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west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Monday, June 4, 2018  
WELL WORK PERMIT  
Horizontal 6A / New Drill

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

Re: Permit approval for BRYAN S-11HM  
47-051-02022-00-00

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: BRYAN S-11HM  
Farm Name: CNX LAND RESOURCED, INC  
U.S. WELL NUMBER: 47-051-02022-00-00  
Horizontal 6A New Drill  
Date Issued: 6/4/2018

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

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

2) Operator's Well Number: Bryan S-11HM Well Pad Name: Bryan

3) Farm Name/Surface Owner: CNX Land Resources, Inc. Public Road Access: Rines Ridge Rd

4) Elevation, current ground: 1191' Elevation, proposed post-construction: 1191'

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

(b) If Gas Shallow  Deep   
Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Marcellus is the target formation at a depth of 6443' - 6496', thickness of 53' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,616' ✓

9) Formation at Total Vertical Depth: Onondoga

10) Proposed Total Measured Depth: 14,744'

11) Proposed Horizontal Leg Length: 6,624'

12) Approximate Fresh Water Strata Depths: 803' ✓

13) Method to Determine Fresh Water Depths: Offset well reports or noticeable flow at the flowline or when need to start soaping

14) Approximate Saltwater Depths: 2040' ✓

15) Approximate Coal Seam Depths: Sewickly Coal - 701' and Pittsburgh Coal - 796' ✓

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

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

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

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WW-6B  
(04/15)

4705102022

API NO. 47-051 -  
OPERATOR WELL NO. Bryan S-11HM  
Well Pad Name: Bryan

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'	336ft^3(CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	953' ✓	953'	1,017ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	953' ✓	953'	1,017ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,602' ✓	2,602'	847ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	14,744' ✓	14,744'	3,336ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		7,399'	
Liners	N/A						

*ju*  
2/5/18

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17 1/2"	.33	2,740	2,192	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.33	2,740	2,192	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE#24	1.19
Production	5 1/2"	8 7/8_8 3/4	.361	12,640	8,000	SEE#24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners	N/A						

PACKERS

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

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WW-6B  
(10/14)

API NO. 47-051 - \_\_\_\_\_  
OPERATOR WELL NO. Bryan S-11HM  
Well Pad Name: Bryan

*JW*  
*2/5/18*

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

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

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

Well to be completed with approximately 17,347,500 lb proppant and 268,205 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 16.14

22) Area to be disturbed for well pad only, less access road (acres): 5.98

23) Describe centralizer placement for each casing string:

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

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

\*See Attached

25) Proposed borehole conditioning procedures:

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

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\*Note: Attach additional sheets as needed.



**Tug Hill Operating, LLC Casing and Cement Program**

**Bryan S-11HM**

**Casing**

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	953'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,602'	CTS
Production	5 1/2"	P110	8 7/8 x 8 3/4"	14,744'	CTS

**Cement**

- Conductor:** Premium NE-1 + 2% bwoc CaC12 + 48.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2
- Surface:** Premium NE-1 + 2% bwoc CaC12 + 48.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2
- Intermediate:** Premium NE-1 + 1% bwoc CaC12 + 48.5% 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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06/08/2018

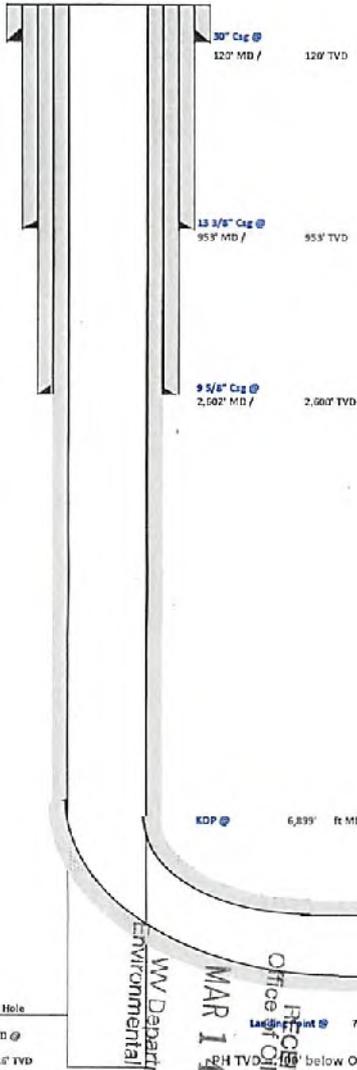


WELL NAME: Bryan S-11HM  
 STATE: West Virginia COUNTY: Marshall  
 DISTRICT: Franklin  
 DF Elev: 1,191' GL Elev: 1,191'  
 TD: 14,744'  
 TN Latitude: 39.7757979  
 TN Longitude: -80.7766657  
 BR Latitude: 39.76256195  
 BR Longitude: -80.75472811

Formation	Depth TVD
Deepest Fresh Water	803
Sewickley Coal	701
Pittsburgh Coal	796
Big Lime	1970
Weir	2324
Berea	2519
Gordon	2864
Rhinestreet	3857
Genesee/Burkett	5347
Tully	5382
Hamilton	5417
Marcellus	5423
Landing Depth	5503
Onondaga	5516
Pilot Hole Depth	5526

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'	8W	8W	Surface
Surface	17.5	13 3/8	533'	533'	54.5	255	Surface
Intermediate 1	12 1/4	9 5/8	2,602'	2,600'	36	255	Surface
Production	8 7/8 x 8 3/4	5 1/2	14,741'	6,624'	20	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,017	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	847	A	15	Air	1 Centralizer every other jt
Production	3,886	A	14.5	Air / 50DM	1 every other joint in lateral, 1 per joint in curve, 1 every other jt to s/c



*JW 2/5/18*

Pilot Hole  
 PH TD @ 6,616' TVD  
 Lateral TD @ 16,714' ft MD  
 6,624' ft TVD  
 below Onondaga Top

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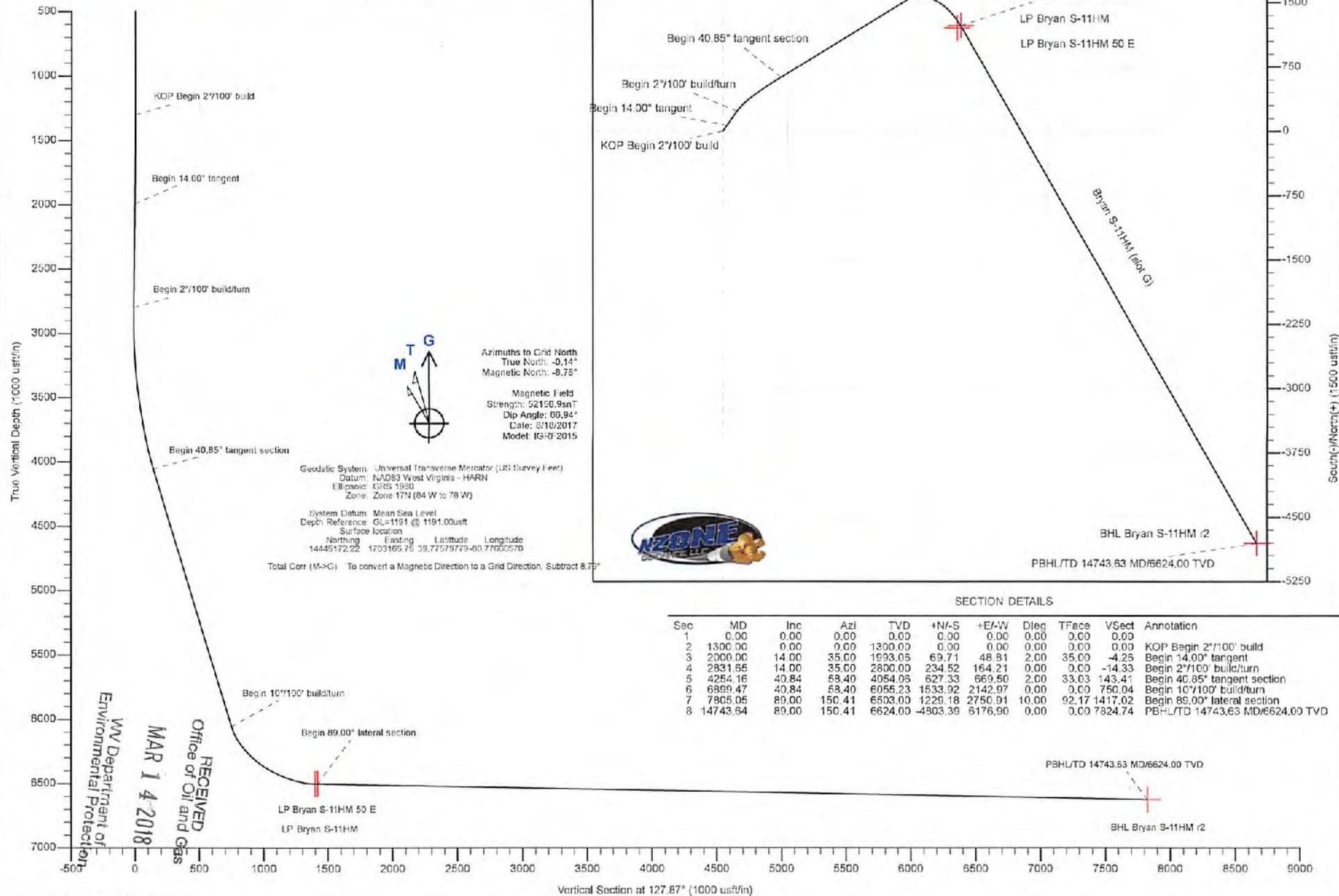
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**TUG HILL**  
OPERATING

**Tug Hill Operating LLC**  
Well: **Bryan S-11HM (slot G)**  
Site: **Bryan Pad**  
Project: **Marshall County, WV**  
Design: **rev2**



**Azimuths to Grid North**  
True North: -0.14°  
Magnetic North: -8.75°

**Magnetic Field**  
Strength: 52156.95nT  
Dip Angle: 80.94°  
Date: 3/10/2017  
Model: IGS-M 2015

**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=1191 @ 1191.00usft  
**Surface location:**  
Northing: 14445172.22    Easting: 1703165.75    Latitude: 39.77579779    Longitude: -80.77600570

Total Corr (M->G) To convert a Magnetic Direction to a Grid Direction, Subtract 8.75°



**SECTION DETAILS**

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1300.00	0.00	0.00	1300.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2'100' build
3	2000.00	14.00	35.00	1933.05	69.71	48.81	2.00	35.00	-4.25	Begin 14.00° tangent
4	2831.65	14.00	35.00	2800.00	234.52	164.21	0.00	0.00	-14.33	Begin 2'100' build/turn
5	4254.16	40.84	58.40	4054.05	627.33	669.50	2.00	33.03	143.41	Begin 40.85° tangent section
6	6889.47	40.84	58.40	6055.23	1533.92	2142.97	0.00	0.00	750.04	Begin 10'100' build/turn
7	7805.05	89.00	150.41	6503.00	1229.18	2750.91	10.00	92.17	1417.02	Begin 89.00° lateral section
8	14743.64	89.00	150.41	6624.00	-4803.39	6176.90	0.00	0.00	7324.74	PBHL/TD 14743.63 MD/6624.00 TVD

