



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, February 5, 2020
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit approval for KEITH STERN N-13HU
47-051-02265-00-00

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: KEITH STERN N-13HU
Farm Name: TH EXPLORATION, LLC
U.S. WELL NUMBER: 47-051-02265-00-00
Horizontal 6A New Drill
Date Issued: 2/5/2020

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.



west virginia department of environmental protection

Oil and Gas Conservation Commission
601 57th Street SE, Charleston, WV 25304
304-926-0499 Ext 1274

Randall M. Albert, Chairman
dep.wv.gov

November 15, 2019

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

RE: Application for Deep Well Permit – API #47-051-02265

COMPANY: Tug Hill Operating, LLC

FARM: TH Exploration, LLC Keith Stern N-13HU

COUNTY: Marshall DISTRICT: Meade QUAD: Glen Easton

The deep well review of the application for the above company is Approved to drill to Trenton for Point Pleasant completion. Pooling Docket No. 290-289.

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

1. Comments to Notice of Deviation filed? No
2. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners? Yes
3. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells: **yes; Docket 290-289 Exception Location Hearing
4. Provided a plat showing that the proposed location is a distance of 400 feet from the nearest lease line or unit boundary with the exception of the toe which is 10 feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Susan Rose
Administrator

51-02265

**Heaven Hill 3-6HU 47-051-01968; Heaven Hill 3-7HU 47-051-01969; Heaven Hill 2-6HU 47-051-01910; Heaven Hill 2-7HU 47-051-01911; Heaven Hill 2-8HU 47-051-01912; Heaven Hill 2W-12HU 47-051-01952; Heaven Hill 2W-13HU 47-051-01957; Keith Stern N-14HU 47-051-02252; Keith Stern N-15HU 47-051-02241; Keith Stern N-16HU 47-051-02242; Keith Stern S-19HU 47-051-02244; Keith Stern S-18HU 47-051-02243; Knob Creek N-12HU 47-051-02268; Knob Creek N-13HU 47-051-02269

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: Keith Stern N-13HU Well Pad Name: Keith Stern

3) Farm Name/Surface Owner: TH Exploration, LLC Public Road Access: Fish Creek Road (County Route 74)

4) Elevation, current ground: 741.50' Elevation, proposed post-construction: 744.65'

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

Other _____

(b) If Gas Shallow _____ Deep

Horizontal

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):

Point Pleasant is the target formation at a depth of 11,096' - 11,218' - thickness of 122' and anticipated pressure of approx. 9500 psi.

8) Proposed Total Vertical Depth: 11,368'

9) Formation at Total Vertical Depth: Trenton, plug back to Reedsville

10) Proposed Total Measured Depth: 18,800'

11) Proposed Horizontal Leg Length: 6,680.59'

12) Approximate Fresh Water Strata Depths: 70' ; 390'

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: 1,740'

15) Approximate Coal Seam Depths: Sewickley Coal - 304' ; Pittsburgh Coal - 397'

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

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

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

Jim Nicholson Appd via Email

4705102265

WW-6B
(04/15)

API NO. 47- 051 -
OPERATOR WELL NO. Keith Stern N-13HU
Well Pad Name: Keith Stern

Handwritten signature/initials

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	20"	NEW	J55	106.5#	490'	490'	846 FT^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	2201'	2201'	1,558FT^3(CTS)
Intermediate	9 5/8"	NEW	HPP110	47#	10,411'	10,411'	3,370FT^3(CTS)
Production	5 1/2"	NEW	P110	23#	18,800'	18,800'	4,483FT^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		10,862'	
Liners							

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	20"	26"	.5	2,410	1,928	SEE # 24	1.2
Coal	13 3/8"	17 1/2"	.38	2,740	2,192	SEE #24	1.2
Intermediate	9 5/8"	12 1/4"	.472	10,730	6,968	SEE #24	1.99
Production	5 1/2"	8 1/2"	.415	16,510	10,864	SEE #24	1.18
Tubing	2 7/8"			11,385	11,624		
Liners							

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

WV Department of Environmental Protection

ju
6/5/19

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

Drill through the Point Pleasant and TD Pilot Hole 150' into the Trenton. Log vertical section and run a solid cement plug back to proposed KOP. Drill curve and lateral per proposed well plan, run and cement production casing. Perform CBL from 60 deg to surface, make cleanout run, and stimulate.

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

Well to be completed with approximately 16,697,500 lb proppant and 258,156 bbl of water. Max rate = 80 bpm; max psi = 12,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 10.35 acres

22) Area to be disturbed for well pad only, less access road (acres): 4.32 acres

23) Describe centralizer placement for each casing string:

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

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

*See Attachment

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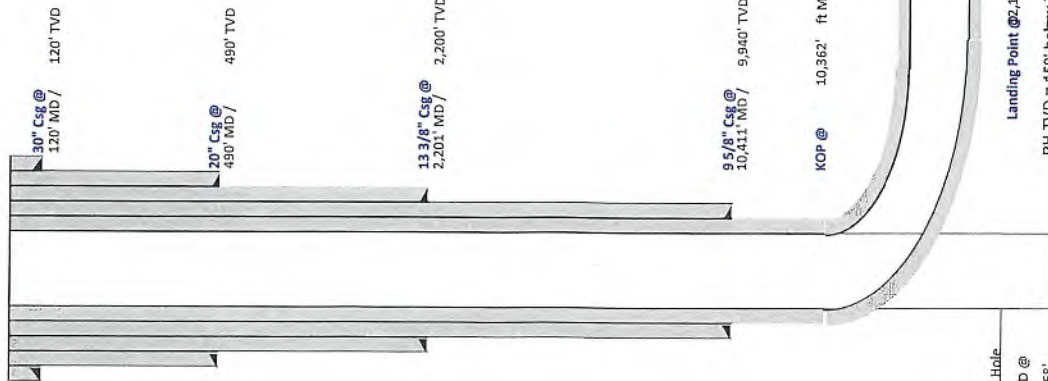
25) Proposed borehole conditioning procedures:

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

*Note: Attach additional sheets as needed.



WELL NAME: Keith Stern N-13HU COUNTY: Marshall
 STATE: WV DISTRICT: Meade
 DE Elev: 744' GL Elev: 744'
 TD: 18,800'
 TH Latitude: 39.77476702
 TH Longitude: -80.69220424
 BH Latitude: 39.786838
 BH Longitude: -80.706277



Formation	Depth (TVD)
Deepest Fresh Water	390'
Sewickley Coal	304'
Pittsburgh Coal	397'
Big Lime	1,611'
Berea	2,116'
Tully	6,137'
Marcellus	6,242'
Onondaga	6,293'
Salina	7,018'
Lockport	8,071'
Utica	10,828'
Point Pleasant	11,096'
Landing Depth	11,151'
Trenton	11,218'
Pilot Hole TD	11,368'

CASING SUMMARY						
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade
Conductor	36	30	120'	120'	BW	Top of Cement Surface
Surface	26	20	490'	490'	J55	Surface
Intermediate 1	17 1/2	13 3/8	2,201'	2,200'	J55	Surface
Intermediate 2	12 1/4	9 5/8	10,411'	9,940'	47	Surface
Production	8 1/2	5 1/2	18,800'	11,035'	23	HCP110 Surface

CEMENT SUMMARY				DRILLING DETAILS	
Sacks	Class	Density	Fluid Type	Centralizer Notes	
338	A	15.6	Air	None	
908	A	15.6	Air	3 Centralizers at equal distance	
1,689	A	15	Air	1 Centralizer every other ft	
2,877	A	14.5	Air	1 Centralizer every other ft	
3,933	A	15	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other ft to s/c	

Handwritten signature and date: 5/30/19

Lateral TD @ 18,800' ft MD
 11,035' ft TVD

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Landing Point @ 2,120' MD / 11,151' TVD
 PH TD = 150' below Trenton Top

Pilot Hole
 PH TD @ 11,368'

KOP @ 10,362' ft MD



Tug Hill Operating, LLC Casing and Cement Program

Keith Stern N-13HU

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	20"	J55	26"	490'	CTS
Intermediate 1	13 3/8"	J55	17 1/2"	2,201'	CTS
Intermediate 2	9 5/8"	HPP110	12 1/4"	10,411'	CTS
Production	5 1/2"	HCP110	8 1/2"	18,800'	CTS

Cement

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

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

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

Production: 50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 15.2ppg, Y = 1.18

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August 23, 2019

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

RE: Keith Stern N-13HU

Subject: Proposed Voluntary Pooling and Unitization

Dear Susan:

Tug Hill Operating, LLC is authorized through, either lease or other agreement, to unitize and pool all lands falling within the boundaries of the proposed voluntary unit included with this submission, with the exception of the following tracts which we intend to force pool.

9-14-25

9-14-26

If your office has any questions or concerns regarding the contents of this letter, please do not hesitate to contact me directly at 724-749-8388, 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
Tug Hill Operating

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Well: Keith Stern N-13 HU (slot C)
Site: Keith Stern
Project: Marshall County, West Virginia.
Design: rev2

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARR
 Ellipsoid: GRS 1960
 Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level
 Depth Reference: GL @ 744.00usft

Northing 14444867.28 Easting 1726897.78 Latitude 39.77476702 Longitude -80.69220424

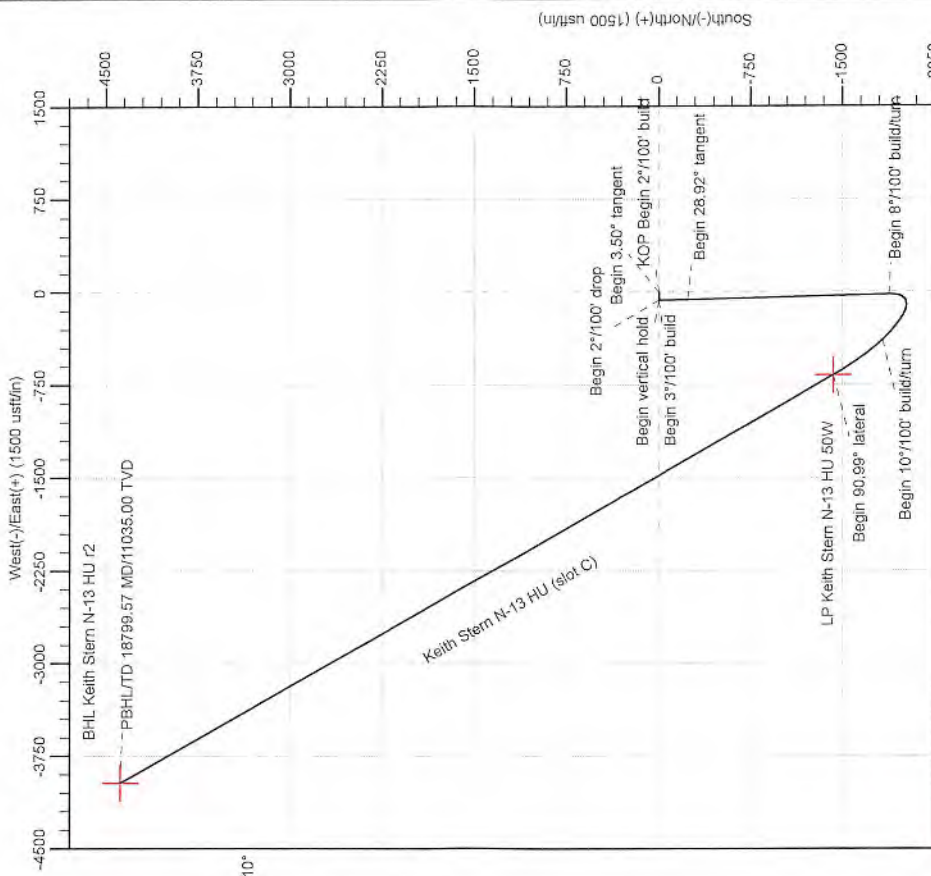
Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.810°



Azimuths to Grid North
 True North: -8.81°
 Magnetic North: -8.81°
 Magnetic Field
 Strength: 52.02.2ant
 Dip Angle: 66.90°
 Date: 1/18/2018
 Model: IGRF2015

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°100' build
3	1575.00	3.50	270.00	1574.89	0.00	-5.34	2.00	270.0000	0.00	Begin 3.50° tangent
4	2601.84	0.00	270.00	2600.00	0.00	-81.93	0.00	0.0000	3.59	Begin 2°100' drop
5	2676.84	0.00	270.00	2674.89	0.00	-67.27	2.00	180.0000	41.57	Begin vertical hold
6	6001.95	0.00	270.00	6000.00	0.00	-67.27	2.00	270.0000	45.15	Begin 3°100' build
7	6965.89	28.92	178.58	6923.53	-238.07	-61.37	3.00	178.579	-135.27	Begin 28.92° tangent
8	10362.23	28.92	178.58	8996.39	-1878.90	-20.65	0.00	0.0000	0.00	Begin 8°100' build/turn
9	11553.21	60.00	376.58	10744.89	-1828.04	-396.23	6.00	147.646	-1085.73	Begin 10°100' build/turn
10	13200.52	91.00	330.43	11151.00	-1465.70	-673.23	8.00	20.591	-605.68	Begin 90.99° lateral
11	18795.57	91.00	330.43	11035.00	-4382.10	-3968.44	0.00	0.0000	59.11	96 PBH/LTD 18795.57 MD/11035.00 TVD



