



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, August 1, 2018
WELL WORK PERMIT
Horizontal 6A / New Drill

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

Re: Permit approval for KEITH STERN S-11HM
47-051-02041-00-00

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 S-11HM
Farm Name: TH EXPLORATION LLC
U.S. WELL NUMBER: 47-051-02041-00-00
Horizontal 6A New Drill
Date Issued: 8/1/2018



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**ORDER
ISSUED UNDER
WEST VIRGINIA CODE, CHAPTER 22, ARTICLE 6A**

TO: Tug Hill Operating
380 Southpointe Boulevard, Plaza II, Suite 200
Cannonsburg, Pa 15317

DATE: July 25, 2018
ORDER NO.: 2018-W-4

INTRODUCTION

This Order (hereinafter "Order") is issued by the Office of Oil and Gas (hereinafter "OOG"), by and through its Chief, pursuant to the authority of W. Va. Code §§ 22-1-1, 22-6-1 and 22-6A-1 *et seq.* to Tug Hill Operating (hereinafter "Tug Hill" or "Operator"), collectively the "Parties."

FINDINGS OF THE CHIEF

In support of this Order, the Chief hereby finds the following:

1. OOG, an office within the West Virginia Department of Environmental Protection, is the agency with the duty and authority to execute and enforce W. Va. Code §22-6-1 and §22-6A-1 *et seq.*, and the rules and regulations promulgated thereunder.
2. Tug Hill is a "person" as defined by W. Va. Code §22-6-1(n), with a corporate address as 380 Southpointe Boulevard, Plaza II, Suite 200, Cannonsburg, Pa 15317
3. On May 5, 2018 Tug Hill submitted a well work permit application identified as API# 47-051-02041. The proposed well is to be located on the Keith Stern Pad in the Meade District of Marshall County, West Virginia.
4. On May 5, 2018 Tug Hill requested a waiver for Perennial Stream S1, Wetland W1 and Wetland W2 outlined in Attachment 1, from well location restriction requirements in W. Va. Code §22-6A-12(b) for the well work permit application identified as API# 47-051-02041.

08/03/2018

CONCLUSIONS OF LAW

1. West Virginia Code §22-1-6(d) requires, in part, that “in addition to other powers, duties and responsibilities granted and assigned to the secretary by this chapter, the secretary is authorized and empowered to... (3) Enter private lands to make surveys and inspections for environmental protection purposes; to investigate for violations of statutes or rules which the Office of Oil and Gas is charged with enforcing; to serve and execute warrants and processes; to make arrests; issue orders, which for the purposes of this chapter include consent agreements; and to otherwise enforce the statutes or rules which the Office of Oil and Gas is charged with enforcing.”
2. West Virginia Code §22-6A-2(a)(6) requires, in part, that “Concomitant with the broad powers to condition the issuance of well work permits, the secretary should also have broad authority to waive certain minimum requirements of this article when, in his or her discretion, such waiver is appropriate: *Provided*, That the secretary shall submit a written report of the number of waivers granted to the Legislature commencing January 1, 2013, and each year thereafter.”
3. West Virginia Code §22-6A-12(b) requires, in part, that “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 Office of Oil and Gas 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 Office of Oil and Gas 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.”

ORDER

West Virginia Code §22-6A-12(b) requires, in part, that “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. The Office of Oil and Gas grants the request for a waiver for Perennial Stream S1, Wetland W1 and Wetland W2 from well location restriction requirements in W. Va. Code §22-6A-12(b) for the well work permit application identified as API# 47-051-02041. The Office of Oil and Gas hereby **ORDERS** that Tug Hill shall meet the following site construction and operational requirements for the Keith Stern Well Pad:

- a. A berm shall be constructed around the perimeter of the pad to contain any potential spills and storm water runoff. Berm is to be at least twenty-four inches (24”) in height;
- b. Erosion control blankets shall be installed on all slopes and down gradient locations of the pad as erosion and sediment controlling BMPs;
- c. Stream 1 shall be protected by twenty-four-inch (24”) compost filter sock and super silt fence. SedCatch inlet protection for existing culverts shall also be provided. This along with temporary and permanent vegetative cover will prevent sediment from reaching the stream.
- d. Wetlands W1 and W2 shall be protected by twenty-four-inch (24”) compost filter sock and super silt fence. This along with temporary and permanent vegetative cover will prevent sediment from reaching the wetlands
- e. Disturbed areas not used for operations shall be seeded and mulched per the seeding tables in the WVDEP-OOG Erosion and Sediment Control Manual;
- f. Drill cuttings and associated drilling mud shall be disposed of in a permitted landfill;
- g. Waste generated by the flowback treatment systems shall be sent to offsite disposal at a permitted landfill;
- h. Weekly site inspections shall be conducted to monitor and maintain the integrity of the BMP storm water controls;
- i. Weekly storm water and spill prevention inspections shall be conducted focusing on storm water and spill prevention BMPs and maintenance of these BMPs;
- j. Inspections of the storm water and spill prevention measures shall be conducted after any major storm event defined as a half inch (½”) rain within any twenty-four (24) hour period;
- k. Pad inspections shall be conducted no less than once a week to identify and mitigate potential deficiencies;
- l. All records from inspections shall be maintained on site for the life of the project and be available upon request.

Thus ORDERED, the 25th day of July, 2018.

IN THE NAME OF THE STATE OF WEST VIRGINIA:

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

By:



JAMES A. MARTIN, CHIEF

Wetland and Perennial Stream Waiver RequestWell Operator: Tug Hill Operating, LLCWell Number: N-1HM Well Pad Name: Keith Stern Well PadCounty, District, Quadrangle of Well Location: Marshall, Meade, Glen Easton**1. Describe the proposed project location, including unique identifying names of all wetlands, and the names of perennial streams for which the waiver is sought.**

The Keith Stern Well Pad is a proposed pad located along County Route 74 (Fish Creek Road) in Meade District, Marshall County, WV. The proposed project location is along the river bottom flat (out of the FEMA 100-Year Flood Zone) with a steep ridge along the cut slope of the location. The proposed project location will be within 100' of two delineated wetlands and one delineated perennial stream. Exhibit A, current site conditions, will be attached to and made part of this waiver request. Exhibit A shows the locations of Wetland W1, Wetland W2, and Perennial Stream S1.

Perennial Stream S1: Perennial Stream S1 (Fish Creek) is located across the county road from the proposed project location. The distance from the Limits of Disturbance (LOD) of the project site and S1 ranges from 71' to 124'. There are three existing culverts that cross under County Route 74 that provide drainage from the project location to Fish Creek. The county road provides a natural berm between Fish Creek and the project location and the culverts will be the controlling factor. Super silt fence and 24" compost filter sock shall be installed upslope of the culverts to provide primary sedimentation protection. A provision for SedCatch inlet protections will also be made for the existing culverts to provide additional protection to Perennial Stream S1.

Wetland W1: Wetland W1 is located 62' south of the proposed project location LOD. Wetland W1 is situated outside the normal water flow of the project location (sediment-laden water does not have a direct flow path to the wetland) near an existing vertical well (API: 051-00726). Super silt fence and silt fence shall be installed along the perimeter of the LOD to control perimeter run-off and also provide a physical barrier between the project site and protected area.

Wetland W2: Wetland W2 is located 15.5' south of the proposed project location LOD. Wetland ^{W2}W1 is situated outside the normal water flow of the project location (sediment-laden water does not have a direct flow path to the wetland) near an existing vertical well (API: 051-00726), adjacent to Wetland W1. Super silt fence and silt fence shall be installed along the perimeter of the LOD to control perimeter run-off and also provide a physical barrier between the project site and the protected area.

API Number: _____
Operator's Well Number: N-1HM

2. Justify the proposed activity by describing alternatives to the project that were considered.

a. Include a No-Action Alternative to show "the future without the project"

b. Location Alternatives must be shown

c. Must demonstrate why a one hundred buffer cannot be maintained

d. Describe how the proposed project is the least environmentally damaging practicable alternative.

2a. No-Action Alternative: In a no-action alternative to the proposed project, the existing location would not be modified to provide access for oil and gas activity. Currently the proposed project location is approximately a 50/50 ratio of open field to light-medium wooded area. In a no-action alternative, Wetland W1 and W2 would still be within 100' of an existing vertical well (API: 051-00726) and Perennial Stream S1 (Fish Creek) is within 100' of the existing county road with roadway traffic.

2b.1. Location Alternative #1: A previous preliminary design for the Keith Stern Well Pad was proposed along the ridge line rather than in the river bottom as currently proposed. The ridge line pad option would require a much larger area for site construction, including longer access roads and additional topsoil stockpiles and spoil areas. In the event of the ridge line pad, the well pad access road would still remain within 100' of Perennial Stream S1 due to the limited access to the area (limited roads, steep/rugged terrain).

2b.2 Location Alternative #2: Due to the rugged terrain and limited access to the surrounding area, a second alternate to the pad is not feasible. There are existing and proposed utilities to the north, east, and south of the proposed location that limit the constructability of a well pad. Perennial Stream S1 (Fish Creek) is to the west of the proposed project area. Any construction on the west side of Fish Creek would likely impact the FEMA 100-Year Flood Zone and would also involve a larger disturbance area to construct a site.

2c. Must Demonstrate why a one hundred foot buffer cannot be maintained: See Exhibit A, Existing Conditions. A 100' buffer cannot be maintained due to the limitations of the project site. Access to any proposed project location within the local vicinity will require access from County Road 74 (Fish Creek Road) which parallels the creek along the majority of its length. Existing topographical features prevent the proposed location from being pushed further north to provide a one hundred foot buffer between the project location LOD and Wetland W1 and W2.

2d. Describe how the proposed project is the least environmentally damaging practicable alternative: The proposed site location, as shown on Exhibit B, is the least environmentally damaging practicable alternative because it is disturbing the smallest area possible while providing the minimal operating area. The proposed design incorporates a soil nail retaining wall along the proposed cut slope to minimize the amount of area disturbed upslope of the proposed pad location and reduces the amount of material excavated necessary to construct the pad, which reduces the need for additional stockpiles and/or enlarging the fill slope. Run-off from the site will be controlled by the existing culverts under the county road due to the natural berm formed by the county road construction which provides for more predictable drainage pattern that can be accounted for a protected.

3. Identify sufficient measures, facilities or practices to be employed during well site construction, drilling and operations to protect the waters of the state. This description should include all additional erosion and sediment control measures and devices that will be used.

Wetland W1 and Wetland W2 will be protected with super silt fence and silt fence. Wetland W1 & W2 will also be protected by the natural terrain (water does not naturally flow towards either wetland). Perennial Stream S1 will be protected with 24" compost filter sock and super silt fence. In addition, SedCage inlet protection may also be used at the crossing culvert inlets to provide additional protection. Upon the completion of the fill slopes, stone check dams may be installed between culvert crossings to slow and control flow to the culverts.

4. Provide mapping, plans, specifications and design analysis for the preferred alternative to the project.

4.a Specify in writing what additional controls, measures, devices, monitoring, etc. will be used to protect these wetlands and/or perennial streams for which the waiver is sought.

