



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

Monday, November 4, 2019
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
380 SOUTHPOINTE BLVD
CANONSBURG, PA 15317

Re: Permit approval for HUDSON S-1HM
47-051-02248-00-00

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: HUDSON S-1HM
Farm Name: CNX LAND LLC
U.S. WELL NUMBER: 47-051-02248-00-00
Horizontal 6A New Drill
Date Issued: 11/4/2019

Promoting a healthy environment.

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.



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Austin Caperton, Cabinet Secretary
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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: November 1, 2019
ORDER NO.: 2019-W-14

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 June 24, 2019 Tug Hill submitted well work permit applications identified as APIs# 47-051-02248, 47-051-02249, 47-051-02250, and 47-051-02251. The proposed wells are to be located on the Hudson Pad in the Meade District of Marshall County, West Virginia.
4. On June 24, 2019 Tug Hill requested a waiver for Wetlands 1 and 3 as outlined in Attachment 1, from well location restriction requirements in W. Va. Code §22-6A-12(b) for the well work permit applications identified as API# # 47-051-02248, 47-051-02249, 47-051-02250, and 47-051-02251.

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 Wetlands 1 and 3 from well location restriction requirements in W. Va. Code §22-6A-12(b) for the well work permit applications identified as API# # 47-051-02248, 47-051-02249, 47-051-02250, and 47-051-02251. The Office of Oil and Gas hereby **ORDERS** that Tug Hill shall meet the following site construction and operational requirements for the Hudson 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. Wetland 1 and 3 shall be protected by both super silt fence and twenty-four inch (24”) compost filter sock. This along rip-rap outlets, temporary and permanent vegetative cover will prevent sediment from reaching the wetlands;
- d. Disturbed areas not used for operations shall be seeded and mulched per the seeding tables in the WVDEP-OOG Erosion and Sediment Control Manual;
- e. Drill cuttings and associated drilling mud shall be disposed of in a permitted landfill;
- f. Waste generated by the flowback treatment systems shall be sent to offsite disposal at a permitted landfill;
- g. Weekly site inspections shall be conducted to monitor and maintain the integrity of the BMP storm water controls;
- h. Weekly storm water and spill prevention inspections shall be conducted focusing on storm water and spill prevention BMPs and maintenance of these BMPs;
- i. 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;
- j. Pad inspections shall be conducted no less than once a week to identify and mitigate potential deficiencies;
- k. All records from inspections shall be maintained on site for the life of the project and be available upon request.

Thus ORDERED, the 1st day of November, 2019.

IN THE NAME OF THE STATE OF WEST VIRGINIA:

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

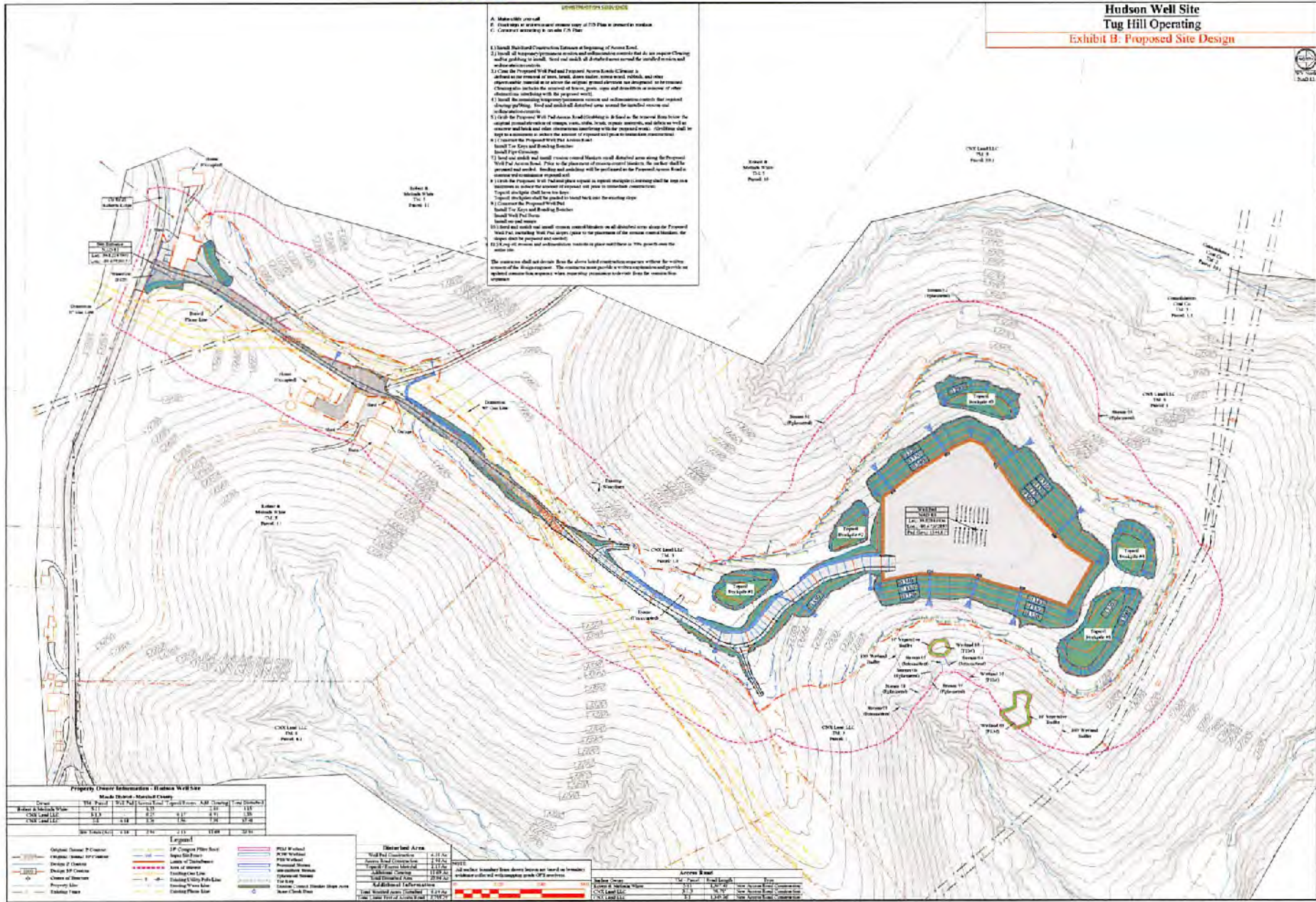
By: 

JAMES A. MARTIN, CHIEF

Attachment 1

Hudson Well Site Tug Hill Operating Exhibit B: Proposed Site Design

- CONSTRUCTION GUIDANCE**
- Marketable parcel.
 - Final steps in stream and stream bank of Tug Hill in accordance with:
 - Construction according to state CFS rules.
- Install Standard Construction Barriers at Beginning of Access Road.
 - Install all necessary erosion control and sedimentation controls that do not require digging or grading to install. Seed and mulch all disturbed areas around the installation and within the construction.
 - Once the Proposed Well Pad and Proposed Access Road (C-Plan) is installed in the proposed well location, place erosion control within and near the proposed well pad to secure the original ground surface (as depicted on the construction plan) to the extent of being, prior, open and available in manner of other construction consistent with the proposed well.
 - Install the necessary temporary sedimentation controls and sedimentation controls that require digging or grading. Seed and mulch all disturbed areas around the installed erosion control.
 - Install the Proposed Well Pad Access Road (D-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank and other construction consistent with the proposed well. (Erosion shall be kept to a minimum to allow the access of equipment to the proposed well.)
 - Install the Proposed Well Pad Access Road (E-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (F-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (G-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (H-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (I-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (J-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (K-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (L-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (M-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (N-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (O-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (P-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (Q-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (R-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (S-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (T-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (U-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (V-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (W-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (X-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (Y-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
 - Install the Proposed Well Pad Access Road (Z-Plan) in the proposed well location to the original ground surface of eroded areas, with erosion control, and allow to seed to secure and bank.
- The contractor shall not disturb any other listed construction activities without the written consent of the design engineer. The contractor shall provide a written notification and provide an updated erosion control plan when necessary to ensure compliance with the proposed well.



Property Owner Information - Hudson Well Site

Parcel	YEA Parcel	YEA Parcel	YEA Parcel	YEA Parcel	YEA Parcel	YEA Parcel
Hudson & Marsh Well	0.11	0.11	0.11	0.11	0.11	0.11
CNS Land LLC	0.11	0.11	0.11	0.11	0.11	0.11
CNS Land LLC	0.11	0.11	0.11	0.11	0.11	0.11
Sub Total (YEA)	0.33	0.33	0.33	0.33	0.33	0.33

Legend

Original Survey Boundary	Proposed Well Pad	Proposed Access Road	Proposed Erosion Control	Proposed Sedimentation Control	Proposed Stream Bank	Proposed Stream Channel	Proposed Stream Bank
Design of Channel	Design of Channel	Design of Channel	Design of Channel	Design of Channel	Design of Channel	Design of Channel	Design of Channel
Property Line	Property Line	Property Line	Property Line	Property Line	Property Line	Property Line	Property Line
Existing Well	Existing Well	Existing Well	Existing Well	Existing Well	Existing Well	Existing Well	Existing Well

Disturbed Area

Disturbed Area	Area (Ac)
Well Pad Construction	0.11
Access Road Construction	0.11
Erosion Control	0.11
Sedimentation Control	0.11
Stream Bank Construction	0.11
Stream Channel Construction	0.11
Total Disturbed Area	0.55

Area Break

Area Break	Area (Ac)
Well Pad Construction	0.11
Access Road Construction	0.11
Erosion Control	0.11
Sedimentation Control	0.11
Stream Bank Construction	0.11
Stream Channel Construction	0.11
Total Area Break	0.55

TUG HILL OPERATING

THIS DOCUMENT PREPARED FOR TUG HILL OPERATING

Kelly Services

Proposed Site Design
Hudson Well Site
Meadow District
Marshall County, WV

Date: 05/03/2018
Scale: As Shown
Drawn By: ZS
File No:
Project No:

Wetland and Perennial Stream Waiver Request

Well Operator: Tug Hill Operating, LLC

Well Number: S-1HM

Well Pad Name: Hudson Well Pad

County, 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 Hudson Well Pad is a proposed pad located along County Route 21 (Roberts Ridge Rd) in Meade District, Marshall County, WV. The proposed project is located along a ridge top. The proposed project location will be within 100' of two delineated wetlands (Wetland 01 & Wetland 03). Exhibit A, Current Site Conditions, will be attached and made part of this waiver request. Exhibit A shows the location of Wetland 01 and Wetland 03.

Wetland 01: Wetland 01 is located on the eastern side of the proposed well pad outside of the Proposed Limits of Disturbance (LOD). Wetland 01 is situated downslope of the proposed well pad. The proposed well pad drainage system will divert surface water from the well pad away from Wetland 01. Super Silt Fence and 24" Compost Filter Sock shall be installed upslope of Wetland 01 to control perimeter run-off and also provide a physical barrier between the work area and the protected area. There will be a 69' buffer between the proposed LOD and Wetland 01.

Wetland 03: Wetland 03 is located on the eastern side of the proposed well pad outside of the Proposed Limits of Disturbance (LOD). Wetland 01 is situated downslope of the proposed well pad. The proposed well pad drainage system will divert surface water from the well pad away from Wetland 03. Super Silt Fence and 24" Compost Filter Sock shall be installed upslope of Wetland 01 to control perimeter run-off and also provide a physical barrier between the work area and the protected area. There will be a 49' buffer between the proposed LOD and Wetland 03.

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 proposed well pad would not be constructed at the proposed location and an alternative site would need to be located and analyzed for suitability. The wetlands would remain in their current state in the cattle pasture field.

2b.1. Location Alternative #1: The alternative to providing additional erosion and sediment controls upslope of the existing wetlands as shown on Exhibit B, Proposed Site Design, would be to modify the proposed pad design to allow for a 100' buffer from the wetlands. The proposed modification would require a retaining wall structure to support the side slope of the well pad. A retaining wall structure would help to provide a 100' buffer from the wetlands but would also pose a safety issue for the landowner's livestock as well as limit the ability of the landowner to gather hay from the well pad fill slopes.

2c. Must Demonstrate why a one hundred foot buffer cannot be maintained: See Exhibit A, Existing Site Conditions. A 100' buffer cannot be maintained due to the location of the proposed well pad and close proximity to the delineated wetlands. The location of the wells is controlled by current mining operations under the proposed location and prevents the pad from being shifted to the west to allow for a 100' buffer from the site LOD to the proposed wetlands.

2d. Describe how the proposed project is the least environmentally damaging practicable alternative: The proposed design, as shown on Exhibit B, Proposed Site Design is the least environmentally damaging practicable alternative because it will allow for the construction of the proposed well site, protection of the existing wetlands, and provide useable area for the landowner once the construction of the site is complete. Constructing a retaining wall structure on the site to provide the 100' buffer would lead to a safety concern for the landowner for livestock within the field area as well as to the landowner if they gather hay from the well pad side slopes.

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 01 & Wetland 02 will be protected with Super Silt Fence and 24" compost filter sock. The controls shall be installed upslope of the wetlands.

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.

Vegetative Buffer: A minimum 10' vegetative buffer shall be maintained around the wetland at all times during the slip repair operation. The minimum 10' vegetative buffer will be outside of the proposed LOD within the current pasture field.

Super Silt Fence: Super silt fence shall be installed at the perimeter of the proposed LOD. The super silt fence shall provide sedimentation control above the wetland to prevent sediments and other materials from being carried downslope to the wetland. Should any large material, typically rock or stone, manage to roll down a slope, the chainlink fence structure shall act as a net to capture the material before it can proceed further downslope towards the wetlands.

API Number: _____

Operator's Well Number: **S-1HM**

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. The 24" compost filter sock will be the primary sediment filter protection for the wetland with the super silt fence being the secondary filter.

Permanent Seeding / Rolled Erosion Control Blankets: Permanent seeding of all disturbed areas upslope of the wetlands shall be performed as soon as practical. Earthwork above the 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 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: The proposed well pad berm will provide well pad containment and prevent water from leaving the well pad except at designated sump outlet locations (water from the sumps shall only be released in accordance with WVDEP requirements). The sump outlets will have erosion controls to prevent erosion of the well pad slopes that may lead to sedimentation downslope. The proposed well pad sumps will be located so that they do not discharge at or near the wetland, providing additional protection to the wetlands.

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

1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Meade Glen Easton 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Hudson S-1HM Well Pad Name: Hudson

3) Farm Name/Surface Owner: CNX Land, LLC Public Road Access: Roberts Ridge Road (CR 21)

4) Elevation, current ground: 1370' Elevation, proposed post-construction: 1344'

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal *JM* 10/29/2019

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 6696' - 8748', thickness of 52' and an anticipated approximate pressure of 3800 psi.

8) Proposed Total Vertical Depth: 6848'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 22,486'

11) Proposed Horizontal Leg Length: 13,584.67'

12) Approximate Fresh Water Strata Depths: 70'; 978'

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

14) Approximate Saltwater Depths: 1,740'

15) Approximate Coal Seam Depths: Sewickley Coal - 886' and Pittsburgh Coal - 972'

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: Marshall County Coal Co./Marshall County Mine
Depth: 1059' TVD and 291' subsea level
Seam: Pittsburgh #8
Owner: Murray Energy / Consolidated Coal Co. RECEIVED
Office of Oil and Gas

OCT 29 2019

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#	1080'	1080' ✓	1100ft ³ (CTS)
Coal	13 3/8"	NEW	J55	54.5#	1080'	1080' ✓	1100ft ³ (CTS)
Intermediate	9 5/8"	NEW	J55	36#	3,020'	3,020' ✓	999ft ³ (CTS)
Production	5 1/2"	NEW	P110	20#	22,486'	22,486'	5735ft ³ (CTS)
Tubing	2 3/8"	NEW	N80	4.7#	7,925'		
Liners							

Ju 6/19/19

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17.5"	.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			

RECEIVED
 Office of Oil and Gas
 JUN 24 2019
 WV Department of
 Environmental Protection

June 19/19

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 33,955,000 lb. proppant and 524,969 barrels of water.
Max rate = 80bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 22.94 acres

22) Area to be disturbed for well pad only, less access road (acres): 6.18 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

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.

