



west virginia department of environmental protection

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

Austin Caperton , Cabinet Secretary
www.dep.wv.gov

Wednesday, February 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-7HM
47-051-01978-00-00

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-7HM
Farm Name: CNX LAND RESOURCES, INC.
U.S. WELL NUMBER: 47-051-01978-00-00
Horizontal 6A / New Drill
Date Issued: 2/7/2018

Promoting a healthy environment.

02/09/2018

PERMIT CONDITIONS 4705101978

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

CONDITIONS

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

PERMIT CONDITIONS **4705101978**

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

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

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

2) Operator's Well Number: Bryan N-7HM 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 _____

JW
1/10/18

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 6466' - 6519', 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: 18,941'

11) Proposed Horizontal Leg Length: 11,178'

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

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

WW-6B
(04/15)

API NO. 47- 051 - _____
 OPERATOR WELL NO. Bryan N-7HM
 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	105'	100'	216FT^3(CTS)
Fresh Water	13 3/8"	NEW	J55	54.5#	963'	953'	954ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	963'	953'	954ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,613'	2,603'	855ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	18,941	18,931'	4834ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		7,593'	
Liners	N/A						

J. [Signature]
1/10/18

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

PACKERS

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

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WW-6B
(10/14)

API NO. 47-051 - _____
OPERATOR WELL NO. Bryan N-7HM
Well Pad Name: Bryan

[Handwritten signature]
1/10/18

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

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

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

Well to be completed with approximately 27,945,000 lb proppant and 432,050 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

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25) Proposed borehole conditioning procedures:

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

*Note: Attach additional sheets as needed.

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 CaCl₂ + 46.5% Fresh Water

- Premium NE-1 – Class A Portland API spec
- CaCl₂ – 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
- CaCl₂ – 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



Tug Hill Operating, LLC Casing and Cement Program

Bryan N-7HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	100'	CTS
Surface	13 3/8"	J55	17 1/2"	953'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,622'	CTS
Production	5 1/2"	P110	8 7/8 x 8 3/4"	18,931'	CTS

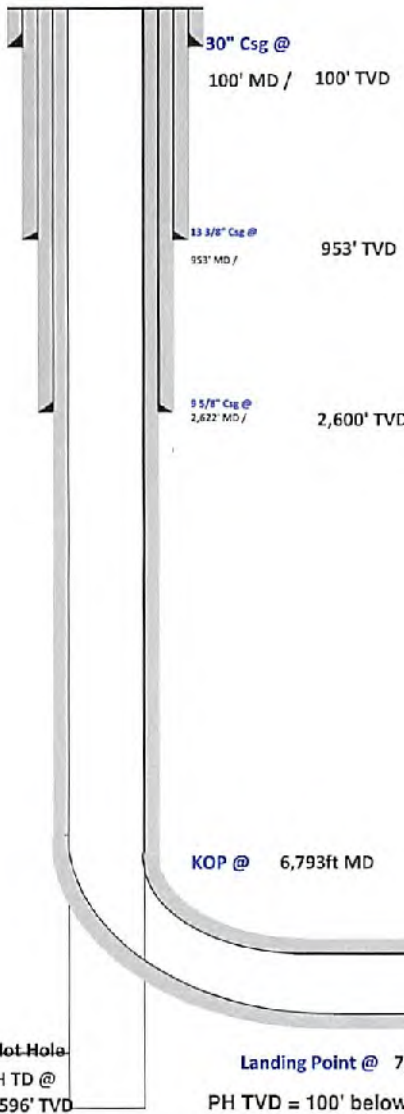
Cement

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

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WELL NAME: Bryan N-7HM
 STATE: West Virginia COUNTY: Marshall
 DISTRICT: Franklin
 DF Elev: 1,191' GL Elev: 1,191'
 TD: 18,931'
 TH Latitude: 39.77574797
 TH Longitude: -80.77656912
 BH Latitude: 39.80686929
 BH Longitude: 80.78777405



FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	803
Sewickley Coal	701
Pittsburgh Coal	796
Big Lime	1970
Weir	2324
Berea	2519
Gordon	2864
Rhinstreet	5717
Geneseo/Burkett	6347
Tully	6382
Hamilton	6417
Marcellus	6466
Landing Depth	6498
Onondaga	6519
Pilot Hole Depth	6596

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	100'	100'	BW	BW	Surface
Surface	17.5	13 3/8	953'	953'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,622'	2,600'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	18,931'	6,302'	20	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	291	A	15.6	Air	None
Surface	971	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	843	A	15	Air	1 Centralizer every other jt
Production	4,268	A	14.5	Air / SOB	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc

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John
1/10/18

Pilot Hole
PH TD @
6,596' TVD

Landing Point @ 7,753' MD / 6,498' TVD
 PH TVD = 100' below Onondaga Top

Lateral TD @ 18,931ft MD
 6,302 ft TVD

4705101978



TUG HILL
OPERATING

Tug Hill Operating LLC

Well: Bryan N-07HM (Slot A)

Site: Bryan Pad

Project: Marshall County, WV

Design: rev4

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	1800.00	12.00	68.23	1795.52	23.22	58.14	2.00	68.23	6.66	Begin 12.00° tangent
4	2929.05	12.00	68.23	2900.00	110.28	276.14	0.00	0.00	31.64	Begin 2°/100' build/turn
5	4345.59	40.33	68.26	4158.47	339.37	850.43	2.00	0.04	97.19	Begin 40.33° tangent
6	6792.79	40.33	68.26	6024.02	926.03	2321.60	0.00	0.00	264.91	Begin 10°/100' build/turn
7	7752.85	91.00	330.15	6498.00	1930.49	2387.50	10.00	-95.55	925.42	Begin 91.00° lateral section
8	18931.14	91.00	330.15	6302.00	11324.49	-3175.06	0.00	0.00	1761.16	PBHL/TD 18931.13 MD/6302.00 TVD



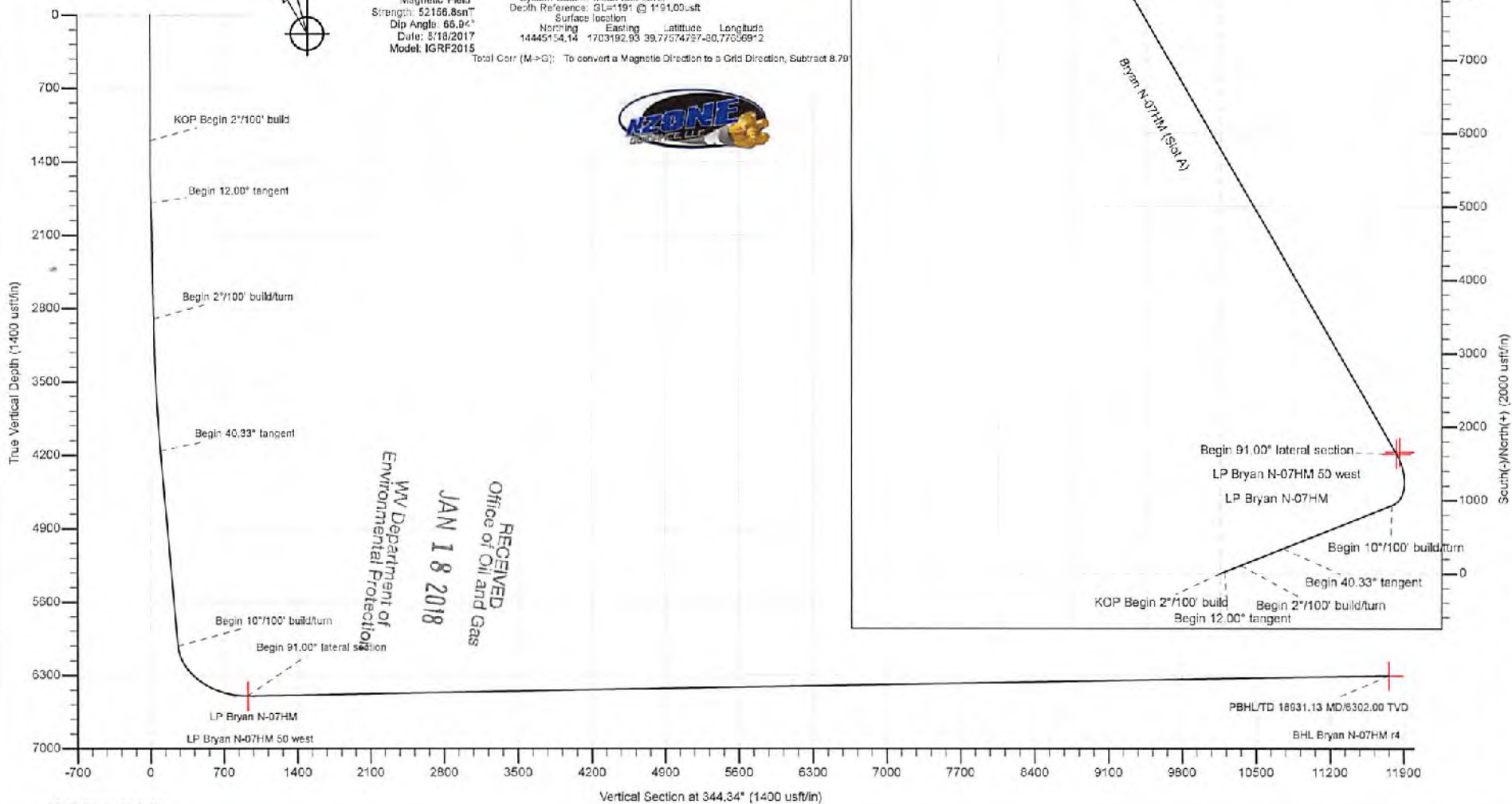
Azimuths to Grid North
True North: -0.14°
Magnetic North: -8.78°

Magnetic Field
Strength: 52166.8snT
Dip Angle: 66.96°
Date: 5/18/2017
Model: IGRF2015

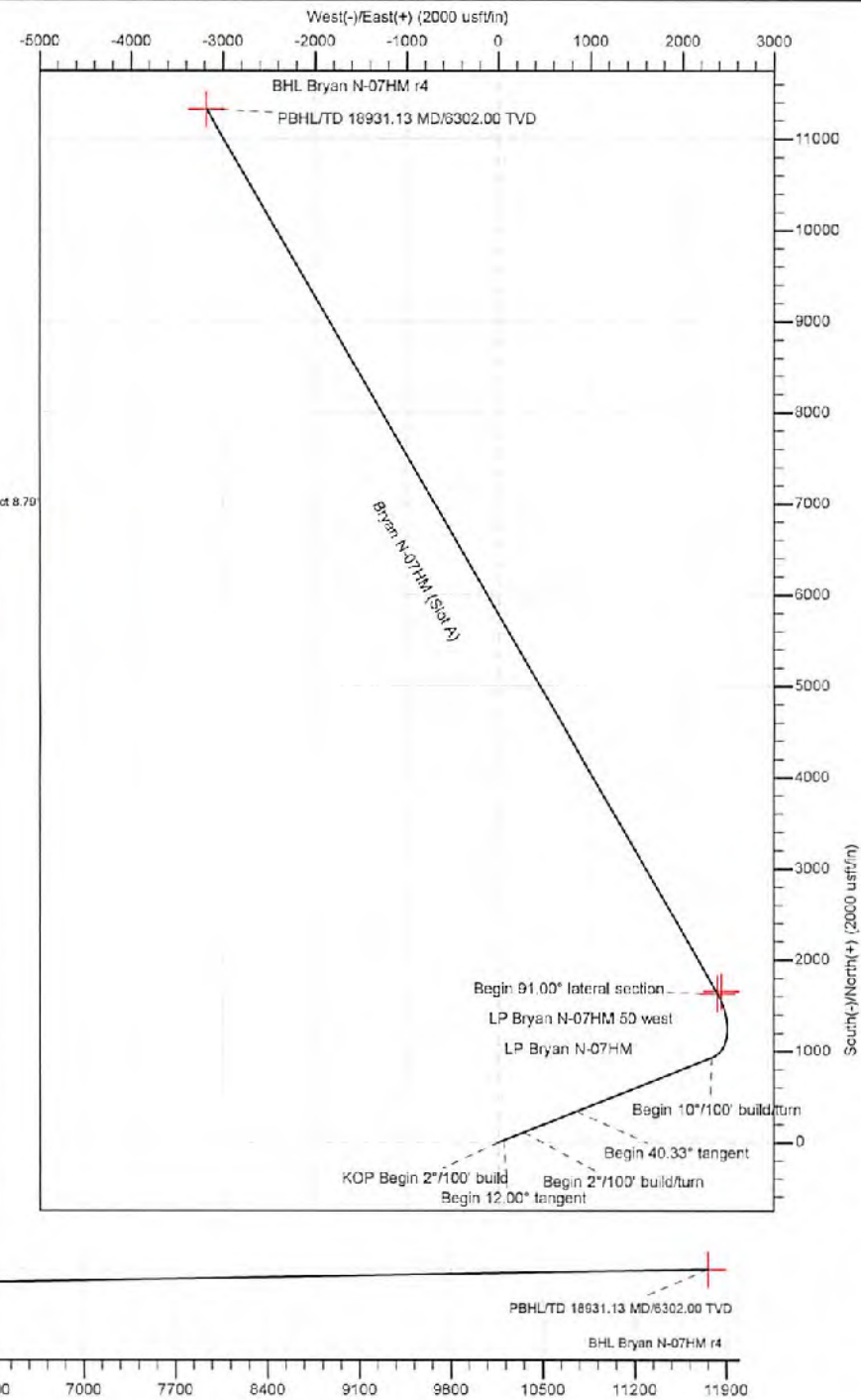
Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD83 West Virginia - HARN
Ellipsoid: GRS 1980
Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level
Depth Reference: GUN=191 @ 191.00usft
Surface location
Northing Easting Latitude Longitude
14445154.14 1703192.93 39.77574737 -80.776569*2