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<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan S-11HM (slot G)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=1191 @ 1191.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL=1191 @ 1191.00usft
<b>Site:</b>	Bryan Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Bryan S-11HM (slot G)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev2		

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

<b>Site</b>	Bryan Pad				
<b>Site Position:</b>		<b>Northing:</b>	14,445,110.80 usft	<b>Latitude:</b>	39.77562900
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,703,181.57 usft	<b>Longitude:</b>	-80.77660992
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.14 °

<b>Well</b>	Bryan S-11HM (slot G)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,445,172.22 usft	<b>Latitude:</b>	39.77579779
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,703,165.75 usft	<b>Longitude:</b>	-80.77666570
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b>	1,191.00 usft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	8/18/2017	-8.64	66.94	52,155.86567196

<b>Design</b>	rev2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	127.87

<b>Plan Survey Tool Program</b>	<b>Date</b>	1/2/2018		
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	14,743.64 rev2 (Original Hole)	MWD	MWD - Standard

<b>Plan Sections</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	<b>TFO (°)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	14.00	35.00	1,993.06	69.71	48.81	2.00	2.00	0.00	0.00	35.00
2,831.65	14.00	35.00	2,800.00	234.52	164.21	0.00	0.00	0.00	0.00	0.00
4,254.16	40.84	58.40	4,054.06	627.33	669.50	2.00	1.89	1.64	0.00	0.00
6,899.47	40.84	58.40	6,055.23	1,533.92	2,142.97	0.00	0.00	0.00	0.00	0.00
7,805.05	89.00	150.41	6,503.00	1,229.18	2,750.91	10.00	5.32	10.16	0.00	92.17 LP Bryan S-11HM 50
14,743.64	89.00	150.41	6,624.00	-4,803.39	6,176.90	0.00	0.00	0.00	0.00	0.00 BHL Bryan S-11HM r2

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Database: DB\_Jul2216dt\_v14  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Bryan Pad  
 Well: Bryan S-11HM (slot G)  
 Wellbore: Original Hole  
 Design: rev2

Local Co-ordinate Reference: Wall Bryan S-11HM (slot G)  
 TVD Reference: GL=1191 @ 1191.00usft  
 MD Reference: GL=1191 @ 1191.00usft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

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Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
100.00	0.00	0.00	100.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
200.00	0.00	0.00	200.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
300.00	0.00	0.00	300.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
400.00	0.00	0.00	400.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
500.00	0.00	0.00	500.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
600.00	0.00	0.00	600.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
700.00	0.00	0.00	700.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
800.00	0.00	0.00	800.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
900.00	0.00	0.00	900.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,445,172.22	1,703,165.75	39.77579779	-80.77666570
<b>KOP Begin 2°/100' build</b>									
1,400.00	2.00	35.00	1,389.98	1.43	1.00	14,445,173.85	1,703,186.75	39.77580171	-80.77666213
1,500.00	4.00	35.00	1,499.84	5.72	4.00	14,445,177.94	1,703,169.75	39.77581346	-80.77665140
1,600.00	6.00	35.00	1,599.45	12.86	9.00	14,445,185.07	1,703,174.75	39.77583303	-80.77663355
1,700.00	8.00	35.00	1,688.70	22.84	15.99	14,445,195.06	1,703,181.74	39.77586040	-80.77660858
1,800.00	10.00	35.00	1,797.47	35.65	24.96	14,445,207.87	1,703,190.71	39.77589553	-80.77657654
1,900.00	12.00	35.00	1,895.62	51.28	35.91	14,445,223.50	1,703,201.66	39.77593838	-80.77653745
2,000.00	14.00	35.00	1,993.06	69.71	48.81	14,445,241.93	1,703,214.56	39.77598889	-80.77649136
<b>Begin 14.00° tangent</b>									
2,100.00	14.00	35.00	2,090.08	89.52	62.69	14,445,261.74	1,703,228.43	39.77604322	-80.77644180
2,200.00	14.00	35.00	2,187.11	109.34	76.56	14,445,281.56	1,703,242.31	39.77609755	-80.77639224
2,300.00	14.00	35.00	2,284.14	129.16	90.44	14,445,301.38	1,703,256.19	39.77615188	-80.77634267
2,400.00	14.00	35.00	2,381.17	148.98	104.31	14,445,321.19	1,703,270.06	39.77620620	-80.77629311
2,500.00	14.00	35.00	2,478.20	168.79	118.19	14,445,341.01	1,703,283.94	39.77626053	-80.77624355
2,600.00	14.00	35.00	2,575.23	188.61	132.07	14,445,360.83	1,703,297.81	39.77631486	-80.77619398
2,700.00	14.00	35.00	2,672.26	208.43	145.94	14,445,380.65	1,703,311.69	39.77636919	-80.77614442
2,800.00	14.00	35.00	2,769.29	228.24	159.82	14,445,400.46	1,703,325.57	39.77642352	-80.77609486
2,831.65	14.00	35.00	2,800.00	234.52	164.21	14,445,406.73	1,703,329.96	39.77644071	-80.77607917
<b>Begin 2°/100' build/turn</b>									
2,900.00	15.16	37.85	2,865.15	248.35	174.44	14,445,420.57	1,703,340.19	39.77647883	-80.77604264
3,000.00	16.92	41.32	2,962.25	269.61	192.07	14,445,441.83	1,703,357.82	39.77653689	-80.77597969
3,100.00	18.72	44.14	3,057.45	292.06	212.86	14,445,464.28	1,703,378.61	39.77659841	-80.77590550
3,200.00	20.56	46.48	3,151.83	315.67	236.78	14,445,487.89	1,703,402.52	39.77666310	-80.77582017
3,300.00	22.43	48.45	3,244.67	340.43	263.79	14,445,512.64	1,703,429.54	39.77673088	-80.77572380
3,400.00	24.32	50.13	3,338.46	366.28	293.87	14,445,538.50	1,703,459.82	39.77680189	-80.77561651
3,500.00	26.22	51.58	3,425.89	393.21	326.98	14,445,565.43	1,703,492.73	39.77687542	-80.77549843
3,600.00	28.13	52.84	3,515.85	421.18	363.08	14,445,593.40	1,703,528.83	39.77695198	-80.77536970
3,700.00	30.06	53.96	3,603.23	450.16	402.12	14,445,622.38	1,703,567.87	39.77703130	-80.77523048
3,800.00	31.99	54.95	3,688.92	480.11	444.06	14,445,652.33	1,703,609.81	39.77711326	-80.77508094
3,900.00	33.93	55.84	3,772.82	511.00	488.85	14,445,683.22	1,703,654.59	39.77719777	-80.77492128
4,000.00	35.88	56.65	3,854.83	542.78	536.42	14,445,715.00	1,703,702.17	39.77728472	-80.77475164
4,100.00	37.83	57.38	3,934.84	575.42	586.73	14,445,747.64	1,703,752.48	39.77737402	-80.77457228
4,200.00	39.78	58.06	4,012.77	608.88	639.72	14,445,781.10	1,703,805.47	39.77746554	-80.77438340
4,254.16	40.84	58.40	4,054.06	627.33	689.51	14,445,799.55	1,703,835.26	39.77751600	-80.77427721
<b>Begin 40.85° tangent section</b>									
4,300.00	40.84	58.40	4,088.74	643.04	695.04	14,445,815.26	1,703,860.79	39.77755897	-80.77418619
4,400.00	40.84	58.40	4,164.39	677.31	750.74	14,445,849.53	1,703,916.49	39.77765270	-80.77398763
4,500.00	40.84	58.40	4,240.04	711.58	806.44	14,445,883.80	1,703,972.19	39.77774644	-80.77378907
4,600.00	40.84	58.40	4,315.69	745.85	862.14	14,445,918.07	1,704,027.89	39.77784017	-80.77359051
4,700.00	40.84	58.40	4,391.34	780.13	917.84	14,445,952.35	1,704,083.59	39.77793390	-80.77339194



<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan S-11HM (slot G)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=1191 @ 1191.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL=1191 @ 1191.00usft
<b>Site:</b>	Bryan Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Bryan S-11HM (slot G)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev2		

