

west virginia department of environmental protection

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

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

Monday, June 22, 2020 WELL WORK PERMIT Horizontal 6A / New Drill

TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD

CANONSBURG, PA 15317

Re: Permit approval for FITZGERALD S-17HU 47-051-02324-00-00

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: 6/22/2020

Promoting a healthy environment.

API Number: 47-051-02324

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: <u>47-051-02324</u>

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, completion of any other permitted well work, and completion of the well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov.

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west virginia department of environmental protection

Oil and Gas Conservation Commission 601 57th Street SE, Charleston, WV 25304 304-926-0499 Ext 41239

Randall M. Albert, Chairman dep.wv.gov

June 11, 2020

Department of Environmental Protection Office of Oil and Gas Charleston, WV 25304

RE: Application for Deep Well Permit – API #47-051-02324

COMPANY: Tug Hill Operating, LLC

FARM: Danny and Frances Kerns Estate

Fitzgerald S-17HU

COUNTY: Marshall DISTRICT: Liberty

QUAD: Glen Easton

The deep well review of the application for the above company is <u>Approved to drill to Trenton for</u> <u>Point Pleasant completion. Pooling Docket No. 294-298.</u>

The applicant has complied with the provision of Chapter 22C-9, of the Code of West Virginia, nineteen hundred and thirty-one (1931), as amended, Oil and Gas Conservation Commission as follows:

- 1. Comments to Notice of Deviation filed? Yes
- 2. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners? Yes
- 3. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells: **yes; Docket 294-298 Exception Location Hearing
- 4. Provided a plat showing that the proposed location is a distance of <u>400+</u> feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Susan Rose

Administrator

** Hudson S-13HU 47-051-02293; Hudson S-12HU 47-051-02292; Hudson S-11HU 47-051-02296, Ten High IN-20HU 47-051-02021, Ten High 1N-13HU 47-051-01965; Ten High 1S-17HU 47-051-02033; Ten High 1S-16HU 47-051-02028; Ten High 1S-15HU 47-051-02027; Ten High 1S-14HU 47-051-01966: Fitzgerald S-18HU 47-051-02325; Fitzgerald S-19HU 47-051-02326

WW-6B (04/15) API NO. 47-051

OPERATOR WELL NO. Fitzgerald S-17HU Well Pad Name: Fitzgerald

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

1) Well Operator:	Tug Hill Op	erating, LLC	494510851	Marshall	Liberty	Glen Easton 7.5'
			Operator ID	County	District	Quadrangle
2) Operator's Well	Number: Fit	zgerald S-17H	U Well I	Pad Name: Fitzg	gerald	
3) Farm Name/Sur	face Owner:	Danny R. Kerr	ns Public R	load Access: Co	ounty Route	90
4) Elevation, curren	nt ground:	1316.5'	Elevation, propose	ed post-construc	tion: <u>1293</u>	.30'
5) Well Type (a)	Gas <u>x</u>	Oil _	Ui	nderground Stor	age	
Oth	her		······			
(b)	If Gas Sha	llow	Deep	x		
	Hoi	rizontal <u>×</u>			Ju -	2020
6) Existing Pad: Ye	es or No <u>No</u>				0 3 4	10
7) Proposed Target Point Pleasant is the target forma			icipated Thicknes anticipated pressure of approx. 9500		Pressure(s):	
8) Proposed Total	Vertical Dept	h: 12,064'				
9) Formation at To	tal Vertical D	epth: Trenton	, plug back to Re	edsville		
10) Proposed Total	Measured D	epth: 23,833'				
11) Proposed Horiz	zontal Leg Le	ngth: 8861.46	6'			
12) Approximate F	resh Water S	trata Depths:	70' ; 927'			
13) Method to Dete	ermine Fresh	Water Depths:	Offset well reports or	r noticeable flow at th	he flowline or w	hen need to start soaping
14) Approximate S	altwater Dep	ths: <u>2,167'</u>				
15) Approximate C	Coal Seam De	pths: Sewickle	y Coal - 835' ; P	ittsburgh Coal -	921'	
16) Approximate D	Pepth to Possi	ble Void (coal 1	nine, karst, other)	: none		
17) Does Proposed directly overlying c				N	0	
(a) If Yes, provide	e Mine Info:	Name: Ma	rshall County Co	oal Co./Marshal	I County Mi	Office of Oil and Gas
· · · · ·		Depth: 105	9' TVD and 291'	subsea level	<u> </u>	MAR 1 7 2020
		Seam: Pitt	sburgh #8			WV Department of Environmental Protection
		Owner: Mu	rray Energy / Co	nsolidated Coal	Co.	i Protection

APINO. 47-051 - 02324

OPERATOR WELL NO. Fitzgerald S-17HU Well Pad Name: Fitzgerald

WW-6B (04/15)

18)

CASING AND TUBING PROGRAM

ТҮРЕ	Size (in)	<u>New</u> <u>or</u> <u>Used</u>	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: <u>Fill-up</u> (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	120'	120'	259FT^3(CTS)
Fresh Water	20"	NEW	J55	106.5#	1020'	1020'	1,644FT^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	2900'	2900'	2,044FT^3(CTS)
Intermediate	9 5/8"	NEW	HPP110	47#	11,400'	11,400'	3,714FT^3(CTS)
Production	5 1/2"	NEW	P110	23#	23,833'	23,833'	5,653FT^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		13,954'	11
Liners							

TYPE	Size (in)	<u>Wellbore</u> Diameter (in)	<u>Wall</u> <u>Thickness</u> <u>(in)</u>	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	<u>Cement</u> <u>Yield</u> (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	20"	26"	.5	2,410	1,928	SEE # 24	1.2
Coal	13 3/8"	17 1/2"	.38	2,740	2,192	SEE #24	1.2
Intermediate	9 5/8"	12 1/4"	.472	10,730	6,968	SEE #24	1.99
Production	5 1/2"	8 1/2"	.415	16,510	10,864	SEE #24	1.18
Tubing	2 7/8"		1	11,385	9,108		
Liners							

PACKERS

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

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APR 30 REC'D

W1/ Department of Environmental Protection

WW-6B (10/14) API NO. 47-051

OPERATOR WELL NO. <u>Fitzgerald S-17HU</u> Well Pad Name: Fitzgerald

\$14/2000

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

Drill through the Point Pleasant and TD Pilot Hole 150' into the Trenton. Log vertical section and run a solid cement plug back to proposed KOP (13,454'). 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 22,150,000 lb proppant and 342,455 bbl of water. Max rate = 80 bpm; max psi = 12,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 21.21 acres

22) Area to be disturbed for well pad only, less access road (acres): 7.44 acres

23) Describe centralizer placement for each casing string:

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

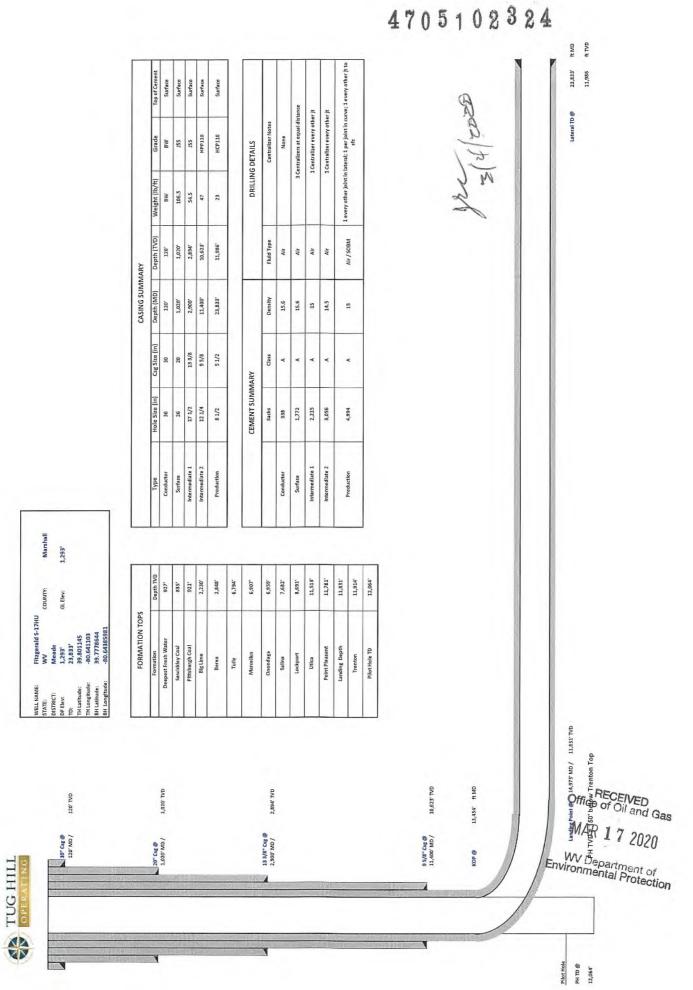
24) Describe all cement additives associated with each cement type:

*See Attachment

25) Proposed borehole conditioning procedures:

Will circulate a minimum of 3 hours at TD, short trip to curve, circulate bottoms up, check for flow,^{" and} Gas POOH Environmental Protection

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4705-02324



Tug Hill Operating, LLC Casing and Cement Program

Fitzgerald S-17HU

		C	asing		
	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	20"	J55	26"	1,020'	CTS
Intermediate 1	13 3/8"	J55	17 1/2"	2,900'	CTS
Intermediate 2	9 5/8"	HPP110	12 1/4"	11,400'	CTS
Production	5 1/2"	HCP110	8 1/2"	23,833'	CTS
Intermediate 1 Intermediate 2	13 3/8" 9 5/8"	J55 HPP110	17 1/2" 12 1/4"	2,900' 11,400'	

Cement

Surface:	Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2
Intermediate 1:	Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.2
Intermediate 2:	Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.99
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 = 1.18

Office of Oil and Gas MAR 1 7 2020

WV Department of Environmental Protection



Well Site Safety Plan Tug Hill Operating, LLC

Ph (2020)

Well Name: Fitzgerald S-17HU

Location: Fitzgerald Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,405,748.20 Easting: 530,724.07

February 2020

Office of Oil and Gas

MAR 1 7 2020

WV Department of Environmental Protection

Operator's Well No. Fitzgerald S-17HU

Area of Review

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

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

Data Sources Reviewed:

1. IHS Well Data service: Public nationwide data service that pulls directly from State agency Oil and Gas databases

2. Farm Maps

3. Topo Maps: Recent and older (contact WVGES)

4. Check with DPS

Contacted Devin Ducoeur 724-705-0444, <u>dducoeur@dpslandservices.com</u> DPS GIS (02/27/2020) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

1. Wellbore with IHS All Wells Layer

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

3. More recent (1970s vintage) topos and older topos

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

- WVGES has plotted every well spot they have access to and are aware of with that contains a coordinate. 30000, 70000, and 90000 series wells are available via the WVGES online map. Some locations aren't great due to vintage and manipulation of maps through time
- 30000 series any well drilled prior to 1929 APIs were not assigned to original wells
- 70000 series Well spots pulled from old Farm line maps that the WVGES has access to
- 90000 series Any sources that the WVGES has access that shows a well spot but has no additional supporting information. DEP does not have 90000 series on their maps.
- There can be duplication between wells in the 3 series
- Phil indicated that other Operators are providing a screenshot of the WVGES map with the MAR 17 2020 planned well and using that for permits

YN Department of Environmental Protection

Page 1 of 4

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Permit well - Fitzgerald S-17HU 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

Plat locations	represent actual field	surveyed loce	cions. Trease			
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
4705170625	Unknown	Unknown	Unknown	Unknown	Uknown but unlikley. The well likley represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete
4705170626	Unknown	Unknown	Unknown	Unknown	Uknown but unlikley. The well likley represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete
4705100632	CNX Gas Co. LLC (North)	2727' TVD	Gordon	Unknown	No, the well is not deep enough to be within the expected fracture propagation from a Point Pleasant stimulation.	Well is not reported to be plugged Production data either not reported or 0 as of 2017
4705100945	Consolidation Coal Co.	Unknown	Unknown	Unknown	Uknown but unlikley. The well likley represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well. Well was plugged in 2004.	Well plugged in 2004
4705101013	Consolidation Coal Co.	Unknown	Vaknown	Unknown	Uknown but unlikley. The well likley represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well. Well was plugged in 2006.	Well plugged in 2006
4705170593	Hope Natural Gas Company	Unknown	Unknown	Unknown	Uknown but unlikley. The well likley represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete
4705101011	Consolidation Coal Co.	Unknown	Unknown	Unknown	Uknown but unlikley. The well likley represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well. Well was plugged in 2006.	Well plugged in 2006
4705170589	Unknown	Unknown	Unknown	Unknown	Uknown but unlikley. The well likley represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete
4705170591	Unknown	Unknown	Unknown	Unknown	Uknown but unlikley. The well likley represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete
4705130266	Randall-Zogg Supply Co.	2998' TVD	Gardon	Unknown	No, the well is not deep enough to be within the expected fracture propagation from a Point Pleasant stimulation. Well was plugged in 1947.	Well plugged in 1947
4705170590	Unknown	Unknown	Unknown	Unknown	Uknown but unlikley. The well likley represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete
4705170580	Unknown	Unknown	Unknown	Unknown	Uknown but unlikley. The well likley represents an old shallow well that is too shallow to be effected by fracturing in the planned Point Pleasant well.	State records are incomplete

Office of Oil and Gas

MAR 1 7 2020

Environmental Protection

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TV Outputs & Lanner Sunay West: County = 61 Permit = 70333	Report Time - Thursday, Petry 27, 2020 1 21 05 PM
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ראיז אין	
There is no Pay case for this west	J
There is no Production Gale Sale for this well There is no Production Cit Sale for this well ** sume operations may have reported NOL under Cit	
There is an Production NCC, data for this well — some operation may here reported INCL under CB There is an Production Water data well	
There's and Endinguing data for this west There's an of Wester (2, Large data for this west	

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WV Department of Environmental Protection