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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Keith Stern N-13 HU (slot C)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 744.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 744.00usft
Site:	Keith Stern	North Reference:	Grid
Well:	Keith Stern N-13 HU (slot C)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

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

Site	Keith Stern				
Site Position:		Northing:	14,444,890.33 usft	Latitude:	39.77483004
From:	Lat/Long	Easting:	1,726,932.47 usft	Longitude:	-80.69208048
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.197 °

Well	Keith Stern N-13 HU (slot C)					
Well Position	+N/-S	0.00 usft	Northing:	14,444,867.26 usft	Latitude:	39.77476702
	+E/-W	0.00 usft	Easting:	1,726,897.78 usft	Longitude:	-80.69220424
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	744.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/18/2018	-8.713	66.896	52,102.17190750

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	317.84

Plan Survey Tool Program	Date	5/6/2019		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	18,799.58 rev2 (Original Hole)	MWD MWD - Standard	

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Project:	Marshall County, West Virginia.	MD Reference:	GL @ 744.00usft
Site:	Keith Stern	North Reference:	Grid
Well:	Keith Stern N-13 HU (slot C)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,575.00	3.50	270.00	1,574.89	0.00	-5.34	2.00	2.00	0.00	270.000	
2,501.84	3.50	270.00	2,500.00	0.00	-61.93	0.00	0.00	0.00	0.000	
2,676.84	0.00	270.00	2,674.89	0.00	-67.27	2.00	-2.00	0.00	180.000	
6,001.95	0.00	270.00	6,000.00	0.00	-67.27	0.00	0.00	0.00	270.000	
6,965.89	28.92	178.58	6,923.53	-238.07	-61.37	3.00	3.00	-9.48	178.579	
10,362.23	28.92	178.58	9,896.39	-1,879.90	-20.65	0.00	0.00	0.00	0.000	
11,583.91	50.00	316.58	10,974.99	-1,828.04	-386.23	6.00	1.73	11.30	147.646	
12,120.22	91.00	330.43	11,151.00	-1,426.70	-673.26	8.00	7.64	2.58	20.591	
18,799.58	91.00	330.43	11,035.00	4,382.10	-3,968.44	0.00	0.00	0.00	0.000	BHL Keith Stern N-13

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Planning Report - Geographic

Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Keith Stern
 Well: Keith Stern N-13 HU (slot C)
 Wellbore: Original Hole
 Design: rev2

Local Co-ordinate Reference: Well Keith Stern N-13 HU (slot C)
 TVD Reference: GL @ 744.00usft
 MD Reference: GL @ 744.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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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	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
100.00	0.00	0.00	100.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
200.00	0.00	0.00	200.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
300.00	0.00	0.00	300.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
400.00	0.00	0.00	400.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
500.00	0.00	0.00	500.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
600.00	0.00	0.00	600.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
700.00	0.00	0.00	700.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
800.00	0.00	0.00	800.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
900.00	0.00	0.00	900.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,444,867.26	1,726,897.78	39.77476702	-80.69220424	
KOP Begin 2°/100' build										
1,500.00	2.00	270.00	1,499.98	0.00	-1.75	14,444,867.26	1,726,896.03	39.77476704	-80.69221045	
1,575.00	3.50	270.00	1,574.89	0.00	-5.34	14,444,867.26	1,726,892.43	39.77476707	-80.69222326	
Begin 3.50° tangent										
1,600.00	3.50	270.00	1,599.84	0.00	-6.87	14,444,867.26	1,726,890.91	39.77476709	-80.69222869	
1,700.00	3.50	270.00	1,699.66	0.00	-12.97	14,444,867.26	1,726,884.80	39.77476714	-80.69225042	
1,800.00	3.50	270.00	1,799.47	0.00	-19.08	14,444,867.26	1,726,878.70	39.77476720	-80.69227214	
1,900.00	3.50	270.00	1,899.29	0.00	-25.18	14,444,867.26	1,726,872.59	39.77476726	-80.69229387	
2,000.00	3.50	270.00	1,999.10	0.00	-31.29	14,444,867.26	1,726,866.49	39.77476732	-80.69231560	
2,100.00	3.50	270.00	2,098.91	0.00	-37.39	14,444,867.26	1,726,860.38	39.77476737	-80.69233733	
2,200.00	3.50	270.00	2,198.73	0.00	-43.50	14,444,867.26	1,726,854.28	39.77476743	-80.69235906	
2,300.00	3.50	270.00	2,298.54	0.00	-49.60	14,444,867.26	1,726,848.17	39.77476749	-80.69238078	
2,400.00	3.50	270.00	2,398.35	0.00	-55.71	14,444,867.26	1,726,842.07	39.77476755	-80.69240251	
2,500.00	3.50	270.00	2,498.17	0.00	-61.81	14,444,867.26	1,726,835.96	39.77476760	-80.69242424	
2,501.84	3.50	270.00	2,500.00	0.00	-61.93	14,444,867.26	1,726,835.85	39.77476761	-80.69242464	
Begin 2°/100' drop										
2,600.00	1.54	270.00	2,598.06	0.00	-66.24	14,444,867.26	1,726,831.54	39.77476765	-80.69243999	
2,676.84	0.00	270.00	2,674.89	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
Begin vertical hold										
2,700.00	0.00	0.00	2,698.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
2,800.00	0.00	270.00	2,798.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
2,900.00	0.00	270.00	2,898.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
3,000.00	0.00	270.00	2,998.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
3,100.00	0.00	270.00	3,098.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
3,200.00	0.00	270.00	3,198.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
3,300.00	0.00	270.00	3,298.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
3,400.00	0.00	270.00	3,398.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
3,500.00	0.00	270.00	3,498.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
3,600.00	0.00	270.00	3,598.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
3,700.00	0.00	270.00	3,698.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
3,800.00	0.00	270.00	3,798.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
3,900.00	0.00	270.00	3,898.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
4,000.00	0.00	270.00	3,998.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
4,100.00	0.00	270.00	4,098.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
4,200.00	0.00	270.00	4,198.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
4,300.00	0.00	270.00	4,298.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
4,400.00	0.00	270.00	4,398.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
4,500.00	0.00	270.00	4,498.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	
4,600.00	0.00	270.00	4,598.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365	



Planning Report - Geographic

Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Keith Stern
 Well: Keith Stern N-13 HU (slot C)
 Wellbore: Original Hole
 Design: rev2

Local Co-ordinate Reference: Well Keith Stern N-13 HU (slot C)
 TVD Reference: GL @ 744.00usft
 MD Reference: GL @ 744.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,700.00	0.00	270.00	4,698.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
4,800.00	0.00	270.00	4,798.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
4,900.00	0.00	270.00	4,898.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
5,000.00	0.00	270.00	4,998.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
5,100.00	0.00	270.00	5,098.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
5,200.00	0.00	270.00	5,198.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
5,300.00	0.00	270.00	5,298.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
5,400.00	0.00	270.00	5,398.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
5,500.00	0.00	270.00	5,498.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
5,600.00	0.00	270.00	5,598.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
5,700.00	0.00	270.00	5,698.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
5,800.00	0.00	270.00	5,798.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
5,900.00	0.00	270.00	5,898.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
6,000.00	0.00	270.00	5,998.05	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
6,001.95	0.00	270.00	6,000.00	0.00	-67.27	14,444,867.26	1,726,830.51	39.77476766	-80.69244365
Begin 3°/100' build									
6,100.00	2.94	178.58	6,098.01	-2.52	-67.21	14,444,864.74	1,726,830.57	39.77476075	-80.69244346
6,200.00	5.94	178.58	6,197.70	-10.26	-67.01	14,444,857.00	1,726,830.76	39.77473949	-80.69244287
6,300.00	8.94	178.58	6,296.85	-23.20	-66.69	14,444,844.06	1,726,831.08	39.77470393	-80.69244189
6,400.00	11.94	178.58	6,395.18	-41.32	-66.24	14,444,825.94	1,726,831.53	39.77465418	-80.69244051
6,500.00	14.94	178.58	6,492.43	-64.55	-65.67	14,444,802.71	1,726,832.11	39.77459036	-80.69243875
6,600.00	17.94	178.58	6,588.33	-92.85	-64.97	14,444,774.41	1,726,832.81	39.77451266	-80.69243659
6,700.00	20.94	178.58	6,682.62	-126.12	-64.14	14,444,741.14	1,726,833.63	39.77442128	-80.69243406
6,800.00	23.94	178.58	6,775.03	-164.27	-63.20	14,444,702.98	1,726,834.58	39.77431648	-80.69243116
6,900.00	26.94	178.58	6,865.32	-207.22	-62.13	14,444,660.04	1,726,835.65	39.77419854	-80.69242790
6,965.89	28.92	178.58	6,923.54	-238.07	-61.37	14,444,629.19	1,726,836.41	39.77411381	-80.69242555
Begin 28.92° tangent									
7,000.00	28.92	178.58	6,953.39	-254.56	-60.96	14,444,612.70	1,726,836.82	39.77406852	-80.69242430
7,100.00	28.92	178.58	7,040.92	-302.90	-59.76	14,444,564.36	1,726,838.02	39.77393575	-80.69242062
7,200.00	28.92	178.58	7,128.45	-351.24	-58.56	14,444,516.02	1,726,839.22	39.77380298	-80.69241695
7,300.00	28.92	178.58	7,215.99	-399.58	-57.36	14,444,467.68	1,726,840.42	39.77367021	-80.69241327
7,400.00	28.92	178.58	7,303.52	-447.92	-56.16	14,444,419.34	1,726,841.62	39.77353744	-80.69240960
7,500.00	28.92	178.58	7,391.05	-496.26	-54.96	14,444,371.00	1,726,842.81	39.77340467	-80.69240592
7,600.00	28.92	178.58	7,478.58	-544.60	-53.76	14,444,322.66	1,726,844.01	39.77327191	-80.69240224
7,700.00	28.92	178.58	7,566.11	-592.94	-52.56	14,444,274.31	1,726,845.21	39.77313914	-80.69239857
7,800.00	28.92	178.58	7,653.64	-641.29	-51.37	14,444,225.97	1,726,846.41	39.77300637	-80.69239489
7,900.00	28.92	178.58	7,741.17	-689.63	-50.17	14,444,177.63	1,726,847.61	39.77287360	-80.69239122
8,000.00	28.92	178.58	7,828.70	-737.97	-48.97	14,444,129.29	1,726,848.81	39.77274083	-80.69238754
8,100.00	28.92	178.58	7,916.23	-786.31	-47.77	14,444,080.95	1,726,850.01	39.77260806	-80.69238387
8,200.00	28.92	178.58	8,003.77	-834.65	-46.57	14,444,032.61	1,726,851.21	39.77247529	-80.69238019
8,300.00	28.92	178.58	8,091.30	-882.99	-45.37	14,443,984.27	1,726,852.40	39.77234252	-80.69237652
8,400.00	28.92	178.58	8,178.83	-931.33	-44.17	14,443,935.93	1,726,853.60	39.77220975	-80.69237284
8,500.00	28.92	178.58	8,266.36	-979.67	-42.97	14,443,887.59	1,726,854.80	39.77207699	-80.69236916
8,600.00	28.92	178.58	8,353.89	-1,028.02	-41.78	14,443,839.24	1,726,856.00	39.77194422	-80.69236549
8,700.00	28.92	178.58	8,441.42	-1,076.36	-40.58	14,443,790.90	1,726,857.20	39.77181145	-80.69236181
8,800.00	28.92	178.58	8,528.95	-1,124.70	-39.38	14,443,742.56	1,726,858.40	39.77167868	-80.69235814
8,900.00	28.92	178.58	8,616.48	-1,173.04	-38.18	14,443,694.22	1,726,859.60	39.77154591	-80.69235446
9,000.00	28.92	178.58	8,704.01	-1,221.38	-36.98	14,443,645.88	1,726,860.80	39.77141314	-80.69235079
9,100.00	28.92	178.58	8,791.55	-1,269.72	-35.78	14,443,597.54	1,726,861.99	39.77128037	-80.69234711
9,200.00	28.92	178.58	8,879.08	-1,318.06	-34.58	14,443,549.20	1,726,863.19	39.77114760	-80.69234344
9,300.00	28.92	178.58	8,966.61	-1,366.40	-33.38	14,443,500.86	1,726,864.39	39.77101483	-80.69233976
9,400.00	28.92	178.58	9,054.14	-1,414.75	-32.18	14,443,452.51	1,726,865.59	39.77088207	-80.69233609
9,500.00	28.92	178.58	9,141.67	-1,463.09	-30.99	14,443,404.17	1,726,866.79	39.77074930	-80.69233241
9,600.00	28.92	178.58	9,229.20	-1,511.43	-29.79	14,443,355.83	1,726,867.99	39.77061653	-80.69232873



Planning Report - Geographic

Database: DB_Jul2218dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Keith Stern
 Well: Keith Stern N-13 HU (slot C)
 Wellbore: Original Hole
 Design: rev2