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.78



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Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Bryan N-07HM (Slot A)
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-07HM (Slot A)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Desgn:	rev4		

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-07HM (Slot A)					
Well Position	+N/-S	0.00 usft	Northing:	14,445,154.15 usft	Latitude:	39.77574797
	+E/-W	0.00 usft	Easting:	1,703,192.93 usft	Longitude:	-80.77656912
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	52,156.84969974

Design	rev4				
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	344.34	

Plan Survey Tool Program	Date	1/5/2018			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	18,931.14 rev4 (Original Hole)	MWD	MWD - Standard	

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Plan Sections											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00		
1,800.00	12.00	68.23	1,795.62	23.22	58.14	2.00	2.00	0.00	68.23		
2,929.05	12.00	68.23	2,900.00	110.28	276.14	0.00	0.00	0.00	0.00		
4,345.59	40.33	68.26	4,158.47	339.37	850.43	2.00	2.00	0.00	0.04		
6,792.79	40.33	68.26	6,024.02	926.03	2,321.60	0.00	0.00	0.00	0.00		
7,752.85	91.00	330.15	6,498.00	1,630.49	2,387.50	10.00	5.28	-10.22	-95.55	LP Bryan N-07HM 50	
18,931.14	91.00	330.15	6,302.00	11,324.49	-3,175.06	0.00	0.00	0.00	0.00	BHL Bryan N-07HM r	



Planning Report - Geographic

Database: DB_Jul2216dt_v14
Company: Tug Hill Operating LLC
Project: Marshall County, West Virginia
Site: Bryan Pad
Well: Bryan N-07HM (Slot A)
Wellbore: Original Hole
Design: rev4

Local Co-ordinate Reference: Well Bryan N-07HM (Slot A)
TVD Reference: GL=1191 @ 1191.00usft
MD Reference: GL=1191 @ 1191.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
100.00	0.00	0.00	100.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
200.00	0.00	0.00	200.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
300.00	0.00	0.00	300.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
400.00	0.00	0.00	400.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
500.00	0.00	0.00	500.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
600.00	0.00	0.00	600.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
700.00	0.00	0.00	700.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
800.00	0.00	0.00	800.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
900.00	0.00	0.00	900.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,445,154.15	1,703,192.93	39.77574797	-80.77656912
KOP Begin 2°/100' build									
1,300.00	2.00	68.23	1,299.98	0.65	1.62	14,445,154.79	1,703,194.55	39.77574974	-80.77656335
1,400.00	4.00	68.23	1,399.84	2.59	6.48	14,445,156.73	1,703,199.41	39.77575504	-80.77654803
1,500.00	6.00	68.23	1,499.45	5.82	14.57	14,445,159.97	1,703,207.50	39.77576388	-80.77651720
1,600.00	8.00	68.23	1,598.70	10.34	25.89	14,445,164.49	1,703,218.82	39.77577619	-80.77647688
1,700.00	10.00	68.23	1,697.47	16.14	40.42	14,445,170.29	1,703,233.35	39.77578202	-80.77642512
1,800.00	12.00	68.23	1,795.62	23.22	58.14	14,445,177.36	1,703,251.07	39.77581134	-80.77636199
Begin 12.00° tangent									
1,900.00	12.00	68.23	1,893.44	30.93	77.45	14,445,185.08	1,703,270.38	39.77583238	-80.77628320
2,000.00	12.00	68.23	1,991.25	38.64	96.75	14,445,192.79	1,703,289.68	39.77585343	-80.77622442
2,100.00	12.00	68.23	2,089.07	46.35	116.08	14,445,200.50	1,703,308.99	39.77587447	-80.77615563
2,200.00	12.00	68.23	2,186.88	54.06	135.37	14,445,208.21	1,703,328.30	39.77589551	-80.77608684
2,300.00	12.00	68.23	2,284.70	61.77	154.68	14,445,215.92	1,703,347.61	39.77591656	-80.77601805
2,400.00	12.00	68.23	2,382.51	69.48	173.99	14,445,223.63	1,703,366.92	39.77593760	-80.77594926
2,500.00	12.00	68.23	2,480.33	77.20	193.30	14,445,231.34	1,703,386.23	39.77595865	-80.77588047
2,600.00	12.00	68.23	2,578.14	84.91	212.60	14,445,239.05	1,703,405.53	39.77597969	-80.77581168
2,700.00	12.00	68.23	2,675.96	92.62	231.91	14,445,246.76	1,703,424.84	39.77600073	-80.77574289
2,800.00	12.00	68.23	2,773.77	100.33	251.22	14,445,254.48	1,703,444.15	39.77602178	-80.77567410
2,900.00	12.00	68.23	2,871.59	108.04	270.53	14,445,262.19	1,703,463.46	39.77604282	-80.77560531
2,929.05	12.00	68.23	2,900.00	110.28	276.14	14,445,264.43	1,703,469.07	39.77604893	-80.77558532
Begin 2°/100' build/tum									
3,000.00	13.42	68.23	2,969.21	116.07	290.63	14,445,270.21	1,703,483.56	39.77606473	-80.77553368
3,100.00	15.42	68.24	3,066.06	125.30	313.76	14,445,279.45	1,703,506.69	39.77608993	-80.77545129
3,200.00	17.42	68.24	3,161.97	135.78	340.01	14,445,289.92	1,703,532.94	39.77611852	-80.77535776
3,300.00	19.42	68.25	3,256.85	147.49	369.35	14,445,301.64	1,703,562.28	39.77615048	-80.77525322
3,400.00	21.42	68.25	3,350.56	160.42	401.78	14,445,314.56	1,703,594.69	39.77618578	-80.77513778
3,500.00	23.42	68.25	3,442.99	174.55	437.18	14,445,328.70	1,703,630.11	39.77622433	-80.77501158
3,600.00	25.42	68.25	3,534.04	189.87	475.57	14,445,344.01	1,703,668.50	39.77626613	-80.77487479
3,700.00	27.42	68.25	3,623.60	206.35	516.90	14,445,360.50	1,703,709.83	39.77631112	-80.77472756
3,800.00	29.42	68.25	3,711.54	223.96	561.10	14,445,378.13	1,703,754.03	39.77635923	-80.77457008
3,900.00	31.42	68.26	3,797.77	242.74	608.13	14,445,396.89	1,703,801.06	39.77641042	-80.77440254
4,000.00	33.42	68.26	3,882.18	262.60	657.92	14,445,416.75	1,703,850.85	39.77646462	-80.77422513
4,100.00	35.42	68.26	3,964.67	283.54	710.42	14,445,437.69	1,703,903.35	39.77652175	-80.77403809
4,200.00	37.42	68.28	4,045.14	305.53	765.56	14,445,459.68	1,703,958.49	39.77658178	-80.77384163
4,300.00	39.42	68.26	4,123.48	328.55	823.28	14,445,482.69	1,704,016.21	39.77664457	-80.77363800
4,345.59	40.33	68.28	4,158.47	339.37	850.43	14,445,493.52	1,704,043.36	39.77667412	-80.77353927
Begin 40.33° tangent									
4,400.00	40.33	68.28	4,199.95	352.42	883.14	14,445,506.56	1,704,076.07	39.77670971	-80.77342274
4,500.00	40.33	68.26	4,276.18	376.39	943.26	14,445,530.54	1,704,136.19	39.77677513	-80.77320855
4,600.00	40.33	68.26	4,352.41	400.36	1,003.37	14,445,554.51	1,704,196.30	39.77684055	-80.77299437
4,700.00	40.33	68.26	4,428.64	424.33	1,063.49	14,445,578.48	1,704,256.42	39.77690598	-80.77278019



Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Bryan Pad
 Well: Bryan N-07HM (Slot A)
 Wellbore: Original Hole
 Design: rev4

Local Co-ordinate Reference: Well Bryan N-07HM (Slot A)
 TVD Reference: GL=1191 @ 1191.00usft
 MD Reference: GL=1191 @ 1191.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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JAN 18 2018