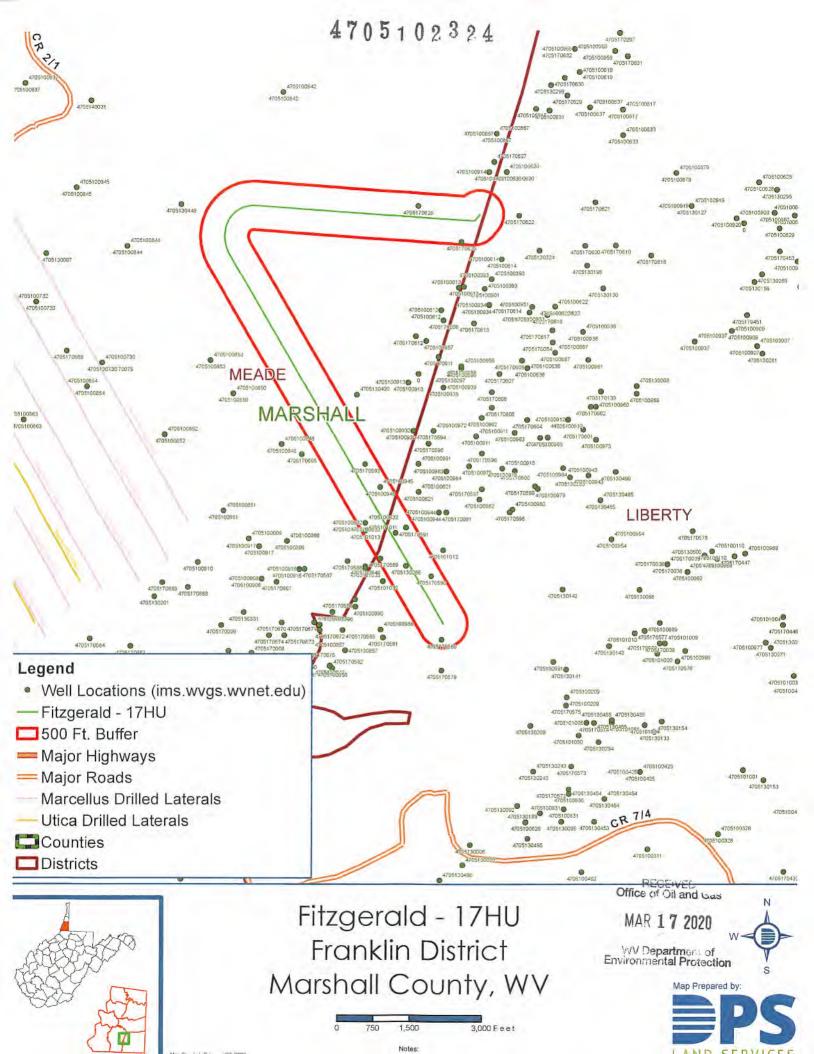
W Campele & Lamme Jonny Well: County = 61 Perrol = 01011	Report Take Thursday February 27 2220 1 21 13 Mar
Located Hermatics Yes Unc LAR COURT FRAIL TO CONTROL ONLY COULS LOT DO VINE UNIX MINIMUM YES IN LOCAT CONTROL CARES AND AND YES HITS LATTICE	
There is no Bobom Hole Location data for this web	
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Trace is no Pay data for bits work	
There is no Production Case calls for the well There is no Production Cit data for this well — some operations care new reported HCL under Cit	
There is an Preduction KOL data for time and " wave open zons may have reported KID, which Ol	
There is no Production Water data for the well There is no Estationary data for the well	
There is no Weekse (B-Lag) data for the well	
Program Monitoria Data Control Control Control Constitution Control Control	
There is no Sample data for this well	
w Caunaya & Caunaya & Medi: Counaty = 61 Permit = 70159	Report Taxon Thursday, February 27, 3830 1 21 25 PM
Lecter Information View Date And County Paral View Bart County autors (1993) County United United United Contracts Present Total Work, Contract County And Bart (1997) Features	
There is an Solom Web Lession data for Bits web	
<u>0.4499 (1997) 1977) 19770) 19770) 1977) 1977) 1977) 1977) 1977) 1977) 1977) 1977) 1</u>	
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There is no Fey data for this well There is no Francisco Cara cata for this well	
There is no Production 02 data for this well — some separation when have regioned NCL where 02	
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There is no Soutpeppy data for this woll	
There a na Mondon (C.L.cg) data for the well There is na Phygleg data for the well	
There is no Example data for this well	
m duringes & Learning Samp Well: County = \$1 Permit = 702\$1	August Same Thumany Patrony 27 2222 1 21 12 Ma
A CONTRACTOR DESCRIPTION OF THE OWNER OWNER OF THE OWNER OWNE	
Anton Manuster You Min. Day 2004 Table U.C. MINET CALL N. CALL II DI DI LAND THE UTION CHILDRE DAY TOL Lond. Confident Land. II DI LA ANDRE LINKS	
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There is an Production Cas data for this work There is an Production Cas data for this work — Soone appared mail, under CB	
There is no Anadoxicon HOL data for Ella wall 🔎 access operators may later reported HOL ander OB	
Pere is no Production Visco data for the well There is no Strategraphy data for the well	
There is no Meyeline (E-Log) data far this well	
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Онин научного Дата и при правити приматрания на селото са состранати составана, състо селото состо на суста на стато на сост Са правита состава на состава на состава со составана составана на составана на	241 (CULIES) (67)
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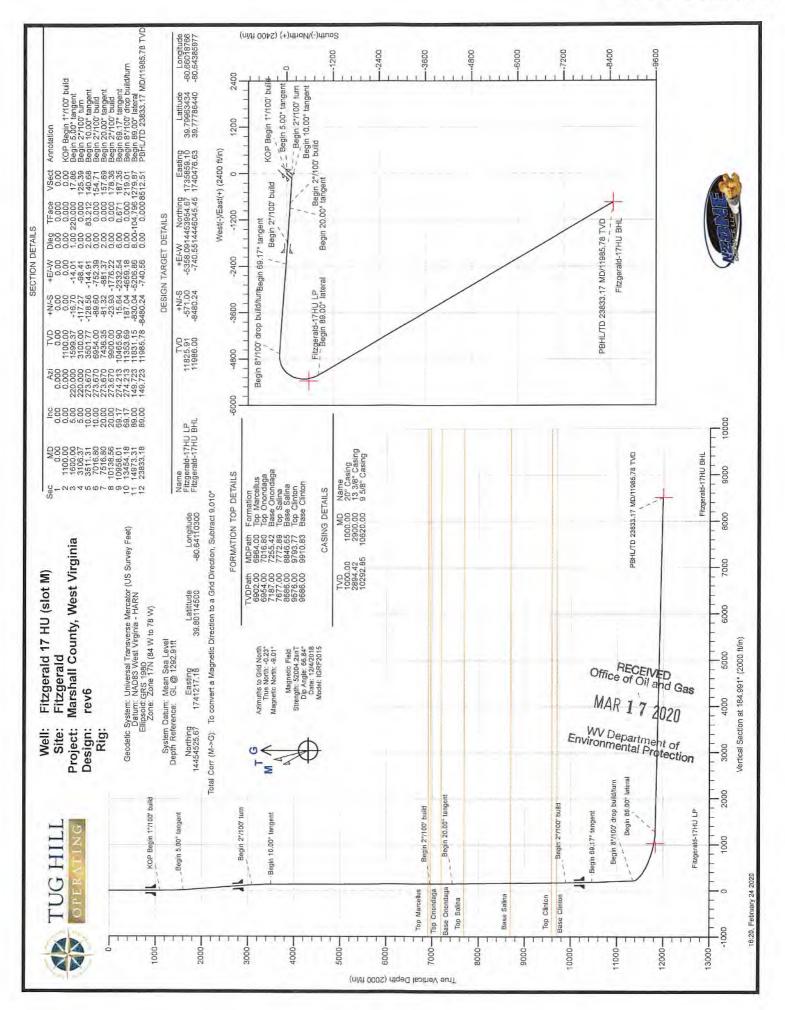
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Page 4 of 4

WV Department of Environmental Protection







Planning Report - Geographic

Database: Company: Project: Site: Well: Wellbore: Design:	DB_Aug1919_v14 Tug Hill Operating Marshall County, Fitzgerald Fitzgerald 17 HU Original Hole rev6	g LLC West Virgir	nia	Local Co-ordina TVD Reference MD Reference: North Referenc Survey Calcula	e:	Well Fitzge GL @ 1292 GL @ 1292 Grid Minimum C	.91ft	(slot M)	
Project	Marshall County, V	West Virgini	а					And a second second second	
oco butann	Universal Transvers NAD83 West Virgini Zone 17N (84 W to	a - HARN	(US Survey Feet)	System Datum:	-	Mean Sea Le	vel		
Site	Fitzgerald		annon-an-long groups						
Site Position: From: Position Uncertainty:	Lat/Long	0.00 ft	Northing: Easting: Slot Radius:	14,454,567.7 1,741,096.2 13-	6 usft Long	ude: itude: Convergence:			39.80126184 80.64153292 0.229 °
Well	Fitzgerald 17 HU (s	slot M)							
Well Position	+N/-S +E/-W	0.00 ft 0.00 ft	Northing: Easting:		4,525.67 usft 1,217.18 usft	Latitude: Longitude:			39.80114500 80.64110300
Position Uncertainty		0.00 ft	Wellhead Ele	vation:		Ground Level:			1,292.91 ft
Wellbore	Original Hole	andha nasimiya — a							
Magnetics	Model Name		Sample Date	Declination (°)		Dip Angle (°)		Field Strength (nT)	
1864. 	IGRF20	015	12/4/2018	-	8.780	66.83	36	52,004.22522	2526
Design	rev6						1997 - 19		
Audit Notes:									
Version:			Phase:	PLAN	Tie On D	epth:	0.00		
Vertical Section:		(rom (TVD) ft)	+N/-S (ft)	+E/-W (ft)		Direction (°)		
		0.	.00	0.00	0.00	an a	184.991		
Plan Survey Tool Pro Depth From (ft)	Depth To	ite 2/24/2 vey (Wellbo		Tool Name	Rer	narks			
1 0.00	23,833.18 rev6	(Original H	lole)	MWD MWD - Standard					

Office of Oil and Gas

MAR 1 7 2020

WV Department of Environmental Protection



Planning Report - Geographic

Well Fitzgerald 17 HU (slot M) Database: DB_Aug1919_v14 Local Co-ordinate Reference: Tug Hill Operating LLC GL @ 1292.91ft Company: **TVD Reference:** Project: Marshall County, West Virginia MD Reference: GL @ 1292.91ft North Reference: Site: Fitzgerald Grid Well: Fitzgerald 17 HU (slot M) Survey Calculation Method: Minimum Curvature Original Hole Wellbore: Design: rev6

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,100.00	0.00	0.000	1,100.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,600.00	5.00	220.000	1,599.37	-16.70	-14.01	1.00	1.00	0.00	220.000	
3,106.37	5.00	220.000	3,100.00	-117.27	-98.41	0.00	0.00	0.00	0.000	
3,511.31	10.00	273.670	3,501.77	-128.56	-144.91	2.00	1.23	13.25	83.212	
7,016.80	10.00	273.670	6,954.00	-89.60	-752.39	0.00	0.00	0.00	0.000	
7,516.80	20.00	273.670	7,436.35	-81.32	-881.37	2.00	2.00	0.00	0.000	
10,138.56	20.00	273.670	9,900.00	-23.93	-1,776.22	0.00	0.00	0.00	0.000	
10,958.01	69.17	274.213	10,465.90	15.64	-2,332.54	6.00	6.00	0.07	0.671	
13,454.18	69.17	274.213	11,353.69	187.04	-4,659.18	0.00	0.00	0.00	0.000	
14,973.31	89.00	149.723	11,831.15	-830.04	-5,206.86	8.00	1.31	-8.19	-104.796	
23,833.18	89.00	149.723	11,985.78	-8,480.24	-740.56	0.00	0.00	0.00	0.000	Fitzgerald-17HU BH

Office of Oil and Gas MAR 1 7 2020

WV Department of Environmental Protection



DB_Aug1919_v14

Fitzgerald

Tug Hill Operating LLC

Fitzgerald 17 HU (slot M)

Marshall County, West Virginia

Planning Report - Geographic

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

Well Fitzgerald 17 HU (slot M) GL @ 1292.91ft GL @ 1292.91ft Grid Minimum Curvature

Office of Cill and Gas MAR 1 7 2020

Database:

Company:

Project:

Site:

Well:

llbore: lign:	Origir rev6	nal Hole							En	MAR 1 7 20, WV Department of Vironmental Protect
nned Survey										rironmental Prote
Measured			Vertical			Мар	Мар			
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Northing	Eastin			
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft	-	Latitude	Longitude
0.00	0.00	0.000	0.00	0.00	0.00	14,454,525.67	1,741,2	217.18	39.80114500	-80.64110300
100.00	0.00	0.000	100.00	0.00	0.00	14,454,525.67	1,741,2	217.18	39.80114500	-80.64110300
200.00	0.00	0.000	200.00	0.00	0.00	14,454,525.67	1,741,2	217.18	39.80114500	-80.64110300
300.00	0.00	0.000	300.00	0.00	0.00	14,454,525.67	1,741,2	217.18	39.80114500	-80.64110300
400.00	0.00	0.000	400.00	0.00	0.00	14,454,525.67	1,741,3		39.80114500	-80,64110300
500.00	0.00	0.000	500.00	0.00	0.00	14,454,525.67	1,741,2	217.18	39.80114500	-80.64110300
600.00	0.00	0.000	600.00	0.00	0.00	14,454,525.67	1,741,2	217.18	39.80114500	-80.64110300
700.00	0.00	0.000	700.00	0.00	0.00	14,454,525.67	1,741,2	217.18	39.80114500	-80.64110300
800.00	0.00	0.000	800.00	0.00	0.00	14,454,525.67	1,741,2	217.18	39.80114500	-80.64110300
900.00	0.00	0.000	900.00	0.00	0.00	14,454,525.67	1,741,2	217.18	39.80114500	-80.64110300
1,000.00	0.00	0.000	1,000.00	0.00	0.00	14,454,525.67	1,741,2	217.18	39.80114500	-80.64110300
20" Casi										00.01110000
1,100.00	0.00	0.000	1,100.00	0.00	0.00	14,454,525.67	1,741,2	217.18	39.80114500	-80.64110300
	jin 1°/100' bui		1 200 00	0.07		14 464 505 04	1 744 4	10 60	20 9011 4217	-80.64110501
1,200.00	1.00	220.000	1,200.00	-0.67	-0.56	14,454,525.01	1,741,2		39.80114317 39.80113768	-80.64110501
1,300.00	2.00 3.00	220,000	1,299.96	-2,67	-2.24 -5.05	14,454,523.00 14,454,519.66	1,741,2		39.80112854	-80,64112106
1,400.00	4.00	220.000 220.000	1,399.87	-6.02	-8.97		1,741,2		39.80111574	-80,64113509
1,600.00	5.00	220.000	1,499.68 1,599.37	-10.69 -16.70	-14.01	14,454,514.98 14,454,508.97	1,741,2		39.80109929	-80.64115314
		220.000	1,099.07	-10.70	-14.01	14,454,506.97	1,741,2	203.10	39.00109929	-00.04110314
1,700.00	00° tangent 5.00	220.000	1,698.99	-23.38	-19.62	14,454,502.30	1,741,1	07 56	39,80108101	-80.64117318
1,800.00	5.00	220.000	1,798.61	-23.36	-25.22	14,454,495.62	1,741,1		39.80106274	-80.64119322
1,900.00	5.00	220.000	1,898.23	-36,73	-30.82	14,454,488.94	1,741,1		39.80104447	-80.64121326
2,000.00	5.00	220.000	1,997.85	-43.41	-36.42	14,454,482.27	1,741,1		39.80102619	-80.64123330
2,100.00	5.00	220.000	2,097.47	-50.08	-42.03	14,454,475.59	1,741,1		39.80100792	-80.64125334
2,200.00	5.00	220.000	2,197.09	-56.76	-47.63	14,454,468.91	1,741,1		39.80098965	-80.64127339
2,300.00	5.00	220.000	2,296.71	-63.44	-53.23	14,454,462.24	1,741,1		39.80097137	-80.64129343
2,400.00	5.00	220.000	2,396.33	-70.11	-58.83	14,454,455.56	1,741,1		39.80095310	-80.64131347
2,500.01	5.00	220.000	2,495.95	-76.79	-64.44	14,454,448.88	1,741,1		39.80093483	-80.64133351
2,600.01	5.00	220.000	2,595.57	-83.47	-70.04	14,454,442.21	1,741,1		39.80091655	-80.64135355
2,700.01	5.00	220.000	2,695.19	-90.14	-75.64	14,454,435.53	1,741,1		39.80089828	-80.64137359
2,800.01	5.00	220.000	2,794.80	-96,82	-81.24	14,454,428.85	1,741,1		39.80088000	-80.64139363
2,900.00	5.00	220.000	2,894.42	-103,50	-86.84	14,454,422.18	1,741,1	30.33	39.80086173	-80.64141368
13 3/8" C	asing									
2,900.01	5.00	220.000	2,894.42	-103.50	-86.84	14,454,422.18	1,741,1	30.33	39.80086173	-80.64141368
3,000.01	5.00	220.000	2,994.04	-110.17	-92.45	14,454,415.50	1,741,1	24.73	39.80084346	-80.64143372
3,100.01	5.00	220.000	3,093.66	-116.85	-98.05	14,454,408.82	1,741,*	119.13	39.80082518	-80.64145376
3,106.37	5.00	220.000	3,100.00	-117.27	-98.41	14,454,408.40	1,741,1	118.77	39.80082402	-80.64145503
Begin 2°	100' turn									
3,200.01	5.54	239.634	3,193.25	-122,69	-104.93	14,454,402.99	1,741,1	112.25	39.80080923	-80.64147834
3,300.01	6.67	255.246	3,292.69	-126.61	-114.72	14,454,399.07	1,741,1	02.46	39.80079857	-80.64151324
3,400.01	8.15	265.816	3,391.86	-128.60	-127.40	14,454,397.07	1,741,0		39.80079323	-80.64155844
3,500.01	9.80	273.008	3,490.63	-128.67	-142.97	14,454,397.00	1,741,0		39.80079321	-80.64161387
3,511.31	10.00	273.670	3,501.77	-128.56	-144.91	14,454,397.11	1,741,0	072.26	39.80079354	-80.64162078
	.00° tangent	070 074	0.000.10	107	100.00					
3,600.01	10.00	273.670	3,589.12	-127.58	-160.28	14,454,398.10	1,741,0		39.80079641	-80.64167549
3,700.01	10.00	273.670	3,687.60	-126.46	-177.61	14,454,399.21	1,741,0		39.80079966	-80.64173717
3,800.01	10.00	273.670	3,786.08	-125.35	-194.94	14,454,400.32	1,741,0		39.80080290	-80.64179885
3,900.01	10.00	273.670	3,884.56	-124.24	-212.27	14,454,401.43	1,741,0		39.80080614	-80.64186054
4,000.01 4,100.01	10.00	273.670 273.670	3,983.04 4,081.52	-123.13	-229.60 -246.93	14,454,402.54	1,740,9		39.80080939	-80.64192222 -80.64198390
4,100.01	10.00	273.670	4,081.52	-122.02	-246.93	14,454,403.66 14,454,404.77	1,740,9		39.80081263 39.80081587	-80.64204559
4,300.01	10.00	273.670	4,278.48	-119.79	-284.28	14,454,405.88	1,740,9		39.80081912	-80.64210727
4,400.01	10.00	273.670	4,276.96	-118.68	-298.92	14,454,406.99	1,740,9		39.80082236	-80.64210727
.,	10.00	270.070	1010.00	110.00	200.02	14,404,400.00	1,740,8	10.20	33.00002230	-00.04210093