Local Co-ordinate Reference: Well Keith Stern N-13 HU (slot C)
 TVD Reference: GL @ 744.00usft
 MD Reference: GL @ 744.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,700.00	28.92	178.58	9,316.73	-1,559.77	-28.59	14,443,307.49	1,726,869.19	39.77048376	-80.69232506
9,800.00	28.92	178.58	9,404.26	-1,608.11	-27.39	14,443,259.15	1,726,870.39	39.77035099	-80.69232138
9,900.00	28.92	178.58	9,491.79	-1,656.45	-26.19	14,443,210.81	1,726,871.59	39.77021822	-80.69231771
10,000.00	28.92	178.58	9,579.33	-1,704.79	-24.99	14,443,162.47	1,726,872.78	39.77008545	-80.69231403
10,100.00	28.92	178.58	9,666.86	-1,753.13	-23.79	14,443,114.13	1,726,873.98	39.76995268	-80.69231036
10,200.00	28.92	178.58	9,754.39	-1,801.47	-22.59	14,443,065.78	1,726,875.18	39.76981991	-80.69230668
10,300.00	28.92	178.58	9,841.92	-1,849.82	-21.40	14,443,017.44	1,726,876.38	39.76968714	-80.69230301
10,362.23	28.92	178.58	9,896.39	-1,879.90	-20.65	14,442,987.36	1,726,877.13	39.76960452	-80.69230072
Begin 8°/100' build/turn									
10,400.00	27.03	181.25	9,929.75	-1,897.61	-20.61	14,442,969.65	1,726,877.17	39.76955588	-80.69230080
10,500.00	22.34	190.26	10,020.62	-1,939.07	-24.49	14,442,928.19	1,726,873.28	39.76944207	-80.69231512
10,600.00	18.38	203.30	10,114.40	-1,972.28	-34.12	14,442,894.98	1,726,863.65	39.76935095	-80.69234980
10,700.00	15.72	221.76	10,210.06	-1,996.88	-49.39	14,442,870.38	1,726,848.38	39.76928352	-80.69240444
10,800.00	15.05	244.38	10,306.57	-2,012.61	-70.14	14,442,854.65	1,726,827.64	39.76924052	-80.69247846
10,900.00	16.62	265.74	10,402.85	-2,019.29	-96.13	14,442,847.97	1,726,801.65	39.76922242	-80.69257104
11,000.00	19.91	281.87	10,497.86	-2,016.85	-127.08	14,442,850.41	1,726,770.69	39.76922942	-80.69268117
11,100.00	24.23	293.03	10,590.56	-2,005.31	-162.66	14,442,861.95	1,726,735.12	39.76926144	-80.69280764
11,200.00	29.11	300.82	10,679.92	-1,984.81	-202.47	14,442,882.45	1,726,695.31	39.76931814	-80.69294906
11,300.00	34.33	306.47	10,764.97	-1,955.55	-246.08	14,442,911.71	1,726,651.70	39.76939888	-80.69310390
11,400.00	39.74	310.78	10,844.78	-1,917.88	-293.00	14,442,949.38	1,726,604.77	39.76950279	-80.69327044
11,500.00	45.29	314.19	10,918.47	-1,872.19	-342.73	14,442,995.07	1,726,555.04	39.76962872	-80.69344686
11,583.91	50.00	316.58	10,974.99	-1,828.04	-386.23	14,443,039.22	1,726,511.54	39.76975039	-80.69360112
Begin 10°/100' build/turn									
11,600.00	51.21	317.16	10,985.20	-1,818.96	-394.73	14,443,048.30	1,726,503.04	39.76977539	-80.69363126
11,700.00	58.76	320.39	11,042.55	-1,757.36	-448.57	14,443,109.90	1,726,449.20	39.76994509	-80.69382212
11,800.00	66.38	323.13	11,088.59	-1,687.66	-503.41	14,443,179.60	1,726,394.37	39.77013700	-80.69401642
11,900.00	74.05	325.57	11,122.42	-1,611.24	-558.17	14,443,256.02	1,726,339.61	39.77034740	-80.69421037
12,000.00	81.74	327.83	11,143.39	-1,529.57	-611.78	14,443,337.69	1,726,285.99	39.77057218	-80.69440018
12,100.00	89.44	330.00	11,151.08	-1,444.25	-663.21	14,443,423.01	1,726,234.56	39.77080698	-80.69458218
12,120.22	90.99	330.43	11,151.00	-1,426.70	-673.25	14,443,440.56	1,726,224.52	39.77085526	-80.69461771
Begin 90.99° lateral									
12,200.00	91.00	330.43	11,149.62	-1,357.32	-712.61	14,443,509.94	1,726,185.16	39.77104617	-80.69475694
12,300.00	91.00	330.43	11,147.88	-1,270.35	-761.95	14,443,596.91	1,726,135.83	39.77128547	-80.69493146
12,400.00	91.00	330.43	11,146.15	-1,183.38	-811.28	14,443,683.88	1,726,086.50	39.77152476	-80.69510598
12,500.00	91.00	330.43	11,144.41	-1,096.42	-860.61	14,443,770.84	1,726,037.16	39.77176405	-80.69528050
12,600.00	91.00	330.43	11,142.67	-1,009.45	-909.95	14,443,857.81	1,725,987.83	39.77200335	-80.69545502
12,700.00	91.00	330.43	11,140.94	-922.49	-959.28	14,443,944.77	1,725,938.49	39.77224264	-80.69562954
12,800.00	91.00	330.43	11,139.20	-835.52	-1,008.62	14,444,031.74	1,725,889.16	39.77248193	-80.69580407
12,900.00	91.00	330.43	11,137.46	-748.55	-1,057.95	14,444,118.71	1,725,839.83	39.77272123	-80.69597859
13,000.00	91.00	330.43	11,135.72	-661.59	-1,107.28	14,444,205.67	1,725,790.49	39.77296052	-80.69615312
13,100.00	91.00	330.43	11,133.99	-574.62	-1,156.62	14,444,292.64	1,725,741.16	39.77319981	-80.69632765
13,200.00	91.00	330.43	11,132.25	-487.65	-1,205.95	14,444,379.61	1,725,691.82	39.77343910	-80.69650218
13,300.00	91.00	330.43	11,130.51	-400.69	-1,255.29	14,444,466.57	1,725,642.49	39.77367839	-80.69667671
13,400.00	91.00	330.43	11,128.78	-313.72	-1,304.62	14,444,553.54	1,725,593.16	39.77391768	-80.69685124
13,500.00	91.00	330.43	11,127.04	-226.75	-1,353.95	14,444,640.51	1,725,543.82	39.77415698	-80.69702577
13,600.00	91.00	330.43	11,125.30	-139.79	-1,403.29	14,444,727.47	1,725,494.49	39.77439627	-80.69720031
13,700.00	91.00	330.43	11,123.57	-52.82	-1,452.62	14,444,814.44	1,725,445.16	39.77463556	-80.69737484
13,800.00	91.00	330.43	11,121.83	34.15	-1,501.95	14,444,901.40	1,725,395.82	39.77487485	-80.69754938
13,900.00	91.00	330.43	11,120.09	121.11	-1,551.29	14,444,988.37	1,725,346.49	39.77511414	-80.69772392
14,000.00	91.00	330.43	11,118.36	208.08	-1,600.62	14,445,075.34	1,725,297.15	39.77535343	-80.69789846
14,100.00	91.00	330.43	11,116.62	295.04	-1,649.96	14,445,162.30	1,725,247.82	39.77559272	-80.69807300
14,200.00	91.00	330.43	11,114.88	382.01	-1,699.29	14,445,249.27	1,725,198.49	39.77583201	-80.69824754
14,300.00	91.00	330.43	11,113.15	468.98	-1,748.62	14,445,336.24	1,725,149.15	39.77607129	-80.69842208
14,400.00	91.00	330.43	11,111.41	555.94	-1,797.96	14,445,423.20	1,725,099.82	39.77631058	-80.69859662



Planning Report - Geographic

Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Keith Stern
 Well: Keith Stern N-13 HU (slot C)
 Wellbore: Original Hole
 Design: rev2

Local Co-ordinate Reference: Well Keith Stern N-13 HU (slot C)
 TVD Reference: GL @ 744.00usft
 MD Reference: GL @ 744.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,500.00	91.00	330.43	11,109.67	642.91	-1,847.29	14,445,510.17	1,725,050.48	39.77654987	-80.69877117
14,600.00	91.00	330.43	11,107.94	729.88	-1,896.62	14,445,597.14	1,725,001.15	39.77678916	-80.69894572
14,700.00	91.00	330.43	11,106.20	816.84	-1,945.96	14,445,684.10	1,724,951.82	39.77702845	-80.69912026
14,800.00	91.00	330.43	11,104.46	903.81	-1,995.29	14,445,771.07	1,724,902.48	39.77726774	-80.69929481
14,900.00	91.00	330.43	11,102.73	990.78	-2,044.63	14,445,858.04	1,724,853.15	39.77750702	-80.69946936
15,000.00	91.00	330.43	11,100.99	1,077.74	-2,093.96	14,445,945.00	1,724,803.82	39.77774631	-80.69964391
15,100.00	91.00	330.43	11,099.25	1,164.71	-2,143.29	14,446,031.97	1,724,754.48	39.77798560	-80.69981846
15,200.00	91.00	330.43	11,097.52	1,251.68	-2,192.63	14,446,118.93	1,724,705.15	39.77822488	-80.69999302
15,300.00	91.00	330.43	11,095.78	1,338.64	-2,241.96	14,446,205.90	1,724,655.81	39.77846417	-80.70016757
15,400.00	91.00	330.43	11,094.04	1,425.61	-2,291.30	14,446,292.87	1,724,606.48	39.77870346	-80.70034213
15,500.00	91.00	330.43	11,092.31	1,512.57	-2,340.63	14,446,379.83	1,724,557.15	39.77894274	-80.70051668
15,600.00	91.00	330.43	11,090.57	1,599.54	-2,389.96	14,446,466.80	1,724,507.81	39.77918203	-80.70069124
15,700.00	91.00	330.43	11,088.83	1,686.51	-2,439.30	14,446,553.77	1,724,458.48	39.77942131	-80.70086580
15,800.00	91.00	330.43	11,087.10	1,773.47	-2,488.63	14,446,640.73	1,724,409.15	39.77966060	-80.70104036
15,900.00	91.00	330.43	11,085.36	1,860.44	-2,537.96	14,446,727.70	1,724,359.81	39.77989988	-80.70121493
16,000.00	91.00	330.43	11,083.62	1,947.41	-2,587.30	14,446,814.67	1,724,310.48	39.78013917	-80.70138949
16,100.00	91.00	330.43	11,081.89	2,034.37	-2,636.63	14,446,901.63	1,724,261.14	39.78037845	-80.70156405
16,200.00	91.00	330.43	11,080.15	2,121.34	-2,685.97	14,446,988.60	1,724,211.81	39.78061773	-80.70173862
16,300.00	91.00	330.43	11,078.41	2,208.31	-2,735.30	14,447,075.57	1,724,162.48	39.78085702	-80.70191318
16,400.00	91.00	330.43	11,076.68	2,295.27	-2,784.63	14,447,162.53	1,724,113.14	39.78109630	-80.70208775
16,500.00	91.00	330.43	11,074.94	2,382.24	-2,833.97	14,447,249.50	1,724,063.81	39.78133558	-80.70226232
16,600.00	91.00	330.43	11,073.20	2,469.21	-2,883.30	14,447,336.46	1,724,014.47	39.78157487	-80.70243689
16,700.00	91.00	330.43	11,071.46	2,556.17	-2,932.64	14,447,423.43	1,723,965.14	39.78181415	-80.70261146
16,800.00	91.00	330.43	11,069.73	2,643.14	-2,981.97	14,447,510.40	1,723,915.81	39.78205343	-80.70278604
16,900.00	91.00	330.43	11,067.99	2,730.10	-3,031.30	14,447,597.36	1,723,866.47	39.78229271	-80.70296061
17,000.00	91.00	330.43	11,066.25	2,817.07	-3,080.64	14,447,684.33	1,723,817.14	39.78253199	-80.70313518
17,100.00	91.00	330.43	11,064.52	2,904.04	-3,129.97	14,447,771.30	1,723,767.81	39.78277128	-80.70330976
17,200.00	91.00	330.43	11,062.78	2,991.00	-3,179.30	14,447,858.26	1,723,718.47	39.78301056	-80.70348434
17,300.00	91.00	330.43	11,061.04	3,077.97	-3,228.64	14,447,945.23	1,723,669.14	39.78324984	-80.70365892
17,400.00	91.00	330.43	11,059.31	3,164.94	-3,277.97	14,448,032.20	1,723,619.80	39.78348912	-80.70383350
17,500.00	91.00	330.43	11,057.57	3,251.90	-3,327.31	14,448,119.16	1,723,570.47	39.78372840	-80.70400808
17,600.00	91.00	330.43	11,055.83	3,338.87	-3,376.64	14,448,206.13	1,723,521.14	39.78396768	-80.70418266
17,700.00	91.00	330.43	11,054.10	3,425.84	-3,425.97	14,448,293.10	1,723,471.80	39.78420696	-80.70435724
17,800.00	91.00	330.43	11,052.36	3,512.80	-3,475.31	14,448,380.06	1,723,422.47	39.78444624	-80.70453183
17,900.00	91.00	330.43	11,050.62	3,599.77	-3,524.64	14,448,467.03	1,723,373.13	39.78468552	-80.70470642
18,000.00	91.00	330.43	11,048.89	3,686.74	-3,573.97	14,448,553.99	1,723,323.80	39.78492480	-80.70488100
18,100.00	91.00	330.43	11,047.15	3,773.70	-3,623.31	14,448,640.96	1,723,274.47	39.78516408	-80.70505559
18,200.00	91.00	330.43	11,045.41	3,860.67	-3,672.64	14,448,727.93	1,723,225.13	39.78540335	-80.70523018
18,300.00	91.00	330.43	11,043.68	3,947.63	-3,721.98	14,448,814.89	1,723,175.80	39.78564263	-80.70540477
18,400.00	91.00	330.43	11,041.94	4,034.60	-3,771.31	14,448,901.86	1,723,126.47	39.78588191	-80.70557936
18,500.00	91.00	330.43	11,040.20	4,121.57	-3,820.64	14,448,988.83	1,723,077.13	39.78612119	-80.70575396
18,600.00	91.00	330.43	11,038.47	4,208.53	-3,869.98	14,449,075.79	1,723,027.80	39.78636047	-80.70592855
18,700.00	91.00	330.43	11,036.73	4,295.50	-3,919.31	14,449,162.76	1,722,978.46	39.78659974	-80.70610315
18,799.57	91.00	330.43	11,035.00	4,382.09	-3,968.64	14,449,249.73	1,722,929.13	39.78683902	-80.70627774

