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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)

Wednesday, February 07, 2018  
WELL WORK PERMIT  
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC  
1320 SOUTH UNIVERSITY DRIVE, SUITE 500

FORT WORTH , TX 76107

Re: Permit approval for BRYAN N-6HM  
47-051-01977-00-00

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 N-6HM  
Farm Name: CNX LAND REOURCES, INC.  
U.S. WELL NUMBER: 47-051-01977-00-00  
Horizontal 6A / New Drill  
Date Issued: 2/7/2018

Promoting a healthy environment.

02/09/2018

**PERMIT CONDITIONS 4705101977**

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

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**CONDITIONS**

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

**PERMIT CONDITIONS 4705101977**

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

WW-6B  
(04/15)

4705101977  
API NO. 47-051 -  
OPERATOR WELL NO. Bryan N-6HM  
Well Pad Name: Bryan

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 N-6HM      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' - 6497', thickness of 54' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,596'

9) Formation at Total Vertical Depth: Onondoga

10) Proposed Total Measured Depth: 14,600'

11) Proposed Horizontal Leg Length: 7,100'

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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**Office of Oil and Gas**

OCT 11 2017

WW-6B  
(04/15)

API NO. 47- <sup>051</sup> -  
OPERATOR WELL NO. Bryan N-8HM  
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	125'	120'	259FT^3(CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	963'	953'	1012ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	963'	953'	1012ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,613'	2,603'	862ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	14,610'	14,600'	3737ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		7,322'	
Liners	N/A						

*Ju*  
10/5/17

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 N-6HM

Well Pad Name: Bryan

*ju*  
*10/5/17*

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 17,750,000 lb proppant and 274,428 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.

**Conductor, Coal and Fresh Water Casing Cement:**

*Premium NE-1 + 2% CaCl*

- Premium NE-1 – Class A Portland API Spec
- CaCl – Calcium Chloride

**Intermediate Casing:**

*Premium NE-1 + 2% bwoc CaCl<sub>2</sub> + 46.5% Fresh Water*

- Premium NE-1 – Class A Portland API spec
- CaCl<sub>2</sub> – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

**Kick Off Plug:**

*Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L + 38% Fresh Water*

- Class H – Increased Compressive Strength Cement
- Sodium Metasilicate – Free Water Control; Early Strength Additive
- R-3 – Cement Retarder
- FP-13L – Anti-Foaming Agent
- CaCl<sub>2</sub> – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

**Production Casing Cement:**

Lead: *50:50 (Poz:Premium NE-1) + .2% R-3 + .2% MPA-170 + .75 gal/100sk FP-13L*

Tail: *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*

- Poz – Fly Ash
- Premium NE-1 – Class A Portland API spec
- R-3 – Cement Retarder
- MPA-170 – Gelling Agent
- FP-13L – Anti-Foaming Agent
- ASA-301 – Free Water Control Agent
- BA-10A – Bonding Agent
- ASCA-1 – Solubility Additive

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## Tug Hill Operating, LLC Casing and Cement Program

### Bryan N-6HM

#### 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"	2,603'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	14,500'	CTS

#### Cement

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

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Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Bryan N-06HM (slot B)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1191 @ 1191.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1191 @ 1191.00usft
Site:	Bryan Pad	North Reference:	Grid
Well:	Bryan N-06HM (slot B)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

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

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

Well	Bryan N-06HM (slot B)					
Well Position	+N/-S	0.00 usft	Northing:	14,445,142.16 usft	Latitude:	39.77571503
	+E/-W	0.00 usft	Easting:	1,703,196.45 usft	Longitude:	-80.77655671
Position Uncertainty	0.00 usft	Wellhead Elevation:		Ground Level:	1,191.00 usft	

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	8/18/2017	-8.64	66.94	52,156.83164355

Design	rev3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	346.48

Plan Survey Tool Program	Date	9/8/2017		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	14,599.98 rev3 (Original Hole)	MWD	
			MWD - Standard	

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Plan Sections	WV Department of Environmental Protection										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00		
1,800.00	4.00	71.28	1,599.84	2.24	6.61	2.00	2.00	0.00	71.28		
3,204.07	4.00	71.28	3,200.00	38.15	112.58	0.00	0.00	0.00	0.00		
5,004.65	40.01	71.29	4,842.06	250.99	741.15	2.00	2.00	0.00	0.02		
6,521.52	40.01	71.29	6,003.85	563.75	1,664.90	0.00	0.00	0.00	0.00		
7,500.18	91.00	330.22	6,496.00	1,269.97	1,738.80	10.00	5.21	-10.33	-97.88	LP Bryan N-06HM 45	
14,800.28	91.00	330.22	6,372.00	7,431.48	-1,787.07	0.00	0.00	0.00	0.00	BHL Bryan N-06HM r	



Planning Report - Geographic



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Bryan N-06HM (slot B)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1191 @ 1191.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1191 @ 1191.00usft
Site:	Bryan Pad	North Reference:	Grid
Well:	Bryan N-06HM (slot B)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

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	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
100.00	0.00	0.00	100.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
200.00	0.00	0.00	200.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
300.00	0.00	0.00	300.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
400.00	0.00	0.00	400.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
500.00	0.00	0.00	500.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
600.00	0.00	0.00	600.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
700.00	0.00	0.00	700.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
800.00	0.00	0.00	800.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
900.00	0.00	0.00	900.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,445,142.16	1,703,196.45	39.77571503	-80.77655671
<b>KOP Begin 2°/100' build</b>									
1,500.00	2.00	71.28	1,499.98	0.56	1.65	14,445,142.72	1,703,198.10	39.77571658	-80.77655082
1,600.00	4.00	71.28	1,599.84	2.24	6.61	14,445,144.40	1,703,203.05	39.77572114	-80.77653317
<b>Begin 4.00° tangent</b>									
1,700.00	4.00	71.28	1,699.59	4.48	13.22	14,445,146.64	1,703,209.66	39.77572724	-80.77650963
1,800.00	4.00	71.28	1,799.35	6.72	19.82	14,445,148.88	1,703,216.27	39.77573334	-80.77648610
1,900.00	4.00	71.28	1,899.10	8.96	26.43	14,445,151.12	1,703,222.88	39.77573945	-80.77646257
2,000.00	4.00	71.28	1,998.86	11.19	33.04	14,445,153.36	1,703,229.48	39.77574555	-80.77643903
2,100.00	4.00	71.28	2,098.62	13.43	39.64	14,445,155.59	1,703,236.09	39.77575165	-80.77641550
2,200.00	4.00	71.28	2,198.37	15.67	46.25	14,445,157.83	1,703,242.70	39.77575776	-80.77639197
2,300.00	4.00	71.28	2,298.13	17.91	52.86	14,445,160.07	1,703,249.30	39.77576386	-80.77636843
2,400.00	4.00	71.28	2,397.88	20.15	59.46	14,445,162.31	1,703,255.91	39.77576996	-80.77634490
2,500.00	4.00	71.28	2,497.64	22.39	66.07	14,445,164.55	1,703,262.52	39.77577606	-80.77632136
2,599.99	4.00	71.28	2,597.40	24.63	72.68	14,445,166.79	1,703,269.12	39.77578217	-80.77629783
2,699.99	4.00	71.28	2,697.15	26.87	79.28	14,445,169.03	1,703,275.73	39.77578827	-80.77627430
2,799.99	4.00	71.28	2,796.91	29.11	85.89	14,445,171.27	1,703,282.34	39.77579437	-80.77625076
2,899.99	4.00	71.28	2,896.67	31.34	92.50	14,445,173.50	1,703,288.94	39.77580048	-80.77622723
2,999.99	4.00	71.28	2,996.42	33.58	99.10	14,445,175.74	1,703,295.55	39.77580658	-80.77620370
3,099.99	4.00	71.28	3,096.18	35.82	105.71	14,445,177.98	1,703,302.16	39.77581268	-80.77618016
3,199.99	4.00	71.28	3,195.93	38.06	112.31	14,445,180.22	1,703,308.76	39.77581879	-80.77615663
3,204.07	4.00	71.28	3,200.00	38.15	112.58	14,445,180.31	1,703,309.03	39.77581903	-80.77615567
<b>Begin 2°/100' build/turn</b>									
3,299.99	5.92	71.29	3,295.56	40.81	120.44	14,445,182.97	1,703,316.88	39.77582628	-80.77612769
3,399.99	7.92	71.29	3,394.83	44.68	131.85	14,445,186.84	1,703,328.29	39.77583682	-80.77608706
3,499.99	9.92	71.29	3,493.61	49.65	146.53	14,445,191.81	1,703,342.98	39.77585038	-80.77603475
3,599.99	11.92	71.29	3,591.80	55.73	164.47	14,445,197.89	1,703,360.91	39.77586694	-80.77597085
3,699.99	13.92	71.29	3,689.28	62.90	185.64	14,445,205.06	1,703,382.09	39.77588649	-80.77589543
3,799.99	15.92	71.29	3,785.89	71.15	210.02	14,445,213.31	1,703,406.47	39.77590900	-80.77580857
3,899.99	17.92	71.29	3,881.55	80.49	237.59	14,445,222.65	1,703,434.03	39.77593444	-80.77571039
3,999.99	19.92	71.29	3,976.15	90.88	268.29	14,445,233.04	1,703,464.74	39.77596278	-80.77560100
4,099.99	21.92	71.29	4,069.55	102.33	302.11	14,445,244.50	1,703,498.56	39.77599400	-80.77548055
4,199.99	23.92	71.29	4,161.65	114.82	338.99	14,445,256.98	1,703,535.44	39.77602804	-80.77534916
4,299.99	25.92	71.29	4,252.34	128.34	378.90	14,445,270.50	1,703,575.35	39.77606487	-80.77520701
4,399.99	27.92	71.29	4,341.50	142.85	421.78	14,445,285.01	1,703,618.22	39.77610445	-80.77505427
4,499.99	29.92	71.29	4,429.02	158.36	467.58	14,445,300.52	1,703,664.02	39.77614672	-80.77489113
4,599.99	31.92	71.29	4,514.81	174.84	516.24	14,445,317.00	1,703,712.69	39.77619164	-80.77471777
4,699.99	33.92	71.29	4,598.75	192.27	567.71	14,445,334.43	1,703,764.16	39.77623914	-80.77453442
4,799.99	35.92	71.29	4,680.74	210.62	621.93	14,445,352.78	1,703,818.37	39.77628918	-80.77434130
4,899.99	37.92	71.29	4,760.69	229.89	678.82	14,445,372.05	1,703,875.27	39.77634160	-80.77414884