COMPASS 5000.14 Build 85



DB_Aug1919_v14

Fitzgerald

Original Hole

Tug Hill Operating LLC

Fitzgerald 17 HU (slot M)

Marshall County, West Virginia

Planning Report - Geographic

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

Well Fitzgerald 17 HU (slot M) GL @ 1292.91ft GL @ 1292.91ft Grid Minimum Curvature

Office of Oil and Gas MAR 1 7 2020

Database:

Company:

Project:

Wellbore:

Design:

Site:

Well:

Design:	rev6	_							WD- WD-
Planned Survey								En	WV Department vironmental Prote
Measured			Vertical			Map	Мар		
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Northing	Easting		
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)	Latitude	Longitude
4,500.01	10.00	273.670	4,475.44	-117.57	-316.25	14,454,408.10	1,740,900.93	39,80082560	-80.6422306
4,600.01	10.00	273.670	4,573.93	-116.46	-333.58	14,454,409.21	1,740,883.60	39.80082884	-80,6422923
4,700.01	10.00	273.670	4,672.41	-115.35	-350.90	14,454,410.33	1,740,866.27	39,80083209	-80.6423540
4,800.01	10.00	273.670	4,770.89	-114.24	-368.23	14,454,411.44	1,740,848.94	39,80083533	-80.6424156
4,900.01	10.00	273.670	4,869.37	-113.13	-385.56	14,454,412.55	1,740,831.61	39,80083857	-80.6424773
	10.00	273.670	4,967.85	-112.01	-402.89	14,454,413.66	1,740,814.29	39.80084181	-80.6425390
5,000.01					-402.85	14,454,414.77	1,740,796.96	39.80084506	-80.6426007
5,100.01	10.00	273.670	5,066.33	-110.90			Contraction of the second second		-80.6426624
5,200.01	10.00	273.670	5,164.81	-109.79	-437.55	14,454,415.88	1,740,779.63	39.80084830	
5,300.01	10.00	273.670	5,263.29	-108.68	-454.88	14,454,416.99	1,740,762.30	39.80085154	-80.6427241
5,400.01	10.00	273.670	5,361.77	-107.57	-472.21	14,454,418.11	1,740,744.97	39.80085478	-80.6427857
5,500.01	10.00	273.670	5,460.25	-106.46	-489.54	14,454,419.22	1,740,727.64	39.80085803	-80.6428474
5,600.01	10.00	273.670	5,558.74	-105.34	-506.87	14,454,420.33	1,740,710.31	39.80086127	-80.6429091
5,700.01	10.00	273.670	5,657.22	-104.23	-524.20	14,454,421.44	1,740,692.98	39.80086451	-80.6429708
5,800.01	10.00	273.670	5,755.70	-103.12	-541.53	14,454,422.55	1,740,675.65	39.80086775	-80.6430325
5,900.01	10.00	273.670	5,854.18	-102.01	-558.86	14,454,423.66	1,740,658.32	39.80087100	-80.6430941
6,000.01	10.00	273.670	5,952.66	-100.90	-576.18	14,454,424.78	1,740,640.99	39.80087424	-80.6431558
6,100.01	10.00	273.670	6,051.14	-99.79	-593.51	14,454,425.89	1,740,623,66	39.80087748	-80.6432175
6,200.01	10.00	273.670	6,149.62	-98.68	-610.84	14,454,427.00	1,740,606.34	39.80088072	-80.6432792
6,300.01	10.00	273.670	6,248,10	-97.56	-628.17	14,454,428.11	1,740,589.01	39.80088396	-80,6433409
6,400.01	10.00	273.670	6,346.58	-96.45	-645.50	14,454,429.22	1,740,571.68	39.80088721	-80.6434026
6,500.01	10.00	273.670	6,445.06	-95.34	-662.83	14,454,430.33	1,740,554.35	39.80089045	-80.6434642
6,600.01	10.00	273.670	6,543.55	-94.23	-680.16	14,454,431.44	1,740,537,02	39.80089369	-80.6435259
6,700.01	10.00	273.670	6,642.03	-93.12	-697.49	14,454,432.56	1,740,519.69	39.80089693	-80.6435876
6,800.01	10.00	273,670	6,740.51	-92.01	-714.82	14,454,433.67	1,740,502.36	39.80090017	-80.6436493
6,900.01	10.00	273.670	6,838.99	-90.90	-732.15	14,454,434.78	1,740,485.03	39.80090342	-80.6437110
6,964.00	10.00	273.670	6,902.00	-90.18	-743.24	14,454,435.49	1,740,473.94	39.80090549	-80.6437504
Top Marc			-1				1.3.1.1.1.1.1.1.1		
7,000.01	10.00	273,670	6,937.47	-89.78	-749.48	14,454,435.89	1,740,467.70	39.80090666	-80.6437727
	10.00	273.670	6,954.00	-89.60	-752.39	14,454,436.08	1,740,464.79	39.80090720	-80.6437830
7,016.80				-09.00	-1 52.55	14,434,430.00	1,740,404.75	39.00090720	-00.04070000
The second se	100' build - T	· · · · · · · · · · · · · · · · · · ·				the same starter			
7,100.01	11.66	273.670	7,035.73	-88.60	-767.99	14,454,437.08	1,740,449.19	39.80091012	-80.6438386
7,200.01	13.66	273,670	7,133.29	-87.19	-789.87	14,454,438.48	1,740,427.31	39.80091421	-80.6439164
7,255.42	14.77	273.670	7,187.00	-86.32	-803.45	14,454,439.35	1,740,413.73	39.80091676	-80.6439648
Base One	ondaga								
7,300.01	15.66	273.670	7,230.03	-85.57	-815.13	14,454,440.10	1,740,402.05	39.80091894	-80.6440064
7,400.01	17.66	273,670	7,325.82	-83.74	-843.75	14,454,441.94	1,740,373.43	39.80092429	-80.64410826
7,500.02	19.66	273.670	7,420.56	-81.69	-875.68	14,454,443.99	1,740,341.50	39,80093027	-80.6442219
7,516.80	20.00	273.670	7,436.35	-81.32	-881.37	14,454,444.35	1,740,335.81	39.80093133	-80.64424210
Begin 20	.00° tangent								
7,600.02	20,00	273.670	7,514.55	-79,50	-909.77	14,454,446.17	1,740,307.41	39.80093664	-80.64434326
7,700.02	20.00	273.670	7,608.52	-77.31	-943.90	14,454,448.36	1,740,273.28	39.80094303	-80.6444647
7,772.89	20.00	273.670	7,677.00	-75.72	-968.78	14,454,449.96	1,740,248.40	39.80094768	-80.6445533
Top Salin							and the states		
7,800.02	20.00	273.670	7,702.49	-75.12	-978.03	14,454,450.55	1,740,239.15	39.80094941	-80.6445862
7,900.02	20.00	273.670	7,796.46	-72.93	-1,012,17	14,454,452.74	1,740,205.01	39.80095580	-80.6447077
8,000.02	20.00	273,670	7,890.42	-70.75	-1,046.30	14,454,454.93	1,740,170.88	39.80096218	-80.6448292
8,100.02	20.00	273,670	7,984,39	-68.56	-1,080.43	14,454,457.12	1,740,136.75	39.80096857	-80,6449507
8,200.02	20.00	273.670	8,078.36	-66.37	-1,114.56	14,454,459.31	1,740,102.62	39.80097495	-80.6450722
8,300.02	20.00	273.670	8,172.33	-64.18	-1,114,58	14,454,461.50	1,740,068.49	39.80097495	-80.6451937
8,400.02	20.00	273.670	8,266.30					39.80098772	-80.6453152
				-61.99	-1,182.82	14,454,463.69	1,740,034.35		
8,500.02	20.00	273.670	8,360.27	-59.80	-1,216.96	14,454,465.88	1,740,000.22	39.80099410	-80.6454366
8,600.02	20.00	273.670	8,454.24	-57.61	-1,251.09	14,454,468.06	1,739,966.09	39.80100048	-80.6455581
8,700.02	20.00	273.670	8,548.21	-55.42	-1,285.22	14,454,470.25	1,739,931.96	39.80100687	-80.6456796
8,800.02	20.00	273,670	8,642.18	-53.23	-1,319.35	14,454,472.44	1,739,897.83	39.80101325	-80.6458011

COMPASS 5000.14 Build 85



DB_Aug1919_v14

Fitzgerald

rev6

Original Hole

Tug Hill Operating LLC

Fitzgerald 17 HU (slot M)

Marshall County, West Virginia

Planning Report - Geographic

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

Well Fitzgerald 17 HU (slot M) GL @ 1292.91ft GL @ 1292.91ft Grid Minimum Curvature

Office of Oil and Gas MAR 1 7 2020

Planned Survey

Database:

Company:

Project:

Wellbore: Design:

Site:

Well:

	origin.									4 202
PI	anned Survey								Env	WV Department of vironmental Protect
	Measured			Vertical			Мар	Мар		Protein
	Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Northing	Easting		
	(ft)	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)	Latitude	Longitude
	8,846.65	20.00	273.670	8,686.00	-52.21	-1,335.27	14,454,473.46	1,739,881.91	39.80101623	-80.64585782
	Base Sa							Children and		
	8,900.02	20.00	273.670	8,736.15	-51.04	-1,353.48	14,454,474.63	1,739,863.70	39.80101963	-80.64592266
	9,000.02		273.670	8,830.12	-48.85	-1.387.62	14,454,476.82	1,739,829.56	39.80102602	-80.64604415
	9,100.02		273.670	8,924.09	-46.66	-1,421.75	14,454,479.01	1,739,795,43	39,80103240	-80,64616564
	9,200.02		273.670	9,018.06	-44.47	-1,455.88	14,454,481.20	1,739,761.30	39,80103878	-80.64628714
	9,300.02		273.670	9,112.03	-42.28	-1,490.01	14,454,483.39	1,739,727.17	39,80104517	-80.64640863
	9,400.02		273.670	9,206.00	-40.10	-1,524.14	14,454,485.58	1,739,693.04	39.80105155	-80.64653012
	9,500.02		273.670	9,299.97	-37.91	-1,558.28	14,454,487.77	1,739,658.90	39.80105793	-80,6466516
	9,600.02		273.670	9,393,94	-35.72	-1,592.41	14,454,489.96	1,739,624,77	39.80106431	-80.6467731
	9,700.02		273,670	9,487.91	-33.53	-1,626.54	14,454,492.15	1,739,590.64	39,80107069	-80,64689460
	9,793.77	20.00	273.670	9,576.00	-31.48	-1,658.54	14,454,494.20	1,739,558.64	39.80107668	-80.64700850
			210.010							
	Top Clin		273.670	9,581.87	-31.34	-1,660.67	14,454,494.34	1,739,556.51	39.80107708	-80.6470160
	9,800.02 9,900.02		273.670	9,5675.84	-29.15	-1,600.67	14,454,494.54	1,739,522.38	39.80108346	-80.64713758
	0.44000.000.		273.670	9,686.00	-28.91	-1,698.49	14,454,496.76	1,739,518.69	39.80108415	-80.6471507
	9,910.83	20.00	2/3.6/0	9,000.00	-20.91	-1,090.49	14,434,490.70	1,739,510,09	53.00100413	-50.04715071
	Base Cli		070 070	0 700 04		4 700.04	11 151 100 74	4 700 400 04	20 00100004	-80.64725908
	10,000.02	20,00	273.670	9,769.81	-26.96	-1,728.94	14,454,498,71	1,739,488.24	39.80108984	-80.64738057
	10,100.02	20.00	273.670	9,863.78	-24.77	-1,763.07	14,454,500.90	1,739,454.11	39.80109622	
	10,138.56	20.00	273.670	9,900.00	-23.93	-1,776.22	14,454,501.75	1,739,440.96	39.80109868	-80.64742739
		/100' build								
	10,200.02	23.69	273.777	9,957.04	-22.44	-1,799.04	14,454,503.23	1,739,418.14	39.80110301	-80.6475086
	10,300.02	29.69	273.898	10,046.34	-19,43	-1,843.83	14,454,506.24	1,739,373.35	39.80111176	-80.6476680
	10,400.02	35.69	273,981	10,130.47	-15.72	-1,897.68	14,454,509,96	1,739,319.50	39.80112253	-80.6478597
	10,500.02		274.043	10,208.49	-11.35	-1,960.01	14,454,514.33	1,739,257.18	39.80113522	-80.64808150
	10,600.02		274.092	10,279.55	-6.36	-2,030.12	14,454,519.32	1,739,187.06	39.80114967	-80.6483311
	10,620.00	48.89	274.100	10,292.85	-5.29	-2,044.99	14,454,520.38	1,739,172.19	39,80115276	-80.64838407
	9 5/8" Ca									
	10,700.02	53.69	274.132	10,342.88	-0.81	-2,107.25	14,454,524.86	1,739,109.93	39.80116573	-80.64860567
	10,800.02		274.166	10,397.78	5.23	-2,190.57	14,454,530.91	1,739,026.62	39.80118323	-80.6489022
	10,900.02	65.69	274.197	10,443.64	11.71	-2,279.14	14,454,537.38	1,738,938.04	39.80120197	-80.64921748
	10,958.01	69.17	274.213	10,465.90	15.64	-2,332.53	14,454,541.31	1,738,884.65	39.80121333	-80.64940752
	Begin 69	.17° tangent								
	11,000.02	69.17	274.213	10,480.84	18.52	-2,371.69	14,454,544.19	1,738,845.49	39.80122167	-80.6495469
	11,100.02	69.17	274.213	10,516.41	25.39	-2,464.90	14,454,551.06	1,738,752.28	39.80124153	-80.64987867
	11,200.02		274.213	10,551.97	32.25	-2,558.11	14,454,557.93	1,738,659.07	39.80126139	-80.65021044
	11,300.02	69.17	274.213	10,587.54	39.12	-2,651.32	14,454,564.79	1,738,565.86	39.80128125	-80.65054221
	11,400.02	69.17	274.213	10,623.11	45.99	-2,744.53	14,454,571.66	1,738,472.65	39.80130110	-80.65087397
	11,500.02	69.17	274.213	10,658.67	52,85	-2,837.74	14,454,578.53	1,738,379.45	39.80132096	-80.65120574
	11,600.02	69.17	274.213	10,694.24	59.72	-2,930.95	14,454,585.39	1,738,286.24	39.80134081	-80.65153751
	11,700.02	69.17	274.213	10,729.81	66.59	-3,024.16	14,454,592.26	1,738,193.03	39.80136066	-80.65186927
	11,800.02	69,17	274.213	10,765.37	73.45	-3,117.36	14,454,599.13	1,738,099.82	39,80138052	-80.65220104
	11,900.02		274.213	10,800.94	80.32	-3,210.57	14,454,605.99	1,738,006.61	39.80140037	-80.6525328
	12,000.02	69.17	274.213	10,836.50	87.19	-3,303.78	14,454,612.86	1,737,913.40	39.80142022	-80.65286458
	12,100.02	69.17	274.213	10,872.07	94.05	-3,396.99	14,454,619.73	1,737,820.19	39.80144007	-80.6531963
	12,200.02	69.17	274.213	10,907.64	100.92	-3,490.20	14,454,626.59	1,737,726.98	39.80145992	-80.6535281
	12,300.02	69.17	274.213	10,943.20	107.79	-3,583.41	14,454,633.46	1,737,633.77	39.80147977	-80.65385988
	12,400.03	69.17	274.213	10,978.77	114.65	-3,676.62	14,454,640.33	1,737,540.57	39.80149961	-80.6541916
	12,500.03	69.17	274.213	11,014.33	121.52	-3,769.83	14,454,647.19	1,737,447.36	39.80151946	-80.65452342
	12,600.03	69.17	274.213	11,049.90	128.39	-3,863.04	14,454,654.06	1,737,354.15	39.80153930	-80.65485519
	12,700.03	69.17	274.213	11,085.47	135.25	-3,956.25	14,454,660.93	1,737,260.94	39.80155915	-80.65518696
	12,800.03	69.17	274.213	11,121.03	142.12	-4,049.46	14,454,667.79	1,737,167.73	39,80157899	-80.65551873
	12,900.03	69.17	274.213	11,156.60	148.99	-4,142.66	14,454,674.66	1,737,074.52	39,80159883	-80.65585050
	13,000.03	69.17	274.213	11,192,17	155.85	-4,235.87	14,454,681.53	1,736,981.31	39.80161867	-80.65618227