PBHL/TD 18799.57 MD/11035.00 TVD

Office of Oil and Gas

AUG 27 2019

WV Department of Environmental Protection



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Keith Stern N-13 HU (slot C)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 744.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 744.00usft
Site:	Keith Stern	North Reference:	Grid
Well:	Keith Stern N-13 HU (slot C)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev2		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
BHL Keith Stern N-13 HI - plan hits target center - Point	0.00	0.00	11,035.00	4,382.10	-3,968.44	14,449,249.36	1,722,929.34	39.78683800	-80.70627700
LP Keith Stern N-13 HU - plan misses target center by 0.10usft at 12120.18usft MD (11151.00 TVD, -1426.73 N, -673.24 E) - Point	0.00	0.00	11,151.00	-1,426.68	-673.15	14,443,440.58	1,726,224.63	39.77085531	-80.69461734

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
1,400.00	1,400.00	0.00	0.00	KOP Begin 2°/100' build
1,575.00	1,574.89	0.00	-5.34	Begin 3.50° tangent
2,501.84	2,500.00	0.00	-61.93	Begin 2°/100' drop
2,676.84	2,674.89	0.00	-67.27	Begin vertical hold
6,001.95	6,000.00	0.00	-67.27	Begin 3°/100' build
6,965.89	6,923.54	-238.07	-61.37	Begin 28.92° tangent
10,362.23	9,896.39	-1,879.90	-20.65	Begin 8°/100' build/turn
11,583.91	10,974.99	-1,828.04	-386.23	Begin 10°/100' build/turn
12,120.22	11,151.00	-1,426.70	-673.25	Begin 90.99° lateral
18,799.57	11,035.00	4,382.09	-3,968.43	PBHL/TD 18799.57 MD/11035.00 TVD

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WW-9
(4/16)

API Number 47 - 051 -
Operator's Well No. Keith Stern N-13HU

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 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1386426)

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

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

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

Company Official Signature Jim Pancake
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 29 day of MAY, 2019

Maureen A Stead

Notary Public
Commonwealth of Pennsylvania - Notary Seal
MAUREEN A STEAD - Notary Public
Washington County
My Commission Expires Jan 28, 2023
Commission Number 1259926

My commission expires 1/28/23

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 19.18 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

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

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [Signature]
Comments:

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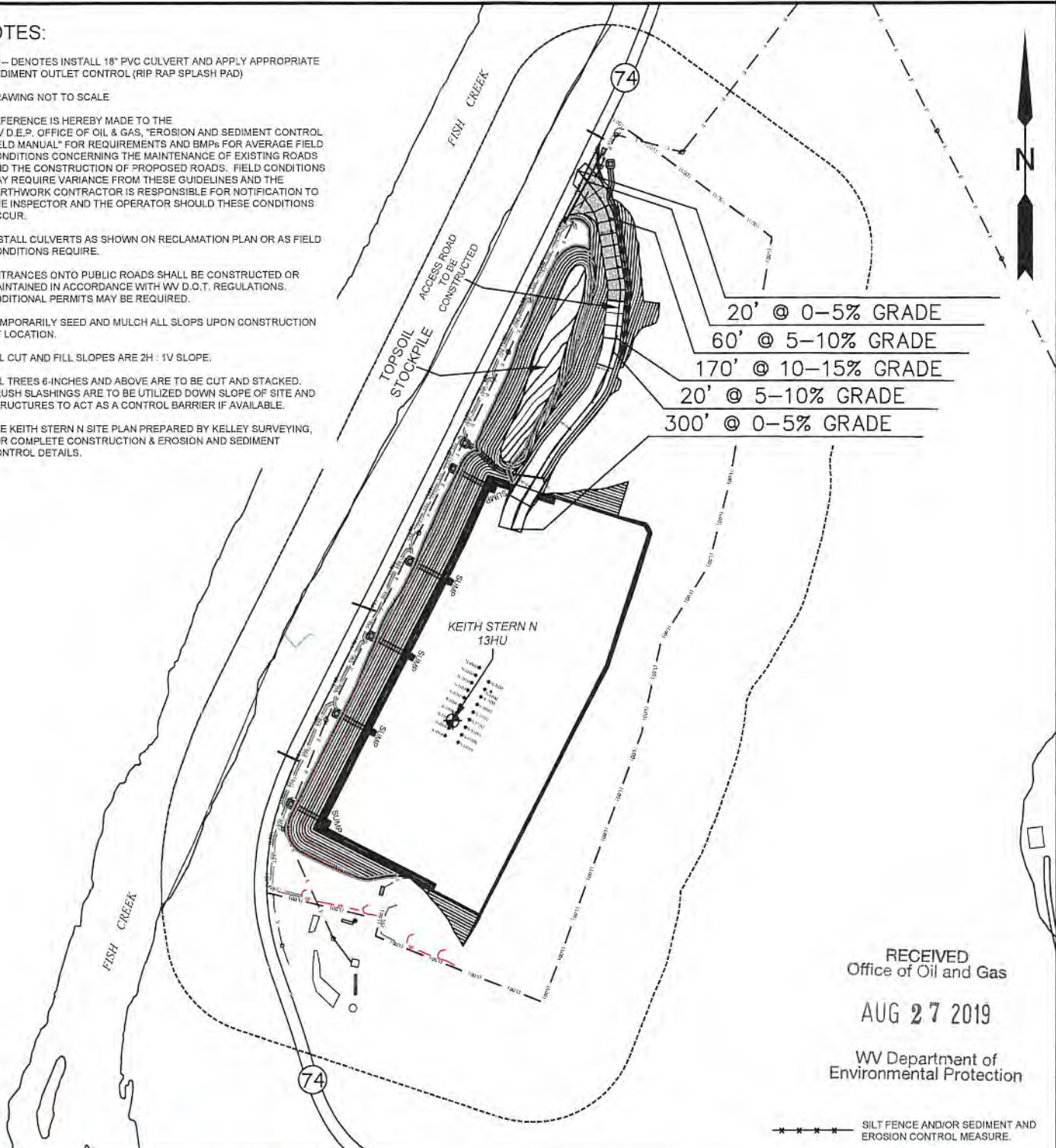
Title: Oil and Gas Inspector Date: 5/30/19

Field Reviewed? (X) Yes () No

PROPOSED KEITH STERN N - 13HU

NOTES:

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



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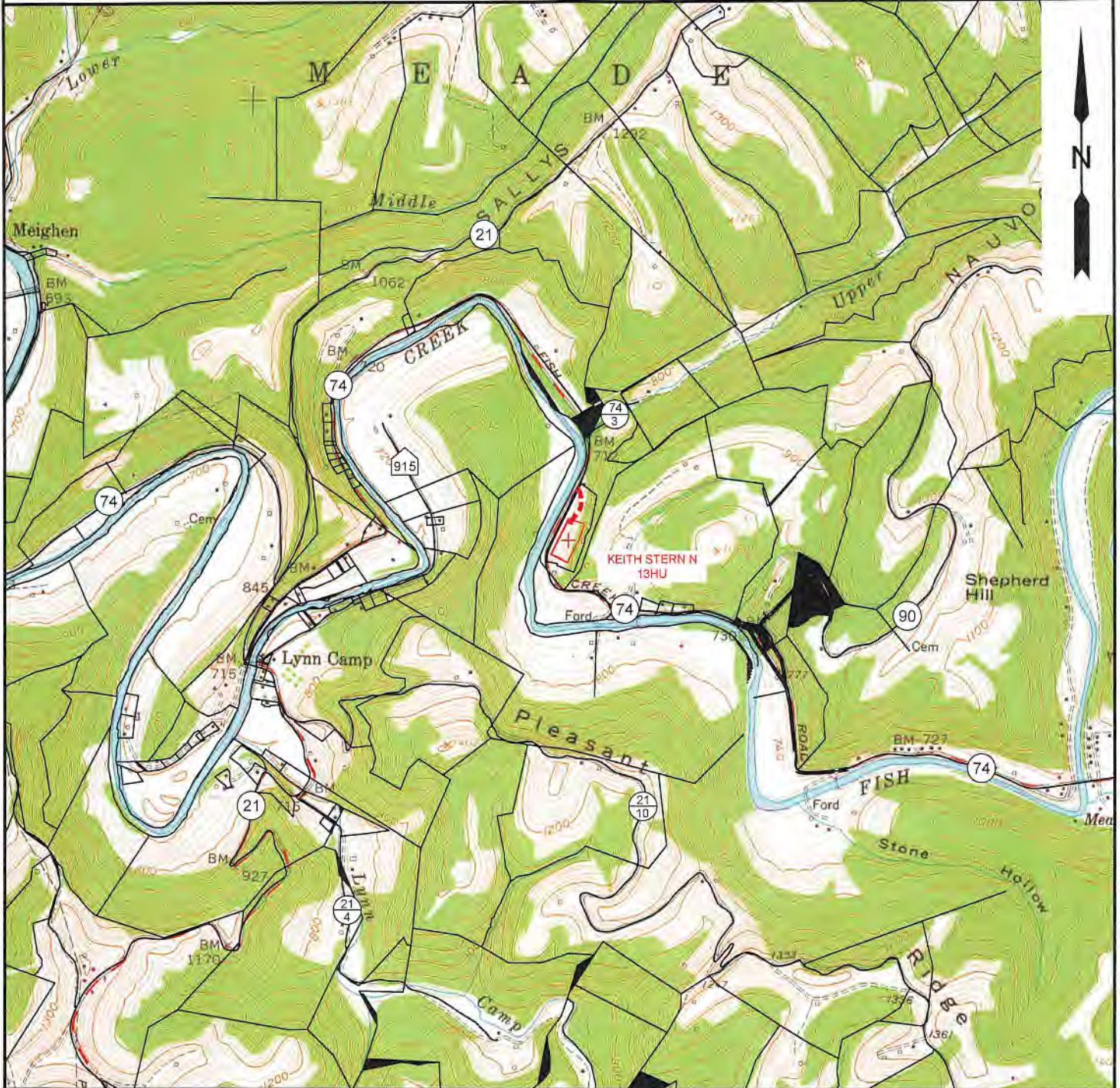
WV Department of
Environmental Protection

SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 462-5634
www.slsurveys.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT		
MARSHALL	MEADE		
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8811	05/29/2019	NONE

TUG HILL
OPERATING

PROPOSED KEITH STERN N - 13HU



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

LAT: 39.7137712
LON: -80.8258327
LOCATED: S 60°11'49" W AT 43,719.31' FROM THE CENTER OF KEITH STERN N WELL PAD LOCATION.