RECEIVED
Office of Oil and Gas
JUN 24 2019
WV Department of
Environmental Protection

*Note: Attach additional sheets as needed.

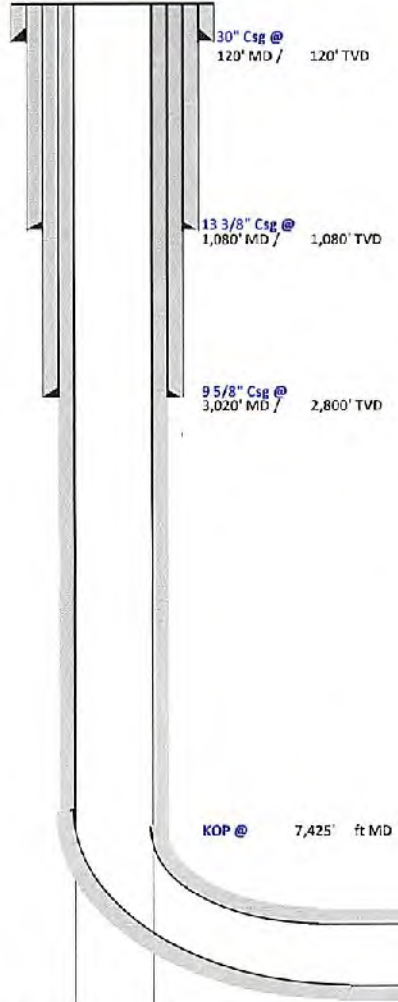


WELL NAME: Hudson S-1HM
 STATE: WV COUNTY: Marshall
 DISTRICT: #N/A
 DF Elev: 1,344' GL Elev: 1,344'
 TD: 22,486'
 TH Latitude: 39.828765
 TH Longitude: -80.67270
 BH Latitude: 8 #N/A
 BH Longitude: #N/A

FORMATION TDPS	
Formation	Depth TVD
Deepest Fresh Water	978
Sewickley Coal	886
Pittsburgh Coal	972
Big Lime	2045
Wobr	2476
Berea	2675
Gordon	2945
Rhinestreet	6062
Genesee/Burkett	6578
Tully	6594
Hamilton	6629
Marcellus	6696
Landing Depth	6731
Onondaga	6748
Pilot Hole Depth	6848

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth [MD]	Depth [TVD]	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	BW	BW	Surface
Surface	17.5	13 3/8	1,080'	1,080'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	3,020'	2,800'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	22,486'	6,969'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,113	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	1,007	A	15	Air	1 Centralizer every other jt
Production	5,270	A	14.5	Air / SOBMM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc



Pilot Hole
 PHTD @ 6,848' TVD
 Landing Point @ 8,903' MD / 6,731' TVD
 PH TDV = 100' below Onondaga Top

Lateral TD @ 22,486' ft MD ✓
 6,969' ft TVD ✓

Handwritten signature and date: JW 6/19/19

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4705, 02248



Tug Hill Operating, LLC Casing and Cement Program

Hudson S-1HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	1,080'	CTS
Intermediate	9 5/8"	J55	12 1/4"	3,020'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	22,486'	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: Hudson S-01 HM (slot D)
 Site: Hudson Alt North
 Project: Marshall County, West Virginia
 Design: rev3

Rig:
 SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dlog	TFace	VSeet	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1300.00	0.00	0.00	1300.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 3°/100' build
3	2889.57	47.69	297.34	2712.30	286.67	-554.46	3.00	297.340	-425.85	Begin 47.69° tangent
4	7425.46	47.69	297.34	5765.77	1827.14	-3533.98	0.00	0.000	-2714.36	Begin 8°/100' build/turn
5	8434.82	50.00	178.65	6567.17	1567.59	-3923.01	8.00	-137.090	-2569.62	Begin 10°/100' build/turn
6	8903.29	89.00	150.08	6731.07	1152.38	-3794.75	10.00	-40.947	-2144.83	Begin 89.00° lateral
7	22485.50	89.00	150.08	6969.00	-10508.20	2978.24	0.00	0.000	1018.34	PBHL/TD 22485.50 MD/6969.00 TVD

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
Hudson 01HM LP r1	6731.25	1155.53	-3819.42	39.83200339	-80.68629758
Hudson 01HM PBHL r2	6969.00	-10508.20	2978.24	39.79960206	-80.65224264

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 @ 1344.25ft

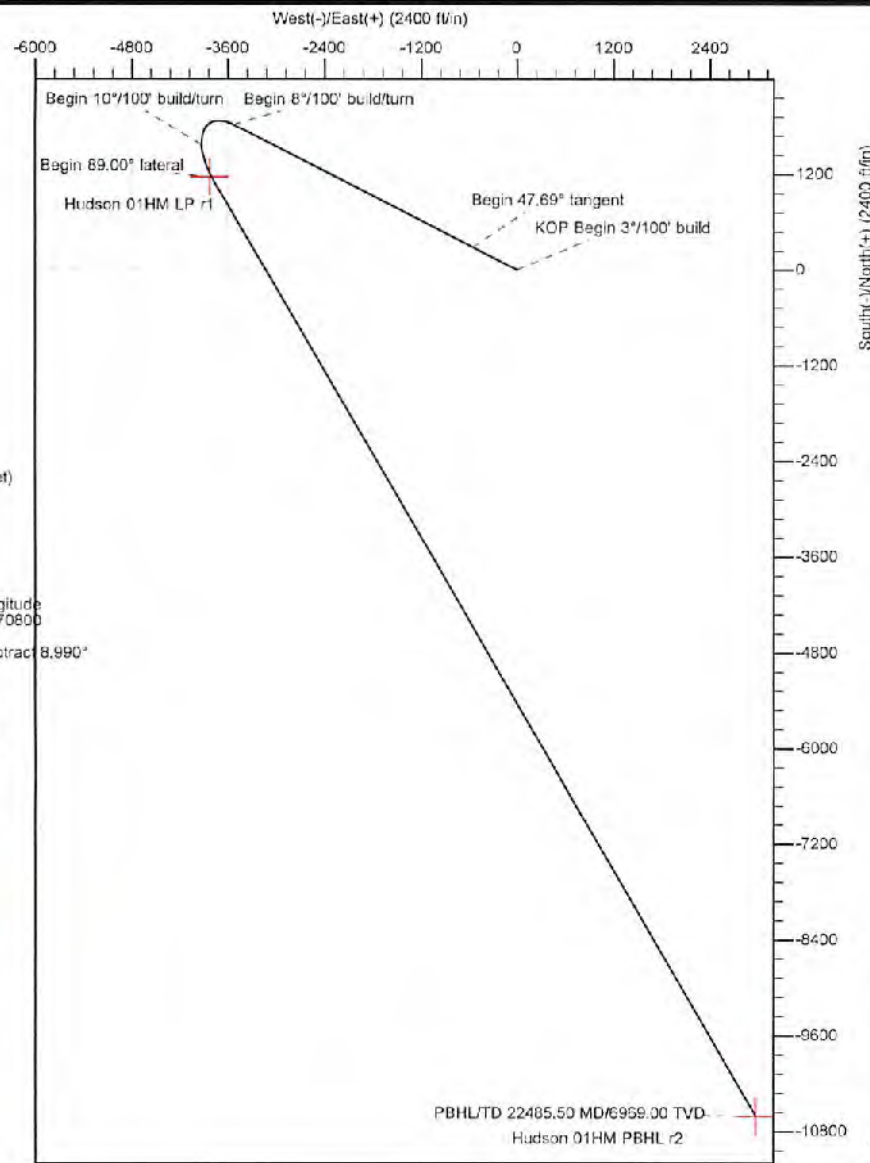
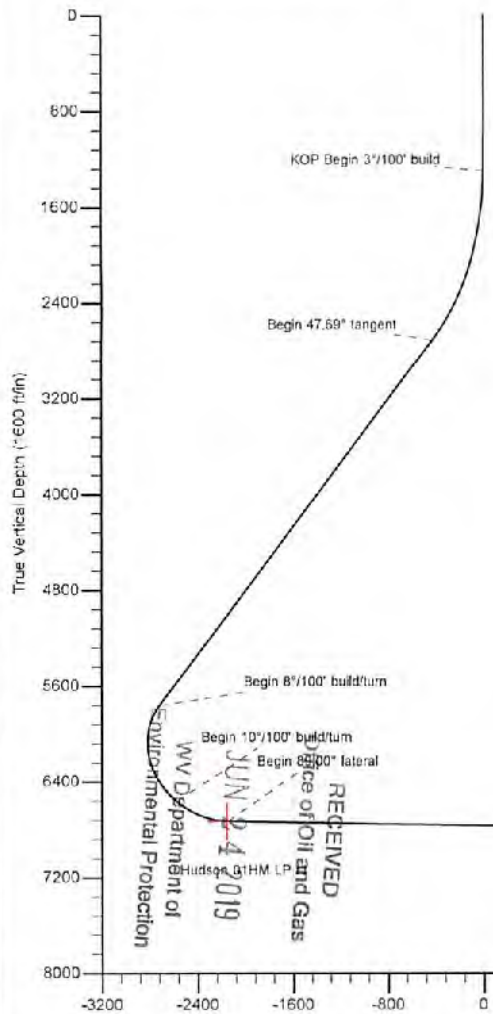
Northing	Easting	Latitude	Longitude
14464548.91	1732303.73	39.82876500	-80.67270800

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.99°



Azimuths to Grid North
 True North: -0.21°
 Magnetic North: -8.99°

Magnetic Field
 Strength: 51962.6nT
 Dip Angle: 66.82°
 Date: 6/7/2019
 Model: IGRF2015



4705102248



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Hudson S-01 HM (slot D)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1344.25ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1344.25ft
Site:	Hudson Alt North	North Reference:	Grid
Well:	Hudson S-01 HM (slot D)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original hole		
Design:	rev3		

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

Site	Hudson Alt North				
Site Position:		Northing:	14,464,552.10 usft	Latitude:	39.82877400
From:	Lat/Long	Easting:	1,732,278.45 usft	Longitude:	-80.67279800
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.210 °

Well	Hudson S-01 HM (slot D)					
Well Position	+N/-S	0.00 ft	Northing:	14,464,548.91 usft	Latitude:	39.82876500
	+E/-W	0.00 ft	Easting:	1,732,303.73 usft	Longitude:	-80.67270800
Position Uncertainty	0.00 ft	Wellhead Elevation:		Ground Level:	1,344.25 ft	

Wellbore	Original hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	6/7/2019	-8.780	66.819	51,962.90807094

Design	rev3				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	164.32	

Plan Survey Tool Program	Date	6/7/2019			
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	22,485.50 rev3 (Original hole)	MWD	MWD - Standard	

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.000	
2,889.57	47.69	297.34	2,712.30	286.67	-554.46	3.00	3.00	0.00	297.340	
7,425.46	47.69	297.34	5,765.77	1,827.14	-3,533.98	0.00	0.00	0.00	0.000	
8,434.82	50.00	178.65	8,567.17	1,567.59	-3,923.01	8.00	0.23	-11.76	-137.094	
8,903.29	89.00	150.08	6,731.07	1,162.38	-3,794.75	10.00	8.32	-6.10	-40.947	
22,485.50	89.00	150.08	6,989.00	-10,808.20	2,978.24	0.00	0.00	0.00	0.000	

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Hudson HM PBHL
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Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Hudson S-01 HM (slot D)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1344.25ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1344.25ft
Site:	Hudson Alt North	North Reference:	Grid
Well:	Hudson S-01 HM (slot D)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original hole		
Design:	rev3		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
100.00	0.00	0.00	100.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
200.00	0.00	0.00	200.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
300.00	0.00	0.00	300.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
400.00	0.00	0.00	400.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
500.00	0.00	0.00	500.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
600.00	0.00	0.00	600.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
700.00	0.00	0.00	700.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
800.00	0.00	0.00	800.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
900.00	0.00	0.00	900.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,464,548.91	1,732,303.73	39.82876500	-80.67270800	
KOP Begin 3°/100' build										
1,400.00	3.00	297.34	1,399.95	1.20	-2.33	14,464,550.12	1,732,301.40	39.82876833	-80.67271627	
1,500.00	6.00	297.34	1,499.63	4.81	-9.29	14,464,553.72	1,732,294.44	39.82877829	-80.67274104	
1,600.00	9.00	297.34	1,598.77	10.80	-20.89	14,464,559.71	1,732,282.84	39.82879487	-80.67278226	
1,700.00	12.00	297.34	1,697.08	19.17	-37.07	14,464,568.08	1,732,266.66	39.82881801	-80.67283980	
1,800.00	15.00	297.34	1,794.31	29.89	-57.81	14,464,578.80	1,732,245.92	39.82884766	-80.67291351	
1,900.00	18.00	297.34	1,890.18	42.93	-83.03	14,464,591.64	1,732,220.70	39.82886373	-80.67300319	
2,000.00	21.00	297.34	1,984.43	58.26	-112.58	14,464,607.17	1,732,191.05	39.82892813	-80.67310880	
2,100.00	24.00	297.34	2,076.81	75.83	-146.57	14,464,624.75	1,732,157.05	39.82897473	-80.67322943	
2,200.00	27.00	297.34	2,167.06	95.60	-184.91	14,464,644.52	1,732,118.82	39.82902940	-80.67336537	
2,300.00	30.00	297.34	2,254.93	117.51	-227.29	14,464,666.43	1,732,076.44	39.82909000	-80.67351604	
2,400.00	33.00	297.34	2,340.18	141.51	-273.70	14,464,690.42	1,732,030.03	39.82915636	-80.67368103	
2,500.00	36.00	297.34	2,422.59	167.52	-324.01	14,464,716.43	1,731,979.72	39.82922830	-80.67385988	
2,600.00	39.00	297.34	2,501.91	195.47	-378.08	14,464,744.39	1,731,925.65	39.82930561	-80.67405211	
2,700.00	42.00	297.34	2,577.95	225.30	-435.76	14,464,774.21	1,731,867.97	39.82938809	-80.67425718	
2,800.00	45.00	297.34	2,650.47	256.91	-496.90	14,464,805.82	1,731,806.83	39.82947551	-80.67447454	
2,889.57	47.69	297.34	2,712.30	286.67	-554.46	14,464,835.58	1,731,749.27	39.82955781	-80.67467917	
Begin 47.69° tangent										
2,900.00	47.69	297.34	2,719.32	290.21	-561.31	14,464,839.12	1,731,742.42	39.82956761	-80.67470354	
3,000.00	47.69	297.34	2,786.64	324.17	-627.00	14,464,873.09	1,731,676.73	39.82966153	-80.67493707	
3,100.00	47.69	297.34	2,853.98	358.13	-692.69	14,464,907.05	1,731,611.05	39.82975545	-80.67517060	
3,200.00	47.69	297.34	2,921.28	392.10	-758.37	14,464,941.01	1,731,545.36	39.82984937	-80.67540413	
3,300.00	47.69	297.34	2,988.60	426.06	-824.06	14,464,974.97	1,731,479.67	39.82994330	-80.67563767	
3,400.00	47.69	297.34	3,055.91	460.02	-889.75	14,465,008.93	1,731,413.98	39.83003722	-80.67587120	
3,500.00	47.69	297.34	3,123.23	493.98	-955.44	14,465,042.89	1,731,348.30	39.83013114	-80.67610473	
3,600.00	47.69	297.34	3,190.55	527.94	-1,021.12	14,465,076.86	1,731,282.61	39.83022506	-80.67633827	
3,700.00	47.69	297.34	3,257.87	561.91	-1,086.81	14,465,110.82	1,731,216.92	39.83031898	-80.67657181	
3,800.00	47.69	297.34	3,325.19	595.87	-1,152.50	14,465,144.78	1,731,151.23	39.83041290	-80.67680534	
3,900.00	47.69	297.34	3,392.50	629.83	-1,218.19	14,465,178.74	1,731,085.55	39.83050681	-80.67703888	
4,000.00	47.69	297.34	3,459.82	663.79	-1,283.87	14,465,212.70	1,731,019.86	39.83060073	-80.67727242	
4,100.00	47.69	297.34	3,527.14	697.75	-1,349.56	14,465,246.67	1,730,954.17	39.83069465	-80.67750596	
4,200.00	47.69	297.34	3,594.46	731.72	-1,415.25	14,465,280.63	1,730,888.48	39.83078857	-80.67773949	
4,300.00	47.69	297.34	3,661.78	765.68	-1,480.94	14,465,314.59	1,730,822.80	39.83088249	-80.67797303	
4,400.00	47.69	297.34	3,729.09	799.64	-1,546.62	14,465,348.55	1,730,757.11	39.83097640	-80.67820656	
4,500.00	47.69	297.34	3,796.41	833.60	-1,612.31	14,465,382.51	1,730,691.42	39.83107032	-80.67844012	
4,600.00	47.69	297.34	3,863.73	867.56	-1,678.00	14,465,416.48	1,730,625.73	39.83116423	-80.67867366	
4,700.00	47.69	297.34	3,931.05	901.53	-1,743.69	14,465,450.44	1,730,560.05	39.83125815	-80.67890720	
4,800.00	47.69	297.34	3,998.37	935.49	-1,809.38	14,465,484.40	1,730,494.36	39.83135206	-80.67914074	
4,900.00	47.69	297.34	4,065.68	969.45	-1,875.06	14,465,518.36	1,730,428.67	39.83144598	-80.67937429	
5,000.00	47.69	297.34	4,133.00	1,003.41	-1,940.75	14,465,552.32	1,730,362.98	39.83153989	-80.67960783	