See Exhibit B, Proposed Design for the proposed site layout and protective control installation locations.

Super Silt Fence: Super silt fence shall be installed upslope of all delineated features. The super silt fence shall provide sedimentation controls above the culverts leading to Stream S1 to prevent sediment and other materials from being carried downstream into the stream. Should any large material, typically rock or stone, manage to roll down a slope, the chainlink fence of the super silt fence structure shall act as a net to capture the material before it can proceed further downslope towards the county road and Stream S1. Super silt fence shall also be installed upslope of Wetland W2 to protect the wetland during the excavation of the well pad.

24" Compost Filter Sock: A 24" compost filter sock shall be installed 2' upslope of the super silt fence to provide additional sedimentation protection for the wetlands.

Silt Fence: Silt fence shall be installed along the perimeter of the LOD to prevent any equipment from encroaching on Wetland W1 & W2. Wetland W1 and W2 are out of the direct flow of any run-off from the site.

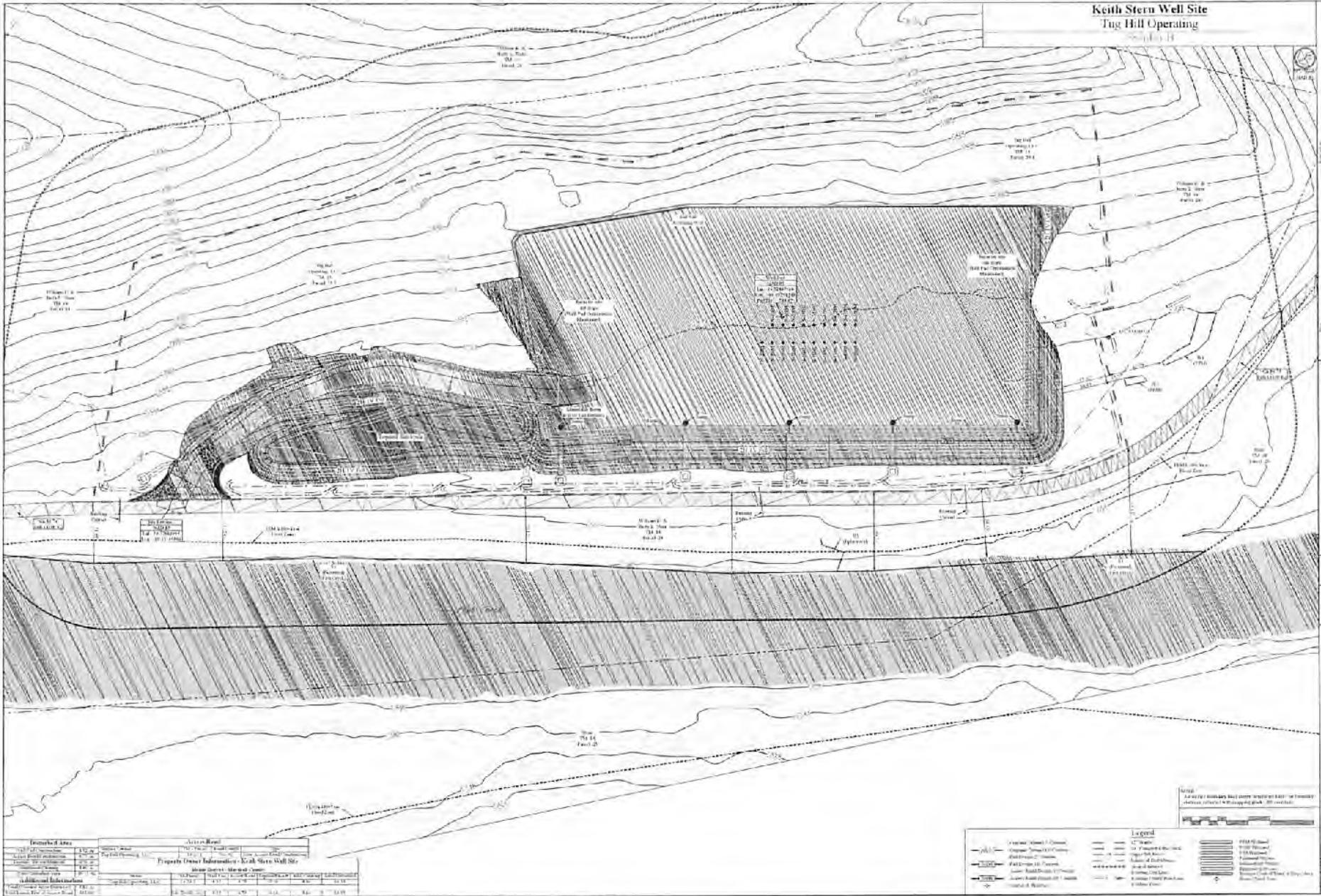
Permanent Seeding/Rolled Erosion Control Blankets: Permanent seeding of all disturbed areas upslope of the streams and wetlands shall be performed as soon as practical. Earthwork above both wetlands shall be kept to a minimum to reduce the amount of disturbed area upslope of the wetlands and shall be vegetated as soon as construction permits. If construction activities upslope of the streams and wetlands are completed at the end of the growing season, rolled erosion control blankets shall be installed to provide additional erosion control until permanent vegetation can be established.

Well Pad Berm: Once installed, the well pad berm will provide well pad containment and prevent water from leaving the well pad except at the designated sump outlet locations (water from the sumps shall only be released in accordance with WVDEP requirements). The sump outlets shall have erosion controls to prevent erosion of the well pad slopes that may lead to sedimentation within the wetlands. The proposed well pad sump outlets shall be placed so that they do not discharge at or near the wetlands, providing additional protection to the wetlands.