WV Department of
Environmental Protection

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,800.00	40.33	88.26	4,504.87	448.31	1,123.61	14,445,602.45	1,704,316.54	39.77697138	-80.77256601
4,900.00	40.33	88.26	4,581.11	472.28	1,183.72	14,445,626.43	1,704,376.65	39.77703680	-80.77235182
5,000.00	40.33	88.26	4,657.34	496.25	1,243.84	14,445,650.40	1,704,436.77	39.77710221	-80.77213764
5,100.00	40.33	88.26	4,733.57	520.22	1,303.95	14,445,674.37	1,704,496.88	39.77716763	-80.77192345
5,200.00	40.33	88.26	4,809.80	544.20	1,364.07	14,445,698.34	1,704,557.00	39.77723304	-80.77170927
5,300.00	40.33	88.26	4,886.03	568.17	1,424.19	14,445,722.32	1,704,617.12	39.77729846	-80.77149508
5,400.00	40.33	88.26	4,962.27	592.14	1,484.30	14,445,746.29	1,704,677.23	39.77736387	-80.77128090
5,500.00	40.33	88.26	5,038.50	616.12	1,544.42	14,445,770.26	1,704,737.35	39.77742928	-80.77106671
5,600.00	40.33	88.26	5,114.73	640.09	1,604.54	14,445,794.23	1,704,797.47	39.77749470	-80.77085253
5,700.00	40.33	88.26	5,190.96	664.06	1,664.65	14,445,818.21	1,704,857.58	39.77756011	-80.77063834
5,800.00	40.33	88.26	5,267.19	688.03	1,724.77	14,445,842.18	1,704,917.70	39.77762552	-80.77042415
5,900.00	40.33	88.26	5,343.43	712.01	1,784.89	14,445,866.15	1,704,977.82	39.77769093	-80.77020997
6,000.00	40.33	88.26	5,419.66	735.98	1,845.00	14,445,890.12	1,705,037.93	39.77775635	-80.76999578
6,100.00	40.33	88.26	5,495.89	759.95	1,905.12	14,445,914.10	1,705,098.05	39.77782176	-80.76978159
6,200.00	40.33	88.26	5,572.12	783.92	1,965.24	14,445,938.07	1,705,158.17	39.77788717	-80.76956740
6,300.00	40.33	88.26	5,648.35	807.90	2,025.35	14,445,962.04	1,705,218.28	39.77795258	-80.76935321
6,400.00	40.33	88.26	5,724.59	831.87	2,085.47	14,445,986.02	1,705,278.40	39.77801799	-80.76913902
6,500.00	40.33	88.26	5,800.82	855.84	2,145.59	14,446,009.99	1,705,338.52	39.77808340	-80.76892483
6,600.00	40.33	88.26	5,877.05	879.81	2,205.70	14,446,033.96	1,705,398.63	39.77814881	-80.76871064
6,700.00	40.33	88.26	5,953.28	903.79	2,265.82	14,446,057.93	1,705,458.75	39.77821422	-80.76849645
6,792.79	40.33	88.26	6,024.02	926.03	2,321.60	14,446,080.18	1,705,514.53	39.77827491	-80.76829770
Begin 10°/100' build/turn									
6,800.00	40.27	67.15	6,029.52	927.80	2,325.92	14,446,081.95	1,705,518.85	39.77827974	-80.76828233
6,900.00	40.48	51.89	6,105.90	960.56	2,381.30	14,446,114.70	1,705,574.24	39.77836930	-80.76808498
7,000.00	42.66	36.96	6,180.88	1,007.88	2,427.27	14,446,162.03	1,705,620.20	39.77849894	-80.76792084
7,100.00	46.58	23.83	6,252.18	1,068.34	2,462.42	14,446,222.49	1,705,655.35	39.77866472	-80.76779519
7,200.00	51.79	12.53	6,317.64	1,140.09	2,485.67	14,446,294.24	1,705,678.60	39.77886162	-80.76771175
7,300.00	57.92	2.86	6,375.27	1,220.98	2,498.33	14,446,375.11	1,705,689.26	39.77908363	-80.76767306
7,400.00	64.70	354.46	6,423.31	1,308.49	2,494.08	14,446,462.64	1,705,687.01	39.77932402	-80.76768028
7,500.00	71.90	346.98	6,460.32	1,400.02	2,478.97	14,446,554.17	1,705,671.90	39.77957549	-80.76773321
7,600.00	79.36	340.10	6,485.15	1,492.76	2,451.47	14,446,646.91	1,705,644.40	39.77983039	-80.76783023
7,700.00	86.96	333.56	6,497.06	1,583.91	2,412.42	14,446,738.06	1,705,605.35	39.78008098	-80.76796840
7,752.85	91.00	330.15	6,498.00	1,630.49	2,387.50	14,446,784.63	1,705,580.43	39.78020907	-80.76805666
Begin 91.00° lateral section									
7,800.00	91.00	330.15	6,497.17	1,671.38	2,364.04	14,446,825.52	1,705,556.97	39.78032153	-80.76813980
7,900.00	91.00	330.15	6,495.42	1,758.10	2,314.27	14,446,912.24	1,705,507.20	39.78056004	-80.76831612
8,000.00	91.00	330.15	6,493.67	1,844.82	2,264.51	14,446,998.97	1,705,457.44	39.78079856	-80.76849245
8,100.00	91.00	330.15	6,491.91	1,931.54	2,214.75	14,447,085.69	1,705,407.88	39.78103707	-80.76866877
8,200.00	91.00	330.15	6,490.16	2,018.26	2,164.99	14,447,172.41	1,705,357.92	39.78127559	-80.76884510
8,300.00	91.00	330.15	6,488.41	2,104.98	2,115.22	14,447,259.13	1,705,308.15	39.78151410	-80.76902143
8,400.00	91.00	330.15	6,486.65	2,191.71	2,065.46	14,447,345.85	1,705,258.39	39.78175262	-80.76919776
8,500.00	91.00	330.15	6,484.90	2,278.43	2,015.70	14,447,432.57	1,705,208.63	39.78199113	-80.76937409
8,600.00	91.00	330.15	6,483.15	2,365.15	1,965.94	14,447,519.30	1,705,158.87	39.78222964	-80.76955042
8,700.00	91.00	330.15	6,481.39	2,451.87	1,916.18	14,447,606.02	1,705,109.11	39.78246816	-80.76972675
8,800.00	91.00	330.15	6,479.64	2,538.59	1,866.41	14,447,692.74	1,705,059.34	39.78270667	-80.76990309
8,900.00	91.00	330.15	6,477.89	2,625.31	1,816.65	14,447,779.46	1,705,009.58	39.78294518	-80.77007942
9,000.00	91.00	330.15	6,476.13	2,712.04	1,766.89	14,447,866.18	1,704,959.82	39.78318369	-80.77025576
9,100.00	91.00	330.15	6,474.38	2,798.76	1,717.13	14,447,952.90	1,704,910.06	39.78342221	-80.77043210
9,200.00	91.00	330.15	6,472.63	2,885.48	1,667.36	14,448,039.63	1,704,860.29	39.78366072	-80.77060844
9,300.00	91.00	330.15	6,470.87	2,972.20	1,617.60	14,448,126.35	1,704,810.53	39.78389923	-80.77078478
9,400.00	91.00	330.15	6,469.12	3,058.92	1,567.84	14,448,213.07	1,704,760.77	39.78413774	-80.77096112
9,500.00	91.00	330.15	6,467.37	3,145.64	1,518.08	14,448,299.79	1,704,711.01	39.78437625	-80.77113746
9,600.00	91.00	330.15	6,465.61	3,232.37	1,468.32	14,448,386.51	1,704,661.25	39.78461476	-80.77131381
9,700.00	91.00	330.15	6,463.86	3,319.09	1,418.55	14,448,473.23	1,704,611.48	39.78485327	-80.77149015



Planning Report - Geographic

4705101978

Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Bryan Pad
 Well: Bryan N-07HM (Slot A)
 Wellbore: Original Hole
 Design: rev4

Local Co-ordinate Reference: Well Bryan N-07HM (Slot A)
 TVD Reference: GL=1191 @ 1191.00usft
 MD Reference: GL=1191 @ 1191.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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Planned Survey

WV Department of
 Environmental Protection

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,800.00	91.00	330.15	6,462.11	3,405.81	1,368.79	14,448,559.96	1,704,561.72	39.78509178	-80.77186650
9,900.00	91.00	330.15	6,460.35	3,492.53	1,319.03	14,448,646.68	1,704,511.96	39.78533029	-80.77184285
10,000.00	91.00	330.15	6,458.60	3,579.25	1,269.27	14,448,733.40	1,704,462.20	39.78556880	-80.77201919
10,100.00	91.00	330.15	6,456.85	3,665.97	1,219.50	14,448,820.12	1,704,412.43	39.78580731	-80.77219554
10,200.00	91.00	330.15	6,455.09	3,752.70	1,169.74	14,448,906.84	1,704,362.67	39.78604582	-80.77237190
10,300.00	91.00	330.15	6,453.34	3,839.42	1,119.98	14,448,993.56	1,704,312.91	39.78628433	-80.77254825
10,400.00	91.00	330.15	6,451.59	3,926.14	1,070.22	14,449,080.29	1,704,263.15	39.78652284	-80.77272460
10,500.00	91.00	330.15	6,449.83	4,012.86	1,020.46	14,449,167.01	1,704,213.39	39.78676135	-80.77290096
10,600.00	91.00	330.15	6,448.08	4,099.58	970.89	14,449,253.73	1,704,163.62	39.78699985	-80.77307731
10,700.00	91.00	330.15	6,446.32	4,186.30	920.93	14,449,340.45	1,704,113.86	39.78723836	-80.77325367
10,800.00	91.00	330.15	6,444.57	4,273.03	871.17	14,449,427.17	1,704,064.10	39.78747687	-80.77343003
10,900.00	91.00	330.15	6,442.82	4,359.75	821.41	14,449,513.89	1,704,014.34	39.78771538	-80.77360639
11,000.00	91.00	330.15	6,441.06	4,446.47	771.65	14,449,600.62	1,703,964.58	39.78795388	-80.77378275
11,100.00	91.00	330.15	6,439.31	4,533.19	721.88	14,449,687.34	1,703,914.81	39.78819239	-80.77395911
11,200.00	91.00	330.15	6,437.56	4,619.91	672.12	14,449,774.06	1,703,865.05	39.78843090	-80.77413548
11,300.00	91.00	330.15	6,435.80	4,706.63	622.36	14,449,860.78	1,703,815.29	39.78866940	-80.77431184
11,400.00	91.00	330.15	6,434.05	4,793.36	572.60	14,449,947.50	1,703,765.53	39.78890791	-80.77448821
11,500.00	91.00	330.15	6,432.30	4,880.08	522.83	14,450,034.22	1,703,715.76	39.78914641	-80.77466457
11,600.00	91.00	330.15	6,430.54	4,966.80	473.07	14,450,120.95	1,703,666.00	39.78938492	-80.77484094
11,700.00	91.00	330.15	6,428.79	5,053.52	423.31	14,450,207.67	1,703,616.24	39.78962342	-80.77501731
11,800.00	91.00	330.15	6,427.04	5,140.24	373.55	14,450,294.39	1,703,566.48	39.78986193	-80.77519368
11,900.00	91.00	330.15	6,425.28	5,226.96	323.79	14,450,381.11	1,703,516.72	39.79010043	-80.77537005
12,000.00	91.00	330.15	6,423.53	5,313.69	274.02	14,450,467.83	1,703,466.95	39.79033894	-80.77554643
12,100.00	91.00	330.15	6,421.78	5,400.41	224.26	14,450,554.55	1,703,417.19	39.79057744	-80.77572280
12,200.00	91.00	330.15	6,420.02	5,487.13	174.50	14,450,641.28	1,703,367.43	39.79081594	-80.77590918
12,300.00	91.00	330.15	6,418.27	5,573.85	124.74	14,450,728.00	1,703,317.67	39.79105445	-80.77609555
12,400.00	91.00	330.15	6,416.52	5,660.57	74.97	14,450,814.72	1,703,267.90	39.79129295	-80.77628193
12,500.00	91.00	330.15	6,414.76	5,747.29	25.21	14,450,901.44	1,703,218.14	39.79153145	-80.77646831
12,600.00	91.00	330.15	6,413.01	5,834.02	-24.55	14,450,988.16	1,703,168.38	39.79176995	-80.77665469
12,700.00	91.00	330.15	6,411.26	5,920.74	-74.31	14,451,074.88	1,703,118.62	39.79200846	-80.77684107
12,800.00	91.00	330.15	6,409.50	6,007.46	-124.07	14,451,161.61	1,703,068.86	39.79224696	-80.77699546
12,900.00	91.00	330.15	6,407.75	6,094.18	-173.84	14,451,248.33	1,703,019.09	39.79248546	-80.77713384
13,000.00	91.00	330.15	6,406.00	6,180.90	-223.60	14,451,335.05	1,702,969.33	39.79272396	-80.77727222
13,100.00	91.00	330.15	6,404.24	6,267.62	-273.36	14,451,421.77	1,702,919.57	39.79296246	-80.77741060
13,200.00	91.00	330.15	6,402.49	6,354.35	-323.12	14,451,508.49	1,702,869.81	39.79320096	-80.77754898
13,300.00	91.00	330.15	6,400.74	6,441.07	-372.89	14,451,595.21	1,702,820.04	39.79343946	-80.77768736
13,400.00	91.00	330.15	6,398.98	6,527.79	-422.65	14,451,681.94	1,702,770.28	39.79367796	-80.77782574
13,500.00	91.00	330.15	6,397.23	6,614.51	-472.41	14,451,768.66	1,702,720.52	39.79391646	-80.77796412
13,600.00	91.00	330.15	6,395.48	6,701.23	-522.17	14,451,855.38	1,702,670.76	39.79415496	-80.77810250
13,700.00	91.00	330.15	6,393.72	6,787.96	-571.93	14,451,942.10	1,702,621.00	39.79439346	-80.77824088
13,800.00	91.00	330.15	6,391.97	6,874.68	-621.70	14,452,028.82	1,702,571.23	39.79463196	-80.77837926
13,900.00	91.00	330.15	6,390.22	6,961.40	-671.46	14,452,115.54	1,702,521.47	39.79487046	-80.77851764
14,000.00	91.00	330.15	6,388.48	7,048.12	-721.22	14,452,202.27	1,702,471.71	39.79510896	-80.77865602
14,100.00	91.00	330.15	6,386.71	7,134.84	-770.98	14,452,288.99	1,702,421.95	39.79534746	-80.77879440
14,200.00	91.00	330.15	6,384.95	7,221.56	-820.75	14,452,375.71	1,702,372.18	39.79558596	-80.77893278
14,300.00	91.00	330.15	6,383.20	7,308.29	-870.51	14,452,462.43	1,702,322.42	39.79582446	-80.77907116
14,400.00	91.00	330.15	6,381.45	7,395.01	-920.27	14,452,549.15	1,702,272.66	39.79606296	-80.77920954
14,500.00	91.00	330.15	6,379.70	7,481.73	-970.03	14,452,635.87	1,702,222.90	39.79630146	-80.77934792
14,600.00	91.00	330.15	6,377.94	7,568.45	-1,019.79	14,452,722.60	1,702,173.14	39.79653996	-80.77948630
14,700.00	91.00	330.15	6,376.19	7,655.17	-1,069.56	14,452,809.32	1,702,123.37	39.79677846	-80.77962468
14,800.00	91.00	330.15	6,374.44	7,741.89	-1,119.32	14,452,896.04	1,702,073.61	39.79701696	-80.77976306
14,900.00	91.00	330.15	6,372.68	7,828.62	-1,169.08	14,452,982.76	1,702,023.85	39.79725546	-80.77990144
15,000.00	91.00	330.15	6,370.93	7,915.34	-1,218.84	14,453,069.48	1,701,974.09	39.79749396	-80.77999982
15,100.00	91.00	330.15	6,369.18	8,002.06	-1,268.60	14,453,156.20	1,701,924.33	39.79773246	-80.78009820
15,200.00	91.00	330.15	6,367.42	8,088.78	-1,318.37	14,453,242.93	1,701,874.56	39.79797096	-80.78019658