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Hudson S-01 HM (slot D)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1344.25ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1344.25ft
Site:	Hudson Alt North	North Reference:	Grid
Well:	Hudson S-01 HM (slot D)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original hole		
Design:	rev3		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,100.00	47.69	297.34	4,200.32	1,037.37	-2,006.44	14,465,586.28	1,730,297.30	39.83163380	-80.87984138	
5,200.00	47.69	297.34	4,267.64	1,071.33	-2,072.13	14,465,520.25	1,730,231.61	39.83172771	-80.88007492	
5,300.00	47.69	297.34	4,334.96	1,105.30	-2,137.81	14,465,554.21	1,730,165.92	39.83182163	-80.88030847	
5,400.00	47.69	297.34	4,402.27	1,139.26	-2,203.50	14,465,688.17	1,730,100.23	39.83191554	-80.88054201	
5,500.00	47.69	297.34	4,469.59	1,173.22	-2,269.19	14,465,722.13	1,730,034.55	39.83200945	-80.88077556	
5,600.00	47.69	297.34	4,536.91	1,207.18	-2,334.88	14,465,756.09	1,729,968.86	39.83210336	-80.88100911	
5,700.00	47.69	297.34	4,604.23	1,241.14	-2,400.56	14,465,790.06	1,729,903.17	39.83219727	-80.88124266	
5,800.00	47.69	297.34	4,671.55	1,275.11	-2,466.25	14,465,824.02	1,729,837.48	39.83229118	-80.88147621	
5,900.00	47.69	297.34	4,738.88	1,309.07	-2,531.94	14,465,857.98	1,729,771.80	39.83238509	-80.88170976	
6,000.00	47.69	297.34	4,806.18	1,343.03	-2,597.63	14,465,891.94	1,729,706.11	39.83247900	-80.88194331	
6,100.00	47.69	297.34	4,873.50	1,376.99	-2,663.31	14,465,925.90	1,729,640.42	39.83257291	-80.88217686	
6,200.00	47.69	297.34	4,940.82	1,410.95	-2,729.00	14,465,959.87	1,729,574.73	39.83266682	-80.88241041	
6,300.00	47.69	297.34	5,008.14	1,444.92	-2,794.69	14,465,993.83	1,729,509.05	39.83276072	-80.88264397	
6,400.00	47.69	297.34	5,075.46	1,478.88	-2,860.38	14,466,027.79	1,729,443.36	39.83285463	-80.88287752	
6,500.00	47.69	297.34	5,142.77	1,512.84	-2,926.07	14,466,061.75	1,729,377.67	39.83294854	-80.88311107	
6,600.00	47.69	297.34	5,210.09	1,546.80	-2,991.75	14,466,095.71	1,729,311.98	39.83304244	-80.88334463	
6,700.00	47.69	297.34	5,277.41	1,580.76	-3,057.44	14,466,129.68	1,729,246.30	39.83313635	-80.88357818	
6,800.00	47.69	297.34	5,344.73	1,614.73	-3,123.13	14,466,163.64	1,729,180.61	39.83323025	-80.88381174	
6,900.00	47.69	297.34	5,412.05	1,648.69	-3,188.82	14,466,197.60	1,729,114.92	39.83332416	-80.88404529	
7,000.00	47.69	297.34	5,479.36	1,682.65	-3,254.50	14,466,231.56	1,729,049.23	39.83341806	-80.88427885	
7,100.00	47.69	297.34	5,546.68	1,716.61	-3,320.19	14,466,265.52	1,728,983.55	39.83351197	-80.88451241	
7,200.00	47.69	297.34	5,614.00	1,750.57	-3,385.88	14,466,299.48	1,728,917.86	39.83360587	-80.88474597	
7,300.00	47.69	297.34	5,681.32	1,784.54	-3,451.57	14,466,333.45	1,728,852.17	39.83369977	-80.88497953	
7,400.00	47.69	297.34	5,748.64	1,818.50	-3,517.25	14,466,367.41	1,728,786.48	39.83379367	-80.88521309	
7,425.46	47.69	297.34	5,765.77	1,827.14	-3,533.98	14,466,376.05	1,728,769.76	39.83381758	-80.88527255	
Begin 8°/100' build/turn										
7,500.00	43.46	291.44	5,817.96	1,849.19	-3,582.37	14,466,398.10	1,728,721.37	39.83387860	-80.88544464	
7,600.00	38.37	281.99	5,893.57	1,868.25	-3,644.85	14,466,417.16	1,728,658.89	39.83393152	-80.88566696	
7,700.00	34.22	270.42	5,974.25	1,874.91	-3,703.42	14,466,423.82	1,728,600.32	39.83395039	-80.88587552	
7,800.00	31.38	256.57	6,058.42	1,869.06	-3,756.95	14,466,417.97	1,728,546.79	39.83393483	-80.88608628	
7,900.00	30.24	241.06	6,144.44	1,850.80	-3,804.39	14,466,399.71	1,728,499.34	39.83388518	-80.88623550	
8,000.00	30.99	225.40	6,230.64	1,820.50	-3,844.83	14,466,369.41	1,728,458.91	39.83380233	-80.88637991	
8,100.00	33.49	211.12	6,315.34	1,778.74	-3,877.46	14,466,327.65	1,728,426.27	39.83368795	-80.88649669	
8,200.00	37.39	199.05	6,396.90	1,726.33	-3,901.67	14,466,275.24	1,728,402.07	39.83354426	-80.88658356	
8,300.00	42.31	189.18	6,473.72	1,664.30	-3,916.97	14,466,213.21	1,728,386.77	39.83337406	-80.88663884	
8,400.00	47.93	181.12	6,544.31	1,593.85	-3,923.07	14,466,142.76	1,728,380.67	39.83318064	-80.88666145	
8,434.82	50.00	178.65	6,567.17	1,567.59	-3,923.01	14,466,116.50	1,728,380.73	39.83310854	-80.88666156	
Begin 10°/100' build/turn										
8,500.00	55.04	173.44	6,606.84	1,516.04	-3,919.37	14,466,064.95	1,728,384.37	39.83296693	-80.88664923	
8,600.00	63.14	166.59	6,658.20	1,431.72	-3,904.31	14,465,980.63	1,728,399.43	39.83273523	-80.88659663	
8,700.00	71.53	160.88	6,696.73	1,343.35	-3,878.21	14,465,892.26	1,728,425.53	39.83249229	-80.88650478	
8,800.00	80.08	155.33	6,721.24	1,253.61	-3,841.87	14,465,802.52	1,728,461.87	39.83224550	-80.88637845	
8,900.00	88.71	150.25	6,731.01	1,165.23	-3,796.39	14,465,714.15	1,728,507.35	39.83200236	-80.88621555	
8,903.29	89.00	150.08	6,731.07	1,162.38	-3,794.75	14,465,711.29	1,728,508.99	39.83199450	-80.88620975	
Begin 89.00° lateral										
9,000.00	89.00	150.08	6,732.77	1,076.57	-3,746.52	14,465,627.48	1,728,557.21	39.83176388	-80.88603902	
9,100.00	89.00	150.08	6,734.52	991.91	-3,696.86	14,465,540.82	1,728,607.08	39.83152540	-80.88586248	
9,200.00	89.00	150.08	6,736.27	905.25	-3,646.79	14,465,454.16	1,728,656.95	39.83128693	-80.88568594	
9,300.00	89.00	150.08	6,738.02	818.58	-3,596.92	14,465,367.50	1,728,706.81	39.83104846	-80.88550940	
9,400.00	89.00	150.08	6,739.77	731.92	-3,547.06	14,465,280.84	1,728,756.68	39.83080998	-80.88533287	
9,500.00	89.00	150.08	6,741.53	645.26	-3,497.19	14,465,194.17	1,728,806.55	39.83057151	-80.88515633	
9,600.00	89.00	150.08	6,743.28	558.60	-3,447.32	14,465,107.51	1,728,856.41	39.83033303	-80.88497990	
9,700.00	89.00	150.08	6,745.03	471.94	-3,397.46	14,465,020.85	1,728,906.28	39.83009456	-80.88480326	
9,800.00	89.00	150.08	6,746.78	385.28	-3,347.59	14,464,934.19	1,728,956.14	39.82985608	-80.88462673	

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Oil and Gas
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 Department of Environmental Protection



Planning Report - Geographic

4705102248

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Hudson S-01 HM (slot D)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1344.25ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1344.25ft
Site:	Hudson Alt North	North Reference:	Grid
Well:	Hudson S-01 HM (slot D)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original hole		
Design:	rev3		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,900.00	89.00	150.08	6,748.53	298.61	-3,297.73	14,464,847.53	1,729,006.01	39.82961761	-80.68445020	
10,000.00	89.00	150.08	6,750.28	211.95	-3,247.86	14,464,760.87	1,729,055.88	39.82937913	-80.68427367	
10,100.00	89.00	150.08	6,752.04	125.29	-3,197.99	14,464,674.20	1,729,105.74	39.82914065	-80.68409714	
10,200.00	89.00	150.08	6,753.79	38.63	-3,148.13	14,464,587.54	1,729,155.61	39.82890218	-80.68382062	
10,300.00	89.00	150.08	6,755.54	-48.03	-3,098.26	14,464,500.88	1,729,205.48	39.82866370	-80.68374409	
10,400.00	89.00	150.08	6,757.29	-134.69	-3,048.39	14,464,414.22	1,729,255.34	39.82842522	-80.68356757	
10,500.00	89.00	150.08	6,759.04	-221.36	-2,998.53	14,464,327.56	1,729,305.21	39.82818675	-80.68339104	
10,600.00	89.00	150.08	6,760.80	-308.02	-2,948.66	14,464,240.90	1,729,355.08	39.82794827	-80.68321452	
10,700.00	89.00	150.08	6,762.55	-394.68	-2,898.79	14,464,154.24	1,729,404.94	39.82770979	-80.68303800	
10,800.00	89.00	150.08	6,764.30	-481.34	-2,848.93	14,464,067.57	1,729,454.81	39.82747131	-80.68286146	
10,900.00	89.00	150.08	6,766.05	-568.00	-2,799.06	14,463,980.91	1,729,504.68	39.82723283	-80.68268496	
11,000.00	89.00	150.08	6,767.80	-654.66	-2,749.19	14,463,894.25	1,729,554.54	39.82699435	-80.68250844	
11,100.00	89.00	150.08	6,769.55	-741.33	-2,699.33	14,463,807.59	1,729,604.41	39.82675588	-80.68233193	
11,200.00	89.00	150.08	6,771.31	-827.99	-2,649.46	14,463,720.93	1,729,654.28	39.82651740	-80.68215541	
11,300.00	89.00	150.08	6,773.06	-914.65	-2,599.59	14,463,634.27	1,729,704.14	39.82627892	-80.68197890	
11,400.00	89.00	150.08	6,774.81	-1,001.31	-2,549.73	14,463,547.60	1,729,754.01	39.82604044	-80.68180239	
11,500.00	89.00	150.08	6,776.56	-1,087.97	-2,499.86	14,463,460.94	1,729,803.88	39.82580196	-80.68162588	
11,600.00	89.00	150.08	6,778.31	-1,174.63	-2,449.99	14,463,374.28	1,729,853.74	39.82556348	-80.68144937	
11,700.00	89.00	150.08	6,780.06	-1,261.30	-2,400.13	14,463,287.62	1,729,903.61	39.82532500	-80.68127286	
11,800.00	89.00	150.08	6,781.82	-1,347.96	-2,350.26	14,463,200.96	1,729,953.48	39.82508652	-80.68109635	
11,900.00	89.00	150.08	6,783.57	-1,434.62	-2,300.39	14,463,114.30	1,730,003.34	39.82484803	-80.68091984	
12,000.00	89.00	150.08	6,785.32	-1,521.28	-2,250.53	14,463,027.64	1,730,053.21	39.82460955	-80.68074334	
12,100.00	89.00	150.08	6,787.07	-1,607.94	-2,200.66	14,462,940.97	1,730,103.07	39.82437107	-80.68056683	
12,200.00	89.00	150.08	6,788.82	-1,694.60	-2,150.79	14,462,854.31	1,730,152.94	39.82413259	-80.68039033	
12,300.00	89.00	150.08	6,790.58	-1,781.27	-2,100.93	14,462,767.65	1,730,202.81	39.82389411	-80.68021383	
12,400.00	89.00	150.08	6,792.33	-1,867.93	-2,051.06	14,462,680.99	1,730,252.67	39.82365562	-80.68003733	
12,500.00	89.00	150.08	6,794.08	-1,954.59	-2,001.19	14,462,594.33	1,730,302.54	39.82341714	-80.67986083	
12,600.00	89.00	150.08	6,795.83	-2,041.25	-1,951.33	14,462,507.67	1,730,352.41	39.82317866	-80.67968433	
12,700.00	89.00	150.08	6,797.58	-2,127.91	-1,901.46	14,462,421.00	1,730,402.27	39.82294018	-80.67950784	
12,800.00	89.00	150.08	6,799.33	-2,214.58	-1,851.59	14,462,334.34	1,730,452.14	39.82270169	-80.67933134	
12,900.00	89.00	150.08	6,801.09	-2,301.24	-1,801.73	14,462,247.68	1,730,502.01	39.82246321	-80.67915485	
13,000.00	89.00	150.08	6,802.84	-2,387.90	-1,751.86	14,462,161.02	1,730,551.87	39.82222472	-80.67897835	
13,100.00	89.00	150.08	6,804.59	-2,474.56	-1,701.99	14,462,074.36	1,730,601.74	39.82198624	-80.67880186	
13,200.00	89.00	150.08	6,806.34	-2,561.22	-1,652.13	14,461,987.70	1,730,651.61	39.82174775	-80.67862537	
13,300.00	89.00	150.08	6,808.09	-2,647.88	-1,602.26	14,461,901.04	1,730,701.47	39.82150927	-80.67844888	
13,400.00	89.00	150.08	6,809.84	-2,734.55	-1,552.39	14,461,814.37	1,730,751.34	39.82127078	-80.67827239	
13,500.00	89.00	150.08	6,811.60	-2,821.21	-1,502.53	14,461,727.71	1,730,801.21	39.82103230	-80.67809591	
13,600.00	89.00	150.08	6,813.35	-2,907.87	-1,452.66	14,461,641.05	1,730,851.07	39.82079381	-80.67791942	
13,700.00	89.00	150.08	6,815.10	-2,994.53	-1,402.79	14,461,554.39	1,730,900.94	39.82055533	-80.67774294	
13,800.00	89.00	150.08	6,816.85	-3,081.19	-1,352.93	14,461,467.73	1,730,950.81	39.82031684	-80.67756645	
13,900.00	89.00	150.08	6,818.60	-3,167.85	-1,303.06	14,461,381.07	1,731,000.67	39.82007835	-80.67738997	
14,000.00	89.00	150.08	6,820.35	-3,254.52	-1,253.19	14,461,294.40	1,731,050.54	39.81983987	-80.67721349	
14,100.00	89.00	150.08	6,822.11	-3,341.18	-1,203.33	14,461,207.74	1,731,100.41	39.81960138	-80.67703701	
14,200.00	89.00	150.08	6,823.86	-3,427.84	-1,153.46	14,461,121.08	1,731,150.27	39.81936289	-80.67686053	
14,300.00	89.00	150.08	6,825.61	-3,514.50	-1,103.59	14,461,034.42	1,731,200.14	39.81912440	-80.67668406	
14,400.00	89.00	150.08	6,827.36	-3,601.16	-1,053.73	14,460,947.76	1,731,250.00	39.81888592	-80.67650758	
14,500.00	89.00	150.08	6,829.11	-3,687.82	-1,003.86	14,460,861.10	1,731,299.87	39.81864743	-80.67633111	
14,600.00	89.00	150.08	6,830.87	-3,774.49	-953.99	14,460,774.44	1,731,349.74	39.81840894	-80.67615463	
14,700.00	89.00	150.08	6,832.62	-3,861.15	-904.13	14,460,687.77	1,731,399.60	39.81817045	-80.67597816	
14,800.00	89.00	150.08	6,834.37	-3,947.81	-854.26	14,460,601.11	1,731,449.47	39.81793196	-80.67580169	
14,900.00	89.00	150.08	6,836.12	-4,034.47	-804.39	14,460,514.45	1,731,499.34	39.81769347	-80.67562522	
15,000.00	89.00	150.08	6,837.87	-4,121.13	-754.53	14,460,427.79	1,731,549.20	39.81745498	-80.67544875	
15,100.00	89.00	150.08	6,839.62	-4,207.79	-704.66	14,460,341.13	1,731,599.07	39.81721649	-80.67527228	
15,200.00	89.00	150.08	6,841.38	-4,294.46	-654.79	14,460,254.47	1,731,648.94	39.81697800	-80.67509582	
15,300.00	89.00	150.08	6,843.13	-4,381.12	-604.93	14,460,167.80	1,731,698.80	39.81673951	-80.67491935	



