

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

Thursday, August 9, 2018 WELL WORK PERMIT Horizontal 6A / New Drill

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

Re: Permit approval for BRYAN S-10HM 47-051-02006-00-00

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: Farm Name: U.S. WELL NUMBER: Horizontal 6A Date Issued: 8/9/2018

Promoting a healthy environment.

PERMIT CONDITIONS

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

API Number: 51-07006

PERMIT CONDITIONS

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

WW-6B (04/15) API NO. 47-051 -OPERATOR WELL NO. Bryan S-10HM Well Pad Name: Bryan

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

		•					
1) Well Operat	or: Tug H	ill Operating	, LLC	494510851	Marshall	Franklin	Powhatan Point
, 1				Operator ID	County	District	Quadrangle
2) Operator's V	Vell Numbe	er: Bryan S-1	онм	Well Pa	ad Name: Bry	an	
3) Farm Name/	/Surface Ov	vner: <u>CNX Lar</u>	nd Resour	rces, Inc. Public Ro	ad Access: R	ines Ridge F	Rd
4) Elevation, c	urrent grour	nd: <u>1191'</u>	I	Elevation, proposed	l post-construc	ction: <u>1191'</u>	
5) Well Type	(a) Gas	X	_ Oil _	Unc	lerground Stor	age	
	Other						
	(b)If Gas	Shallow	<u>x</u>	Deep			
		Horizontal	<u>X</u>			Moli	8
6) Existing Pac	l: Yes or No	Yes			_	1/10/1	
· •	•			icipated Thickness	-		f
Marcellus is t	he target for	mation at a dep	oth of 646	53' - 6516', thickness	of 54' and antici	pated pressur	e of approx. 3800 psi
8) Proposed To	otal Vertical	Depth: 6,5	96'				
9) Formation a	t Total Vert	ical Depth:	Onondo	oga		<u>.</u>	
10) Proposed 7	Total Measu	red Depth:	14,898'				
11) Proposed H	Horizontal L	eg Length:	7,376'				
12) Approxima	ate Fresh W	ater Strata De	pths:	803'			
13) Method to	Determine	Fresh Water I	Depths:	Offset well reports or r	noticeable flow at	the flowline or v	when need to start soaping
14) Approxima			-				
15) Approxima	ate Coal Sea	am Depths: S	Sewickly	Coal - 701' and F	Pittsburgh Co	al - 796'	RECEIVED Office of Oil and Ga
16) Approxima	ate Depth to	Possible Voi	d (coal r	mine, karst, other):	None anticip	ated	
					•••		JAN 1 8 2018
17) Does Prope directly overly					۲۲	No <u>X</u>	WV Department o Environmental Protect
(a) If Yes, pro	ovide Mine	Info: Name	:				
		Depth	ı:				
		Seam					
		Owne	r:				

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API NO. 47-_⁰⁵¹_-OPERATOR WELL NO. Bryan S-10HM

Well Pad Name: Bryan

WW-6B (04/15)

18)

CASING AND TUBING PROGRAM

TYPE	<u>Size</u> (in)	<u>New</u> <u>or</u> <u>Used</u>	Grade	<u>Weight per ft.</u> <u>(lb/ft)</u>	<u>FOOTAGE: For</u> <u>Drilling (ft)</u>	INTERVALS: Left in Well (ft)	<u>CEMENT:</u> <u>Fill-up</u> (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#	2,612'	2,602'	862ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	14,898'	14,888'	3810ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		6,979'	
Liners	N/A	_					
<u> </u>	•				<u></u>	d'il	0 (1 ⁸

ТҮРЕ	Size (in)	<u>Wellbore</u> <u>Diameter (in)</u>	<u>Wall</u> <u>Thickness</u> (in)	<u>Burst Pressure</u> (psi)	Anticipated Max. Internal Pressure (psi)	<u>Cement</u> <u>Type</u>	<u>Cement</u> <u>Yield</u> (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						

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PACKERS

JAN 18 2018

Kind:	N/A	E	WV Department of nvironmental Protection
Sizes:	N/A		
Depths Set:	N/A		

API NO. 47- 051 OPERATOR WELL NO. Bryan S-10HM Well Pad Name: Bryan

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 18,440,000 lb proppant and 285,096 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
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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:	BECEIVED
	Office of Oil and Gas

*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



Tug Hill Operating, LLC Casing and Cement Program

Bryan S-10HM

		C	asing		
	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"	2,602'	CTS
Production	5 1/2"	P110	8 7/8 x 8 3/4	14,888'	CTS

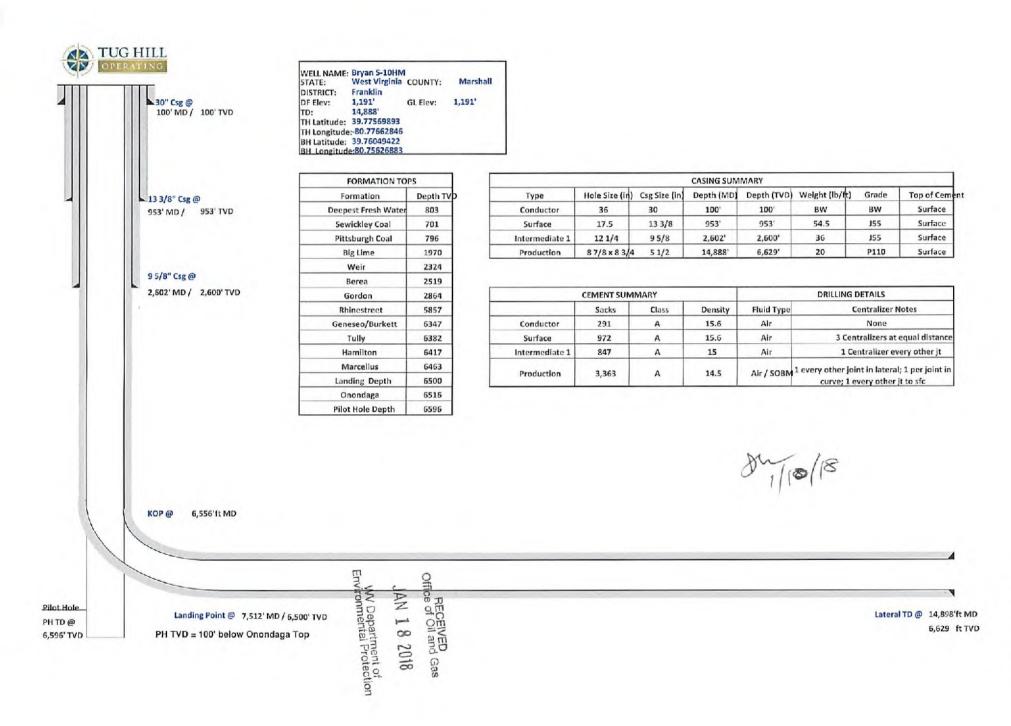
Cement

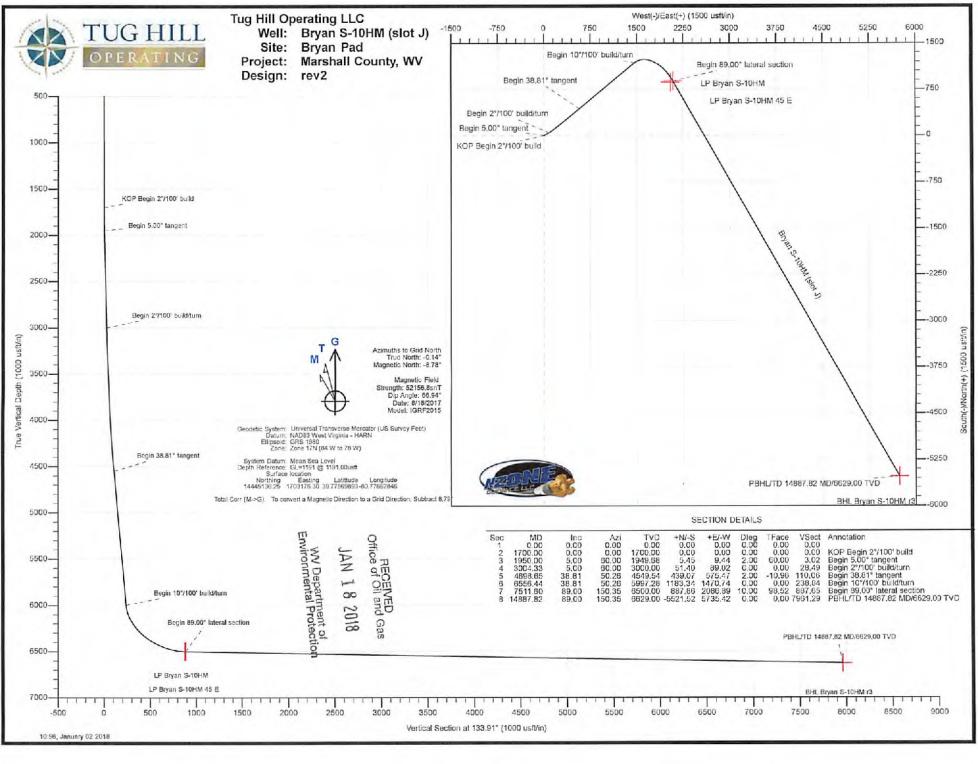
Conductor:	Premium NE-1 + 2% bwcc CaC12 + 46.5% Fresh Water - Conductor Cement mixed at 15.6 ppg, Y=1.2
Surface:	Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water - Surface Cement mixed at 15.6 ppg, Y=1.2
Intermediate:	Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water - Intermediate Cement mixed at 15.6 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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51-02606

Operator's Well No. Bryan S-10HM

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:

 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

Map with Farm lines overlain and any well spots identified on Farm Maps

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 RECEIVED planned well and using that for permits

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51-02006

Permit well - Bryan S-10HM

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)	A CONTRACT OF	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.
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

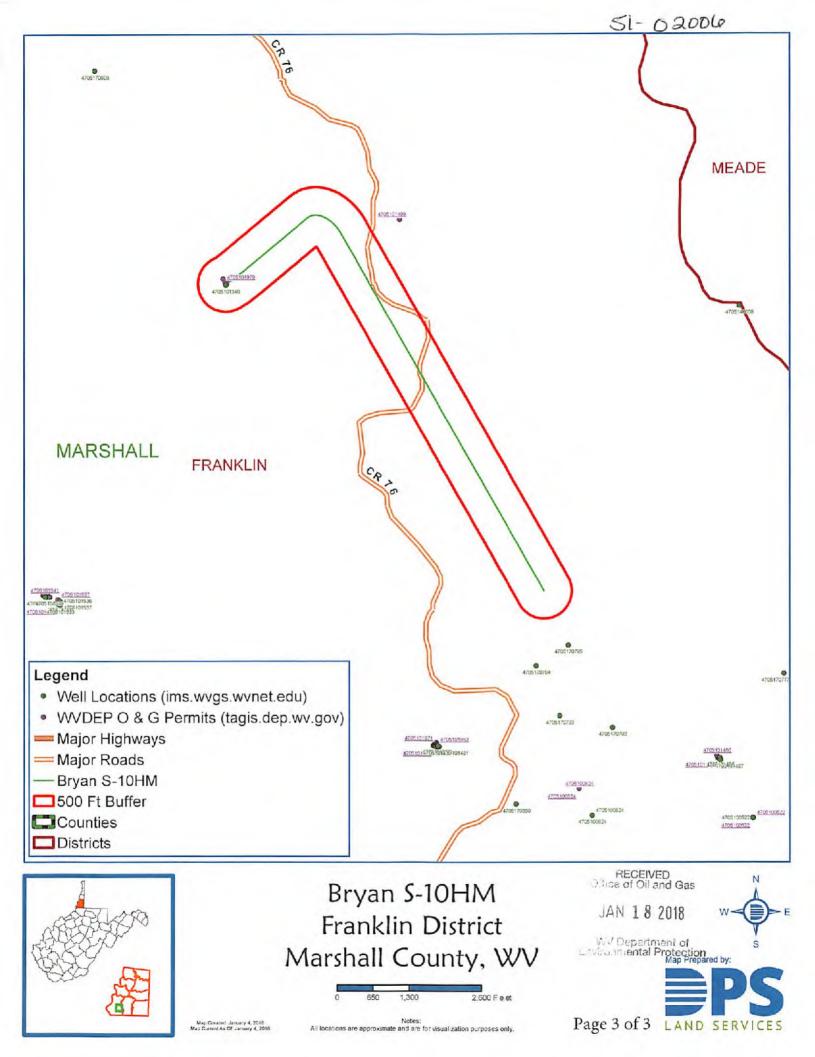
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Planning Report - Geographic