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Planning Report - Geographic



<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan N-06HM (slot B)
<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 N-06HM (slot B)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,999.99	39.92	71.29	4,838.49	250.03	738.32	14,445,392.19	1,703,934.77	39.77639660	-80.77392669	
5,004.65	40.01	71.29	4,842.06	250.99	741.15	14,445,393.15	1,703,937.60	39.77639922	-80.77391659	
<b>Begin 40.01° tangent</b>										
5,099.99	40.01	71.29	4,915.08	270.65	799.22	14,445,412.81	1,703,995.66	39.77645280	-80.77370976	
5,199.99	40.01	71.29	4,991.67	291.27	860.11	14,445,433.43	1,704,056.56	39.77650900	-80.77349283	
5,299.99	40.01	71.29	5,068.26	311.89	921.01	14,445,454.05	1,704,117.46	39.77656520	-80.77327590	
5,399.99	40.01	71.29	5,144.85	332.51	981.91	14,445,474.67	1,704,178.36	39.77662141	-80.77305696	
5,499.99	40.01	71.29	5,221.45	353.13	1,042.81	14,445,495.29	1,704,239.25	39.77667761	-80.77284203	
5,599.99	40.01	71.29	5,298.04	373.74	1,103.71	14,445,515.90	1,704,300.15	39.77673381	-80.77262510	
5,699.99	40.01	71.29	5,374.63	394.36	1,164.60	14,445,536.52	1,704,361.05	39.77679001	-80.77240816	
5,799.99	40.01	71.29	5,451.22	414.98	1,225.50	14,445,557.14	1,704,421.95	39.77684621	-80.77219123	
5,899.99	40.01	71.29	5,527.81	435.60	1,286.40	14,445,577.76	1,704,482.85	39.77690241	-80.77197429	
5,999.99	40.01	71.29	5,604.40	456.22	1,347.30	14,445,598.38	1,704,543.75	39.77695861	-80.77175736	
6,099.99	40.01	71.29	5,680.99	476.84	1,408.20	14,445,619.00	1,704,604.64	39.77701481	-80.77154042	
6,199.99	40.01	71.29	5,757.58	497.46	1,469.09	14,445,639.62	1,704,665.54	39.77707101	-80.77132349	
6,299.99	40.01	71.29	5,834.18	518.08	1,529.99	14,445,660.24	1,704,726.44	39.77712720	-80.77110655	
6,399.99	40.01	71.29	5,910.77	538.70	1,590.89	14,445,680.86	1,704,787.34	39.77718340	-80.77088961	
6,499.99	40.01	71.29	5,987.36	559.31	1,651.79	14,445,701.48	1,704,848.24	39.77723960	-80.77067268	
6,521.52	40.01	71.29	6,003.85	563.75	1,664.90	14,445,705.92	1,704,861.35	39.77725170	-80.77052596	
<b>Begin 10°/100' build/turn</b>										
6,599.99	39.53	59.04	6,064.24	584.74	1,710.30	14,445,726.90	1,704,906.75	39.77730900	-80.77046419	
6,699.99	40.88	43.66	6,140.77	624.90	1,760.33	14,445,767.06	1,704,956.78	39.77741895	-80.77028574	
6,799.99	44.08	29.60	6,214.69	678.95	1,800.21	14,445,821.11	1,704,996.65	39.77756711	-80.77014334	
6,899.99	48.78	17.40	6,283.73	745.25	1,828.70	14,445,887.41	1,705,025.15	39.77774699	-80.77004130	
6,999.99	54.59	7.01	6,345.80	821.79	1,844.96	14,445,963.95	1,705,041.41	39.77795906	-80.76998273	
7,099.99	61.17	358.10	6,399.02	906.23	1,848.49	14,446,048.39	1,705,044.93	39.77819093	-80.76996941	
7,199.99	68.25	350.28	6,441.77	996.01	1,839.17	14,446,138.17	1,705,035.62	39.77843755	-80.77000175	
7,299.99	75.67	343.23	6,472.74	1,086.40	1,817.30	14,446,230.56	1,705,013.74	39.77869145	-80.77007676	
7,399.99	83.29	338.63	6,491.01	1,180.60	1,783.53	14,446,322.76	1,704,979.98	39.77894489	-80.77019810	
7,499.99	90.99	330.23	6,496.00	1,269.80	1,738.90	14,446,411.96	1,704,935.34	39.77919019	-80.77035615	
7,500.18	91.00	330.22	6,496.00	1,269.97	1,738.80	14,446,412.13	1,704,935.25	39.77919065	-80.77035650	
<b>Begin 91.00° lateral section</b>										
7,599.98	91.00	330.22	6,494.26	1,356.58	1,689.24	14,446,498.75	1,704,865.68	39.77942886	-80.77053212	
7,699.98	91.00	330.22	6,492.51	1,443.37	1,639.58	14,446,585.53	1,704,835.03	39.77966753	-80.77070808	
7,799.98	91.00	330.22	6,490.76	1,530.15	1,589.92	14,446,672.31	1,704,786.37	39.77990620	-80.77088404	
7,899.98	91.00	330.22	6,489.02	1,616.93	1,540.26	14,446,759.09	1,704,736.71	39.78014488	-80.77106001	
7,999.98	91.00	330.22	6,487.27	1,703.71	1,490.60	14,446,845.87	1,704,687.05	39.78038355	-80.77123597	
8,099.98	91.00	330.22	6,485.52	1,790.49	1,440.94	14,446,932.65	1,704,637.39	39.78062222	-80.77141194	
8,199.98	91.00	330.22	6,483.78	1,877.27	1,391.28	14,447,019.43	1,704,587.73	39.78086089	-80.77158791	
8,299.98	91.00	330.22	6,482.03	1,964.05	1,341.62	14,447,106.21	1,704,538.07	39.78109956	-80.77176388	
8,399.98	91.00	330.22	6,480.29	2,050.83	1,291.96	14,447,192.99	1,704,488.41	39.78133823	-80.77193985	
8,499.98	91.00	330.22	6,478.54	2,137.61	1,242.30	14,447,279.77	1,704,438.75	39.78157690	-80.77211583	
8,599.98	91.00	330.22	6,476.79	2,224.39	1,192.64	14,447,366.55	1,704,389.09	39.78181557	-80.77229180	
8,699.98	91.00	330.22	6,475.05	2,311.17	1,142.98	14,447,453.33	1,704,339.43	39.78205424	-80.77246778	
8,799.98	91.00	330.22	6,473.30	2,397.95	1,093.32	14,447,540.11	1,704,289.77	39.78229291	-80.77264375	
8,899.98	91.00	330.22	6,471.55	2,484.73	1,043.67	14,447,626.89	1,704,240.11	39.78253158	-80.77281973	
8,999.98	91.00	330.22	6,469.81	2,571.51	994.01	14,447,713.67	1,704,190.45	39.78277025	-80.77299571	
9,099.98	91.00	330.22	6,468.06	2,658.29	944.35	14,447,800.45	1,704,140.79	39.78300892	-80.77317169	
9,199.98	91.00	330.22	6,466.31	2,745.07	894.69	14,447,887.23	1,704,091.13	39.78324759	-80.77334767	
9,299.98	91.00	330.22	6,464.57	2,831.85	845.03	14,447,974.01	1,704,041.47	39.78348625	-80.77352365	
9,399.98	91.00	330.22	6,462.82	2,918.63	795.37	14,448,060.79	1,703,991.82	39.78372492	-80.77369961	
9,499.98	91.00	330.22	6,461.07	3,005.41	745.71	14,448,147.57	1,703,942.16	39.78396359	-80.77387552	
9,599.98	91.00	330.22	6,459.33	3,092.19	696.05	14,448,234.35	1,703,892.50	39.78420226	-80.77405161	
9,699.98	91.00	330.22	6,457.58	3,178.97	646.39	14,448,321.14	1,703,842.84	39.78444092	-80.77422760	

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Planning Report - Geographic