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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	
DRAWN BY		DATE	SCALE
K.G.M.		05/29/2019	1" = 2000'



TUG HILL
OPERATING



Well Site Safety Plan

Tug Hill Operating, LLC

ju 5/20/19

Well Name: Keith Stern N-13HU

Pad Location: Old Crow

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

NORTHING -4,402,804.35

EASTING -526,359.50

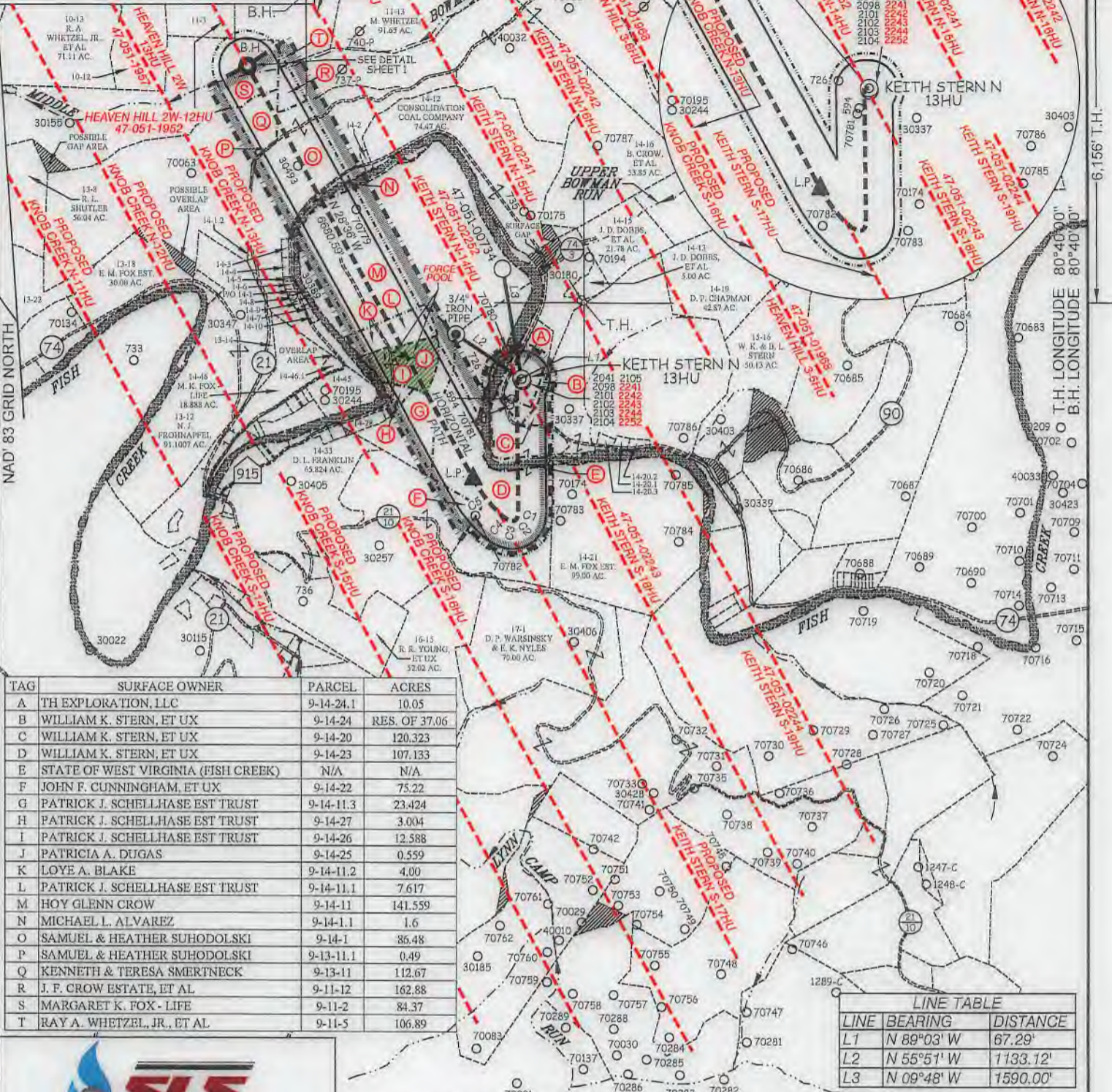
May 2019

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AUG 27 2019

WV Department of
Environmental Protection

KEITH STERN N LEASE UTICA UNIT - 266.15 AC± WELL 13HU TUG HILL OPERATING



TAG	SURFACE OWNER	PARCEL	ACRES
A	TH EXPLORATION, LLC	9-14-24.1	10.05
B	WILLIAM K. STERN, ET UX	9-14-24	RES. OF 37.06
C	WILLIAM K. STERN, ET UX	9-14-20	120.323
D	WILLIAM K. STERN, ET UX	9-14-23	107.133
E	STATE OF WEST VIRGINIA (FISH CREEK)	N/A	N/A
F	JOHN F. CUNNINGHAM, ET UX	9-14-22	75.22
G	PATRICK J. SCHELLHASE EST TRUST	9-14-11.3	23.424
H	PATRICK J. SCHELLHASE EST TRUST	9-14-27	3.004
I	PATRICK J. SCHELLHASE EST TRUST	9-14-26	12.588
J	PATRICIA A. DUGAS	9-14-25	0.559
K	LOYE A. BLAKE	9-14-11.2	4.00
L	PATRICK J. SCHELLHASE EST TRUST	9-14-11.1	7.617
M	HOY GLENN CROW	9-14-11	141.559
N	MICHAEL L. ALVAREZ	9-14-1.1	1.6
O	SAMUEL & HEATHER SUHODOLSKI	9-14-1	85.48
P	SAMUEL & HEATHER SUHODOLSKI	9-13-11.1	0.49
Q	KENNETH & TERESA SMERTNECK	9-13-11	112.67
R	J. F. CROW ESTATE, ET AL	9-11-12	162.88
S	MARGARET K. FOX - LIFE	9-11-2	84.37
T	RAY A. WHETZEL, JR., ET AL	9-11-5	106.89

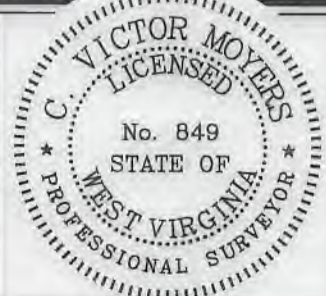
LINE	BEARING	DISTANCE
L1	N 89°03' W	67.29'
L2	N 55°51' W	1133.12'
L3	N 09°48' W	1590.00'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	93.99'	238.95'	S 09°15' W	93.39'
C2	68.32'	74.68'	S 48°09' W	65.96'
C3	82.33'	134.59'	N 80°41' W	81.05'
C4	157.53'	555.74'	N 55°11' W	157.00'
C5	624.15'	1908.94'	N 36°47' W	621.38'

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P.O. Box 150 | 12 Vinton Drive | Glenville, WV 26031 | (304) 492-9634
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P.S. 849 *C. Victor Moyers*

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)			
NAD'83 S.P.C.(FT)	N. 466,532.98	E. 1,633,422.22	
NAD'83 GEO.	LAT-(N) 39.774767	LONG-(W) 80.692204	
NAD'83 UTM (M)	N. 4,402,804.35	E. 525,359.50	
LANDING POINT			
NAD'83 S.P.C.(FT)	N. 465,117.9	E. 1,632,725.0	
NAD'83 GEO.	LAT-(N) 39.770855	LONG-(W) 80.694618	
NAD'83 UTM (M)	N. 4,402,359.5	E. 525,154.3	
BOTTOM HOLE			
NAD'83 S.P.C.(FT)	N. 470,982.3	E. 1,629,526.2	
NAD'83 GEO.	LAT-(N) 39.786838	LONG-(W) 80.706277	
NAD'83 UTM (M)	N. 4,404,140.0	E. 525,149.9	



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

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

UNIT BOUNDARY	[Symbol]
LEASED TRACTS INSIDE	[Symbol]
UNIT BOUNDARY	[Symbol]
SURFACE LINE	[Symbol]
PROPOSED UTICA	[Symbol]
WELL LATERAL	[Symbol]
400' OFFSET LINE	[Symbol]
500' OFFSET LINE	[Symbol]
TIE LINE	[Symbol]
CREEK	[Symbol]
ROAD	[Symbol]
COUNTY ROUTE	[Symbol]
PROPOSED WELL	[Symbol]
EXISTING WELL	[Symbol]
PERMITTED WELL	[Symbol]
SURFACE OWNER (SEE TABLE)	[Symbol]
LEASE # (SEE ADDITIONAL SHEETS)	[Symbol]

SCALE 1" = 2000' FILE NO. 8811P13HUR3.dwg
KEITH STERN N-13HU-REV2
DATE MAY 29, 2019
REVISED AUGUST 21, 2019 & SEPTEMBER 4, 2019
OPERATORS WELL NO. KEITH STERN N-13HU
API WELL 47-051-02265 H6A
NO. STATE COUNTY PERMIT

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

11,131' B.H.

7,178' T.H.

**KEITH STERN N LEASE
UTICA UNIT - 266.15 AC±
WELL 13HU
TUG HILL OPERATING**

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

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)		
NAD'83 S.P.C.(FT)	N. 466,532.98	E. 1,633,422.22
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NAD'83 UTM (M)	N. 4,402,804.35	E. 526,359.50
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BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 470,982.3	E. 1,629,526.2
NAD'83 GEO.	LAT-(N) 39.786838	LONG-(W) 80.706277
NAD'83 UTM (M)	N. 4,404,140.0	E. 525,149.9

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°40'00"
1,759' T.H.
6,156' B.H.

MAB/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
9-10-12	RAY A. WHETZAL, JR., ET AL	36.31
9-11-3	RAY A. WHETZAL, JR., ET AL	33.33
9-13-14	MARGARET K. FOX - LIFE	3.00
9-13-22	TRICYCLE LLC	47.25
9-14-1,2	KENNETH N. & TERESA A. SMERTNECK	1.02
9-14-2	MICHAEL L. ALVAREZ	0.75
9-14-3	MICHAEL L. ALVAREZ	NORTH P/O 3 PCLS
9-14-4	MICHAEL L. ALVAREZ	3 PCLS & 1/8 AC
9-14-5	MICHAEL L. ALVAREZ	200 X 60 PCL
9-14-6	MICHAEL L. ALVAREZ	120 X 200 PCL
9-14-7	JOHN T. ERAZMUS, III	0.25
9-14-8	JOHNNY C. HOLCOMB & JOHNNY C. HOLCOMB, II	2/5 AC.
9-14-9	JOHN E. DUFFY, ET UX	2/5 AC.
9-14-10	ROBERT I. DUFFY - LIFE	25/100 AC.
9-14-20,1	WILLIAM K. STERN, ET UX	1.321
9-14-20,2	WILLIAM K. STERN, ET UX	1.525
9-14-20,3	WILLIAM K. STERN, ET UX	0.831
9-14-28	CHARLES R. SCHELL-HASE, ET UX	3.029
9-14-43	GEORGE R. TAYLOR, ET UX	10.98
9-14-46,1	MARHA JANE FAZZARO	1.512

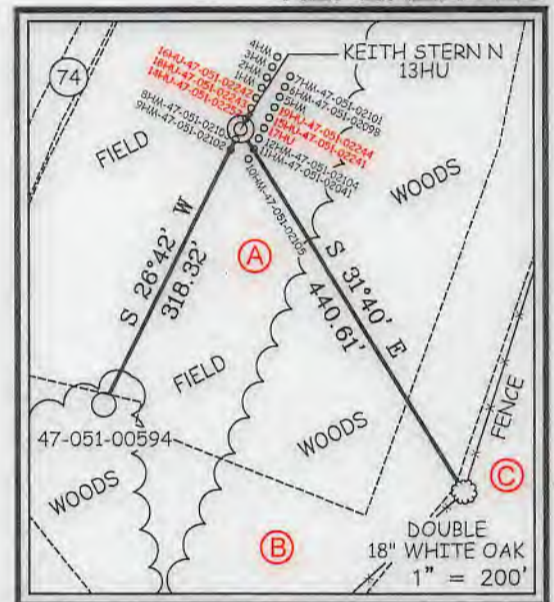


NOTES ON SURVEY

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE ARE 1"=2000'
- PROPOSED LATERAL OR TOP HOLE OF KEITH STERN N-13HU IS WITHIN 3000' OF THE TOP HOLES OR LATERALS OF THE FOLLOWING: KEITH STERN N-14HU (47-051-02252), KEITH STERN N-15HU (47-051-02241), KEITH STERN N-16HU (47-051-02242), PROPOSED KEITH STERN S-17HU, KEITH STERN S-18HU (47-051-02243), KEITH STERN S-19HU (47-051-02244), PROPOSED KNOB CREEK N-12HU & 13HU, PROPOSED KNOB CREEK S-15HU & 16HU, HEAVEN HILL 2W-12HU (47-051-01952), HEAVEN HILL 2W-13HU (47-051-01957), HEAVEN HILL 2-7HU (47-051-01911), HEAVEN HILL 2-8HU (47-051-01912).



