



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

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Thursday, August 26, 2021
WELL WORK PERMIT
Horizontal 6A / New Drill

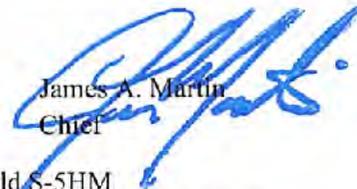
TUG HILL OPERATING, LLC
380 SOUTHPOINTE BOULEVARD, PLAZA II
SUITE 200
CANONSBURG, PA 15317

Re: Permit approval for Fitzgerald S-5HM
47-051-02395-00-00

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: Fitzgerald S-5HM
Farm Name: Danny and Frances Kerns Estate
U.S. WELL NUMBER: 47-051-02395-00-00
Horizontal 6A New Drill
Date Issued: 8/26/2021

Promoting a healthy environment.

08/27/2021

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. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

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

API Number: _____

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.

08/27/2021

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

1) Well Operator: Tug Hill Operating, LLC 494510851 Marshall Liberty Glen Easton-7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Fitzgerald S-5HM Well Pad Name: Fitzgerald

3) Farm Name/Surface Owner: Danny and Frances Kern Estate Public Road Access: Rines Ridge Road (County Route 76)

4) Elevation, current ground: 1,293' Elevation, proposed post-construction: 1,293'

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

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No Yes *Baug Stith 5-27-21*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6,875' - 6,925', thickness of 50' and anticipated pressure of approx. 3800 psi.

8) Proposed Total Vertical Depth: 7,025'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 16,206'

11) Proposed Horizontal Leg Length: 7,557.80'

12) Approximate Fresh Water Strata Depths: 70; 1,029'

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

14) Approximate Saltwater Depths: 1,468'

15) Approximate Coal Seam Depths: Sewickley Coal - 925' and Pittsburgh Coal - 1,023'

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

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

(a) If Yes, provide Mine Info: Name: Marshall County Coal Co./Marshall County Mine
Depth: Pittsburgh coal 1,023' and 270' subsea level
Seam: Pittsburgh #8
Owner: Murray Energy / Consolidated Coal

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18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	120'	120'	259FT ^3(CTS)
Fresh Water/Coal	13 3/8"	NEW	J55	54.5#	1,150'	1,150'	1,149FT^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	3,062'	3,062'	1016FT^3(CTS)
Production	5 1/2"	NEW	P110	20#	16,206'	16,206'	4,145FT^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		7,698'	
Liners							

Boony Shetye 7-22-21

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17 1/2"	.38	2,740	2,192	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"	.352	3,520	2,816	SEE #24	1.19
Production	5 1/2"	8 7/8" _ 8 3/4"	.361	12,640	10,112	SEE #24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners							

PACKERS

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

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

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

B.S. 5-27-21

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

Well to be completed with approximately 19,000,000 lb. proppant and 350,000 bbls of water.
Max rate = 80 bpm; max psi = 9,000#.

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 other joint. Production casing will have one centralizer every other joint in lateral, one centralizer every joint through curve, one centralizer every other joint to surface.

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

Sfc - Premium NE-1 + 2% CaCl; Int1 - Premium NE-1 + 1.5% CaCL + Flake; Int2 - Lead: Premium NE-1 + 5% BA-90 + .85% R-3 + 3% KCl + .75 gals/100sk FP-13L + 1% MPA-170 Tail: Premium NE-1 + .1% R-3 + 5% KCl + 1% CD-32 + .4% FL-52 + .2% ASA-301 + .6% Sodium Metasilicate; Kick Plug - Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L; Prod - Lead: 50:50 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .75 gal/100sk FP-13L Tail: 25:75 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .375 gal/100sk FP-13L

25) Proposed borehole conditioning procedures:

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

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*Note: Attach additional sheets as needed.