Planning Report - Geographic

DB_Aug1919_v14 Tug Hill Operating LLC Marshall County, West Virginia Fitzgerald Fitzgerald 17 HU (slot M) Original Hole rev6

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

Well Fitzgerald 17 HU (slot M) GL @ 1292.91ft GL @ 1292.91ft Grid Minimum Curvature

Office of Oil and Gas MAR 1 7 2020

Planned Survey

Database:

Company:

Project:

Wellbore: Design:

Site:

Well:

esign:									- 2020
Planned Survey	•						-	Envir	W Department of onmental Protecti
Measured			Vertical			Мар	Мар		rotecti
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Northing	Easting		
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)	Latitude	Longitude
13,100.03	69.17	274.213	11,227.73	162.72	-4,329.08	14,454,688.39	1,736,888.10	39.80163851	-80.65651404
13,200.03	69.17	274.213	11,263.30	169.59	-4,422.29	14,454,695.26	1,736,794.89	39.80165835	-80.65684581
13,300.03	69.17	274.213	11,298.86	176.45	-4,515.50	14,454,702.13	1,736,701.69	39,80167819	-80.65717758
13,400.03	69.17	274.213	11,334.43	183.32	-4,608.71	14,454,708,99	1,736,608.48	39.80169803	-80.65750935
13,454.18	69.17	274.213	11,353.69	187.04	-4,659.19	14,454,712.71	1,736,558.00	39.80170877	-80.65768901
	/100' drop bu		11,000.00	101104	1,000.10	11,101,112,11	11.00,000.00		
13,500.03	68.27	270,398	11,370.34	188.76	-4,701.86	14,454,714.43	1,736,515.33	39,80171395	-80.65784094
13,600.03	66.64	261.917	11,408.74	182.61	-4,793.90	14,454,708.29	1,736,423.29	39,80169804	-80.65816872
13,700.03	65.47	253,256	11,449.40	163.02	-4,883.05	14,454,688,69	1,736,334.14	39.80164516	-80.65848638
13,800.03	64.80	244.468	11,491.52	130.36	-4,967.56	14,454,656.03	1,736,249.63	39.80155636	-80.65878774
			11,534.28	85.27	-5,045.80	14,454,610.94	1,736,171.38	39.80143335	-80.65906692
13,900.03	64.65	235,621	and the second		and the second	A CARLEY AND A CAR	and the second second second	39.80127852	-80.65931849
14,000.03	65.03	226.791	11,576.86	28.63	-5,116.25	14,454,554.30	1,736,100.94		-80.65953756
14,100.03	65.93	218.052	11,618.43	-38.47	-5,177.52	14,454,487.20	1,736,039.67	39.80109490	
14,200.03	67.32	209.467	11,658.16	-114.71	-5,228.43	14,454,410.96	1,735,988.76	39.80088606	-80.65971986
14,300.03	69.15	201.080	11,695.30	-198.61	-5,267.99	14,454,327.06	1,735,949.19	39.80065606	-80.65986185
14,400.03	71.38	192.916	11,729.12	-288.54	-5,295.43	14,454,237.13	1,735,921.76	39.80040938	-80.65996076
14,500.03	73.95	184.979	11,758.95	-382.75	-5,310.21	14,454,142.92	1,735,906.98	39.80015081	-80.66001466
14,600.03	76.81	177.254	11,784.23	-479.40	-5,312.05	14,454,046.27	1,735,905.14	39.79988540	-80.66002251
14,700.03	79.89	169.715	11,804.45	-576.62	-5,300.91	14,453,949.06	1,735,916.28	39.79961831	-80.65998415
14,800.03	83.14	162.322	11,819.23	-672.50	-5,277.00	14,453,853,17	1,735,940.19	39.79935474	-80.65990034
14,900.03	86,50	155.032	11,828.27	-765.19	-5,240.80	14,453,760.48	1,735,976.39	39.79909981	-80.65977270
14,973.31	89.00	149.723	11,831.15	-830.04	-5,206.86	14,453,695.64	1,736,010.33	39.79892137	-80.65965274
Begin 89	0.00° lateral								
15,000.03	89.00	149.723	11,831.62	-853.11	-5,193.39	14,453,672.56	1,736,023,80	39.79885787	-80.65960510
15,100.03	89.00	149.723	11,833.36	-939.46	-5,142.98	14,453,586.22	1,736,074.21	39.79862022	-80.65942679
15,200.03	89.00	149.723	11,835.11	-1,025.81	-5,092.57	14,453,499.87	1,736,124.62	39.79838256	-80.65924849
15,300.03	89.00	149.723	11,836.85	-1,112.15	-5,042.16	14,453,413,52	1,736,175.03	39,79814491	-80,65907019
15,400.03	89.00	149.723	11,838.60	-1,198.50	-4,991.75	14,453,327.18	1,736,225.44	39.79790725	-80.65889188
15,500.03	89.00	149.723	11,840.34	-1,284.85	-4,941.34	14,453,240.83	1,736,275.85	39,79766959	-80.65871358
15,600.03	89.00	149.723	11,842.09	-1,371.19	-4,890,93	14,453,154.48	1,736,326.26	39.79743194	-80.65853528
15,700.03	89.00	149.723	11,843.83	-1,457.54	-4,840.52	14,453,068.14	1,736,376.67	39,79719428	-80.65835698
15,800.03	89.00	149.723	11,845.58	-1,543.89	-4,790.11	14,452,981.79	1,736,427.08	39.79695662	-80.65817869
	89.00	149.723	11,847.32	and the second second	-4,739.70		1,736,477.49	39.79671897	-80.65800039
15,900.03				-1,630.23		14,452,895.44		39.79648131	-80.65782209
16,000.03	89.00	149.723	11,849.07	-1,716.58	-4,689.29	14,452,809.10	1,736,527.90	39.79624365	
16,100.03	89.00	149.723	11,850.81	-1,802.93	-4,638.87	14,452,722.75	1,736,578.31		-80.65764380
16,200.03	89.00	149.723	11,852.56	-1,889.27	-4,588.46	14,452,636.40	1,736,628.72	39.79600599	-80.65746551
16,300.03	89.00	149.723	11,854.30	-1,975.62	-4,538.05	14,452,550.06	1,736,679.13	39.79576833	-80.65728722
16,400.03	89.00	149.723	11,856.05	-2,061.97	-4,487.64	14,452,463.71	1,736,729.54	39.79553067	-80.65710893
16,500.03	89.00	149.723	11,857.80	-2,148.31	-4,437.23	14,452,377.36	1,736,779.95	39,79529301	-80.65693064
16,600.03	89.00	149.723	11,859.54	-2,234.66	-4,386.82	14,452,291.02	1,736,830.36	39.79505536	-80.65675235
16,700.03	89.00	149.723	11,861.29	-2,321.01	-4,336.41	14,452,204.67	1,736,880.77	39.79481770	-80.65657406
16,800.03	89.00	149.723	11,863.03	-2,407.35	-4,286.00	14,452,118.32	1,736,931.18	39.79458004	-80.65639578
16,900.03	89.00	149.723	11,864.78	-2,493.70	-4,235.59	14,452,031.98	1,736,981.59	39.79434238	-80.65621749
17,000.03	89.00	149.723	11,866.52	-2,580.05	-4,185.18	14,451,945.63	1,737,032.01	39.79410471	-80.65603921
17,100.03	89.00	149.723	11,868.27	-2,666.39	-4,134.77	14,451,859.28	1,737,082.42	39.79386705	-80,65586093
17,200.03	89.00	149.723	11,870.01	-2,752.74	-4,084,36	14,451,772.94	1,737,132.83	39,79362939	-80.65568265
17,300.03	89.00	149.723	11,871.76	-2,839.09	-4,033.95	14,451,686.59	1,737,183.24	39.79339173	-80.65550437
17,400.04	89.00	149.723	11,873.50	-2,925.44	-3,983.54	14,451,600.24	1,737,233.65	39.79315407	-80.65532609
17,500.04	89.00	149.723	11,875.25	-3,011.78	-3,933.13	14,451,513.90	1,737,284.06	39.79291641	-80.65514781
17,600.04	89.00	149.723	11,876.99	-3,098.13	-3,882.72	14,451,427.55	1,737,334.47	39,79267875	-80.65496954
17,700.04	89.00	149.723	11,878.74	-3,184.48	-3,832.31	14,451,341.20	1,737,384.88	39.79244108	-80.65479126
17,800.04	89.00	149.723	11,880.48	-3,270.82	-3,781.90	14,451,254.86	1,737,435.29	39.79220342	-80.65461299
17,900.04	89.00	149.723	11,882.23	-3,357.17	-3,731.49	14,451,168.51	1,737,485.70	39.79196576	-80.65443472
18,000.04	89.00	149,723	11,883.97	-3,443.52	-3,681.08	14,451,082.16	1,737,536.11	39.79172809	-80.65425645



Planning Report - Geographic

Database: DB_Aug1919_v14 Tug Hill Operating LLC Company: Project: Marshall County, West Virginia Fitzgerald Fitzgerald 17 HU (slot M) Original Hole Wellbore: rev6 Design:

Planned Survey

Site:

Well:

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

Well Fitzgerald 17 HU (slot M) GL @ 1292.91ft GL @ 1292.91ft Grid Minimum Curvature

Office of Oil and Gas MAR 1 7 2020

En WV Dena

			Vertical			1100	Mag	Enviror	mental ment of
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Map Northing	Map Easting		Department of mental Protect
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)	Latitude	Longitude
18,100.04	89.00	149.723	11,885.72	-3,529.86	-3,630.66	14,450,995.82	1,737,586.52	39,79149043	-80.654078
18,200.04	89.00	149,723	11,887.46	-3,616.21	-3,580,25	14,450,909.47	1,737,636.93	39,79125277	-80.653899
18,300.04	89.00	149.723	11,889,21	-3,702.56	-3,529.84	14,450,823.12	1,737,687,34	39,79101510	-80.653721
18,400.04	89.00	149.723	11,890.95	-3,788.90	-3,479.43	14,450,736.78	1,737,737.75	39.79077744	-80.653543
18,500.04	89.00	149.723	11,892.70	-3,875.25	-3,429.02	14,450,650.43	1,737,788.16	39.79053977	-80.65336
18,600.04	89.00	149.723	11,894.45	-3,961.60	-3,378.61	14,450,564.08	1,737,838.57	39.79030211	-80.65318
18,700.04	89.00	149.723	11,896.19	-4,047.94	-3,328.20	14,450,477.74	1,737,888.98	39.79006444	-80.65300
18,800.04	89.00	149.723	11,897.94	-4,134.29	-3,277.79	14,450,391.39	1,737,939.39	39.78982678	-80.65283
18,900.04	89.00	149.723	11,899.68	-4,220.64	-3,227.38	14,450,305.04	1,737,989.80	39.78958911	-80.65265
19,000.04	89.00	149.723	11,901.43	-4,306.98	-3,176.97	14,450,218.70	1,738,040.21	39.78935145	-80.65247
19,100.04	89.00	149.723	11,903.17	-4,393.33	-3,126.56	14,450,132.35	1,738,090.62	39.78911378	-80.65229
19,200.04	89.00	149.723	11,904.92	-4,479.68	-3,076.15	14,450,046.00	1,738,141.03	39.78887611	-80.65211
19,300.04	89.00	149.723	11,906.66	-4,566.02	-3,025.74	14,449,959.66	1,738,191.44	39.78863845	-80.65193
19,400.04	89.00	149,723	11,908.41	-4,652.37	-2,975.33	14,449,873.31	1,738,241.86	39,78840078	-80.65176
19,500.04	89.00	149,723	11,910,15	-4,738.72	-2,924.92	14,449,786.96	1,738,292.27	39.78816311	-80.65158
19,600.04	89.00	149.723	11,911.90	-4,825.07	-2,874.51	14,449,700.62	1,738,342.68	39.78792544	-80.65140
19,700.04	89.00	149.723	11,913.64	-4,911.41	-2,824.10	14,449,614.27	1,738,393.09	39.78768777	-80.65122
19,800.04	89.00	149.723	11,915.39	-4,997.76	-2,773.69	14,449,527.92	1,738,443.50	39,78745011	-80.65104
19,900.04	89.00	149,723	11,917.13	-5,084.11	-2,723.28	14,449,441.58	1,738,493.91	39.78721244	-80.65086
20,000.04	89.00	149,723	11,918.88	-5,170,45	-2,672.86	14,449,355.23	1,738,544.32	39.78697477	-80.65069
20,100.04	89.00	149.723	11,920.62	-5,256.80	-2,622.45	14,449,268.88	1,738,594.73	39.78673710	-80,65051
20,200.04	89.00	149.723	11,922.37	-5,343.15	-2,572.04	14,449,182.54	1,738,645.14	39.78649943	-80.65033
20,300.04	89.00	149.723	11,924.11	-5,429.49	-2,521.63	14,449,096.19	1,738,695.55	39.78626176	-80.65015
20,400.04	89.00	149,723	11,925.86	-5,515.84	-2,471.22	14,449,009.84	1,738,745.96	39.78602409	-80.64997
20,500.04	89.00	149.723	11,927.61	-5,602.19	-2,420.81	14,448,923.50	1,738,796.37	39.78578642	-80.64980
20,600.04	89.00	149.723	11,929.35	-5,688.53	-2,370.40	14,448,837.15	1,738,846.78	39.78554875	-80.64962
20,700.04	89.00	149.723	11,931.10	-5,774.88	-2,319.99	14,448,750.80	1,738,897.19	39.78531108	-80.64944
20,800.04	89.00	149.723	11,932.84	-5,861.23	-2,269.58	14,448,664.46	1,738,947.60	39.78507341	-80.64926
20,900.04	89.00	149.723	11,934.59	-5,947.57	-2,219.17	14,448,578.11	1,738,998.01	39.78483574	-80.64908
21,000.04	89.00	149.723	11,936.33	-6,033.92	-2,168.76	14,448,491.77	1,739,048.42	39.78459806	-80.64890
21,100.04	89.00	149.723	11,938.08	-6,120.27	-2,118.35	14,448,405.42	1,739,098.83	39.78436039	-80,64873
21,200.04	89.00	149.723	11,939.82	-6,206.61	-2,067.94	14,448,319.07	1,739,149.24	39.78412272	-80.64855
21,300.04	89.00	149.723	11,941.57	-6,292.96	-2,017.53	14,448,232.73	1,739,199.65	39,78388505	-80.64837
21,400.04	89.00	149.723	11,943.31	-6,379,31	-1,967.12	14,448,146.38	1,739,250.06	39.78364738	-80.64819
21,500.04	89.00	149.723	11,945.06	-6,465.65	-1,916.71	14,448,060.03	1,739,300.47	39,78340970	-80.64801
21,600.04	89.00	149.723	11,946.80	-6,552.00	-1,866.30	14,447,973.69	1,739,350.88	39.78317203	-80.64783
21,700.04	89.00	149.723	11,948.55	-6,638.35	-1,815.89	14,447,887.34	1,739,401.29	39,78293436	-80.64766
21,800.04	89.00	149.723	11,950.29	-6,724.70	-1,765.48	14,447,800.99	1,739,451.71	39.78269668	-80.64748
21,900.04	89.00	149.723	11,952.04	-6,811.04	-1,715.06	14,447,714.65	1,739,502.12	39.78245901	-80.64730
22,000.04	89.00	149.723	11,953.78	-6,897.39	-1,664.65	14,447,628.30	1,739,552.53	39.78222133	-80.64712
22,100.04	89.00	149.723	11,955.53	-6,983.74	-1,614.24	14,447,541.95	1,739,602.94	39.78198366	-80.64694
22,200.04	89.00	149.723	11,957,27	-7,070.08	-1,563.83	14,447,455.61	1,739,653.35	39.78174598	-80.64677
22,300.05	89.00	149.723	11,959.02	-7,156.43	-1,513.42	14,447,369.26	1,739,703.76	39.78150831	-80.64659
22,400.05	89.00	149.723	11,960.76	-7,242.78	-1,463.01	14,447,282.91	1,739,754.17	39.78127063	-80,64641
22,500.05	89.00	149.723	11,962.51	-7,329.12	-1,412.60	14,447,196.57	1,739,804.58	39.78103296	-80.64623
22,600.05	89.00	149.723	11,964,26	-7,415.47	-1,362.19	14,447,110.22	1,739,854.99	39,78079528	-80.64605
22,700.05	89.00	149.723	11,966.00	-7,501.82	-1,311.78	14,447,023.87	1,739,905.40	39.78055760	-80.64587
22,800.05	89.00	149.723	11,967.75	-7,588.16	-1,261.37	14,446,937.53	1,739,955.81	39.78031993	-80,64570
22,900.05	89.00	149.723	11,969.49	-7,674.51	-1,210.96	14,446,851.18	1,740,006.22	39,78008225	-80.64552
23,000.05	89.00	149.723	11,971,24	-7,760.86	-1,160.55	14,446,764.83	1,740,056.63	39.77984457	-80.64534
23,100.05	89.00	149.723	11,972.98	-7,847.20	-1,110.14	14,446,678.49	1,740,107.04	39.77960690	-80.64516
23,200.05	89.00	149.723	11,974.73	-7,933.55	-1,059,73	14,446,592.14	1,740,157.45	39.77936922	-80,64498
23,300.05	89.00	149.723	11,976.47	-8,019.90	-1,009.32	14,446,505,79	1,740,207.86	39.77913154	-80.64480
23,400.05	89.00	149.723	11,978.22	-8,106.24	-958.91	14,446,419.45	1,740,258.27	39.77889386	-80.64463
23,500.05	89.00	149.723	11,979.96	-8,192.59	-908.50	14,446,333.10	1,740,308.68	39.77865618	-80.644453