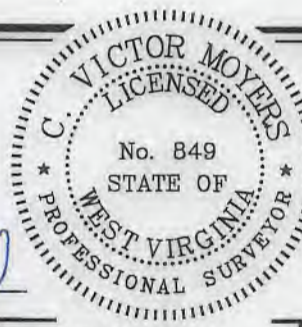
REFERENCES



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

P.S. 849 *C. Victor Moyers*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE MAY 29, 20 19
REVISED AUGUST 21, 2019 & SEPTEMBER 4, 2019
OPERATORS WELL NO. KEITH STERN N-13HU
API WELL NO. 47-051-02265 **H6A**
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8811P13HUR3.dwg
KEITH STERN N-13HU-REV2
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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

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

LOCATION: GROUND = 738.60' ELEVATION PROPOSED = 744.65' WATERSHED FISH CREEK (HUC 10)
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER TH EXPLORATION, LLC ACREAGE 10.05±
ROYALTY OWNER ISAAC CROW, ET AL - SEE WW-6A1 ACREAGE 10.05±

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 POINT PLEASANT
ESTIMATED DEPTH TVD: 11,368' / TMD: 18,800'

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

WW-6A1
(5/13)

Operator's Well No. Keith Stern N-13HU

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

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

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

Lease Name or Number	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
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*See attached pages

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

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

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

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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 -Appalachia Region

Lease No.	Term	Period	Lessee	State	Acres	Block	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
10718599	A	9-1-2-1	ISAC CROW ET UX	OHIO	391	71	391	NA	NA	1487289 Wheeling Natural Gas Company to Manufacturers Light & Heat Company	1497120 Manufacturers Light & Heat Company to Union Gasoline & Oil Corp	1497120 Manufacturers Light & Heat Company to Union Gasoline & Oil Corp	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company
10718595	B	9-1-2-1	ISAC CROW ET UX	OHIO	394	71	394	NA	NA	1487289 Wheeling Natural Gas Company to Manufacturers Light & Heat Company	1497120 Manufacturers Light & Heat Company to Union Gasoline & Oil Corp	1497120 Manufacturers Light & Heat Company to Union Gasoline & Oil Corp	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company	15136 Union Gasoline & Oil Corp to Precision Oil Company
10718599	C	9-1-2-0	WILLIAM S STERN AND BETTY L STERN	OHIO	310	718	310	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718582	D	9-1-2-3	WILLIAM S STERN AND BETTY L STERN	OHIO	220	697	220	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718486	D	9-1-2-3	FRANCO D VENTY AND CHRISTOPHER M VENTY	OHIO	319	951	319	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718599	D	9-1-2-3	GENEVA MASON	OHIO	460	942	460	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718299	D	9-1-2-3	CAROL L BOBBY AND DONALD BOBBY	OHIO	291	929	291	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718592	D	9-1-2-3	BROOKLYN TINKLEY	OHIO	352	931	352	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718595	D	9-1-2-3	JUDITH TRENKLE AND LOUIS TRENKLE	OHIO	390	931	390	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718586	D	9-1-2-3	LARRY W MUEY	OHIO	348	931	348	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718597	D	9-1-2-3	BROOKLYN STE KUE	OHIO	346	931	346	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718593	D	9-1-2-3	SHARLA BOULDS AND GARY BOULDS	OHIO	359	931	359	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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10718518	0	9-14-23	SUDAN ISABER	THE CORPORATION, LLC	1/80	933	540	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
10718520	0	9-14-23	CHESTER KEIL	THE CORPORATION, LLC	1/80	933	504	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718512	0	9-14-23	NANCY BERGLER	THE CORPORATION, LLC	1/80	932	542	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718517	0	9-14-23	BRIAN RAMON AND JEFFREY SHANKS	THE CORPORATION, LLC	1/80	931	613	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718514	0	9-14-23	MARK A STONCH JR AND STEVEN STONCH	THE CORPORATION, LLC	1/80	935	149	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718515	0	9-14-23	SANDRA SUE HILL AND DAVID HILL	THE CORPORATION, LLC	1/80	935	135	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718517	0	9-14-23	PETER G STONCH AND LAURE STONCH	THE CORPORATION, LLC	1/80	935	132	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718518	0	9-14-23	JANIS F COMPTON AND PATRICIA COMPTON	THE CORPORATION, LLC	1/80	935	161	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718519	0	9-14-23	ROBERT R AND SCOTLAND	THE CORPORATION, LLC	1/80	935	164	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718522	0	9-14-23	BOB LANGRISH	THE CORPORATION, LLC	1/80	935	112	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718513	0	9-14-23	DALE R MARY	THE CORPORATION, LLC	1/80	935	174	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10718513	0	9-14-23	ROBERT THORNE AND RICH THORNE JR	THE CORPORATION, LLC	1/80	938	574	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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10719805	D	9-14-23	RONALD WERNIGAU	THI EXPOSITION, LLC	1784	944	466	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10719807	D	9-14-23	NEL SCHEFFER AND CRYSTAL LEAFER	THI EXPOSITION, LLC	1784	944	147	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10719801	D	9-14-23	THOMMY LEE COLLEY	THI EXPOSITION, LLC	1784	944	140	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10719803	D	9-14-23	TERESA ALLEY	THI EXPOSITION, LLC	1784	944	145	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10719806	D	9-14-23	KARON J AND MICHAEL E MORGENTHAU	THI EXPOSITION, LLC	1784	944	143	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10719712	D	9-14-23	CHUCK AMON COLLEY AND DANA COLLINS	THI EXPOSITION, LLC	1784	927	139	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10719723	D	9-14-23	RAO ELATHRACHE AND TOMVA ELATHRACHE	THI EXPOSITION, LLC	1784	927	131	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10719809	D	9-14-23	ELIZABETH A STONE	THI EXPOSITION, LLC	1784	945	603	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10719800	D	9-14-23	ANDON N STONE	THI EXPOSITION, LLC	1784	945	601	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10719801	D	9-14-23	DOREEN STOKER AND SONJA STONE	THI EXPOSITION, LLC	1784	945	605	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10719802	D	9-14-23	STEVE R BERNHETT	THI EXPOSITION, LLC	1784	945	608	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10719804	D	9-14-23	JOE T KELLER JR AND SHARON MARIE KELLER	THI EXPOSITION, LLC	1784	945	610	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Operator's Well No. Keith Stern N - 13H10

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1071481	0	9-1-23	ROBERT LANGRISH AND LIBERTY LANGRISH	THE CORPORATION, LLC	1/8-	956	928	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1071490	0	9-1-23	DANIEL WILLIAMSON AND MARTHA R WILLIAMSON	THE CORPORATION, LLC	1/8-	972	153	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1071493	0	9-1-23	DENNA ALLEY JR	THE CORPORATION, LLC	1/8-	958	64	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1071497	0	9-1-23	KATHLEEN G WILLIAMSON	THE CORPORATION, LLC	1/8-	977	324	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1071497	0	9-1-23	WILLIAM BRUNN COLBY	THE CORPORATION, LLC	1/8-	959	627	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1071493	0	9-1-23	MICHAEL WAYNE ALLEY AND DENNA ALLEY	THE CORPORATION, LLC	1/8-	953	501	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1071391	0	9-1-23	JOHN WILLIAMSON JR	THE CORPORATION, LLC	1/8-	960	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1071972	0	9-1-23	CATHERINE AND ERNEST M SIEMBO	THE CORPORATION, LLC	1/8-	950	585	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1071979	0	9-1-23	CHARLES SKAMON	THE CORPORATION, LLC	1/8-	954	340	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1071991	0	9-1-23	JOANN BELLU' TRUST KENNETH MAZZ LOSORICE	THE CORPORATION, LLC	1/8-	953	341	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1071992	0	9-1-23	MICHAEL SANDERS AND AMY SANDERS	THE CORPORATION, LLC	1/8-	951	595	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1072004	0	9-1-23	RAYN EDWARD WILLIAMSON	THE CORPORATION, LLC	1/8-	953	507	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Operator's Well No. Keith Stern N - 341

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1072391	0	9-14-23	JON K AND MICHA KOHRS	AMERICAN PETROLEUM PARTNERS LLC	1/84	948	372	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42708 America Petroleum Systems Operating LLC to TH Exploration LLC
1072392	0	9-14-23	JAMES PAHLER	AMERICAN PETROLEUM PARTNERS LLC	1/84	945	215	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	42708 America Petroleum Systems Operating LLC to TH Exploration LLC	
1072375	0	9-14-23	DANNA LVA SHEPARD	TH EXPLORATION, LLC	1/84	970	30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1072378	0	9-14-23	DANNEY COOPER AND LOREAN COOPER	TH EXPLORATION, LLC	1/84	972	40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1072383	0	9-14-23	MARVIN WARRISS SA AND SHELBY WARRISS	TH EXPLORATION, LLC	1/84	966	455	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1072388	0	9-14-23	JULIA MAE BERGUS	TH EXPLORATION, LLC	1/84	972	30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1072384	0	9-14-23	JULIAN EMMIE	TH EXPLORATION, LLC	1/84	977	32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1072378	0	9-14-23	AUBREY E RELAY	TH EXPLORATION, LLC	1/84	977	26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1072379	0	9-14-23	BRENDAN G RELAY	TH EXPLORATION, LLC	1/84	977	28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1072346	0	9-14-23	JOAQUIN ALBERT AND JF SANT	WEST VIRGINIA DIVISION OF NATURAL RESOURCES	1/84	112	45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1072458	6	WW - Fossil Creek Reservoirs	TH EXPLORATION, LLC	1/84	1019	373	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1072479	F	9-14-23	JOHN F GUNNINGHAM AND BRENCE K GUNNINGHAM	FOSSIL CREEK COND. LLC	1/84	825	88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

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WW-6A1 Supplement

10720222	R	9-11-12	SALVATION ARMY TH CORPORATION, LLC	1/8-	1073	371	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10720282	R	9-11-12	CHAR COBBINE TH CORPORATION, LLC	1/8-	1073	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10720285	R	9-11-12	KATHLEEN OLIPH TH CORPORATION, LLC	1/8-	1073	522	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10720490	R	9-11-12	JANE WANDER ET AL TH CORPORATION, LLC	1/8-	1074	317	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1072081131	R	9-11-12	LEON G GARDNER TH CORPORATION, LLC	1/8-	879	389	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1072081132	R	9-11-12	JAMES P HOLIDAY AND JACQUELINE HOLIDAY TH CORPORATION, LLC	1/8-	879	143	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1072081133	S	9-11-12	MARY A FOX TH CORPORATION, LLC	1/8-	879	332	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1072081132	S	9-11-12	PAUL C FOX TH CORPORATION, LLC	1/8-	879	335	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1072081133	S	9-11-12	MARIE H FOX TH CORPORATION, LLC	1/8-	879	338	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1072081134	S	9-11-12	DAVID C FOX TH CORPORATION, LLC	1/8-	879	55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1072081135	S	9-11-12	LOUIS F FOX AND MAREN A FOX TH CORPORATION, LLC	1/8-	879	58	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1072081136	S	9-11-12	THOMAS FOX TH CORPORATION, LLC	1/8-	879	61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Operator's Well No. Keith Stern
Office # 887

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OPE LAND SERVICE
6000 TOWN CENTER BLVD STE 145
DANBURG, PA 15317-5841

BOOK 0036 PAGE 0148

STATE OF WEST VIRGINIA §
§
COUNTY OF MARSHALL §

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

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 17th day of May, 2016 (the "Effective Date"), by and between CHEVRON U.S.A. INC. (hereinafter "Assignor") and TH EXPLORATION, LLC (hereinafter "Assignee") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated May 2, 2016 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in Exhibit "A", and as depicted in Exhibits "A-1" and "A-2", attached hereto and made a part hereof (hereinafter the "Leases"); and

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

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

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon, except that Assignor accepts and reserves from this Assignment the Chevron ORRI previously conveyed to Assignor and as described in that certain Memorandum of Assignment of Oil and Gas Lease Interests dated November 6, 2012 by and between Cornell Holdings Incorporated and Chevron U.S.A. Inc., which is recorded at Book 0028, Page 0239 in the Office of the County Clerk of Marshall County, West Virginia.

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

2. Special Warranty. Assignor represents and warrants that Assignor has not conveyed or otherwise encumbered (other than Permitted Encumbrances) its interest in the Conveyed Interests since the time that Assignor obtained its interests in the Leases. Assignor does covenant, promise and agree, to and with the Assignee, its respective successors and assigns, to forever specially warrant and defend the title to the Leases or portions thereof included under this Assignment, unto the Assignee and its respective successors and assigns, against the lawful claims of Assignor, and all persons claiming, or to claim, the same or any part thereof, by, through or under Assignor.

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ASSIGNMENT AND CONVEYANCE

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

ARTICLE 1 ASSIGNMENT OF ASSETS

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

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

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

ARTICLE 2 SPECIAL WARRANTY OF TITLE AND DISCLAIMERS

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

Section 2.2 Disclaimers of Warranties and Representations.

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

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ASHLEY FAVINGER
 AMERICAN PETROLEUM PARTNERS OPERATING LLC
 4600 J BARRY COURT STE 310
 CANNONBURG PA 15317-5854

BOOK 0042 PAGE 0109

STATE OF WEST VIRGINIA §
 §
 COUNTY OF MARSHALL §

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 18th day of May, 2018, and made effective December 12, 2017 (the "Effective Date"), by and between AMERICAN PETROLEUM PARTNERS OPERATING, LLC, (hereinafter "Assignor") and TH EXPLORATION, LLC (hereinafter "Assignee") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated December 12, 2017 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

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

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

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

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

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

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

Marshall County
 Jan Pest, Clerk
 Instrument 1440860
 05/25/2018 @ 02:36:09 PM
 ASSIGNMENTS
 Book 42 @ Page 109
 Pages Recorded 9
 Recording Cost \$ 15.00

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WV-AGIR-0009

PARTIAL ASSIGNMENT OF OIL AND GAS LEASES

This **PARTIAL ASSIGNMENT OF OIL AND GAS LEASES** (hereinafter, "**Assignment**"), made the 21 day of May, 2018 (hereinafter, "**Effective Date**"), is by and between **CNX GAS COMPANY LLC**, a Virginia limited liability company, whose address is 1000 CONSOL Energy Drive, Suite 400, Canonsburg, Pennsylvania 15317 (hereinafter "**Assignor**") and **TH EXPLORATION, LLC**, a Texas limited liability company, whose address is 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "**Assignee**"). All references in this Assignment to "**Party**" or "**Parties**" shall be deemed at all times to mean Assignor or Assignee or both. Capitalized terms used but not defined herein shall have the meaning given such terms in the Acreage Trade Agreement, by and between Assignor and Assignee dated April 9, 2018 (the "**ATA**").