4705102041

Keith Stern Well Site
Tug Hill Operating

2010.03.11



TUG HILL
OPERATING



IN 1/4" = 100'
PLOT # 47-110
TUG HILL
OFFENSIVE

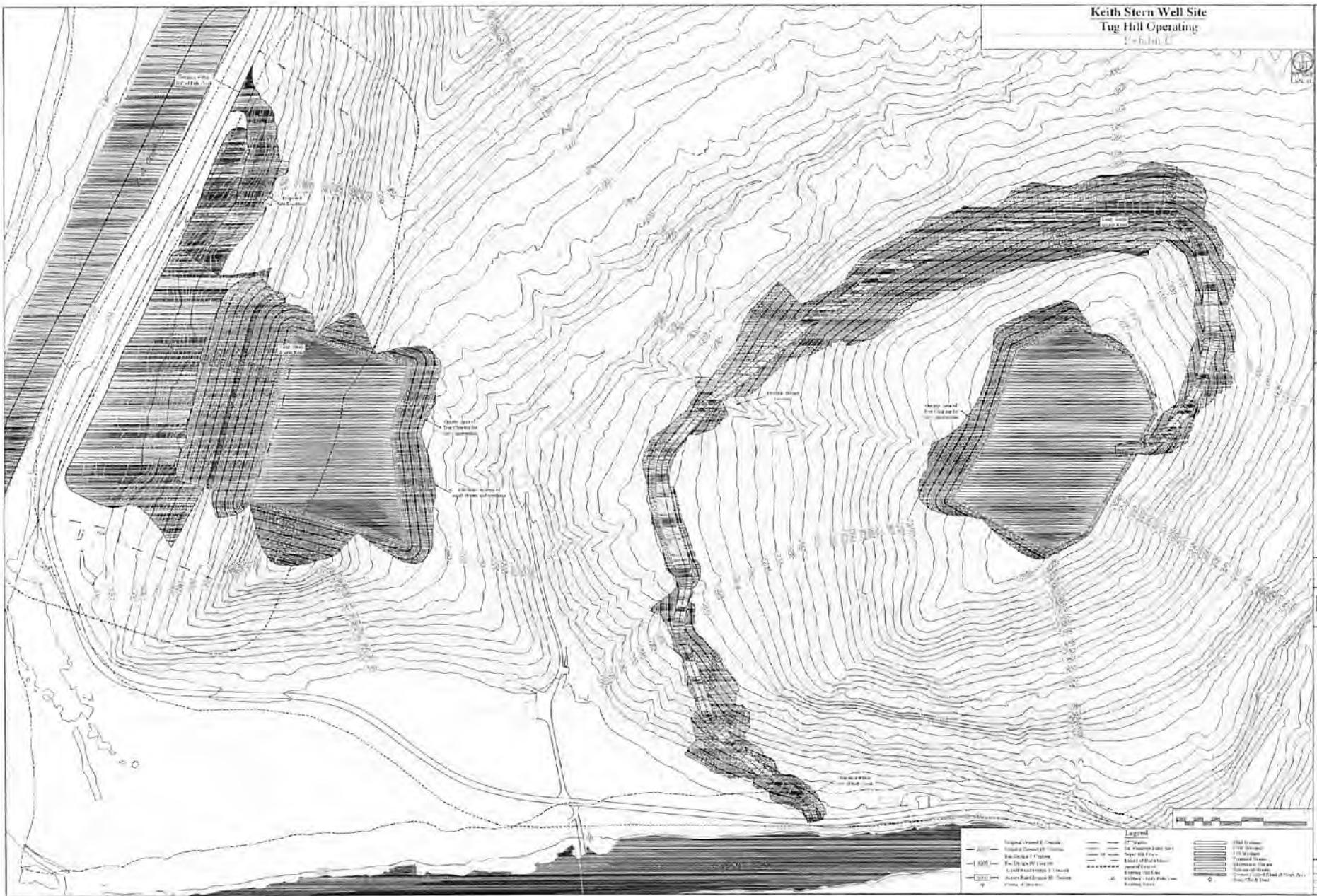
Keith Stern
OPERATING

Keith Stern Site
Marshall County, WV

Description of Area		Acres	
Well Site	1.2	1.2	
Well Pad	0.5	0.5	
Well Road	0.1	0.1	
Well Driveway	0.1	0.1	
Well Access	0.1	0.1	
Well Enclosure	0.1	0.1	
Well Foundation	0.1	0.1	
Well Drilling	0.1	0.1	
Well Completion	0.1	0.1	
Well Production	0.1	0.1	
Well Abandonment	0.1	0.1	
Well Decommissioning	0.1	0.1	
Well Restoration	0.1	0.1	
Well Reclamation	0.1	0.1	
Well Remediation	0.1	0.1	
Well Rehabilitation	0.1	0.1	
Well Renovation	0.1	0.1	
Well Repair	0.1	0.1	
Well Maintenance	0.1	0.1	
Well Inspection	0.1	0.1	
Well Testing	0.1	0.1	
Well Monitoring	0.1	0.1	
Well Record Keeping	0.1	0.1	
Well Reporting	0.1	0.1	
Well Compliance	0.1	0.1	
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Well Access Control	0.1	0.1	
Well Identification	0.1	0.1	
Well Labeling	0.1	0.1	
Well Marking	0.1	0.1	
Well Signage	0.1	0.1	
Well Fencing	0.1	0.1	
Well Barriers	0.1	0.1	
Well Guards	0.1	0.1	
Well Caps	0.1	0.1	
Well Covers	0.1	0.1	
Well Enclosures	0.1	0.1	
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Well Foundations	0.1	0.1	
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Well Spacers	0.1	0.1	
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Well Seals	0.1	0.1	
Well Liners	0.1	0.1	
Well Casings	0.1	0.1	
Well Screens	0.1	0.1	
Well Packers	0.1	0.1	
Well Gravel	0.1	0.1	
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Well Shalestone	0.1	0.1	
Well Limestone	0.1	0.1	
Well Sandstone	0.1	0.1	
Well Siltstone	0.1	0.1	
Well Shalestone	0.1	0.1	
Well Limestone	0.1	0.1	
Well Sandstone	0.1	0.1	
Well Siltstone	0.1	0.1	
Well Shalestone	0.1	0.1	
Well Limestone	0.1	0.1	
Well Sandstone	0.1	0.1	
Well Siltstone	0.1	0.1	
Well Shalestone	0.1	0.1	
Well Limestone	0.1	0.1	
Well Sandstone	0.1	0.1	
Well Siltstone	0.1	0.1	
Well Shalestone	0.1	0.1	
Well Limestone	0.1	0.1	
Well Sandstone	0.1	0.1	
Well Siltstone	0.1	0.1	
Well Shalestone	0.1	0.1	
Well Limestone	0.1	0.1	
Well Sandstone	0.1	0.1	
Well Siltstone	0.1	0.1	
Well Shalestone	0.1	0.1	
Well Limestone	0.1	0.1	
Well Sandstone	0.1	0.1	
Well Siltstone	0.1	0.1	
Well Shalestone	0.1	0.1	
Well Limestone	0.1	0.1	
Well Sandstone	0.1	0.1	
Well Siltstone	0.1	0.1	
Well Shalestone	0.1	0.1	
Well Limestone	0.1	0.1	
Well Sandstone	0.1	0.1	
Well Siltstone	0.1	0.1	
Well Shalestone	0.1	0.1	
Well Limestone	0.1	0.1	
Well Sandstone	0.1	0.1	
Well Siltstone	0.1	0.1	
Well Shalestone	0.1	0.1	
Well Limestone	0.1	0.1	
Well Sandstone	0.1	0.1	
Well Siltstone	0.1	0.1	
Well Shalestone	0.1	0.1	
Well Limestone	0.1	0.1	
Well Sandstone	0.1		

4705102041

Keith Stern Well Site
Tug Hill Operating
Feb. 10, 2014



Legend	
Original Ground Elevation	10' Contour
Proposed Ground Elevation	20' Contour
Proposed Ground Elevation	30' Contour
Proposed Ground Elevation	40' Contour
Proposed Ground Elevation	50' Contour
Proposed Ground Elevation	60' Contour
Proposed Ground Elevation	70' Contour
Proposed Ground Elevation	80' Contour
Proposed Ground Elevation	90' Contour
Proposed Ground Elevation	100' Contour
Proposed Ground Elevation	110' Contour
Proposed Ground Elevation	120' Contour
Proposed Ground Elevation	130' Contour
Proposed Ground Elevation	140' Contour
Proposed Ground Elevation	150' Contour
Proposed Ground Elevation	160' Contour
Proposed Ground Elevation	170' Contour
Proposed Ground Elevation	180' Contour
Proposed Ground Elevation	190' Contour
Proposed Ground Elevation	200' Contour
Proposed Ground Elevation	210' Contour
Proposed Ground Elevation	220' Contour
Proposed Ground Elevation	230' Contour
Proposed Ground Elevation	240' Contour
Proposed Ground Elevation	250' Contour
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Proposed Ground Elevation	360' Contour
Proposed Ground Elevation	370' Contour
Proposed Ground Elevation	380' Contour
Proposed Ground Elevation	390' Contour
Proposed Ground Elevation	400' Contour
Proposed Ground Elevation	410' Contour
Proposed Ground Elevation	420' Contour
Proposed Ground Elevation	430' Contour
Proposed Ground Elevation	440' Contour
Proposed Ground Elevation	450' Contour
Proposed Ground Elevation	460' Contour
Proposed Ground Elevation	470' Contour
Proposed Ground Elevation	480' Contour
Proposed Ground Elevation	490' Contour
Proposed Ground Elevation	500' Contour
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Proposed Ground Elevation	790' Contour
Proposed Ground Elevation	800' Contour
Proposed Ground Elevation	810' Contour
Proposed Ground Elevation	820' Contour
Proposed Ground Elevation	830' Contour
Proposed Ground Elevation	840' Contour
Proposed Ground Elevation	850' Contour
Proposed Ground Elevation	860' Contour
Proposed Ground Elevation	870' Contour
Proposed Ground Elevation	880' Contour
Proposed Ground Elevation	890' Contour
Proposed Ground Elevation	900' Contour
Proposed Ground Elevation	910' Contour
Proposed Ground Elevation	920' Contour
Proposed Ground Elevation	930' Contour
Proposed Ground Elevation	940' Contour
Proposed Ground Elevation	950' Contour
Proposed Ground Elevation	960' Contour
Proposed Ground Elevation	970' Contour
Proposed Ground Elevation	980' Contour
Proposed Ground Elevation	990' Contour
Proposed Ground Elevation	1000' Contour

TUG HILL
ENVIRONMENTAL
OPERATIONS



ENVIRONMENTAL
OPERATIONS

K/S
SURVEYING

Keith Stern Site
Mable District
Marshall County, WV

Date: 02/10/14
Scale: 1" = 500'
Drawing No: 22
Sheet: 1 of 1

PERMIT CONDITIONS

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

CONDITIONS

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

PERMIT CONDITIONS

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

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

1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Meade Powhatan Point 7.
Operator ID County District Quadrangle

2) Operator's Well Number: Keith Stern S-11HM 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):

Marcellus is the target formation at a depth of 6258' - 6309', thickness of 51' and an anticipated approximate pressure of 3800 psi.

JW 4/25/18

8) Proposed Total Vertical Depth: 6409'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 14,322'

11) Proposed Horizontal Leg Length: 7,526'

12) Approximate Fresh Water Strata Depths: 70'; 460'

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

14) Approximate Saltwater Depths: 1,740'

15) Approximate Coal Seam Depths: Sewickley Coal - 369' and Pittsburgh Coal - 454'

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: _____

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Environmental Protection

18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	120'	120'	259ft^3(CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	600'	600'	767ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	600'	600'	767ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,20'	2,200'	719ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	14,322'	14,322'	3666ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#	7,278'		
Liners							

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

PACKERS

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

WW-6B
(10/14)

API NO. 47-051 -

OPERATOR WELL NO. Keith Stern S-11HM

Well Pad Name: 4705102041

JN 4/25/18

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

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

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

Well to completed with approximately 18,120,000 lb. proppant and 280,148 barrels of water. Max rate = 80bpm; max psi = 9,000#.

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

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

*See 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.

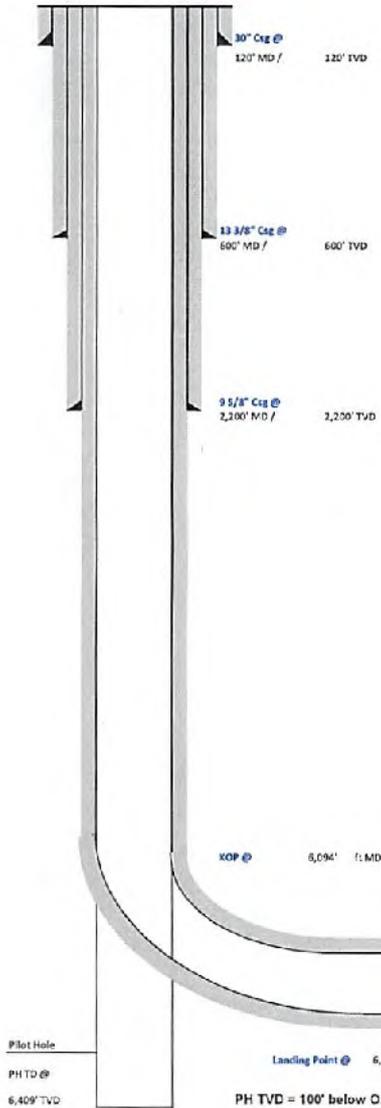


WELL NAME: Keith Stern S-11HM
STATE: WV **COUNTY:** Marshall
DISTRICT: Meade
DF Elev: 744' **GL Elev:** 744'
TD: 14,322'
TH Latitude: 39.77471193
TH Longitude: -80.6921562
BH Latitude: 39.75416642
BH Longitude: -80.67456004

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	460
Sewickley Coal	360
Pittsburgh Coal	454
Big Lime	1511
Weir	1924
Berea	2116
Gordon	2381
Rhinestreet	5592
Genesee/Burkett	6106
Tully	6137
Hamilton	6172
Marcellus	6258
Landing Depth	6298
Onondaga	6309
Pilot Hole Depth	6409

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	BW	BW	Surface
Surface	17.5	13 3/8	600'	600'	54.5	J55	Surface
Intermediate 1	17 1/4	9 5/8	2,200'	2,200'	35	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	14,322'	6,430'	20	CVHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Field Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	751	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	724	A	15	Air	1 Centralizer every other jt
Production	3,230	A	14.5	Air / SOBMT	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



Handwritten signature and date: 5/25/18

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Lateral TD @ 14,322' ft MD
 6,430' ft TVD

4705102041

4705102041



Tug Hill Operating, LLC Casing and Cement Program

JS
4/27/18

Keith Stern S-11HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	600'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,200'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	14,322'	CTS

Cement

- Conductor: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2
- Surface: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2
- Intermediate: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.19
- Kick Off Plug: Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L - KOP Plug
- Production: 50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 15.2ppg, Y = 1.19