047-051-01977



Database:	DB_Jul2216d_v14	Local Co-ordinate Reference:	Well Bryan N-06HM (slot B)
Company:	Tug Hill Operating LLC	TVD Reference:	GL=1191 @ 1191.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL=1191 @ 1191.00usft
Site:	Bryan Pad	North Reference:	Grid
Well:	Bryan N-06HM (slot B)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,799.98	91.00	330.22	6,455.84	3,265.76	596.73	14,448,407.92	1,703,793.18	39.78467959	-80.77440358
9,899.98	91.00	330.22	6,454.09	3,352.54	547.07	14,448,494.70	1,703,743.52	39.78491826	-80.77457957
9,999.98	91.00	330.22	6,452.34	3,439.32	497.41	14,448,581.48	1,703,693.86	39.78515692	-80.77475556
10,099.98	91.00	330.22	6,450.60	3,526.10	447.75	14,448,668.26	1,703,644.20	39.78539559	-80.77493156
10,199.98	91.00	330.22	6,448.85	3,612.88	398.09	14,448,755.04	1,703,594.54	39.78563425	-80.77510755
10,299.98	91.00	330.22	6,447.10	3,699.66	348.43	14,448,841.82	1,703,544.88	39.78587292	-80.77528354
10,399.98	91.00	330.22	6,445.36	3,786.44	298.77	14,448,928.60	1,703,495.22	39.78611158	-80.77545954
10,499.98	91.00	330.22	6,443.61	3,873.22	249.11	14,449,015.38	1,703,445.56	39.78635025	-80.77563554
10,599.98	91.00	330.22	6,441.86	3,960.00	199.46	14,449,102.16	1,703,395.90	39.78658891	-80.77581154
10,699.98	91.00	330.22	6,440.12	4,046.78	149.80	14,449,188.94	1,703,346.24	39.78682758	-80.77598754
10,799.98	91.00	330.22	6,438.37	4,133.56	100.14	14,449,275.72	1,703,296.58	39.78706624	-80.77616354
10,899.98	91.00	330.22	6,436.62	4,220.34	50.48	14,449,362.50	1,703,246.92	39.78730491	-80.77633954
10,999.98	91.00	330.22	6,434.88	4,307.12	0.82	14,449,449.28	1,703,197.26	39.78754357	-80.77651554
11,099.98	91.00	330.22	6,433.13	4,393.90	-48.84	14,449,536.06	1,703,147.60	39.78778223	-80.77669155
11,199.98	91.00	330.22	6,431.38	4,480.68	-98.50	14,449,622.84	1,703,097.95	39.78802090	-80.77686755
11,299.98	91.00	330.22	6,429.64	4,567.46	-148.16	14,449,709.62	1,703,048.29	39.78825956	-80.77704356
11,399.98	91.00	330.22	6,427.89	4,654.24	-197.82	14,449,796.40	1,702,998.63	39.78849822	-80.77721957
11,499.98	91.00	330.22	6,426.15	4,741.02	-247.48	14,449,883.18	1,702,948.97	39.78873688	-80.77739558
11,599.98	91.00	330.22	6,424.40	4,827.80	-297.14	14,449,969.96	1,702,899.31	39.78897554	-80.77757159
11,699.98	91.00	330.22	6,422.65	4,914.58	-346.80	14,450,056.74	1,702,849.65	39.78921421	-80.77774760
11,799.98	91.00	330.22	6,420.91	5,001.36	-396.46	14,450,143.53	1,702,799.99	39.78945287	-80.77792361
11,899.98	91.00	330.22	6,419.16	5,088.15	-446.12	14,450,230.31	1,702,750.33	39.78969153	-80.77809962
11,999.98	91.00	330.22	6,417.41	5,174.93	-495.78	14,450,317.09	1,702,700.67	39.78993019	-80.77827564
12,099.98	91.00	330.22	6,415.67	5,261.71	-545.44	14,450,403.87	1,702,651.01	39.79016885	-80.77845166
12,199.98	91.00	330.22	6,413.92	5,348.49	-595.10	14,450,490.65	1,702,601.35	39.79040751	-80.77862767
12,299.98	91.00	330.22	6,412.17	5,435.27	-644.76	14,450,577.43	1,702,551.69	39.79064617	-80.77880369
12,399.98	91.00	330.22	6,410.43	5,522.05	-694.41	14,450,664.21	1,702,502.03	39.79088483	-80.77897971
12,499.98	91.00	330.22	6,408.68	5,608.83	-744.07	14,450,750.99	1,702,452.37	39.79112349	-80.77915573
12,599.98	91.00	330.22	6,406.93	5,695.61	-793.73	14,450,837.77	1,702,402.71	39.79136215	-80.77933176
12,699.97	91.00	330.22	6,405.19	5,782.39	-843.39	14,450,924.55	1,702,353.05	39.79160081	-80.77950778
12,799.97	91.00	330.22	6,403.44	5,869.17	-893.05	14,451,011.33	1,702,303.39	39.79183947	-80.77968381
12,899.97	91.00	330.22	6,401.70	5,955.95	-942.71	14,451,098.11	1,702,253.74	39.79207812	-80.77985983
12,999.97	91.00	330.22	6,399.95	6,042.73	-992.37	14,451,184.89	1,702,204.08	39.79231678	-80.78003586
13,099.97	91.00	330.22	6,398.20	6,129.51	-1,042.03	14,451,271.67	1,702,154.42	39.79255544	-80.78021189
13,199.97	91.00	330.22	6,396.46	6,216.29	-1,091.69	14,451,358.45	1,702,104.76	39.79279410	-80.78038792
13,299.97	91.00	330.22	6,394.71	6,303.07	-1,141.35	14,451,445.23	1,702,055.10	39.79303275	-80.78056395
13,399.97	91.00	330.22	6,392.96	6,389.85	-1,191.01	14,451,532.01	1,702,005.44	39.79327141	-80.78073998
13,499.97	91.00	330.22	6,391.22	6,476.63	-1,240.67	14,451,618.79	1,701,955.78	39.79351007	-80.78091601
13,599.97	91.00	330.22	6,389.47	6,563.41	-1,290.33	14,451,705.57	1,701,906.12	39.79374872	-80.78109205
13,699.97	91.00	330.22	6,387.72	6,650.19	-1,339.99	14,451,792.35	1,701,856.46	39.79398738	-80.78126809
13,799.97	91.00	330.22	6,385.98	6,736.97	-1,389.65	14,451,879.13	1,701,806.80	39.79422604	-80.78144412
13,899.97	91.00	330.22	6,384.23	6,823.75	-1,439.31	14,451,965.92	1,701,757.14	39.79446469	-80.78162016
13,999.97	91.00	330.22	6,382.48	6,910.54	-1,488.97	14,452,052.70	1,701,707.48	39.79470335	-80.78179620
14,099.97	91.00	330.22	6,380.74	6,997.32	-1,538.62	14,452,139.48	1,701,657.82	39.79494200	-80.78197224
14,199.97	91.00	330.22	6,378.99	7,084.10	-1,588.28	14,452,226.26	1,701,608.16	39.79518066	-80.78214828
14,299.97	91.00	330.22	6,377.24	7,170.88	-1,637.94	14,452,313.04	1,701,558.50	39.79541931	-80.78232433
14,399.97	91.00	330.22	6,375.50	7,257.66	-1,687.60	14,452,399.82	1,701,508.84	39.79565797	-80.78250037
14,499.97	91.00	330.22	6,373.75	7,344.44	-1,737.26	14,452,486.60	1,701,459.18	39.79589662	-80.78267642
14,599.97	91.00	330.22	6,372.01	7,431.22	-1,786.92	14,452,573.38	1,701,409.52	39.79613527	-80.78285246
14,600.27	91.00	330.22	6,372.00	7,431.48	-1,787.07	14,452,573.64	1,701,409.38	39.79613599	-80.78285300
<b>PBHL/TD 14600.27 MD/6372.00 TVD</b>									
14,600.28	91.00	330.22	6,372.00	7,431.48	-1,787.07	14,452,573.64	1,701,409.37	39.79613600	-80.78285300

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Planning Report - Geographic



<b>Database:</b>	DB_Jul2216dt_v14	<b>Local Co-ordinate Reference:</b>	Well Bryan N-06HM (slot B)
<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 N-06HM (slot B)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev3		

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BHL Bryan N-06HM r2 - plan hits target center - Point	0.00	0.00	6,372.00	7,431.48	-1,787.07	14,452,573.64	1,701,409.37	39.79613600	-80.78265300
LP Bryan N-06HM 45 W - plan hits target center - Point	0.00	0.00	6,496.00	1,269.97	1,738.80	14,446,412.13	1,704,935.25	39.77919065	-80.77035649
LP Bryan N-06HM - plan misses target center by 44.99usft at 7500.35usft MD (6496.00 TVD, 1270.12 N, 1738.72 E) - Point	0.00	0.00	6,496.00	1,292.47	1,777.77	14,446,434.63	1,704,974.22	39.77925215	-80.77021759

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,400.00	1,400.00	0.00	0.00	KOP Begin 2°/100' build
1,600.00	1,599.84	2.24	6.61	Begin 4.00° tangent
3,204.07	3,200.00	38.15	112.58	Begin 2°/100' build/turn
5,004.65	4,842.05	250.99	741.15	Begin 40.01° tangent
6,521.52	6,003.85	563.75	1,664.90	Begin 10°/100' build/turn
7,500.18	6,496.00	1,269.97	1,738.80	Begin 91.00° lateral section
14,600.27	6,372.00	7,431.48	-1,787.07	PBHL/TD 14600.27 MD/6372.00 TVD

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## Area of Review

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

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

#### Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, [dducoeur@dpslandservices.com](mailto:dducoeur@dpslandservices.com) DPS GIS (12/19/2016) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

#### Request maps for:

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

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

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

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Permit well - Bryan N-6HM

Wells within 500' Buffer

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

Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Comments
4705101340	Tug Hill Operating (formerly operated by Chevron and AB Resources)	6450' TVD 10501' MD	Marcellus	Unknown	Yes, existing Marcellus producer. Proper casing and cement should prevent migration of fluids from new wellbore to existing wellbore Producing Marcellus horizontal well. A field survey was conducted to locate this well and it was found producing at the location shown on the well plat.