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

NOW, THEREFORE, for and in consideration of TEN AND NO/100 DOLLARS (\$10.00) and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Assignor does hereby **GRANT, BARGAIN, ASSIGN, TRANSFER, AND CONVEY** unto Assignee the following "**Assigned Rights**":

- (a) All of Assignor's right, title, and interest in and to those Leases set forth on Exhibit A attached hereto **INSOFAR AND ONLY INSOFAR** as to the particular Target Formation(s) (defined below) described and delineated on Exhibit A for each Lease:
 - i. "**Target Formation(s)**" means, with respect to each Lease, two hundred feet (200') above the top and two hundred feet (200') below the base of the Marcellus Formation or the Utica Formation or both, as specified for each Lease on Exhibit A. For the purposes of this Assignment, the Marcellus Formation shall be defined as the formation commonly known as the Marcellus Shale Formation, with the top of the Marcellus Shale Formation defined as the correlative stratigraphic equivalent to that point found at 6517 feet (6517') measured depth on the Halliburton Simms U-5H Composite DLL_DEN_NEU Log dated June 14, 2014 (the "**Log**")

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

STATE OF WEST VIRGINIA §
 §
 COUNTY OF MARSHALL §

ASSIGNMENT AND CONVEYANCE

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

**ARTICLE 1
 ASSIGNMENT OF ASSETS**

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

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

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

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

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

Section 2.2 Disclaimers of Warranties and Representations.

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

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August 3, 2018

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

RE: Keith Stern N-13HU

Subject: Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Keith Stern N-13HU well plat.

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

Sincerely,

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

Amy L. Miller
Permitting Specialist – Appalachia Region

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WW-6AC
(1/12)

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

Date of Notice Certification: 08/22/2019

API No. 47- 051 -

Operator's Well No. Keith Stern N-13HU

Well Pad Name: Keith Stern

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>526,359.50</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,804.35</u>
District:	<u>Meade</u>	Public Road Access:	<u>Fish Creek Road (County Route 74)</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>TH Exploration, LLC</u>	
Watershed:	<u>Fish Creek (HUC 10)</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.

<p>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:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><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</p> <p style="padding-left: 100px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p>OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p>
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Required Attachments:

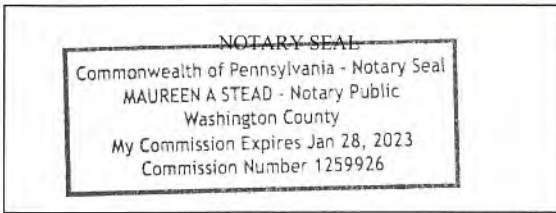
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication 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.

WW-6AC
(1/12)

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:	<u>Tug Hill Operating, LLC</u>	Address:	<u>380 Southpointe Boulevard, Plaza II, Suite 200</u>
By:	<u>Amy L. Miller <i>Amy Miller</i></u>		<u>Canonsburg, PA 15317</u>
Its:	<u>Permitting Specialist - Appalachia Region</u>	Facsimile:	<u>724-338-2030</u>
Telephone:	<u>724-749-8388</u>	Email:	<u>amiller@tug-hillop.com</u>



Subscribed and sworn before me this 22 day of AUGUST, 2019
Maureen A Stead Notary Public
 My Commission Expires 1/28/23

Oil and Gas Privacy Notice:

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

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WW-6A
(9-13)

API NO. 47- 051 -
OPERATOR WELL NO. Keith Stern N-13HU
Well Pad Name: Keith Stern

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

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

Date of Notice: 6/3/2019 Date Permit Application Filed: 8/22/2019

Notice of:

- [X] 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 [X] 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.

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

[X] SURFACE OWNER(s)
Name: TH Exploration, LLC (Access Road and Well Pad)
Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15318

[X] COAL OWNER OR LESSEE
Name: CONSOL Energy, Inc. Attn: Casey Saunders
Address: 1000 CONSOL Energy Drive
Canonsburg, PA 15317

Name: _____
Address: _____

[] COAL OPERATOR
Name: _____
Address: _____

[] SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: _____
Address: _____

[X] SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)
Name: *See attached list
Address: _____

Name: _____
Address: _____

[] SURFACE OWNER(s) (Impoundments or Pits)
Name: _____
Address: _____

[] OPERATOR OF ANY NATURAL GAS STORAGE FIELD
Name: _____
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

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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

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

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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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WW-6A
(8-13)

4705102265

API NO. 47-051 -
OPERATOR WELL NO. Keith Stern N-13HU
Well Pad Name: Keith Stern

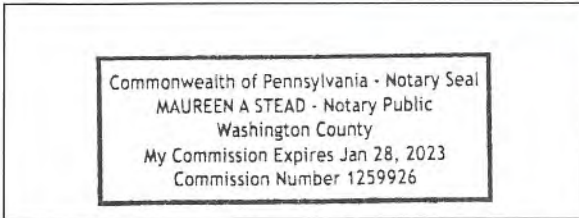
Notice is hereby given by:

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

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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 3 day of JUNE, 2019.
Maureen A Stead Notary Public
My Commission Expires 1/28/23

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Exhibit WW-6A**Supplement Pg. 1A**

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

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

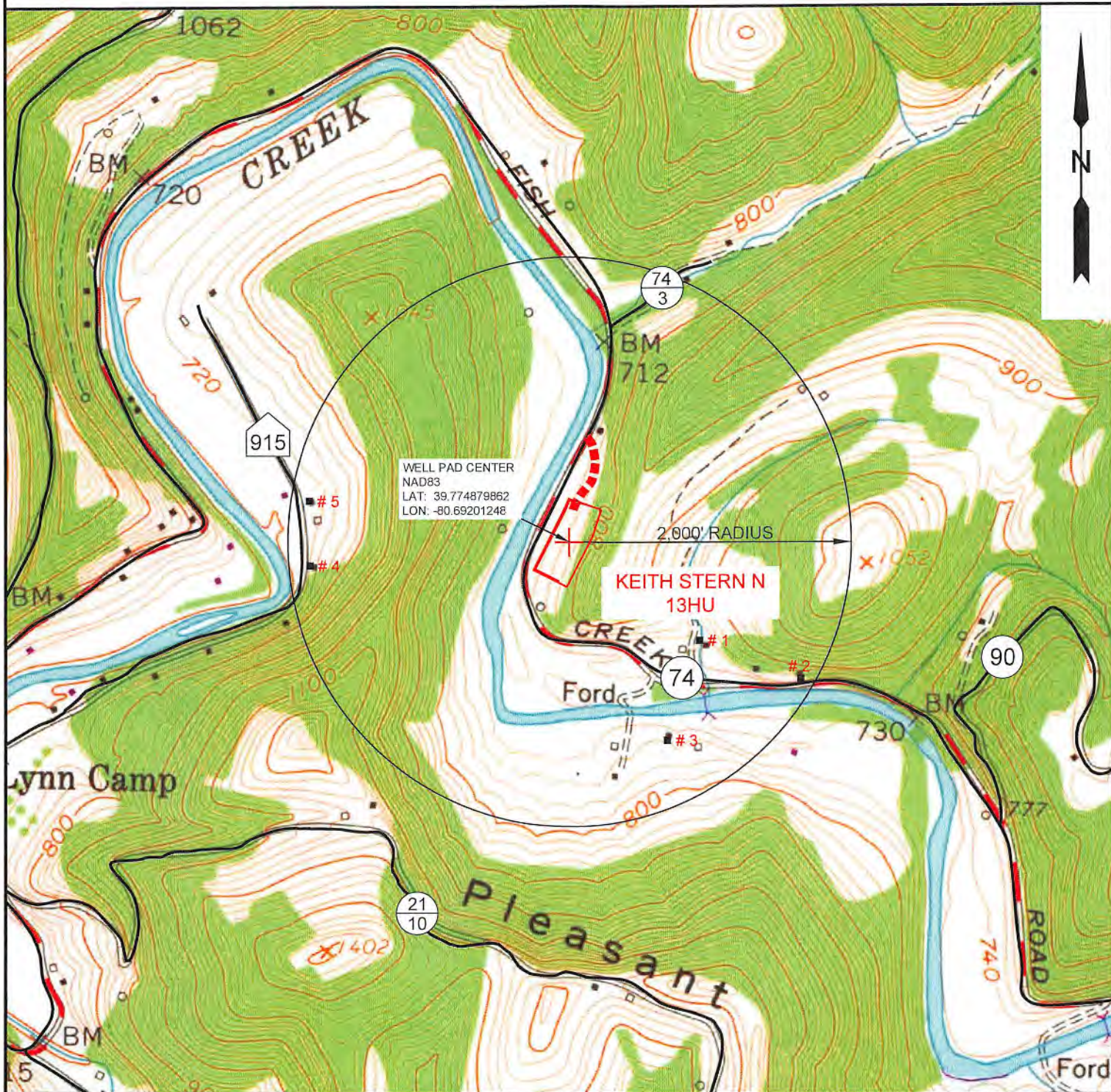
Well: KEITH STERN N – 13HU
 District: Meade (House #'s 1-5)
 State: WV

There are five (5) residences, no businesses, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

<p>House 1 TM 14 Pcl. 20 William K. Stern, Et Ux Phone: 304-843-1478 (Per Address – Keith, Betty & Ginger Sue Stern) Physical Address: 14912 Fish Creek Rd. Glen Easton, WV 26039 Tax Address: Same</p>	<p>House 2 TM 14 Pcl. 20.1 William K. Stern, Et Ux Phone: 304-843-1478 (Per Address – Keith, Betty & Ginger Sue Stern) Physical Address: 15056 Fish Creek Rd. Glen Easton, WV 26039 Tax Address: 14912 Fish Creek Rd. Glen Easton, WV 26039</p>	<p>House 3 TM 14 Pcl. 21 Eleanore M. Fox Est. Phone: 304-845-6016 (Per Tax Address – Thomas Fox) Physical Address: None Found – Appears to be an old home. Tax Address: 100 Lynn Camp Ln. Glen Easton, WV 26039-9707</p>
<p>House 4 TM 14 Pcl. 27 Patrick J. Shellhase Phone: 304-845-0742; 304-810-0258 Physical Address: 593 Crow Dr. Glen Easton, WV 26039 Tax Address: 2300 7th St. Moundsville, WV 26041</p>	<p>House 5 TM 14 Pcl. 25 Patricia A. Dugas Phone: None Found Physical Address: 681 Crow Dr. Glen Easton, WV 26039 Tax Address: Same</p>	

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PROPOSED KEITH STERN N - 13HU



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Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 462-5634
www.slssurveys.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT		
MARSHALL	MEADE		
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8811	05/29/2019	1" = 1000'

WV Department of Environmental Protection
TUG HILL OPERATING

WW-70
Rev. 7/01

Affidavit of Personal Service

State Of Pennsylvania
County Of Washington

The undersigned, being first duly sworn, says that the undersigned served a true and complete copy of all sides of--

- (1) Notice on Form WW-2(A) / WW-3(A) / WW-4(A) / WW-5(A) / WW-6(A) X, WW-0A5
- (2) Application on Form WW-2(B) / WW-3(B) / WW-4(B) / WW-5(B) / WW-6(B)
- (3) Plat showing the well location on Form WW-6, and
- (4) Construction and Reclamation Plan on Form WW-9

--all with respect to operator's Well No. Keith Stern N-14HU located in Meade District, Marshall County, West Virginia, upon the person or organization named--

TH Exploration, LLC

--by delivering the same in Washington County, State of Pennsylvania on the 3rd day of June, 2019 in the manner specified below.

[COMPLETE THE APPROPRIATE SECTION]

For an individual:

[] Handing it to him / her / or, because he / she / refused to take it when offered it, by leaving it in his / her / presence.

[] Handing it to a member of his or her family above the age of 16 years named who resides at the usual place of abode of the person to be served, and asking the family member to give it to the person to be served as soon as possible.

For a partnership:

[] Handing it to , a partner of the partnership or, because the partner refused to take it when I handed it over, by leaving it in the presence of the partner.

For a limited partnership:

[] Handing it to the general partner, named , or, because the general partner refused to take it when I tried to hand it over, by leaving it in the presence of the general partner.

For a corporation:

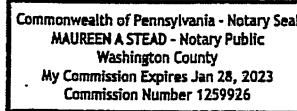
[] Handing it to the corporation's employee / officer / director / attorney in fact / named David DeLallo.

Maureen A Stead
(Signature of person executing service)

Taken, subscribed and sworn before me this 7 day of JUNE 2019.
My commission expires 1/28/23.

Maureen A Stead
Notary Public

(AFFIX SEAL IF NOTARIZED OUTSIDE THE STATE)



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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: 12/11/17 **Date of Planned Entry:** 12/18/17

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: TH Exploration, LLC (Access Road and Well Pad)
 Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15318
 Name: _____
 Address: _____
 Name: _____
 Address: _____

COAL OWNER OR LESSEE
 Name: Consol Energy, Inc.
 Address: CNX Center, 1000 Consol Energy Drive
Canonsburg, PA 15317

MINERAL OWNER(s)
 Name: William K. and Betty L. Stern
 Address: 14912 Fish Creek Road
Glen Easton, WV 26039

*please attach additional forms if necessary

Notice is hereby given:

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

State: <u>West Virginia</u>	Approx. Latitude & Longitude: <u>39.7748867; -80.6920362</u>
County: <u>Marshall</u>	Public Road Access: <u>Fish Creek Road (County Route 74)</u>
District: <u>Meade</u>	Watershed: <u>Fish Creek (HUC 10)</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>TH Exploration, LLC</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: Tug Hill Operating, LLC
 Telephone: 724-749-8388
 Email: amiller@tug-hillop.com

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

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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.