Planning Report - Geographic

4705102248

Database:	DB_Jul2218dt_v14	Local Co-ordinate Reference:	Well Hudson S-01 HM (slot D)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1344.25ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1344.25ft
Site:	Hudson Alt North	North Reference:	Grid
Well:	Hudson S-01 HM (slot D)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original hole		
Design:	rev3		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
15,400.00	89.00	150.08	6,844.88	-4,467.78	-555.06	14,460,081.14	1,731,748.67	39.81650102	-80.67474289	
15,500.00	89.00	150.08	6,846.63	-4,554.44	-505.19	14,459,994.48	1,731,798.54	39.81626253	-80.67456643	
15,600.00	89.00	150.08	6,848.38	-4,641.10	-455.33	14,459,907.82	1,731,848.40	39.81602404	-80.67438996	
15,700.00	89.00	150.08	6,850.13	-4,727.76	-405.46	14,459,821.16	1,731,898.27	39.81578555	-80.67421350	
15,800.00	89.00	150.08	6,851.89	-4,814.43	-355.59	14,459,734.50	1,731,948.14	39.81554706	-80.67403705	
15,900.00	89.00	150.08	6,853.64	-4,901.09	-305.73	14,459,647.84	1,731,998.00	39.81530856	-80.67386059	
16,000.00	89.00	150.08	6,855.39	-4,987.75	-255.86	14,459,561.17	1,732,047.87	39.81507007	-80.67368413	
16,100.00	89.00	150.08	6,857.14	-5,074.41	-205.99	14,459,474.51	1,732,097.74	39.81483158	-80.67350768	
16,200.00	89.00	150.08	6,858.89	-5,161.07	-156.13	14,459,387.85	1,732,147.60	39.81459309	-80.67333122	
16,300.00	89.00	150.08	6,860.65	-5,247.74	-106.26	14,459,301.19	1,732,197.47	39.81435459	-80.67315477	
16,400.00	89.00	150.08	6,862.40	-5,334.40	-56.39	14,459,214.53	1,732,247.34	39.81411610	-80.67297832	
16,500.00	89.00	150.08	6,864.15	-5,421.06	-6.53	14,459,127.87	1,732,297.20	39.81387761	-80.67280187	
16,600.00	89.00	150.08	6,865.90	-5,507.72	43.34	14,459,041.20	1,732,347.07	39.81363911	-80.67262542	
16,700.00	89.00	150.08	6,867.65	-5,594.38	93.21	14,458,954.54	1,732,396.93	39.81340062	-80.67244897	
16,800.00	89.00	150.08	6,869.40	-5,681.04	143.07	14,458,867.88	1,732,446.80	39.81316212	-80.67227252	
16,900.00	89.00	150.08	6,871.16	-5,767.71	192.94	14,458,781.22	1,732,496.67	39.81292363	-80.67209606	
17,000.00	89.00	150.08	6,872.91	-5,854.37	242.81	14,458,694.56	1,732,546.53	39.81268513	-80.67191963	
17,100.00	89.00	150.08	6,874.66	-5,941.03	292.67	14,458,607.90	1,732,596.40	39.81244664	-80.67174319	
17,200.00	89.00	150.08	6,876.41	-6,027.69	342.54	14,458,521.24	1,732,646.27	39.81220814	-80.67156675	
17,300.00	89.00	150.08	6,878.16	-6,114.35	392.40	14,458,434.57	1,732,696.13	39.81196965	-80.67139031	
17,400.00	89.00	150.08	6,879.91	-6,201.01	442.27	14,458,347.91	1,732,746.00	39.81173115	-80.67121387	
17,500.00	89.00	150.08	6,881.67	-6,287.68	492.14	14,458,261.25	1,732,795.87	39.81149265	-80.67103743	
17,600.00	89.00	150.08	6,883.42	-6,374.34	542.00	14,458,174.59	1,732,845.73	39.81125416	-80.67086099	
17,700.00	89.00	150.08	6,885.17	-6,461.00	591.87	14,458,087.93	1,732,895.60	39.81101566	-80.67068456	
17,800.00	89.00	150.08	6,886.92	-6,547.66	641.74	14,458,001.27	1,732,945.47	39.81077716	-80.67050812	
17,900.00	89.00	150.08	6,888.67	-6,634.32	691.60	14,457,914.60	1,732,995.33	39.81053866	-80.67033169	
18,000.00	89.00	150.08	6,890.43	-6,720.98	741.47	14,457,827.94	1,733,045.20	39.81030017	-80.67015526	
18,100.00	89.00	150.08	6,892.18	-6,807.65	791.34	14,457,741.28	1,733,095.07	39.81006167	-80.66997883	
18,200.00	89.00	150.08	6,893.93	-6,894.31	841.20	14,457,654.62	1,733,144.93	39.80982317	-80.66980240	
18,300.00	89.00	150.08	6,895.68	-6,980.97	891.07	14,457,567.96	1,733,194.80	39.80958467	-80.66962597	
18,400.00	89.00	150.08	6,897.43	-7,067.63	940.94	14,457,481.30	1,733,244.67	39.80934617	-80.66944954	
18,500.00	89.00	150.08	6,899.18	-7,154.29	990.80	14,457,394.64	1,733,294.53	39.80910767	-80.66927312	
18,600.00	89.00	150.08	6,900.94	-7,240.95	1,040.67	14,457,307.97	1,733,344.40	39.80886917	-80.66909669	
18,700.00	89.00	150.08	6,902.69	-7,327.62	1,090.54	14,457,221.31	1,733,394.27	39.80863067	-80.66892027	
18,800.00	89.00	150.08	6,904.44	-7,414.28	1,140.40	14,457,134.65	1,733,444.13	39.80839217	-80.66874384	
18,900.00	89.00	150.08	6,906.19	-7,500.94	1,190.27	14,457,047.99	1,733,494.00	39.80815367	-80.66856742	
19,000.00	89.00	150.08	6,907.94	-7,587.60	1,240.14	14,456,961.33	1,733,543.86	39.80791517	-80.66839100	
19,100.00	89.00	150.08	6,909.69	-7,674.26	1,290.00	14,456,874.67	1,733,593.73	39.80767667	-80.66821458	
19,200.00	89.00	150.08	6,911.45	-7,760.92	1,339.87	14,456,788.00	1,733,643.60	39.80743817	-80.66803817	
19,300.00	89.00	150.08	6,913.20	-7,847.59	1,389.74	14,456,701.34	1,733,693.46	39.80719967	-80.66786175	
19,400.00	89.00	150.08	6,914.95	-7,934.25	1,439.60	14,456,614.68	1,733,743.33	39.80696117	-80.66768534	
19,500.00	89.00	150.08	6,916.70	-8,020.91	1,489.47	14,456,528.02	1,733,793.20	39.80672267	-80.66750892	
19,600.00	89.00	150.08	6,918.45	-8,107.57	1,539.34	14,456,441.36	1,733,843.06	39.80648416	-80.66733251	
19,700.00	89.00	150.08	6,920.20	-8,194.23	1,589.20	14,456,354.70	1,733,892.93	39.80624566	-80.66715610	
19,800.00	89.00	150.08	6,921.96	-8,280.89	1,639.07	14,456,268.04	1,733,942.80	39.80600716	-80.66697969	
19,900.00	89.00	150.08	6,923.71	-8,367.56	1,688.94	14,456,181.37	1,733,992.66	39.80576866	-80.66680328	
20,000.00	89.00	150.08	6,925.46	-8,454.22	1,738.80	14,456,094.71	1,734,042.53	39.80553016	-80.66662687	
20,100.00	89.00	150.08	6,927.21	-8,540.88	1,788.67	14,456,008.05	1,734,092.40	39.80529165	-80.66645046	
20,200.00	89.00	150.08	6,928.96	-8,627.54	1,838.54	14,455,921.39	1,734,142.26	39.80505315	-80.66627406	
20,300.00	89.00	150.08	6,930.72	-8,714.20	1,888.40	14,455,834.73	1,734,192.13	39.80481464	-80.66609765	
20,400.00	89.00	150.08	6,932.47	-8,800.87	1,938.27	14,455,748.07	1,734,242.00	39.80457614	-80.66592125	
20,500.00	89.00	150.08	6,934.22	-8,887.53	1,988.14	14,455,661.40	1,734,291.86	39.80433763	-80.66574485	
20,600.00	89.00	150.08	6,935.97	-8,974.19	2,038.00	14,455,574.74	1,734,341.73	39.80409912	-80.66556845	
20,700.00	89.00	150.08	6,937.72	-9,060.85	2,087.87	14,455,488.08	1,734,391.60	39.80386062	-80.66539205	
20,800.00	89.00	150.08	6,939.47	-9,147.51	2,137.74	14,455,401.42	1,734,441.46	39.80362212	-80.66521565	

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Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Hudson S-01 HM (slot D)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1344.25ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1344.25ft
Site:	Hudson Alt North	North Reference:	Grid
Well:	Hudson S-01 HM (slot D)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original hole		
Design:	rev3		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
20,900.00	89.00	150.08	6,941.23	-9,234.17	2,187.80	14,455,314.76	1,734,491.33	39.80338361	-80.66503925	
21,000.00	89.00	150.08	6,942.98	-9,320.84	2,237.47	14,455,228.10	1,734,541.20	39.80314511	-80.66486286	
21,100.00	89.00	150.08	6,944.73	-9,407.50	2,287.34	14,455,141.44	1,734,591.06	39.80290660	-80.66458646	
21,200.00	89.00	150.08	6,946.48	-9,494.16	2,337.20	14,455,054.77	1,734,640.93	39.80266809	-80.66451007	
21,300.00	89.00	150.08	6,948.23	-9,580.82	2,387.07	14,454,968.11	1,734,690.79	39.80242959	-80.66433368	
21,400.00	89.00	150.08	6,949.98	-9,667.48	2,436.94	14,454,881.45	1,734,740.66	39.80219108	-80.66415729	
21,500.00	89.00	150.08	6,951.74	-9,754.14	2,486.80	14,454,794.79	1,734,790.53	39.80195257	-80.66398090	
21,600.00	89.00	150.08	6,953.49	-9,840.81	2,536.67	14,454,708.13	1,734,840.39	39.80171406	-80.66380451	
21,700.00	89.00	150.08	6,955.24	-9,927.47	2,586.54	14,454,621.47	1,734,890.26	39.80147556	-80.66362812	
21,800.00	89.00	150.08	6,956.99	-10,014.13	2,636.40	14,454,534.81	1,734,940.13	39.80123705	-80.66345174	
21,900.00	89.00	150.08	6,958.74	-10,100.79	2,686.27	14,454,448.14	1,734,989.99	39.80099854	-80.66327535	
22,000.00	89.00	150.08	6,960.50	-10,187.45	2,736.14	14,454,361.48	1,735,039.86	39.80076003	-80.66309887	
22,100.00	89.00	150.08	6,962.25	-10,274.11	2,786.00	14,454,274.82	1,735,089.73	39.80052152	-80.66292259	
22,200.00	89.00	150.08	6,964.00	-10,360.78	2,835.87	14,454,188.16	1,735,139.59	39.80028301	-80.66274621	
22,300.00	89.00	150.08	6,965.75	-10,447.44	2,885.74	14,454,101.50	1,735,189.46	39.80004450	-80.66256983	
22,400.00	89.00	150.08	6,967.50	-10,534.10	2,935.60	14,454,014.84	1,735,239.33	39.79980599	-80.66239345	
22,485.50	89.00	150.08	6,969.00	-10,608.20	2,978.24	14,453,940.74	1,735,281.96	39.79960207	-80.66224264	

PBHL/TD 22485.50 MD/6969.00 TVD

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Hudson 01HM LP r1 - hit/miss target - Shape - Point	0.00	0.01	6,731.25	1,165.53	-3,819.42	14,465,714.44	1,728,484.32	39.83200339	-80.68629758	
- plan misses target center by 19.93ft at 8889.26ft MD (6730.68 TVD, 1174.58 N, -3801.67 E)										
Hudson 01HM PBHL r2 - plan hits target center - Point	0.00	0.01	6,969.00	-10,608.20	2,978.24	14,453,940.74	1,735,281.96	39.79960206	-80.66224264	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,300.00	1,300.00	0.00	0.00	KOP Begin 3"/100' build	
2,889.57	2,712.30	286.67	-554.46	Begin 47.69° tangent	
7,425.46	5,765.77	1,827.14	-3,533.98	Begin 8"/100' build/turn	
8,434.82	6,567.17	1,567.59	-3,923.01	Begin 10"/100' build/turn	
8,903.29	6,731.07	1,162.38	-3,794.75	Begin 89.00° lateral	
22,485.50	6,969.00	-10,608.20	2,978.24	PBHL/TD 22485.50 MD/6969.00 TVD	

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Area of Review

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

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

Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (06/03/2019) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