WV Geological & Economic Survey

Well: County = 51 Permit = 01340

Location Information: View Map

API: COUNTY PERMIT TAX\_DISTRICT QUAD\_25 QUAD\_10 LAT\_50 LONG\_00 UTM\_E UTM\_N

Bottom Hole Location Information:

API: EP\_FLAG UTM\_X UTM\_Y LONG\_00 LAT\_50

Owner Information:

API: CMP\_DT\_SUFFIX STATUS SURFACE\_OWNER WELL\_NUM CO\_NUM LEASE LEASE\_NUM MINERAL\_OWN OPERATOR\_AT\_COMPLETION PROP\_VD PROP\_TWT\_FM TFM\_EST\_FM

Completion Information:

API: CMP\_DT SPMCL\_DT ELEV DATUM FIELD DEEPEST\_FM DEEPEST\_FAT INITIAL\_CLASS FINAL\_CLASS TYPE RID CMP\_MTRD TVD TMD NEIN FTD G\_DEP G\_AFT G\_DEP G\_AFT NOL\_BEL NOL\_AFT P\_BEL\_T

Comment: 4/1/2010 Kick off point at 5966

Pay/Show/Water Information:

API: CMP\_DT ACTIVITY PRODUCT SECTION DEPTH\_TOP\_FM\_TOP DEPTH\_BOT\_FM\_BOT G\_DEP G\_AFT G\_DEP G\_AFT WATER\_QHTY

Production Gas Information (Volumes in Mcf):

API	PRODUCING_OPERATOR	PRD_YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101340	AB Resources PA	2012	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2012	285	425	0	0	0	24	207	51	190	73	182	62
4705101340	Chevron Appalachia, LLC	2013	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2013	285	273	11	214	0	0	0	40	323	59	0	0
4705101340	Chevron Appalachia, LLC	2014	37	74	42	15	42	34	0	1	24	20	0	0
4705101340	Chevron Appalachia, LLC	2015	484	217	0	0	4	222	22	426	13	587	62	726
4705101340	Chevron Appalachia, LLC	2016	481	514	42	849	41	254	48	120	43	789	62	262

Production Oil Information (Volumes in Bbl):

API	PRODUCING_OPERATOR	PRD_YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101340	AB Resources PA	2012	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2012	33	374	0	0	0	0	4	102	3	100	6	132
4705101340	Chevron Appalachia, LLC	2013	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2013	16	393	110	0	0	0	61	352	132	1162	2746	2283
4705101340	Chevron Appalachia, LLC	2014	8	225	228	1	175	0	184	42	0	0	0	0
4705101340	Chevron Appalachia, LLC	2015	17	718	0	0	240	2542	1803	2375	2507	2106	1725	1461
4705101340	Chevron Appalachia, LLC	2016	8	115	1027	760	331	542	858	311	419	438	34	445

Production Water Information (Volumes in Gallons):

API	PRODUCING_OPERATOR	PRD_YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705101340	Chevron Appalachia, LLC	2012	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2013	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2014	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2015	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2016	0	0	0	0	0	0	0	0	0	0	0	0

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_BOTTOM	THICKNESS	THICKNESS_QUALITY	ELEV DATUM		
4705101340	Dash Dgn	Les	Buffed	Well Record	8236	Reasonable	48	Reasonable	1211	Half Boring
4705101340	Dash Dgn	Les	Tuff Lr	Well Record	8279	Reasonable	35	Reasonable	1211	Half Boring
4705101340	Dash Dgn	Les	Hamble	Well Record	8414	Reasonable	48	Reasonable	1217	Half Boring
4705101340	Dash Dgn	Les	Martha's Pt	Well Record	8462	Reasonable	47	Reasonable	1217	Half Boring
4705101340	Dash Dgn	Les	Concho	Well Record	8514	Reasonable	57	Reasonable	1217	Half Boring

Wireline (E-Log) Information:

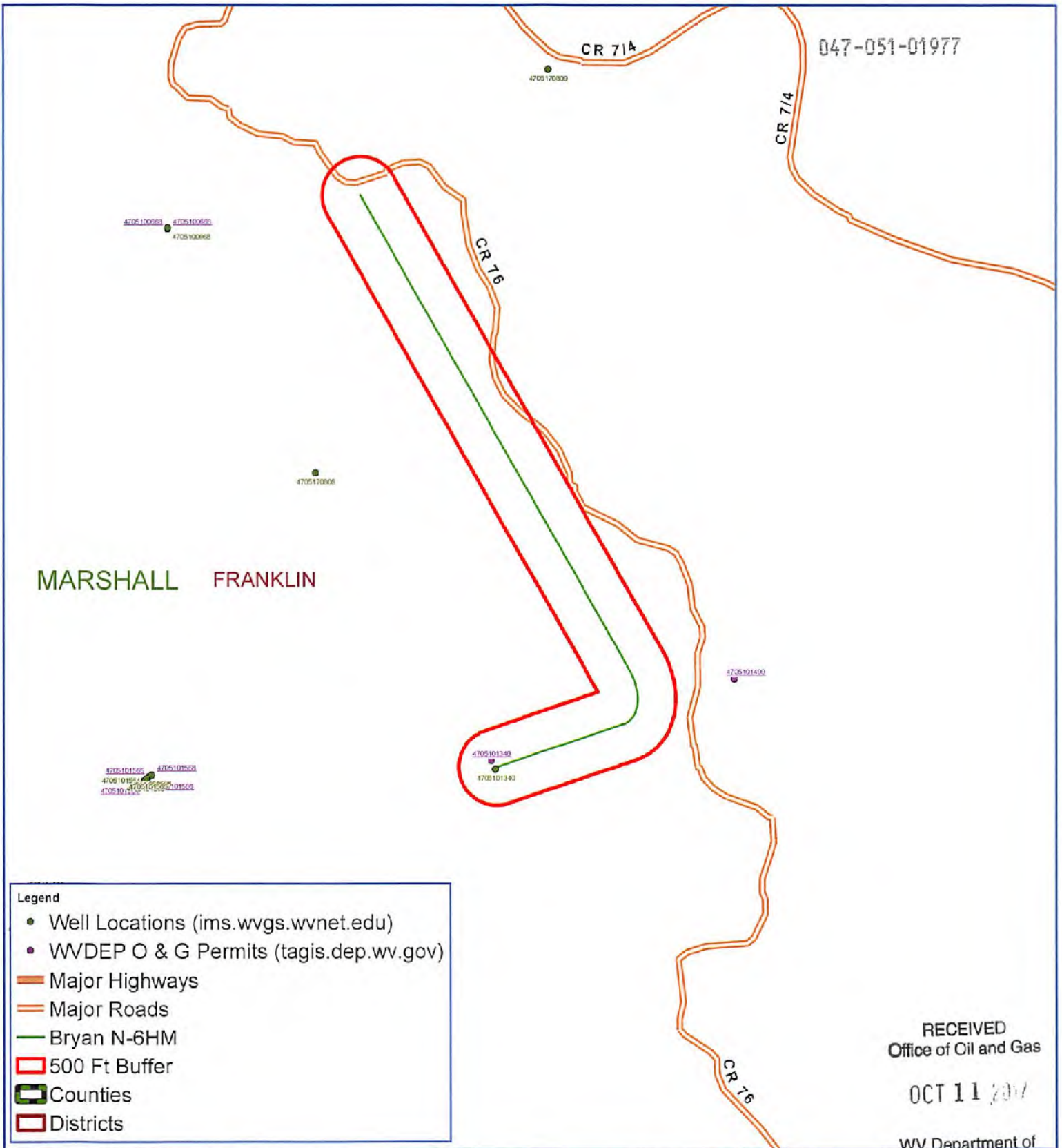
API	LOG_TOP	LOG_BOT	DEEPEST_FML	LOG_1_AVAL	SCAN	DIGITIZED	GR_TOP	GR_BOT	D_TOP	D_BOT	N_TOP	N_BOT	L_TOP	L_BOT	F_TOP	F_BOT	S_TOP	S_BOT	O_TOP	O_BOT	INCH	INCH	REDUCED	ROP	LOGRAD	ELEV_BOT
4705101340	784	0	785	0	785	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1001

Comment: logs: caliper, tension, PE, LWD. G with measurements and vertical depth included

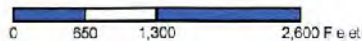
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# Bryan N-6HM Franklin District Marshall County, WV



Map Created: September 28, 2017  
Map Current As Of: September 28, 2017

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





WW-9  
(4/16)

API Number 47 - 051 - \_\_\_\_\_  
Operator's Well No. Bryan N-6HM

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

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

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

Will a pit be used? Yes  No

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

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

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number UIC 2459, UIC 985, 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? Welzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP ECF#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

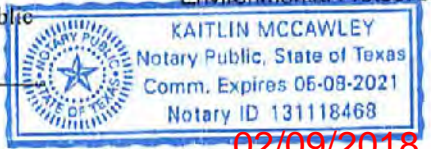
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Subscribed and sworn before me this 2 day of October, 20 17