51-02006

Database: Company: Project:	DB_Jul2218dt_v14 Tug Hill Operating LLC Marshall County, West Virginia Bryan Pad Bryan S-10HM (slot J)			Local Co-ordinate Reference: Well Bryan S-10HM (slot J) TVD Reference: GL=1191 @ 1191.00usft MD Reference: GL=1191 @ 1191.00usft						
Site:				North Reference: Grid						
Vell:				Survey Ca	Iculation Meth	nod:	Minimum Curvatu	ire		
Vellbore:	Original Hole									
Design:	rev2				_				_	
Project	Marshall C	County, West	Virginia							
Geo Datum:	Universal Transverse Mercator (US Survey Feet) NAD83 West Virginia - HARN Zone 17N (84 W to 78 W)				System Datum: Mean Sea Level					
Site	Bryan Pad	í.								
Site Position:			Nort	hing:	14,445	,110.80 usft	Latitude:			39,77562900
From:	Lat/Lon	ng	East	ing:	1,703	181.57 usft	Longitude:			-80.77660992
Position Uncertainty:		0.00	usft Slot	Radius:		13-3/16 "	Grid Converg	ence:		0.14 °
Well	Bryan S-10	OHM (slot J)								
Well Position	+N/-S	0.0	0 usft M	Northing:		14,445,136.25	usft Lat	itude:		39.77569893
	+E/-W	0.0	0 usft E	asting:		1,703,175.30	usft Lor	gitude:		-80.77662846
Position Uncertainty		0.0	0 usft V	Vellhead Elevat	ion:		Gro	und Level:		1,191.00 usf
Wellbore	Original H	lole								
		I Name	Com	I. Date	Declina	tion	Dip /	ngle	Field S	trength
Magnetics	Model	rivarne	Sam	ple Date	(°)		1	7	(n	T)
Magnetics	Model	IGRF2015	Sam	B/18/2017		-8.64	(") 66.94	Au	T) 56.83148209
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Design Audit Notes:			Pha	8/18/2017		-8.64	On Depth:	66,94	Au	
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Design Audit Notes: Version: Vertical Section: Plan Survey Tool Pro Depth From (usft) 1 0.00 Plan Sections Measured Depth Inclin (usft) (rev2 ogram Depth To (usft) 14,887	IGRF2015 Date O Survey (:82 rev2 (Ori cstimuth (*)	Pha epth From ((usft) 0.00 1/2/2018 Wellbore) iginal Hole) Vertical Depth (usft)	8/18/2017 se: F TVD) +N/-S (usft)	(*) PLAN +N/-S (usft) 0.00 Tool Name MWD MWD - Stand +E/-W (usft)	-8.64 Tie +E (u 0.	On Depth: (/-W sft) 00 Remarks Build Rate (°/100usft)	66,94 (Dire (13: 13: 13: 13: 13: 13: 13: 13: 14: 14: 14: 14: 14: 14: 14: 14: 14: 14	52,11 0.00 ction ") 3.91 Offic JA WV Environ	RECEIVED e of Oil and Gas N 1 8 2018 Department of mental Protectio
Design Audit Notes: Version: Vertical Section: Plan Survey Tool Pro Depth From (usft) 1 0.00 Plan Sections Measured Depth Inclin (usft) (0.00	rev2 ogram Depth To (usft) 14,887	IGRF2015 Date O Survey (2.82 rev2 (Ori vzimuth (°) 0.00	Pha epth From ((usft) 0.00 1/2/2018 Wellbore) iginal Hole) Vertical Depth (usft) 0.00	8/18/2017 se: F TVD) +N/-S (usft) 0.00	(*) PLAN +N/-S (usft) 0.00 Tool Name MWD MWD - Stand +E/-W (usft) 0.00	-8.64 Tie +E (u 0. 0. 0. 0. 0.00	On Depth: (/-W sft) 00 Remarks Build Rate (°/100usft) 0.00	66,94 (Dire (13: 13: 13: 13: 13: 13: 13: 13: 14: 14: 14: 14: 14: 14: 14: 14: 14: 14	52,11 0.00 ction ") 3.91 Offic JA WV Environ TFO (") 0.00	RECEIVED e of Oil and Gas N 1 8 2018 Department of mental Protectio
Design Audit Notes: Version: Vertical Section: Plan Survey Tool Pro Depth From (usft) 1 0.00 Plan Sections Measured Depth Inclin (usft) (0.00 1,700.00	rev2 gram Depth To (usft) 14,887 nation A °) 0.00 0.00	IGRF2015 Date O Survey (2.82 rev2 (Ori xzimuth (°) 0.00 0.00	Pha epth From ((usft) 0.00 1/2/2018 Wellbore) iginal Hole) Vertical Depth (usft) 0.00 1,700.00	8/18/2017 se: F TVD) +N/-S (usft) 0.00 0.00	(*) PLAN +N/-S (usft) 0.00 Tool Name MWD MWD - Stand +E/-W (usft) 0.00 0.00	-8.64 Tie +E (u 0. 0. 0.00 8ate (*/100usft) 0.00 0.00	On Depth: (/-W sft) 00 Remarks Build Rate (°/100usft) 0.00 0.00	66,94 (Dire (13: 13: 13: 13: 13: 13: 13: 13: 14: 14: 14: 14: 14: 14: 14: 14: 14: 14	52,11 0.00 ction ") 3.91 Offic JA WV Environ (") 0.00 0.00 0.00	RECEIVED e of Oil and Gas N 1 8 2018 Department of mental Protectic
Design Audit Notes: Version: Vertical Section: Plan Survey Tool Pro Depth From (usft) 1 0.00 Plan Sections Measured Depth Inclin (usft) (0.00 1,700.00 1,950.00	rev2 ogram Depth To (usft) 14,887 nation A °) 0.00 0.00 5.00	IGRF2015 Date O Survey (2.82 rev2 (Ori xzimuth (°) 0.00 0.00 60.00	Pha epth From ((usft) 0.00 1/2/2018 Wellbore) iginal Hole) Vertical Depth (usft) 0.00 1,700.00 1,949.68	8/18/2017 se: F TVD) +N/-S (usft) 0.00 0.00 5.45	(*) PLAN +N/-S (usft) 0.00 Tool Name MWD MWD - Stand +E/-W (usft) 0.00 0.00 0.00 9.44	-8.64 Tie +E (u 0. 0. 0.00 Rate (*/100usft) 0.00 0.00 2.00	Con Depth: (/-W sft) 00 Remarks Build Rate (°/100usft) 0.00 0.00 2.00	66,94 Dire (13: 13: 13: 13: 13: 13: 13: 13: 13: 13:	52,11 0.00 ction ") 3.91 Offic JA WV Environ (") 0.00 0.00 0.00 60.00	RECEIVED e of Oil and Gas N 1 8 2018 Department of mental Protectio
Design Audit Notes: Version: Vertical Section: Plan Survey Tool Pro Depth From (usft) 1 0.00 Plan Sections Measured Depth Inclin (usft) (0,00 1,700.00 1,950.00 3,004.33	rev2 gram Depth To (usft) 14,887 14,887 0.00 0.00 5.00 5.00	IGRF2015 Date Date Survey (2.82 rev2 (Ori 2.82 rev2 (Ori 0.00 60.00 60.00 60.00	Pha epth From ((usft) 0.00 1/2/2018 Wellbore) iginal Hole) Vertical Depth (usft) 0.00 1,700.00 1,949.68 3,000.00	8/18/2017 se: F TVD) +N/-S (usft) 0.00 0.00 5.45 51.40	(*) PLAN +N/-S (usft) 0.00 Tool Name MWD MWD - Stand +E/-W (usft) 0.00 0.00 0.00 0.44 89,02	-8.64 Tie +E (u 0. 0. 0.00 Rate (*/100usft) 0.00 0.00 2.00 0.00	Con Depth: (/-W sft) 00 Remarks Build Rate (°/100usft) 0.00 0.00 2.00 0.00	66,94 Dire (13: 13: 13: 13: 13: 13: 13: 13: 13: 13:	52,11 0.00 ction ") 3.91 Offic JA WV Environ TFO (") 0.00 0.00 0.00 60.00 0.00	RECEIVED e of Oil and Gas N 1 8 2018 Department of mental Protectic
Design Audit Notes: Version: Vertical Section: Plan Survey Tool Pro Depth From (usft) 1 0.00 Plan Sections Measured Depth Inclir (usft) (0.00 1,700.00 1,950.00 3,004.33 4,698.65	rev2 gram Depth To (usft) 14,887 14,887 0.00 0.00 5.00 5.00 38.81	IGRF2015 Date Date Survey (2.82 rev2 (Ori 2.82 rev2 (Ori 0.00 60.00 60.00 60.00 60.00 50.26	Pha epth From ((usft) 0.00 1/2/2018 Wellbore) iginal Hole) Vertical Depth (usft) 0.00 1,700.00 1,949.68 3,000.00 4,549.54	8/18/2017 se: F TVD) +N/-S (usft) 0.00 0.00 5.45 51.40 439.07	(*) PLAN +N/-S (usft) 0.00 Tool Name MWD MWD - Stand +E/-W (usft) 0.00 0.00 0.00 0.44 89.02 575.47	-8.64 Tie +E (u 0. 0. 0.00 Rate (*/100usft) 0.00 0.00 2.00	Con Depth: (/-W sft) 00 Remarks Build Rate (°/100usft) 0.00 0.00 2.00 0.00 2.00	66,94 Dire (13: 13: 13: 13: 13: 13: 13: 13: 13: 13:	52,11 0.00 ction ") 3.91 Offic JA WV Environ (") 0.00 0.00 0.00 60.00 0.00 -10.96	RECEIVED e of Oil and Gas N 1 8 2018 Department of mental Protectio
Design Audit Notes: Version: Vertical Section: Plan Survey Tool Pro Depth From (usft) 1 0.00 Plan Sections Measured Depth Inclir (usft) (0.00 1,700.00 1,950.00 3,004.33	rev2 gram Depth To (usft) 14,887 14,887 0.00 0.00 5.00 5.00	IGRF2015 Date Date Survey (2.82 rev2 (Ori 2.82 rev2 (Ori 0.00 60.00 60.00 60.00	Pha epth From ((usft) 0.00 1/2/2018 Wellbore) iginal Hole) Vertical Depth (usft) 0.00 1,700.00 1,949.68 3,000.00	8/18/2017 se: F TVD) +N/-S (usft) 0.00 0.00 5.45 51.40 439.07 1,183.34	(*) PLAN +N/-S (usft) 0.00 Tool Name MWD MWD - Stand +E/-W (usft) 0.00 0.00 0.00 0.44 89,02	-8.64 Tie +E (u 0. 0. 0.00 Rate (*/100usft) 0.00 0.00 2.00 0.00	Con Depth: (/-W sft) 00 Remarks Build Rate (°/100usft) 0.00 0.00 2.00 0.00	66,94 Dire (13: 13: 13: 13: 13: 13: 13: 13: 13: 13:	52,11 0.00 ction ") 3.91 Offic JA WV Environ TFO (") 0.00 0.00 0.00 60.00 0.00 -10.96 0.00	RECEIVED e of Oil and Gas N 1 8 2018 Department of mental Protectio



DB_Jul2216dt_v14 Tug Hill Operating LLC

Bryan S-10HM (slot J)

Bryan Pad

Original Hole

rev2

Marshall County, West Virginia

Planning Report - Geographic

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

Well Bryan S-10HM (slot J) GL=1191 @ 1191.00usftRECEIVED GL=1191 @ 1191.00tiste of Oil and Gas