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

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

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

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Permit well - Hudson 5-1HM

Wells within 500' Buffer

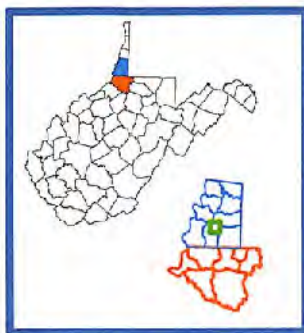
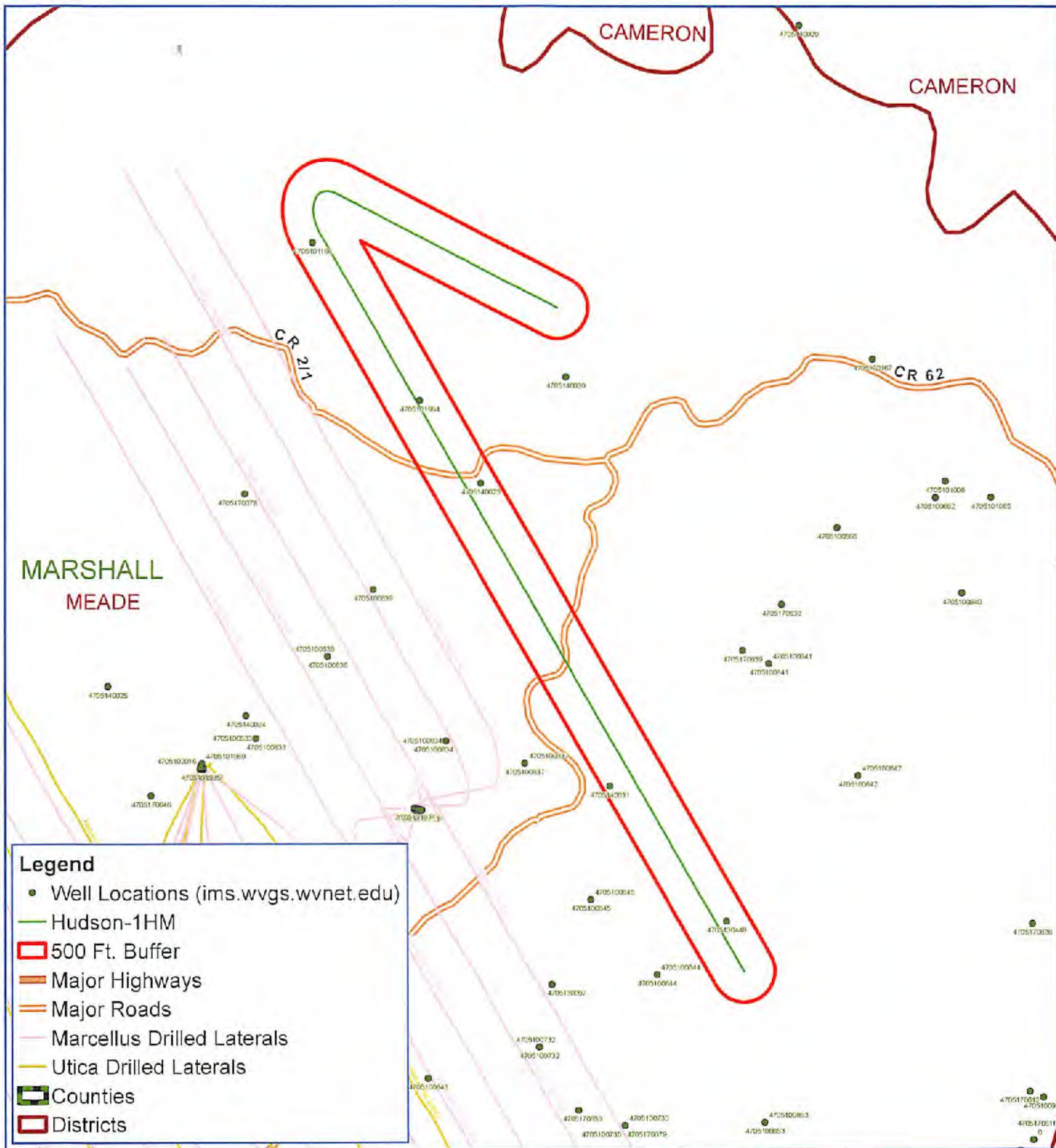
Note: Well spots depicted on Area of Review map (page 3) are derived from State held coordinates. The spots may differ from those depicted on the Well Plat because the Plat locations represent actual field surveyed locations. Please refer to the Plat for surveyed well spots

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705101166	Chevron Appalachia	6,950' TVD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore	Producing Marcellus well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.
4705101964	Tug Hill Operating	N/A	N/A	N/A	N/A	Currently a permit
4705140023	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Marcellus well.	State records are incomplete
4705140031	Unknown	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Marcellus well.	State records are incomplete
4705130448	Manufacturers Light & Heat Co	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Marcellus well.	Well was plugged 9/20/1963

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Hudson - 1HM Meade District Marshall County, WV



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

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Map Prepared by:
WV Department of
Environmental Protection

WVPS
LAND SERVICES

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) Grave Creek Quadrangle Glen Easton 7.5'

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WW0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1366426)

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

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

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

Company Official Signature James Pancake

Company Official (Typed Name) James Pancake

Company Official Title Vice President - Geoscience

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Subscribed and sworn before me this 19 day of JUNE, 20 19

Maureen A Stead

Notary Public

My commission expires 1/28/23

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

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 22.94 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

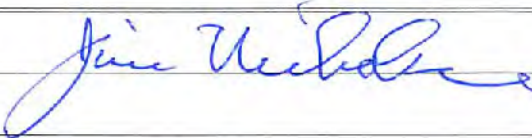
Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Orchard Grass	12
Spring Oats	96	Ladino	3
		White Clover	2

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:




Comments:

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Title: Oil and Gas Inspector

Date:



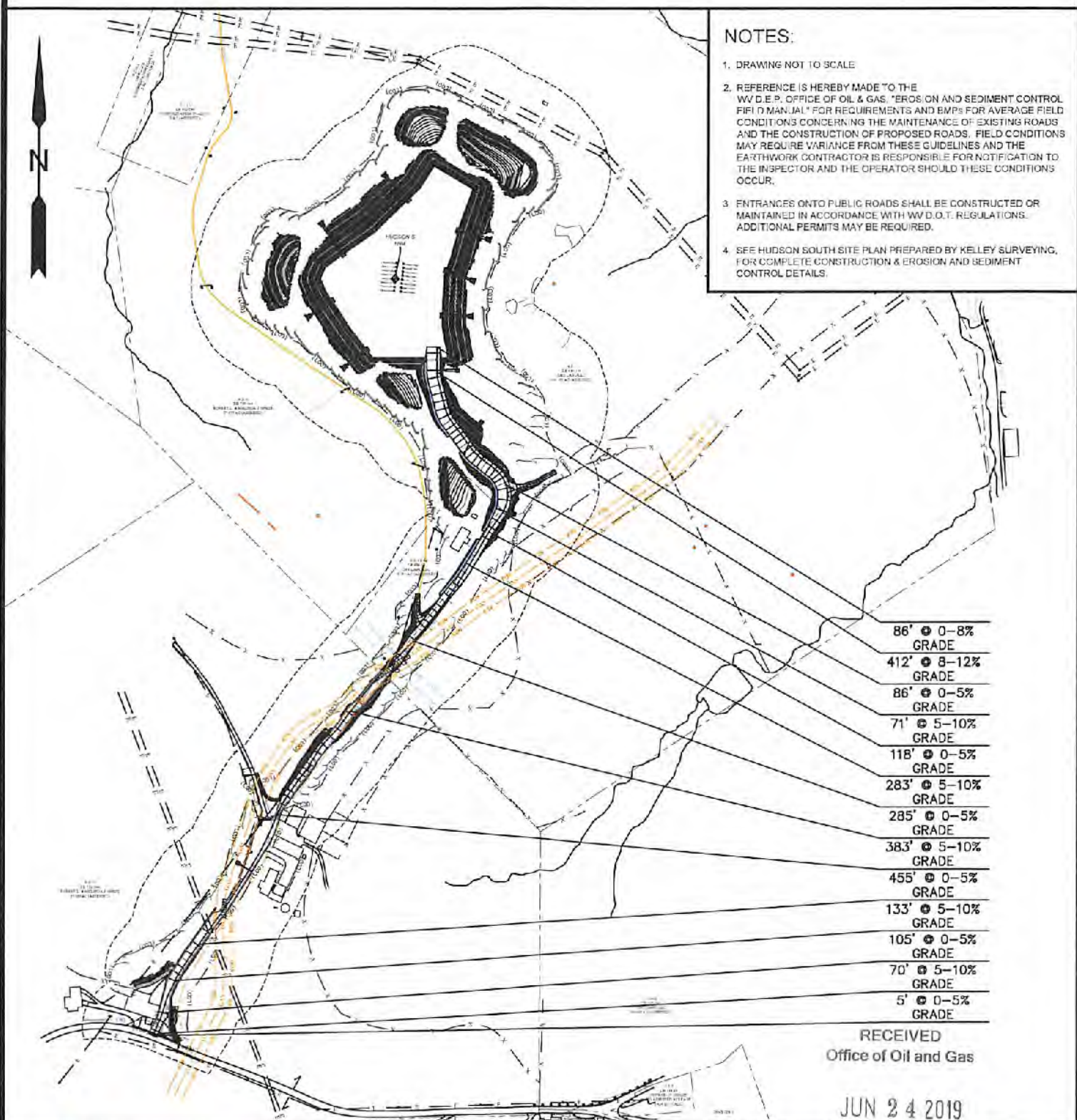
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Field Reviewed?

Yes

No

PROPOSED HUDSON S - 1HM



NOTES:

1. DRAWING NOT TO SCALE
2. REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.
3. ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.
4. SEE HUDSON SOUTH SITE PLAN PREPARED BY KELLEY SURVEYING, FOR COMPLETE CONSTRUCTION & EROSION AND SEDIMENT CONTROL DETAILS.

- 86' @ 0-8% GRADE
- 412' @ 8-12% GRADE
- 86' @ 0-5% GRADE
- 71' @ 5-10% GRADE
- 118' @ 0-5% GRADE
- 283' @ 5-10% GRADE
- 285' @ 0-5% GRADE
- 383' @ 5-10% GRADE
- 455' @ 0-5% GRADE
- 133' @ 5-10% GRADE
- 105' @ 0-5% GRADE
- 70' @ 5-10% GRADE
- 5' @ 0-5% GRADE

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www.slsww.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, I.I.C.	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8911	06/07/19	NONE

WV Department of Environmental Protection
TUG HILL OPERATING



Well Site Safety Plan
Tug Hill Operating, LLC

June 19/19

Well Name: Hudson S-1HM

Pad Location: Hudson Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,408,803.33

Easting: 528,007.23

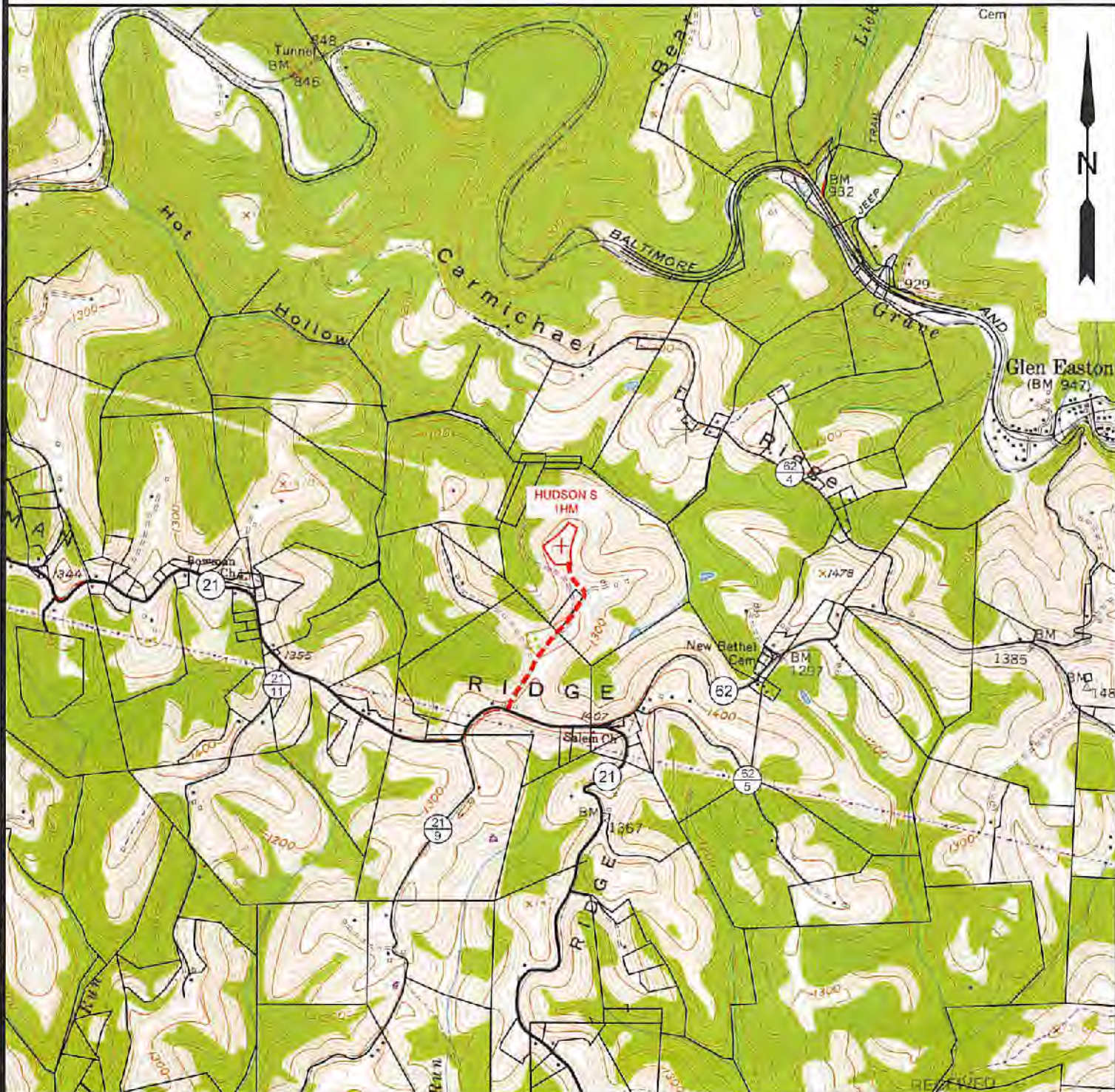
June 2019

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PROPOSED HUDSON S - 1HM



NOTE: CLOSEST WATER PURVEYOR
CITY OF CAMERON - FRANK WALKER RESERVOIR.
CAMDEN, WV

LAT: 39.829855
LON: -80.573724
LOCATED: N 89°55'26" E AT 27,779.45' FROM THE CENTER OF HUDSON S WELL PAD LOCATION

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TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
DRAWN BY		DATE	SCALE
K.G.M.		06/07/2019	1" = 2000'