Kaitlin McCawley Kaitlin McCawley Notary Public  
My commission expires 5/8/2021

WV Department of Environmental Protection



02/09/2018

Form WW-9

Operator's Well No. Bryan N-6HM

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 Kishner*

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

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Title: Oil + Gas Inspector Date: 10/5/17

Field Reviewed? (  ) Yes (  ) No

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02/09/2018

WW-9

# PROPOSED BRYAN N-6HM

SUPPLEMENT PG 1

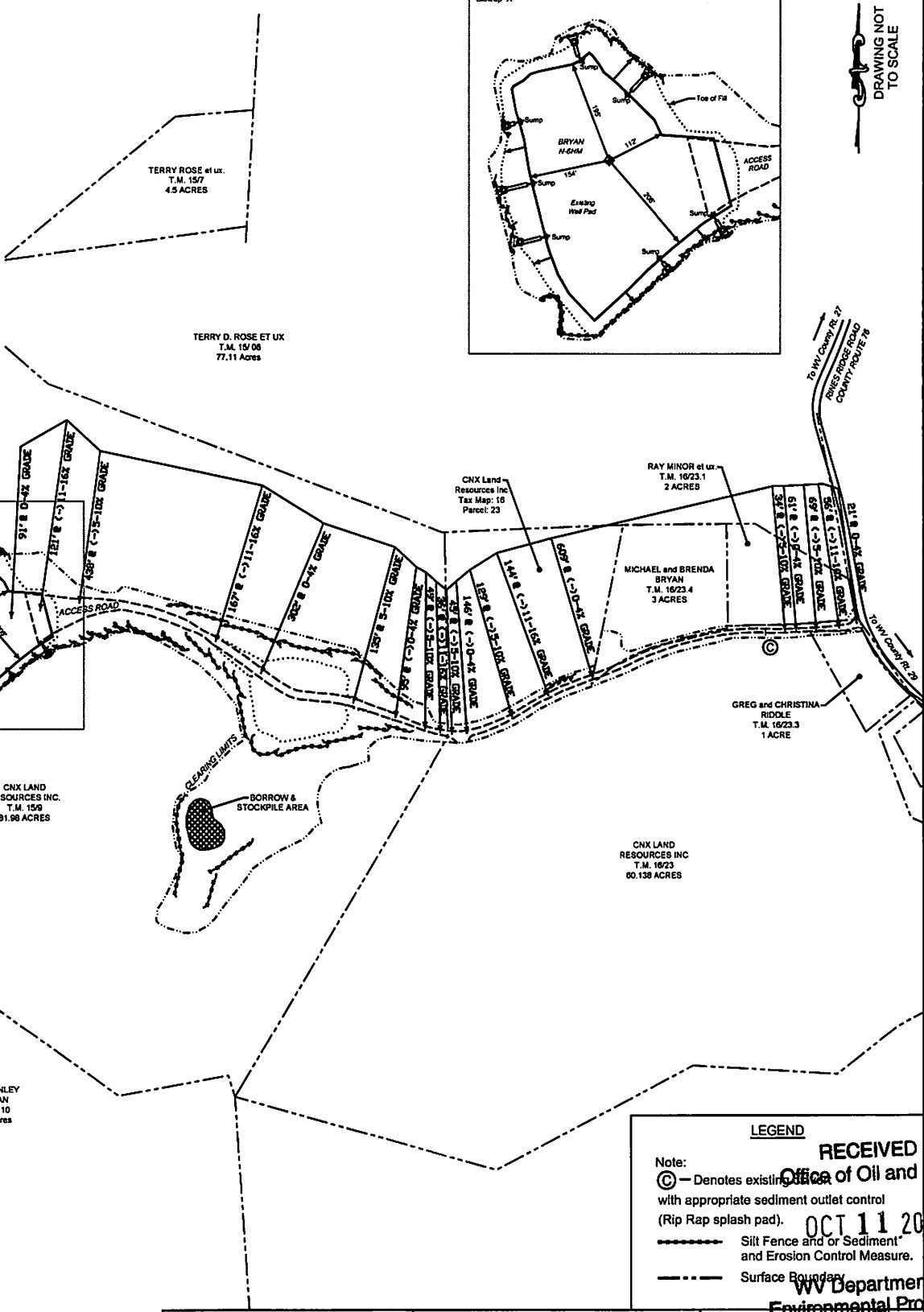
REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES 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 W.V. 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 SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.



DRAWING NOT TO SCALE

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**LEGEND**

Note:  
 (C) - Denotes existing structure with appropriate sediment outlet control (Rip Rap splash pad).  
 - - - - - Silt Fence and or Sediment and Erosion Control Measure.  
 - - - - - Surface Boundary

DATE: 09/27/17      PROJECT NO: 494510851      DRAWN BY: J.A.H.



# Well Site Safety Plan

## Tug Hill Operating, LLC

*ju*  
*10/13/17*

Well Name: Bryan N-8HM

Pad Location: Bryan Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,402,893.64

Easting: 519,127.03

October 2017

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# BRYAN LEASE WELL N-6HM 558.6158 ± ACRES

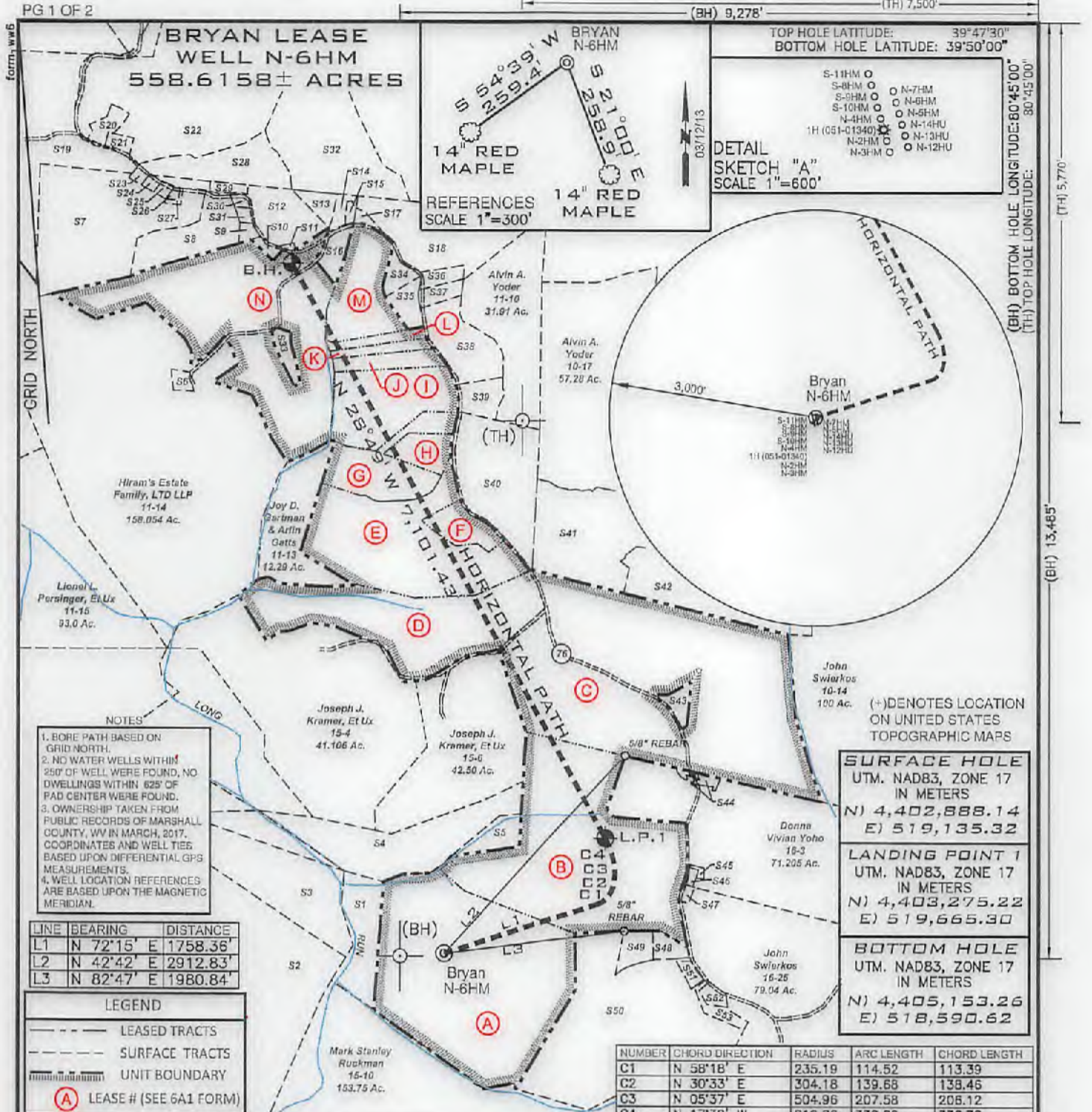
TOP HOLE LATITUDE: 39°47'30"  
BOTTOM HOLE LATITUDE: 39°50'00"

- S-11HM ○
- S-8HM ○
- S-9HM ○
- S-10HM ○
- N-4HM ○
- 1H (051-01340) ○
- N-2HM ○
- N-3HM ○
- N-7HM ○
- N-6HM ○
- N-5HM ○
- N-14HU ○
- N-13HU ○
- N-12HU ○

DETAIL  
SKETCH "A"  
SCALE 1"=600'

REFERENCES  
SCALE 1"=300'