**Planned Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,800.00	40.84	58.40	4,466.99	814.40	973.54	14,445,986.62	1,704,139.29	39.77802764	-80.77319338
4,900.00	40.84	58.40	4,542.64	848.67	1,029.25	14,446,020.89	1,704,194.99	39.77812137	-80.77299482
5,000.00	40.84	58.40	4,618.29	822.94	1,084.95	14,446,055.16	1,704,250.70	39.77821510	-80.77279626
5,100.00	40.84	58.40	4,693.94	817.21	1,140.65	14,446,089.43	1,704,306.40	39.77830883	-80.77259769
5,200.00	40.84	58.40	4,769.59	851.48	1,196.35	14,446,123.70	1,704,362.10	39.77840256	-80.77239913
5,300.00	40.84	58.40	4,845.24	885.78	1,252.05	14,446,157.98	1,704,417.80	39.77849629	-80.77220056
5,400.00	40.84	58.40	4,920.89	1,020.03	1,307.75	14,446,192.25	1,704,473.50	39.77859002	-80.77200200
5,500.00	40.84	58.40	4,996.54	1,054.30	1,363.45	14,446,226.52	1,704,529.20	39.77868375	-80.77180343
5,600.00	40.84	58.40	5,072.19	1,088.57	1,419.15	14,446,260.79	1,704,584.90	39.77877748	-80.77160486
5,700.00	40.84	58.40	5,147.83	1,122.84	1,474.85	14,446,295.08	1,704,640.60	39.77887121	-80.77140630
5,800.00	40.84	58.40	5,223.48	1,157.11	1,530.55	14,446,329.33	1,704,696.30	39.77896494	-80.77120773
5,900.00	40.84	58.40	5,299.13	1,191.38	1,586.25	14,446,363.61	1,704,752.00	39.77905867	-80.77100916
6,000.00	40.84	58.40	5,374.78	1,225.66	1,641.96	14,446,397.88	1,704,807.70	39.77915240	-80.77081059
6,100.00	40.84	58.40	5,450.43	1,259.93	1,697.66	14,446,432.15	1,704,863.41	39.77924612	-80.77061202
6,200.00	40.84	58.40	5,526.08	1,294.20	1,753.36	14,446,466.42	1,704,919.11	39.77933985	-80.77041345
6,300.00	40.84	58.40	5,601.73	1,328.47	1,809.06	14,446,500.69	1,704,974.81	39.77943358	-80.77021488
6,400.00	40.84	58.40	5,677.38	1,362.74	1,864.76	14,446,534.96	1,705,030.51	39.77952731	-80.77001631
6,500.00	40.84	58.40	5,753.03	1,397.02	1,920.46	14,446,569.24	1,705,086.21	39.77962103	-80.76981774
6,600.00	40.84	58.40	5,828.68	1,431.29	1,976.16	14,446,603.51	1,705,141.91	39.77971476	-80.76961916
6,700.00	40.84	58.40	5,904.33	1,465.56	2,031.86	14,446,637.78	1,705,197.61	39.77980848	-80.76942059
6,800.00	40.84	58.40	5,979.98	1,499.83	2,087.56	14,446,672.05	1,705,253.31	39.77990221	-80.76922202
6,899.47	40.84	58.40	6,055.23	1,533.92	2,142.97	14,446,706.14	1,705,308.72	39.77999544	-80.76902450
<b>Begin 10°/100' build/turn</b>									
6,900.00	40.84	58.48	6,055.63	1,534.10	2,143.26	14,446,706.32	1,705,309.01	39.77999593	-80.76902344
7,000.00	41.48	73.67	6,131.11	1,560.58	2,203.07	14,446,732.80	1,705,363.82	39.78006822	-80.76881033
7,100.00	44.02	87.94	6,204.71	1,571.17	2,269.74	14,446,743.39	1,705,435.49	39.78009682	-80.76857293
7,200.00	48.15	100.61	6,274.21	1,565.54	2,341.25	14,446,737.76	1,705,507.00	39.78008087	-80.76831846
7,300.00	53.49	111.54	6,337.48	1,543.88	2,415.42	14,446,716.10	1,705,581.17	39.78002085	-80.76805464
7,400.00	59.89	120.95	6,392.61	1,508.84	2,490.01	14,446,679.08	1,705,655.76	39.77991859	-80.76778950
7,500.00	65.48	129.19	6,437.92	1,455.54	2,562.75	14,446,627.76	1,705,728.49	39.77977719	-80.76753109
7,600.00	73.56	138.60	6,472.03	1,391.54	2,631.42	14,446,563.78	1,705,797.16	39.77960095	-80.76728726
7,700.00	81.08	143.48	6,493.91	1,316.80	2,693.93	14,446,489.01	1,705,859.68	39.77939523	-80.76706543
7,800.00	88.62	150.08	6,502.90	1,233.57	2,748.40	14,446,405.79	1,705,914.15	39.77916627	-80.76687233
7,805.05	89.00	150.41	6,503.00	1,229.18	2,750.91	14,446,401.40	1,705,916.66	39.77915422	-80.76686345
<b>Begin 89.00° lateral section</b>									
7,900.00	89.00	150.41	6,504.66	1,146.63	2,797.79	14,446,318.85	1,705,963.54	39.77892717	-80.76669735
8,000.00	89.00	150.41	6,506.40	1,059.69	2,847.17	14,446,231.91	1,706,012.92	39.77868805	-80.76652241
8,100.00	89.00	150.41	6,508.14	972.75	2,896.54	14,446,144.97	1,706,062.29	39.77844893	-80.76634747
8,200.00	89.00	150.41	6,509.89	885.80	2,945.92	14,446,058.02	1,706,111.67	39.77820981	-80.76617254
8,300.00	89.00	150.41	6,511.63	798.86	2,995.29	14,445,971.08	1,706,161.04	39.77797088	-80.76599761
8,400.00	89.00	150.41	6,513.38	711.92	3,044.67	14,445,884.14	1,706,210.42	39.77773156	-80.76582268
8,500.00	89.00	150.41	6,515.12	624.98	3,094.05	14,445,797.20	1,706,259.80	39.77749244	-80.76564775
8,600.00	89.00	150.41	6,516.86	538.03	3,143.42	14,445,710.25	1,706,309.17	39.77725332	-80.76547282
8,700.00	89.00	150.41	6,518.61	451.09	3,192.80	14,445,623.31	1,706,358.55	39.77701419	-80.76529789
8,800.00	89.00	150.41	6,520.35	364.15	3,242.17	14,445,536.37	1,706,407.92	39.77677507	-80.76512296
8,900.00	89.00	150.41	6,522.09	277.21	3,291.55	14,445,449.43	1,706,457.30	39.77653595	-80.76494804
9,000.00	89.00	150.41	6,523.84	190.26	3,340.93	14,445,362.48	1,706,506.67	39.77629682	-80.76477311
9,100.00	89.00	150.41	6,525.58	103.32	3,390.30	14,445,275.54	1,706,556.05	39.77605770	-80.76459819
9,200.00	89.00	150.41	6,527.33	16.38	3,439.68	14,445,188.60	1,706,605.43	39.77581857	-80.76442327
9,300.00	89.00	150.41	6,529.07	-70.56	3,489.05	14,445,101.66	1,706,654.80	39.77557945	-80.76424834
9,400.00	89.00	150.41	6,530.81	-157.50	3,538.43	14,445,014.71	1,706,704.18	39.77534032	-80.76407343
9,500.00	89.00	150.41	6,532.56	-244.45	3,587.80	14,444,927.77	1,706,753.55	39.77510120	-80.76389851
9,600.00	89.00	150.41	6,534.30	-331.39	3,637.18	14,444,840.83	1,706,802.93	39.77486207	-80.76372359
9,700.00	89.00	150.41	6,536.05	-418.33	3,686.56	14,444,753.89	1,706,852.31	39.77462295	-80.76354867

Office of Oil and Gas

<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan S-11HM (slot G)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=1191 @ 1191.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL=1191 @ 1191.00usft
<b>Site:</b>	Bryan Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Bryan S-11HM (slot G)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev2		

**Planned Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,800.00	89.00	150.41	6,537.79	-505.27	3,735.93	14,444,666.94	1,706,901.68	39.77438382	-80.76337376
9,900.00	89.00	150.41	6,538.53	-592.22	3,785.31	14,444,580.00	1,706,951.06	39.77414469	-80.76319885
10,000.00	89.00	150.41	6,541.28	-679.16	3,834.68	14,444,493.06	1,707,000.43	39.77360557	-80.76302393
10,100.00	89.00	150.41	6,543.02	-766.10	3,884.06	14,444,406.12	1,707,049.81	39.77366644	-80.76284902
10,200.00	89.00	150.41	6,544.76	-853.04	3,933.44	14,444,319.18	1,707,099.19	39.77342731	-80.76267411
10,300.00	89.00	150.41	6,546.51	-939.99	3,982.81	14,444,232.23	1,707,148.56	39.77318819	-80.76249920
10,400.00	89.00	150.41	6,548.25	-1,026.93	4,032.19	14,444,145.29	1,707,197.94	39.77294906	-80.76232430
10,500.00	89.00	150.41	6,550.00	-1,113.87	4,081.56	14,444,058.35	1,707,247.31	39.77270993	-80.76214939
10,600.00	89.00	150.41	6,551.74	-1,200.81	4,130.94	14,443,971.41	1,707,296.69	39.77247060	-80.76197448
10,700.00	89.00	150.41	6,553.48	-1,287.76	4,180.32	14,443,884.46	1,707,346.06	39.77223167	-80.76179958
10,800.00	89.00	150.41	6,555.23	-1,374.70	4,229.69	14,443,797.52	1,707,395.44	39.77199254	-80.76162468
10,900.00	89.00	150.41	6,556.97	-1,461.64	4,279.07	14,443,710.58	1,707,444.82	39.77175341	-80.76144978
11,000.00	89.00	150.41	6,558.72	-1,548.58	4,328.44	14,443,623.64	1,707,494.19	39.77151429	-80.76127486
11,100.00	89.00	150.41	6,560.46	-1,635.53	4,377.82	14,443,536.69	1,707,543.57	39.77127515	-80.76109998
11,200.00	89.00	150.41	6,562.20	-1,722.47	4,427.19	14,443,449.75	1,707,592.94	39.77103603	-80.76092506
11,300.00	89.00	150.41	6,563.95	-1,809.41	4,476.57	14,443,362.81	1,707,642.32	39.77079690	-80.76075018
11,400.00	89.00	150.41	6,565.69	-1,896.35	4,525.95	14,443,275.87	1,707,691.70	39.77055777	-80.76057529
11,500.00	89.00	150.41	6,567.44	-1,983.30	4,575.32	14,443,188.92	1,707,741.07	39.77031863	-80.76040039
11,600.00	89.00	150.41	6,569.18	-2,070.24	4,624.70	14,443,101.98	1,707,790.45	39.77007950	-80.76022550
11,700.00	89.00	150.41	6,570.92	-2,157.18	4,674.07	14,443,015.04	1,707,839.82	39.76984037	-80.76005061
11,800.00	89.00	150.41	6,572.67	-2,244.12	4,723.45	14,442,928.10	1,707,889.20	39.76960124	-80.75987572
11,900.00	89.00	150.41	6,574.41	-2,331.07	4,772.83	14,442,841.15	1,707,938.57	39.76936211	-80.75970083
12,000.00	89.00	150.41	6,576.15	-2,418.01	4,822.20	14,442,754.21	1,707,987.95	39.76912298	-80.75952594
12,100.00	89.00	150.41	6,577.90	-2,504.95	4,871.58	14,442,667.27	1,708,037.33	39.76888384	-80.75935105
12,200.00	89.00	150.41	6,579.64	-2,591.89	4,920.95	14,442,580.33	1,708,086.70	39.76864471	-80.75917617
12,300.00	89.00	150.41	6,581.39	-2,678.84	4,970.33	14,442,493.38	1,708,136.08	39.76840558	-80.75900126
12,400.00	89.00	150.41	6,583.13	-2,765.78	5,019.70	14,442,406.44	1,708,185.45	39.76816645	-80.75882634
12,500.00	89.00	150.41	6,584.87	-2,852.72	5,069.08	14,442,319.50	1,708,234.83	39.76792731	-80.75865152
12,600.00	89.00	150.41	6,586.62	-2,939.66	5,118.46	14,442,232.56	1,708,284.21	39.76768818	-80.75847664
12,700.00	89.00	150.41	6,588.36	-3,026.60	5,167.83	14,442,145.61	1,708,333.58	39.76744904	-80.75830176
12,800.00	89.00	150.41	6,590.11	-3,113.55	5,217.21	14,442,058.67	1,708,382.96	39.76720991	-80.75812688
12,900.00	89.00	150.41	6,591.85	-3,200.49	5,266.58	14,441,971.73	1,708,432.33	39.76697078	-80.75795200
13,000.00	89.00	150.41	6,593.59	-3,287.43	5,315.96	14,441,884.79	1,708,481.71	39.76673164	-80.75777712
13,100.00	89.00	150.41	6,595.34	-3,374.37	5,365.34	14,441,797.84	1,708,531.08	39.76649251	-80.75760225
13,200.00	89.00	150.41	6,597.08	-3,461.32	5,414.71	14,441,710.90	1,708,580.46	39.76625337	-80.75742736
13,300.00	89.00	150.41	6,598.82	-3,548.26	5,464.09	14,441,623.96	1,708,629.84	39.76601424	-80.75725250
13,400.00	89.00	150.41	6,600.57	-3,635.20	5,513.46	14,441,537.02	1,708,679.21	39.76577510	-80.75707763
13,500.00	89.00	150.41	6,602.31	-3,722.14	5,562.84	14,441,450.08	1,708,728.59	39.76553596	-80.75690276
13,600.00	89.00	150.41	6,604.06	-3,809.09	5,612.21	14,441,363.13	1,708,777.96	39.76529683	-80.75672789
13,700.00	89.00	150.41	6,605.80	-3,896.03	5,661.59	14,441,276.19	1,708,827.34	39.76505769	-80.75655303
13,800.00	89.00	150.41	6,607.54	-3,982.97	5,710.97	14,441,189.25	1,708,876.72	39.76481855	-80.75637816
13,900.00	89.00	150.41	6,609.29	-4,069.91	5,760.34	14,441,102.31	1,708,926.09	39.76457942	-80.75620329
14,000.00	89.00	150.41	6,611.03	-4,156.86	5,809.72	14,441,015.36	1,708,975.47	39.76434028	-80.75602843
14,100.00	89.00	150.41	6,612.78	-4,243.80	5,859.09	14,440,928.42	1,708,024.84	39.76410114	-80.75585357
14,200.00	89.00	150.41	6,614.52	-4,330.74	5,908.47	14,440,841.48	1,708,074.22	39.76386200	-80.75567871
14,300.00	89.00	150.41	6,616.26	-4,417.68	5,957.85	14,440,754.54	1,708,123.59	39.76362286	-80.75550384
14,400.00	89.00	150.41	6,618.01	-4,504.63	6,007.22	14,440,667.59	1,708,172.97	39.76338373	-80.75532899
14,500.00	89.00	150.41	6,619.75	-4,591.57	6,056.60	14,440,580.65	1,708,222.35	39.76314459	-80.75515413
14,600.00	89.00	150.41	6,621.50	-4,678.51	6,105.97	14,440,493.71	1,708,271.72	39.76290545	-80.75497927
14,700.00	89.00	150.41	6,623.24	-4,765.45	6,155.35	14,440,406.77	1,708,321.10	39.76266631	-80.75480442
14,743.63	89.00	150.41	6,624.00	-4,803.39	6,176.89	14,440,368.83	1,708,342.64	39.76256197	-80.75472813
<b>PBHL/TD 14743.63 MD/6624.00 TVD</b>									
14,743.64	89.00	150.41	6,624.00	-4,803.39	6,176.89	14,440,368.83	1,708,342.65	39.76256195	-80.75472811