Planning Report - Geographic

Database:	DB_Aug1919_v14	Local Co-ordinate Reference:	Well Fitzgerald 17 HU (slot M)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1292.91ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1292.91ft
Site:	Fitzgerald	North Reference:	Grid
Well:	Fitzgerald 17 HU (slot M)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev6		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
23,600.05	89.00	149.723	11,981.71	-8,278.94	-858.09	14,446,246.75	1,740,359.09	39.77841850	-80.64427525
23,700.05	89.00	149.723	11,983.45	-8,365.28	-807.68	14,446,160.41	1,740,409.50	39.77818082	-80.64409704
23,800.05	89.00	149.723	11,985.20	-8,451.63	-757.26	14,446,074.06	1,740,459.91	39.77794314	-80.64391884
23,833.17	89.00	149.723	11,985.78	-8,480.23	-740.57	14,446,045.46	1,740,476.61	39.77786442	-80.64385982
PBHL/TC	23833.17 MD	/11985.78 TV	D						
23,833,18	89.00	149.723	11,985.78	-8,480.24	-740.56	14,446,045.45	1,740,476.61	39.77786440	-80.64385981

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Fitzgerald-17HU LP - plan misses targe - Point	0.00 at center by 60.3		11,825.91 2.52ft MD (11	-571.00 803.12 TVD, -	-5,358.09 -569.34 N, -53	14,453,954.68 802.19 E)	1,735,859.10	39.79963434	-80.66018766
Fitzgerald-17HU BHL - plan misses targe - Point	0.00 et center by 0.22	0.000 2ft at 23833.	11,986.00 18ft MD (119	-8,480.24 85.78 TVD, -8	-740.55 3480.24 N, -74	14,446,045.45 0.56 E)	1,740,476.63	39.77786440	-80.64385977

Casing Points

Measured Depth (ft)	Vertical Depth (ft)		Name	Casing Diameter ('')	Hole Diameter (")
1,000.00	1,000.00	20" Casing		20	26
2,900.00	2,894.42	13 3/8" Casing		13-3/8	17-1/2
10,620.00	10,292.85	9 5/8" Casing		9-5/8	12-1/4

Formations	Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
	6,964.00	6,902.00	Top Marcellus		0.000		
	7,016.80	6,954.00	Top Onondaga		0.000		
	7,255.42	7,187.00	Base Onondaga		0.000		
	7,772.89	7,677.00	Top Salina		0.000		DR
	8,846.65	8,686.00	Base Salina		0.000		Office of CEIVED
	9,793.77	9,576.00	Top Clinton		0.000		Office of Oil and
	9,910.83	9,686.00	Base Clinton		0.000		MAR 17 202



Planning Report - Geographic

Well Fitzgerald 17 HU (slot M) DB_Aug1919_v14 Local Co-ordinate Reference: Database: Tug Hill Operating LLC GL @ 1292.91ft Company: TVD Reference: Project: Marshall County, West Virginia MD Reference: GL @ 1292.91ft Fitzgerald Grid Site: North Reference: Minimum Curvature Fitzgerald 17 HU (slot M) Well: Survey Calculation Method: Original Hole Wellbore: rev6 Design:

Plan Annotations

Measured	Vertical	Local Coor	dinates	
Depth (ft)	Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
1,100.00	1,100.00	0.00	0.00	KOP Begin 1°/100' build
1,600.00	1,599.37	-16.70	-14.01	Begin 5.00° tangent
3,106.37	3,100.00	-117.27	-98.41	Begin 2°/100' turn
3,511.31	3,501.77	-128.56	-144.91	Begin 10.00° tangent
7,016.80	6,954.00	-89.60	-752.39	Begin 2°/100' build
7,516.80	7,436.35	-81.32	-881.37	Begin 20.00° tangent
10,138.56	9,900.00	-23.93	-1,776.22	Begin 2°/100' build
10,958.01	10,465.90	15.64	-2,332.53	Begin 69.17° tangent
13,454.18	11,353.69	187.04	-4,659.19	Begin 8°/100' drop build/turn
14,973.31	11,831.15	-830.04	-5,206.86	Begin 89.00° lateral
23,833,17	11.985.78	-8,480.23	-740.57	PBHL/TD 23833.17 MD/11985.78 TVD

Office of Oil and Gas MAR 1 7 2020 WV Department of Environmental Protection

WW-9 (4/16)

API Number 47 - 051 - _

Operator's Well No. Fitzgerald S-17HU

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC	OP Code _494510851
Watershed (HUC 10) Upper Fish Creek	Quadrangle Glen Easton 7.5'
Do you anticipate using more than 5,000 bbls of water to comp Will a pit be used? Yes <u>No</u> No	lete the proposed well work? Yes No
If so, please describe anticipated pit waste: AST Tanks Will a synthetic liner be used in the pit? Yes Proposed Disposal Method For Treated Pit Wastes:	with proper containment will be used for staging fresh water for frac and flow back water No If so, what ml.?AST Tenks will be used with proper contain
Land Application Underground Injection (UIC Permit Reuse (at API Number	NumberUIC 2459, UIC 965, UIC 359, UIC 2D0732540, UIC 2D0732523)
Off Site Disposal (Supply form WW Other (Explain	7-9 for disposal location)
Will closed loop system be used? If so, describe: Yes - For Ve	rtical and Horizontal Drilling

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

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

Additives to be used in drilling medium? Barite for weight

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

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

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

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

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

Company Official Signature	Office of Oil and Gas
Company Official (Typed Name) Jim Pancake	MAR 1 7 2020
Company Official Title Vice President - Geosciences	WV Department of Environmental Protection
1 da	20 2 Commonwealth of Pennsylvania - Notary Seal Chester Arthur West IV, Notary Public ary Public Washington County
My commission expires 2-10-2024	My commission expires February 10, 2024 Commission number 1267179 Member, Pennsylvania Association of Notaries

Operator's Well No. Fitzgerald S-17HU

Tug Hill Operating, LLC

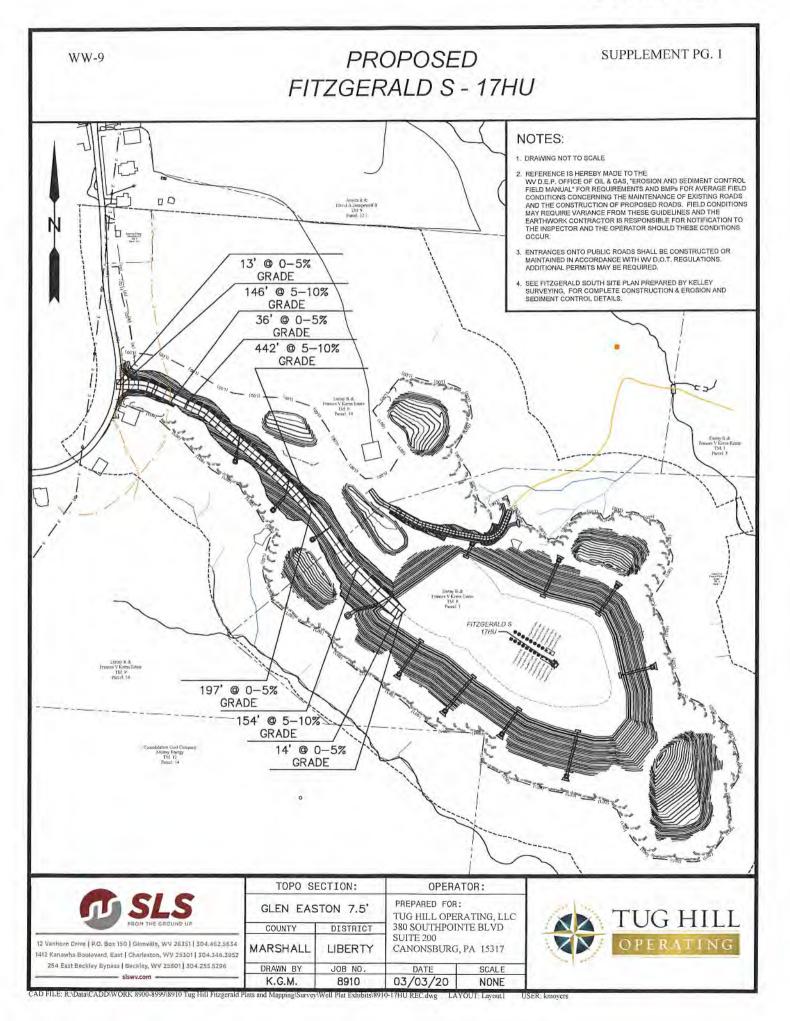
ns/acre or to correct to pH	6.5	
····· · · · · · · · · ·		
lbs/a	acre	
Tons/acr	e	
		ent
bs/acre	Seed Type	lbs/acre
40	Orchard Grass	12
96	Ladino	3
	White Clover	2
	Tons/acr seed f bs/acre 40	bs/acreSeed Type40Orchard Grass96Ladino

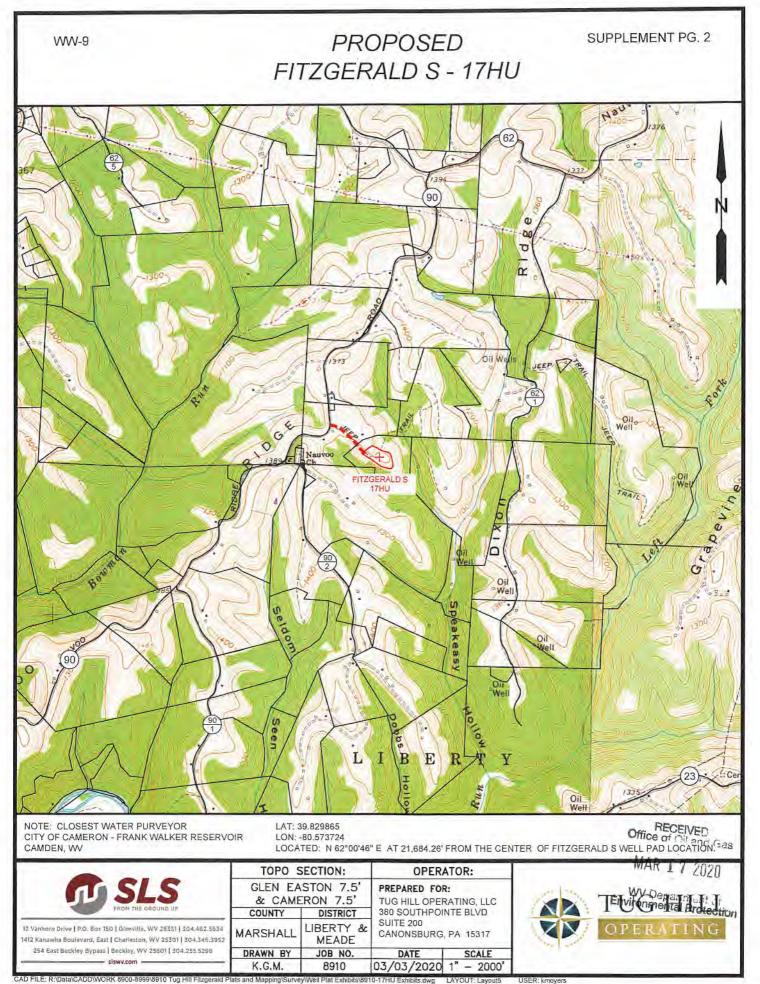
Attach:

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

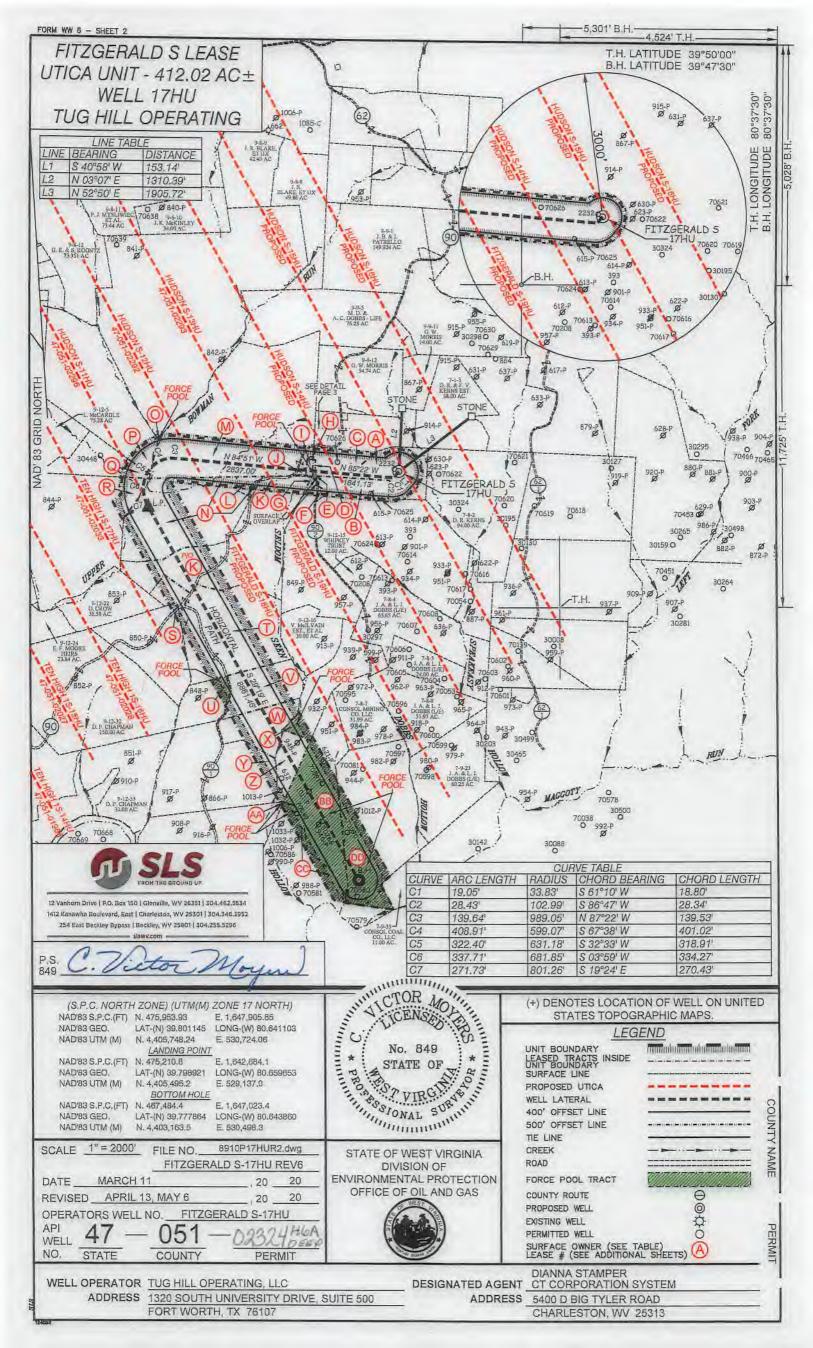
Photocopied section of involved 7.5' topographic sheet.