14" RED MAPLE  
14" RED MAPLE



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

LINE	BEARING	DISTANCE
L1	N 72°15' E	1758.36'
L2	N 42°42' E	2912.83'
L3	N 82°47' E	1980.84'

LEGEND

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

(-) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

SURFACE HOLE	
UTM, NAD83, ZONE 17 IN METERS	
N)	4,402,888.14
E)	519,135.32
LANDING POINT 1	
UTM, NAD83, ZONE 17 IN METERS	
N)	4,403,275.22
E)	519,665.30
BOTTOM HOLE	
UTM, NAD83, ZONE 17 IN METERS	
N)	4,405,153.26
E)	518,590.62

NUMBER	CHORD DIRECTION	RADIUS	ARC LENGTH	CHORD LENGTH
C1	N 58°18' E	235.19	114.52	113.39
C2	N 30°33' E	304.18	139.68	138.46
C3	N 05°37' E	504.96	207.58	206.12
C4	N 17°30' W	819.86	339.20	336.78

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

DRAWING NUMBER BRYAN\_WP\_N-6HM

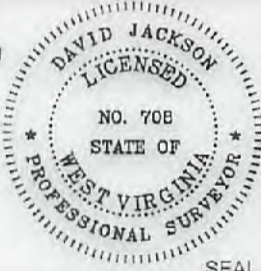
SCALE 1" = 1500'

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

P.S. 708 *David L Jackson*



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

WVDEP  
OFFICE OF OIL & GAS  
601 57TH STREET, SE  
CHARLESTON, WV 25304

WELL TYPE: OIL \_\_\_ GAS X LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_  
(IF "GAS") PRODUCTION X STORAGE \_\_\_ DEEP \_\_\_ SHALLOW X

LOCATION ELEVATION 1191.0' WATERSHED (HUC 10) Fish Creek

DATE: SEPTEMBER 27, 2017

OPERATORS WELL NO. BRYAN N-6HM

API WELL NO. 47-051-01977

STATE WV COUNTY Marshall PERMIT 01977

DISTRICT Franklin COUNTY Marshall

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

SURFACE OWNER CNX LAND RESOURCES, INC. ACREAGE 81.98

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

PROPOSED WORK: DRILL X CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION \_\_\_  
PERFORATE NEW FORMATION \_\_\_ OTHER PHYSICAL CHANGE (SPECIFY) \_\_\_\_\_

TARGET FORMATION Marcellus ESTIMATED DEPTH TVD: 6,596' TMD: 14,610'

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

02/09/2018

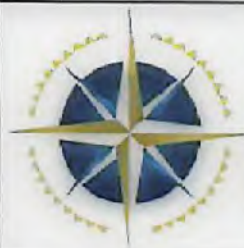
COUNTY NAME PERMIT

**BRYAN LEASE  
WELL N-6HM  
558.6158± ACRES**

GRID NORTH

Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES
S1	15-13	CNX Land Resources	11.0
S2	15-12	John David Petrock Et Ux	150.23
S3	15-14	John David Petrock Et Ux	25.0
S4	15-6.1	Joseph J. Kramer Et Ux	39.40
S5	15-7	Terry D. Rose Et Ux	4.5
S6	11-14.1	Dennis F. Moore Et Ux	1.056
S7	11-17	Kevin R. Corley Et Ux	36.13
S8	11-17.2	Brenda & Michael Bryan	11.504
S9	11-25	Owen Michael Barr	0.598
S10	11-16.1	Susan Marie Smith- Life	0.876
S11	11-5.2	Rickey Lynn & Victoria Rose Cross	1.0
S12	11-5	Kevin R. Corley Et Ux	10.36
S13	11-5.3	Robert Harris Arrick Et Ux	3.0
S14	11-6	Robert & Rebecca Arrick	1.29
S15	11-7	Baptist Cemetery	1.0
S16	11-16.3	Kegan Michael Haught- Life	3.265
S17	11-8	Baptist Church	0.8
S18	11-9	Southern Country Farms Inc.	54.625
S19	11-21	Omar Rine Est & CNX Land LLC	112.67
S20	11-2.1	Walter C. & Cheryl A. Rine	1.19
S21	11-2.2	Marlon R. Connee	2.193
S22	11-2	Walter C. & Cheryl A. Rine	42.367
S23	11-20	David E. Gray	0.569
S24	11-19	David E. Gray	0.532
S25	11-18	David E. Gray	0.569
S26	11-22	David Gray	0.353
S27	11-17.1	David Gray	0.297
S28	11-3	Kevin R. Corley Et Ux	13.18
S29	11-5.2	Rickey Lynn & Victoria Rose Cross	1.0
S30	11-24	Charles Edward Furbee Et Ux	0.603
S31	11-23	Owen Michael Barr	0.845
S32	11-4	David H. Arrick Et Ux	31.5
S33	11-16.2	Joseph Haught	2.181
S34	11-9.10	John A. & Janet L. Beucke	2.348
S35	11-9.2	Michael R. Bryan	3.143
S36	11-9.8	Sean F. Moore	2.070
S37	11-9.7	Sean F. Moore	2.026
S38	11-9.1	Jack Shephard Higgins Jr. Et Al	10.92
S39	11-9.4	Jack S. Higgins Et Ux	4.129
S40	11-11.2	Wesley R. Bryan & Wesley R. Bryan II	25.031
S41	10-16.4	Elizabeth & Melvin E. Ferguson Jr.	30.87
S42	10-16	Linda & Timothy McGinnis Sr.	30.87
S43	10-15.1	Donald T. Miller	2.095
S44	16-3.2	Jimmy Ostrander Sr. Et Ux	1.435
S45	16-3	Donna Vivian Yoho	71.205
S46	16-2	Christian Church	0.19
S47	16-1	Christian Church	0.50
S48	16-23.1	Ray E. Minor Et Ux	2.0
S49	16-23.4	Michael R. & Brenda K. Bryan	3.0
S50	16-23	CNX Land Resources Inc.	60.138
S51	16-23.3	Greg & Christina Riddle	1.0
S52	16-24	Alan M. Bayser Et Ux	1.083
S53	16-23.2	Alan M. Bayser Et Ux	1.726

02/09/2018



**TUG HILL**  
OPERATING

OPERATOR'S

WELL #: Bryan N-6HM

DISTRICT:

Franklin

COUNTY:

Marshall

STATE: WV

WELL PLAT

PAGE 2 OF 2

DATE: 09/27/2017

WW-6A1  
(5/13)

Operator's Well No. Bryan N-6HM

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

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

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

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

\*See attached sheets

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

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

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

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

Well Operator: Tug Hill Operating, LLC  
 By: Amy L. Miller *Amy Miller*  
 Its: Regulatory Compliance Specialist

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 Protection

Lease No.	Tags	Parcel	Lessor	Lessee	Instrument #	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
19294	A	5-15-9	BRYAN MICHAEL ET UX	TRIENERGY, INC.	1249372	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	685/645 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	40/57 Chevron USA Inc to TH Exploration LLC
19340	B	5-15-8	YOHO DONNA VIVIAN	GASTAR EXPLORATION USA, INC.	1237758	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	23/635 AB Resources LLC to TriEnergy Holdings 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 (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	40/57 Chevron USA Inc to TH Exploration LLC
19017	C	5-10-15	RINE PAUL ANDREW ET UX	CHEVRON U.S.A. INC	1344001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc to TH Exploration LLC
19293	D	5-11-12	KRAMAR JOSEPH ET UX	TRIENERGY, INC.	107026	N/A	N/A	19/623 TriEnergy Inc 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 (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	40/57 Chevron USA Inc to TH Exploration LLC
19336	E	5-11-11.3	DAWSON BONNIE ET UX	GASTAR EXPLORATION USA, INC.	1247755	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	23/635 AB Resources LLC to TriEnergy Holdings 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 (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	40/57 Chevron USA Inc to TH Exploration LLC
19141	F	5-11-11.1	SPENCER ROBERT W JR ET UX	GASTAR EXPLORATION USA, INC.	1290609	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	23/624 Gastar Exploration USA Inc and Atinum Marcellus I LLC to AB Resources LLC, Chief Exploration & Development LLC, Radler 2000 Limited Partnership and Enerplus Resources USA Corp	24/1 AB Resources LLC, Chief Exploration & Development LLC, Radler 2000 Limited Partnership, Enerplus Resources Corp to TriEnergy Holdings LLC	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	40/127 Chevron USA Inc to TH Exploration LLC
19336	G	5-11-11.4	DAWSON BONNIE ET UX	GASTAR EXPLORATION USA, INC.	1247755	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	23/633 AB Resources LLC to TriEnergy Holdings 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 (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	40/57 Chevron USA Inc to TH Exploration LLC
19336	H	5-11-11	DAWSON BONNIE ET UX	GASTAR EXPLORATION USA, INC.	1247755	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	23/633 AB Resources LLC to TriEnergy Holdings 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 (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	40/57 Chevron USA Inc to TH Exploration LLC
14099	I	5-11-9	SOUTHERN COUNTRY FARMS	GASTAR EXPLORATION USA, INC.	1250002	N/A	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	40/127 Chevron USA Inc to TH Exploration LLC
19158	J	5-11-9.9	PARSONS LEONARD ET UX	GASTAR EXPLORATION USA, INC.	1289440	N/A	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	40/127 Chevron USA Inc to TH Exploration LLC
14099	K	5-11-9.8	SOUTHERN COUNTRY FARMS	GASTAR EXPLORATION USA, INC.	1250002	N/A	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	40/127 Chevron USA Inc to TH Exploration LLC
14099	L	5-11-9.5	SOUTHERN COUNTRY FARMS	GASTAR EXPLORATION USA, INC.	1250002	N/A	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	40/127 Chevron USA Inc to TH Exploration LLC
18339	M	5-11-9.3	RESOURCE MINERALS HEADWATER I, LP	TH EXPLORATION LLC	1429852	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19139	N	5-11-16	MOORE HIRAM V - SFX	GASTAR EXPLORATION USA, INC.	1284529	N/A	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	40/127 Chevron USA Inc to TH Exploration LLC
19179	N	5-11-16	HAUGHT KEITH ET UX - SFX	GASTAR EXPLORATION USA, INC.	1293638	N/A	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	40/127 Chevron USA Inc to TH Exploration LLC
19180	N	5-11-16	HAUGHT STEVEN - SFX	TRIENERGY, INC. - LEASE SAYS GASTAR EXPLORATION USA INC	1293068	N/A	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	40/127 Chevron USA Inc to TH Exploration LLC
19176	N	5-11-16	HAUGHT JOSEPH - SFX	GASTAR EXPLORATION USA, INC.	1293069	N/A	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	40/127 Chevron USA Inc to TH Exploration LLC



AFFIDAVIT

047-051-01977

STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

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

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

FURTHER, AFFIANT SAITH NOT.