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<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan S-11HM (slot G)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL=1191 @ 1191.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL=1191 @ 1191.00usft
<b>Site:</b>	Bryan Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	Bryan S-11HM (slot G)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev2		

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LP Bryan S-11HM 50 E - plan hits target center - Point	0.00	0.00	6,503.00	1,229.18	2,750.91	14,446,401.40	1,705,916.66	39.77915422	-80.76686345
LP Bryan S-11HM - plan misses target center by 50.00usft at 7805.41usft MD (6503.01 TVD, 1228.87 N, 2751.09 E) - Point	0.00	0.00	6,503.00	1,204.18	2,707.61	14,446,376.40	1,705,873.36	39.77908586	-80.76701779
BHL Bryan S-11HM r2 - plan hits target center - Point	0.00	0.00	6,624.00	-4,803.39	6,176.90	14,440,368.83	1,709,342.65	39.76256195	-80.75472811

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,300.00	1,300.00	0.00	0.00	KOP Begin 2°/100' build
2,000.00	1,993.06	69.71	48.81	Begin 14.00° tangent
2,831.65	2,800.00	234.52	164.21	Begin 2°/100' build/turn
4,254.16	4,054.06	627.33	669.51	Begin 40.85° tangent section
6,899.47	6,055.23	1,533.92	2,142.97	Begin 10°/100' build/turn
7,805.05	6,503.00	1,229.18	2,750.91	Begin 89.00° lateral section
14,743.63	6,624.00	-4,803.39	6,176.89	PBHL/TD 14743.63 MD/6624.00 TVD

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**Tug Hill Operating, LLC**

Proposed Revegetation Treatment: Acres Disturbed 18.43 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

**Seed Mixtures**

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

**Attach:**

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: *Jim [Signature]*

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Title: Oil & Gas Inspector

Date: 2/5/18

Field Reviewed?  Yes  No

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MAR 14 2018

WV Department of  
Environmental Protection

06/08/2018

WW-9  
(4/16)

API Number 47 - 051 - \_\_\_\_\_  
Operator's Well No. Bryan S-11HM

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510651

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

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

Will a pit be used? Yes  No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

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

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

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

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

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

Company Official (Typed Name) Sean Gasser

Company Official Title Engineer

Subscribed and sworn before me this 5<sup>th</sup> day of FEBRUARY, 20 18

Kaitlin McCawley Kaitlin McCawley Notary Public

My commission expires 5/8/2021



06/08/2018

# PROPOSED BRYAN S-11HM

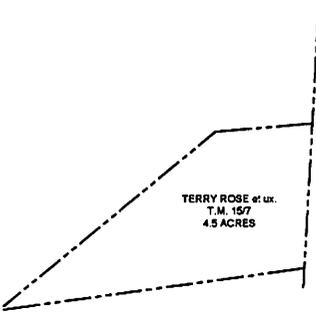
REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

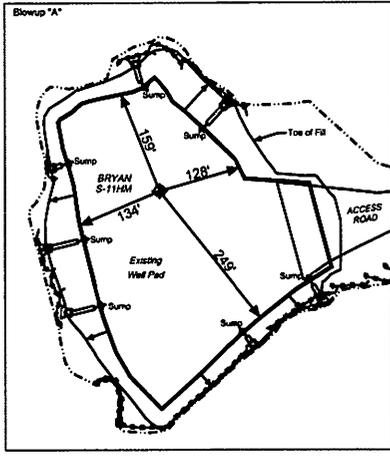
ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED. TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE

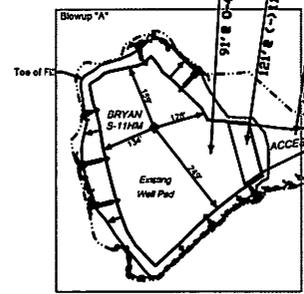
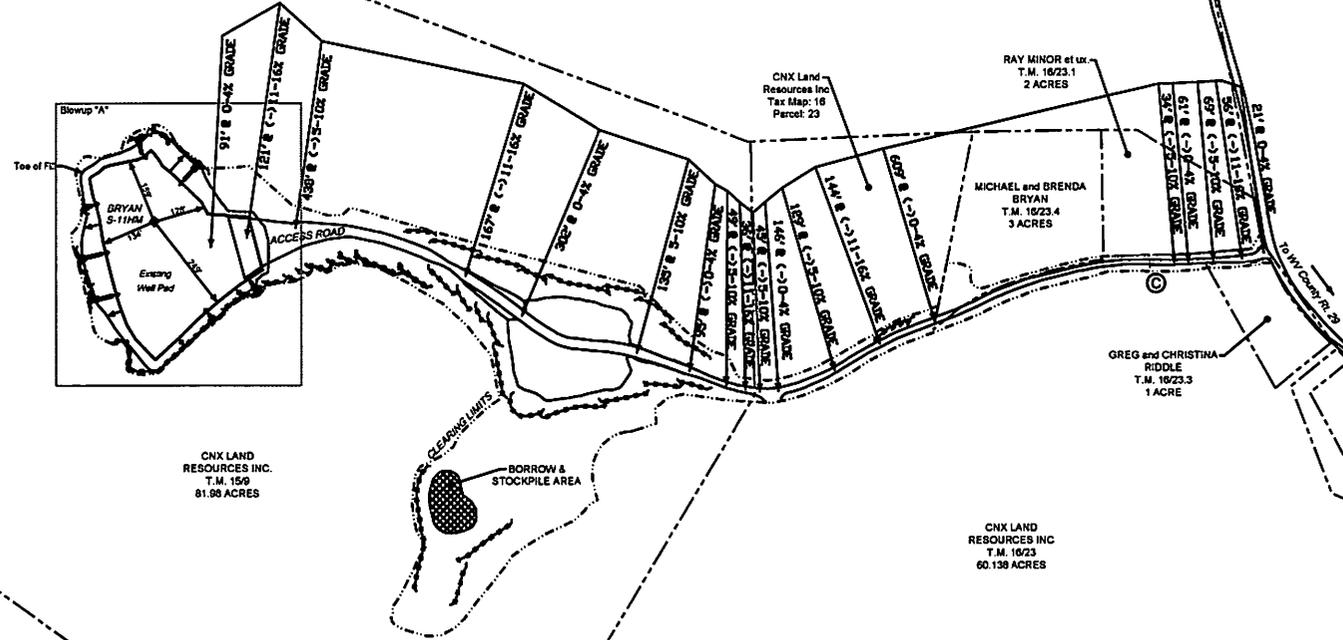
ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.



TERRY D. ROSE ET UX  
T.M. 15/08  
77.11 Acres



DRAWING NOT TO SCALE



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WV Department of Environmental Protection

**LEGEND**

- Denotes existing culvert with appropriate sediment outlet control (Biosilt splash pad).
- Silt Fence and or Sediment and Erosion Control Measure.
- Surface Boundary



# Well Site Safety Plan

## Tug Hill Operating, LLC

*JW*  
*2/5/18*

Well Name: Bryan S-11HM

Pad Location: Bryan Pad

Marshall County, West Virginia

UTM meters , NAD83, Zone 17:

Northing: 4,402,897.30

Easting: 519,125.96

February 2018

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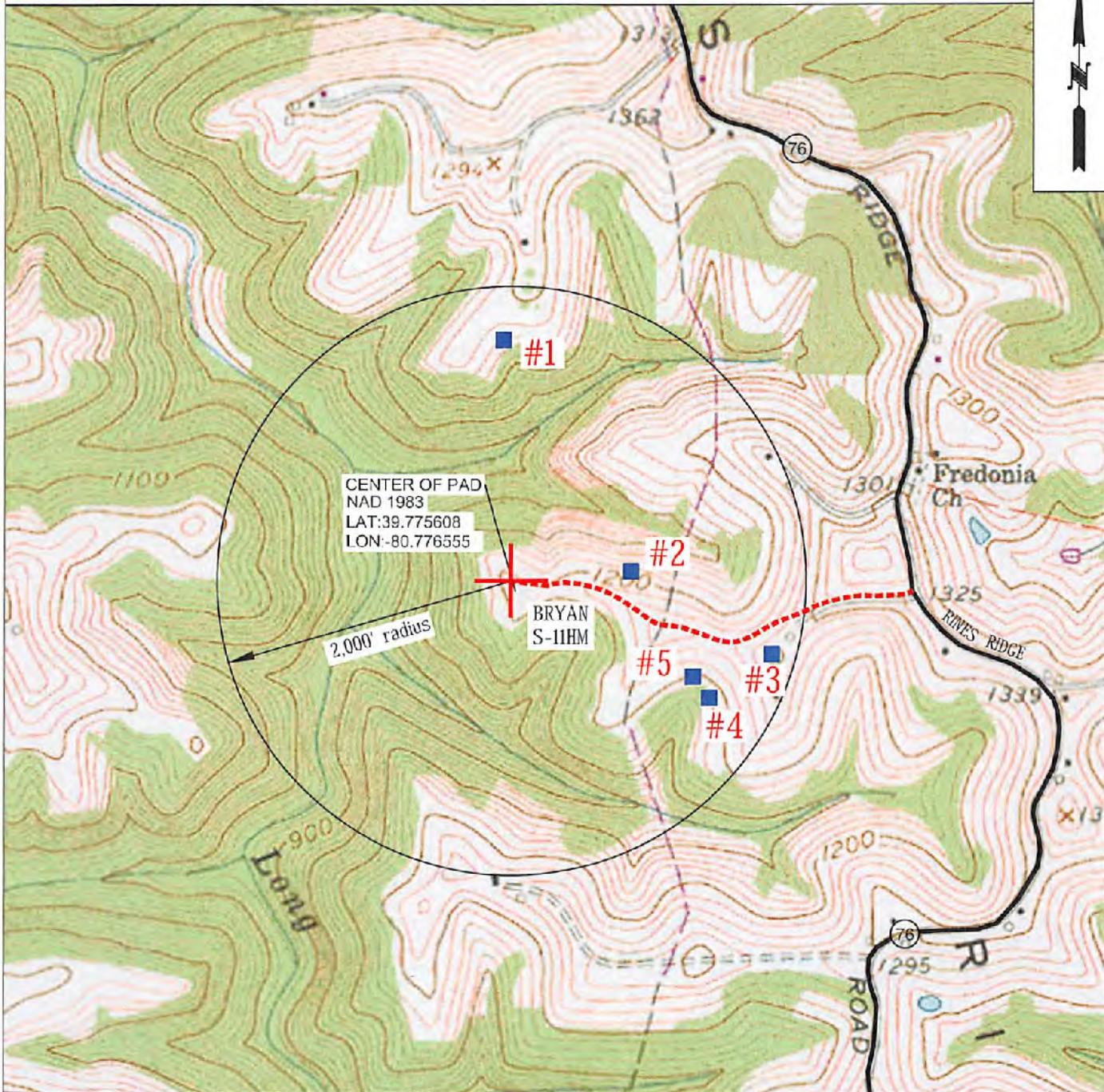
MAR 14 2018

WV Department of  
Environmental Protection

06/08/2018

# PROPOSED BRYAN S-11HM

There appears to be Five ( 5 ) possible water sources within 2,000'.



CENTER OF PAD  
NAD 1983  
LAT:39.775608  
LON:-80.776555

BRYAN  
S-11HM

2,000' radius

#1

#2

#5

#3

#4



**TUG HILL**  
OPERATING

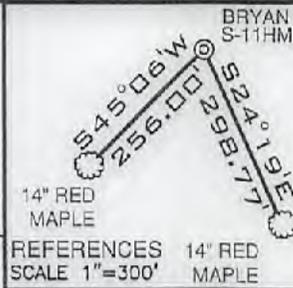
OPERATOR 494510851  
TUG HILL OPERATING, LLC  
380 SOUTHPOINTE BLVD  
SUITE 200  
CANONSBURG, PA 15317

TOPO SECTION POWHATAN POINT 7.5'  
SCALE: 1" = 1000'

LEASE NAME BRYAN  
DATE: 1/05/18  
DATE: MAR 14 2018

RECEIVED  
Office of Oil and Gas  
WV Department of Environmental Protection  
06/08/2018

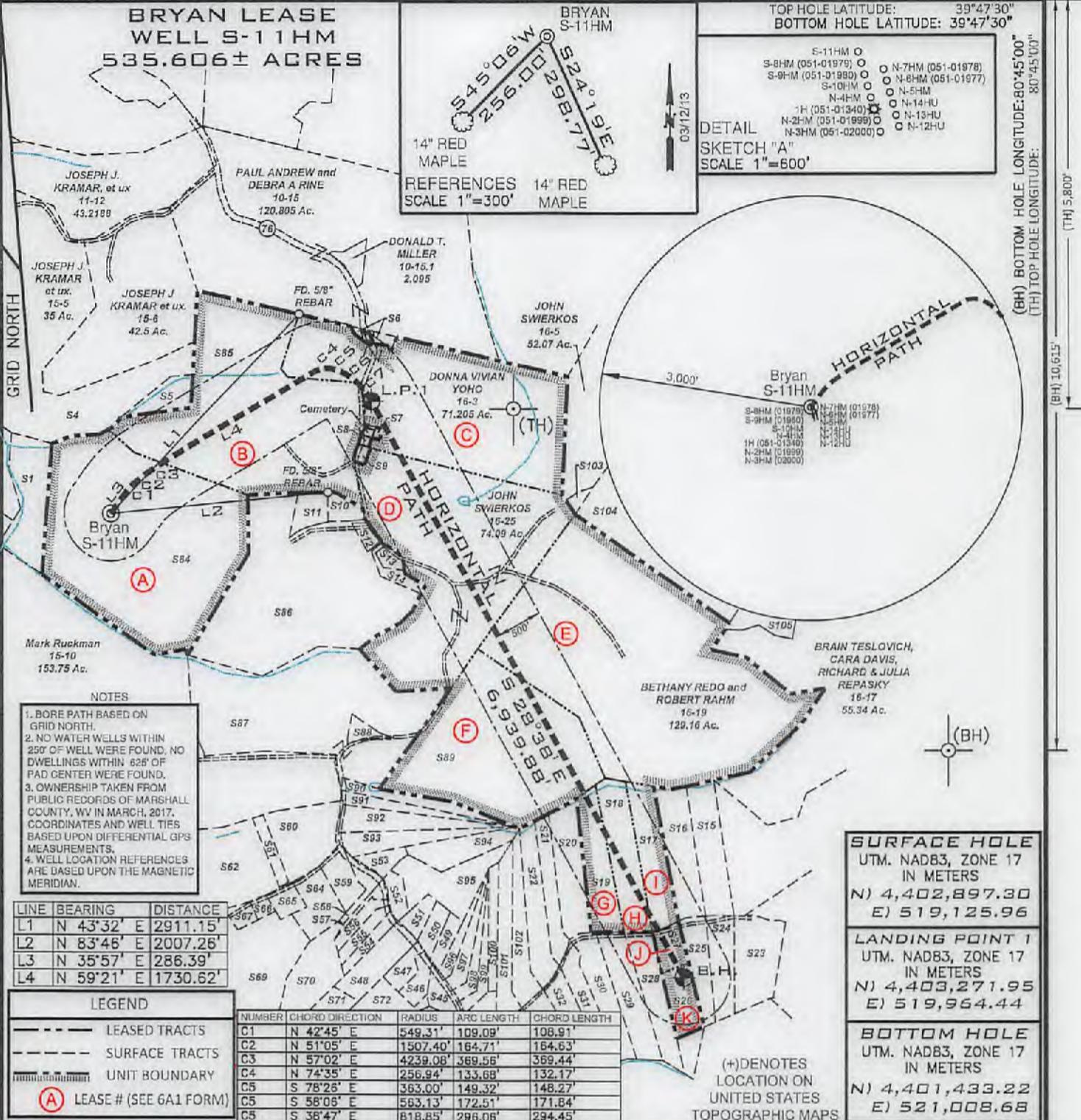
**BRYAN LEASE  
WELL S-11HM  
535.606± ACRES**



TOP HOLE LATITUDE: 39°47'30"  
BOTTOM HOLE LATITUDE: 39°47'30"

S-11HM ○  
S-8HM (051-01979) ○  
S-9HM (051-01980) ○  
S-10HM (051-01977) ○  
N-7HM (051-01978) ○  
N-8HM (051-01977) ○  
N-4HM ○  
N-5HM ○  
N-14HU ○  
N-13HU ○  
N-12HU ○  
1H (051-01340) ○  
N-2HM (051-01998) ○  
N-3HM (051-02000) ○

DETAIL SKETCH "A"  
SCALE 1"=600'



**NOTES**

- BORE PATH BASED ON GRID NORTH.
- NO WATER WELLS WITHIN 250' OF WELL WERE FOUND. NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.
- OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN MARCH, 2017. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
- WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

LINE	BEARING	DISTANCE
L1	N 43°32' E	2911.15'
L2	N 83°46' E	2007.26'
L3	N 35°57' E	286.39'
L4	N 59°21' E	1730.62'

**LEGEND**

- LEASED TRACTS
- SURFACE TRACTS
- UNIT BOUNDARY
- (A) LEASE # (SEE 6A1 FORM)

NUMBER	CHORD DIRECTION	RADIUS	ARC LENGTH	CHORD LENGTH
C1	N 42°45' E	549.31'	109.09'	108.91'
C2	N 51°05' E	1507.40'	164.71'	164.63'
C3	N 57°02' E	4239.08'	369.56'	369.44'
C4	N 74°35' E	256.94'	133.68'	132.17'
C5	S 78°26' E	363.00'	149.32'	148.27'
C6	S 58°08' E	563.13'	172.51'	171.84'
C7	S 36°47' E	618.85'	296.06'	294.45'

**SURFACE HOLE**  
UTM. NAD83, ZONE 17  
IN METERS  
N) 4,402,897.30  
E) 519,125.96

**LANDING POINT 1**  
UTM. NAD83, ZONE 17  
IN METERS  
N) 4,403,271.95  
E) 519,964.44

**BOTTOM HOLE**  
UTM. NAD83, ZONE 17  
IN METERS  
N) 4,401,433.22  
E) 521,008.68

FILE NUMBER \_\_\_\_\_

DRAWING NUMBER BRYAN\_WP\_S-11HM

SCALE 1" = 1500'

MINIMUM DEGREE OF ACCURACY 1/200

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING  
GRADE GPS

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 RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

*David L Jackson*



JACKSON SURVEYING INC.  
P.O. Box 1460  
Clarksburg, WV 26302  
304-623-5851

DATE: FEBRUARY 05, 2018

OPERATORS WELL NO. BRYAN S-11HM

API WELL NO. 47-051-02022 H6A

STATE WV COUNTY Marshall PERMIT \_\_\_\_\_

LOCATION ELEVATION 1191.0' WATERSHED (HUC 10) Fish Creek

DISTRICT Franklin COUNTY Marshall

QUADRANGLE Powhatan Point 7.5' LEASE NUMBER SEE WW-6A1 Form

SURFACE OWNER CNX LAND RESOURCES, INC. ACREAGE 81.98 06/08/2018

OIL & GAS ROYALTY OWNER MICHAEL R. BRYAN - SEE WW 6A1 LEASE ACREAGE 81.98

PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION

PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE (SPECIFY) \_\_\_\_\_

PLUG & ABANDON  CLEAN OUT & REPLUG

TARGET FORMATION Marcellus ESTIMATED DEPTH TVD: 6,616' TMD: 14,744'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER  
CT CORPORATION SYSTEM