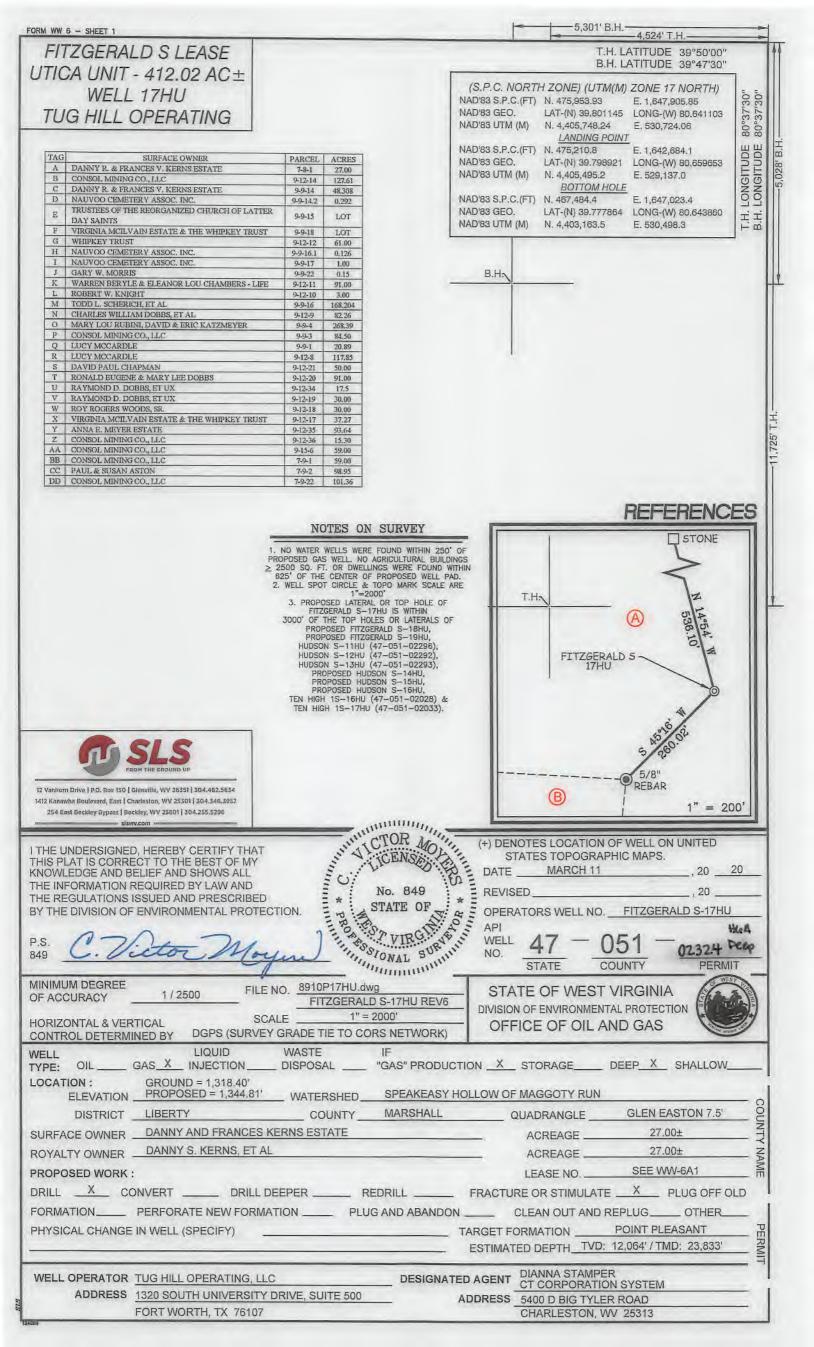
Plan Approved by: Juic Unilola	~	
Comments:		
		b _
		Office of Oil and Gas
		MAR 1 7 2020
Title: Oil and Gas Inspector	Date: 2/4/2020	WV Department of Environmental Protection
Field Reviewed? (Yes	() No	





FILE: R:\Data\CADD\WORK 8900-8999\8910 Tug Hill Fitzgerald and Mapping/Survey/Well Plat Exhibits/8910-17HU Exhibits dwo LAYOUT: Layout5





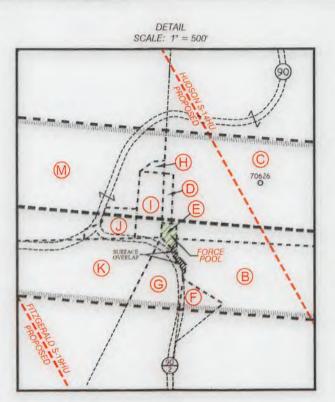
FORM WW 6 - SHEET 3

FITZGERALD S LEASE UTICA UNIT - 412.02 AC± WELL 17HU TUG HILL OPERATING

NO.	Lease ID	Tags	Parcel	Grantor, Lessor, Etc.	Deed Bo	ok/Page
1	10*25518	A	7-8-1	DANNY S KERNS, MARRIED MAN DEALING WITH HIS SOLE AND SEPARATE PROPERTY et al	1010	532
2	10*18339	В	9-12-14	RESOURCE MINERALS HEADWATER I LP et al	940	448
3	PENDING	C	9-9-14	REGINA DANETTE FIGUEROA et al	1075	137
4	10*27299	D	9-9-14.2	NAUVOO CEMETERY ASSOCIATION	1057	357
5	**	Е	9-9-15	REORGANIZED CHURCH OF LATER DAY SAINTS	UNLE	ASED
б	10*22524	F	9-9-18	ALYCE LYNN MCGUFFIE et al	1027	233
7	10*19557	G	9-12-12	TERRY L BLAKE et al	944	649
8	10*19987	н	9-9-16.1	LESLEY D BALLA et al	955	103
9	10*27299	1	9-9-17	NAUVOO CEMETERY ASSOCIATION	1057	357
10	10*24535	1	9-9-22	BOARD OF EDUCATION OF MARSHALL COUNTY	1026	64
11	10*15494	K	9-12-11	CHRISTOPHER SINGER AND SHEREA SINGER et al	898	433
12	10*23656	L	9-12-10	ROBERT W KNIGHT AND BARBARA J KNIGHT	1011	504
13	10*19987	M	9.9.16	LESLEY D BALLA et al	955	103
14	10*15999	N	9-12-9	CHARLES W DOBBS AND JUDITH M DOBBS et al	702	171
15	**	0	9.9.4	MARY LOU RUSINI AKA MARY LOU MILLER et al	793	287
10	10*47051.304.0	P	9.9.3	UNITED BANK INC	905	5
17	10*23386	Q	9-9-1	EDITH CARMICHAEL HEIRS BY HERMAN LANTZ, ESQ AS SPEC COMMISSIONER et al	1008	68
18	10*47051.289.1	R	9-12-8	JANICE M HIXSON AND HARRY C HIXSON et al	898	461
19	10*47051.140.1	5	9-12-21	DAVID P CHAPMAN & DEBORAH BORCK CHAPMAN et al	866	318
20	10*24579	T.	9-12-20	PIKEWOOD ENERGY CORPORATION AN OHIO CORPORATION et al	1026	149
21	10*21449	U	9-12-34	GARY WAYNE MORRIS et al	957	262
22	10*19748	V	9-12-19	ELIZABETH JANE KELLEY et al	957	335
23	10*18073	W	9-12-18	ROY R WOODS	927	22
24	10*21532	X	9 12-17	CHARLES E RICHARDSON AND SHIRLEY'S RICHARDSON et al	957	327
25	10*19706	Y	9 12 35	BARBARA JO BEVERIDGE et al	944	627
26	PENDING	Z	9-12-36	OCTO OIL COMPANY LLC	1076	17
27	PENDING	AA	9-15-6	OCTO OIL COMPANY LLC et al	1076	17
28	10*22631	88	7-9-1	FREDA EUZABETH BLAKE et al	966	632
29	**	CC	7-9-2	AUSTIE CARNEY ET AL	363	15
30	10*17930	DD	7-9-22	BOUNTY MINERALS LLC et al	928	395

In WV 26351 | \$08.462.5634

(4)2 Kanawim Boulevard, Ext [Continues, WV 25401 (204 546 1952 254 Kast Biochiny Bypnin [Biochiny, WY 25601] 204 255 5295



No. 849 * STATE OF * VIRCING COUNTY NAME FILE NO. _____8910P17HUR.dwg FITZGERALD S-17HU REV6 STATE OF WEST VIRGINIA **DIVISION OF** DATE MARCH 11 , 20 ____ 20 ENVIRONMENTAL PROTECTION OFFICE OF OIL AND GAS . 20 _ REVISED MARCH 25 20 OPERATORS WELL NO. FITZGERALD S-17HU HGA 051 API 02324 Deep 47 P.S. 849 WELL STATE NO. COUNTY PERMIT DESIGNATED AGENT ADDRESS 5400 D BIG TYLER ROAD WELL OPERATOR TUG HILL OPERATING, LLC ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH, TX 76107 CHARLESTON, WV 25313

WW-6A1 (5/13) Operator's Well No. Fitzgerald S-17HU

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
	*S	see attached pages		

*Co-tenancy utilization – At least 7 mineral owners in tract. At least 75% of the royalty owners have executed a lease on the tract. The interests of the remaining co-tenants were acquired pursuant to the Co-tenancy Modernization and Majority Protection Act.

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

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

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

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

Well Operator:	Tug Hill Operating, LLC
By:	Amy L. Miller UNUS Ulle
Its:	Permitting Specialist - Appalachia Region

WW-6A1 Supplement

v

Operator's Well No. <u>Fitzgerald S-17HU</u>

10*24398	10*24397	10°24047	10*23315	50/77_0T	10*22553	10*22528	10*22526	1000000	10*22202		10*22201	66T77 -0T		10*21322	/1172-01	10*19994	10*19993	10*27710	10*24396	10*23227	10*21896		10*21882 10*21890		10*21781	10°19696	10*19633	7CORT . OT	10+10620	10°19631	10*19571	10°19570	10*19567	TOCELOT	10*19558	10*19557	10*27774	10°22524	:	10*27299		PENDING	PENDING	10°22524	0EE81+UL	10*25522		10°25520		10*25518		Lease No.
н 9-9-16.1	н 9-9-16.1	н 9-9-16.1	н 9-9-16.1	1 272-20.4	н 9-9-16.1	-	H 9-9-16.1		н 9-9-16.1		н 9-9-16.1	T.01-6-6 U		н 9-9-16.1	T.01-6-6	╋	H	G 9-12-1	-	G 9-12-1		_	G 9-12-12 G 9-12-12	-+	G 9-12-12	G 9-12-12	G 9-12-12	-+		G 9-12-12	+	G 9-12-12		-	G 9-12-12	+	F 9-9-18		E 9-9-15	D 9-9-14.2	-	C 9-9-14	-	B 9-12-14	B 9-12-14	A 7-8-1		A 7-8-1		A 7-8-1		Tago Farcer
			_		1 GIJZANNE SWIET	.1 RONALD DAKAN	1 BARBARA FURFARI	1 MELISSA ELAINE SCHROTH	1 MARK DAVID HUNT		1 FREDERICK MAXWELL YEATER		_	1 WAYT	PHILLIP H WAYT AND BILLIE A	ELAINE A FONTES	DIANA D COSLICK	I FSI FY D BALLA	ELEANOR CHAMBERS	ROGER F CROSS	NANCY ID FENN	REBECCA LYNN RITZ AND	2 DARLA J KLUKAS		_	_	GARY F BLAKE AND DORIS E	-	CHARLES W DOBBS AND		MARLENE GARIN	ALICE BUZZARD	PURDY	JOHN PURDY AND BRENDA S		ROBERT C BLAKE AND LYN		RESOURCE MINERALS	1	REORGANIZED CHURCH OF	NAUVOO CEMETERY	DEENA JANINE PALOMO DANNY SHAWN KERNS	REGINA DANETTE FIGUEROA	ALYCE LYNNE MCGUFFIE	RESOURCE MINERALS HEADWATER I LP	REGINA D FIGUEROA		DEENA J PALOMO		AND SEPAKATE PROPERT	MAN DEALING WITH HIS SOLE	
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10*27947	10*23386	10*47051.304.0	:	:	:	PENDING	10*28510	10*28509	10*16001		10*16000	10*15999		10*24413	10°24398	10*24397	10°24047	10°23315	10°22553 10°22783	10*22528	10*22203	10-22202		10*33301	10*22199		10*19994 10*21117			14517.01		10*16485	10°16484	10415404	10*74535	10*24413	
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Operator's Well No. Fitzgerald S-17HU