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

David D. Kalish
Affiant: David D. Kalish

JURAT

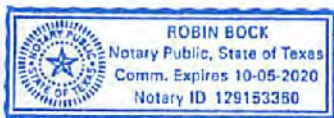
Carol S Haight
WETZEL County 10:29:27 AM
Instrument No 212095
Date Recorded 10/20/2016
Document Type AFDI
Pages Recorded 1
Book-Page 119-291
Recording Fee \$5.00
Additional \$6.00

STATE OF TEXAS §
§ SS
COUNTY OF TARRANT §

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

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

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



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WV Department of Environmental Protection

02/09/2018







October 6, 2017

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

RE: Bryan N-6HM

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 N-6HM 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: 10/06/2017

API No. 47- 051 -  
 Operator's Well No. Bryan N-6HM  
 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>519,135.32</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,888.14</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.

Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:  *PLEASE CHECK ALL THAT APPLY  <input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED  <input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED  <input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or  <input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)  <input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION  <input checked="" type="checkbox"/> 5. PUBLIC NOTICE  <input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION	<b>OOG OFFICE USE ONLY</b>  <input type="checkbox"/> RECEIVED/ NOT REQUIRED  <input checked="" type="checkbox"/> RECEIVED  <input type="checkbox"/> RECEIVED/ NOT REQUIRED  <input checked="" type="checkbox"/> RECEIVED  <input checked="" type="checkbox"/> RECEIVED  <input checked="" type="checkbox"/> RECEIVED
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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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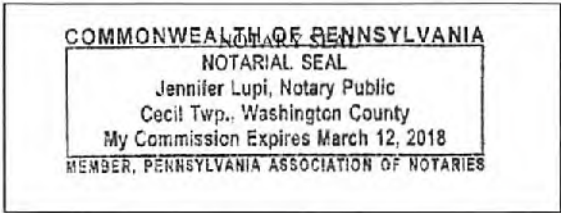
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02/09/2018  
 WV Department of  
 Environmental Protection

**Certification of Notice is hereby given:**

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

Well Operator: Tug Hill Operating, LLC  
By: Amy L. Miller  
Its: Permit Specialist - Appalachia  
Telephone: 724-749-8388

Address: 380 Southpointe Boulevard, Plaza II, Suite 200  
Canonsburg, PA 15317  
Facsimile: 724-338-2030  
Email: amiller@tug-hillop.com



Subscribed and sworn before me this 6<sup>th</sup> day of Oct 2017.  
Jennifer Lupi Notary Public  
My Commission Expires March 12, 2018

**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-6A  
(9-13)

047-051-01977

API NO. 47- \_\_\_\_\_  
OPERATOR WELL NO. Bryan N-6HM  
Well Pad Name: Bryan

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

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

**Date of Notice:** 10/6/2017 **Date Permit Application Filed:** 10/5/2017

Notice of:

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

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

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

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

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

SURFACE OWNER(s)  
Name: CNX Land Resources, Inc. (Pad)  
Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317

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

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

SURFACE OWNER(s) (Impoundments or Pits)  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

COAL OWNER OR LESSEE  
Name: Leatherwood, Inc.  
Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317-6508

COAL OPERATOR  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)  
Name: \*See attached sheet  
Address: \_\_\_\_\_

OPERATOR OF ANY NATURAL GAS STORAGE FIELD  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_

\*Please attach additional forms if necessary

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Environmental Protection  
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WW-6A  
(8-13)

API NO. 47- \_\_\_\_\_ - \_\_\_\_\_  
OPERATOR WELL NO. Bryan N-6HM  
Well Pad Name: Bryan

**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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WW-6A  
(8-13)

047-051-01977  
API NO. 47- \_\_\_\_\_ - \_\_\_\_\_  
OPERATOR WELL NO. Bryan N-6HM  
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 N-6HM  
Well Pad Name: Bryan

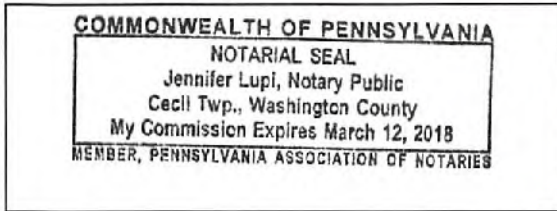
**Notice is hereby given by:**

Well Operator: Tug Hill Operating, LLC  
Telephone: 724-749-3398  
Email: amiller@tug-hilltop.com *amy miller*

Address: 390 Southpointe Boulevard, Plaza II, Suite 200  
Canonsburg, PA 15317  
Facsimile: 724-338-2030

**Oil and Gas Privacy Notice:**

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



Subscribed and sworn before me this 6<sup>th</sup> day of Oct, 2017.

*Jennifer Lupi* Notary Public

My Commission Expires March 12, 2018

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WW-6A

Supplement Pg. 1A

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

## WATER WELL REPORT

Well: BRYAN No. N-6HM  
 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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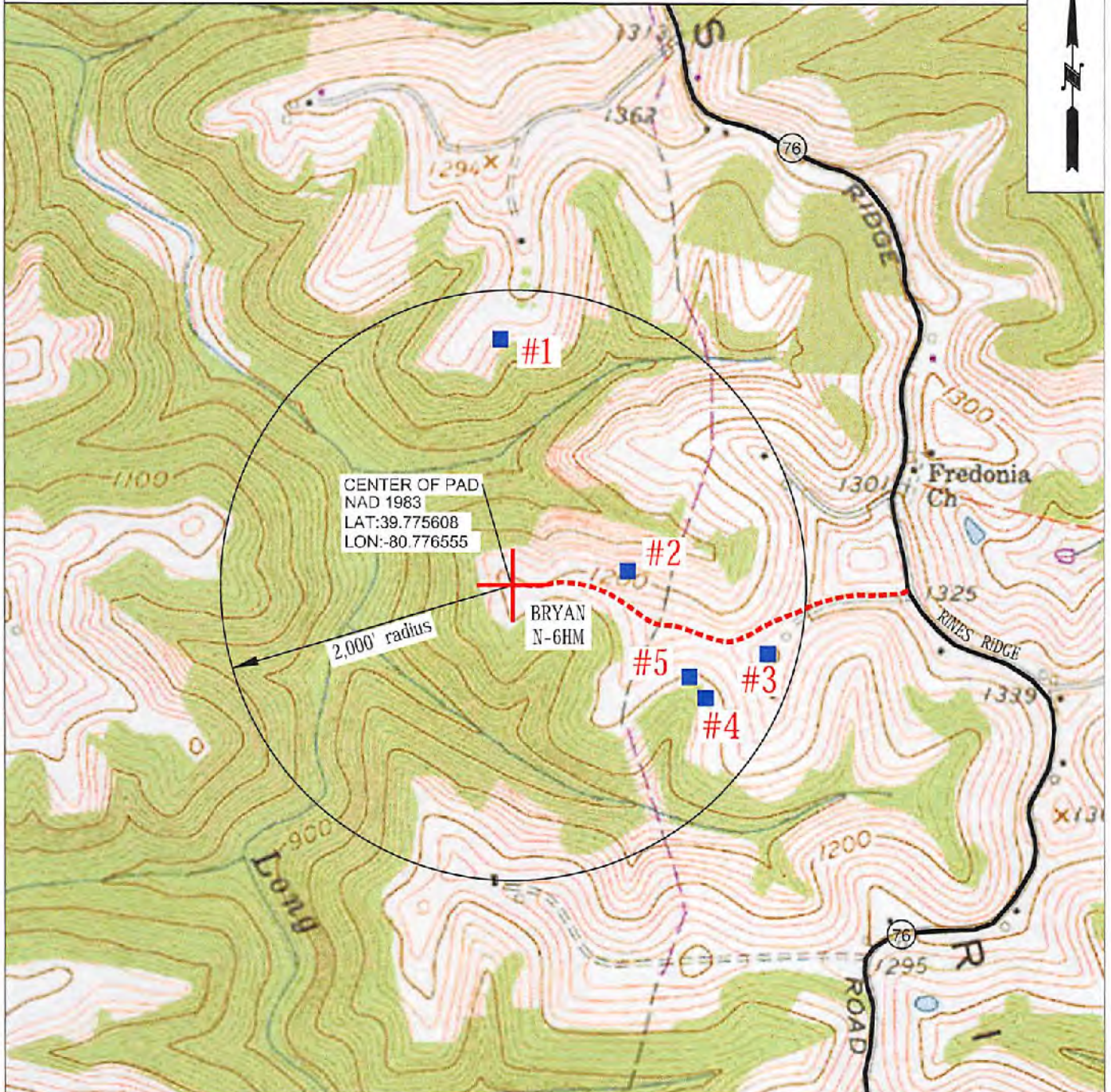
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WW-6A