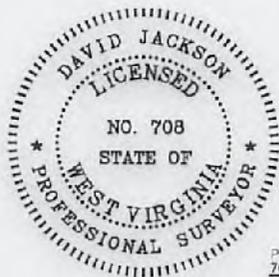
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD  
FORT WORTH, TX 76107 CHARLESTON, WV 25313

form wv6

**BRYAN LEASE  
WELL S-11HM  
535.606± ACRES**

GRID NORTH

Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES
S1	15-13	CNX Land Resources Inc.	11.0
S4	15-6.1	Joseph J. Kramer Et Ux	39.40
S5	15-7	Terry D. Rose Et Ux	4.5
S6	16-3.2	Jimmy Ostrander Sr. Et Ux	1.435
S7	16-3.1	Dennis Jackson Et Ux	0.27
S8	16-2	Fredonia Christian Church	0.19
S9	16-1	Fredonia Christian Church	0.50
S10	16-23.1	Ray E. Minor Et Ux	2.0
S11	16-23.4	Michael R. & Brenda K. Bryan	3.0
S12	16-23.3	Greg & Christina Riddle	1.0
S13	16-24	Alan M. Beyser Et Ux	1.083
S14	16-23.2	Alan M. Beyser Et Ux	1.726
S15	17-16	Glen A. Gunto	9.702
S16	16-15.1	Glen A. Gunto	10.17
S17	17-15	Glen A. Gunto	10.22
S18	18-13	Southern Country Farms Inc.	11.415
S19	18-13.9	Roy & Renee Butler	9.603
S20	18-13.4	Renee D. Straight	9.938
S21	18-13.12	Charles A. & Mary Nice	5.969
S22	18-13	Southern Country Farms Inc.	8.037
S23	17-3.1	Wilbur L. Riddle Et Ux	10.148
S24	17-1.6	Lola M. Slaughter	6.347
S25	17-1.5	Donnie R. & Lola M. Slaughter	5.607
S26	17-1.3	Jody & Michelle Anderson	5.0
S27	17-1.2	Donnie R. & Lola M. Slaughter	5.073
S28	17-1.1	Donnie R. & Lola M. Slaughter	8.078
S29	17-1.4	Donnie R. & Lola M. Slaughter	8.844
S30	17-14	Southern Country Farms Inc.	7.314
S31	17-13	Roy E. & Renee Butler	5.433
S32	17-1.7	Roy E. & Renee Butler	5.22
S45	18-25	Charles & Marie Rayl	2.133
S46	18-41	Cory A. Holt	2.308
S47	18-40	Cory A. Holt	2.237
S48	18-14	Michael Fincham & Kezia Winters	6.386
S49	18-39	Marion R. Conner	2.001
S50	18-38	Marion R. Conner	2.231
S51	18-37	John W. Wetzel	2.064
S52	18-49	Tanner Butler	2.023
S53	18-50	Steven Berisford	2.170
S54	18-45	Michael Fincham & Kezia Winters	2.07
S55	18-46	Dale W. & Patricia Gardner	2.030
S56	18-47	Robert Pellay II & Susan Briggs	2.010
S57	18-13.5	Wesley Bryan	1.023
S58	18-36	Ruth Mulligan Est.	2.030
S59	18-15.2	Edward Burge	4.171
S60	18-11	Benjamin Robinson	12.883
S61	18-11.2	Edward Lee Burge Jr.	2.0
S62	18-11.1	Edward Lee Burge Jr.	18.0
S64	18-15.1	Jason Blair	5.948
S65	18-12	William Wayne Et Ux	2.27
S66	18-10	David & Nancy Anderson	0.907
S67	18-10.2	David Anderson Et Ux	1.377
S69	18-15.5	Darrell & Teresa Boley	23.547
S70	18-13.3	Robert Closterman	9.813
S71	18-17	Michael S. Fincham & Kezia M. Winters	6.555
S72	18-13.1	Betty Tagg Est.	9.248
S84	15-09	CNX Land Resources Inc.	81.98
S85	15-08	Terry D. Rose et ux	77.11
S86	16-23	CNX Land Resources Inc.	60.138
S87	16-22	James M. Ruckman et ux	54.605
S88	16-22.1	Heather A. Burgy	1.465
S89	16-21	James M. Ruckman et ux	60.75
S90	18-56	William O'Hara	3.965
S91	18-55	William O'Hara	3.202
S92	18-28	Dotson Harrison	6.36
S93	18-28.1	Carol Helmick	5.696
S94	18-13.2	Steven Berisford	6.023
S95	18-13	Southern Country Farms, Inc.	11.054
S96	18-27.1	Marion R. Conner	2.003
S97	18-27.2	Linda L. Moore	3.009
S98	18-27	Linda L. Moore	2.447
S99	18-26	Linda L. Moore	2.624
S100	18-13.11	Linda L. Moore	3.156
S101	18-53.1	Christopher M. Previtera	6.283
S102	18-60	Christopher M. Previtera	6.297
S103	16-4	John Swierkos	0.96
S104	16-6	John Swierkos	134.05
S105	16-18	John Swierkos	10.0



P.S. 708

*David L Jackson*

06/08/2018



**TUG HILL  
OPERATING**

OPERATOR'S  
WELL #: Bryan S-11HM  
DISTRICT: \_\_\_\_\_  
COUNTY: Franklin  
STATE: Marshall  
STATE: WV

WELL PLAT  
PAGE 2 OF 2  
DATE: 02/05/2018

Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*19294	A	5-15-9	BRENDA K BRYAN	TRIENERGY INC	1/8+	741	78	N/A	20/348 TriEnergy Inc to AB Resources LLC	21/491 AB Resources LLC to Chief Exploration & Development LLC and Radler 2000 Limited Partnership	685/643 Chief Exploration & Development LLC and Radler 2000 Limited Partnership to Enerplus Resources (USA) Corporation	25/1 Chief Exploration & Development, LLC, Chief Oil and Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources to Chevron USA Inc	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19340	B	5-15-8	DONNA V YOHO	GASTAR EXPLORATION USA INC	1/8+	665	407	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	23/617 Gastar Exploration USA Inc and Atinum Marcellus I LLC to AB Resources LLC	24/319 AB Resources LLC to Chief Exploration & Development LLC and Radler 2000 Limited Partnership	25/1 Chief Exploration & Development, LLC, Chief Oil and Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	40/57 Chevron USA Inc. to TH Exploration LLC
10*19340	C	5-16-3	DONNA VIVIAN YOHO	GASTAR EXPLORATION USA INC	1/8+	665	407	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	23/617 Gastar Exploration USA Inc and Atinum Marcellus I LLC to AB Resources LLC	24/319 AB Resources LLC to Chief Exploration & Development LLC and Radler 2000 Limited Partnership	25/1 Chief Exploration & Development, LLC, Chief Oil and Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	40/57 Chevron USA Inc. to TH Exploration LLC
10*21468	D	5-16-25	JOHN A SWIERKOS	TH EXPLORATION LLC	1/8+	953	317	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18280	E	5-16-19	DEBRA L RICHEY AND JAMES F RICHEY SR	TH EXPLORATION LLC	1/8+	929	108	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19130	E	5-16-19	FRANCES O HALL	CHEVRON USA INC	1/8+	763	641	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc to TH Exploration LLC
10*19152	E	5-16-19	BETTY J PARRIOTT	CHEVRON USA INC	1/8+	772	192	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc to TH Exploration LLC
10*19211	E	5-16-19	PATRICIA F PARRIOTT	CHEVRON USA INC	1/8+	784	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc to TH Exploration LLC
10*19213	E	5-16-19	KIMBERLY LAKE	CHEVRON USA INC	1/8+	784	280	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc to TH Exploration LLC

Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment						
10*21017	E	5-16-19	CATHERINE R KLUG PAUL FOX - POWER OF ATTORNEY	TH EXPLORATION LLC	1/8+	938	299	N/A	N/A						
10*19129	E	5-16-19	VERLA FLORENCE SHUTLER	CHEVRON USA INC	1/8+	761	366	N/A	40/127 Chevron USA Inc to TH Exploration LLC						
	E	5-16-19	TRUDY B AND DANNY SAMPSON	NOBLE ENERGY, INC	1/8+	828	637	N/A	N/A	N/A	N/A	N/A	N/A	38/297 Noble Energy, Inc. to HG Energy II Appalachia, LLC	962/488 HG Energy II Appalachia, LLC to TH Exploration, LLC
	E	5-16-19	TIMOTHY SCOTT AND AMY C LEMASTERS	NOBLE ENERGY, INC	1/8+	829	630	N/A	N/A	N/A	N/A	N/A	N/A	38/297 Noble Energy, Inc. to HG Energy II Appalachia, LLC	962/488 HG Energy II Appalachia, LLC to TH Exploration, LLC
	E	5-16-19	MARY L PARRIOTT	NOBLE ENERGY, INC	1/8+	836	455	N/A	N/A	N/A	N/A	N/A	N/A	38/297 Noble Energy, Inc. to HG Energy II Appalachia, LLC	962/488 HG Energy II Appalachia, LLC to TH Exploration, LLC
	E	5-16-19	HARRY LEROY AND NANCY S PARRIOTT	NOBLE ENERGY, INC	1/8+	829	153	N/A	N/A	N/A	N/A	N/A	N/A	38/297 Noble Energy, Inc. to HG Energy II Appalachia, LLC	962/488 HG Energy II Appalachia, LLC to TH Exploration, LLC
	E	5-16-19	DEBORAH D AND CALVIN P MERCER	NOBLE ENERGY, INC	1/8+	828	639	N/A	N/A	N/A	N/A	N/A	N/A	38/297 Noble Energy, Inc. to HG Energy II Appalachia, LLC	962/488 HG Energy II Appalachia, LLC to TH Exploration, LLC