WW-6A1 Supplement

Operator's Well No. <u>Fitzgerald S-17HU</u>

WW-6A1 Supplement

10*23750	10°23677	10*23676	10*23675	10*23674	10*23673	10*23499		10*23431	10*73430	10*23414	10*23105	30150 01	1000000	10*22/95	10*22794		10°22793	10*22792		10*22791	10 111 00	10*775R	10°22746	10*22741		10*22635	10*22634	CC077.0T	10*22481		10°22480	10°22419	20 55007	1042291	10411501	10*22261	27 - CANADA	10*22260	10*22060		10*22059	9CU77.0T	10°21856		10°21855	10*21854	10*21852		10*21851	AC017 OF	10*71850	101011007	10*21596	10*71449	:	:	PENDING	10*27097	100724001	1000	10°24679		10*47051.140.2		10*47051.140.1	10*47051.289.2	10*47051.289.1	
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17 JAN MICHELE DUNLAP		17 WILLIAM N LOGSDON	_			17 JOSEPH CHINCHECK	tet.	_	2 2	_	17 JEAN A PYLE				VIRGINIA E HAGIN AND	-	_	CLARENCE C STOVER JR AND	_	_		_	_	+-+					8 ROY R WOODS	WILLIAM DEAL, ACTING TRUSTEE FOR GEORGIA	9 DIVISION OF HIGHWAYS	ANN MULERAIN ET AL	ALMA L SAMPSON	DOBBS	GLADYS V LARSEN	LEONA B RICHMOND	JUDY M KICHARDSON	KEITH A RICHMOND	ROBIN K RICHMOND AND		GARY L RICHMOND AND	_	JOHN R HOBBS AND HOLLY		CAROLYN J MCILVAIN	SARA LOU KINNEY	BOBBI LOGSDON	JACK C MCILVAIN TRUST	DAVID L WHIPKEY	RANDOLPH HAGIN	VIRGINIA E HAGIN AND
TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC		TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	ŧ	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC		TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	IN EXPLORATION, LLC		TH EXPLORATION, LLC	TH EXPLORATION, LLC		NA	NA	SOUTH PENN OIL COMPA	_			TH EXPLORATION, LLC	TH EXPLORATION LLC	TH EXPLORATION, LLC	IN EAR WAATION, LES	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC		TH EXPLORATION. LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC		TH EXPLORATION, LLC	TH EXPLORATION, LLC					
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	KAREN L WALKER TRUST DATED NOV. 7, 1996		DANIEL M WILLIAMSON	Ð	KATHLEEN G WILLIAMSON		STACY L BARNHART			DEBORAH L TURLEY	ON JR	RD RALPH WILLIAMSON	TRACY BLACKBURN	MARIE HONE	-	ARMER AND LORI	JDERS		TEMPLE	JUDITH F TEMPLE AND LOUIS I	RE ALLEY JR	NUT HOLDINGS INC					GARY E STRAIT	TRAIT AND		BARBARA JO BEVERIDGE				UZANNE		JULIA ANN WALTON AIF NANCY MARIKAR					AND	JEAN ELISE DAVIS		DENNIS M BOWMAN	_	_	SAMS	A DAVIS	_	CASSANDRA J SHERMAN AND
TH EXPLORATION, LLC	AMERICAN PETROLEUM PARTNERS LLC		TH EXPLORATION, LLC	TH EXPLORATION. LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC			TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC		TH EXPLORATION, LLC		TH EXPLORATION, LLC	TH EXPLORATION, LLC	COMPANY LLC	SWN PRODUCTION	TH EXPLORATION, LLC		TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC		TH EXPLORATION, LLC		TH EXPLORATION, LLC	TH EXPLORATION, LLC	H EXPLORATION, LLC	TH EXPLORATION, LLC	H EXPLORATION, LLC	TH EXPLORATION, LLC	H EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION, LLC							
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NANCY F PATTERSON		I ONNIE I VODENICHAR	PATRICIA I VODENICHAR AND		KATHLEEN M BUAKE	ROBERT E BLAKE AND			ROBERT N HINDS JR				PATRICIA M LEWIS	ROBERT W LEWIS AND			HARLES R MARTIN	SANDRA D MARTIN AND			MARIE DILTS	HADONI DII TE AVA SHADON		STEVEN R BLAKE				BRADLEY A HOLSTEIN	AMMY M HOLSTEIN AND			TINA I OLJISE NICGORSKI			WILLIAM BLAKE				E A CRISWELL					CTO OIL COMPANY LLC	CHK-MAC LLC		CHARLES A BLOYD III AND KIM	BLOYD AND RANDY L DULA	_		BLOYD	_		PHILLIP JOSEPH LONGO SR				AND THROUGH ITS GENERAL	MMM-MARCELLUS III LP BY		CHK-MAC LLC				NE M JOLLY-SMART .			STONE HILL MINERALS	- 8	1
CHESAPEAKE APPALACHIA			CHESAPEAKE APPALACHIA			CHESAPEAKE APPALACHIA			шс	CHESAPEAKE APPALACHIA			Inc	CHESAPEAKE APPALACHIA			luc	CHESAPEAKE APPALACHIA				CHECADEAKE APPAI ACHIA		uc	CHESAPEAKE APPALACHIA			μc	CHESAPEAKE APPALACHIA			HC	CHESAPEAKE APPALACHIA		uc	CHESAPEAKE APPALAUNIA			SOUTH PENN OIL COMPANY					TH EXPLORATION, LLC	NA	E	CHESAPEAKE APPALACHIA	uc	CHESAPEAKE APPALACHIA			CHESADEAKE APPALACHIA		UTER DATE AT ADADIM				CHESAPEAKE APPALACHIA				CHESAPEAKE APPALACHIA		TH EXPLORATION, LLC	TH EXPLORATION, LLC	TH EXPLORATION. LLC	TH EXPLORATION, LLC		TH EXPLORATION, LLC	
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31/246 Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc		Onshore Properties Inc	Appalachia LLC to Statoil USA	27/50 Chesapeake	Cision From the tree	Appaientia LLC to statuti Use	2//SO Chesapeake		Unshore Properties Inc	Appaiacnia LLC to station USA	Transference	at 1346 Charanaska	Unsitore Fropel des life	Appaiacnia LLC to station Usin	31/249 Cilesopeane	21/245 Charanaska	Onshore Properties Inc	Appalachia LLC to Statoli USA	27/50 Chesapeake		Onshore Properties Inc	Appalachia LLC to Statoil USA	27/50 Chesapeake	Unsilote Floperities ille	Appalachia LLC to statoli USA	27/50 Chesapeake		Onshore Properties Inc	Appalachia LLC to Statoil USA	31/246 Chesapeake		Onshore Properties Inc	Appalachia LLC to Statoil USA	27/50 Chesapeake	Citation 1 reperious n	Onshore Properties Inc	Annalachia IIC to Statoli USA	31/175 Checaneake	Natural Gas Company	Company to South Penn	209/552 South Penn Oil			NA		Production Company LLC	Appalachia LLC to SWN	35/32 Chesapeake	Appalachia LLC to SWN	35/32 Chesapeake	Onshore Properties Inc	33/4/ Chesapeake Appalachia LLC to Statoil USA			33/47 Chesapeake						Onshore Properties Inc	29/325 Unesapeake Appalachia LLC to Statoil USA	1275 (Theconooko		NA		NA		NA	
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33/424 Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC		5	Properties Inc to SWN	33/424 Statoil USA Onshore		Exchange Titleholder IIC	Shore		Exchange Theiloider CCC		Bronotias inc to SWN	33/474 Statoil USA Onshore	Contraction (Contraction) and		Properties Inc to SWN	33/474 Statoll USA Onshore	Exchange (thenolder LLC	Properties inc to SWN Exchange Titlebolder II C	33/424 Statoli USA Onshore		Exchange Titleholder LLC	Properties Inc to SWN	33/424 Statoil USA Onshore		Exchange Titleholder IIC	33/424 Statoli USA Unshore		-		_	_	LC.		33/424 Statoil USA Onshore		LC		33/424 Statoil USA Onshore	Company	il Products	mpany			NA							٦ ר	Properties Inc to SWN			Properties Inc to SWN	_						** FORCE POOL			NA		NA		NA	
Titleholder LLC and SWN Production Company LLC merger	19/624 SWN Exchange	merger .	Production Company LLC	Titleholder LLC and SWN	19/624 SWN Exchange	merger	Induction Company IIC	Titleholder IIC and SWN	19/674 SWN Exchange		Production Company IIC	Titleholder LLC and SWN	19/624 SWN Exchange	nonor	Production Company IIC	Titleholder LLC and SWN	There and a start and a start and a start and a start	Production Company LLC	Littenoider LLC and SWN	19/624 SWN Exchange	merger	Production Company LLC	Titleholder LLC and SWN	19/624 SWN Exchange	riodacaon company Lee	Ittienotoer LLC and Swiv	19/624 SWN Exchange	merger	Production Company LLC	Titleholder LLC and SWN	19/624 SWN Exchange	merger	Production Company LLC	Titleholder LLC and SWN	19/624 SWN Exchange	merger	Production Company LLC	Titleholder LLC and SWN	merger 19/624 SWN Exchange	Production Company LP	Pennzoil, and Devon Energy	Company LLC, formerly	Exploration and Production	NA 18/635 PennzEnerøv							merger	Production Company LLC	19/624 SWN Exchange	merger		19/624 SWN Exchange									NA		NA		NA	
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ASSIGNMENT OF OIL AND GAS LEASES

This ASSIGNMENT OF OIL AND GAS LEASES (the "<u>Assignment</u>") is made and entered into this 8th day of March, 2018 (the "<u>Effective Date</u>"), from Blue Roan Resources, LLC, a West Virginia limited liability company, having an address at 3437 University Avenue, Morgantown, WV, 26505 (hereinafter "<u>Assignor</u>"), and TH Exploration, LLC, a Texas limited liability company, having an address at 1320 S. University Drive, Suite 500, Fort Worth, TX 76107 (hereinafter "<u>Assignee</u>").

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" attached hereto and made a part hereof (hereinafter the "Leases"); and

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

NOW, THEREFORE, for and in consideration of the sum of Ten Dollars (\$10.00), cash in hand paid, and other 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>Hydrocarbons</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 drill through, but not perforate or stimulate, all other depths and formations necessary for the purpose of reaching the Assigned Formations and to conduct operations therein.

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

2. <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.

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 and assigns, and such terms shall be covenants running with the land, and with each subsequent transfer or assignment thereof.

4. <u>Further Assurances</u>. Assignor and Assignee hereby agree to take all actions and execute, acknowledge, and deliver all such instruments as are necessary or advisable to effectuate the purposes of this Assignment.

RECEIVED Office of Cill and Gas MAR 1 7 2020 WV Department of Environmental Protection

4705102324

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

STATE OF WEST VIRGINIA § COUNTY OF MARSHALL §

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ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "<u>Assignment</u>") is made and entered into this 23rd day of April, 2019 (the "<u>Effective Date</u>"), by and between **AMERICAN PETROLEUM PARTNERS OPERATING, LLC**, (hereinafter "<u>Assignor</u>") and **TH EXPLORATION, LLC** (hereinafter "<u>Assignee</u>") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated November 15, 2018 (the "<u>Acreage Trade Agreement</u>"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in Exhibit A-2, attached hereto and made a part hereof (hereinafter the "Leases"); 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.

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, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon.

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

2. <u>Special Warranty</u>. Assignor represents and warrants that Assignor has not conveyed or otherwise encumbered (other than Permitted Encumbrances) its interest in the Leases since the time that Assignor obtained its interests in the Leases. Assignor does covenant, promise and agree, to and with the Assignee, its respective successors and assigns, to forever specially warrant and defend the title to the Leases or portions thereof included under this Assignment, unto the Assignee and its respective successors and assigns, against the lawful claims of Assignor, and all persons claiming, or to claim, the same or any part thereof, by, through or under Assignor.

Assignor represents and warrants that Assignor has paid any and all bonuses, rentals, 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, and that Assignor has fully performed all conditions necessary to maintain the Leases in full force and effect during such period, free and clear of all Encumbrances, except for and subject only to Permitted Encumbrances.

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

Office of Oil and Gas MAK 1 7 2020 WV Department of Environmental Protection DPS LAND SERVICES CORP 6000 TOWN CENTER BOULEVARD, SUITE 145 CANONSBURG PA 15317-5841

ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "Assignment") is from EQUINOR USA ONSHORE PROPERTIES INC., a Delaware corporation ("Assignor"), to TH Exploration, LLC, a Texas limited liability company ("Assignee"), and is executed on December 9, 2019 (the "Effective Date"). Assignor and Assignee may be referred to herein collectively as the "Parties," or individually as a "Party." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignor and the Assignee dated November 1, 2019 (the "Acreage Trade Agreement").

ARTICLE 1 ASSIGNMENT OF ASSETS

Assignment. For good and valuable consideration, the receipt and Section 1.1 sufficiency of which are hereby acknowledged, Assignor hereby GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS unto Assignee all of Assignor's right, title and interest in and to (i) the oil and gas leases described in more detail on Exhibit A attached hereto (the "Leases") INSOFAR AND ONLY INSOFAR as they cover those lands described on Exhibit A (the "Leasehold Rights") and (ii) any surface use agreements that relate to such Leasehold Rights (collectively with the Leasehold Rights, the "Conveyed Assets").

TO HAVE AND TO HOLD the Conveyed Assets, together with all and singular the rights, privileges, contracts and appurtenances, in any way appertaining or belonging thereto, unto Assignee, its successors and assigns, forever, subject, to the terms and conditions of this Assignment.

Assignment Subject to Acreage Trade Agreement. This Assignment is Section 1.2 made in accordance with and is subject to the terms, covenants and conditions contained in that certain Acreage Trade Agreement. In the event of a conflict between the provisions of the Acreage Trade Agreement and this Assignment, the provisions of the Acreage Trade Agreement shall control. The execution and delivery of this Assignment by Assignor, and the execution and acceptance of this Assignment by Assignee, shall not operate to release or impair any surviving rights or obligations of either Party with respect to the other under the Acreage Trade Agreement.

ARTICLE 2

SPECIAL WARRANTY OF TITLE AND DISCLAIMERS

Special Warranty of Title. Assignor hereby agrees to warrant and defend Section 2.1 Defensible Title to the Leases unto Assignee, its successors and assigns, against every Person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Assignor or any of its Affiliates, but not otherwise.

Disclaimers of Warranties and Representations. Section 2.2

Office of Oil and Gas (a) EXCEPT AS EXPRESSLY REPRESENTED OTHER WISE IN SECTION (1) CONTRACT EXCEPT AS EXPRESSLY REPRESENTED OTHERWISE IN SECTION THE LEASEHOLD RIGHTS, (II) THE CONTENTS, CHARACTER OR NATURE OF ANY DESCRIPTIVE MEMORANDUM, OR ANY REPORT OF ANY OF ITS PETROLEUM ENGINEERING CONSULTANTS, OR ANY GEOLOGICAL OR SEISMIC DATA OR INTERPRETATION, RELATING TO THE LEASEHOLD RIGHTS, (III) THE QUANTITY, QUALITY OR RECOVERABILITY OF PETROLEUM SUBSTANCES IN OR FROM THE LEASEHOLD RIGHTS, (IV) THE EXISTENCE OF ANY PROSPECT, OR ANY RECOMPLETION, INFILL OR STEP-OUT DRILLING OPPORTUNITIES, (V) ANY ESTIMATES OF THE VALUE OF THE LEASEHOLD RIGHTS, (VI) THE PRODUCTION OF PETROLEUM SUBSTANCES FROM THE LEASEHOLD RIGHTS, OR ANY PRODUCTION OR DECLINE RATES, (VII) THE MAINTENANCE, REPAIR, CONDITION, QUALITY, SUITABILITY, DESIGN OR MARKETABILITY OF THE LEASEHOLD RIGHTS, (VIII) INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHT, AND (IX) ANY OTHER MATERIALS OR INFORMATION THAT MAY HAVE BEEN MADE AVAILABLE OR COMMUNICATED TO ASSIGNEE OR ITS AFFILIATES, OR ITS OR THEIR RESPECTIVE

BOOK 0036 BAGE 0455

ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "Assignment") is from STATOIL USA ONSHORE PROPERTIES INC., a Delaware corporation ("Assignor"), to TH Exploration, LLC, a Texas limited liability company ("Assignee"), and is executed on August 22, 2016 (the "Effective Date"). Assignor and Assignee may be referred to herein collectively as the "Parties," or individually as a "Party." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignor and the Assignee dated June 19, 2016 (the "Acreage Trade Agreement").

ARTICLE 1

ASSIGNMENT OF ASSETS

Section 1.1 <u>Assignment</u>. For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor hereby GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS unto Assignee all of Assignor's right, title and interest in and to (i) the oil and gas leases described in more detail on <u>Exhibit A</u> attached hereto (the "Leases") INSOFAR AND ONLY INSOFAR as they cover the Target Formations and INSOFAR AND ONLY INSOFAR as they cover those lands described on <u>Exhibit A</u> (the "Leasehold Rights") and (ii) any surface use agreements that relate to such Leasehold Rights (collectively with the Leasehold Rights, the "Conveyed Assets"). Assignor does hereby reserve unto itself the right and subsurface easement to drill through the Leasehold Rights to access the those depths and formations in the Leases other than the Target Formations and (y) to shoot seismic, sonic, or other energy or waves through the Leasehold Rights and to receive, record and evaluate such energy or waves, including those reflected from or in any way pertaining to the reserved depths, and to utilize any and all other exploration technologies that image the subsurface of the leasehold including the reserved depths and to receive, record and evaluate all images resulting therefrom.

TO HAVE AND TO HOLD the Conveyed Assets, together with all and singular the rights, privileges, contracts and appurtenances, in any way appertaining or belonging thereto, unto Assignee, its successors and assigns, forever, subject, to the terms and conditions of this Assignment.

Section 1.4 <u>Assignment Subject to Acreage Trade Agreement</u>. This Assignment is made in accordance with and is subject to the terms, covenants and conditions contained in that certain Acreage Trade Agreement. In the event of a conflict between the provisions of the Acreage Trade Agreement and this Assignment, the provisions of the Acreage Trade Agreement shall control. The execution and delivery of this Assignment by Assignor, and the execution and acceptance of this Assignment by Assignee, shall not operate to release or impair any surviving rights or obligations of either Party with respect to the other under the Acreage Trade Agreement.

ARTICLE 2

SPECIAL WARRANTY OF TITLE AND DISCLAIMERS

Section 2.1 <u>Special Warranty of Title</u>. Assignor hereby agrees to warrant and defend Defensible Title to the Leases unto Assignee, its successors and assigns, against every Person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Assignor or any of its Affiliates, but not otherwise.