Database: DB_Jul2216dt_v14
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Bryan Pad
 Well: Bryan N-07HM (Slot A)
 Wellbore: Original Hole
 Design: rev4

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well Bryan N-07HM (Slot A)
 GL=1191 @ 1191.00usft
 GL=1191 @ 1191.00usft
 Grid
 Minimum Curvature

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Planned Survey										WV Department of Environmental Protection
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
15,300.00	91.00	330.15	6,365.67	8,175.50	-1,368.13	14,453,329.65	1,701,624.80	39.79820942	-80.78136743	
15,400.00	91.00	330.15	6,363.92	8,262.22	-1,417.89	14,453,416.37	1,701,775.04	39.79844791	-80.78154384	
15,500.00	91.00	330.15	6,362.16	8,348.95	-1,467.65	14,453,503.09	1,701,725.28	39.79866641	-80.78172026	
15,600.00	91.00	330.15	6,360.41	8,435.67	-1,517.42	14,453,589.81	1,701,675.51	39.79892490	-80.78189667	
15,700.00	91.00	330.15	6,358.65	8,522.39	-1,567.18	14,453,676.53	1,701,625.75	39.79916339	-80.78207309	
15,800.00	91.00	330.15	6,356.90	8,609.11	-1,616.94	14,453,763.26	1,701,575.99	39.79940189	-80.78224951	
15,900.00	91.00	330.15	6,355.15	8,695.83	-1,666.70	14,453,849.98	1,701,526.23	39.79964038	-80.78242593	
16,000.00	91.00	330.15	6,353.39	8,782.55	-1,716.46	14,453,936.70	1,701,476.47	39.79987887	-80.78260235	
16,100.00	91.00	330.15	6,351.64	8,869.28	-1,766.23	14,454,023.42	1,701,426.70	39.80011737	-80.78277876	
16,200.00	91.00	330.15	6,349.89	8,955.00	-1,815.99	14,454,110.14	1,701,376.94	39.80035586	-80.78295520	
16,300.00	91.00	330.15	6,348.13	9,042.72	-1,865.75	14,454,196.87	1,701,327.18	39.80059435	-80.78313163	
16,400.00	91.00	330.15	6,346.38	9,129.44	-1,915.51	14,454,283.59	1,701,277.42	39.80083284	-80.78330805	
16,500.00	91.00	330.15	6,344.63	9,216.16	-1,965.28	14,454,370.31	1,701,227.65	39.80107134	-80.78348448	
16,600.00	91.00	330.15	6,342.87	9,302.88	-2,015.04	14,454,457.03	1,701,177.89	39.80130983	-80.78366091	
16,700.00	91.00	330.15	6,341.12	9,389.61	-2,064.80	14,454,543.75	1,701,128.13	39.80154832	-80.78383734	
16,800.00	91.00	330.15	6,339.37	9,476.33	-2,114.56	14,454,630.47	1,701,078.37	39.80178681	-80.78401377	
16,900.00	91.00	330.15	6,337.61	9,563.05	-2,164.32	14,454,717.20	1,701,028.61	39.80202530	-80.78419021	
17,000.00	91.00	330.15	6,335.86	9,649.77	-2,214.09	14,454,803.92	1,700,978.84	39.80226379	-80.78436664	
17,100.00	91.00	330.15	6,334.11	9,736.49	-2,263.85	14,454,890.64	1,700,929.08	39.80250228	-80.78454307	
17,200.00	91.00	330.15	6,332.35	9,823.21	-2,313.61	14,454,977.36	1,700,879.32	39.80274077	-80.78471951	
17,300.00	91.00	330.15	6,330.60	9,909.94	-2,363.37	14,455,064.08	1,700,829.56	39.80297926	-80.78489595	
17,400.00	91.00	330.15	6,328.85	9,996.66	-2,413.14	14,455,150.80	1,700,779.79	39.80321775	-80.78507239	
17,500.00	91.00	330.15	6,327.09	10,083.38	-2,462.90	14,455,237.53	1,700,730.03	39.80345624	-80.78524883	
17,600.00	91.00	330.15	6,325.34	10,170.10	-2,512.66	14,455,324.25	1,700,680.27	39.80369473	-80.78542527	
17,700.00	91.00	330.15	6,323.59	10,256.82	-2,562.42	14,455,410.97	1,700,630.51	39.80393321	-80.78560171	
17,800.00	91.00	330.15	6,321.83	10,343.54	-2,612.18	14,455,497.69	1,700,580.75	39.80417170	-80.78577816	
17,900.00	91.00	330.15	6,320.08	10,430.27	-2,661.95	14,455,584.41	1,700,530.98	39.80441019	-80.78595460	
18,000.00	91.00	330.15	6,318.33	10,516.99	-2,711.71	14,455,671.13	1,700,481.22	39.80464868	-80.78613105	
18,100.00	91.00	330.15	6,316.57	10,603.71	-2,761.47	14,455,757.86	1,700,431.46	39.80488717	-80.78630749	
18,200.00	91.00	330.15	6,314.82	10,690.43	-2,811.23	14,455,844.58	1,700,381.70	39.80512565	-80.78648394	
18,300.00	91.00	330.15	6,313.07	10,777.15	-2,861.00	14,455,931.30	1,700,331.94	39.80536414	-80.78666039	
18,400.00	91.00	330.15	6,311.31	10,863.87	-2,910.76	14,456,018.02	1,700,282.17	39.80560263	-80.78683684	
18,500.00	91.00	330.15	6,309.56	10,950.60	-2,960.52	14,456,104.74	1,700,232.41	39.80584111	-80.78701330	
18,600.00	91.00	330.15	6,307.81	11,037.32	-3,010.28	14,456,191.46	1,700,182.65	39.80607960	-80.78718975	
18,700.00	91.00	330.15	6,306.05	11,124.04	-3,060.04	14,456,278.18	1,700,132.89	39.80631808	-80.78736620	
18,800.00	91.00	330.15	6,304.30	11,210.76	-3,109.81	14,456,364.91	1,700,083.12	39.80655657	-80.78754266	
18,900.00	91.00	330.15	6,302.55	11,297.48	-3,159.57	14,456,451.63	1,700,033.36	39.80679505	-80.78771912	
18,931.13	91.00	330.15	6,302.00	11,324.48	-3,175.06	14,456,478.63	1,700,017.87	39.80686929	-80.78777405	
PBHL/TD 18931.13 MD/6302.00 TVD										
18,931.14	91.00	330.15	6,302.00	11,324.49	-3,175.06	14,456,478.63	1,700,017.87	39.80686931	-80.78777406	



Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Bryan N-07HM (Slot A)
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-07HM (Slot A)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev4		

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Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
BHL Bryan N-07HM r4 - plan hits target center - Point	0.00	0.00	6,302.00	11,324.49	-3,175.06	14,456,478.63	1,700,017.87	39.80666931	-80.78777406
LP Bryan N-07HM - plan misses target center by 50.00usft at 7752.98usft MD (6498.00 TVD, 1630.60 N, 2387.44 E) - Point	0.00	0.00	6,498.00	1,655.48	2,430.80	14,446,809.63	1,705,623.73	39.78027740	-80.76790229
LP Bryan N-07HM 50 wt - plan hits target center - Point	0.00	0.01	6,498.00	1,630.49	2,387.50	14,446,784.63	1,705,580.43	39.78020907	-80.76805666

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Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	
1,200.00	1,200.00	0.00	0.00	KOP Begin 2°/100' build
1,800.00	1,795.62	23.22	58.14	Begin 12.00° tangent
2,929.05	2,900.00	110.28	276.14	Begin 2°/100' build/turn
4,345.59	4,158.47	339.37	850.43	Begin 40.33° tangent
6,792.79	6,024.02	926.03	2,321.60	Begin 10°/100' build/turn
7,752.85	6,498.00	1,630.49	2,387.50	Begin 91.00° lateral section
18,931.13	6,302.00	11,324.48	-3,175.06	PBHL/TD 18931.13 MD/6302.00 TVD

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

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

Data Sources Reviewed:

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

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (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-7HM

Wells within 500' Buffer

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705101340	Tug Hill Operating (formerly operated by Chevron and AB Resources)	6450' TVD 10601' 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.
4705170810	Manufacturer's Light and Heat	Unknown	Unknown	Unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be effected by fracturing in the planned Marcellus well.	State records are incomplete
4705101977	Tug Hill Operating	6596' TVD, planned	None	None	No, Permit submitted	Permit submitted Marcellus well. Not yet drilled
4705101978	Tug Hill Operating	6596' TVD, planned	None	None	No, Permit submitted	Permit submitted Marcellus well. Not yet drilled
4705101979	Tug Hill Operating	6596' TVD, planned	None	None	No, Permit submitted	Permit submitted Marcellus well. Not yet drilled
4705101980	Tug Hill Operating	6596' TVD, planned	None	None	No, Permit submitted	Permit submitted Marcellus well. Not yet drilled

WV Geological & Economic Survey

Well: County = 51 Permit = 01340

Location Information:

API: COUNTY PERMIT TAX DISTRICT QUAD_W3 QUAD_W4 LAT_BO LON_BO UTMN UTMN

4705101340 Marshall 1340 Production Exchange Dist. Operation 39 17103 49 77631 510100 84029010

Bottom Hole Location Information:

API: SP FLWD UTMN LON_BO LAT_BO

4705101340 1 As Proposed 01340 4 8404200.9 80 78208 20 78181

Owner Information:

API	COMP_OI	SURFAC	OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_Ownr	OPERATOR_AT_COMPLETION	PRDF_VDR	PRDF_TRG	PRM_TFM	EST_PR
4705101340	410230	Oil/Gas/Prod	Chevron Appalachia LLC	1060	1060	1060	1060	1060	1060	1060	1060	1060	1060

Completion Information:

API	COMP_OI	ACTIVITY	FIELD	DEPTH_FTH	DEPTH_FTH	INITIAL_CLASS	FINAL_CLASS	TYPE	BD	CRP_MIND	TVD	TMD	NEW_FTH	G_LSEP	O_AFT	O_LSEP	O_AFT	NOI_LSEP	NOI_AFT	P_FSEP
4705101340	410230	Oil/Gas/Prod	1311	6450	10601	Development	Development	Oil/Gas	2465	1000	10601	10601	6450	10601	10601	10601	10601	10601	10601	10601

Comment: 4/1/2010 Kick off point at 5500

Pay/Show/Water Information:

API	COMP_OI	ACTIVITY	PRODUCT	SECTION	DEPTH_TOP	FM_TOP	DEPTH_BOTTOM	FM_BOTTOM	O_REF	O_AFT	O_LSEP	O_AFT	WATER_ONTY
4705101340	410230	Water	Oil/Gas	1060	10601	10601	10601	10601	10601	10601	10601	10601	10601

Production Gas Information (Volumes in Mcf)

API	PRODUCTION_OPERATOR	PRD_YEAR	ANL_QTY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4705101340	AB Resources PA	2010	0	0	0	0	0	0	0	0	0	0	0	0	0

Production Oil Information (Volumes in Bbl) ** some operators may have reported NGL under Oil

API	PRODUCTION_OPERATOR	PRD_YEAR	ANL_QTY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4705101340	AB Resources PA	2010	0	0	0	0	0	0	0	0	0	0	0	0	0

Production NGL Information (Volumes in Dth) ** some operators may have reported NGL under Oil

API	PRODUCTION_OPERATOR	PRD_YEAR	ANL_QTY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4705101340	Chevron Appalachia, LLC	2010	0	0	0	0	0	0	0	0	0	0	0	0	0

Production Water Information (Volumes in Gallons)

API	PRODUCTION_OPERATOR	PRD_YEAR	ANL_QTY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4705101340	Chevron Appalachia, LLC	2010	0	0	0	0	0	0	0	0	0	0	0	0	0

Stratigraphy Information:

API	SURFACE	FB	FM_QUALITY	DEPTH_TOP	DEPTH_BOTTOM	THICKNESS	THICKNESS_QUALITY	ELEV DATUM
4705101340	Oil/Gas/Prod	Surf	Oil/Gas	0	0	0	0	0

Wireline (E-Log) Information:

API	LOG_ID	LOG_BO	DEPTH_FTH	LOG_ID_AVAL	SCAN	DIGITIZED	GR_BO	GR_TOP	O_TOP	O_BO	L_TOP	L_BO	T_TOP	T_BO	O_TOP	O_BO	INCH	RECORDED	KDF	LOGNO	REV_N
4705101340	1060	10601	6450	10601	10601	10601	10601	10601	10601	10601	10601	10601	10601	10601	10601	10601	10601	10601	10601	10601	10601


Comment: logs: caliper, lamination, PE: LWD, G with measured and vertical depth included.