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Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
	E	5-16-19	BRIAN EDWIN AND BEVERLY J LEMASTERS	NOBLE ENERGY, INC	1/8+	831	44	N/A	N/A	N/A	N/A	N/A	N/A	N/A	38/297 Noble Energy, Inc. to HG Energy II Appalachia, LLC	962/488 HG Energy II Appalachia, LLC to TH Exploration, LLC
10*21917	E	5-16-19	BETHANY A AND ROBERT W RAHM	FOSSIL CREEK OHIO, LLC	1/8+	827	142	N/A	N/A	N/A	N/A	N/A	N/A	34/398 Fossil Creek to Gulfport	36/588 Gulfport to APP	41/224 APP to TH Exploration, LLC
10*19338	F	5-16-21	JAMES M AND KIMBERLY L RUCKMAN	TRIENERGY INC	1/8+	741	72	20/348 TriEnergy Inc to AB Resources LLC	21/491 AB Resources LLC to Chief Exploration & Development LLC and Radler 2000 Limited Partnership	685/643 Chief Exploration & Development LLC and Radler 2000 Limited Partnership to Enerplus Resources (USA) Corporation	25/1 Chief Exploration & Development, LLC, Chief Oil and Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc. to TH Exploration LLC	
10*14915	G	5-18-13.9	CHESTNUT HOLDINGS, INC.	GASTAR EXPLORATION INC	1/8+	827	552	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC
10*21465	G	5-18-13.9	MOLLY D ASTON & HOWARD PRIOR ASTON	TH EXPLORATION LLC	1/8+	954	134	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17812	G	5-18-13.9	POTOMAC MINERAL GROUP LLC	TH EXPLORATION LLC	1/8+	940	437	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17826	G	5-18-13.9	ALLDALE MINERALS II LP	TH EXPLORATION LLC	1/8+	940	439	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21462	G	5-18-13.9	MAGGY D. ASTON, ET VIR	TH EXPLORATION, LLC	1/8+	954	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*14099	G	5-18-13.9	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*17826	H	5-18-13	ALLDALE MINERALS II, LP	TH EXPLORATION, LLC	1/8+	940	439	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17812	H	5-18-13	POTOMAC MINERAL GROUP, LLC	TH EXPLORATION, LLC	1/8+	940	437	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21465	H	5-18-13	MOLLY D. ASTON, ET VIR	TH EXPLORATION, LLC	1/8+	954	134	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21462	H	5-18-13	MAGGY D. ASTON, ET VIR	TH EXPLORATION, LLC	1/8+	954	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*14915	H	5-18-13	CHESTNUT HOLDINGS, INC.	GASTAR EXPLORATION INC	1/8+	827	552	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC
10*14099	I	5-17-15	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
10*14915	I	5-17-15	CHESTNUT HOLDINGS, INC.	GASTAR EXPLORATION INC	1/8+	827	552	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC
10*21465	I	5-17-15	MOLLY D ASTON & HOWARD PRIOR ASTON	TH EXPLORATION LLC	1/8+	954	134	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17812	I	5-17-15	POTOMAC MINERAL GROUP LLC	TH EXPLORATION LLC	1/8+	940	437	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17826	I	5-17-15	ALLDALE MINERALS II LP	TH EXPLORATION LLC	1/8+	940	439	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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| Lease No. | Tags | Parcel   | Lessor  | Lessee              | Royalty | Book | Pg  | Assignment |
|-----------|------|----------|---|---------------------|---------|------|-----|------------|------------|------------|------------|------------|------------|------------|------------|
| 10*21462  | I    | 5-17-15  | MOLLY D. ASTON, ET VIR                        | TH EXPLORATION, LLC | 1/8+    | 954  | 128 | N/A        |
| 10*17643  | J    | 5-17-1.2 | DONALD R SLAUGHTER AND LOLA SLAUGHTER         | TH EXPLORATION LLC  | 1/8+    | 940  | 445 | N/A        |
| 10*18217  | K    | 5-17-1.3 | JODY LANE ANDERSON AND MICHELE MARIE ANDERSON | TH EXPLORATION LLC  | 1/8+    | 929  | 101 | N/A        |

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**ASSIGNMENT OF OIL AND GAS LEASES**

This ASSIGNMENT OF OIL AND GAS LEASES (the "Assignment") is made and entered into this 29th day of November, 2017 (the "Effective Date"), from TH Exploration II, LLC, a Texas limited liability company, having an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "Assignor"), and TH Exploration, LLC, a Texas limited liability company, having an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "Assignee").

**WITNESSETH:**

WHEREAS, Assignor is the owner of the right, title, and interest in those certain Oil and Gas Leases situated in Marshall County, West Virginia, which are described in Exhibit "A" and Exhibit "A-1" attached hereto and made a part hereof (hereinafter the "Leases"); and

WHEREAS, subject to the exceptions and reservations herein contained, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to the Leases.

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

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, subject to the terms, reservations, waivers and provisions as hereinafter set forth, an undivided interest of all of Assignor's right, title and interest in and to the Leases and all oil, natural gas, natural gas liquids, condensate, casinghead gas and other liquefied or gaseous hydrocarbons or products ("Hydrocarbons") thereby held, in any and all depths and formations ("Assigned Formations"), together with any and all other rights that are reasonably necessary or convenient to explore for and produce Hydrocarbons from the Assigned Formations, including, but not limited to, the right of surface access, use and occupancy, the right of ingress and egress, the right to conduct geophysical and other exploratory activities, the right to lay pipeline, the right to drill through, but not perforate or stimulate, all other depths and formations necessary for the purpose of reaching the Assigned Formations and to conduct operations therein.

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

2. Representations and Warranties. Assignor represents and warrants that such Assignor has not conveyed or otherwise encumbered its interest in the Leases since the time that Assignor obtained its interests in the Leases.

Assignor represents and warrants that, as to its interests in the Leases, Assignor has paid all royalties, overriding royalties, and other payments required by the Leases which were due for the period in which Assignor held its interests in the Leases, including, but not limited to, the interests assigned hereunder, and that Assignor has fully performed all conditions necessary to maintain the Leases in full force and effect during such period.

Assignor represents and warrants that, as to its interests in the Leases, Assignor shall not, by virtue of this Assignment or otherwise, retain any interest in the Assigned Formations, including, without limitation, any overriding royalty interest or working interest therein or with respect thereto.

3. Successors and Assigns. The terms of this Assignment shall be binding upon and inure to the benefit of the parties hereto and each of their respective successors

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MICHAEL MORAN  
BRIGHTON RESOURCES  
2821 ELLSWORTH AVENUE, #1  
PITTSBURGH PA 15232-1707

BOOK 040 PAGE 0127

STATE OF WEST VIRGINIA §  
§  
COUNTY OF MARSHALL §

Marshall County  
Jan Pest, Clerk  
Instrument 1628366  
08/16/2017 @ 12:08:49 PM  
ASSIGNMENTS  
Book 40 § Page 127  
Pages Recorded 25  
Recording Cost \$ 33.00

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this day of AUGUST, 2017 (the "Effective Date"), by and between CHEVRON U.S.A. INC. (hereinafter "Assignor") and TH EXPLORATION, LLC (hereinafter "Assignee") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated the 1st day of August, 2017 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

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

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to the Leases as described below, subject to certain overriding royalty interests and less and except certain exclusions.

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

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

A. The Chevron ORRI previously conveyed to Assignor and as described in that certain Memorandum of Assignment of Oil and Gas Lease Interests dated November 6, 2012 by and between Cornell Holdings Incorporated and Chevron U.S.A. Inc., which is recorded at Book 0028, Page 0239 in the Office of the County Clerk of Marshall County, West Virginia, and

B. As to each of the Leases and all oil, gas, and associated hydrocarbons produced, saved and sold thereunder, an overriding royalty interest equal to the difference between 82% and the

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**COPY**

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement is entered into this 26<sup>th</sup> day of February, 2018, between TUG HILL OPERATING, LLC ("THQ"), a Texas limited liability company, whose address is 1320 S. University Blvd., Suite 500, Fort Worth, TX 76107 and HG Energy II APPALACHIA, LLC ("HG"), a Delaware limited liability company, whose address is 5260 Dupont Road, Parkersburg, WV 26101.

PARTIES AND AGREEMENT REFERENCE: THQ and HG entered into a letter agreement ("Letter Agreement") dated February 26, 2018 (the "Commencement Date") outlining pursuit of definitive agreements to allow THQ the right to permit, drill, extract, produce and market oil and gas from those certain oil and gas interests controlled by HG in Franklin District of Marshall County, West Virginia, as more fully described in Exhibit A attached hereto, made a part hereof, and incorporated herein by reference.

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

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

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

Tug Hill Operating, LLC

HG Energy II Appalachia, LLC

By:   
Name: Douglas L. DeMartino  
Title: Attorney-in-Fact

  
By: Ed Haas  
Its: U.P. of Land + Attorney in - Fact

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

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Marshall County  
Jan Pest, Clerk  
Instrument 1437593  
03/12/2018 @ 03:12:57 PM  
Department of Environmental Protection  
AGREEMENT  
Book 962 @ Page 488  
Pages Recorded 3  
Recording Cost \$ 11.00  
06/08/2018



March 13, 2018

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

RE: Bryan S-11HM

Subject: Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Bryan S-11HM well plat.

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

Sincerely,

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

Amy L. Miller  
Permitting Specialist – Appalachia Region

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

Date of Notice Certification: 03/13/2018

API No. 47- 051 - \_\_\_\_\_  
Operator's Well No. Bryan S-11HM  
Well Pad Name: Bryan

**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>519,125.96</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,897.30</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Rines Ridge Road</u>	
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>CNX Land Resources, Inc.</u>	
Watershed:	<u>Fish Creek (HUC-10)</u>			

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

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 100px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p><b>OOG OFFICE USE ONLY</b></p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED</p>
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**Required Attachments:**

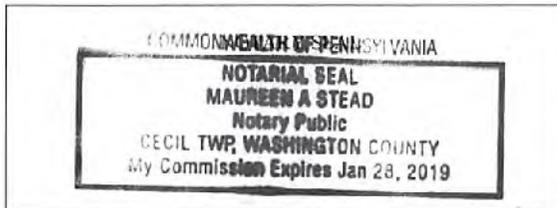
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

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**Certification of Notice is hereby given:**

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

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



Subscribed and sworn before me this 13 day of MARCH.

*Maureen A Stead* Notary Public

My Commission Expires 1/28/19

**Oil and Gas Privacy Notice:**

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



**Notice is hereby given:**

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

**This Notice Shall Include:**

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

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

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

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

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

**Well Location Restrictions**

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

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API NO. 47- \_\_\_\_\_ - \_\_\_\_\_  
OPERATOR WELL NO. Bryan S-111HM  
Well Pad Name: Bryan

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

**Water Well Testing:**

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

**Water Testing Laboratories:**

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

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

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

**Written Comment:**

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

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

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

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**Time Limits and Methods for Filing Comments.**

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

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

**Comment Requirements**

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

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

**Permit Denial or Condition**

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

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

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

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

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API NO. 47- \_\_\_\_\_ -  
OPERATOR WELL NO. Bryan S-111HM  
Well Pad Name: Bryan

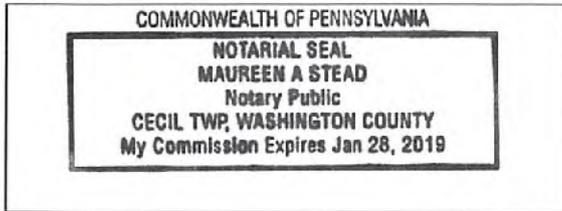
**Notice is hereby given by:**

Well Operator: Tug Hill Operating, LLC  
Telephone: 724-749-8368  
Email: amiller@tug-hill-op.com *amy miller*

Address: 360 Southpointe Boulevard, Plaza II, Suite 200  
Canonsburg, PA 15317  
Facsimile: 724-338-2030

**Oil and Gas Privacy Notice:**

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



Subscribed and sworn before me this 12 day of 2018, MARCH.  
Maureen A Stead Notary Public  
My Commission Expires 1/28/19

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Tug Hill Operating, LLC  
 380 Southpointe BLVD, Suite 200  
 Canonsburg, PA 15317

**WATER WELL REPORT**

Well: BRYAN No. S-11HM  
 District: Franklin  
 County: Marshall  
 State: WV

There appears to be Five ( 5 ) possible water sources within 2,000 feet of the above referenced well location.