# PROPOSED BRYAN N-6HM

SUPPLEMENT PG 1

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



**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:** 09/27/17  
**DATE:** OCT 11 2017

**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 76)</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-hillop.com

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

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**Oil and Gas Privacy Notice:**

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

02/09/2018

Operator Well No. Bryan N-6HM**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:** 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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WW-6A5  
(1/12)

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

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

**Date of Notice:** 10/06/2017      **Date Permit Application Filed:** 10/09/2017

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

CERTIFIED MAIL                                       HAND  
RETURN RECEIPT REQUESTED                                      DELIVERY

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

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

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

Name: Ray E. and Katherine L. Minor  
Address: 4193 Rines Ridge Road  
Proctor, WV 26055      \*See attached sheet

**Notice is hereby given:**

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>519,135.32</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,888.14</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>			

**This Notice Shall Include:**

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

**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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047-051-01977

Operator Well No. Bryan N-6HM

**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. and Brenda K. Bryan  
195 Isaiah Drive  
Proctor, WV 26055

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02/09/2018



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 N-6HM Well site  
 47-051-01977

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 N-6HM

<b>PRODUCT NAME:</b>	<b>CHEMICAL DESCRIPTION:</b>	<b>PRODUCT USE:</b>	<b>HAZARDOUS COMPONENT:</b>
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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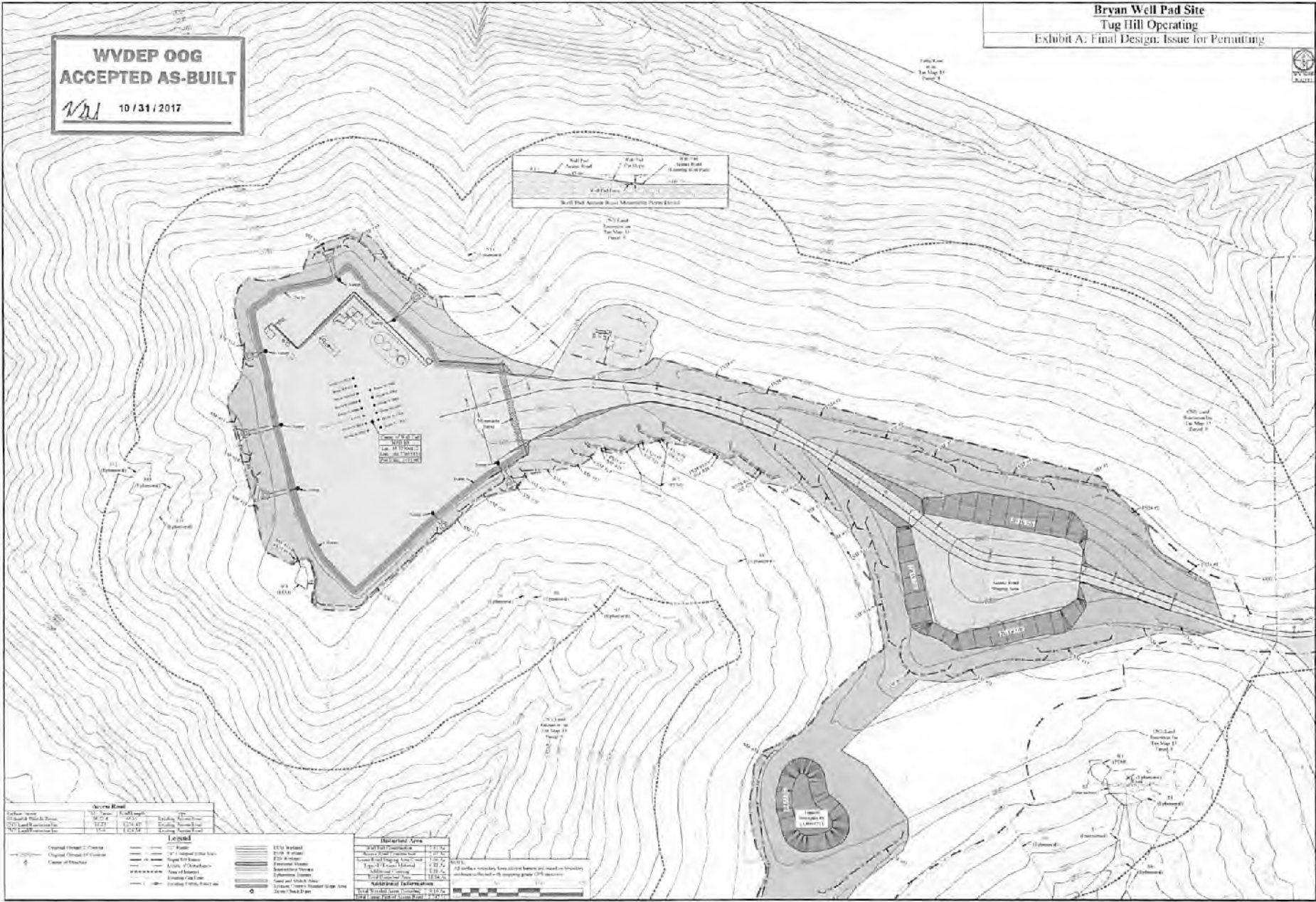
WV Department of  
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**Bryan Well Pad Site**  
**Tug Hill Operating**  
 Exhibit A: Final Design: Issue for Permitting



**WVDEP OOG**  
**ACCEPTED AS-BUILT**  
*WJ* 10/31/2017



**Access Road**

Location	Width	Surface	Notes
Well Pad Access Road	12' - 14'	Gravel	See Plan 11
Main Access Road	12' - 14'	Gravel	See Plan 11

**Legend**

Central Street (1" Contour)	1" Contour	20' - 25' Elevation
Original Ground (1" Contour)	1" Contour	20' - 25' Elevation
Center of Structure	1" Contour	20' - 25' Elevation
1" Contour	1" Contour	20' - 25' Elevation
2" Contour	2" Contour	20' - 25' Elevation
3" Contour	3" Contour	20' - 25' Elevation
4" Contour	4" Contour	20' - 25' Elevation
5" Contour	5" Contour	20' - 25' Elevation
6" Contour	6" Contour	20' - 25' Elevation
7" Contour	7" Contour	20' - 25' Elevation
8" Contour	8" Contour	20' - 25' Elevation
9" Contour	9" Contour	20' - 25' Elevation
10" Contour	10" Contour	20' - 25' Elevation
11" Contour	11" Contour	20' - 25' Elevation
12" Contour	12" Contour	20' - 25' Elevation
13" Contour	13" Contour	20' - 25' Elevation
14" Contour	14" Contour	20' - 25' Elevation
15" Contour	15" Contour	20' - 25' Elevation
16" Contour	16" Contour	20' - 25' Elevation
17" Contour	17" Contour	20' - 25' Elevation
18" Contour	18" Contour	20' - 25' Elevation
19" Contour	19" Contour	20' - 25' Elevation
20" Contour	20" Contour	20' - 25' Elevation

**Historical Area**

Area	Notes
Well Pad	See Plan 11
Access Road	See Plan 11
Main Access Road	See Plan 11
1" Contour	See Plan 11
2" Contour	See Plan 11
3" Contour	See Plan 11
4" Contour	See Plan 11
5" Contour	See Plan 11
6" Contour	See Plan 11
7" Contour	See Plan 11
8" Contour	See Plan 11
9" Contour	See Plan 11
10" Contour	See Plan 11
11" Contour	See Plan 11
12" Contour	See Plan 11
13" Contour	See Plan 11
14" Contour	See Plan 11
15" Contour	See Plan 11
16" Contour	See Plan 11
17" Contour	See Plan 11
18" Contour	See Plan 11
19" Contour	See Plan 11
20" Contour	See Plan 11

**Additional Information**

Well Pad	See Plan 11
Access Road	See Plan 11
Main Access Road	See Plan 11
1" Contour	See Plan 11
2" Contour	See Plan 11
3" Contour	See Plan 11
4" Contour	See Plan 11
5" Contour	See Plan 11
6" Contour	See Plan 11
7" Contour	See Plan 11
8" Contour	See Plan 11
9" Contour	See Plan 11
10" Contour	See Plan 11
11" Contour	See Plan 11
12" Contour	See Plan 11
13" Contour	See Plan 11
14" Contour	See Plan 11
15" Contour	See Plan 11
16" Contour	See Plan 11
17" Contour	See Plan 11
18" Contour	See Plan 11
19" Contour	See Plan 11
20" Contour	See Plan 11

**TUG HILL**  
**OPERATING**



100000:1  
 REPARABLE  
 3122 HILL  
 OPERATING



**Bryan Well Pad Site**  
 Pendleton District  
 Mingo County, WV

Date: 10/31/2017  
 Scale: As Shown  
 Drawing: 11-25  
 Sheet: 1 of 1