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Select County: (051) Marshall

Enter Permit #: 70810

Get Data Reset

Select datatypes: (Check All)

Location Production Plugging

Owner/Completion Stratigraphy Sample

Pay/Show/Water Logs Btm Hole Loc

[TABLE Descriptions](#)

[County Code Translations](#)

[Permit Withdrawal Status](#)

[About Notes](#)

[Contact Information](#)

[Database](#)

[WVGES Main](#)

[Pipeline.Planet](#)

Well: County = 61 Permit = 70810

WV Geological & Economic Survey

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_78	QUAD_18	LAT_DD	LONG_DD	UTMR	UTMN
4708170810	Marshall	70810	Franklin	Ravensan Point	Carlington	29.625978	-90.738355	518117	4402244.4

There is no Bottom Hole Location data for this well

Owner Information

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TROJ_FM	TFM_EST_PR
4708170810	William Pugh, Miss Jeanne Sphaus	1	1621				Managers Light & Heat Co.			

Completion Information

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	R/O	CMP_MTHD	TVD	TMD	NEW_FTO	O_BEF	O_AFT	O_BEF	O_AFT	NGL
4708170810	undata/ed	undata/ed	not available	undata/ed	undata/ed

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well


There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

There is no Plugging data for this well

There is no Sample data for this well

4705101978



WVGES
"Pipeline"

Select County: (051) Marshall

Enter Permit #: 70810

Select datatypes: (Check All)

Location Production Plugging

Owner/Completion Stratigraphy Sample

Pay/Show/Water Logs Bm Hole Log

[Table Descriptions](#)

[County Code Translations](#)

[Permit Application Series](#)

[Issue Dates](#)

[Contact Information](#)

[Operator](#)

[Operator Map](#)

[Production](#)

WV Geological & Economic Survey Well: County = 51 Permit = 70810

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_CO	LONG	UTMR	UTMN
4728172810	Marshall	70810	Franklin	Roundtop Point	Clanstown	39.852975	-80.738156	51811T	446244.4

There is no Bottom Hole Location data for this well

Owner Information

API	CMP_ID	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VO	PROP_TROT_FM	TFM_EST_FR
4728172810	-	-	-	unbroken Patr. Map Jeanna Sphaus	1	1531				Manufacturers Light & Heat Co.			

Completion Information

API	CMP_ID	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTO	O_BEF_O_AFT	O_BEF_O_AFT	NGL
4728172810	-	-	-	-	undrilled	undrilled	npl	undrilled	undrilled	unbroken	unbroken						

There is no Pay data for this well

There is no Production Gas data for this well

There is no Production Oil data for this well ** some operators may have reported NGL under Oil

There is no Production NGL data for this well ** some operators may have reported NGL under Oil

There is no Production Water data for this well

There is no Stratigraphy data for this well

There is no Wireline (E-Log) data for this well

There is no Plugging data for this well

There is no Sample data for this well

Page 3 of 4
RECEIVED
 Office of Oil and Gas
 JAN 18 2018
 WV Department of
 Environmental Protection

02/09/2018

Permit well - Bryan N-7HM

Wells within 500' Buffer

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705101340	Tug Hill Operating (formerly operated by Chevron and AB Resources)	6450' TVD 10601' 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.
4705170810	Manufacturer's Light and Heat	Unknown	Unknown	Unknown	Uknown but unlikely. The well likley represents an old shallow well that is too shallow to be effected by fracturing in the planned Marcellus well.	State records are incomplete
4705101977	Tug Hill Operating	6596' TVD, planned	None	None	No, Permit submitted Marcellus well	Permit submitted Marcellus well. Not yet drilled
4705101978	Tug Hill Operating	6596' TVD, planned	None	None	No, Permit submitted Marcellus well	Permit submitted Marcellus well. Not yet drilled
4705101979	Tug Hill Operating	6596' TVD, planned	None	None	No, Permit submitted Marcellus well	Permit submitted Marcellus well. Not yet drilled
4705101980	Tug Hill Operating	6596' TVD, planned	None	None	No, Permit submitted Marcellus well	Permit submitted Marcellus well. Not yet drilled

Well: County = 01 Permit = 01340

Location Information: View Map

Bottom Hole Location Information:

Owner Information:

Completion Information:

Pay/Show/Water Information:

Production Gas Information: (Volumes in Mcf)

API	PRODUCING OPERATOR FID	YEAR	ANN	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4705101340	AB Resources PA	2010	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2011	200	400	0	0	0	0	24667	81890	73188	62319	63100	0	0
4705101340	Chevron Appalachia, LLC	2012	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2013	200	872	11213	0	0	0	7637	40573	69062	18130	47624	41082	50027
4705101340	Chevron Appalachia, LLC	2014	57	740	42810	42304	300	0	1368	200	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2015	444	217	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2016	481	0	42810	41874	40478	40307	43704	42303	40400	41000	18111	43118	40500

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil

API	PRODUCING OPERATOR FID	YEAR	ANN	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4705101340	AB Resources PA	2010	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2011	33	974	0	0	0	0	4	131	2160	4103	0	0	0
4705101340	Chevron Appalachia, LLC	2012	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2013	18	980	787	0	0	0	592	2520	2229	1123	2745	2683	3320
4705101340	Chevron Appalachia, LLC	2014	6328	2343	1362	1178	0	0	184	40	0	0	112	0	0
4705101340	Chevron Appalachia, LLC	2015	17	710	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2016	6118	1507	793	721	642	525	352	653	370	130	345	440	347

Production NGL Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil

API	PRODUCING OPERATOR FID	YEAR	ANN	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4705101340	Chevron Appalachia, LLC	2011	0	0	0	0	0	0	0	0	0	0	0	0	0
4705101340	Chevron Appalachia, LLC	2012	0	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	0
4705101340	Chevron Appalachia, LLC	2014	0	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	0
4705101340	Chevron Appalachia, LLC	2016	0	0	0	0	0	0	0	0	0	0	0	0	0

Production Water Information: (Volumes in Gallons)

API	PRODUCING OPERATOR FID	YEAR	ANN	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4705101340	Chevron Appalachia, LLC	2011	0	0	0	0	0	0	0	0	0	0	0	0	0

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV DATUM
4705101340	Dist Orig Log	Summ	Well Report	3238	Reasonable	62	Reasonable	1217' Kelly Shallow
4705101340	Dist Orig Log	Tug Hill	Well Report	2373	Reasonable	31	Reasonable	1217' Kelly Shallow
4705101340	Dist Orig Log	Marathon	Well Report	2414	Reasonable	45	Reasonable	1217' Kelly Shallow
4705101340	Dist Orig Log	Marathon Sh	Well Report	2402	Reasonable	47	Reasonable	1217' Kelly Shallow
4705101340	Dist Orig Log	ConocoPhillips	Well Report	2514	Reasonable	21	Reasonable	1217' Kelly Shallow

Wellbore (C-Log) Information:

API	LOG_TOP	LOG_BOTTOM	DEEPEST_WELL	LOG_L_AVAL	SCAN	DIGITIZED	GR_TOP	D_TOP	D_BOTTOM	N_TOP	N_BOTTOM	L_TOP	L_BOTTOM	S_TOP	S_BOTTOM	O_TOP	O_BOTTOM	INCHES	REDUCED	KOP	LOGSD	ELEV_WB
4705101340	0	2004	0	0	0	0	2645	2005	2140	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100

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

4705101978

FRANKLIN
MARSHALL

Legend

- Well Locations (ims.wvgs.wvnet.edu)
- WVDEP O & G Permits (tagis.dep.wv.gov)
- Major Highways
- Major Roads
- Bryan N-7HM
- 500 Ft Buffer
- Counties
- Districts

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WV Department of
Environmental Protection



Bryan N-7HM
Franklin District
Marshall County, WV



Map Prepared by:
EPS
02/09/2018
LAND SERVICES

WW-9
(4/16)

API Number 47 - 051 - _____
Operator's Well No. Bryan N-7HM

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

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

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

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

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

Company Official Signature _____

Company Official (Typed Name) Sean Gasser

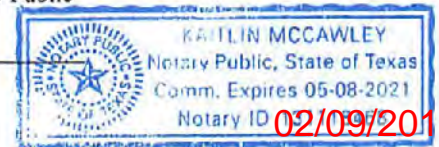
Company Official Title Engineer

Subscribed and sworn before me this 2 day of October, 2017

Kaitlin McCawley Kaitlin McCawley

Notary Public

My commission expires 5/8/2021



4705101978

Form WW-9

Operator's Well No. Bryan N-7HM

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 Unbroken*

Comments: _____

Title: *Oil & Gas Inspector* Date: *10/5/17*

Field Reviewed? () Yes () No

WW-9

PROPOSED BRYAN
N-7HM

SUPPLEMENT PG 1

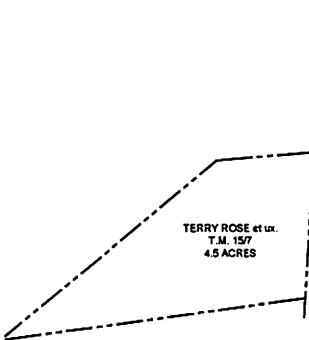
REFERENCE IS HEREBY MADE TO THE
WV D.E.P. OFFICE OF OIL & GAS,
"EROSION AND SEDIMENT CONTROL
FIELD MANUAL" FOR REQUIREMENTS
AND BMPs FOR AVERAGE FIELD
CONDITIONS CONCERNING THE
MAINTENANCE OF EXISTING ROADS
AND THE CONSTRUCTION OF
PROPOSED ROADS. FIELD CONDITIONS
MAY REQUIRE VARIANCE FROM THESE
GUIDELINES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

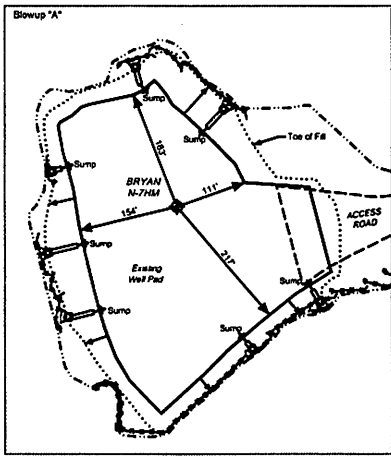
ENTRANCES ONTO PUBLIC ROADS
SHALL BE CONSTRUCTED OR
MAINTAINED IN ACCORDANCE WITH WV
D.O.T. REGULATIONS. ADDITIONAL
PERMITS MAY BE REQUIRED.
TEMPORARILY SEED AND MULCH
ALL SLOPES UPON
CONSTRUCTION OF LOCATION.