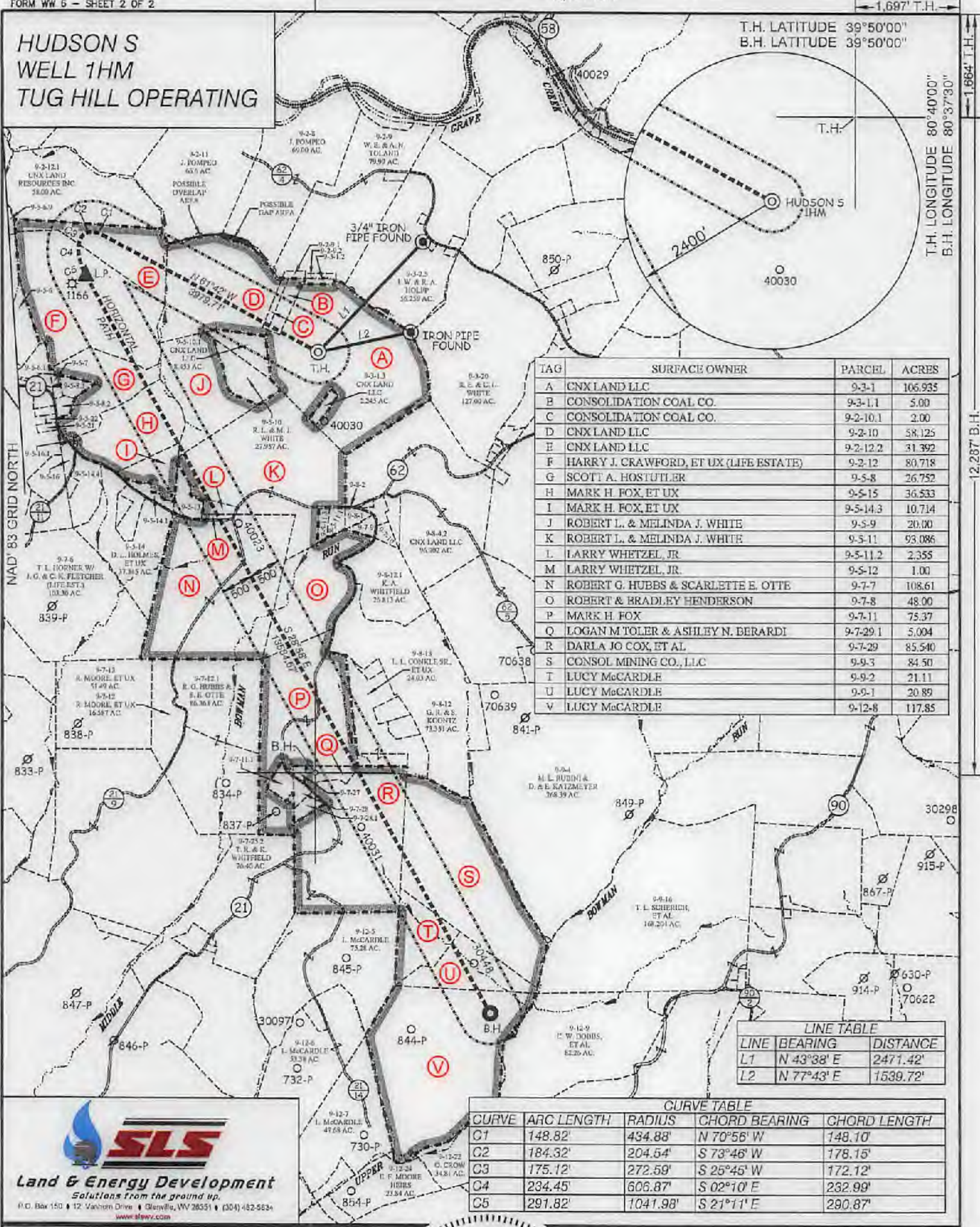


**HUDSON S
WELL 1HM
TUG HILL OPERATING**

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

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

NAD'83 GRID NORTH



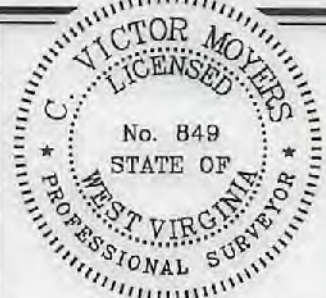
TAG	SURFACE OWNER	PARCEL	ACRES
A	CNX LAND LLC	9-3-1	106.935
B	CONSOLIDATION COAL CO.	9-3-1.1	5.00
C	CONSOLIDATION COAL CO.	9-2-10.1	2.00
D	CNX LAND LLC	9-2-10	58.125
E	CNX LAND LLC	9-2-12.2	31.392
F	HARRY J. CRAWFORD, ET UX (LIFE ESTATE)	9-2-12	80.718
G	SCOTT A. HOSTUTLER	9-5-8	26.752
H	MARK H. FOX, ET UX	9-5-15	36.533
I	MARK H. FOX, ET UX	9-5-14.3	10.714
J	ROBERT L. & MELINDA J. WHITE	9-5-9	20.00
K	ROBERT L. & MELINDA J. WHITE	9-5-11	93.086
L	LARRY WHITZEL, JR.	9-5-11.2	2.355
M	LARRY WHITZEL, JR.	9-5-12	1.00
N	ROBERT G. HUBBS & SCARLETTE E. OTTE	9-7-7	108.61
O	ROBERT & BRADLEY HENDERSON	9-7-8	48.00
P	MARK H. FOX	9-7-11	75.37
Q	LOGAN M. TOLER & ASHLEY N. BERARDI	9-7-29.1	5.004
R	DARLA JO COX, ET AL.	9-7-29	85.540
S	CONSOL MINING CO., L.L.C.	9-9-3	84.50
T	LUCY McCARDLE	9-9-2	21.11
U	LUCY McCARDLE	9-9-1	20.89
V	LUCY McCARDLE	9-12-8	117.85

LINE	BEARING	DISTANCE
L1	N 43°38' E	2471.42'
L2	N 77°43' E	1539.72'

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	148.82'	434.88'	N 70°56' W	148.10'
C2	184.32'	204.54'	S 73°46' W	178.15'
C3	175.12'	272.59'	S 25°45' W	172.12'
C4	234.45'	606.87'	S 02°10' E	232.99'
C5	291.82'	1041.98'	S 21°11' E	290.87'

SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 | 12 Vanhook Drive | Glenville, WV 26031 | (304) 482-5524
www.slsww.com

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)			
NAD'83 S.P.C.(FT)	N. 486,123.14	E. 1,639,158.21	
NAD'83 GEO	LAT-(N) 39.828755	LONG-(W) 80.672708	
NAD'83 UTM (M)	N. 4,408,803.33	E. 529,007.23	
LANDING POINT			
NAD'83 S.P.C.(FT)	N. 487,354.2	E. 1,635,382.1	
NAD'83 GEO	LAT-(N) 39.831995	LONG-(W) 80.686210	
NAD'83 UTM (M)	N. 4,409,157.6	E. 526,850.6	
BOTTOM HOLE			
NAD'83 S.P.C.(FT)	N. 475,469.1	E. 1,641,959.7	
NAD'83 GEO	LAT-(N) 39.799602	LONG-(W) 80.692243	
NAD'83 UTM (M)	N. 4,405,569.8	E. 528,915.0	



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

P.S. 849 *C. Victor Moyers*

SCALE	1" = 2000'	FILE NO.	8911P1HM.dwg
			HUDSON S-1HM REV3
DATE	JUNE 14		20 19
REVISED			20
OPERATORS WELL NO.	HUDSON S-1HM		
API WELL NO.	47	051	02248
NO.	STATE	COUNTY	PERMIT

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

LEGEND

- LEASE LINE
- SURFACE LINE
- WELL LATERAL
- OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- TAX MAP-PARCEL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE WW-5A1)

WELL OPERATOR	TUG HILL OPERATING, LLC	DESIGNATED AGENT	DIANNA STAMPER
ADDRESS	1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH, TX 76107	ADDRESS	5400 D BIG TYLER ROAD CHARLESTON, WV 26313

COUNTY NAME
PERMIT

**HUDSON S
WELL 1HM
TUG HILL OPERATING**

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

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

MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
9-2-9.1	CONSOLIDATION COAL CO.	1.00
9-2-9.2	CONSOLIDATION COAL CO.	1.00
9-3-1.2	CONSOLIDATION COAL CO.	1.00
9-5-6	NANCY L. SNYDER (LIFE ESTATE)	82.858
9-5-6.1	JON B. CRAWFORD	4.679
9-5-6.9	CNX LAND CO. LLC	22.39
9-5-7	ME CHURCH	81.5 POLES (6 AC. ASSD)
9-5-8.1	ISACC MCKINNEY, ET UX	2.875
9-5-8.2	MISTY CROW W/ ROBERT & ELSIE WHETZEL (LIFE ESTATE)	1.973
9-5-11.1	MARK H. FOX	2.619
9-5-11.3	MARK H. FOX	1.94
9-5-13	SHELLY ANN JORDAN	5.51
9-5-14.1	SAVANNA N & MATTHEW WEST	2.819
9-5-14.4	BETTY R. OTT	10.501
9-5-16	LARRY L. CONKLE, JR.	2.365
9-5-16.1	SCOTT A. HOSTUTLER	0.142
9-5-21	RALPH E. WELLMAN, ET UX	1.00
9-5-22	RALPH E. WELLMAN, ET UX	0.5
9-7-9	CNX LAND CO. LLC	2.00
9-7-10	DONALD M. & THERESA L. HARRIS	3.00
9-7-11.1	WV DEPT. OF HIGHWAYS	3.63
9-7-27	LOGAN M TOLER & ASHLEY N. BERARDI	1.005
9-7-28	VICTOR & CLAIRE CAMERON	1.983
9-7-28.1	NATHAN WILLIAMS	2.768
9-8-1	CNX LAND CO. LLC	2.908
9-8-2	CNX LAND CO. LLC	6000 SQ. FT.

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

NAD'83 S.P.C.(FT)	N. 486,128.14	E. 1,635,158.21
NAD'83 GEO.	LAT-(N) 39.828765	LONG-(W) 80.672708
NAD'83 UTM (M)	N. 4,408,803.33	E. 528,007.23
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 487,354.2	E. 1,635,382.1
NAD'83 GEO.	LAT-(N) 39.831995	LONG-(W) 80.686210
NAD'83 UTM (M)	N. 4,409,157.6	E. 528,850.8
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 475,468.1	E. 1,641,959.7
NAD'83 GEO.	LAT-(N) 39.799602	LONG-(W) 80.682243
NAD'83 UTM (M)	N. 4,405,569.9	E. 528,915.0

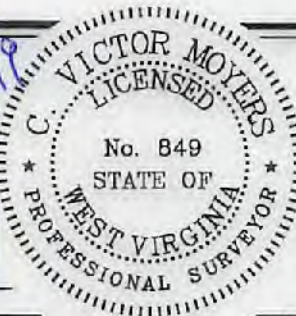


REFERENCES



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

P.S. *C. Victor Moyers*
849



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE JUNE 14, 20 19
REVISED _____, 20 ____
OPERATORS WELL NO. HUDSON S-1HM
API WELL NO. 47 - 51 - 02248
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8911P1HM.dwg
HUDSON S-1HM REV3
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 X INJECTION _____ WASTE DISPOSAL _____ IF "GAS" PRODUCTION X STORAGE _____ DEEP _____ SHALLOW X

LOCATION: GROUND = 1,370.20' ELEVATION PROPOSED = 1,344.81' WATERSHED GRAVE CREEK (HUC 10) DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER CNX LAND LLC ACREAGE 106.935±

ROYALTY OWNER CHARLENE L. BAKER, ET AL ACREAGE 106.935±

PROPOSED WORK: DRILL X CONVERT _____ DRILL DEEPER _____ REDRILL _____ FRACTURE OR STIMULATE X 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: 6,848' / TMD: 22,486'

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

COUNTY NAME PERMIT

WW-6A1
(5/13)

Operator's Well No. Hansen S-1HM

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

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

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

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

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

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

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

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

Well Operator: Tug Hill Operating, LLC

By: Amy L. Miller *Amy Miller* RECEIVED
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JUN 24 2019

Its: Permitting Specialist - Appalachia Region WV Department of
Environmental Protection

Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*26044	B	9-3-1.1	WALLACE JOYCE A	CHEVRON USA INC	1/8+	863	296	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26047	B	9-3-1.1	BLAKE ROBERT ET UX	CHEVRON USA INC	1/8+	863	138	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26048	B	9-3-1.1	ELIAS LOIS ET VIR	CHEVRON USA INC	1/8+	861	599	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26049	B	9-3-1.1	HUBBS MARY H	CHEVRON USA INC	1/8+	863	560	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26050	B	9-3-1.1	CROW BERNARD ET UX	CHEVRON USA INC	1/8+	863	627	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26051	B	9-3-1.1	KIDNER ROBERT W	CHEVRON USA INC	1/8+	863	644	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26052	B	9-3-1.1	BLAKE BETTY	CHEVRON USA INC	1/8+	863	545	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26053	B	9-3-1.1	MOORE ANTHONY T	CHEVRON USA INC	1/8+	854	343	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26054	B	9-3-1.1	MOORE HIRAM V	CHEVRON USA INC	1/8+	854	353	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26055	B	9-3-1.1	MOORE LARRY SR	CHEVRON USA INC	1/8+	854	348	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26056	B	9-3-1.1	MOORE RONALD W	CHEVRON USA INC	1/8+	854	338	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26057	B	9-3-1.1	PURDY BRENDA ET VIR	CHEVRON USA INC	1/8+	854	420	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC

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10*26058	B	9-3-1.1	WOOD CAROLE JEAN	CHEVRON USA INC	1/8+	854	414	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26059	B	9-3-1.1	BLAKE TERRY L	CHEVRON USA INC	1/8+	854	215	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26060	B	9-3-1.1	BLAKE ROBERT ET UX	CHEVRON USA INC	1/8+	854	333	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26061	B	9-3-1.1	HUBBS RODNEY ET UX	CHEVRON USA INC	1/8+	854	435	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26062	B	9-3-1.1	HUBBS SHANNON ET UX	CHEVRON USA INC	1/8+	854	233	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26063	B	9-3-1.1	RINE PATTY ET VIR	CHEVRON USA INC	1/8+	854	238	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26064	B	9-3-1.1	BLAKE CATHARINE LEE	CHEVRON USA INC	1/8+	863	550	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26065	B	9-3-1.1	MOORE DENNIS ET UX	CHEVRON USA INC	1/8+	857	646	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26066	B	9-3-1.1	BEYSER DANNY ET UX	CHEVRON USA INC	1/8+	858	36	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26067	B	9-3-1.1	BEYSER DONALD D	CHEVRON USA INC	1/8+	858	41	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26068	B	9-3-1.1	BLAKE GARY ET UX	CHEVRON USA INC	1/8+	858	31	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26069	B	9-3-1.1	REILLEY MARILYN SUE	CHEVRON USA INC	1/8+	857	597	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26070	B	9-3-1.1	HOLMES MARY W	CHEVRON USA INC	1/8+	857	602	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC

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10*26071	B	9-3-1.1	BAKER CHARLENE	CHEVRON USA INC	1/8+	857	607	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26072	B	9-3-1.1	BLAKE JAMES L	CHEVRON USA INC	1/8+	857	616	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26073	B	9-3-1.1	BEYSER DARLENE L	CHEVRON USA INC	1/8+	860	176	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26074	B	9-3-1.1	MOORE RANDYLYN	CHEVRON USA INC	1/8+	860	166	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26075	B	9-3-1.1	CECIL BETTY JOANN	CHEVRON USA INC	1/8+	860	119	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26076	B	9-3-1.1	GARRISON DORIS I	CHEVRON USA INC	1/8+	860	114	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26077	B	9-3-1.1	BLAKE DOROTHY J ET VIR	CHEVRON USA INC	1/8+	860	104	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26078	B	9-3-1.1	HARRIS VELMA RUTH	CHEVRON USA INC	1/8+	860	228	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26079	B	9-3-1.1	LOUDEN MARY ET VIR	CHEVRON USA INC	1/8+	860	109	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26080	B	9-3-1.1	JAHN SHARON D ET VIR	CHEVRON USA INC	1/8+	860	217	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26081	B	9-3-1.1	WILSON CYNTHIA ET VIR	CHEVRON USA INC	1/8+	861	545	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26082	B	9-3-1.1	LUTZ BRIAN C ET UX	CHEVRON USA INC	1/8+	861	550	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26083	B	9-3-1.1	BLAKE WILLIAMS JR	CHEVRON USA INC	1/8+	861	535	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC

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10*26084	B	9-3-1.1	DAVIDSON CYNTHIA ET VIR	CHEVRON USA INC	1/8+	889	46	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26085	B	9-3-1.1	HIGGINS CLYDE ET UX	CHEVRON USA INC	1/8+	861	508	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26086	B	9-3-1.1	HIGGINS DELMAS ET UX	CHEVRON USA INC	1/8+	861	503	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26087	B	9-3-1.1	HIGGINS JERRY ET UX	CHEVRON USA INC	1/8+	861	526	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26088	B	9-3-1.1	HIGGINS SHIRL ET UX	CHEVRON USA INC	1/8+	861	540	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26089	B	9-3-1.1	HIGGINS ALVA ET UX	CHEVRON USA INC	1/8+	861	521	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26090	B	9-3-1.1	HIGGINS DEAN ET UX	CHEVRON USA INC	1/8+	861	516	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26091	B	9-3-1.1	MANN JOELENE M	CHEVRON USA INC	1/8+	864	55	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26092	B	9-3-1.1	CREWS SHAWN ET UX	CHEVRON USA INC	1/8+	864	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26093	B	9-3-1.1	CONE JOYCE ET VIR	CHEVRON USA INC	1/8+	861	493	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26094	B	9-3-1.1	CURRY MARK L	CHEVRON USA INC	1/8+	865	102	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26095	B	9-3-1.1	MUNSON CHRISTINA C	CHEVRON USA INC	1/8+	865	107	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26097	B	9-3-1.1	BEYSER DAVID L	CHEVRON USA INC	1/8+	865	173	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC

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10*26098	B	9-3-1.1	HOLDER KIMBERLY	CHEVRON USA INC	1/8+	867	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26099	B	9-3-1.1	TROWBRIDGE CAROL ET VIR	CHEVRON USA INC	1/8+	866	138	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26100	B	9-3-1.1	MAUPIN JOSEPH ET UX	CHEVRON USA INC	1/8+	866	67	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26120	B	9-3-1.1	YOCUM JAMES ET UX	CHEVRON USA INC	1/8+	884	635	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26121	B	9-3-1.1	BRYNER BETTY	CHEVRON USA INC	1/8+	871	64	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26236	B	9-3-1.1	QUIGLEY VICKI ET VIR SFX	CHEVRON USA INC	1/8+	884	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26237	B	9-3-1.1	CAMPBELL FREDA L SFX	CHEVRON USA INC	1/8+	889	40	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26238	B	9-3-1.1	MERCER MARSHA L SFX	CHEVRON USA INC	1/8+	883	639	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26287	B	9-3-1.1	BLAKE IVAN R ET UX	CHEVRON USA INC	1/8+	888	542	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26288	B	9-3-1.1	BLAKE REBECCA J	CHEVRON USA INC	1/8+	888	571	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26289	B	9-3-1.1	FROMHART DUANETTA B	CHEVRON USA INC	1/8+	888	574	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26290	B	9-3-1.1	BLAKE WANDA M	CHEVRON USA INC	1/8+	889	43	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26291	B	9-3-1.1	MASON BARBARA A	CHEVRON USA INC	1/8+	901	125	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC

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10*26292	B	9-3-1.1	BLAKE JUDITH L	CHEVRON USA INC	1/8+	882	329	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26293	B	9-3-1.1	CURRY JAY C	CHEVRON USA INC	1/8+	882	433	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26294	B	9-3-1.1	GIEGER JOAN A	CHEVRON USA INC	1/8+	880	509	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26295	B	9-3-1.1	WARYCK ARTHUR ET AL	CHEVRON USA INC	1/8+	880	512	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26296	B	9-3-1.1	CALDWELL CARL G	CHEVRON USA INC	1/8+	883	530	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26297	B	9-3-1.1	MCKINNEY DIANA L	CHEVRON USA INC	1/8+	885	560	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26298	B	9-3-1.1	HENDRICKSON JANE	CHEVRON USA INC	1/8+	886	429	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26299	B	9-3-1.1	WILKINSON BETTY AIF D A M	CHEVRON USA INC	1/8+	886	432	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26300	B	9-3-1.1	HENNEN JILL LORI	CHEVRON USA INC	1/8+	886	439	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC
10*26304	B	9-3-1.1	CNX GAS COMPANY ET AL	CHEVRON USA INC	1/8+	888	521	NA	NA	NA	NA	NA	NA	NA	NA	NA	43/95 Chevron USA Inc to TH Exploration II LLC and TH Exploration LLC

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DPS LAND SERVICES CORP
6000 TOWN CENTER BOULEVARD, SUITE 145
CARLETONBURG PA 15317-5841

BOOK-0-043 PAGE 0095

STATE OF WEST VIRGINIA §
 §
COUNTY OF MARSHALL §

ASSIGNMENT AND BILL OF SALE

This ASSIGNMENT AND BILL OF SALE (this "Assignment") dated as of February 7, 2019 (the "Signing Date"), but effective from and after 7:00 a.m., Eastern Standard Time on February 1, 2019 (the "Effective Date"), is made by Chevron U.S.A. Inc., a Pennsylvania corporation, with an address at 700 Cherrington Parkway, Coraopolis, PA 15108 ("Chevron" or "Assignor") to TH Exploration II, LLC and TH Exploration, LLC, Texas limited liability companies, with an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (collectively "Assignee") and is accepted by Assignee upon the following terms and conditions.

RECITALS

- A. Assignor desires to sell, convey, transfer, assign and deliver to Assignee Assignor's Crawford 1 well and certain related assets, including certain leasehold interests, located in Marshall County, West Virginia.
- B. Through an Acreage Trade Agreement to be executed contemporaneously with this Assignment, Assignor desires to transfer, convey and assign to Assignee certain of Assignor's oil and gas leasehold interests located in Marshall County, West Virginia in exchange for the transfer, conveyance and assignment to Assignor by Assignee certain of Assignee's oil and gas leasehold interests located in Marshall County, West Virginia.
- C. In consideration of the mutual promises set out in this Assignment, including execution of the Acreage Trade Agreement, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree to be bound by the terms of this Assignment.

1. DEFINITIONS

1.1 **Definitions.** As used in this Assignment, these words and expressions have the following meanings:

"**Acreage Trade Agreement**" means that certain Acreage Trade Agreement by and between Chevron U.S.A. Inc. and TH Exploration, LLC with an Effective Date of February 1, 2019 to be contemporaneously executed with this Assignment.

"**Act**" has the meaning given to such term in Section 9.1(C).

"**Affiliate**" means any legal entity which controls, is controlled by, or is under common control with, another legal entity. An entity is deemed to "control" another if it owns directly or indirectly at least fifty percent of either of the following: (A) the shares entitled to vote at a general election of directors of such

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June 21, 2019

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

RE: Hudson S-1HM

Subject: Marshall County Route 21 Road Crossing Letter

Dear Laura:

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

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

Sincerely,

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

Amy Miller
Permit Specialist – Appalachia Region
Cell 304-376-0111
Email: amiller@tug-hilop.com

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

Date of Notice Certification: 06/21/2019

API No. 47- 051

Operator's Well No. Hudson S-1HM

Well Pad Name: Hudson

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>4 408,803.33</u>
County:	<u>Marshall</u>		Northing:	<u>528,007.28</u>
District:	<u>Mecca</u>	Public Road Access:	<u>Roberts Ridge Road (CR 21)</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>CNX Land, LLC</u>	
Watershed:	<u>Grave 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: 40px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p>OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p>
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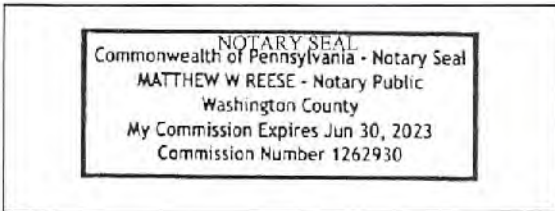
Required Attachments:

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

Certification of Notice is hereby given:

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

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



Subscribed and sworn before me this 21 day of June 2019
[Signature] Notary Public
 My Commission Expires 6-30-2023

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. 47-51 05 02248
OPERATOR WELL NO. Hudson S-IHM
Well Pad Name: Hudson

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

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

Date of Notice: 6/21/2019 Date Permit Application Filed: 6/21/2019

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: CNX Land Resources, LLC Attn: Casey Saunders (Well Pad)
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317
Name: _____
Address: _____

SURFACE OWNER(s) (Road and/or Other Disturbance)
Name: Robert L. and Melinda J. White (Access Road)
Address: 129 Freddie's Lane
Glen Easton, WV 26039
Name: _____
Address: _____

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

COAL OWNER OR LESSEE
Name: Consolidation Coal Company
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

COAL OPERATOR
Name: Murray American Energy, Inc. attn: Mason Smith
Address: 46226 National Road
St. Clairsville, OH 43905

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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Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

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Environmental Protection

WW-6A
(8-13)

4705-02248
API NO. 47-051
OPERATOR WELL NO. Hudson S-1HM
Well Pad Name: Hudson

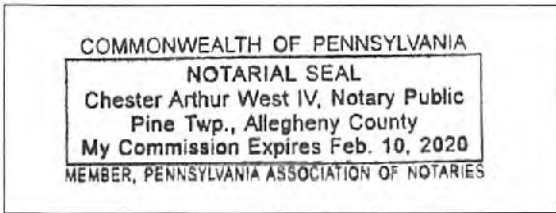
Notice is hereby given by:

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

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 21 day of June, 2019.
[Signature] Notary Public
My Commission Expires 2-10-2020

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Environmental Protection

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

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

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

Well: Hudson S – 2HM
 District: Meade
 State: WV

There are four (4) residences, no business or commercial sites, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

<p>Residence (#1) TM 3 Pcl. 1.3 CNX Land LLC Phone: None Found Physical Address: 143 Freddies Ln Proctor, WV 26055 Tax Address: 1000 Consol Energy Dr. Canonsburg, PA 15317-6506</p>	<p>Residence (#2) TM 5 Pcl. 11 Robert L. & Melinda J. White Phone: 740-667-3018; 304-845-2703 (Robert Andrew Williams – Reverse Address); 304-845-3756 (Melinda J. White); 304-845-4858 (Robert L. White) Physical Address: 129 Freddies Ln Proctor, WV 26055 Tax Address: 129 Freddies Ln Glen Easton, WV 26039</p>	<p>Residence (#3) TM 5 Pcl. 10 Robert L. & Melinda J. White Phone: 304-845-0562 (Charlotte A. Streight – Reverse Address) Physical Address: 443 Freddies Ln Proctor, WV 26055 Tax Address: 129 Freddies Ln Glen Easton, WV 26039</p>
<p>Residence (#4) TM 5 Pcl. 10 Robert L. & Melinda J. White Phone: 304-845-6068; 304-845-3756 (Robert L. White Jr. – Reverse Address); 304-845-3759 (Melinda J. White) Physical Address: 642 Freddies Ln Proctor, WV 26055 Tax Address: 129 Freddies Ln Glen Easton, WV 26039</p>		

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PROPOSED HUDSON S - 2HM



NOTE: THERE APPEARS TO BE FOUR (4) POSSIBLE WATER SOURCES WITHIN 2,000'.

SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26031 • (304) 452-9634
www.slsww.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT		
MARSHALL	MEADE		
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8911	06/14/2019	1" = 1000'

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Office of Oil and Gas

TUG HILL OPERATING
JUN 24 2019
WV Department of Environmental Protection

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

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

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

Well: Hudson S – 1HM
 District: Meade
 State: WV

There are four (4) residences, no business or commercial sites, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

Residence (#1) TM 3 Pcl. 1.3 CNX Land LLC Phone: None Found Physical Address: 143 Freddie's Ln Proctor, WV 26055 Tax Address: 1000 Consol Energy Dr. Canonsburg, PA 15317-6506	Residence (#2) TM 5 Pcl. 11 Robert L. & Melinda J. White Phone: 740-667-3018; 304-845-2703 (Robert Andrew Williams – Reverse Address); 304-845-3756 (Melinda J. White); 304-845-4858 (Robert L. White) Physical Address: 129 Freddie's Ln Proctor, WV 26055 Tax Address: 129 Freddie's Ln Glen Easton, WV 26039	Residence (#3) TM 5 Pcl. 10 Robert L. & Melinda J. White Phone: 304-845-0562 (Charlotte A. Streight – Reverse Address) Physical Address: 443 Freddie's Ln Proctor, WV 26055 Tax Address: 129 Freddie's Ln Glen Easton, WV 26039
Residence (#4) TM 5 Pcl. 10 Robert L. & Melinda J. White Phone: 304-845-6068; 304-845-3756 (Robert L. White Jr. – Reverse Address); 304-845-3759 (Melinda J. White) Physical Address: 642 Freddie's Ln Proctor, WV 26055 Tax Address: 129 Freddie's Ln Glen Easton, WV 26039		

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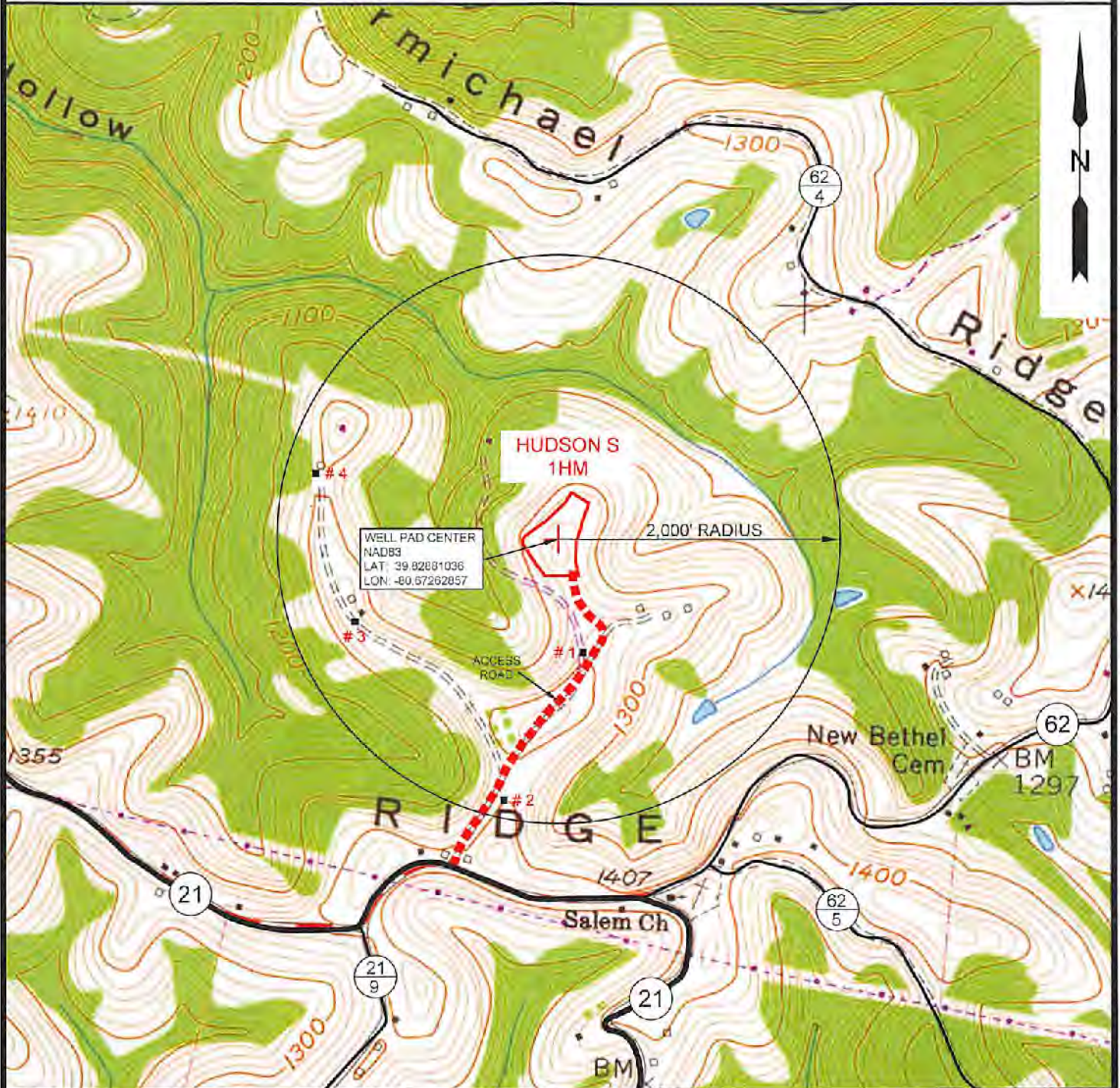
JUN 24 2019
 WV Department of
 Environmental Protection

4705-02248

WW-6A

PROPOSED HUDSON S - 1HM

SUPPLEMENT PG. 1B



NOTE: THERE APPEARS TO BE FOUR (4) POSSIBLE WATER SOURCES WITHIN 2,000'.