51-02004

Planned Survey

Database:

Company:

Project:

Wellbore:

Design:

Site:

Well:

Depth	Inclination	Azimuth	Vertical Depth (usft)	+N/-S	+E/-W	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
(usft)	(°)	(°)	(usit)	(usft)	(usft)	lasid	(usit)	and the second se	
0.00	0.00	0.00	0.00	0.00	0.00	14,445,136.25	1,703,176.30	39,77569893	-80,77662
100.00	0.00	0.00	100.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80.77662
200.00	0.00	0.00	200.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80,7766
300.00	0.00	0.00	300.00	0.00	0.00	14,445,136,25	1,703,176.30	39,77569893	-80.7766
400.00	0.00	0.00	400.00	0.00	0.00	14,445,136.25	1,703,176.30	39,77569893	-80.7766
500.00	0.00	0.00	500,00	0.00	0.00	14,445,136,25	1,703,176,30	39,77569893	-80.7766
600.00	0.00	0.00	600.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-30.7766
700.00	0.00	0.00	700.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80.7766
800.00	0.00	0.00	800.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80.7766
900.00	0.00	0.00	900.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80.7766
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80.7766
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80.7766
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80.7766
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80.7766
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80.7766
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80.7766
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,445,136,25	1,703,176.30	39.77569893	-80,7766
1,700.00	0.00	0.00	1,700.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80,7766
	jin 2º/100' bui						1		
1,800.00	2.00	60.00	1,799,98	0.87	1.51	14,445,137.12	1,703,177.81	39.77570132	-80.7766
1,900.00	4.00	60.00	1,899.84	3.49	6.04	14,445,139.74	1,703,182.35	39.77570847	-80.7766
1,950.00	5.00	60.00	1,949.68	5.45	9.44	14,445,141.70	1,703,185.74	39.77571384	-80.7765
		00.00	1,348.00	5.45	0.44	14,440,141.70	1,700,100.74	33.7737 1304	-00.7705
and the second se	00° tangent				10.01				00 7705
2,000.00	5.00	60.00	1,999.49	7.63	13.21	14,445,143.88	1,703,189.52	39.77571979	-80.7765
2,100.00	5.00	60.00	2,099.11	11.99	20.76	14,445,148.24	1,703,197.06	39.77573171	-80.7765
2,200.00	5.00	60.00	2,198.73	16.35	28.31	14,445,152.59	1,703,204.61	39.77574363	-80.7765
2,300.00	5.00	60.00	2,298.35	20.70	35.86	14,445,156.95	1,703,212.16	39.77575554	-80,7765
2,400.00	5,00	60.00	2,397.97	25.06	43.41	14,445,161.31	1,703,219.71	39.77576746	-80.7764
2,500.00	5.00	60.00	2,497,59	29.42	50.95	14,445,165,67	1,703,227.26	39,77577937	-80.7764
2,600.00	5.00	60.00	2,597.21	33.78	58.50	14,445,170.02	1,703,234.80	39.77579129	-80.7764
2,700.00	5.00	60.00	2,696.83	38.13	66.05	14,445,174.38	1,703,242.35	39.77580321	-80,7763
2,800.00	5.00	60.00	2,796.45	42.49	73,60	14,445,178.74	1,703,249.90	39.77581512	-80.7763
2,900.00	5.00	60.00	2,896.07	46.85	81.15	14,445,183.10	1,703,257.45	39.77582704	-80.7763
3,000.00	5.00	60.00	2,995.69	51.21	88,69	14,445,187.46	1,703,265.00	39.77583895	-80.7763
3,004.33	5.00	60.00	3,000.00	51.40	89.02	14,445,187.64	1,703,265.32	39.77583947	-80.776
Begin 2°	/100' build/tui	m							
3,100.00	6.89	56.97	3,095.15	56.61	97.44	14,445,192.86	1,703,273.74	39.77585373	-80.7762
3,200.00	8,87	55.17	3,194.20	64.28	108,80	14,445,200.53	1,703,285,10	39.77587472	-80.7762
3,300.00	10.86	54.03	3,292.72	74.22	122.76	14,445,210.47	1,703,299.06	39.77590193	-80.7761
3,400.00	12.86	53.24	3,390.58	86.42	139,30	14,445,222.66	1,703,315.61	39.77593530	-80.7761
3,500.00	14.85	52.66	3,487.66	100.85	158.41	14,445,237.10	1,703,334.71	39.77597480	-80.7760
3,600.00	16.85	52.22	3,583.86	117.50	180.06	14,445,253.75	1,703,356,36	39.77602039	-80.7759
3,700.00	18.85	51.86	3,679.04	136.36	204.22	14,445,272.60	1,703,380.52	39.77607200	-80.7759
3,800.00	20.84	51.58	3,773.10	157.39	230.86	14,445,293.64	1,703,407.16	39.77612958	-80.7758
3,900.00	22.84	51.34	3,865.91	180.57	259.96	14,445,316.82	1,703,436.26	39.77619305	-80.7757
4,000.00	24.84	51.13	3,957.38	205.88	291.47	14,445,342.13	1,703,467.77	39.77626234	-80.7755
4,100.00	26.84	50.96	4,047.37	233.28	325.36	14,445,369.53	1,703,501.66	39.77633736	-80.7754
4,200.00	28.84	50.81	4,135.80	262.75	361.59	14,445,398,99	1,703,537.89	39.77641802	-80.7753
4,300.00	30.84	50,67	4,222,54	294.23	400.10	14,445,430,48	1,703,576.41	39.77650423	-80,7752
4,400.00	32.83	50.55	4,307.49	327.70	440.87	14,445,463.95	1,703,617.17	39.77659587	-80.7750
4,500.00	34.83	50.45	4,390.55	363.12	483.83	14,445,499.37	1,703,660,13	39,77669283	-80.7749
4,600.00	36.83	50.35	4,471.62	400.44	528.93	14,445,536.69	1,703,705.23	39.77679501	-80.7747
4,698.65	38.81	50.26	4,549.54	439.07	575.47	14,445,575.32	1,703,751,78	39.77690078	-80,7745
	.81° tangent	55,20	10.000						

WV Department of Environmental Protection



Database:

Company:

Project:

Wellbore:

Planned Survey

Design:

Site:

Well:

DB_Jul2216dt_v14

Bryan Pad

Original Hole

rev2

Tug Hill Operating LLC

Bryan S-10HM (slot J)

Planning Report - Geographic

Local Co-ordinate Reference: TVD Reference: Marshall County, West Virginia MD Reference: North Reference: Survey Calculation Method:

Well Bryan S-10HM (slot J) GL=1191 @ 1191.00usft GL=1191 @ 1191.00usft RECEIVED Office of Oil and Gas Grid Minimum Curvature JAN 1 8 2018

WV Department of Environmental Protection

51-02006

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,700.00	38.81	50,26	4,550.60	439.61	576.12	14,445,575.86	1,703,752.43	39,77690226	-80,774574
4,800.00	38.61	50.26	4,628.52	479.67	624.31	14,445,615.92	1,703,800,62	39,77701195	-80.774402
4,900.00	38.81	50.26	4,706.45	519.74	672.50	14,445,655.98	1,703,848,81	39,77712164	-80.774230
5,000.00	38.81	50.26	4.784.38	559.80	720.69	14,445,696,05	1,703,897.00	39,77723133	-80.774058
5,100.00	38.81	50.26	4,862,31	599.86	768.88	14,445,736.11	1,703,945.19	39,77734102	-80.773886
5,200.00	38.81	50.26	4,940.24	639.92	817.07	14,445,776.17	1,703,993.38	39,77745070	-80.773714
5,300.00	38.81	50.26	5,018.16	679.98	865.26	14,445,816.23	1,704,041.57	39.77756039	-80.77354
5,400.00	38.81	50.26	5,096.09	720.05	913.45	14,445,856.29	1,704,089.76	39.77767008	-80.77337
5,500.00	38.81	50.26	5,174.02	760.11	961.64	14,445,896.36	1,704,137.95	39.7777976	-80.77319
5,600.00	38.81	50.26	5,251.95	800.17	1,009.83	14,445,936.42	1,704,186.14	39.77788945	-80.77302
5,700.00	38.81	50.26	5,329.87	840.23	1,058.02	14,445,976,48	1,704,234.33	39.77799914	-80.77285
5,800.00	38.81	50.26	5,407.80	880.30	1,106.21	14,446,016.54	1,704,282.52	39.77810882	-80.77268
5,900.00	38.81	50.26	5,485.73	920.36	1,154.40	14,446,056.61	1,704,330.71	39.77821851	-80.77251
2 · 2 · 2 / 2 · 2 /	38.81	50.26	5,563.66	960.42	1,202.59	14,446,096.67	1,704,378.90	39.77832819	-80.77233
6,000.00	38.81	50.26	5,641.59	1.000.48	1,250.78	14,446,136.73	1,704,427.09	39.77843788	-80.77216
6,100.00	38.81	50.26	5,719.51	1,040.54	1,298.97	14,446,176.79	1,704,475.28	39.77854756	-80,77199
6,200.00	38.81	50.26	5,797.44	1,030,61	1,347.16	14,446,216.85	1,704,523,47	39.77865725	-80.77182
6,300.00		50.26	5,875.37	1,120,67	1,395,35	14,446,256.92	1,704,571.66	39.77876693	-80.77165
6,400.00	38,81		5,953.30	1,160.73	1,443.54	14,446,296.98	1,704,619.85	39.77887662	-80.77148
6,500.00	38.81	50.26		1,183.34	1.470.74			39.77893852	-80.77138
6,556.44	38,81	50.26	5,997.28	1,185.54	1.470.74	14,446,319.59	1,704,647.04	39.17093032	-00.77150
Begin 10									
6,600.00	38.36	57.21	6,031.35	1,199.39	1,492,61	14,448,335,64	1,704,668.91	39.77898246	-80.77130
6,700.00	38.93	73.23	6,109.65	1,225.33	1.548,92	14,446,361.58	1,704,725.23	39.77905328	-80.77110
6,800.00	41.57	88,19	6,186.15	1,235.46	1 612.32	14,446,371.71	1,704,788.63	39.77908067	-80.77087
6,900.00	45.92	101.25	6,258.53	1,229.49	1.680.88	14,446,365.74	1,704,857.18	39.77906378	-80,77063
7,000.00	51,53	112.28	6,324.59	1,207.59	1.752.51	14,445,343.84	1,704,928.82	39.77900313	-80.7703E
7,100.00	58.02	121.60	6,382.31	1,170.43	1.825.05	14,446,306.67	1,705,001.35	39.77890056	-80.77012
7,200.00	65.11	129.64	6,429.96	1,119.13	1.896.28	14,446,255.38	1,705,072.58	39.77875920	-80.76986
7,300.00	72.57	136.79	6,466.07	1,055.27	1 964.04	14,446,191.52	1,705,140.34	39.77858333	-80.75962
7,400.00	80.27	143.36	6,489.56	980.77	2.026.27	14,446,117.02	1,705,202.57	39.77837829	-80.76940
7,500.00	88.09	149.63	6,499.71	897.90	2.081.09	14,446,034.15	1,705,257.39	39.77815033	-80.7592
7,511.60	89.00	150.35	6,500.00	887.86	2,086.89	14,446,024.11	1,705,263.19	39.77812271	-80.76919
Begin 89	.00° lateral se	ection							
7,600.00	89.00	150.35	6,501.55	811.05	2,130.61	14,445,947.30	1,705,306.92	39.77791145	-80.76903
7,700.00	89.00	150.35	6,503.30	724.16	2,180.08	14,445,860.40	1,705,356.38	39.77767247	-80.76888
7,800.00	89.00	150.35	6,505.04	637.26	2,229.54	14,445,773.51	1,705,405.84	39.77743349	-80.76868
7,900.00	89.00	150.35	6,506.79	550.37	2,279.00	14,445,686.62	1,705,455.31	39.77719451	-80,7685
8.000.00	89.00	150.35	6,508.54	463.48	2,328.47	14,445,599.73	1,705,504.77	39.77695553	-80.76833
8,100.00	89.00	150.35	6,510.29	376.59	2,377.93	14,445,512.83	1,705,554.23	39.77671654	-80.76816
8,200.00	89.00	150.35	6,512.04	289.69	2,427.39	14,445,425.94	1,705,603.70	39.77647756	-80,76798
8,300.00	89.00	150.35	6,513.79	202.80	2,476.86	14,445,339.05	1,705,653.16	39.77623858	-80.7678
8,400.00	89.00	150.35	6,515,54	115,91	2,526,32	14,445,252,16	1,705,702.62	39,77599960	-80.76763
8,500.00	89.00	150.35	6,517.29	29.02	2,575.78	14,445,165.26	1,705,752.09	39.77576061	-80.76746
8,500.00	89.00	150.35	6,519.03	-57.88	2,625,25	14,445,078.37	1,705,801.55	39.77552163	-80,76728
8,700.00	89.00	150.35	6,520.78	-144.77	2,674.71	14,444,991.48	1,705,851.01	39.77528264	-80.76711
8,800.00	89.00	150.35	6,522,53	-231.66	2,724.18	14,444,904.59	1,705,900.48	39.77504366	-80,76693
8,900.00	89.00	150.35	6,524.28	-318.55	2,773.64	14,444,817.69	1,705,949.94	39.77480467	-80.76675
9,000.00	89.00	150.35	6,526,03	-405,45	2,823,10	14,444,730.80	1,705,999.40	39,77456569	-80,76658
9,100.00	89.00	150.35	6,527.78	-492.34	2,872.57	14,444,643.91	1,706,048.87	39.77432670	-80,76640
9,200.00	89.00	150.35	6,529.53	-579.23	2,922.03	14,444,557.02	1,706,098.33	39.77408772	-80,76623
9,300.00	89.00	150.35	6,531,28	-666.12	2,971.49	14,444,470.12	1,706,147.79	39.77384873	-80.76605
9,400.00	89.00	150.35	6,533.03	-753.02	3,020.96	14,444,383,23	1,706,197.26	39.77360975	-80.76588
9,500.00	89.00	150.35	6,534.77	-839.91	3,070.42	14,444,296.34	1,706,246.72	39.77337076	-80.76570
	89.00	150.35	6,536.52	-926.80	3,119.88	14,444,209.45	1,706,295.18	39.77313178	-80.76553