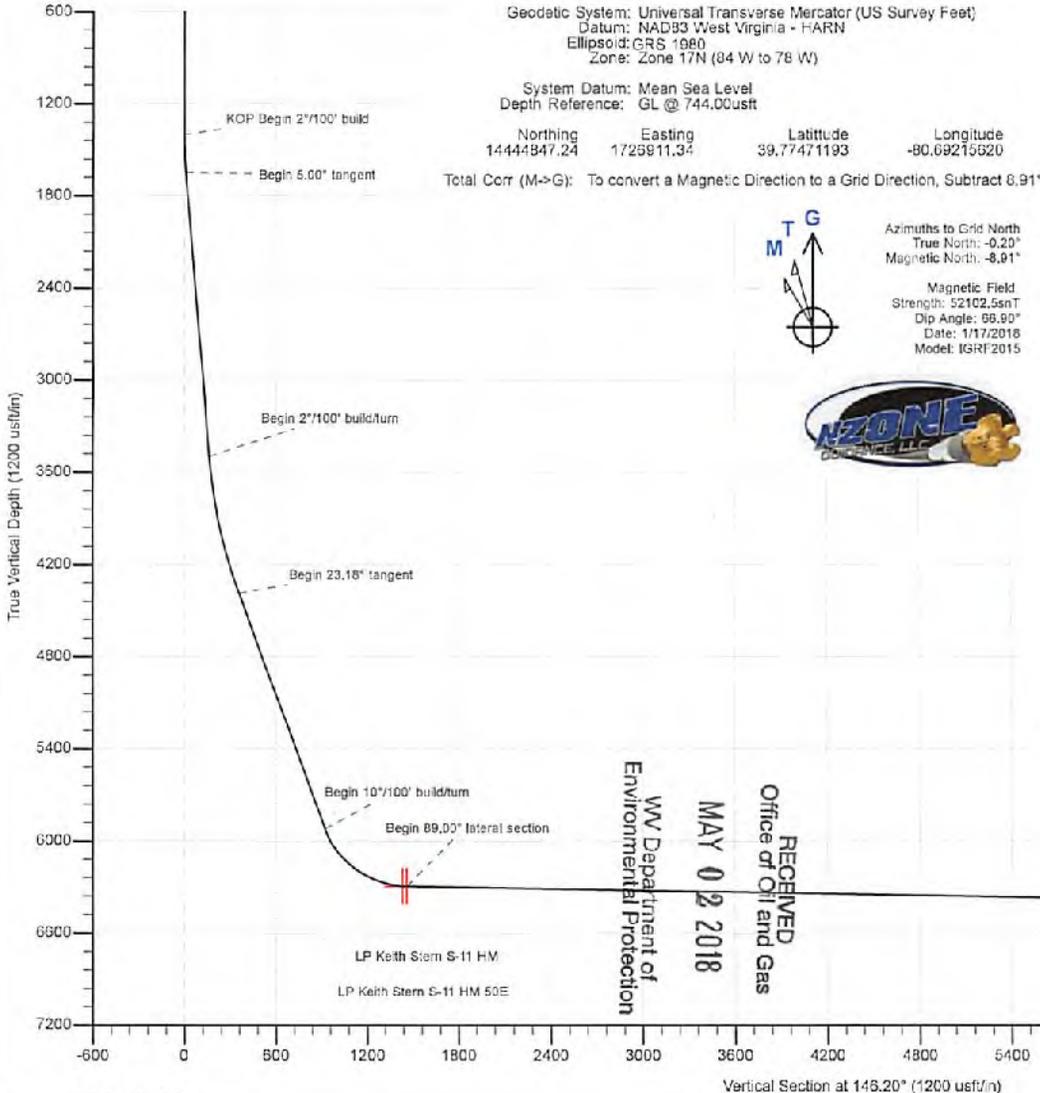
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Well: Keith Stern S-11 HM (slot M)
 Site: Keith Stern
 Project: Marshall County, West Virginia
 Design: rev1

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	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	1400.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	1650.00	5.00	130.00	1649.68	-7.01	8.35	2.00	130.00	10.47	Begin 5.00° tangent
4	3607.39	5.00	130.00	3500.00	-111.06	132.36	0.00	0.00	155.92	Begin 2°/100' build/turn
5	4426.62	23.18	115.49	4387.91	-215.55	328.03	2.00	-18.23	361.60	Begin 23.18° tangent
6	6063.97	23.18	115.49	5920.72	-497.99	920.63	0.00	0.00	925.91	Begin 10°/100' build/turn
7	6796.06	89.00	150.47	6293.00	-916.58	1262.13	10.00	37.53	1453.78	Begin 89.00° lateral section
8	14044.27	89.00	150.47	6425.00	-7222.19	4834.28	0.00	0.00	8690.81	PBHL/TD 14044.27 MD/6425.00 TVD



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

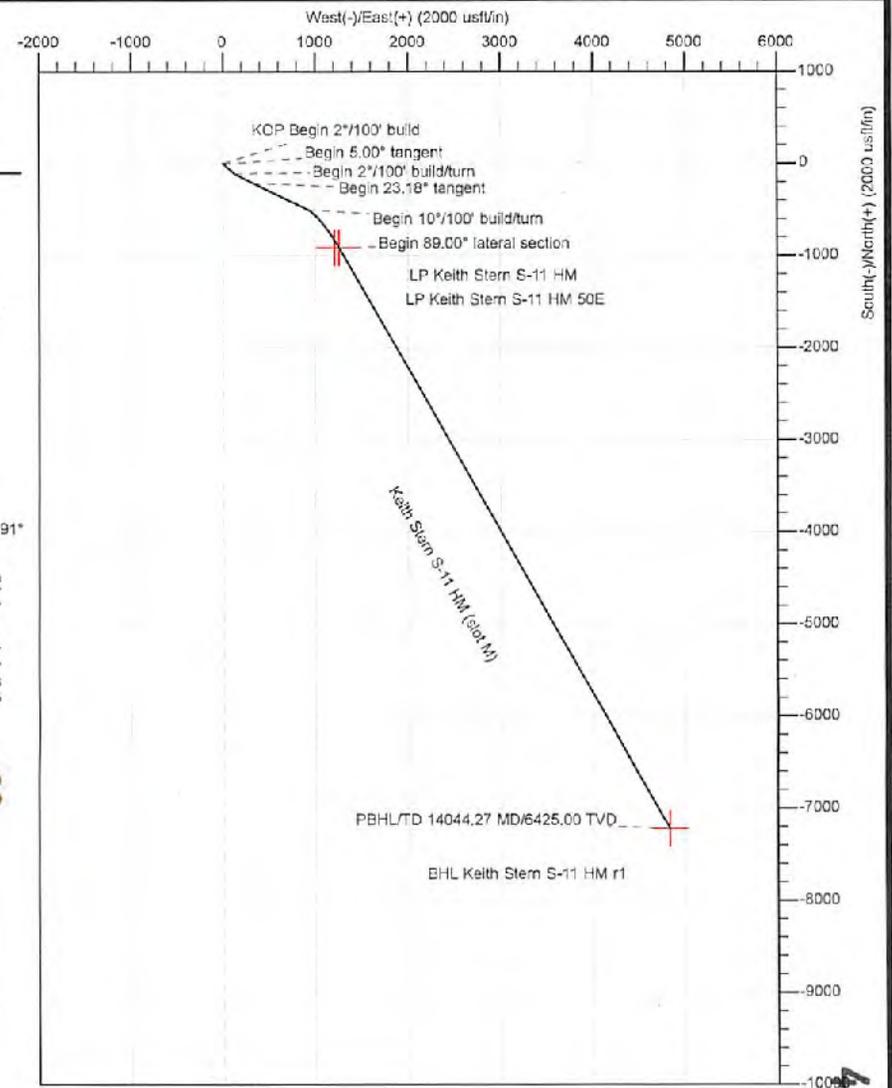
System Datum: Mean Sea Level
 Depth Reference: GL @ 744.00usft

Northing: 14444847.24 Easting: 1725911.34 Latitude: 39.77471193 Longitude: -80.69215520

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 6.91°

Azimuths to Grid North
 True North: -0.29°
 Magnetic North: -8.91°

Magnetic Field
 Strength: 52102.55nT
 Dip Angle: 89.90°
 Date: 1/17/2018
 Model: IGRF2015



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 Environmental Protection

PB-HL/TD 14044.27 MD/6425.00 TVD
 BHL Keith Stern S-11 HM r1

4705402041

WW-9
(4/16)

4705 + 02041

API Number 47 - 051 -
Operator's Well No. Keith Stern S-11HM

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 Glan 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 containment

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 _____)

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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#1386428)

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

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

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

Company Official Signature _____

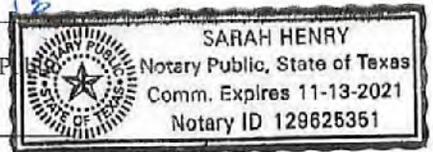
Company Official (Typed Name) Sean Gasser

Company Official Title Engineer

Subscribed and sworn before me this 25 day of April, 2018

Sarah Hennes

Notary Public



My commission expires _____

08/03/2018

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: Jan Vukobratovic

Comments: _____

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Title: Oil and Gas Inspector

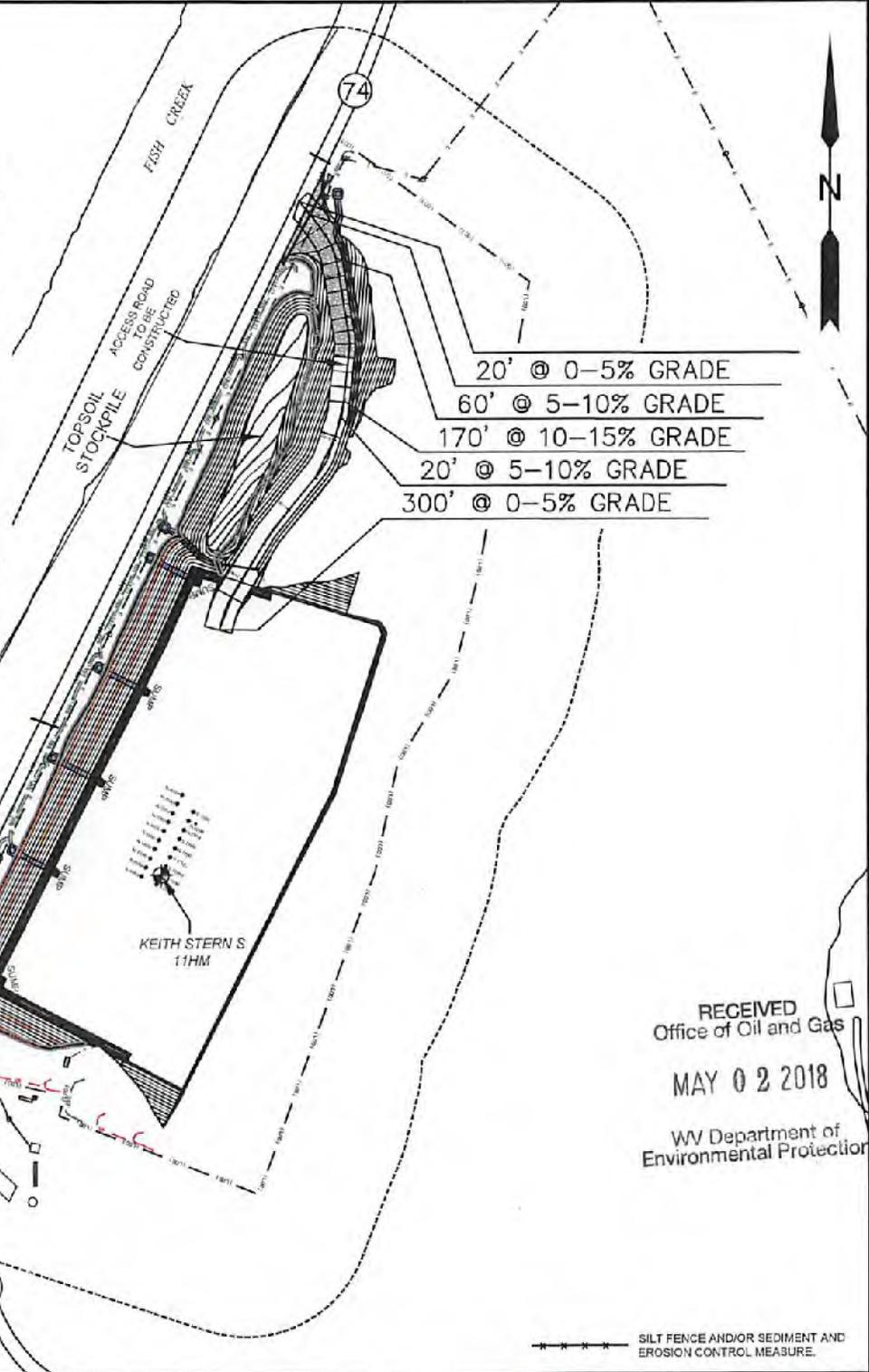
Date: 4/25/18

Field Reviewed? Yes No

PROPOSED KEITH STERN S - 11HM

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 ROAD 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 S SITE PLAN PREPARED BY KELLEY SURVEYING, FOR COMPLETE CONSTRUCTION & EROSION AND SEDIMENT CONTROL DETAILS.