Section 2.2 Disclaimers of Warranties and Representations.

and a second
(a) EXCEPT AS EXPRESSLY REPRESENTED OTHERWISE IN <u>SECTION</u> <u>VI</u> OF THE ACREAGE TRADE AGREEMENT OR THIS ASSIGNMENT, ASSIGNOR MAKES NO, AND HEREBY EXPRESSLY DISCLAIMS, ANY REPRESENTATION OR WARRANTY, EXPRESS, IMPLIED OR STATUTORY, INCLUDING AS TO (I) TITLE TO THE LEASEHOLD RIGHTS, (II) THE CONTENTS, CHARACTER OR NATURE OF ANY

Office of Oil and Gas MAR 1 7 2020 WV Department of Environmental Protection

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STATE OF WEST VIRGINIA § COUNTY OF MARSHALL §

ASSIGNMENT AND CONVEYANCE

Marshall County Jan Pest, Clerk Instrument 1453305 04/24/2019 @ 11:51:22 AM ASSIGNMENTS Book 43 @ Page 503 Pages Recorded 10 Recording Cost \$ 17.00

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 23rd day of April, 2019 (the "<u>Effective Date</u>"), by and between AMERICAN PETROLEUM PARTNERS OPERATING, LLC, (hereinafter "<u>Assignor</u>") and TH EXPLORATION, LLC (hereinafter "<u>Assignee</u>") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated November 15, 2018 (the "<u>Acreage Trade Agreement</u>"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in Exhibit A-2, attached hereto and made a part hereof (hereinafter the "Leases"); 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.

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

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

2. Special Warranty. Assignor represents and warrants that Assignor has not conveyed or otherwise encumbered (other than Permitted Encumbrances) its interest in the Leases since the time that Assignor obtained its interests in the Leases. Assignor does covenant, promise and agree, to and with the Assignee, its respective successors and assigns, to forever specially warrant and defend the title to the Leases or portions thereof included under this Assignment, unto the Assignee and its respective successors and assigns, against the lawful claims of Assignor, and all persons claiming, or to claim, the same or any part thereof, by, through or under Assignor.

Assignor represents and warrants that Assignor has paid any and all bonuses, rentals, 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, and that Assignor has fully performed all conditions necessary to maintain the Leases in full force and effect during such period, free and clear of all Encumbrances, except for and subject only to Permitted Encumbrances.

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

WV Department of Environmental Protection



March 10, 2020

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

RE: Fitzgerald S-17HU

Subject: Marshall County Route 90 Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 90 in the area reflected on the Fitzgerald S-17HU well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Routes and is not currently aware of any recorded document that would suggest an ownership other than THO.

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

Sincerely,

Amy L. Miller Permitting Specialist Appalachia Region

Office of Oil and Gas MAR 1 7 2020

WV Department of Environmental Protection WW-6AC (1/12)

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

Date of Notice Certification: 05/23/2019

API No. 47- 051 -Operator's Well No. Fitzgerald S-17HU Well Pad Name: Fitzgerald

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:	530,724.06
County:	Marshall	Northing	4,405,748.24
District:	Liberty	Public Road Access:	Rines Ridge Road (County Route 76)
Quadrangle:	Glen Easton 7.5'	Generally used farm name:	Danny S. Kerns, et al
Watershed:	Upper Fish Creek		

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 decmed 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 by the applicant.

Pursuant to West Virginia Code § 22-6A, the 0 that the Operator has properly served the requi *PLEASE CHECK ALL THAT APPLY	Operator has attached proof to this Notice Certification red parties with the following:	OOG OFFICE USE ONLY
□ 1. NOTICE OF SEISMIC ACTIVITY O	T INOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED	RECEIVED/ NOT REQUIRED
2. NOTICE OF ENTRY FOR PLAT SUP	EVEY oF 🔲 NO PLAT SURVEY WAS CONDUCTED	RECEIVED
□ 3. NOTICE OF INTENT TO DRILL o	NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or	RECEIVED/ NOT REQUIRED
	WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)	
4. NOTICE OF PLANNED OPERATION	4	E RECEIVED AN 17 200
5. PUBLIC NOTICE		RECEIVED
■ 6. NOTICE OF APPLICATION		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 Why Sull		Canonsburg, PA 15317
Its:	Permitting Specialist - Appalachia Region	Facsimile:	724-338-2030
Telephone:	724-749-8388	Email:	amiller@tug-hillop.com
Chester My commis Com	Arthur West IV, Notary Public Washington County ssion expires February 10, 2024	cribed and swo	orn before methis 13 th day of <u>7020</u> . Notary Public xpires <u>2.10-2024</u>

Oil and Gas Privacy Notice:

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

Office of Oil and Gas MAR 1 7 2020 WV Department of Environmental Protection

OPERATOR WELL NO. Fitzgerald S-17HU Well Pad Name: Fitzgerald

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

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

Date of Notice: 3/10/2020 Date Permit Application Filed: 3/12/2020

No	tice	of:
1,0		O

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

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

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

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

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

Name: Regina D. Figuer	
Address: 94 E. 700 N	
Valparaiso, IN 46383	
Name: Danny S. Kerns	See attached list
Address: 3500 West 80	Oth Place
Merrillville, IN 46410	1
SURFACE OWN Name: Regina D. Figuer	ER(s) (Road and/or Other Disturbance)
Address: 94 E. 700 N	
Valparaiso, IN 46383	
Name: Danny S. Kerns	*See attached list
Address: 3500 West 80	th Rlace
Merrillville, IN 46410	
	ER(s) (Impoundments or Pits)

Address:	1000 Consol Energy Drive
Canonsburg	, PA 15317
COAL	OPERATOR
Name: M	urray American Energy, Inc. attn: Mason Smith
Address:	46226 National Road
St. Clairsville	e, OH 43905
SURFA	CE OWNER OF WATER WELL
AND/OR	WATER PURVEYOR(s)
Name: Da	anny R. Kerns *See attached list
Address:	3500 West 80th Place
Merrillville, II	N 64610
OPERA	TOR OF ANY NATURAL GAS STORAGE FIELD
Name:	
Address:	

*Please attach additional forms if necessary

API NO. 47-41705102324 OPERATOR WELL NO. Fitzgerald S-17HU Well Pad Name: Fitzgerald

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental CEIVED Protection headquarters, located at 601 57th Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting www.dep.wv.gov/dip// and Gas MAR 1 7 2020 and-gas/pages/default.aspx.

Well Location Restrictions Environment of WV Department of Pursuant to W. Va. Code § 22-6A-12, Wells may not be drilled within two hundred fifty feet measured horizontally from any existing feet of well and s may not be located within six 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

OPERATOR WELL NO. Fitzgerald S-17HU Well Pad Name: Fitzgerald

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

Chief, Office of Oil and Gas Department of Environmental Protection 601 57th St. SE Charleston, WV 25304 (304) 926-0450 MAR 1 7 2020 WV Department of Protection

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.

API NO. 47- 051 4 7 0 5 1 0 2 3 2 4

OPERATOR WELL NO. Fitzgerald S-17HU Well Pad Name: Fitzgerald

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 six of this chapter, as applicable and as incorporated into this 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 permit decision and a list of persons qualified to test water.

MAR 17 2020

API NO. 47-051 **4.705102324** OPERATOR WELL NO. Fitzgerald S-17HU Well Pad Name: Fitzgerald

Notice is hereby given by:

Well Operato	r: Tug Hill Opera	rating, LLC	
Telephone: 7	24-749-8388		
Email: amiller@	tug-hillop.com	any Stulle	

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 - Notary Seal MAUREEN A STEAD - Notary Public Washington County My Commission Expires Jan 28, 2023 Commission Number 1259926

Subscribed and sworn before methis day of	MARCH 2020.
Carrent Stend	Notary Public
My Commission Expires 1/20 21	

RECEIVED Office of Cil and Gas

MAR 1 7 2020

WV Department of Environmental Protection

WW-6A NOTICE OF APPLICATION

FITZGERALD S-17HU

ADDITIONAL PARTIES TO NOTICE

Surface Owner (Pad and Access Road)

Deena J. Palomo 20 Maxwell St. Apt. 4 ~ Hebron, IN 46341

> RECEIVED Office of Oil and Gas

MAR 1 7 2020

WV Department of Environmental Protection

Exhibit WW-6A

Supplement Pg. 1A

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

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

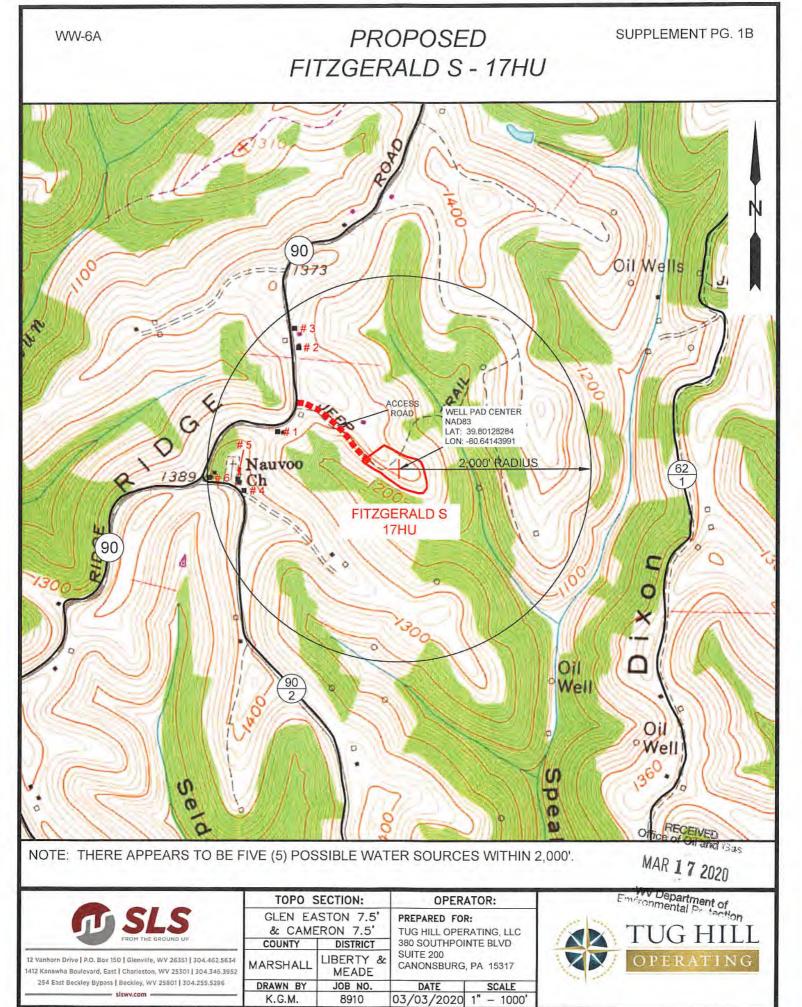
Well:	Fitzgerald S – 17HU
District:	Liberty
State:	WV

There are four (4) residences, one (1) business or commercial site, one (1) church, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

Residence (#1)	Residence (#2)	Residence (#3)
TM 9 Pcl. 14	TM 9 Pcl. 12.1	TM 9 Pcl. 12
Danny R. Kerns, Et Al	Jessica R. & David A. II Dempewolf	Gary W. Morris
Phone: 219-887-6761 (Reverse Address	Phone: 304-810-0500 (Reverse Address	c/o Gary Morris & Cynthia Patrello
– David A. & Regina D. Figueroa	– Jolene Morris)	Phone: None Found
Physical Address:	Physical Address:	Physical Address:
1352 Nauvoo Ridge Rd.	1180 Nauvoo Ridge Rd.	1156 Nauvoo Ridge Rd.
Cameron, WV 26033	Cameron, WV 26033	Cameron, WV 26033
Tax Address:	Tax Address:	Tax Address:
94 E 700 N	Same	Same
Valparaiso, IN 46383		
Business/Commercial Site (#4)	Church (#5)	Residence (#6)
TM 12 Pcl. 14	TM 9 Pcl. 15	VM 9 Pcl. 22
Consol Mining Co. LLC	Trustees of the Reorganized Church of	Gary W. Morris
Consolidation Coal Company	Latter Day Saints	Phone: None Found
c/o Murray Energy c/o Land Dept.	Phone: None	Physical Address:
Physical Address:	Physical Address:	1556 Nauvoo Ridge Rd.
90 The Corner Ln.	88 The Corner Ln.	Cameron, WV 26033
Glen Easton, WV 26039	Glen Easton, WV 26039	Tax Address:
(Appears to be an underground mine	Tax Address:	1156 Nauvoo RDG
vent or fan site or other related	Exempt/None	Glen Easton, WV 26039
infrastructure)		
Tax Address:		Dra
46226 National Rd.		Office of Oil and Ga
Saint Clairsville, OH 43950		AAA Ga
		MAR 1 7 2020

WV Department of Environmental Protection

4705102324



USER: kmoyers

CAD FILE: R:\Data\CADD\WORK 8900-8999\8910 Tug Hill Fitzgerald Plats and Mapping\Survey\Well Plat Exhibits\8910-17HU Exhibits.dwg LAYOUT: Layout4

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:	4/24/2019	Date of Planned Entry	: 5/3/2019

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)	CQAL OWNER OR LESSEE
Name: Regina D. Figueroa	Name: Consol Energy Attn: Casey Saunders
Address: 94 E 700 N	Address: 1000 Consol Energy Drive
Valparaiso, IN 46383	Canonsburg, PA 15317
Name: Danny S. Kerns	
Address: 3500 West 80th PI.	MINERAL OWNER(s)
Merrillville, IN 46410	Name: Regina D. Figueroa
Name: Deena J. Palomo	Address: 94 E 700 N
Address: 20 Maxwell St., Apt. 4	Valparaiso, IN 46383 *See attached list
Hebron, IN 46341	*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:	39.80128284; -80.64143991	
Marshall	Public Road Access:	County Route 90	
Liberty	Watershed:	Upper Fish Creek	
Glen Easton 7.5'	Generally used farm name:	Danny & Frances Kerns Estate	
	Marshall Liberty	Marshall Public Road Access: Liberty Watershed:	Marshall Public Road Access: County Route 90 Liberty Watershed: Upper 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:		Address:	380 Southpointe Boulevard, Plaza II, Suite 200	Office of Oil and Gas
Telephone:	724-749-8388		Canonsburg, PA 15317	MAR 1 7 2020
Email:	amiller@tug-hillop.com	Facsimile:	724-338-2030	
Oil and Gas F	Privacy 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.

WW-6A3 NOTICE OF ENTRY FOR PLAT SURVEY FITZGERALD PAD

MINERAL OWNERS

Danny S. Kerns 3500 West 80th Pl. Merrillville, IN 46410

Deena J. Palomo 20 Maxwell Street, Apt. 4 Hebron, IN 46341 WW-6A5 (1/12) Operator Well No. Fitzgerald S-17HU

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:
 03/12/2020

 Date Permit Application Filed:
 03/13/2020

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

CERTIFIED MAIL RETURN RECEIPT REOUESTED 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: Danny S. Kerns		
Address: 3500 West 80th PI		
Merrillville, IN 46410		

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 Virginia	UTM NAD 83	Easting:	530,724.06	
County:	Marshall	UTM NAD 83	Northing:	4,405,748.24	
District:	Liberty	Public Road Acc	ess:	Rines Ridge Road (County Route 76)	
Quadrangle:	Glen Easton 7.5'	Generally used f	arm name:	Danny R. Kerns, et al	
Watershed:	Upper 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	Office of Oil and Gas	
Telephone:	724-749-8388		Canonsburg, PA 15317	1110	
Email:	amiller@tug-hillop.com	Facsimile:	724-338-2030	MAR 1 7 2020	

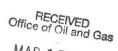
Oil and Gas Privacy Notice:

WV Department of Environmental Protection

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>.

Additional Party to Notice WW-6A5 Fitzgerald Pad

Deana J. Palomo 20 Maxwell Street, Apt. 4 Hebron, IN 46341



MAR 1 7 2020

WV Department of Environmental Protection



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION Division of Highways

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

February 27, 2020

Byrd E. White, III Secretary of Transportation/ Commissioner of Highways

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

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

Subject: DOH Permit for the Fitzgerald Pad, Marshall County Fitzgerald S-17HU Well Site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2019-0351 which has been issued to Tug Hill Operating, LLC for access to the State Road for a well site located off Marshall County Route 90 SLS.

This operator is in compliance with §22-6A-20 of the WV Code. 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 October 1, 2018.

Very Truly Yours,

Jary K. Clayton

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

Office of Ci and Gas

MAR 1 7 2020

W Department of Environmental Protection

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



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Fitzgerald S-17HU

Wen No. Thegerata 5 1	1110		
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

Office of Gas MAK 17 2020

WV Department or Environmental Protection