COMPASS 5000.14 Build 85



Planning Report - Geographic

Well Bryan S-10HM (slot a)FCEIVED GL=1191 @ 1191.001999 of Cili and Gas DB_Jul2216dt_v14 Tug Hill Operating LLC Local Co-ordinate Reference: Database: TVD Reference: Company: JAN 18 2018 Marshall County, West Virginia MD Reference: GL=1191 @ 1191.00usft Grid Bryan Pad North Reference: Bryan S-10HM (slot J) Survey Calculation Method: Minimum Curvature WV Department of Environmental Protection Original Hole Wellbore: rev2

Planned Survey

Project:

Design:

Site:

Well:

leasured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,700.00	89.00	150.35	6,538.27	-1,013,69	3,169.35	14,444,122,55	1,706,345.65	39,77289279	-80.76535
9,800.00	89.00	150.35	6,540.02	-1,100,59	3,218,81	14,444,035.66	1,706,395.11	39.77265380	-80.76518
9,900.00	89.00	150.35	6,541.77	-1,187.48	3,268.27	14,443,948.77	1,706,444.58	39.77241481	-80,76500
10,000,00	89.00	150.35	6,543.52	-1,274.37	3,317.74	14.443,861.88	1,706,494.04	39.77217583	-80.76483
10,100.00	89.00	150.35	6,545.27	-1,361.26	3,367.20	14,443,774.98	1,706,543.50	39.77193684	-80,76465
10,200.00	89.00	150.35	6,547.02	-1,448.16	3,416.66	14,443,688.09	1,706,592.97	39.77169785	-80.76448
10,300.00	89.00	150.35	6,548.77	-1,535.05	3,466.13	14,443,601.20	1,706,642.43	39.77145886	-80.76430
10,400.00	89.00	150.35	6,550.51	-1,621.94	3,515.59	14,443,514.31	1,706,691.89	39.77121987	-80.76413
10,500.00	89.00	150.35	6,552.26	-1,708.83	3,565.05	14,443,427.41	1,706,741.36	39.77098088	-80.76395
10,600.00	89.00	150.35	6,554.01	-1,795.73	3,614.52	14,443,340.52	1,706,790.82	39,77074190	-80.76378
10,700.00	89.00	150.35	6,555.76	-1,882.62	3,663,98	14,443,253.63	1,706,840.28	39.77050291	-80.76360
10,800.00	89.00	150.35	6,557.51	-1,969.51	3,713.44	14,443,166.74	1,706,889.75	39.77026392	-80.7634:
10,900.00	89.00	150.35	6,559.26	-2,058.40	3,762.91	14,443,079.84	1,706,939.21	39.77002493	-80.76325
11,000.00	89.00	150.35	6,561.01	-2,143.30	3,812.37	14,442,992.95	1,705,988.67	39.76978594	-80.7630
11,100.00	89.00	150,35	6,562.76	-2,230.19	3,861,83	14,442,906.06	1,707,038.14	39.76954695	-80.7629
11,200.00	89.00	150.35	6,564.51	-2,317.08	3,911.30	14,442,819,17	1,707,087.60	39.76930795	-80,7627
11.300.00	89.00	150.35	6,566.25	-2,403.97	3,960.76	14,442,732.27	1,707,137.06	39,76906896	-80.7625
11,400.00	89.00	150.35	6,568.00	-2,490.87	4,010.23	14,442,645.38	1,707,186.53	39,76882997	-80,7623
11,500.00	89.00	150.35	6,569.75	-2,577.76	4,059.69	14,442,558.49	1,707,235,99	39.76859098	-80.7622
11,600.00	89.00	150.35	6,571.50	-2,664.65	4,109.15	14,442,471.60	1,707,285.45	39.76835199	-80,7620
11,700.00	89.00	150.35	6,573.25	-2,751.54	4,158.62	14,442,384.70	1,707,334.92	39,76811300	-80.7618
11,800.00	89.00	150.35	6,575.00	-2,838.44	4,208.08	14,442,297.81	1,707,384.38	39,76787400	-80.7616
11,900.00	89.00	150.35	6,576,75	-2,925.33	4,257.54	14,442,210.92	1,707,433.84	39.76763501	-80,7615
12,000.00	89.00	150.35	8,578.50	-3.012.22	4,307.01	14,442,124.03	1,707,483.31	39.76739602	-80.7613
12,100.00	89.00	150.35	6,580.25	-3,099.11	4,356.47	14,442,037.13	1,707.532.77	39.76715702	-80.7611
12,200.00		150.35	6,581.99	-3,186.01	4,405.93	14,441,950.24	1,707,582.23	39.76691803	-80.7609
12,300.00	89.00	150.35	6,583.74	-3,272.90	4,455.40	14,441,863.35	1,707,631.70	39.76667904	-80.7608
12,400.00	89.00	150.35	8,585.49	-3,359.79	4,504.86	14,441,776.46	1,707,681.16	39.76644004	-80.7606
12,500.00		150.35	6,587.24	-3,446.68	4,554.32	14,441,689.56	1,707,730.63	39.76620105	-80.7604
12,600.00	89.00	150.35	6.588.99	-3,533.58	4,603.79	14,441,602.67	1,707,780.09	39,76596205	-80.7602
12,700.00		150.35	6,590.74	-3,620.47	4,653.25	14,441,515.78	1,707,829.55	39,76572306	-80.7601
12,800.00		150.35	6,592.49	-3,707.36	4,702.71	14,441,428.89	1,707,879.02	39,76548406	-80.7599
12,900.00		150.35	6,594.24	-3,794.25	4,752.18	14,441,341.99	1,707,928.48	39.76524507	-80.7597
13,000.00		150.35	6,595.98	-3,881.15	4,801.64	14,441,255.10	1,707,977.94	39,76500607	-80,7595
13,100.00		150.35	6,597,73	-3,968.04	4,851.10	14,441,168.21	1,708,027.41	39.76476708	-80,7594
13,200.00		150.35	6,599.48	-4,054,93	4,900.57	14,441,081.32	1,708,076.87	39,76452808	-80.7592
13,200.00		150.35	6,601.23	-4,141.82	4,950.03	14,440,994.42	1,708,126.33	39.76428908	-80.7590
10010000000		150.35	6,602.98	-4,228.72	4,999.49	14,440,907.53	1,708,175.80	39.76405009	-80.7588
13,400.00								39.76381109	-80.7586
13,500.00		150.35	6,604.73 6,606.48	-4,315.61	5,048.96	14,440,820.64	1,708,225.26	39.76357209	-80.7585
13,600.00		150.35 150.35		-4,402.50	5,098.42	14,440,733.75		39.76333310	-80.7583
13,700.00			6,608.23		5,147.88	14,440,646.85	1,708,324.19	39.76309410	-80.7581
13,800.00		150.35	6,609.98	-4,576.29	5,197.35	14,440,559.96	1,708,373.65	39.76285510	-80.7579
13,900.00	89.00	150.35	6,611.72	-4,663.18	5,246.81	14,440,473.07	1,708,423.11		
14,000.00		150,35	6,613.47	-4,750.07	5,296.28	14,440,386.18	1,708,472.58	39.76261610	-80.7578
14,100.00		150.35	6,615.22	-4,836.96	5,345.74	14,440,299.28	1,708,522.04	39.76237710	-80.7576
14,200.00		150.35	6,616.97	-4,923.86	5,395.20	14,440,212.39	1,708,571.50	39.76213810	-80.7574
14,300.00		150.35	6,618.72	-5,010.75	5,444.67	14,440,125.50	1,708,620.97	39.76189910	-80.7572
14,400.00		150.35	6,620.47	-5,097.64	5,494,13	14,440,038.61	1.708,670.43	39.76165011	-80.7571
14,500.00		150.35	6,622.22	-5,184.53	5,543.59	14,439,951.71	1,708,719.89	39.76142111	-80.7569
14,600.00		150.35	6,623.97	-5,271.43	5,593.06	14,439,864.82	1,708,769.36	39.76118211	-80.7567
14,700.00		150.35	6,625.72	-5,358.32	5,642.52	14,439,777.93	1,708,818.82	39.76094311	-80.7565
14,800.00		150.35	6,627.46	-5,445.21	5,691.98	14,439,691.04	1,708,868,28	39,76070410	-80,7564
14,887.82	89.00	150.35	6,629.00	-5,521.52	5,735,42	14,439,614.73	1,708,911.72	39.76049422	-80.7562

COMPASS 5000.14 Build 85

51-02006



Planning Report - Geographic

	Bryan Pad	North Reference:	Grid
Well:	Bryan S-10HM (slot J)	Survey Calculation Method:	Minimum Curvature, oil and Gas
	Original Hole	ourrey oucculation method.	Grid Minimum Curvature of Oli and Gas Office of Oli and Gas
Design:	rev2		JAN 1 8 2018

Target Name								WV Departine Environmental Pro	otection
- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LP Bryan S-10HM - plan misses target o - Point	0.00 enter by 45.0	0.00 00usft at 751	6,500.00 1.87usft MD	865.37 (6500.00 TVD	2,047.91), 887.63 N, 2	14,446,001.61 087.02 E)	1,705,224.22	39.77806121	-80.76933173
LP Bryan S-10HM 45 E - plan hits target cent - Point	0.00 er	0.00	6,500.00	887.87	2,086.89	14,446,024.11	1,705,263.19	39.77812272	-80.76919281
BHL Bryan S-10HM r3 - plan hits target cent - Point	0.00 er	0.00	6,629.00	-5,521.52	5,735.42	14,439,614.73	1,708,911.72	39.76049422	-80.75626883