WW-6A5
(1/12)

4705 02265
Operator Well No. Keith Stern S-17HU

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

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

Date of Notice: 06/03/2019 **Date Permit Application Filed:** 08/22/2019

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: TH Exploration, LLC
Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15318

Name: _____
Address: _____

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: West Virginia UTM NAD 83 Easting: 526,366.85
County: Marshall Northing: 4,402,804.81
District: Meade Public Road Access: Fish Creek Road (County Route 74)
Quadrangle: Glen Easton 7.5' Generally used farm name: TH Exploration, LLC
Watershed: Fish Creek (HUC 10)

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: amiller@tug-hillop.com

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

Oil and Gas Privacy Notice:

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

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Office of Oil and Gas
AUG 27 2019
WV Department of
Environmental Protection

WW-70
Rev. 7/01

Affidavit of Personal Service

State Of Pennsylvania

County Of Washington

The undersigned, being first duly sworn, says that the undersigned served a true and complete copy of all sides of--

- (1) Notice on Form WW-2(A) ___ / WW-3(A) ___ / WW-4(A) ___ / WW-5(A) ___ / WW-6(A) X, WW-6A5
- (2) Application on Form WW-2(B) ___ / WW-3(B) ___ / WW-4(B) ___ / WW-5(B) ___ / WW-6(B) ___
- (3) Plat showing the well location on Form WW-6, and
- (4) Construction and Reclamation Plan on Form WW-9

--all with respect to operator's Well No. Keith Stern N-14HU located in Meade District, Marshall County, West Virginia, upon the person or organization named--

TH Exploration, LLC

--by delivering the same in Washington County, State of Pennsylvania on the 3rd day of June, 2019 in the manner specified below.

[COMPLETE THE APPROPRIATE SECTION]

For an individual:

Handing it to him ___ / her ___ / or, because he ___ / she ___ / refused to take it when offered it, by leaving it in his ___ / her ___ / presence.

Handing it to a member of his or her family above the age of 16 years named ___ who resides at the usual place of abode of the person to be served, and asking the family member to give it to the person to be served as soon as possible.

For a partnership:

Handing it to ___, a partner of the partnership or, because the partner refused to take it when I handed it over, by leaving it in the presence of the partner.

For a limited partnership:

Handing it to the general partner, named ___, or, because the general partner refused to take it when I tried to hand it over, by leaving it in the presence of the general partner.

For a corporation:

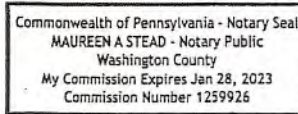
Handing it to the corporation's employee / officer ___ / director ___ / attorney in fact ___ / named David DeLallo.

Maureen A Stead
(Signature of person executing service)

Taken, subscribed and sworn before me this 7 day of JUNE 2019.
My commission expires 1/28/23.

Maureen A Stead
Notary Public

(AFFIX SEAL IF NOTARIZED OUTSIDE THE STATE)



RECEIVED
Office of Oil and Gas
AUG 27 2019
WV Department of
Environmental Protection



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Byrd E. White, III
Secretary of Transportation

June 11, 2019

Jimmy Wriston, P. E.
Deputy Secretary/
Acting Commissioner

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 Keith Stern Pad, Marshall County
Keith Stern N-13HU Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2018-0068 issued to Tug Hill Operating for access to the State Road for a well site located off of Marshall County Route 74 SLS.

This operator is in compliance with §22-6A-20 of the WV Code. 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 October 1, 2018.

Very Truly Yours,

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

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

Cc: Amy Miller
Tug Hill Operating
CH, OM, D-6
File

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AUG 27 2019
WV Department of
Environmental Protection



TUG HILL

PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

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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Office of Oil and Gas
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Environmental Protection

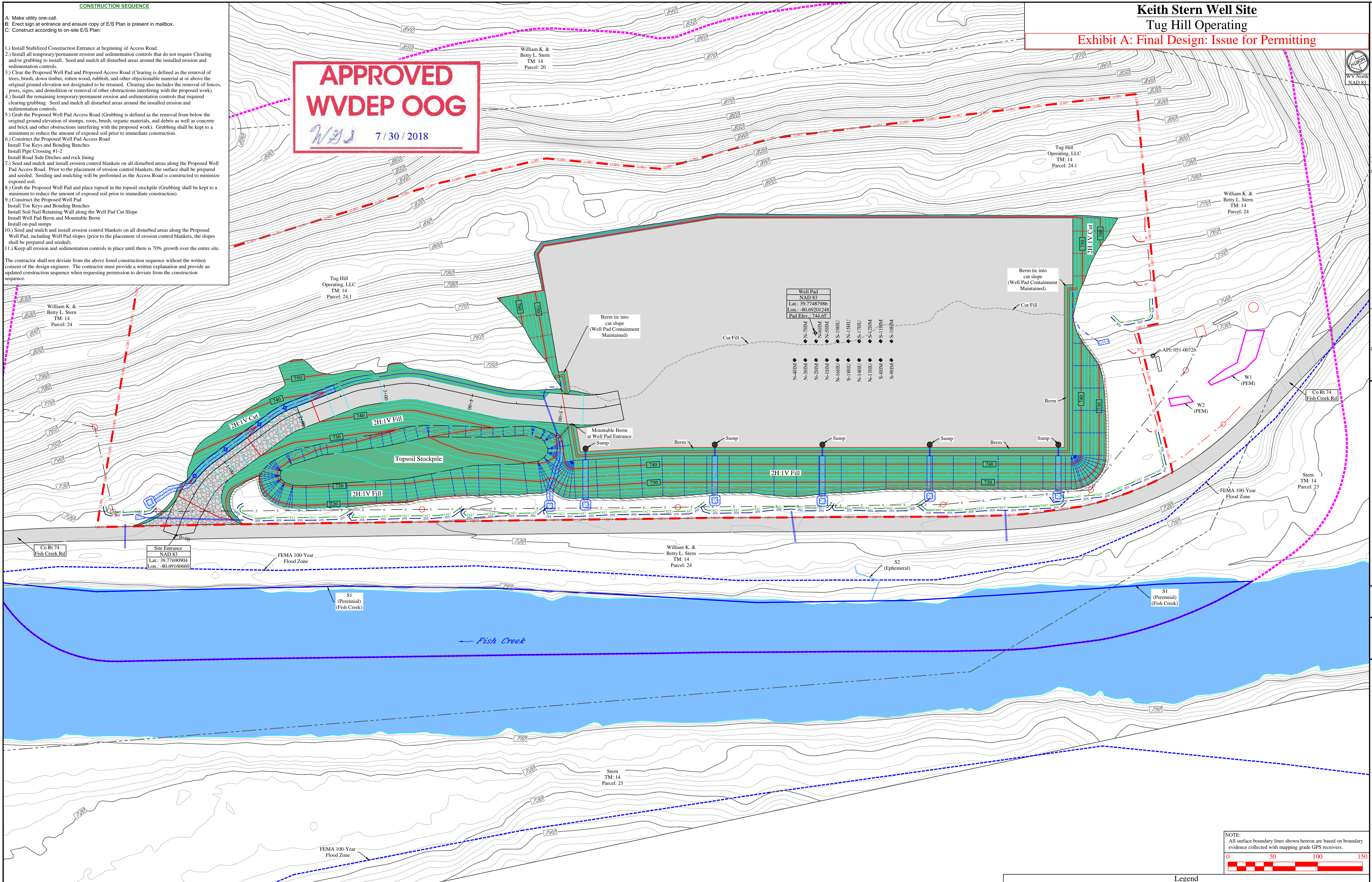
Keith Stern Well Site
Tug Hill Operating

Exhibit A: Final Design: Issue for Permitting

- CONSTRUCTION SEQUENCE**
- A. Make utility one-call.
 - B. Erect sign at entrance and ensure copy of E/S Plan is present in mailbox.
 - C. Construct according to on-site E/S Plan:
- 1.) Install Stabilized Construction Entrance at beginning of Access Road.
 - 2.) Install all temporary/permanent erosion and sedimentation controls that do not require Clearing and/or grubbing to install. Seed and mulch all disturbed areas around the installed erosion and sedimentation controls.
 - 3.) Clear the Proposed Well Pad and Proposed Access Road (Clearing is defined as the removal of trees, brush, down timber, rotten wood, rubbish, and other objectionable material at or above the original ground elevation not designated to be retained. Clearing also includes the removal of fences, posts, signs, and demolition or removal of other obstructions interfering with the proposed work).
 - 4.) Install the remaining temporary permanent erosion and sedimentation controls that required clearing/grubbing. Seed and mulch all disturbed areas around the installed erosion and sedimentation controls.
 - 5.) Grub the Proposed Well Pad Access Road (Grubbing is defined as the removal from below the original ground elevation of stumps, roots, brush, organic materials, and debris as well as concrete and brick and other obstructions interfering with the proposed work). Grubbing shall be kept to a minimum to reduce the amount of exposed soil prior to immediate construction.
 - 6.) Construct the Proposed Well Pad Access Road
 - Install Toe Keys and Bonding Benches
 - Install Pipe Crossing #1-2
 - Install Road Side Ditches and rock lining
 - 7.) Seed and mulch and install erosion control blankets on all disturbed areas along the Proposed Well Pad Access Road. Prior to the placement of erosion control blankets, the surface shall be prepared and seeded. Seeding and mulching will be performed as the Access Road is constructed to minimize exposed soil.
 - 8.) Grub the Proposed Well Pad and place topsoil in the topsoil stockpile (Grubbing shall be kept to a minimum to reduce the amount of exposed soil prior to immediate construction).
 - 9.) Construct the Proposed Well Pad
 - Install Toe Keys and Bonding Benches
 - Install Soil Nail Retaining Wall along the Well Pad Cut Slope
 - Install Well Pad Berm and Mountable Berm
 - Install on-pad stumps
 - 10.) Seed and mulch and install erosion control blankets on all disturbed areas along the Proposed Well Pad, including Well Pad slopes (prior to the placement of erosion control blankets, the slopes shall be prepared and seeded).
 - 11.) Keep all erosion and sedimentation controls in place until there is 70% growth over the entire site.
- The contractor shall not deviate from the above listed construction sequence without the written consent of the design engineer. The contractor must provide a written explanation and provide an updated construction sequence when requesting permission to deviate from the construction sequence.

APPROVED
WVDEP OOG

W/S 7/30/2018

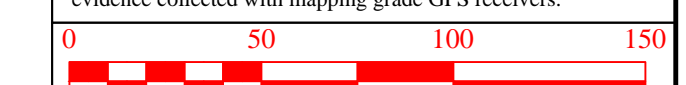


Disturbed Area		Access Road	
Well Pad Construction	4.32 Ac	Surface Owner	TM - Parcel
Access Road Construction	0.73 Ac	Tug Hill Operating, LLC	14-24.1
Topsoil / Excess Material	0.50 Ac	Road Length	566.91'
Additional Clearing	4.80 Ac	Type	New Access Road Construction
Total Disturbed Area	10.35 Ac	Property Owner Information - Keith Stern Well Site	
Meade District - Marshall County			
Additional Information		Owner	TM-Parcel
Total Wooded Acres Disturbed	4.81 Ac	Tug Hill Operating, LLC	14-24.1
Total Linear Feet of Access Road	566.91'	Well Pad	4.32
		Access Road	0.73
		Topsoil/Excess	0.50
		Add. Clearing	4.80
		Total Disturbed	10.35
		Site Totals (Ac)	4.32 0.73 0.50 4.80 10.35

Well Pad	
NAD 83	
Lat.: 39.77487986	
Lon.: -80.69201248	
Pad Elev.: 744.65'	

- ◆ N-21HM
- ◆ N-21HM
- ◆ N-21HM
- ◆ N-11HM
- ◆ N-16HU
- ◆ N-14HU
- ◆ N-13HU
- ◆ S-21HM
- ◆ S-11HM
- ◆ S-09HM
- ◆ S-09HU
- ◆ S-17HU
- ◆ S-17HU
- ◆ S-12HM
- ◆ S-11HM
- ◆ S-09HM

NOTE:
All surface boundary lines shown hereon are based on boundary evidence collected with mapping grade GPS receivers.



Legend	
	Original Ground 2' Contour
	Original Ground 10' Contour
	Pad Design 2' Contour
	Pad Design 10' Contour
	Access Road Design 2' Contour
	Access Road Design 10' Contour
	Center of Structure
	12' Wall
	24' Compost Filter Sock
	Super Silt Fence
	Limits of Disturbance
	Area of Interest
	Existing Gas Line
	Existing Utility Pole Line
	Existing Fence
	FEMA Wetland
	POW Wetland
	PSS Wetland
	Perennial Stream
	Intermittent Stream
	Ephemeral Stream
	Toe Key
	Erosion Control Blanket Slope Area
	Stone Check Dam

Revision	Date
Design	02-16-2018

TUG HILL OPERATING

THIS DOCUMENT PREPARED FOR TUG HILL OPERATING

Kelly Surveying

2540 S. 25th St., WV 26439
304-338-6985

Overall Plan View

Keith Stern Site

Meade District
Marshall County, WV

Date: 02/16/2018
Scale: As Shown
Designed By: ZS
File No.
Sheet 5 of 11