Topo spot #1 (Possible Spring) TM 15 Par.6 Joseph & Joann Kramer 304-845-0896 3303 Rines Ridge Rd. Proctor, WV 26055	Topo Spot # 2 (Spring) TM 15 Par. 9 CNX Land Resources, LLC 724-485-4000, 713-893-4476 1000 Consol Energy Dr. Canonsburg, PA 15317	Topo Spot # 3 (Water Well) TM 16 Par. 23 CNX Land Resources, LLC 724-485-4000, 713-893-4476 1000 Consol Energy Dr. Canonsburg, PA 15317
Topo Spot # 4 (Water Trough) TM 16 Par. 23 CNX Land Resources, LLC 724-485-4000, 713-893-4476 1000 Consol Energy Dr. Canonsburg, PA 15317	Topo Spot # 5 (Water Trough) TM 15 Par. 9 CNX Land Resources, LLC 724-485-4000, 713-893-4476 1000 Consol Energy Dr. Canonsburg, PA 15317	

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

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

**Date of Notice:** 8/10/2017      **Date of Planned Entry:** 8/17/2017

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

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

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

**Notice is hereby provided to:**

SURFACE OWNER(s)

Name: CNX Land Resources, Inc.  
Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317

Name: Ray E. and Katherine L. Minor  
Address: 4193 Rines Ridge Road  
Proctor, WV 26055

Name: Michael R. and Brenda K. Bryan  
Address: 195 Isaiah Drive  
Proctor, WV 26055 \*See Attachment

COAL OWNER OR LESSEE

Name: Leatherwood, Inc.  
Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317-6506

MINERAL OWNER(s)

Name: Greg and Christina Riddle  
Address: 4205 Rines Ridge Road  
Proctor, WV 26055

\*please attach additional forms if necessary

**Notice is hereby given:**

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

State:	<u>West Virginia</u>	Approx. Latitude & Longitude:	<u>39.7756312; -80.7766011</u>
County:	<u>Marshall</u>	Public Road Access:	<u>Rines Ridge Road (County Route 78)</u>
District:	<u>Franklin</u>	Watershed:	<u>(HUC-10) Fish Creek</u>
Quadrangle:	<u>Powhatan Point</u>	Generally used farm name:	<u>Michael and Brenda Bryan</u>

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

**Notice is hereby given by:**

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

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

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**Oil and Gas Privacy Notice:**

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

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**WW-6A3 Notice of Entry for Plat Survey**

**Attachment 1 of 1**

**Surface Owner(s):**

**Name:** Greg and Christina Riddle  
**Address:** 4205 Rines Ridge Road ✓  
Proctor, WV 26055

**Mineral Owner(s):**

**Name:** Ray E. and Katherine L. Minor  
**Address:** 4193 Rines Ridge Road ✓  
Proctor, WV 26055

**Name:** Michael R. Bryan ✓  
**Address:** 195 Isaiah Drive ✓  
Proctor, WV 26055

**Name:** Brenda K. Bryan ✓  
**Address:** 1971 Rines Ridge Road ✓  
Proctor, WV 26055

**Name:** Wesley Russell Bryan II ✓  
**Address:** P.O. Box 1107 ✓  
Sunbury, OH 43074

**Name:** Appalachian Energy Holdings I, LP  
**Address:** 14 Dunmoyle Place ✓  
Pittsburgh, PA 15217

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Operator Well No. Bryan S-11HM

**WW-6A5 NOTICE OF PLANNED OPERATION**

**ATTACHMENT 1 OF 1**

**Surface Owner(s):**

Greg and Christina Riddle ✓  
4205 Rines Ridge Road  
Proctor, WV 26055

Michael R. Bryan ✓  
195 Isaiah Drive  
Proctor, WV 26055

Brenda K. Bryan ✓  
1971 Rines Ridge Road  
Proctor, WV 26055

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
**Division of Highways**

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

Jim Justice  
Governor

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

September 7, 2017

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

Subject: DOH Permit for the Bryan Pad, Marshall County  
Bryan S-11HM Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2017-0528 which has been issued to Tug Hill Operating, LLC for access to the State Road for a well site located off of Marshall County Route 76 SLS.

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

Very Truly Yours,

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

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

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**PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION**

Well No. Bryan S-11HM

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

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724.698.2650





# WVDEP 00G ACCEPTED AS-BUILT

10/31/2017



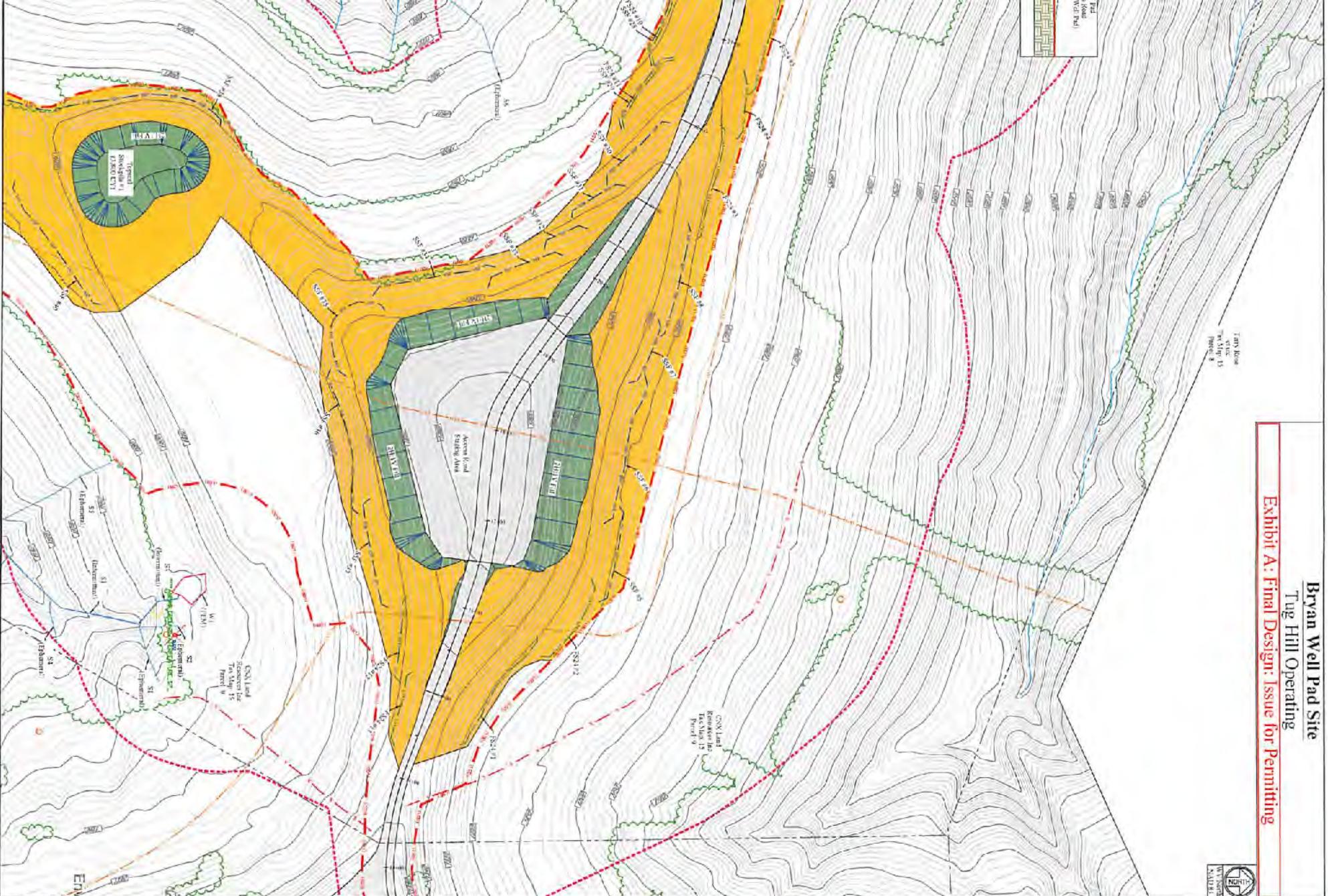
Location of Well Pad

NAD 83	EAT 317968172
UTM	18Q UTM 11U 807
UTM	18Q UTM 11U 807

- 12" x 12" x 12" concrete
- 6" x 6" x 6" concrete
- 4" x 4" x 4" concrete
- 2" x 2" x 2" concrete
- 1" x 1" x 1" concrete
- 1/2" x 1/2" x 1/2" concrete
- 1/4" x 1/4" x 1/4" concrete
- 1/8" x 1/8" x 1/8" concrete
- 1/16" x 1/16" x 1/16" concrete
- 1/32" x 1/32" x 1/32" concrete
- 1/64" x 1/64" x 1/64" concrete
- 1/128" x 1/128" x 1/128" concrete
- 1/256" x 1/256" x 1/256" concrete
- 1/512" x 1/512" x 1/512" concrete
- 1/1024" x 1/1024" x 1/1024" concrete
- 1/2048" x 1/2048" x 1/2048" concrete
- 1/4096" x 1/4096" x 1/4096" concrete
- 1/8192" x 1/8192" x 1/8192" concrete
- 1/16384" x 1/16384" x 1/16384" concrete
- 1/32768" x 1/32768" x 1/32768" concrete
- 1/65536" x 1/65536" x 1/65536" concrete
- 1/131072" x 1/131072" x 1/131072" concrete
- 1/262144" x 1/262144" x 1/262144" concrete
- 1/524288" x 1/524288" x 1/524288" concrete
- 1/1048576" x 1/1048576" x 1/1048576" concrete
- 1/2097152" x 1/2097152" x 1/2097152" concrete
- 1/4194304" x 1/4194304" x 1/4194304" concrete
- 1/8388608" x 1/8388608" x 1/8388608" concrete
- 1/16777216" x 1/16777216" x 1/16777216" concrete
- 1/33554432" x 1/33554432" x 1/33554432" concrete
- 1/67108864" x 1/67108864" x 1/67108864" concrete
- 1/134217728" x 1/134217728" x 1/134217728" concrete
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- 1/1073741824" x 1/1073741824" x 1/1073741824" concrete
- 1/2147483648" x 1/2147483648" x 1/2147483648" concrete
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- 1/2199023260672" x 1/2199023260672" x 1/2199023260672" concrete
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**Bryan Well Pad Site**  
Tug Hill Operating

**Exhibit A: Final Design: Issue for Permitting**



Revision  
Design  
Design: WVD/E/Comm

Date  
08-29-2017  
10-30-2017

**TUG HILL**  
OPERATING



THIS DOCUMENT  
PREPARED FOR  
TUG HILL  
OPERATING

**Kyle Spinning**  
PROJECT MANAGER

**Erosion and Sediment Control Plan**  
**Bryan Well Pad Site**  
Franklin District  
Marshall County, WV

**MAR 14 2018**

WV Department of  
Environmental Protection

Date: 08/29/2017  
Scale: As Shown  
Designed By: ZS  
File No.  
Sheet 9 of 17