Plan Annotations

Measured	Vertical	Local Coor	dinates	
Depth (usft)	Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
1,700.00	1,700.00	0.00	0.00	KOP Begin 2°/100' build
1,950.00	1,949.68	5.45	9.44	Begin 5.00° tangent
3,004.33	3,000.00	51.40	89.02	Begin 2°/100' build/turn
4,698.65	4,549.54	439.07	575.47	Begin 38.81° tangent
6,556.44	5,997.28	1,183.34	1,470.74	Begin 10°/100' build/turn
7,511.60	6,500.00	887.86	2,086.89	Begin 89.00° lateral section
14,887,82	6,629,00	-5,521.52	5,735.42	PBHL/TD 14887.82 MD/6629.00 TVD

51-02004

51-02006

WW-9	API Number 47 - 051 - 02004
(4/16)	Operator's Well No. Bryan S-10HM
	OF WEST VIRGINIA
	VVIRONMENTAL PROTECTION E OF OIL AND GAS
OFFICE	
FLUIDS/ CUTTINGS DI	ISPOSAL & 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 con Will a pit be used? Yes No V	mplete the proposed well work? Yes No
If so, please describe anticipated pit waste:AST Ta	inks 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 with a used with proper containing
Proposed Disposal Method For Treated Pit Wastes:	
Land Application	
Underground Injection (UIC Per	rmit Number_UIC 2459, UIC 965, UIC 359, UIC 2D0732540, UIC 2D0732523)
Reuse (at API Number)
Off Site Disposal (Supply form V Other (Explain	ww-9 for disposal location)
•	
Will closed loop system be used? If so, describe: Yes - For	Vertical and Horizontal Drilling
	ontal)? Air, freshwater, oil based, etcAir for vertical / Oll for Horizontal
-If oil based, what type? Synthetic, petroleum, etc.	
Additives to be used in drilling medium? Barite for weight	
Drill cuttings disposal method? Leave in pit, landfill, remov	and offerte etc. All drill cultings to be disposed of in a Landfill
-If left in pit and plan to solidify what medium will	
-Landfill or offsite name/permit number?	Sanilary Landfa (SWF-1021 / WV0109185) and Westmoreland Sanilary Landfal, LLC (SAN1405 / PA DEP EC#1386426)
	nd Gas of any load of drill cuttings or associated waste rejected at any ded within 24 hours of rejection and the permittee shall also disclose
on August 1, 2005, by the Office of Oil and Gas of the West provisions of the permit are enforceable by law. Violation law or regulation can lead to enforcement action. I certify under penalty of law that I have person application form and all attachments thereto and that, but	nd conditions of the GENERAL WATER POLLUTION PERMIT issued t Virginia Department of Environmental Protection. I understand that the is of any term or condition of the general permit and/or other applicable ally examined and am familiar with the information submitted on this ased on my inquiry of those individuals immediately responsible for is true, accurate, and complete. I am aware that other are significant sibility of fine or imprisonment.
	JAN 18 2018
Company Official Signature Company Official (Typed Name) Sean Gasser	WV Department of
	Environmental Protection
Company Official Title	
Subscribed and sworn before me this 10th day of	A 12 1 1 0 1 0 1
Subscribed and sworn before me this 10-5 day of	anuary, 2018
Kelligs Donnelly	Notary Public KELLY SUZAN
Q B-21-21	Notary Public,
My commission expires $0^{-}0[-\infty]$	Notary ID

ļ J

Form WW-9

		Operator's Well No. Bryan S-10HM		
Tug Hill Operating, LL	С			
Proposed Revegetation Treatmen	nt: Acres Disturbed 18.43	Prevegetation pH	6.0	
Lime 3	_ Tons/acre or to correct to pH	<u> 6.5 </u>		
Fertilizer type _10-20-2	20			
Fertilizer amount 500]I	bs/acre		
Mulch 2.5	Tons/	acre		
	See	d Mixtures		
Temp		Perma	nent	
Seed Type	lbs/acre	Seed Type	lbs/acre	
Annual Ryegrass	40	Orchard Grass	12	
Spring Oats	96	Ladino	3	
		White Clover	2	

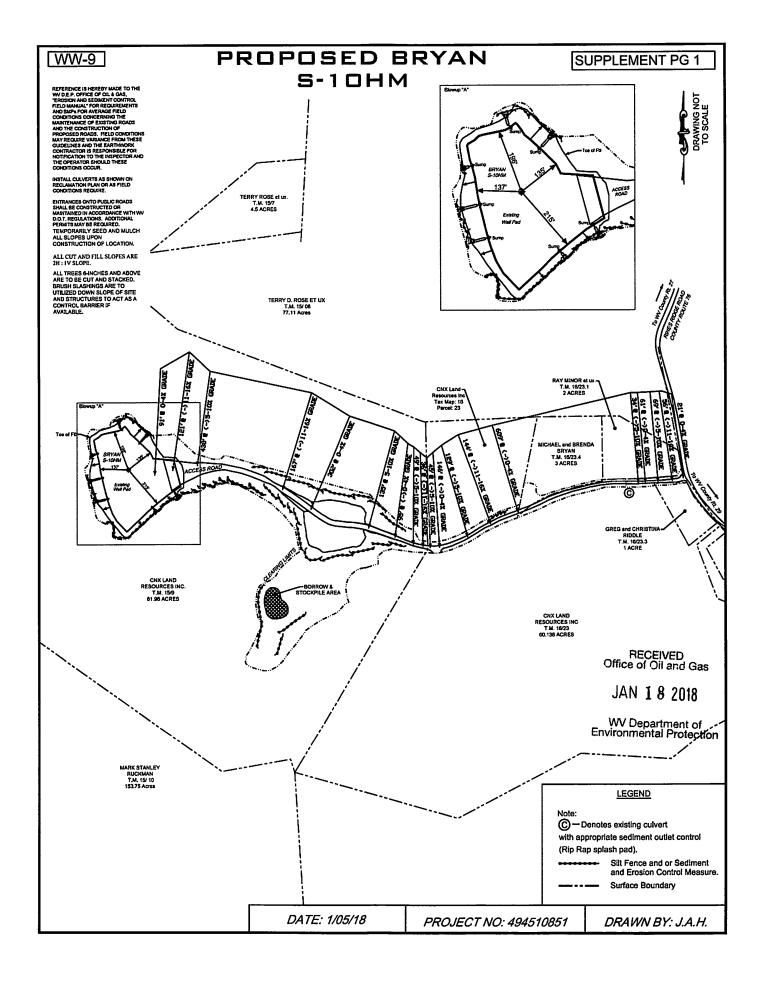
Maps Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, include dimensions ($L \times W \times D$) of the pit, and dimensions ($L \times W$), and area in acreage, of the land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

Photocopied section of involved 7.5' topographic sheet.

RECEIVED Office of Oil and Gas
JAN 1.8-2018
WV Department of Environmental Protection
-

Title: Di / & Occi /uspector Date: 1/10/18 Field Reviewed?

51-02004



51-02006



Well Site Safety Plan

Tug Hill Operating, LLC ອີ້ (ເ^ຍ|ໃ^ຮ

Well Name:Bryan S-10HM

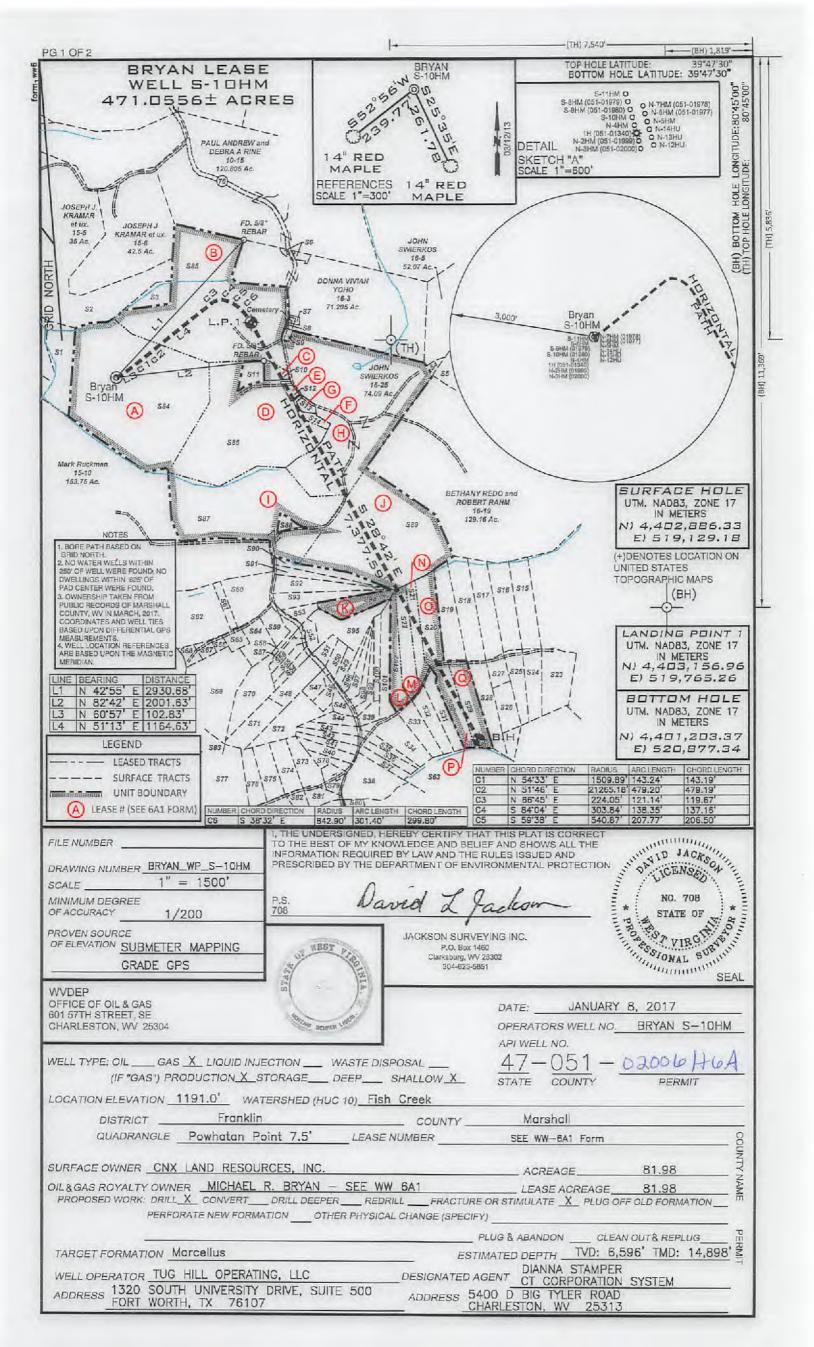
Pad Location: Bryan Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17: Northing: 4,402,886.33 Easting: 519,129.18