RECEIVED
Office of Oil and Gas
MAY 02 2018
WV Department of
Environmental Protection

SLS
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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:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPONTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8811	04/17/2018	NONE

TUG HILL
OPERATING

08/03/2018

4705102041



Well Site Safety Plan

Tug Hill Operating, LLC

JN 6/27/18

Well Name: Keith Stern S-11HM

Pad Location: Keith Stern Pad

Marshall County, West Virginia

UTM meters , NADD83, Zone 17:

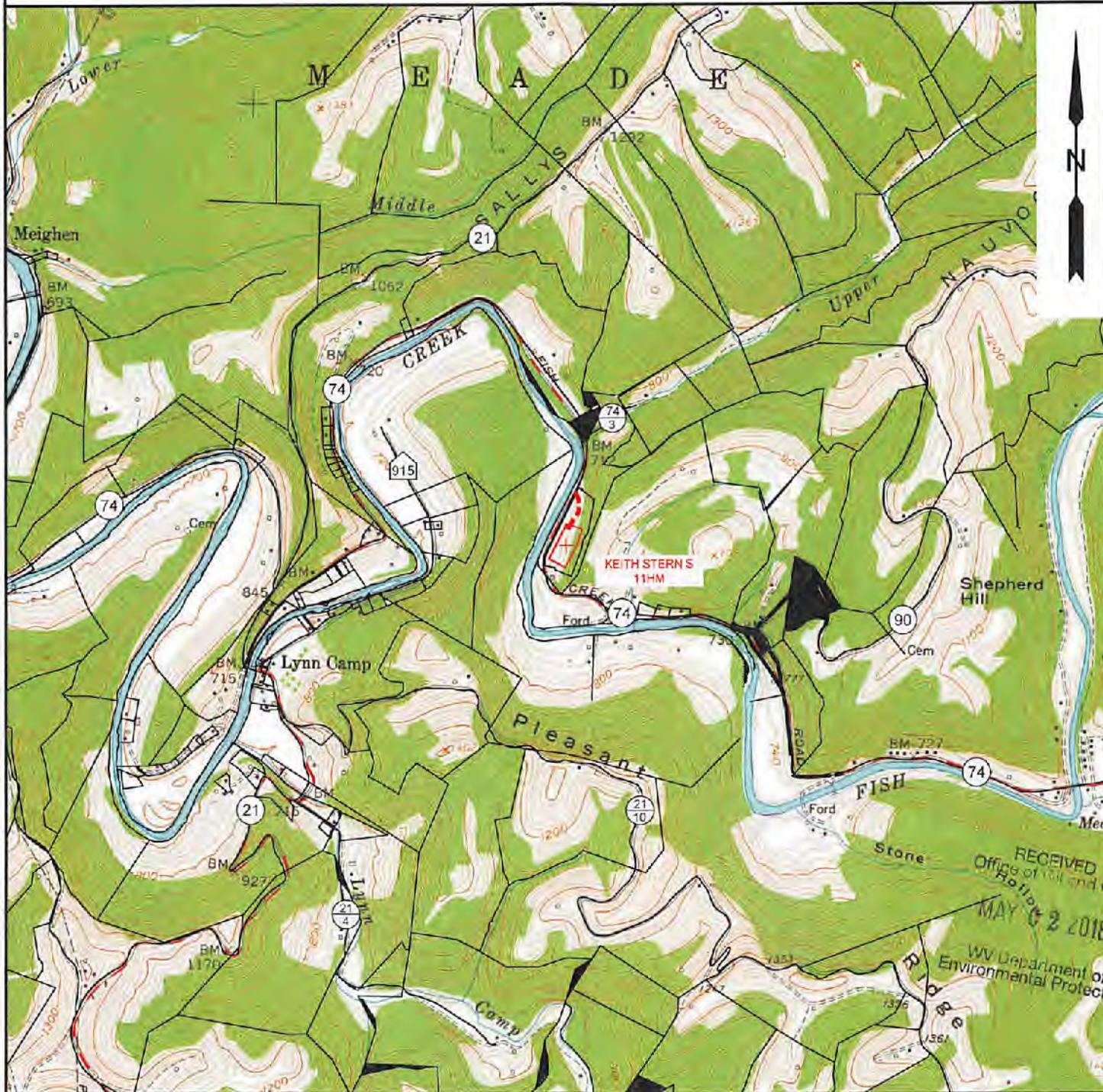
Northing: 4,402,798.24

Easting: 526,363.63

A ril 2018

08/03/2018

PROPOSED
KEITH STERN S - 11HM



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

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

LAT: 39.7137712
LON: -80.8258327
LOCATED: S 60°11'49" W AT 43,719.31' FROM THE CENTER OF KEITH STERN S 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	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8811	04/17/2018	1" = 2000'

TUG HILL
OPERATING

08/03/2018

**KEITH STERN S LEASE
WELL 11HM
TUG HILL OPERATING**

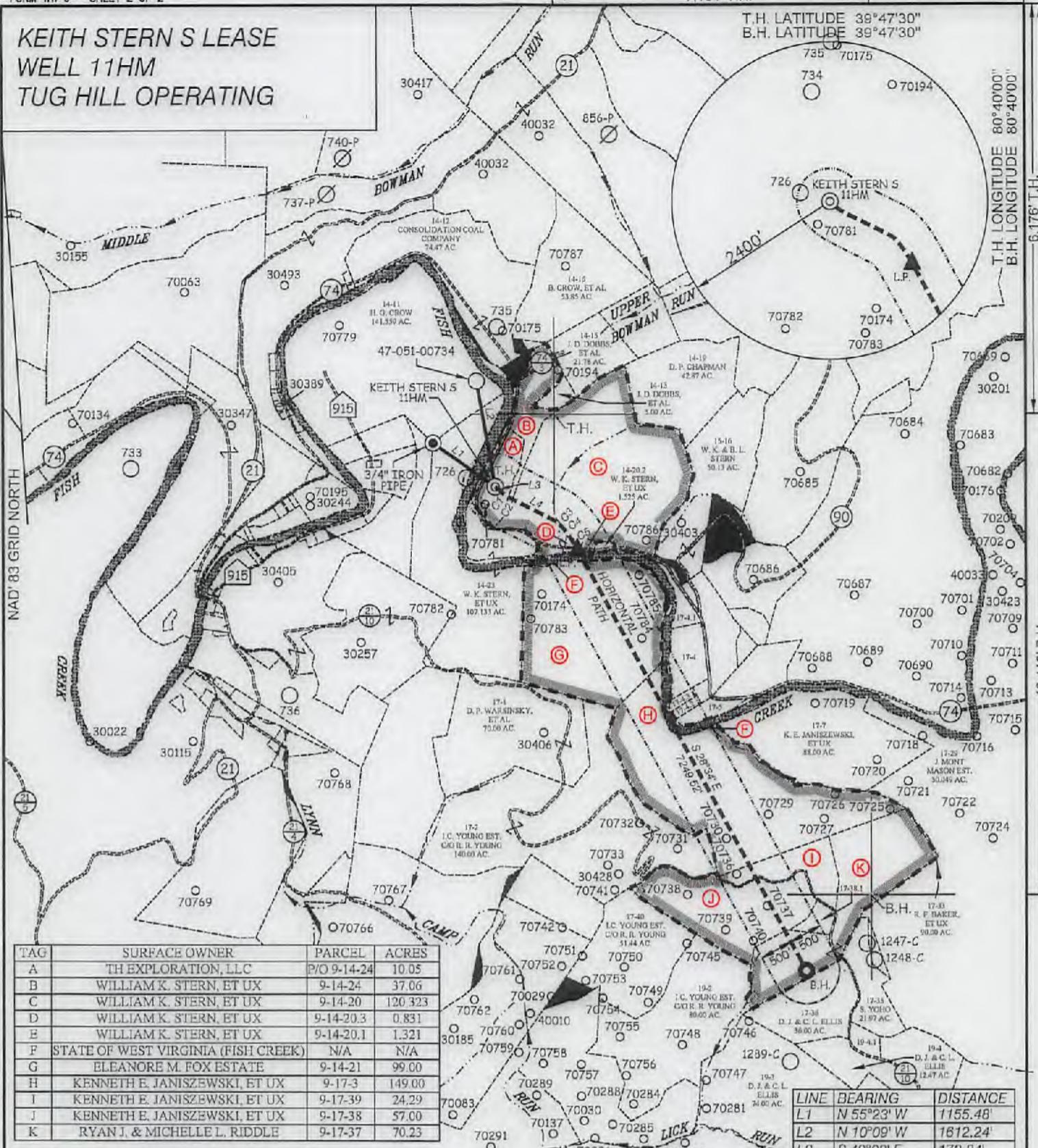
7,164' T.H.

2,355' B.H.

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

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

NAD'83 GRID NORTH



TAG	SURFACE OWNER	PARCEL	ACRES
A	TH EXPLORATION, LLC	P/O 9-14-24	10.05
B	WILLIAM K. STERN, ET UX	9-14-24	37.06
C	WILLIAM K. STERN, ET UX	9-14-20	120.323
D	WILLIAM K. STERN, ET UX	9-14-20.3	0.831
E	WILLIAM K. STERN, ET UX	9-14-20.1	1.321
F	STATE OF WEST VIRGINIA (FISH CREEK)	N/A	N/A
G	ELEANORE M. FOX ESTATE	9-14-21	99.00
H	KENNETH E. JANISZEWSKI, ET UX	9-17-3	149.00
I	KENNETH E. JANISZEWSKI, ET UX	9-17-39	24.29
J	KENNETH E. JANISZEWSKI, ET UX	9-17-38	57.00
K	RYAN J. & MICHELLE L. RIDDLE	9-17-37	70.23

LINE	BEARING	DISTANCE
L1	N 55°23' W	1155.48'
L2	N 10°09' W	1612.24'
L3	S 49°03' E	172.84'
L4	S 63°32' E	706.28'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	39.91'	298.26'	S 55°46' E	39.88'
C2	135.02'	2083.33'	S 61°38' E	134.99'
C3	106.44'	381.08'	S 51°25' E	106.10'
C4	221.89'	1250.64'	S 38°28' E	221.60'
C5	215.05'	2251.26'	S 31°18' E	214.97'

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

P.S. 677

Gregory A. Smith

LEGEND

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

SCALE 1" = 2000' FILE NO. 8811P11HM.dwg
DATE APRIL 17, 2018
REVISED _____, 20____
OPERATORS WELL NO. KEITH STERN S-11HM
API WELL NO. 47-051-02041 H6A
NO. STATE COUNTY PERMIT

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



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

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

08/03/2018

COUNTY NAME PERMIT

47 051 02041
 7,164' T.H. 2,355' B.H.

