	3.97	1.18	1.32	0.81	0.81	25.19	AG
Site Location	5.97'	7.18'	1.32'	7.18'	7.18'	7.18'	16.50	AG

Access Road

Start Point	End Point	Area	Use
START POINT 1	END POINT 1	1.00	AG
START POINT 2	END POINT 2	1.00	AG
START POINT 3	END POINT 3	1.00	AG

Disturbed Area

Area	Area	Area	Area
Water Footprint	5.97 AC		
Water Footprint Construction	1.32 AC		
Water Footprint Erosion Control	1.32 AC		
Water Footprint Access Road	2.18 AC		
Total Disturbed Area	10.79 AC		

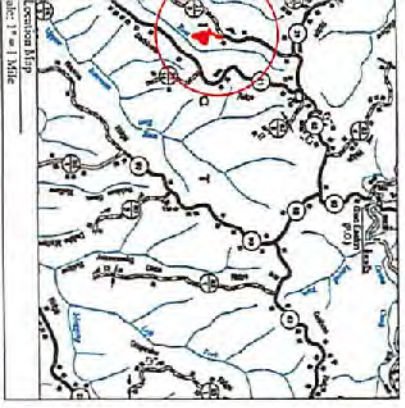
Ten High Well Site Quantities

Description	Quantity	Unit	Description	Quantity	Unit
Water Footprint	5.97	AC	Stock Pile	1000	CU YD
Water Footprint Construction	1.32	AC	Stock Pile Length of Edge	1000	FT
Water Footprint Erosion Control	1.32	AC	Stock Pile Area	1000	SQ FT
Water Footprint Access Road	2.18	AC	Stock Pile Volume	1000	CY
Water Footprint Total	10.79	AC	Stock Pile Weight	1000	TONS

gr 12/2017

Site Locations (MAD 83)

Structure	Latitude (GDS)	Longitude (GDS)
Well Pad	39.80696402	-80.68086081
Water Footprint	39.80696402	-80.68086081



EXISTING API NUMBERS
 4705101934
 4705101943
 4705101944
 4705101945
 4705101964

Well Location Restrictions
 All Well locations shall comply with the following restrictions:
 1) 200 feet from any existing well or abandoned well, except for a distance of 100 feet from an existing well or abandoned well that is 200 feet or more from the edge of the well pad.
 2) 100 feet from the edge of any existing well or abandoned well, except for a distance of 100 feet from the edge of the well pad.
 3) 100 feet from the edge of any existing well or abandoned well, except for a distance of 100 feet from the edge of the well pad.
 4) 100 feet from the edge of any existing well or abandoned well, except for a distance of 100 feet from the edge of the well pad.
 5) 100 feet from the edge of any existing well or abandoned well, except for a distance of 100 feet from the edge of the well pad.
 6) 100 feet from the edge of any existing well or abandoned well, except for a distance of 100 feet from the edge of the well pad.
 7) 100 feet from the edge of any existing well or abandoned well, except for a distance of 100 feet from the edge of the well pad.
 8) 100 feet from the edge of any existing well or abandoned well, except for a distance of 100 feet from the edge of the well pad.
 9) 100 feet from the edge of any existing well or abandoned well, except for a distance of 100 feet from the edge of the well pad.
 10) 100 feet from the edge of any existing well or abandoned well, except for a distance of 100 feet from the edge of the well pad.



This is a preliminary drawing. It is not to be used for construction without the approval of the engineer. The engineer is not responsible for any errors or omissions in this drawing. The engineer is not responsible for any damage to property or persons caused by the use of this drawing. The engineer is not responsible for any delay in the completion of the project caused by the use of this drawing. The engineer is not responsible for any cost overruns caused by the use of this drawing. The engineer is not responsible for any other consequences of the use of this drawing.

Zachary C. Stumacher
 Professional Engineer
 State of West Virginia
 License No. 22214

Sheet	Description
VI	Cover Sheet
VI-1	Schedule of Quantities
VI-2	Site Plan
VI-3	Site Plan - Construction Site Conditions
VI-4	Site Plan - Clearing Exhibit
VI-5	Overall Plan View
VI-6	Access Road View
VI-7	Top Key Exhibit
VI-8	Plan View
VI-9	Plan Section - Well Pad
VI-10	Plan Section - Access Road
VI-11	Geotechnical Exhibit - Road
VI-12	Geotechnical Exhibit - Well Pad
VI-13	Landscape Disturbed Area Exhibit
VI-14	Site Reclamation
VI-15	Production Exhibit
VI-16	Erosion and Sediment Control Details
VI-17	Access Road Details
VI-18	Well Details