JAN 1 8 2018

WV Department of Environmental Protection January 2018



PG2OF2 BRYAN LEASE WELL S-10HM 471.0556± ACRES

GRID NORTH

WWE

form

lumber	TAX MAP -PARCEL	ADJOINER OWNER	ACRES	S52	18-49	Tanner Butler	2.02
1	15-13	CNX Land Resources Inc.	11.0	\$53	18-50	Steven Berisford	2.170
52	15-6.1	Joseph J. Kramer Et Ux	39.40	S54	18-45	Michael Fincham & Kezla Winters	2.07
33	15-7	Terry D. Rose Et Ux	4.5	S55	18-46	Dale W. & Patricia Gardner	2.03
54	16-4	John Swierkos	0.96	S56	18-47	Robert Pelley II & Susan Briggs	2.01
5	16-6	John Swierkos	134.05	S57	18-13.5	Wesley Bryan	1.02
6	16-3.2	Jimmy Ostrander Sr. Et Ux	1.435	S58	18-36	Ruth Mulligan Est.	2.03
57	16-3.1	Dennis Jackson Et Ux	0.27	S59	18-15.2	Edward Burge	4.17
68	16-2	Fredonia Christian Church	0.19	S60	18-11	Benjamin Robinson	1.02
69	16-1	Fredonia Christian Church	0.50	S61	18-11.2	Edward Lee Burge Jr.	2.0
510	16-23.1	Ray E. Minor Et Ux	2.0	S62	18-11.1	Edward Lee Burge Jr.	18.0
511	16-23.4	Michael R. & Brenda K. Bryan	3.0	S63	17-02	Phyllis Flouhouse Trust & Belle Yoho	104
\$12	16-23.3	Greg & Christina Riddle	1.0	S64	18-15.1	Jason Blair	5.94
\$13	16-24	Alan M. Beyser Et Ux	1.083	S65	18-12	William Wayne Et Ux	2.27
514	16-23.2	Alan M. Beyser Et Ux	1.726	S66	18-10	David & Nancy Anderson	0.90
515	17-16	Glen A. Gunto	9.702	S67	18-10.2	David Anderson Et Ux	1.37
516	16-15.1	Glen A. Gunto	10.17	S68	18-10.1	David Anderson Et Ux	1.65
517	17-15	Glen A. Gunto	10.22	S69	18-15.5	Darrell & Teresa Boley	23.5
18	18-13	Southern Country Farms Inc.	11.415	S70	18-13.3	Robert Closterman	9.8
519	18-13.9	Roy & Rense Butler	9.603	S71	18-17	Michael S. Fincham & Kezia M. Winters	6.55
520	18-13.4	Renee D. Straight	9.938	S72	18-13.1	Betty Tagg Est.	9.24
521	18-13.12	Charles A. & Mary Nice	5.969	S73	18-13.7	Victor W. Woods Jr. & Jessica L. Woods	5.25
522	18-13	Southern Country Farms Inc.	8.037	S74	18-13.6	Glenn Eugene Whisler El Ux	5.38
523	17-3.1	Wilbur L. Riddle Et Ux	10.148	S75	18-13.13	Glenn E. & Sandra K. Whisler	5.59
524	17-1.6	Lola M. Slaughter	6.347	S76	18-34	Jodi A. & Gary A. Hall	5.00
525	17-1.5	Donnie R. & Lola M. Slaughtar	5.607	S77	18-13	Southern Country Farms Inc.	24.7
526	17-1.3	Jody & Michelle Anderson	5.0	S78	18-57	Marvin D. Roberts	2.22
527	17-1.2	Donnie R. & Lola M. Slaughter	5.073	S79	18-18	Linda Coen	3.0
28	17-1.1	Donnie R. & Lola M. Slaughter	8.078	SBO	17-10.4	Ron Murrin Et Al	2.01
529	17-1.4	Donnie R. & Lola M. Slaughter	8.844	S81	18-48	Marvin Dean Roberts Et Al	2.92
30	17-14	Southern Country Farms Inc.	7.314	S82	18-13.14	Glenn & Sandra Whisler	2.1
531	17-13	Roy E. & Renee Butler	5.433	S83	18-16	Charles Yeater	17.7
32	17-1.7	Roy E. & Renee Butter	5.22	S84	15-09		81.9
333	17-1	Southern Country Farms Inc.	5.030	S85		CNX Land Resources Inc.	-
534	18-13	Southern Country Farms Inc.		S86	15-08	Terry D. Rose et ux	77.
335	18-58	Kevin W. Roberts	8.743	S87	16-23	CNX Land Resources Inc.	60.
336	18-35	Mary Anderson	the second se		16-22	James M. Ruckman et ux	54.6
37	18-42		2.635	S88	16-22.1	Heather A. Burgy	1.46
338	18-19	Roger Howard Hall Roger Howard Hall Jr.	2.383	S89	16-21	James M. Ruckman et ux	60.7
339	18-53		10.0	590	18-56	William O'Hara	3.96
540	18-61	Christopher M. Previtera Roger White Jr.	2.0	S91	18-55	William O'Hara	3.20
			2.984	592	18-28	Dotson Harrison	6.36
541	18-52	Roger Hall	2.536	S93	18-28.1	Carol Helmick	5.69
542	18-51	Roger Hall	2.505	S94	18-13.2	Steven Berisford	6.02
543	18-43	Roy E. & Renee Butler	2.532	S95	18-13	Southern Country Farms, Inc.	11.0
544	18-44	Renee Streight Butler	2.133	S96	18-27.1	Marlon R. Conner	2.00
545	18-25	Charles & Maria Rayl	2.133	S97	18-27.2	Linda L, Moore	3.00
546	18-41	Cory A. Holt	2.308	S98	18-27	Linda L. Moore	2.44
547	18-40	Cory A. Holt	2.237	S99	18-26	Linda L. Moore	2.62
548	18-14	Michael Fincham & Kezia Winters	6.386	S100	18-13.11	Linda L. Moore	3.15
549	18-39	Marion R. Conner	2.001	S101	18-53.1	Christopher M. Previtera	6.28
50	18-38	Marlon R. Conner	2.231	S102	18-60	Christopher M. Previtera	6.29



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WELL PLAT
PAGE 2 OF 2
DATE:01/08/2018

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WW-6A1 (5/13) Operator's Well No. Bryan S-10HM

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

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

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

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

*See attached pages

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

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

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

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

Well Operator:		RECEIVED
By:	Amy Miller	RECEIVED Office of Oil and Gas
Its:	Permitting Specialist	JAN 1 8 2018

WV Department of Environmental Protection Page 1 of _____

51-02006

DPS LAND SERVICEB CORP 6000 TONN CENTER BOLLEWARD, SUITE 145 CANINSEING PA 15317-5541

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STATE OF WEST VIRGINIA

COUNTY OF MARSHALL

ASSIGNMENT AND BILL OF SALE

This ASSIGNMENT AND BILL OF SALE (this "<u>Assignment</u>") dated as of August 1, 2017 (the "<u>Signing Date</u>"), but effective from and after 7:00 a.m., Bastem Standard Time on . August 2, 2017 being the day immediately following the Signing Date (the "<u>Effective Date</u>"), is made by Chevron U.S.A. Inc., a Pennsylvania corporation, with an address at 700 Cherrington Parkway, Coraopolis, PA 15108 ("<u>Chevron</u>" or "<u>Assignor</u>") to TH Exploration II, LLC and TH Exploration, LLC, Texas limited liability companies, with an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (collectively "<u>Assignee</u>") and is accepted by Assignee upon the following terms and conditions.

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RECITALS

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

1. DEFINITIONS

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

"Actease Trade Agreement" means that certain Acreage Trade Agreement by and between Chevron U.S.A. Inc. and TH Exploration, LLC with an Effective Date of August 1, 2017 to be contemporaneously executed with this Assignment.

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

"Affiliate" means any legal entity which controls, is controlled by, or is under common control with, another legal entity. An entity is deemed to "control" another if it owns directly or indirectly at least fifty percent of either of the following: (A) the shares entitled to vote at a general election of directors of such ' other entity or (B) the voting interest in such other entity if such entity does not have either shares or directors.

"<u>Applicable Law(s)</u>" means all laws, principles of common law, regulations, statutes, codes, rules, orders, ordinances, permits, enforceable policies, licenses, certifications, decrees, constitutions, standards or other requirements with similar effect of any Government Entity and any binding interpretations of the foregoing.

"Assets" has the meaning given to such term in Section 2.1 of this Assignment.

"<u>Assigned Hydrocarbons</u>" means all Hydrocarbons produced and severed from, or allocable, after severance, to the Leases, Units, and Wells on and after the Effective Date. RECEIVED Office of Oil and Gas

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WV Department of Environmental Protection

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Page 1 of 33



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STATE OF WEST VIRGINIA

COUNTY OF MARSHALL

Harshall County Jan Pest, Elerk Instrument 1428356 09/16/2017 0 12:082:49 PH ASSIEMENTS Book 40 0 Pase 127 Pases Recorded 25 Recurdins Cost \$ 33.00

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

ASSIGNMENT AND CONVEYANCE

WITNESSETH:

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

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

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

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

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

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

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WV Department of Environmental Protection

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DFS LAND SERVICES CORP 6000 TOWN CENTER BOULEVARD, SUITE 145 CANONSEURG PA 15317-5941

ASSIGNMENT OF OIL AND GAS LEASES

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

WITNESSETH:

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

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

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

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

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

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

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

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

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

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WV Department of Environmental Protection

Operator's Well No. Bryan S - 10HM

WW-6A1 Supplement

Lease No.	Tegs	Parcel	Lessor	Lessee	Royatty	Book	1	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
5*19294		5-15-9	BRENDA K GRYAN	TRIENERGY INC	1/8+	743	78	NA	20/343 TriEnergy Inc to AB Resources LLC	21/491 AB Resources LLC to Chief Exploration & Development LLC and Radier 2000 Uwited Partpership	685/643 Chief Exploration & Deviopment LUC and Racker 2000 Limited Partnership to Enerphra Resources (USA) Corporation	25/1 Chief Exploration & Development, LLC, Chief Oil and Ges, LLC, Radier 2000 Limited Parteenthy and François Resources to Chevron USA Inc	756/397 AB Resources LLC to Chewon USA lac	28/356 TriEnergy Holdings LLC and TriEnergy Holdings LLC USA Inc	40/57 Chevron USA loc to TI Exploration LLC
· *19340	8	5-15-8	DONNA V YOHO	GASTAR EXPLORATION USA INC	1/8+	665	407	NA	23/353 Gester Exploration USA Inc. to Atlnum MarceEus f LLC	23/617 Gester Exploration USA Inc and Atlaum MarceRus I LLC to AB Resources LLC	24/319 AB Resources LLC to Chief Exploration & Development LLC and Radier 2000 Limited Partnership	25/1 Chief Exploration & Development, LLC, Chief OII and Gas, LLC, Ratilar 2000 Limited Partnerhip and feneptus Resources to Chevron USA Inc	25/105 Chief Exploration & Development, 11C, Chief Od & Ges, LLC, Radier 2000 Limited Partnership and Enerpius Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	40/57 Chavron USA Inc. to Ti Exploration LLC
19145	c	5-16-23.1	BAY E MINDR CATHY L MINOR	TRIEMERGY HOLDINGS, LLC	1/8+	705	293	H/A	NA	24/180 TriEnargy Holdings, LLC, to NPAR, LLC	25/1 Chief Exploration & Development, LLC, Chief Oil and Gas, LLC, Radior 2000 Limited Partnerksip and Energhus Resources to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Of & Gas, LLC, Radier 2000 United Partnership and Easphys Resources (USA) Corporation to Chevron USA Inc.	755/332 NPAR, LLC to Chevron USA	28/356 TriEnergy Holdings, LLC and TriEnergy, Inc to Chevron USA Inc	40/127 Chevron USA Inc. to T Exploration, LLC
9*19165	D	5-16-23	BRENDA K BRYAN	TRIEHERGY INC	1/8+	741	78	N/A	20/348 TriEnergy Inc to AB Resources LLC	21/491 A8 Resources LLC to Chief Exploration & Development LLC and Radier 2000 Limited Partnership	685/643 Chief Exploration & Devlopment LLC and Radier 2000 Limited Partnership to Enerphas Resources (USA) Corporation	25/1 Chief Exploration & Development, LLC, Chief OB and Gas, LLC, Radier 2000 Limited Partnership and Energius Resources to Chevron USA Inc	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Cleavron USA Inc	40/57 Chewoa USA lac to Th Exploratioa LLC
*19144	ε	5-16-23.3	GREG A RIDDLE CHRISTINA L RIDDLE	TRIENERGY HOLDINGS, LLC	1/8+	704	354	N/A	24/180 TriEnergy Holdings, LLC, to NPAR, LLC	24/406 AB Resources LLC and NPAR, LLC to Chief Exploration & Development LLC and Radier 2000 Limited Partnership	25/3 Chief Exploration & Development, LLC, Chief OI and Gas, LLC, Radier 2000 Limited Partnerhsip and Enerphus Resources to Chevron USA Inc.	25/105 Chief Exploration & Development, LLC, Chief OB & Gas, LLC, Radior 2000 Limited Partnership and Exerplus Resources (USA) Corporation to Chavron USA Inc.	756/332 NPAR, LLC to Chevron USA	28/356 TriEnergy Holdings, LLC and TriEnergy, Inc to Chevron USA Inc	40/127 Chevron USA Inc. to T Exploration, LLC
19162	F	5-16-23.2	ALAN M BEYSER LORI A BEYSER	TRIENERGY HOLDINGS, LLC	1/8+	711	355	24/180 Trileerzy Holdings, LLC, to NPAR, LLC	24/466 AB Resources LLC and NPAR, LLC to Chief Exploration & Development LLC and Radter 2000 Limited Partnership	25/3 Chief Exploration & Development, LLC, Chief OD and Gas, LLC, Radier 2000 United Pertnethist and Energius Resources to Chevron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oli & Ges, LLC, Redier 2000 Limited Pertnership and Encrylos Resources LUGA Corporation to Chrynon USA lac.	756/332 NPAR, LLC to Chevron USA	28/356 TriEnergy Holdings, LLC and TriEnergy, Inc to Chevron USA Inc	35/470 WPP LLC to KRP Marcellus J, LLC, Rivertrest Royattles II, LLC, BRD Royatty Holdings, LLC and Amon G Carter Foundation	40/127 Chevron USA Isc. to T Exploration, 112
•21468	н	5-16-25	JOHN A SWIERKOS	TH Exploration, LLC	1/8+	953	917	N/A	N/A	N/A	N/A	N/A	K/A	N/A	N/A
19338	_		JAMES M AND KOMDERLY L RUCKMAN	TRIENERGY INC.	1/2+	741	n	20/348 TriEnergy Inc to AB Resources LLC	21/491 AB Resources LLC to Chief Exploration & Development LLC and Radier 2000 Limited Partnership	685/643 Chief Exploration & Deviopment LLC and Radler 2000 limited Partnership to Enerpius Resources (USA) Corporation	25/1 Chief Exploration & Development, LLC, Chief OB and Ges, LLC, Radier 2000 Limited Partnerholp and Energius Resources to Cherron USA inc	25/105 Chief Exploration & Development, LLC, Chief Col & Gas, LLC, Radier 2000 Umited Partnership and Energius Resources (USA) Corporation to Chevron USA Inc.	756/397 AB Resources LLC to Chevron USA Inc	28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	4Q/S7 Chavron USA frc to TH Exploration U.C