**KEITH STERN S LEASE
 WELL 11HM
 TUG HILL OPERATING**

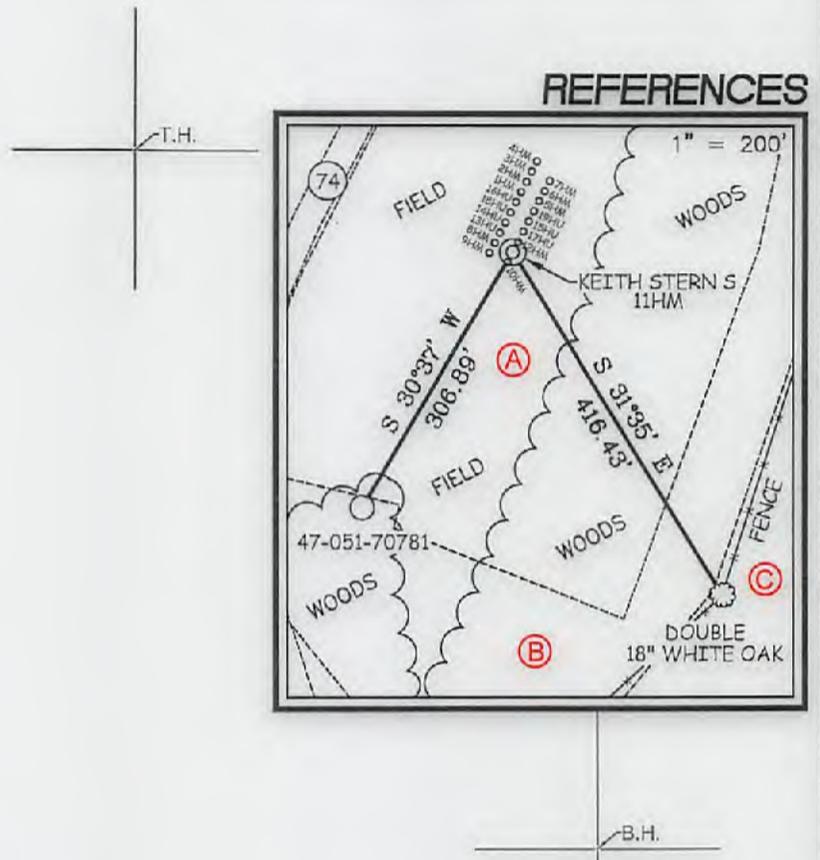
T.H. LATITUDE 39°50'00"
 B.H. LATITUDE 39°47'30"

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

NAD'83 S.P.C.(FT)	N. 466,512.72	E. 1,633,435.45
NAD'83 GEO.	LAT-(N) 39.774712	LONG-(W) 80.692156
NAD'83 UTM (M)	N. 4,402,793.24	E. 526,363.63
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 465,574.9	E. 1,634,632.6
NAD'83 GEO.	LAT-(N) 39.772183	LONG-(W) 80.687675
NAD'83 UTM (M)	N. 4,402,518.9	E. 526,748.3
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 459,208.3	E. 1,638,150.0
NAD'83 GEO.	LAT-(N) 39.754831	LONG-(W) 80.675044
NAD'83 UTM (M)	N. 4,400,596.9	E. 527,837.1

T.H. LONGITUDE 80°40'00"
 B.H. LONGITUDE 80°40'00"
 6,176' T.H.
 13,418' B.H.

TAX MAP/PCL	ADJOINING SURFACE OWNER	ACRES
17-4	PHILLIP L. MCCABE	7.097
17-4.1	DAVID M. FRABRIZIO	5.780
17-4.2	RICKY E. DAVIS	1.301
17-4.3	SYLVIA JEAN NEEHOUSE	1.329
17-5	KENNETH E. JANISZEWSKI, ET UX	5.00
17-38.1	RYAN J. & MICHELLE L. RIDDLE	3.00
19-4.1	SAMUEL YOHO	3.97



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 IS 1"=2000'



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. 677 *Gregory A. Smith*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 DATE APRIL 17, 20 18
 REVISED _____, 20 ____
 OPERATORS WELL NO. KEITH STERN S-11HM
 API WELL NO. 47 - -
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8811P11HM.dwg
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK)
 SCALE 1" = 2000'

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

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

LOCATION: GROUND = 1,342.20' ELEVATION PROPOSED = 1,326.35' WATERSHED FISH CREEK (HUC 10)
 DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

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

PROPOSED WORK:
 DRILL CONVERT _____ DRILL DEEPER _____ REDRILL _____ FRACTURE OR STIMULATE PLUG OFF OLD FORMATION _____ PERFORATE NEW FORMATION _____ PLUG AND ABANDON _____ CLEAN OUT AND REPLUG _____ OTHER _____
 PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD: 6,409' / TMD: 14,322'

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

08/03/2018

COUNTY TIME PERMIT

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

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

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

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

*See attached pages

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

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

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

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

Well Operator: Tug Hill Operating, LLC
 By: Amy L. Miller *Amy L. Miller*
 Its: Permitting Specialist - Appalachia Region

Lease ID	Tag	Parcel No.	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment			
10*15804	K	9-17-37	JOE GOULDSBERRY	CHESAPEAKE APPALACHIA LLC	1/8+	683	637	N/A	Chesapeake to Statoil: 22/636	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15805	K	9-17-37	MARY ELLEN CHAMBERS	CHESAPEAKE APPALACHIA LLC	1/8+	694	82	N/A	Chesapeake to Statoil: 32/247	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15806	K	9-17-37	IOANNE FOX	CHESAPEAKE APPALACHIA LLC	1/8+	683	634	N/A	Chesapeake to Statoil: 22/636	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15807	K	9-17-37	GLORIS VAN SCYOC	CHESAPEAKE APPALACHIA LLC	1/8+	685	190	N/A	Chesapeake to Statoil: 22/636	Statoil to SWN Exchange: 33/121	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15808	K	9-17-37	ANGELA YDHO	CHESAPEAKE APPALACHIA LLC	1/8+	685	193	N/A	Chesapeake to Statoil: 22/471	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15809	K	9-17-37	RYAN J AND MICHELE L RIDDLE	CHESAPEAKE APPALACHIA LLC	1/8+	687	225	N/A	Chesapeake to Statoil: 22/471	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15810	K	9-17-37	FLOSSIE P RUTAN	CHESAPEAKE APPALACHIA LLC	1/8+	690	266	N/A	Chesapeake to Statoil: 24/338	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15811	K	9-17-37	SANDRA M WINSLOW	CHESAPEAKE APPALACHIA LLC	1/8+	719	51	N/A	Chesapeake to Statoil: 26/42	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*21969	K	9-17-37	MARK WESLEY RICHARDSON	TH EXPLORATION LLC	1/8+	960	507	N/A	N/A	N/A	N/A	N/A	N/A	

47051 02041

Lease ID	Tag	Parcel No.	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
10*15605	A	9-14-24	ISAAC CROW ET UX	JOHN G CRAWFORD	1/8+	74 394	Wheeling Natural Gas Company to The Manufacturers Light & Heat Company: 148/389	Manufacturers to Union Gasoline & Oil Corp: 197/120	Union to The Preston Oil Company: 2/136	Preston to Manufacturers Light & Heat Company: 2/225	Cert. of Merger of Manufactureres Light & Heat Company into Columbia Gas Transmission Corp: 422/204	Columbia Gas Trans. Corp. To Columbia Natural Resources, Inc: 537/518	Columbia Natural Resource Inc. to Nicole Gas Production, LTD: 13/623	Nicole Gas Production, LTD to William F. Dobbs, Trustee of Pennsylvania Land Holdings Corp: 618/206	Pennsylvania Land Holdings Corp. appoints Dennis N. Broglio as Successor Trustee: 624/654	Dennis N. Broglio, Successor Trustee to Tri-County Oil & Gas, Inc: 14/471	Tri-County Oil & Gas Inc. merged into Leatherwood, Inc. on Oct. 24, 2007	Sublease from Leatherwood Inc to CNX Gas Company LLC: 684/252	Memorandum of Agreement between Tug Hill Operating LLC and CNX Gas Company LLC: 968/460
10*15605	B	9-14-24	ISAAC CROW ET UX	JOHN G CRAWFORD	1/8+	74 394	Wheeling Natural Gas Company to The Manufacturers Light & Heat Company: 148/389	Manufacturers to Union Gasoline & Oil Corp: 197/120	Union to The Preston Oil Company: 2/136	Preston to Manufacturers Light & Heat Company: 2/225	Cert. of Merger of Manufactureres Light & Heat Company into Columbia Gas Transmission Corp: 422/204	Columbia Gas Trans. Corp. To Columbia Natural Resources, Inc: 537/518	Columbia Natural Resource Inc. to Nicole Gas Production, LTD: 13/623	Nicole Gas Production, LTD to William F. Dobbs, Trustee of Pennsylvania Land Holdings Corp: 618/206	Pennsylvania Land Holdings Corp. appoints Dennis N. Broglio as Successor Trustee: 624/654	Dennis N. Broglio, Successor Trustee to Tri-County Oil & Gas, Inc: 14/471	Tri-County Oil & Gas Inc. merged into Leatherwood, Inc. on Oct. 24, 2007	Sublease from Leatherwood Inc to CNX Gas Company LLC: 684/252	Memorandum of Agreement between Tug Hill Operating LLC and CNX Gas Company LLC: 968/460
10*15509	C	9-14-20	WILLIAM K AND BETTY L STERN	NPAR, LLC	1/8+	718 320	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*15957	D	9-14-20.3	BRADLEY CROW AND BETTY L CROW	CHESAPEAKE APPALACHIA LLC	1/8+	768 350	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Chesapeake to Statoil: 31/279	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	SWN Production to Tug Hill: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15958	D	9-14-20.3	GLADYS CROW	CHESAPEAKE APPALACHIA LLC	1/8+	769 609	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Chesapeake to Statoil: 31/279	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	SWN Production to Tug Hill: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15959	D	9-14-20.3	LEWIS M QUIGLEY AND MAXINE V QUIGLEY	CHESAPEAKE APPALACHIA LLC	1/8+	769 603	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Chesapeake to Statoil: 31/279	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	SWN Production to Tug Hill: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15960	D	9-14-20.3	CONNIE HECKLE	CHESAPEAKE APPALACHIA LLC	1/8+	770 547	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Chesapeake to Statoil: 31/279	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	SWN Production to Tug Hill: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15961	D	9-14-20.3	H GLENN CROW	CHESAPEAKE APPALACHIA LLC	1/8+	770 565	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Chesapeake to Statoil: 31/279	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	SWN Production to Tug Hill: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15964	E	9-14-20.1	GLADYS CROW	CHESAPEAKE APPALACHIA LLC	1/8+	769 410	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Chesapeake to Statoil: 31/279	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	SWN Production to Tug Hill: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455