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

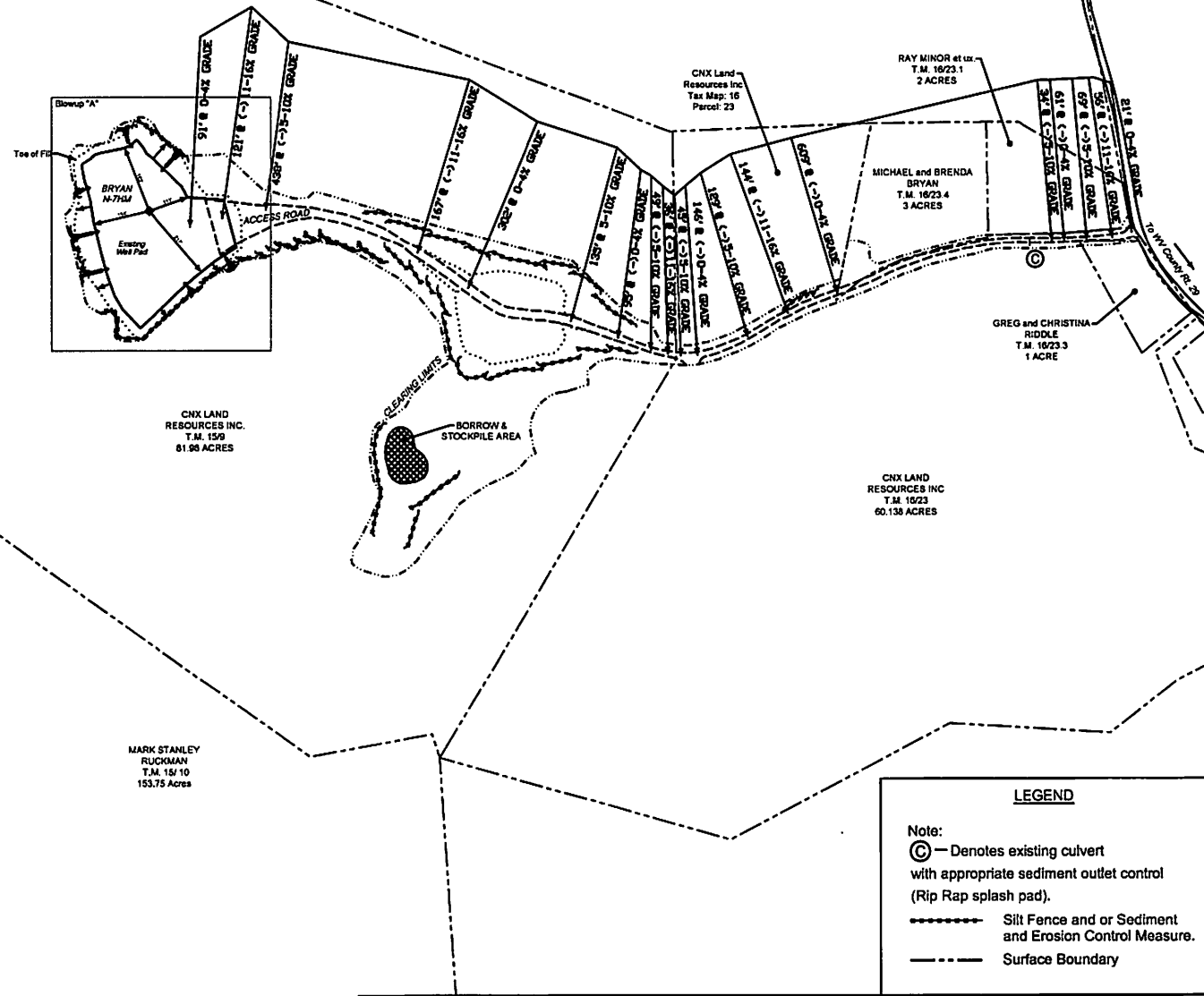
ALL TREES 6-INCHES AND ABOVE
ARE TO BE CUT AND STACKED.
BRUSH SLASHINGS ARE TO
UTILIZED DOWN SLOPE OF SITE
AND STRUCTURES TO ACT AS A
CONTROL BARRIER IF
AVAILABLE.



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



DRAWING NOT
TO SCALE



LEGEND

- Note:
- ⊙ — Denotes existing culvert 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.

4705101978



JW
1/10/18

Well Site Safety Plan

Tug Hill Operating, LLC

Well Name: Bryan N-7HM

Pad Location: Bryan Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,402,891.79

Easting: 519,134.24

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Office of Oil and Gas
JAN 18 2018
WV Department of
Environmental Protection

January 2018

02/09/2018

4705101978



Ju
1/10/18

Well Site Safety Plan

Tug Hill Operating, LLC

Well Name: Bryan N-7HM

Pad Location: Bryan Pad

Marshall County, West Virginia

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Environmental Protection

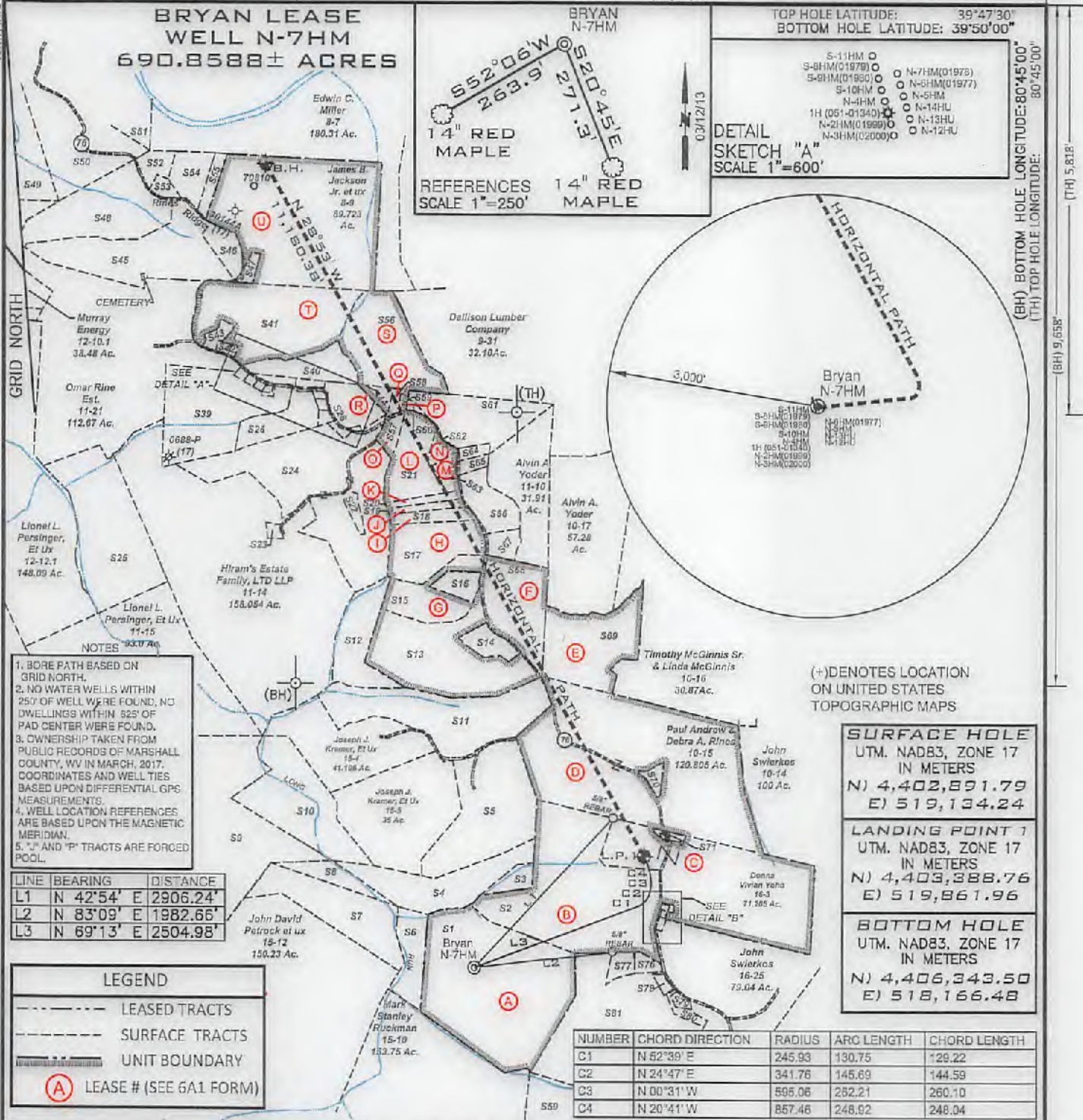
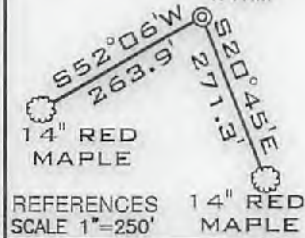
January 2018

02/09/2018

**BRYAN LEASE
WELL N-7HM
690.8588± ACRES**

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

DETAIL
SKETCH "A"
SCALE 1"=600'



- BORE PATH BASED ON GRID NORTH.
- NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 525' OF PAD CENTER WERE FOUND.
- OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN MARCH, 2017. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
- WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.
- "J" AND "P" TRACTS ARE FORCED POOL.

LINE	BEARING	DISTANCE
L1	N 42°54' E	2906.24'
L2	N 83°09' E	1982.66'
L3	N 69°13' E	2504.98'

LEGEND

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

TYPE	UTM. NAD83, ZONE 17 IN METERS
SURFACE HOLE	N) 4,402,891.79 E) 519,134.24
LANDING POINT 1	N) 4,403,388.76 E) 519,861.96
BOTTOM HOLE	N) 4,406,343.50 E) 518,166.48

NUMBER	CHORD DIRECTION	RADIUS	ARC LENGTH	CHORD LENGTH
C1	N 62°39' E	245.93	130.75	129.22
C2	N 24°47' E	341.76	145.69	144.59
C3	N 00°31' W	595.06	282.21	260.10
C4	N 20°41' W	867.46	248.92	248.04

FILE NUMBER _____

DRAWING NUMBER BRYAN_WP_N-7HM

SCALE 1" = 2000'

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* 1/10/18



JACKSON SURVEYING INC.
P.O. Box 1460
Clarksburg, WV 26302
304-828-6861



DATE: SEPTEMBER 19, 2017

REVISED DATE: JANUARY 10, 2018

OPERATORS WELL NO. BRYAN N-7HM

API WELL NO. 47-051-01978

STATE WV COUNTY Marshall PERMIT 02/09/2018

LOCATION ELEVATION 1191.0' WATERSHED (HUC 10) Fish Creek

DISTRICT Franklin COUNTY Marshall

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

SURFACE OWNER CNX LAND RESOURCES, INC. ACREAGE 81.98

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

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

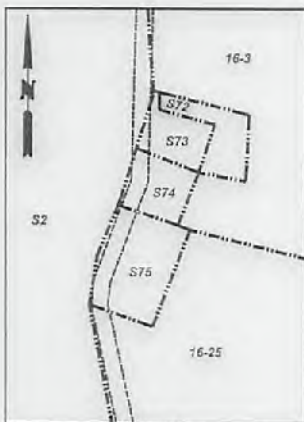
TARGET FORMATION Marcellus ESTIMATED DEPTH TVD: 6,596' TMD: 18,941'

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

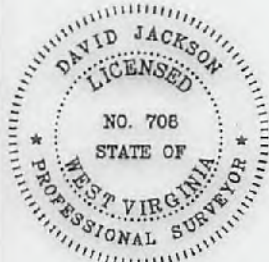
**BRYAN LEASE
WELL N-7HM
690.8588± ACRES**



DETAIL "A"
SCALE 1"=500'



DETAIL "B"
SCALE 1"=250'