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Operator's Well No. Bryan S - 10HM

Lesse No.	Tags	Parcel	Lessor	Lessee	Royalty	Bock	Pg	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*19338		5-16-21	JAMES M AND KIMDERLY L RUCKMAN	TRIENINGY INC	1/8+	741	<u>n</u>	20/348 TriEnergy Inc to AB Arsources LLC	21/491 AB Resources LLC to Chief Exploration & Development LLC and Radier 2000 Limited Partnership	685/643 Chief Exploration & Deviopment LLC and Radier 2000 Linited Partnership to Enerplus Resources (USA) Corporation	25/1 Chief Exploration & Development, LLC, Chief OB and Ges, LLC, Raifer 2000 limited Pertnerhsip and Enerphus Resources to Chewron USA Inc	25/105 Chief Exploration & Development, LLC, Chief Oil & Gas, LLC, Radier 2000 Limited Partnership and Enerplus Resources (USA) Corporation to Chevron USA lac.		28/356 TriEnergy Holdings LLC and TriEnergy Inc to Chevron USA Inc	40/57 Chevron USA Inc. to TH Exploration LLC
10*17825	<u> </u>	S-18-60	ALLDALE MINERALS II, LP	TH EXPLORATION, LLC	1/8+	940	499	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17812	ι	5-18-60	POTOMAC MINERAL GROUP, LLC	TH EXPLORATION, LLC	1/8+	940	437	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21465		5-18-60	MOLLY D. ASTON, ET VIR	TH EXPLORATION, LLC_	1/8+	954	134	N/A	N/A	N/A	N/A	N/A	N/A	R/A	N/A
10*21452		5-18-60	MAGGY D. ASTON, ET VIR	TH EXPLORATION, LLC	1/8+	954	121	N/A	N/A	N/A	N/A	R/A	N/A	N/A	N/A
10*14915		5-1B-60	CHESTNUT HOLDINGS, INC.	GASTAR EXPLORATION INC	1/8+	827	552	N/A	N/A	N/A	N/A	N/A	N/A	36/9 Gester Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC
10*14099	м	5-18-13	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8+	_666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Athum Marcelus I LLC	32/362 Gestar Exploration USA Inc and Atinum Marcellus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
0*17826		5-18-13	ALLDALE MINERALS II, LP	TH EXPLORATION, LLC	1/8+	940	439	H/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
													190		
0*17812	_ M	5-18-13	POTOMAC MINERAL GROUP, LLC	TH EXPLORATION, LLC	1/8+	940	437	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0*21465	м	5-18-13	MOLLY D. ASTON, ET VIR	TH EXPLORATION, LLC	1/8+	954	134	N/A	N/A	N/A	N/A	N/A	N/A	NVA	N/A
0*21462		5-18-13	MAGGY D. ASTON, ET VIR	TH EXPLORATION, LLC	3/8+	954	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0°14915	M	5-18-13	CHESTNUT HOLDINGS, INC.	GASTAR DIPLORATION INC	1/8+	827	552	N/A	N/A	N/A	N/A	N/A	N/A	35/9 Gaster Exploration inc to TH Exploration II, LLC	40/552 TH Exploration W, LLC to TH Exploration, LLC

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WW-6A1 Supplement

Operator's Well No. Bryan S - 10HM

Lease No.	Taga	Parcel	Lessor	Lessee	Royatty	Bock	PE	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
			1												
			1				1								
			1											32/362 Gaster Exploration USA	
0*14099	N	5.18.13.12	SOUTHERN COUNTRY FARMS INC	GASTAR EXPLORATION USA INC	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	23/353 Gastar Exploration USA Inc. to Atinura Marcellus I LLC	Inc and Alinum Marcallus I LLC to Chevron USA Inc	40/127 Chevron USA Inc to TH Exploration LLC
	1 ~								<u> </u>	NA	N/A	NA	INC. TO ALSTORA MISPEERRY I LLC	to Laevron USA Inc	Exploration LLC
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0*17826	N	5-12-13.12	ALLOALE MONERALS II, LP	TH EXPLORATION, LLC	1/8+	940	439	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
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0*17812	N	5-18-13.12	POTOMAC MINERAL GROUP, LLC	TH EXPLORATION, LLC	1/8+	940	437	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
							<u> </u>					1	1		
												1			
0*21465	N	6.18.13.13	MOLLY D. ASTON, ET VIR	TH EXPLORATION, LLC.	3/8+	954	194	N/A	N/A	N/A		N/A			
V 21405	- <u></u>	3-10-13.12	MOLET D. ASTON, ET VIA	In exclosed on, tec	407	334	139	<u> </u>	NYA	n/A	N/A	N/A	N/A	N/A	N/A
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0*21462	N	5-18-13.12	MAGGY D. ASTON, ET VIR	TH EXPLORATION, LLC	1/8+	954	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
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0*14915	N	5-18-13.12	CHESTMUT HOLDINGS, INC.	GASTAR EXPLORATION INC	3/8+	827	552	N/A	N/A	N/A	N/A	N/A	N/A	38/9 Gaster Exploration Inc. to TH Exploration II, LLC	to TH Exploration, LLC
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	1 1		ł	[1					1	1		32/362 Gastar Exploration USA	
0*14099	•		SOUTHERN COUNTRY FARMS INC										23/353 Gastar Exploration USA		
0.140.33	- <u> </u>	>-10-13.4	SOUTHERN COUNTRY FARMS INC.	GASTAN EXPLORATION USA INC	1/8+	666	489	N/A	N/A	N/A	N/A	N/A	Inc. to Atlnum Marcelius FLLC	to Chavron USA Inc	Exploration LUC
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3*17825	0	\$-18-13.4	ALLDALE MINERALS IL LP	TH EXPLORATION, LLC	1/2+	940	439	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
												ł			
*17812	0	5-18-13.4	POTOMAC MINERAL GROUP, LLC	TH EXPLORATION, LLC	1/2+	940	437	N/A	N/A	R/A	N/A	N/A	N/A	*/A	N/A
			/										N/A		
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			1												
P21465	•	5-18-13.4	MOLLY D. ASTON, ET VIR	TH EXPLORATION, LLC	1/8+	954	334	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
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															N/A

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WW-6A1 Supplement

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Operator's Well No. <u>Bryan S - 10HM</u>

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Lease No.	Tags	Parcel	Lestor	Lessee	Royalty	Book	2	Assignment	Assignment						
															Assgratient
10*14915		5-18-13.4	CHESTNUT HOLDINGS, INC.	GASTAR EXPLORATION INC	1/8+	827	552	N/A	N/A	NA	N/A	N/A	N/A	36/9 Gastar Exploration Inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC
10°14915	,	5-17-14	CHESTNUT HOLDINGS, INC.	GASTAR EXPLORATION INC	1/8+	827	552		N/A	H/A	N/A	N/A	N/A	35/9 Gester Exploration inc to TH Exploration B, U.C	40/352 TH Exploration II, LLC to TH Exploration, LLC
10*17826	P	5-17-14	ALLDALE MINERALS II LP	TH EXPLORATION LLC	1/8+	940	439	N/A		N/A	N/A	N/A	N/A	N/A	N/A
10*17812		5-17-14	POTOMAC MINERAL GROUP LLC	TH EXPLORATION LLC	1/8+	940	437	NA	N/A	N/A	N/A	N/A	N/A	NA	N/A
10*21465	,	5-17-14	MOLLY OL ASTON, ET VIR	TH EXPLORATION, LLC	1/8+	954	134	NA	NA	N/A	N/A	N/A	N/A	N/A	N/A
10°21452	P	5-17-14	MAGGY D. ASTON, ET VIR	TH EXPLORATION, LLC	3/8+	954	120	N/A	R/A						
10*14915	a	5-17-1.4	CHESTNUT HOLDINGS, INC.	GASTAR EXPLORATION INC	1/8+	827	552	N/A		N/A	N/A	K/A	N/A	35/9 Gastar Exploration inc to TH Exploration II, LLC	40/552 TH Exploration II, LLC to TH Exploration, LLC
			1												
10*17825	4	5-17-1.4	ALLDALE MINERALS II LP	TH EXPLORATION LLC	1/8+	940	439	N/A	R/A						
10*17812	a	5-17-1.4	POTOMAC MINERAL GROUP LLC	TH EXPLORATION LLC	1/8+	940	437	N/A	R/A	N/A	N/A	N/A	N/A	N/A	N/A
0°21465	a		MOLLY D. ASTON, ET VIR	TH EXPLORATION, LLC	1/8+	954	134	N/A	N/A	N/A	N/A	N/A	N/A	R/A	N/A
10*21462	q	5-17-1.4	MAGGY D. ASTON, LY VIR	TH EXPLORATION, LLC	1/8+	954	128	N/A	N/A						





January 12, 2018

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

RE: Bryan S-10HM

Subject: Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC will not be drilling, extracting or producing any minerals under any WV County or State Routes in the area reflected on the Bryan S-10HM 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-hillop.com.

Sincerely,

any liller

Amy Miller Permit Specialist

RECEIVED Office of Oil and Gas

JAN 1 8 2018

WV Department of Environmental Protection

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS <u>NOTICE CERTIFICATION</u>

Date of Notice Certification: 01/11/2018

API No. 47- 051	- 02004
Operator's Well N	0. Bryan S-10HM
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:	West Virginia	UTM NAD 83	Easting:	519,129.18		
County:	Marshall	UTMINAD 65	Northing:	4,402,886.33		
District:	Franklin	Public Road Ac	cess:	Rines Ridge Road		
Quadrangle:	Powhatan Point 7.5'	Generally used	farm name:	CNX Land Resources, Inc.		
Watershed:	Fish Creek (HUC-10)					

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

Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:	
*PLEASE CHECK ALL THAT APPLY	OOG OFFICE USE ONLY
□ 1. NOTICE OF SEISMIC ACTIVITY or ■ NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED	RECEIVED/ NOT REQUIRED
■ 2. NOTICE OF ENTRY FOR PLAT SURVEY or □ NO PLAT SURVEY WAS CONDUCTED	□ RECEIVED
□ 3. NOTICE OF INTENT TO DRILL or ■ NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or	RECEIVED/ NOT REQUIRED
U WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)	
4. NOTICE OF PLANNED OPERATION	
ECEN 5. PUBLIC NOTICE	
Section JAN 18 JAN 18 WV Depart Environmenta	RECEIVED

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.