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Solutions from the ground up.
P.O. Box 150 • 12 Van Horn Drive • Genoville, WV 26351 • (304) 462-5634
www.slsww.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.	8911	06/07/2019	1" = 1000'

JUN 24 2019

WV Department of Environmental Protection
TUG HILL OPERATING

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: 6/4/2019 **Date of Planned Entry:** 6/11/2019

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: CNX Land Resources, LLC Attn: Casey Saunders (Well Pad)

Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

Name: Robert L. and Melinda J. White (Access Road)

Address: 129 Freddie Lane
Glen Easton, WV 26039

Name: _____

Address: _____

COAL OWNER OR LESSEE

Name: Consolidation Coal Company

Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

MINERAL OWNER(s)

Name: Charlene L. Baker *See attached list

Address: 5523 Roberts Ridge Road
Moundsville, WV 26041

*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	Approx. Latitude & Longitude: 39.82881036; -80.67262857
County: Marshall	Public Road Access: Co. Route 21
District: Meade	Watershed: Grave Creek
Quadrangle: Glen Easton	Generally used farm name: CNX Land Resources, LLC

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

Notice is hereby given by:

Well Operator: Tug Hill Operating, LLC

Telephone: 724-749-8388

Email: amiller@tug-hill.com

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

Facsimile: 724-338-2030

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Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of its 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.

WV Department of

Additional Mineral Owners for Notice
WW-6A3
Hudson Pad

Black Gold Group
P.O. Box 85
Strasburg, OH 44680

Catherine Lee Blake
101 Tomlinson Ave.
Moundsville, WV 26041

Ivan R. Blake
2315 Wolf Run Rd.
Cameron, WV 26033

Judith L. Blake
515 Meade Ave.
Akron, OH 44305

Robert C. Blake
1400 Third St.
Moundsville, WV 26041

Terry L. Blake
213 Birch Ave.
Moundsville, WV 26041

Betty Joan Cecil
200 Simmons Dr.
Moundsville, WV 26041

Bernard R. Crow
78 Dwight Ave.
Moundsville, WV 26041

Mark L. Curry
14 Pilgrims Way
Bentonville, VA 22610

Lois J. Elias
17 East Paxton Ave.
Wheeling, WV 26033

Dorothy J. Harris
2212 Turkey Run Rd.
Buckhannon, WV 26201

Jane Lynn Hendrickson
236 Westwood Dr.
Circleville, OH 43113

Betty J. Blake
2 Portsmouth Rd.
Front Royal, VA 22630

Gary F. Blake
3801 Needham Rd.
Mansfield, OH 44904

James L. Blake
P.O. Box 124
Farson, WY 82932

Rebecca J. Blake
1506 6th St.
Moundsville, WV 26041

Robert D. Blake
3757 Main St.
Weirton, WV 26062

William S. Blake Jr.
P.O. Box 349
Comfort, WV 25049

Shawn J. Crews
39 Branch Ln.
Broadway, NC 27505

Jay C. Curry
635 Minebanck Rd.
Middletown, VA 22645

Cynthia A. Davidson
7079 Hayes Orangeville Road NE
Burghill, OH 44404

Daunetta B. Fromhart
1309 Center St.
Moundsville, WV 26041

Velma Ruth Harris
3307 Bowman Ridge Rd.
Glen Easton, WV 26039

Jill Lori Hennen
2004 Baxter Ave.
Orlando, FL 32806

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Alva L. Higgins
4466 Templeton Road NW
Warren, OH 44481

H. Dean Higgins
9729 Gladstone Rd.
North Jackson, OH 44451

Jerry L. Higgins
3460 Park Avenue Ext.
Warren, OH 44481

Kimberly J. Holder
5815 Highway 217
Erwin, NC 28339

Rodney W. Hubbs
305 Sentimental Dr.
Moundsville, WV 26041

Robert W. Kidner
7757 Hansgrove Ct.
Dublin, OH 43016

Brian C. Lutz
364 Roseberry Ln.
Wheeling, WV 26003

Barbara A. Mason
363 Ridgeview Lane
Moundsville, WV 26041

Joseph L. Maupin
34626 Morning Glory Glen
Zephyrhills, FL 33541

Christina C. Munson
14 Pilgrims Way
Bentonville, VA 22610

Brenda S. Purdy
1404 Third St.
Moundsville, WV 26041

Carol J. Trowbridge
34710 Morning Glory Glen
Zephyrhills, FL 33541

Carol Jean Wood
106 Arlington Ave.
Moundsville, WV 26041

Clyde R. Higgins
2601 Milton Newton Rd.
Newton Falls, OH 44444

Delmas W. Higgins
7316 Elm St.
Newton Falls, OH 44444

Shirl W. Higgins
5241 Pritchard Ohltown Rd.
Newton Falls, OH 44444

Mary H. Hubbs
17 Hubbs Ln.
Moundsville, WV 26041

Shannon Roger Hubbs
27 Bowman Ridge
Moundsville, WV 26041

Mary O. Loudon
10 Sandy Ave.
Moundsville, WV 26041

Jolene M. Mann
494 Longfellow Ave.
Worthington, OH 43085

Master Mineral Holdings II, L.P.
P.O. Box 10886
Midland, TX 79702

Diana L. McKinney
275 Skyline Dr.
Moundsville, WV 26041

Potomac Mineral Group LLC
615 Washington Rd. Ste 201
Pittsburgh, PA 15228

Patty L. Rine
801 Benton St.
Apt. 2204
Searcy, AR 72143

Cynthia Jean Wilson
1709 Bennis Church Place
Virginia Beach, VA 23455

Betty Bryner
P.O. Box 270
Bruceton Mills, WV 26525

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47 05 102248

Betty Wilkinson
9271 Barn Swallow Lane
Marshall, VA 20115

Carl Caldwell
501 Morgantown Avenue
Apartment 201
Barnesville, OH 43713

Doris Garrison
28 Hickory Avenue
Moundsville, WV 26041

Crystal Thomas
1402 Sixth Street
Moundsville, WV 26041

Arthur Lee Waryck
912 Tomlinson Avenue
Glen Dale, WV 26038

Hiram Vernon Moore
609 Pink Apartment Rd
Davenport, FL 33837

Larry Vernon Moore, Sr.
135 Clover Hill Ln
Newport, VA 24128

Ronald Wayne Moore
434 Moores Ln
New Cumberland, WV 26047

Dennis F. Moore
471 Peal Dr, 104
Proctor, WV 26055

Anthony Moore
215 Ash Avenue
Moundsville, WV 26041

Freda L. Campbell
307 Elizabeth Street
Glen Dale, WV 26038

James D. Yocum
5200 NW 31st Avenue
Apartment B 38
Ft. Lauderdale, FL 33309

Joan A. Gieger
621 Pepperdine Avenue
Edmond, OK 33013

Joyce Elaine Cone
1831 Old Westminster Pike
Finksburg, MD 21048

Mary W. Holmes
197 Spindle Lane
Moundsville, WV 26041

Marilyn Sue Reilly
197 Spindle Lane
Moundsville, WV 26041

Freddie C. White
RR 1 Box 59A
Glen Easton, WV 26039

Sharon Diane Jahn
2802 Spindle Lane
Bowie, MD 20715

Joyce A. Wallace
4107 Shoemaker Hollow Road
New Philadelphia, OH 44663

Tamala Schollick
112 Jennifer Drive
Moundsville, WV 26041

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JUN 24 2019

WV Department of
Environmental Protection

WW-6A5
(1/12)

Operator Well No. 4705-02248 Hudson S-1HM

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

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

Date of Notice: 06/21/2019 **Date Permit Application Filed:** 06/21/2019

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

CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

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

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

Name: CNX Land Resources, LLC Attn: Casey Saunders(Well Pad)
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

Name: Robert L. and Melinda J. White (Access Road)
Address: 129 Freddie's Lane
Glen Easton, WV 26039

Notice is hereby given:

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>4,408,803.33</u>
County:	<u>Marshall</u>		Northing:	<u>528,007.28</u>
District:	<u>Meade</u>	Public Road Access:	<u>Roberts Ridge Road (CR 21)</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>CNX Land, LLC</u>	
Watershed:	<u>Grave Creek (HUC 10)</u>			

This Notice Shall Include:

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

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

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

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Office of Oil and Gas

JUN 24 2019

WV Department of
Environmental Protection

4705 * 02248



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Byrd E. White, III
Secretary of Transportation

June 21, 2019

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

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

Subject: DOH Permit for the Hudson Pad, Marshall County
Hudson S-1HM Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2019-0353 issued to Tug Hill Operating for access to the State Road for a well site located off of Marshall County Route 21 SLS.

This operator is in compliance with §22-6A-20 of the WV Code. Operator has signed a DISTRICT WIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated October 1, 2018.

Very Truly Yours,

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

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

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

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PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Hudson Pad

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

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Environmental Protection

WEST VIRGINIA COUNTY MAP



PROJECT LOCATION

APPROVED WVDEP OOG

8/30 11/4/2019

Hudson Well Site Site Design, Construction Plan, & Erosion and Sediment Control Plans

Tug Hill Operating Marshall County Meade District

Latitude 39.82881036° Longitude -80.67262857° Grave Creek Watershed

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

Property Owner Information - Hudson Well Site

Table with columns: Owner, Parcel No., Parcel Area, Acres, and other details. Includes information for Tug Hill Operating.

Exhibit A: Final Design: Issue for Permitting



Scale: 1" = 100' Contour Interval: 5'

Tables for 'Access Road', 'Disturbed Area', and 'Additional Information'.

Table for 'Hudson Well Site Quantities' showing various metrics like Volume, Area, and Length.

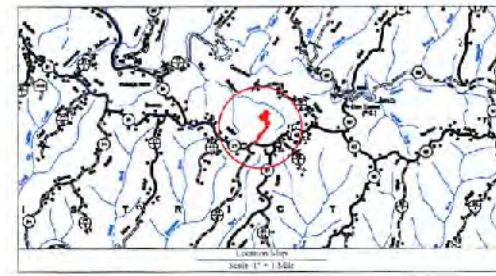
Grid of site location coordinates (Northing and Easting) for various points on the site.



Table with site location coordinates (Northing, Easting) for various points.

Approach Routes

From the intersection of WV Rt 2 and 226th Street in Meade District, WV. Travel South on WV Rt 2 for 4.3 miles. Turn left onto WV Rt 226th Street (Rural Route 226). Travel West for 1.5 miles. Turn Right onto Co. Rd. 226 (Gravelly Ridge Rd). Follow Co. Rd. 226 for 0.8 miles. The site entrance will be on the North (Right) side of the road.



Well Location Modifications

- List of modifications to the well location, including notes on setbacks and easements.



Signature and title of the engineer responsible for the design.

Table with columns: Sheet, Description, and other details for the project sheets.

Project Contacts: Includes contact information for Tug Hill Operating, LLC and the design firm.

Design and Engineer: Includes contact information for the design firm.

MISS UTILITY OF WEST VIRGINIA: Information regarding utility services and regulations.

WVDEP Website: Information regarding the West Virginia Department of Environmental Protection website.

Permitting Authority: Information regarding the permitting process and authority.



DESIGN PREPARED FOR TUG HILL OPERATING

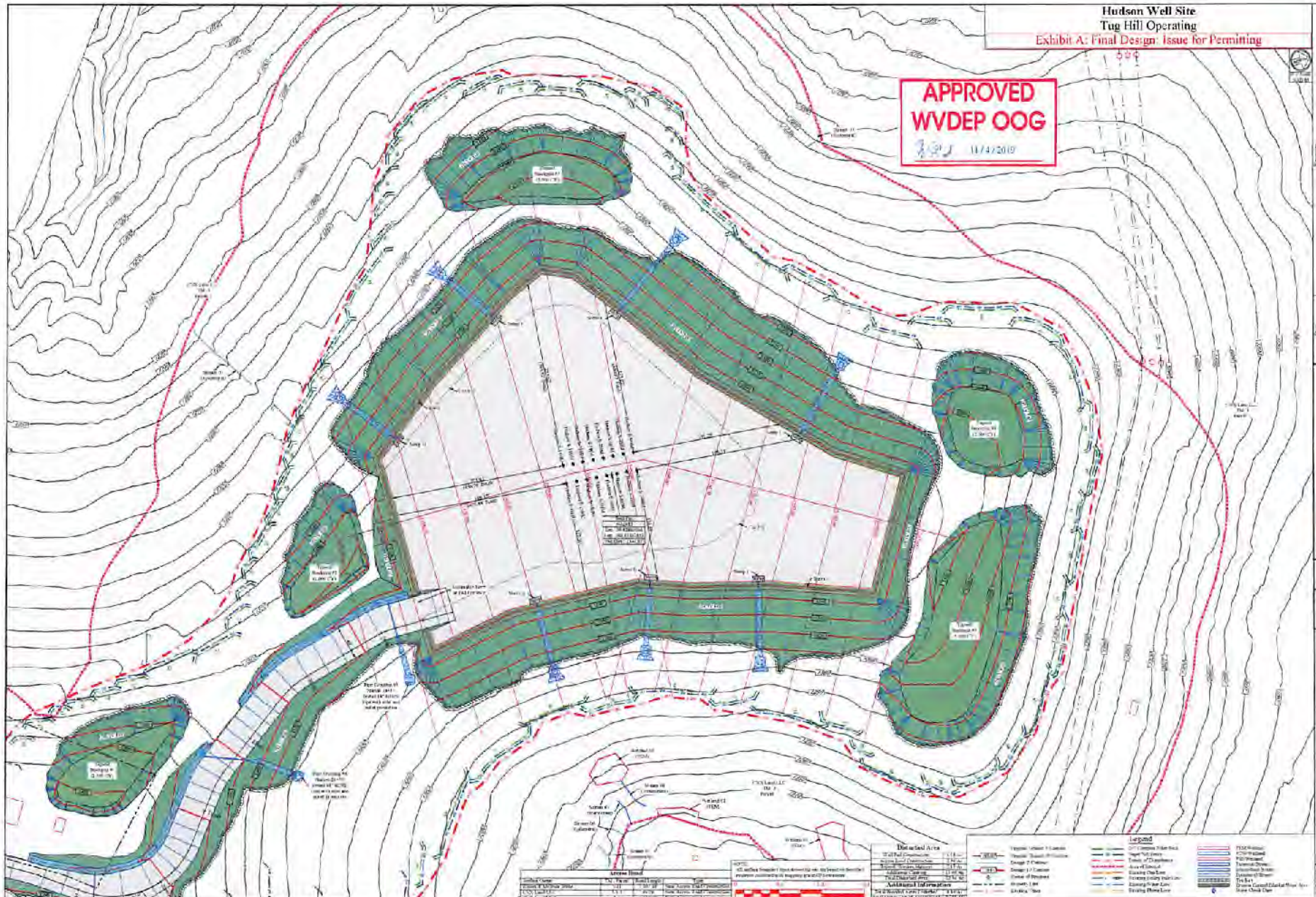


K&S Engineering, Inc. 1000 1/2 West Virginia Ave., Charleston, WV 25301

Hudson Well Site Meade District, Marshall County, WV

Table with columns: Date, Scale, Drawn By, and other details.

APPROVED
WVDEP OOG
 3/2/11 11/4/2010



THIS DOCUMENT
 PREPARED FOR
 TUG HILL
 OPERATING



Hudson Well Site
 Marshall County, WV

Scale: As Shown
 Unapproved for Use
 Date: 11/22/10

Area	Area	Area	Area
Disturbed Area	Disturbed Area	Disturbed Area	Disturbed Area
Disturbed Area	Disturbed Area	Disturbed Area	Disturbed Area

Disturbed Area

Area	Area	Area	Area
Disturbed Area	Disturbed Area	Disturbed Area	Disturbed Area
Disturbed Area	Disturbed Area	Disturbed Area	Disturbed Area

Legend

Symbol	Description	Symbol	Description
[Symbol]	Proposed Well Location	[Symbol]	Proposed Well Location
[Symbol]	Proposed Well Location	[Symbol]	Proposed Well Location
[Symbol]	Proposed Well Location	[Symbol]	Proposed Well Location