Cover Sheet
 Ten High Well Site
 Meade District
 Marshall County, WV

DATE: 07/12/2017
 SCALE: AS SHOWN
 DRAWN BY: ZCS
 CHECKED BY: ZCS
 SHEET 1 OF 13



Kelly Sponsoring
 Environmental Services

Revision	Date
Design	02-17-2017
As-Built	12-06-2017

Ten High Well Site
Tug Hill Operating
Exhibit A: As-Built



Date	Revision
02-17-2017	Design
12-06-2017	As-Built

TUG HILL
OPERATING

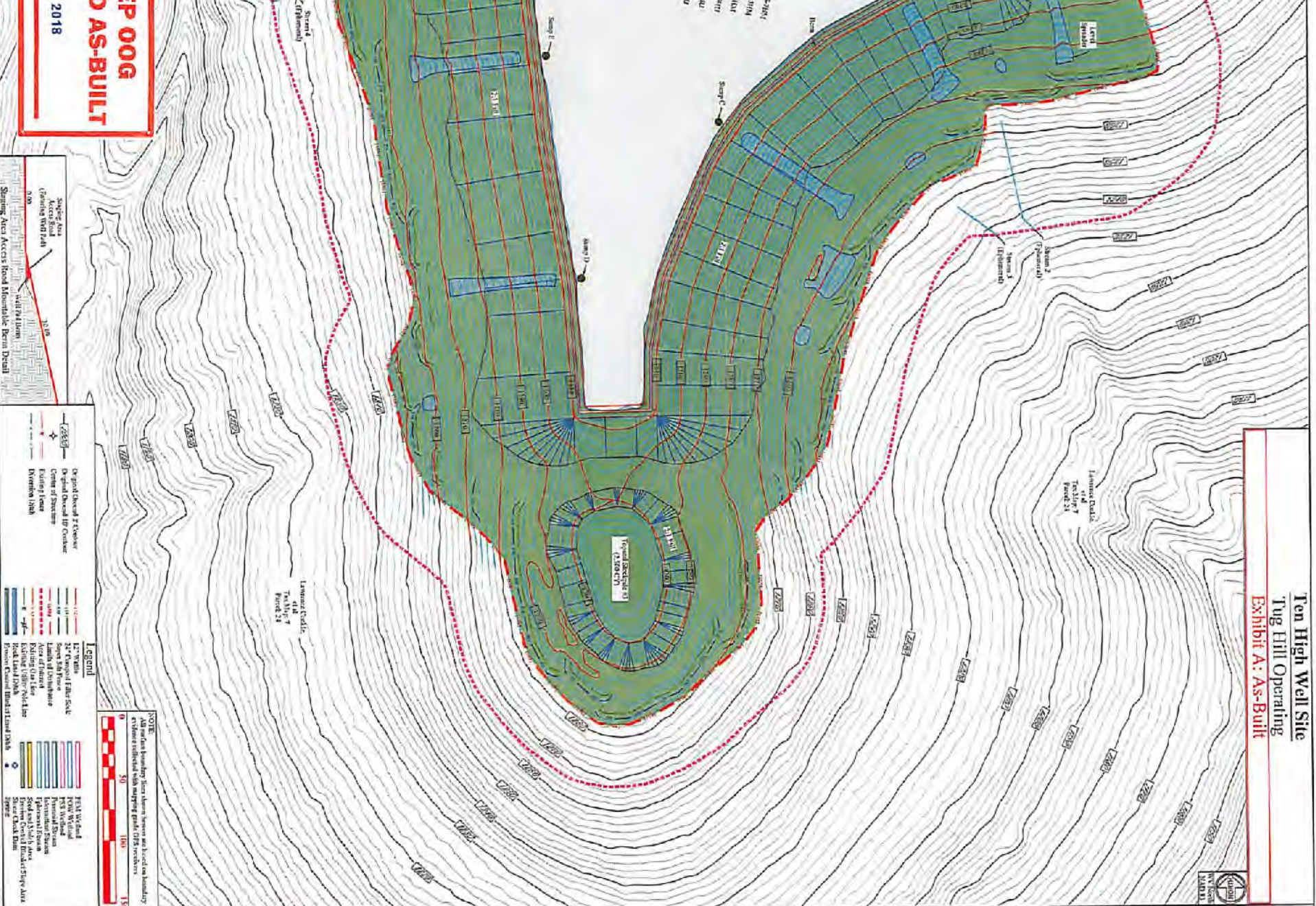


THIS DOCUMENT
PREPARED FOR
TUG HILL
OPERATING



Erosion and Sediment Control Plan
Ten High Well Site
Meade District
Marshall County, WV