1102041
47 051 151 64

Lease ID	Tag	Parcel No.	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment			
10*15965	E	9-14-20.1	H GLENN CROW	CHESAPEAKE APPALACHIA LLC	1/8+	770 535	N/A	Chesapeake to Statoil: 31/279	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15962	F	9-14-20.1	BRADLEY CROW AND BETTY L CROW	CHESAPEAKE APPALACHIA LLC	1/8+	768 362	N/A	Chesapeake to Statoil: 31/279	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15963	E	9-14-20.1	LEWIS M QUIGLEY AND MAXINE V QUIGLEY	CHESAPEAKE APPALACHIA LLC	1/8+	769 416	N/A	Chesapeake to Statoil: 31/279	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15966	E	9-14-20.1	CONNIE HECKLE	CHESAPEAKE APPALACHIA LLC	1/8+	770 541	N/A	Chesapeake to Statoil: 31/279	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
LI-17-1/25-1986	F	FISH CREEK	WV DEPT OF COMMERCE, DIVISION OF NATURAL RESOURCES	TH EXPLORATION LLC	N/A	NOT RECORDED	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.243.1	G	9-14-21	MARY A FOX	TH EXPLORATION LLC	1/8+	879 332	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.243.2	G	9-14-21	PAUL G FOX	TH EXPLORATION LLC	1/8+	879 335	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.243.3	G	9-14-21	MARK H FOX	TH EXPLORATION LLC	1/8+	879 338	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.243.4	G	9-14-21	DAVID E FOX	TH EXPLORATION LLC	1/8+	876 55	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.243.5	G	9-14-21	LOUIS T FOX AND KAREN A FOX	TH EXPLORATION LLC	1/8+	876 58	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.243.6	G	9-14-21	THOMAS J FOX	TH EXPLORATION LLC	1/8+	876 61	N/A	N/A	N/A	N/A	N/A	N/A	
10*15832	H	9-17-3	ANITA DIANE ANTILL AND TERRY ANTILL	CHESAPEAKE APPALACHIA LLC	1/8+	742 121	N/A	Chesapeake to Statoil: 27/50	Chesapeake to SWN Production: 33/110	Statoil to SWN Exchange: 33/424	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15835	H	9-17-3	LUCINDA RAE ALLEN AND DAVID A ALLEN	CHESAPEAKE APPALACHIA LLC	1/8+	742 104	N/A	Chesapeake to Statoil: 27/50	Chesapeake to SWN Production: 33/110	Statoil to SWN Exchange: 33/424	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15847	H	9-17-3	ROGER BRIGHT AND SUSAN LEIMER - DECEASED	CHESAPEAKE APPALACHIA LLC	1/8+	743 285	N/A	Chesapeake to Statoil: 27/50	Chesapeake to SWN Production: 33/110	Statoil to SWN Exchange: 33/424	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455

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Lease ID	Tag	Parcel No.	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment			
10*15848	H	9-17-3	HOMER L SIMMONS AND GLADYS R SIMMONS	CHESAPEAKE APPALACHIA LLC	1/8+	745 194	N/A	Chesapeake to Statoil: 27/50	Chesapeake to SWN Production: 33/110	Statoil to SWN Exchange: 33/424	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15855	H	9-17-3	ALICE THIPPHAVONG AND V/SITH THIPPHAVONG	CHESAPEAKE APPALACHIA LLC	1/8+	747 635	N/A	Chesapeake to Statoil: 27/50	Chesapeake to SWN Production: 33/110	Statoil to SWN Exchange: 33/424	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15856	H	9-17-3	LEO C HILKE AND BETTY M HILKE	CHESAPEAKE APPALACHIA LLC	1/8+	747 629	N/A	Chesapeake to Statoil: 27/50	Chesapeake to SWN Production: 33/110	Statoil to SWN Exchange: 33/424	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15870	H	9-17-3	JOHN H HILKE AND ALIDA HILKE	CHESAPEAKE APPALACHIA LLC	1/8+	750 206	N/A	Chesapeake to Statoil: 27/50	Chesapeake to SWN Production: 33/110	Statoil to SWN Exchange: 33/424	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15872	H	9-17-3	SUSAN H KEY	CHESAPEAKE APPALACHIA LLC	1/8+	751 191	N/A	Chesapeake to Statoil: 27/50	Chesapeake to SWN Production: 33/110	Statoil to SWN Exchange: 33/424	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*47051.185.1	I	9-17-39	HOMER L SIMMONS AND GLADYS R SIMMONS	TH EXPLORATION LLC	1/8+	885 68	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.185.2	I	9-17-39	LUCINDA RAE ALLEN AND DAVID A ALLEN	TH EXPLORATION LLC	1/8+	894 482	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.185.3	I	9-17-39	ANITA DIANE ANTILL AND TERRY ANTILL	TH EXPLORATION LLC	1/8+	885 71	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.185.1	J	9-17-38	HOMER L SIMMONS AND GLADYS R SIMMONS	TH EXPLORATION LLC	1/8+	885 68	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.185.2	J	9-17-38	LUCINDA RAE ALLEN AND DAVID A ALLEN	TH EXPLORATION LLC	1/8+	894 482	N/A	N/A	N/A	N/A	N/A	N/A	
10*47051.185.3	J	9-17-38	ANITA DIANE ANTILL AND TERRY ANTILL	TH EXPLORATION LLC	1/8+	885 71	N/A	N/A	N/A	N/A	N/A	N/A	
10*15802	K	9-17-37	TOM GOULDSBERRY	CHESAPEAKE APPALACHIA LLC	1/8+	683 640	N/A	Chesapeake to Statoil: 22/636	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455
10*15803	K	9-17-37	CHARLOTTE CROW	CHESAPEAKE APPALACHIA LLC	1/8+	683 631	N/A	Chesapeake to Statoil: 22/636	Statoil to SWN Exchange: 33/424	Chesapeake to SWN Production: 33/110	Cert. of Merger - SWN Exchange Titleholder LLC to SWN Production Company LLC: 19/624	SWN Production to Tug Hill: 36/431	Statoil to Tug Hill: 36/455

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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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WV Department of
Environmental Protection

08/03/2018

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement is entered into this 23rd day of March, 2018, between **TUG HILL OPERATING, LLC (THQ)**, a Texas limited liability company, whose address is 1320 S. University Blvd., Suite 500, Fort Worth, TX 76107 and **CNX GAS COMPANY LLC (CNX)**, a Virginia limited liability company, whose address is 1000 Consol Energy Drive, Suite 400, Canonsburg, PA 15317.

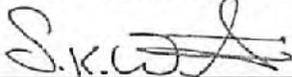
PARTIES AND AGREEMENT REFERENCE: THQ and CNX entered into a letter agreement ("Letter Agreement") dated March 29, 2018 (the "Commencement Date") granting THQ the right to permit, drill, extract, produce and market oil and gas from those certain oil and gas interests controlled by CNX in the Meade, Cameron, and Franklin Districts of Marshall County, West Virginia, as more fully described in Exhibit A attached hereto, made a part hereof, and incorporated herein by reference.

1. TERM: The Letter Agreement shall remain in full force and effect for a term of one hundred eighty (180) days.

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

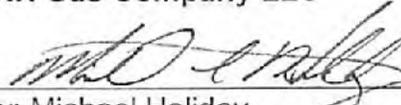
IN WITNESS WHEREOF, the parties have signed their names hereto as of the date first above written.

Tug Hill Operating, LLC



By: Sean Willis
Its: SVP – Engineering & Development

CNX Gas Company LLC



By: Michael Holiday
Its: Assistant Vice President

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

Marshall County
Jan Pest, Clerk
Instrument 1439654
04/27/2018 @ 10:03:48 AM
AGREEMENT
Book 968 @ Page 460
Pages Recorded 3
Recording Cost \$ 11.00

STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

Jan Pest
MARSHALL County 12:43:01 PM
Instrument No 1404876
Date Recorded 05/20/2016
Document Type 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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for a.s.w.



TUG HILL

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April 30, 2018

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

RE: Keith Stern S-11HM

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 S-11HM 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,

Amy L. Miller
Permitting Specialist – Appalachia Region

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Environmental Protection

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

Date of Notice Certification: 04/30/2018

API No. 47- 051 - _____
Operator's Well No. Keith Stern S-11HM
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>526,363.63</u>
County: <u>Marshall</u>	Northing: <u>4,402,798.24</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 style="text-align: center;">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 style="text-align: center;">RECEIVED Office of Oil and Gas MAY 02 2018 WV Department of Environmental Protection</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:

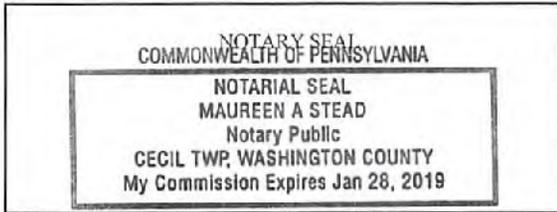
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

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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>360 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@lug-hilltop.com</u>



Subscribed and sworn before me this 30 day of APRIL 2018.
Maureen A Stead Notary Public
 My Commission Expires 1/28/19

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 S-11HM
Well Pad Name: Keith Stern

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

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

Date of Notice: 4/26/2018 Date Permit Application Filed: 4/27/2018

Notice of:

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

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

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

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

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

SURFACE OWNER(s)

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

Name: _____
Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)

Name: _____
Address: _____

Name: _____
Address: _____

SURFACE OWNER(s) (Impoundments or Pits)

Name: _____
Address: _____

COAL OWNER OR LESSEE

Name: CONSOL Energy, Inc. Attn: Casey Saunders
Address: 1000 CONSOL Energy Drive
Canonsburg, PA 15317

COAL OPERATOR
Name: _____
Address: _____

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)

Name: *See attached list
Address: _____

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: _____
Address: _____

*Please attach additional forms if necessary

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08/03/2018

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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.