P.S.
708

David L Jackson

Number	TAX MAP -PARCEL	ADJOINER OWNER	ACRES
S1	15-9	CNX Land Resources, Inc.	81.98
S2	15-8	Terry D. Rose, et ux	77.1
S3	15-7	Terry D. Rose, et ux	4.5
S4	15-6.1	Joseph J. Kramar, et ux	39.40
S5	15-6	Joseph J. Kramar, et ux	42.5
S6	15-13	CNX Land Resources	11.0
S7	15-14	John David Petrock, et ux	25.0
S8	15-2	John David Petrock, et ux	5.0
S9	15-1	Marcus Sharp & David Schlabach	121.0
S10	15-3	Joseph J. Kramar, et ux	36.10
S11	11-12	Joseph J. Kramar, et ux	43.2188
S12	11-13	Joy D. Gartman & Arlin Gatts	12.29
S13	11-11.3	Herman D. & Herman J. Lantz	43.96
S14	11-11.1	Nellie Marie & Robert W. Spencer	5.813
S15	11-11.4	Brad M. & Amanda J. Blake	15.193
S16	11-11	Brad M. & Amanda J. Blake	5.0
S17	11-9	Edwin C. & Kimberly A. Miller	41.773
S18	11-9.9	Leonard L. Parsons, et ux	5.89
S19	11-9.6	Southern Country Farms, Inc	2.488
S20	11-9.5	Southern Country Farms, Inc	2.559
S21	11-9.3	Joseph M. Haught & Steven Haught	16.3
S22	11-16.2	Joseph Haught	2.181
S23	11-14.1	Dennis F. Moore, et ux	1.056
S24	11-16	Keith E. Haught, et al	83.674
S25	12-11	Wesley Bryan & Wesley Bryan II	52.478
S26	11-17.2	Brenda & Michael Bryan	11.504
S27	11-5.1	James R. Anderson, et ux	0.205
S28	11-5	Kevin R. Corley, et ux	10.36
S29	11-16.1	Susan Smith, LE	0.876
S30	11-25	Owen Michael Barr	0.598
S31	11-23	Owen Michael Barr	0.845
S32	11-24	Charles Edward Furbee, et ux	0.603
S33	11-5.2	Rickey & Victoria Cross	1.0
S34	11-17.1	David Gray	0.297
S35	11-22	David Gray	0.353
S36	11-18	David E. Gray	0.569
S37	11-19	David E. Gray	0.532
S38	11-20	David E. Gray	0.569
S39	11-17	Kevin R. Corley, et ux	36.13
S40	11-3	Kevin R. Corley, et al	13.18
S41	11-2	Walter C. Cheryl A. Rine	42.367
S42	11-2.2	Joshua A. Myers	2.193
S43	11-2.1	Walter C. & Cheryl A. Rine	1.19
S44	11-5.3	Robert Harris Arrick, et ux	3.0
S45	11-1.1	Larry W. Dunlap, et al	34.405
S46	11-1.2	Jay A. Conner, et ux	5.824
S47	8-9.1	Scott E. Jackson, Tammy S. South & Marlon Jackson	1.957
S48	11-1.4	Larry W. Dunlap, et al	32.493
S49	7-39	Lionel L. Persinger, et ux	57.0
S50	7-33	William N. Roupe	24.60
S51	7-31	William N. Roupe	43.147
S52	11-1	William N. & Virginia A. Roupe	4.527
S53	11-1.6	Debra Morris	2.093
S54	11-1.7	William S. & Mary K. Adams	8.0
S55	11-1.5	Paul White	3.507
S56	11-4	David H. Arrick, et ux	31.5
S57	11-16.3	Kegan Michael Haught - Life	3.265
S58	11-6	Robert & Rebecca Arrick	1.29
S59	11-7	Baptist Cemetery	1.0
S60	11-8	Baptist Church	0.8
S61	11-9	Edwin C. & Kimberly A. Miller	41.773
S62	11-9.10	John A. & Janet L. Beucke	2.348
S63	11-9.2	Michael R. Bryan	3.143
S64	11-9.8	Sean F. Moore	2.070
S65	11-9.7	Sean F. Moore	2.026
S66	11-9.1	Jack Shepard Huggins Jr., et al	10.92
S67	11-9.4	Jack S. Huggins, et al	4.129
S68	11-11.2	Wesley R. Bryan & Wesley R. Bryan II	25.031
S69	10-16.4	Melvin E. Ferguson & Elizabeth Ferguson	30.87
S70	10-15.1	Donald T. Miller	2.095
S71	16-3.2	Jimmy Lee Ostrander Jr., Sheena Lynn Ostrander & Brody Ray Ostrander	1.435
S72	16-3.1	Dennis E. Jackson, et ux	0.27
S73		Cemetery - No Deed	
S74	16-2	Christian Church	0.19
S75	16-1	Christian Church	0.50
S76	16-23.1	Ray E. Minor, et ux	2.0
S77	16-23.4	Michael R. & Brenda K. Bryan	3.0
S78	16-23.3	Greg & Christina Riddle	1.0
S79	16-24	Alan M. Beyser, et ux	1.083
S80	16-23.2	Alan M. Beyser, et ux	1.726
S81	16-23	CNX Land Resources, Inc.	60.138

02/09/2018



OPERATOR'S
WELL #: Bryan N-7HM
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV

WELL PLAT
PAGE 2 OF 2
DATE: 9/19/2017
REVISED DATE:
1/10/18

WW-6A1
(5/13)

Operator's Well No. Bryan N-7HM

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

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

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

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

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

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

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

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

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

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Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*19294	A	5-15-9	BRYAN MICHAEL ET UX	TRIENERGY, INC.	1/8+	666	289	N/A	20/348 TriEnergy Inc to AB Resources LLC	21/491 AB Resources LLC to Chief Exploration & Development LLC and Radler 2000 Limited Partnership	685/643 Chief Exploration & Development LLC and Radler 2000 Limited Partnership to Enerplus Resources (USA) Corporation	25/1 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19340	B	5-15-8	YOHO DONNA VIVIAN	GASTAR EXPLORATION USA, INC.	1/8+	665	407	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 to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19017	C	5-10-15	RINE PAUL ANDREW ET UX	CHEVRON U.S.A. INC	1/8+	796	24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc to TH Exploration LLC
10*19293	D	5-11-12	KRAMAR JOSEPH ET UX	TRIENERGY, INC.	1/8+	655	566	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 to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19336	E	5-11-11.3	DAWSON BONNIE ET UX	GASTAR EXPLORATION USA, INC.	1/8+	665	397	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 to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19141	F	5-11-11.1	SPENCER ROBERT W JR ET UX	GASTAR EXPLORATION USA, INC.	1/8+	706	468	N/A	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	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	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 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
10*19336	G	5-11-11.4	DAWSON BONNIE ET UX	GASTAR EXPLORATION USA, INC.	1/8+	665	397	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 to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*19336	H	5-11-11	DAWSON BONNIE ET UX	GASTAR EXPLORATION USA, INC.	1/8+	665	397	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 & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radler 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	40/57 Chevron USA Inc to TH Exploration LLC
10*14099	I	5-11-9	SOUTHERN COUNTRY FARMS	GASTAR EXPLORATION USA, INC.	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC

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Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*19158	J	5-11-9.9	PARSONS LEONARD ET UX	GASTAR EXPLORATION USA, INC.	1/8+	705	125	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc 40/127 Chevron USA Inc to TH Exploration LLC
10*14099	K	5-11-9.6	SOUTHERN COUNTRY FARMS	GASTAR EXPLORATION USA, INC.	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc 40/127 Chevron USA Inc to TH Exploration LLC
10*14099	L	5-11-9.5	SOUTHERN COUNTRY FARMS	GASTAR EXPLORATION USA, INC.	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc 40/127 Chevron USA Inc to TH Exploration LLC
10*18339	M	5-11-9.3	RESOURCE MINERALS HEADWATER I, LP	TH EXPLORATION LLC	1/8+	940	448	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19139	N	5-11-16	MOORE HIRAM V - SFX	GASTAR EXPLORATION USA, INC.	1/8+	699	53	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA 40/127 Chevron USA Inc to TH Exploration LLC
10*19179	N	5-11-16	HAUGHT KEITH ET UX - SFX	GASTAR EXPLORATION USA, INC.	1/8+	710	587	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA 40/127 Chevron USA Inc to TH Exploration LLC
10*19180	N	5-11-16	HAUGHT STEVEN - SFX	TRIENERGY, INC. - LEASE SAYS GASTAR EXPLORATION USA INC	1/8+	710	67	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA 40/127 Chevron USA Inc to TH Exploration LLC
10*19178	N	5-11-16	HAUGHT JOSEPH - SFX	GASTAR EXPLORATION USA, INC.	1/8+	710	69	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinum Marcellus I LLC	32/362 Gastar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA 40/127 Chevron USA Inc to TH Exploration LLC
10*19176	O	5-11-5.2	MAUNA MAXINE BEYSER	GASTAR EXPLORATION USA INC	1/8+	710	602	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc 40/127 Chevron USA Inc. to TH Exploration, LLC
10*19177	O	5-11-5.2	NINA L KOVACS	GASTAR EXPLORATION USA INC	1/8+	710	594	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc 40/127 Chevron USA Inc. to TH Exploration, LLC
10*19185	O	5-11-5.2	HARRIETT LODUTH FOLEY	GASTAR EXPLORATION USA INC	1/8+	710	598	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc 40/127 Chevron USA Inc. to TH Exploration, LLC

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10*19186	O	5-11-5.2	JOEL GLOVER	GASTAR EXPLORATION USA INC	1/8+	710	600	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19189	O	5-11-5.2	SHERRY ANN MCPHERON	GASTAR EXPLORATION USA INC	1/8+	710	606	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19190	NN	5-11-5.2	SALLY LEE RIVERA	GASTAR EXPLORATION USA INC	1/8+	710	590	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19191	O	5-11-5.2	SHARLA BETH WEAVER	GASTAR EXPLORATION USA INC	1/8+	710	608	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19192	O	5-11-5.2	JAMES E YOHO	GASTAR EXPLORATION USA INC	1/8+	714	129	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19201	O	5-11-5.2	DANIEL K YOHO	GASTAR EXPLORATION USA INC	1/8+	714	125	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19202	O	5-11-5.2	DEBORAH L WOOLEY	GASTAR EXPLORATION USA INC	1/8+	714	131	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19203	O	5-11-5.2	CAROL M YOHO	GASTAR EXPLORATION USA INC	1/8+	713	205	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19204	O	5-11-5.2	DAYNA MARLENE YOHO	GASTAR EXPLORATION USA INC	1/8+	714	127	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19205	O	5-11-5.2	JEFFREY C YOHO	GASTAR EXPLORATION USA INC	1/8+	713	203	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC

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Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment		
10*19251	O	5-11-5.2	RAE SUZETTE BAKER	GASTAR EXPLORATION USA INC	1/8+	748	315	N/A	N/A	N/A	N/A	N/A	26/639 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC	
10*19252	O	5-11-5.2	JOHN WILSON	GASTAR EXPLORATION USA INC	1/8+	749	522	N/A	N/A	N/A	N/A	N/A	26/639 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC	
10*19502	O	5-11-5.2	SUSAN BLANCHE BEYSER	TH EXPLORATION LLC	1/8+	942	623	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19893	O	5-11-5.2	WINIFRED G AND EDDIE G TURNER	TH EXPLORATION, LLC	1/8+	948	277	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21041	O	5-11-5.2	SHERY AND RANDEN RITCHEA	TH EXPLORATION, LLC	1/8+	949	365	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21224	O	5-11-5.2	RICKEY LYNN CROSS & VICTORIA ROSE CROSS	TH EXPLORATION LLC	1/8+	939	589	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19139	P	5-11-16.1	HIRAM V MOORE	GASTAR EXPLORATION USA INC	1/8+	699	53	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	23/353 Gastar Exploration USA Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19170	P	5-11-16.1	SUSAN MARIE SMITH NKA SUSAN MARIE HAMNER	GASTAR EXPLORATION USA INC	1/8+	706	583	N/A	N/A	N/A	N/A	N/A	21/41 Cert. of Merger Gastar Exploration USA, Inc to Gastar Exploration Inc	23/353 Gastar Exploration USA Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19126	Q	5-11-5	KEVIN R. CORLEY AND ANITA L. CORLEY, HUSBAND AND WIFE	CHEVRON USA INC	1/8+	859	47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19176	Q	5/11/2005	MAUNA MAXINE BEYSER	GASTAR EXPLORATION USA INC	1/8+	710	602	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC	
10*19177	Q	5/11/2005	NINA L KOVACS	GASTAR EXPLORATION USA INC	1/8+	710	594	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC	
10*19185	Q	5/11/2005	HARRIETT LODUTH FOLEY	GASTAR EXPLORATION USA INC	1/8+	710	598	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC	
10*19186	Q	5-11-5	JOEL GLOVER	GASTAR EXPLORATION USA INC	1/8+	710	600	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC	
10*19189	Q	5-11-5	SHERRY ANN MCPHERON	GASTAR EXPLORATION USA INC	1/8+	710	606	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC	