Date: 02/17/2017
Drawn: AJ Brown
Checked: JES
Scale: ASB
Sheet 7 of 13



Legend

	12" Vents
	24" Topsoil Filter Sock
	36" Topsoil Filter Sock
	48" Topsoil Filter Sock
	60" Topsoil Filter Sock
	72" Topsoil Filter Sock
	84" Topsoil Filter Sock
	96" Topsoil Filter Sock
	108" Topsoil Filter Sock
	120" Topsoil Filter Sock
	132" Topsoil Filter Sock
	144" Topsoil Filter Sock
	156" Topsoil Filter Sock
	168" Topsoil Filter Sock
	180" Topsoil Filter Sock
	192" Topsoil Filter Sock
	204" Topsoil Filter Sock
	216" Topsoil Filter Sock
	228" Topsoil Filter Sock
	240" Topsoil Filter Sock
	252" Topsoil Filter Sock
	264" Topsoil Filter Sock
	276" Topsoil Filter Sock
	288" Topsoil Filter Sock
	300" Topsoil Filter Sock
	312" Topsoil Filter Sock
	324" Topsoil Filter Sock
	336" Topsoil Filter Sock
	348" Topsoil Filter Sock
	360" Topsoil Filter Sock
	372" Topsoil Filter Sock
	384" Topsoil Filter Sock
	396" Topsoil Filter Sock
	408" Topsoil Filter Sock
	420" Topsoil Filter Sock
	432" Topsoil Filter Sock
	444" Topsoil Filter Sock
	456" Topsoil Filter Sock
	468" Topsoil Filter Sock
	480" Topsoil Filter Sock
	492" Topsoil Filter Sock
	504" Topsoil Filter Sock
	516" Topsoil Filter Sock
	528" Topsoil Filter Sock
	540" Topsoil Filter Sock
	552" Topsoil Filter Sock
	564" Topsoil Filter Sock
	576" Topsoil Filter Sock
	588" Topsoil Filter Sock
	600" Topsoil Filter Sock
	612" Topsoil Filter Sock
	624" Topsoil Filter Sock
	636" Topsoil Filter Sock
	648" Topsoil Filter Sock
	660" Topsoil Filter Sock
	672" Topsoil Filter Sock
	684" Topsoil Filter Sock
	696" Topsoil Filter Sock
	708" Topsoil Filter Sock
	720" Topsoil Filter Sock
	732" Topsoil Filter Sock
	744" Topsoil Filter Sock
	756" Topsoil Filter Sock
	768" Topsoil Filter Sock
	780" Topsoil Filter Sock
	792" Topsoil Filter Sock
	804" Topsoil Filter Sock
	816" Topsoil Filter Sock
	828" Topsoil Filter Sock
	840" Topsoil Filter Sock
	852" Topsoil Filter Sock
	864" Topsoil Filter Sock
	876" Topsoil Filter Sock
	888" Topsoil Filter Sock
	900" Topsoil Filter Sock
	912" Topsoil Filter Sock
	924" Topsoil Filter Sock
	936" Topsoil Filter Sock
	948" Topsoil Filter Sock
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	972" Topsoil Filter Sock
	984" Topsoil Filter Sock
	996" Topsoil Filter Sock
	1008" Topsoil Filter Sock
	1020" Topsoil Filter Sock
	1032" Topsoil Filter Sock
	1044" Topsoil Filter Sock
	1056" Topsoil Filter Sock
	1068" Topsoil Filter Sock
	1080" Topsoil Filter Sock
	1092" Topsoil Filter Sock
	1104" Topsoil Filter Sock
	1116" Topsoil Filter Sock
	1128" Topsoil Filter Sock
	1140" Topsoil Filter Sock
	1152" Topsoil Filter Sock
	1164" Topsoil Filter Sock
	1176" Topsoil Filter Sock
	1188" Topsoil Filter Sock
	1200" Topsoil Filter Sock
	1212" Topsoil Filter Sock
	1224" Topsoil Filter Sock
	1236" Topsoil Filter Sock
	1248" Topsoil Filter Sock
	1260" Topsoil Filter Sock
	1272" Topsoil Filter Sock
	1284" Topsoil Filter Sock
	1296" Topsoil Filter Sock
	1308" Topsoil Filter Sock
	1320" Topsoil Filter Sock
	1332" Topsoil Filter Sock
	1344" Topsoil Filter Sock
	1356" Topsoil Filter Sock
	1368" Topsoil Filter Sock
	1380" Topsoil Filter Sock
	1392" Topsoil Filter Sock
	1404" Topsoil Filter Sock
	1416" Topsoil Filter Sock
	1428" Topsoil Filter Sock
	1440" Topsoil Filter Sock
	1452" Topsoil Filter Sock
	1464" Topsoil Filter Sock
	1476" Topsoil Filter Sock
	1488" Topsoil Filter Sock
	1500" Topsoil Filter Sock
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	1536" Topsoil Filter Sock
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	1572" Topsoil Filter Sock
	1584" Topsoil Filter Sock
	1596" Topsoil Filter Sock
	1608" Topsoil Filter Sock
	1620" Topsoil Filter Sock
	1632" Topsoil Filter Sock
	1644" Topsoil Filter Sock
	1656" Topsoil Filter Sock
	1668" Topsoil Filter Sock
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	1764" Topsoil Filter Sock
	1776" Topsoil Filter Sock
	1788" Topsoil Filter Sock
	1800" Topsoil Filter Sock

Stamping Area Access Road Mountable Berm Detail

AS-BUILT
2018