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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

WV Department of Environmental Protection

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

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WW-6A
(8-13)

API NO. 4705102041
OPERATOR WELL NO. Keith Stern S-111M
Well Pad Name: Keith Stern

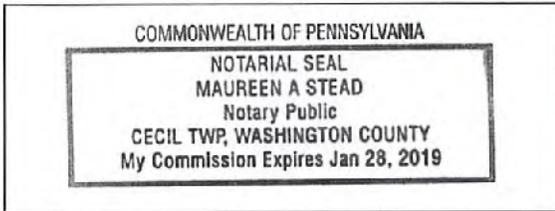
Notice is hereby given by:

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

Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-336-2030

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 26 day of APRIL 2018.
Maureen A Stead Notary Public
My Commission Expires 1/28/19

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WV Department of
Environmental Protection

08/03/2018

Exhibit WW-6A

Supplement Pg. 1A

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

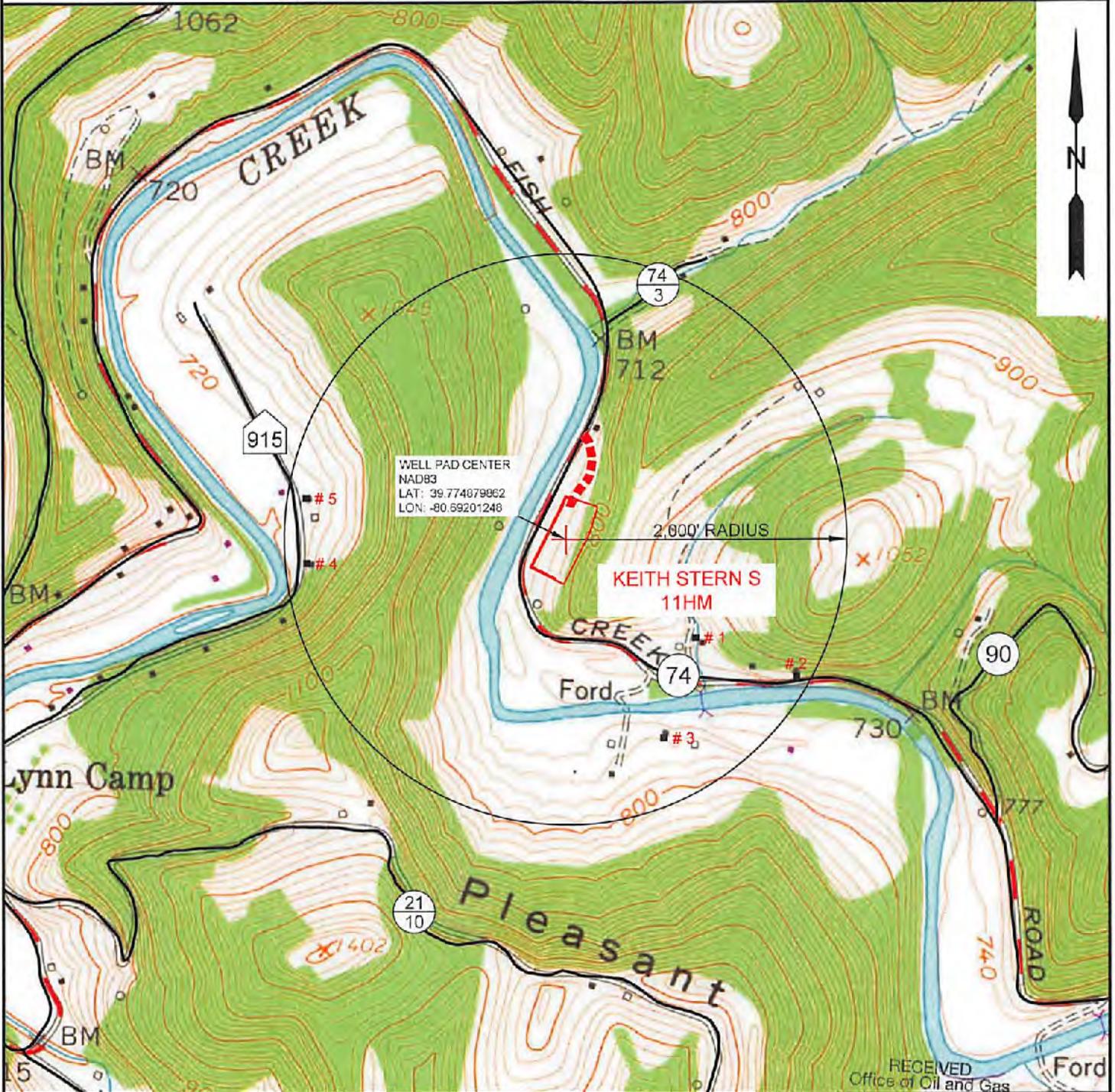
Residences within Two-Thousand Feet (2,000')

Well: KEITH STERN S – 11HM
 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>	<p style="text-align: right;"> RECEIVED Office of Oil and Gas MAY 02 2018 WV Department of Environmental Protection </p>

PROPOSED
KEITH STERN S - 11HM



NOTE: THERE APPEARS TO BE FIVE (5) POSSIBLE WATER SOURCES WITHIN 2,000'.

MAY 02 2018

SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 462-5834
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.C.M.		04/17/2018	1" = 1000'

WV Department of Environmental Protection

TUG HILL OPERATING

08/03/2018

4705702041

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) 6AS
- (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 511HM located in Meade District, Marshall County, West Virginia, upon the person or organization named--

Tug Hill Operating, LLC / TH Exploration, LLC
--by delivering the same in Washington County, State of Pennsylvania on the 20th day of April, 2018 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 Jim Pancake.

Amy Miller
(Signature of person executing service)

Taken, subscribed and sworn before me this 26 day of APRIL
My commission expires 1/28/19

Maureen A Stead
Notary Public

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(AFFIX SEAL IF NOTARIZED OUTSIDE THE STATE)

NOTARIAL SEAL
MAUREEN A STEAD
Notary Public
CECIL TWP, WASHINGTON COUNTY
My Commission Expires Jan 28, 2019

4705 + 02041

**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: West Virginia
County: Marshall
District: Meade
Quadrangle: Glen Easton 7.5'

Approx. Latitude & Longitude: 39.7748867; -80.6920362
Public Road Access: Fish Creek Road (County Route 74)
Watershed: Fish Creek (HUC 10)
Generally used farm name: TH Exploration, LLC

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Environmental Protection

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: 724-749-8368
Email: amiller@tug-hill-op.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.

08/03/2018

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

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

Date of Notice: 04/25/2018 **Date Permit Application Filed:** 04/30/2018

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

- CERTIFIED MAIL RETURN RECEIPT REQUESTED
- HAND 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:	526,363.63
County:	Marshall		Northing:	4,402,798.24
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: _____
Email: _____

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.

Affidavit of Personal Service

4705102041

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) 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 S-11HM located in Meade District, Marshall County, West Virginia, upon the person or organization named--

Tug Hill Operating, LLC / TH Exploration, LLC
--by delivering the same in Washington County, State of Pennsylvania on the 20th day of April, 2018 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 Jim Pancake.

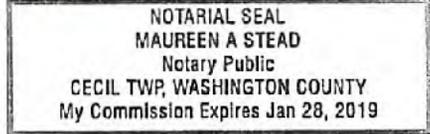
Amy Miller
(Signature of person executing service)

Taken, subscribed and sworn before me this 26 day of APRIL 2018
My commission expires 1/28/19

Maureen A Stead
Notary Public

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(AFFIX SEAL IF NOTARIZED OUTSIDE THE STATE)





4705702041

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

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

February 20, 2018

Jill M. Newman
Deputy 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 1HM	Keith Stern 2HM	Keith Stern 3HM	Keith Stern 4HM
Keith Stern 5HM	Keith Stern 6HM	Keith Stern 7HM	Keith Stern 8HM
Keith Stern 9HM	Keith Stern 10HM	Keith Stern 11HM	Keith Stern 12HM
Keith Stern 13HU	Keith Stern 14HU	Keith Stern 15HU	Keith Stern 16HU
Keith Stern 17HU	Keith Stern 18HU	Keith Stern 19HU	

Dear Mr. Martin,

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

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

Very Truly Yours,

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

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MAY 02 2018
WV Department of
Environmental Protection

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

47 051 02041



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Keith Stern S-11HM

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



APPROVED
WVDEP OOG
7/30/2018

Keith Stern Well Site
Site Design, Construction Plan, &
Erosion and Sediment Control Plans
Tug Hill Operating
Marshall County
Meade District
Latitude 39.77487986°
Longitude -80.69201248°
Middle Fish Creek Watershed

Pertinent Site Information
Keith Stern Well Site
Emergency Number: 304-445-1270
Meade District, Marshall County, WV
Watershed: Middle Fish Creek Watershed
Site 911 Address:

Tug Hill Contour Number: 1-4-17-633-3400

Property Owner Information - Keith Stern Well Site

Parcel	Owner	Address	City	County	State
1	Keith Stern	10000	Marshall	WV	USA

Exhibit A: Final Design: Issue for Permitting

Table with columns for Parcel ID, Owner Name, and Address. Lists various parcels in the area.

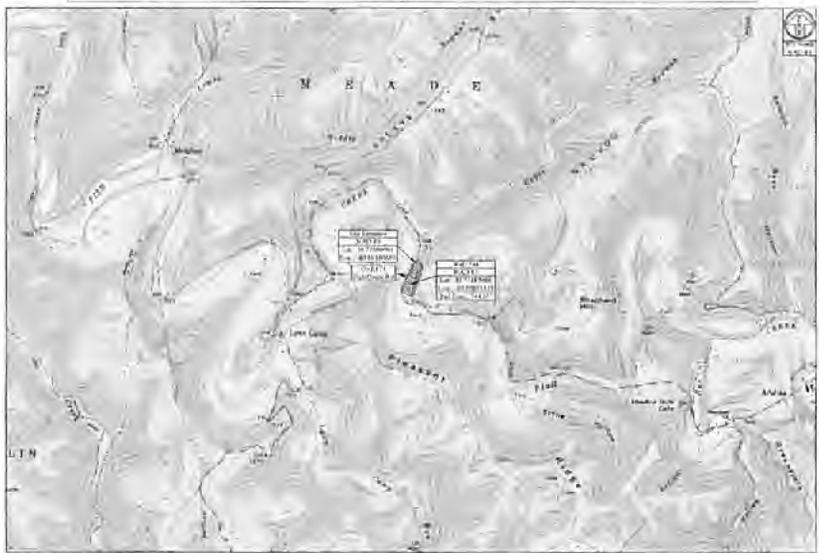


Table with columns for Property Owner Information, including parcel number, owner name, address, city, county, and state.

Table with columns for Parcel ID, Owner Name, and Address. Lists various parcels in the area.

Project Contact
Site Design
Erosion and Sediment Control
Tug Hill Operating
Marshall County
Meade District
Watershed: Middle Fish Creek Watershed
Site 911 Address:

Tug Hill Contour Number: 1-4-17-633-3400

Approach Route
The site is located on the east side of the road, north of the intersection of the road and the creek. The site is located on the east side of the road, north of the intersection of the road and the creek. The site is located on the east side of the road, north of the intersection of the road and the creek.

Table with columns for Site Location (NSD 27) and Site Location (NSD 83). Lists site details and coordinates.



Well Location Restrictions
The well location is restricted to the area shown on the site plan. The well location is restricted to the area shown on the site plan. The well location is restricted to the area shown on the site plan.

Table with columns for Sheet Number and Description. Lists the contents of the drawing.

TUG HILL OPERATING

Keith Stern Well Site
Meade District
Marshall County, WV

Scale: As Shown
Drawing No. 27
Date: 7/30/2018
Sheet 1 of 1