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10*19190	Q	5-11-5	SALLY LEE RIVERA	GASTAR EXPLORATION USA INC	1/8+	710	590	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19191	Q	5-11-5	SHARLA BETH WEAVER	GASTAR EXPLORATION USA INC	1/8+	710	608	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19192	Q	5-11-5	JAMES E YOHO	GASTAR EXPLORATION USA INC	1/8+	714	129	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19201	Q	5-11-5	DANIEL K YOHO	GASTAR EXPLORATION USA INC	1/8+	714	125	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19202	Q	5-11-5	DEBORAH L WOOLEY	GASTAR EXPLORATION USA INC	1/8+	714	131	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19203	Q	5-11-5	CAROL M YOHO	GASTAR EXPLORATION USA INC	1/8+	713	205	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19204	Q	5-11-5	DAYNA MARLENE YOHO	GASTAR EXPLORATION USA INC	1/8+	714	127	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19205	Q	5-11-5	JEFFREY C YOHO	GASTAR EXPLORATION USA INC	1/8+	713	203	N/A	N/A	N/A	N/A	N/A	735/263 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19251	Q	5-11-5	RAE SUZETTE BAKER	GASTAR EXPLORATION USA INC	1/8+	748	315	N/A	N/A	N/A	N/A	N/A	26/639 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19252	Q	5-11-5	JOHN WILSON	GASTAR EXPLORATION USA INC	1/8+	749	522	N/A	N/A	N/A	N/A	N/A	26/639 Gastar Exploration USA, Inc to Atinum Marcellus I LLC	32/362 Gastar Exploration Inc. and Atinum Marcellus I LLC, to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19502	Q	5-11-5	SUSAN BLANCHE BEYSER	TH EXPLORATION LLC	1/8+	942	623	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19893	Q	5-11-5	WINIFRED G AND EDDIE G TURNER	TH EXPLORATION, LLC	1/8+	948	277	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21041	Q	5-11-5	SHERY AND RANDEN RITCHEA	TH EXPLORATION, LLC	1/8+	949	365	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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WV Department of
Environmental Protection

Lease No.	Tags	Parcel	Lessor	Lessee	Royalty	Book	Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
	R	5-11-5.1	JAMES R AND MELODY A ANDERSON	NOBLE ENERGY INC	1/8+	812	31	ON TRADE #1 HG- TH SCHEDULE								
10*18722	S	5-11-3	HIRAMS ESTATE FAMILY LIMITED LIABILITY LIMITED PARTNERSHIP	TH EXPLORATION LLC	1/8+	938	523	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19126	S	5-11-3	KEVIN R. CORLEY AND ANITA L. CORLEY, HUSBAND AND WIFE	CHEVRON USA INC	1/8+	859	47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC	
10*19127	T	5-11-2	WALTER C. RINE AND CHERYL ANN RINE	CHEVRON USA INC	1/8+	859	49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/127 Chevron USA Inc. to TH Exploration, LLC	
10*47051.10 5.0	U	5-8-9	JAMES B JACKSON JR AND MARION L JACKSON	TH EXPLORATION LLC	1/8+	859	478	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*19219	V	5-8-9.1	SCOTT E AND TAMMY SUE JACKSON	TRIENERGY HOLDINGS, LLC	1/8+	731	102	N/A	N/A	N/A	N/A	N/A	N/A	25/449 TriEnergy Holdings LLC to NPAR, LLC	756/332 NPAR, LLC to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC
10*19168	W	5-11-1.5	PAUL AND SANDY WHITT	CHESAPEAKE APPALACHIA LLC	1/8+	715	565	N/A	N/A	N/A	N/A	N/A	N/A	N/A	30/392 Chesapeake Appalachia, LLC, to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration, LLC
10*19174	X	5-11-1.7	WILLIAM S ADAMS MARY K ADAMS	TRIENERGY HOLDINGS, LLC	1/8+	711	318	N/A	N/A	24/430 TriEnergy Holdings, LLC to NPAR, LLC	24/466 AB Resources LLC and NPAR 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.	756/332 NPAR LLC to Chevron USA Inc	40/127 Chevron USA Inc. to TH Exploration, LLC	

RECEIVED
Office of Oil and Gas

JAN 18 2018

WV Department of
Environmental Protection

AFFIDAVIT

4705101978

STATE OF TEXAS §
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

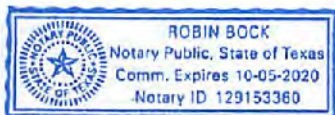
JURAT

Carol S Haupt
Metzler County 10:29:27 AM
Instrument No 212093
Date Recorded 10/20/2016
Document Type AFFID
Pages Recorded 1
Book-Page 119-291
Recording Fee \$5.00
Additional \$6.00

STATE OF TEXAS §
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

4705101978



TUG HILL

October 6, 2017

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

RE: Bryan N-7HM

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-7HM well plat.

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

Sincerely,

Amy L. Miller
Permitting Specialist – Appalachia Region

4705101978

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-7HM

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>519,134.24</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,891.79</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Rines Ridge Road</u>	
Quadrangle:	<u>Powhatan Point 7.5'</u>	Generally used farm name:	<u>CNX Land Resources, Inc.</u>	
Watershed:	<u>Fish Creek (HUC-10)</u>			

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

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 40px;"><input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)</p> <p><input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION</p> <p><input checked="" type="checkbox"/> 5. PUBLIC NOTICE</p> <p><input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION</p>	<p>OOG OFFICE USE ONLY</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input type="checkbox"/> RECEIVED/ NOT REQUIRED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p> <p><input checked="" type="checkbox"/> RECEIVED</p>
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Required Attachments:

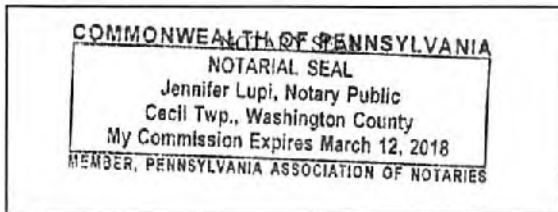
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

02/09/2018

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



Subscribed and sworn before me this 6th 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.

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:** 10/6/2017

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: 4183 Rines Ridge Road
Proctor, WV 26055

Name: Michael R. and Brenda K. Bryan
 Address: 195 Iseleh 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 15317-6506

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

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

WW-6A
(8-13)

API NO. 47- -
OPERATOR WELL NO. Bryan N-7HM
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 57th St. SE
Charleston, WV 25304
(304) 926-0450

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

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

WW-6A
(8-13)

API NO. 47-4705101978
OPERATOR WELL NO. Bryan N-7HM
Well Pad Name: Bryan

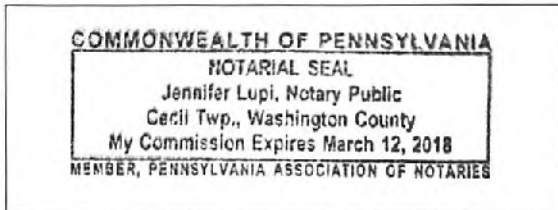
Notice is hereby given by:

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

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.



Subscribed and sworn before me this 6th day of Oct, 2014.
Jennifer Lupi Notary Public
My Commission Expires March 12, 2018

02/09/2018

WW-6A

Supplement Pg. 1A

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

WATER WELL REPORT

Well: BRYAN No. N-7HM
 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.

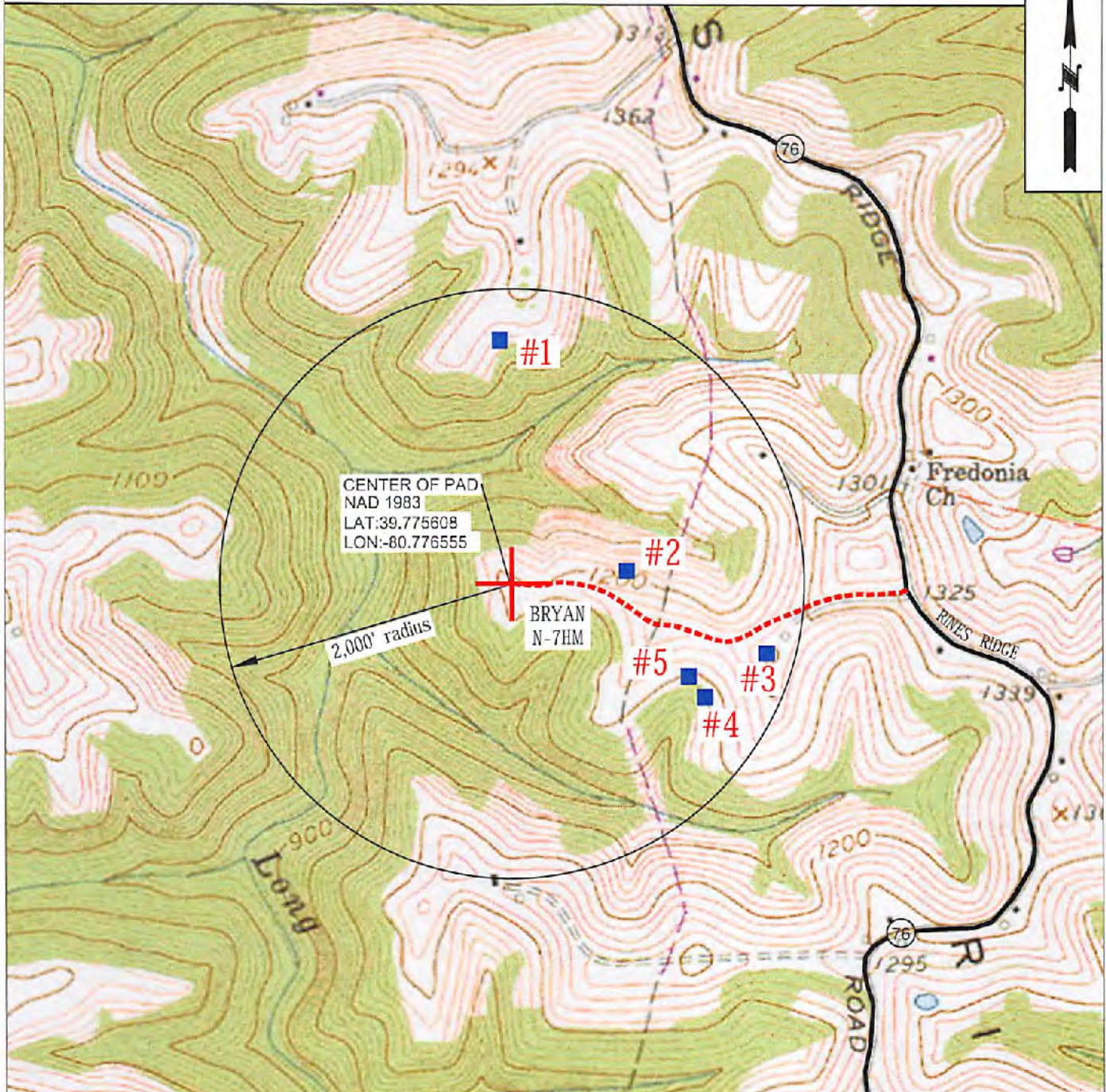
Topo spot #1 (Possible Spring) TM 15 Par.6 Joseph & Joann Kramer 304-845-0896 3303 Rines Ridge Rd. Proctor, WV 26055	Topo Spot # 2 (Spring) TM 15 Par. 9 CNX Land Resources, LLC 724-485-4000, 713-893-4476 1000 Consol Energy Dr. Canonsburg, PA 15317	Topo Spot # 3 (Water Well) TM 16 Par. 23 CNX Land Resources,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

WW-6A

PROPOSED BRYAN N-7HM

SUPPLEMENT PG 1

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



OPERATOR	494510851	TOPO SECTION	LEASE NAME
TUG HILL OPERATING, LLC 380 SOUTHPONTE BLVD SUITE 200 CANONSBURG, PA 15317		POWATAN POINT 7.5'	BRYAN
SCALE:		DATE:	
1" = 1000'		DATE: 09/27/17	

4705101978

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 15317-8508

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; -80.7756011</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 57th Street, SE, Charleston, WV 25304 (304-926-0450). Copies of such documents or additional information related to horizontal drilling may be obtained from the Secretary by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

Notice is hereby given by:

Well Operator:	<u>Tug Hill Operating, LLC</u>	Address:	<u>380 Southpointe Boulevard, Plaza II, Suite 200</u>
Telephone:	<u>724-749-8388</u>		<u>Canonsburg, PA 15317</u>
Email:	<u>emiller@tug-hillop.com</u>	Facsimile:	<u>724-338-2030</u>

Oil and Gas Privacy Notice:

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

WW-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

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:** 10/06/2017

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>519,134,242</u>
County:	<u>Marshall</u>		Northing:	<u>4,402,891.79</u>
District:	<u>Franklin</u>	Public Road Access:	<u>Rines Ridge Road</u>	
Quadrangle:	<u>Pewhatan 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 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/oil-and-gas/pages/default.aspx.

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

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

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4705101978

Operator Well No. Bryan N-7HM

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

02/09/2018



4705101978

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 57th Street, SE
Charleston, WV 25304

Subject: DOH Permit for the Bryan Pad, Marshall County
Bryan N-7HM Well site
47-051-01978

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



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Bryan N-7HM

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