WW-6AC (1/12)

Certification of Notice is hereby given:

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

Well Operator:	Tug Hill Operating, LLC	Address:	380 Southpointe Boulevard, Plaza II, Suite 200
By:	Amy L. Miller any lulle		Canonsburg, PA 15317
Its:	Permit Specialist - Appalachia	Facsimile:	724-338-2030
Telephone:	724-749-8388	Email:	amiller@tug-hillop.com
Ce My Cor	NOTARIAL SEAL Jennifer Lupi, Notary Public cil Twp., Washington County mmission Expires March 12, 2018	oribed and swo JAAA ommission Ex	orn before me this <u>If</u> day of <u>an</u> . <u>2018</u> . <u>Ju Jupi</u> Notary Public xpires <u>March</u> 12, 2918

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 <u>depprivacyofficer@wv.gov</u>.

RECEIVED Office of Oil and Gas

JAN 1 8 2018

WV Department of Environmental Protection WW-6A (9-13)

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS <u>NOTICE OF APPLICATION</u>

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

Date of Notice: 1/11/2018 Date Permit Application Filed: 1/11/2018

Not	ice of:			
1	PERMIT FOR AN WELL WORK	—		OF APPROVAL FOR THE ON OF AN IMPOUNDMENT OR PIT
Deli	ivery method pursu	ant to West Virginia C	ode§2	2-6A-10(b)
	PERSONAL SERVICE	REGISTERED MAIL	V	METHOD OF DELIVERY THAT REQUIRES A RECEIPT OR SIGNATURE CONFIRMATION
n		00 (A 10/1-) - 1-4 4		

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:

SURFA	ACE OWNER(s)		r COA
Name: CI	NX Land Resources, Inc. (Pad)		Name:
Address:	1000 Consol Energy Drive		Addres
	Canonsburg, PA 15317		
Name: G	reg and Christina Riddle (Road)		
Address:	4205 Rines Ridge Road		Name:
	Proctor, WV 26055		Addres
SURF A	ACE OWNER(s) (Road/and/or Other Dist	urbance)	
	ay E. and Katherine L. Minor	,	SUR
Address:	4193 Rines Ridge Road		AND/0
	Proctor, WV 26055		Name:
Name: M	ichael R. and Brenda K. Bryan		Addres
Address:	195 Isaiah Drive		
	Proctor, WV 26055		OPE
URFA	ACE OWNER(s) (Impoundments or Pits)		Name:
Name:	• • • •		Addres
Address:			
		-	*Pleas

	OWNER OR LESSEE eatherwood, Inc.	RECEIVED Office of Oil and Gros	
	1000 Consol Energy Drive	Office of Office of Office	
	Canonsburg, PA 15317-6506	JAN 18 2018	
COAL	OPERATOR		
Name:		Department of	
Address:		W Department of Environmental Protecti	วก
	ACE OWNER OF WATER	RWELL	
AND/OR	WATER PURVEYOR(s)	1	
Name: *	See attached sheet		
Address:			
OPER/	ATOR OF ANY NATURA	L GAS STORAGE FIELD	
Address:			

Please attach additional forms if necessary

WW-6A (8 - 13)

API NO. 47-OPERATOR WELL NO. Bryan S-10HM Well Pad Name: Bryan

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmentation of Environmenta Additional information related to horizontal drilling may be obtained from the Secretary, at the Wy Department of the Secretary, at the Wy Department of the Secretary at the Secretary at the Wy Department of the Secretary at the Secretar

WV Department WV Departing on the filled within two hundred fifty feet measured horizontally from any existing tection 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 S-10HM 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 RECEIVED Office of Oil and Gas 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 fix A wither **2018** 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 existing the control of the application or construction of 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.

WW-6A (8-13) API NO. 47-____ OPERATOR WELL NO. Bryan S-10HM Well Pad Name: Bryan

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-

<u>Permits/Pages/default.aspx</u> 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 permitting density G_{as} of persons qualified to test water.

JAN 1 8 2018

WW-6A (8-13) API NO. 47- 47 05 902006

OPERATOR WELL NO. Bryan S-10HM Well Pad Name: Bryan

Notice is hereby given by:

elephone: 724-749-8388	• • •
mail: amiller@tug-hillop.cor	" any Shell

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 <u>depprivacyofficer@wv.gov</u>.

COMMONWEALTH OF PENNSYLVANIA NOTARIAL SEAL Jennifer Lupi, Notary Public Cecil Twp., Washington County My Commission Expires March 12, 2018 MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

Subscribed and sworn before me this 1/44 day of	an, 2018.
Jenniler Jupi	Notary Public
My Commission Expires March 12	12018

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JAN 1 8 2018

WW-6A

Supplement Pg. 1A

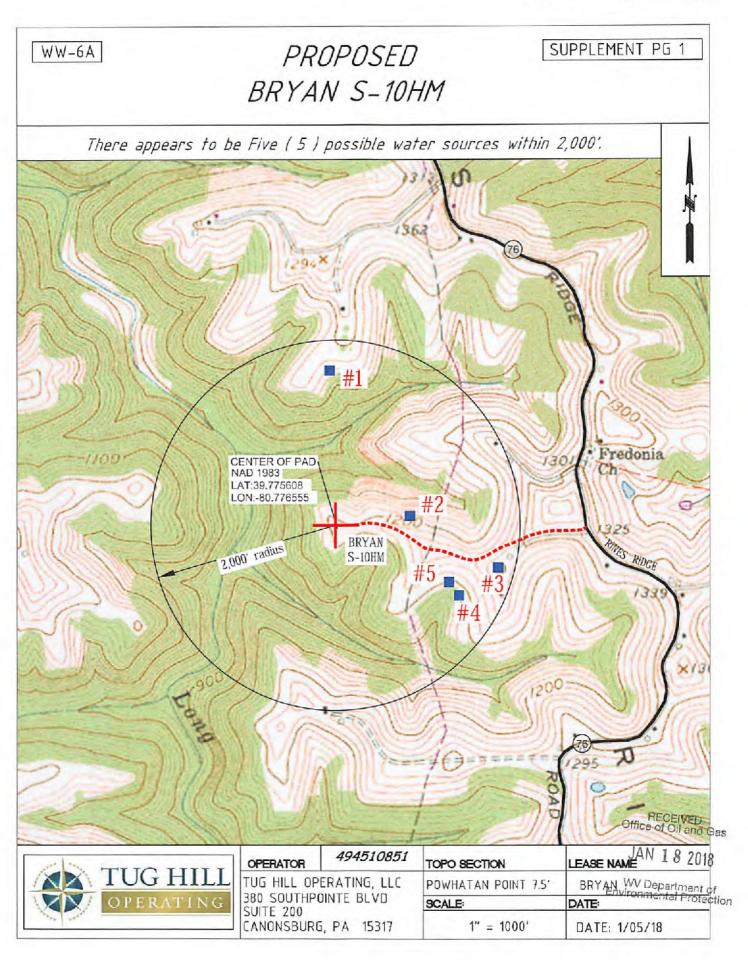
Tug Hill Operating, LLC 380 Southpointe BLVD, Suite 200 Canonsburg, PA 15317

WATER WELL REPORT

Well:BRYAN No. S-10HMDistrict:FranklinCounty:MarshallState: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		
			EIVED Dil and Gas



Operator Well No. Bryan S-10HM

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	=	REGISTERED	=	METHOD OF DELIVERY THAT REQUIRES A
SERVICE		MAIL		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)	COAL OWNER OR LESSEE /
Name: CNX Land Resources, Inc.	Name: Leatherwood, Inc.
Address: 1000 Consol Energy Drive	Address: 1000 Consol Energy Drive
Canonsburg, PA 15317	Canonsburg, PA 15317-6506
Name: Ray E. and Katherine L. Minor	
Address: 4193 Rines Ridge Road	MINERAL OWNER(s)
Proctor, WV 26055	Name: Greg and Christina Riddle
Name: Michael R. and Brenda K. Bryan	Address: 4205 Rines Ridge Road
Address: 195 Isaiah Drive	Proctor, WV 26055
Proctor, WV 26055 *See Attachment	*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:

West Virginia	Approx. Latitude & Longitude:	39.7756312; -80.7766011	
Marshall	Public Road Access:	Rines Ridge Road (County Route 76)	
Franklin	Watershed:	(HUC-10) Fish Greek	
Powhatan Point	Generally used farm name:	Michael and Brenda Bryan	
	Marshall Franklin	Marshall Public Road Access: Franklin Watershed:	Marshall Public Road Access: Rines Ridge Road (County Route 76) Franklin Watershed: (HUC-10) Fish Creek

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 here Well Operator:	by given by: Tug Hill Operating, LLC	Address:	380 Southpointe Boulevard, Plaza II, Suite 200	Office of Oil and Gas
Telephone:	724-749-8388		Canonsburg, PA 15317	JAN 1 8 2018
Email:	amiller@tug-hillop.com	Facsimile:	724-338-2030	
Oil and Cas F	wiyooy Notice			Environmental Protection

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.

Operator Well No. Bryan S-10HM

WW-6A3 Notice of Entry for Plat Survey

Attachment 1 of 1

Surface Owner(s):

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

Mineral Owner(s):

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

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

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

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

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

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JAN 1 8 2018

Operator Well No. Bryan S-10HM

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: 01/12/2018 Date Permit Application Filed: 01/12/2018

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

CERTIFIED MAIL		
RETURN RECEIPT REQUESTED		

HAND DELIVERY

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

Notice is hereby provided to the SURFACE OWNER(s)

(at the address listed in the records of the sheriff at the time of notice):

 Name:
 CNX Land Resources, Inc.

 Address:
 1000 Consol Energy Drive

 Canonsburg, PA 15317
 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:	West Virgnia	UTM NAD 83	Easting:	519,129.18	
County:	Marshall	UTM NAD 83	Northing:	4,402.886.33	
District:	Franklin	Public Road Acc	ess:	Rines Ridge Road	
Quadrangle:	Powhatan Point 7.5'	Generally used fa	arm name:	CNX Land Resources, Inc.	
Watershed:	Fish Creek (HUC-10)			-	

This Notice Shall Include:

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

Well Operator:	Tug Hill Operating, LLC	Address:	380 Southpointe Boulevard, Plaza II, Suite 200	
Telephone:	724-749-8388		Canonsburg, PA 15317	
Email:	amiller@tug-hillop.com	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 program as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests floan of the other state agencies about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.



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 S-10HM Well site

Dear Mr. Martin,

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

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

Very Truly Yours,

Jan K. Clayton

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

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WV Department of Environmental Protection

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



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Bryan S-10HM	ļ.		
PRODUCT NAME:	CHEMICAL DESCRIPTION:	PRODUCT USE:	HAZARDOUS COMPONENT:
GBW-20C	Hemicellulase Breaker	Breaker - Water	None
ALPHA 1427		Biocide	Glutaraldehyde – CAS#000111-30-8 Quatemary ammonium chloride CAS# 007173-51-5 Alky dimethyl benzyl ammonium Chloride (C12-16) – CAS#068424-85-1 Ethanol – CAS# 000064-17-5 Water – CAS# 007732-18-5
FRAC SAND	Silica Sand (various Mesh sizes)	Proppant	Crystalline silica (quartz) CAS# 14808-60-7
S-8C, Sand	Silica Sand (100 mesh)	Sand	Silica – CAS# 14808-60-7
GW-3LDF		Gellant - Water	Petroleum Distillate Blend – Proprietary, (Not Associated with Diesel Fuel) Guar gum – CAS# 009000-30-0
FRW-18		Friction Reducer	Hydrotreated light distillate CAS# 064742-47-8
Scaletrol		Scale Inhibitor	Ethylene glycol – CAS# 000107-21-1 Diethylene glycol – CAS# 000111-46-6

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