Tug Hill Operating, LLC Casing and Cement Program

Fitzgerald S-5HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	1,150'	CTS
Intermediate	9 5/8"	J55	12 1/4"	3,062'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	16,206'	CTS

Cement

Conductor:	Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Conductor Cement mixed at 15.6 ppg, Y=1.2
Surface:	Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2
Intermediate:	Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15.6 ppg, Y=1.19
Kick Off Plug:	Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L - KOP Plug
Production:	50.50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 15.2ppg, Y = 1.19

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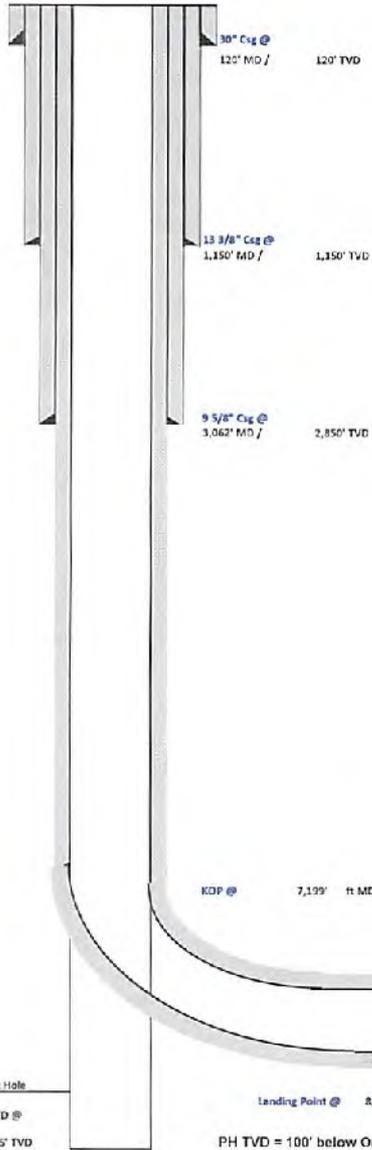


WELL NAME: Fitzgerald S-5HM
 STATE: WV COUNTY: Marshall
 DISTRICT: Liberty
 DI Elev: 1,293' GL Elev: 1,293'
 TD: 16,206'
 TH Latitude: 39.80125832
 TH Longitude: -80.64136307
 BH Latitude: 39.785541
 BH Longitude: -80.639506

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	1029
Sewickley Coal	925
Pittsburgh Coal	1023
Big Lime	2081
Weir	2499
Berea	2715
Gordon	2968
Rhinestreet	6172
Genesee/Burkett	6731
Tully	6759
Hamilton	6785
Marcellus	6875
Landing Depth	6928
Onondaga	6925
Pilot Hole Depth	7025

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	BW	BW	Surface
Surface	17.5	13 3/8	1,150'	1,150'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	3,062'	2,850'	36	J55	Surface
Production	8 7/8 x 8 3/4	9 1/2	16,206'	7,060'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,165	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	1,019	A	15	Air	1 Centralizer every other jt
Production	3,799	A	14.5	Air / SOBMs	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to s/c



Pilot Hole
 PH TD @
 7,025' TVD

Landing Point @ 8,625' MD / 6,928' TVD

PH TVD = 100' below Onondaga Top

KOP @ 7,199' R MD

Lateral TD @ 16,206' R MD
 7,060' R TVD

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

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FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

JUL 26 2021

Operator Name Tug Hill Operating, LLC OP Code 494510851 WV Department of Environmental Protection
Watershed (HUC 10) Upper Fish Creek Quadrangle Glen Easton 7.5'

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WV0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1386420)

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.

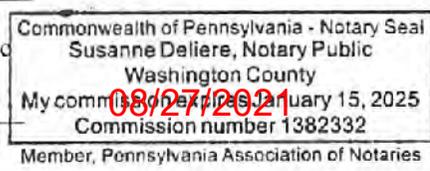
I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is 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 Jim Pancake
Company Official (Typed Name) Jim Pancake
Company Official Title Vice President - Geosciences

Subscribed and sworn before me this 25th day of May, 2021

Susanne Deliere Notary Public

My commission expires 1/15/2025



Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 7.44 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

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Seed Mixtures

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

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

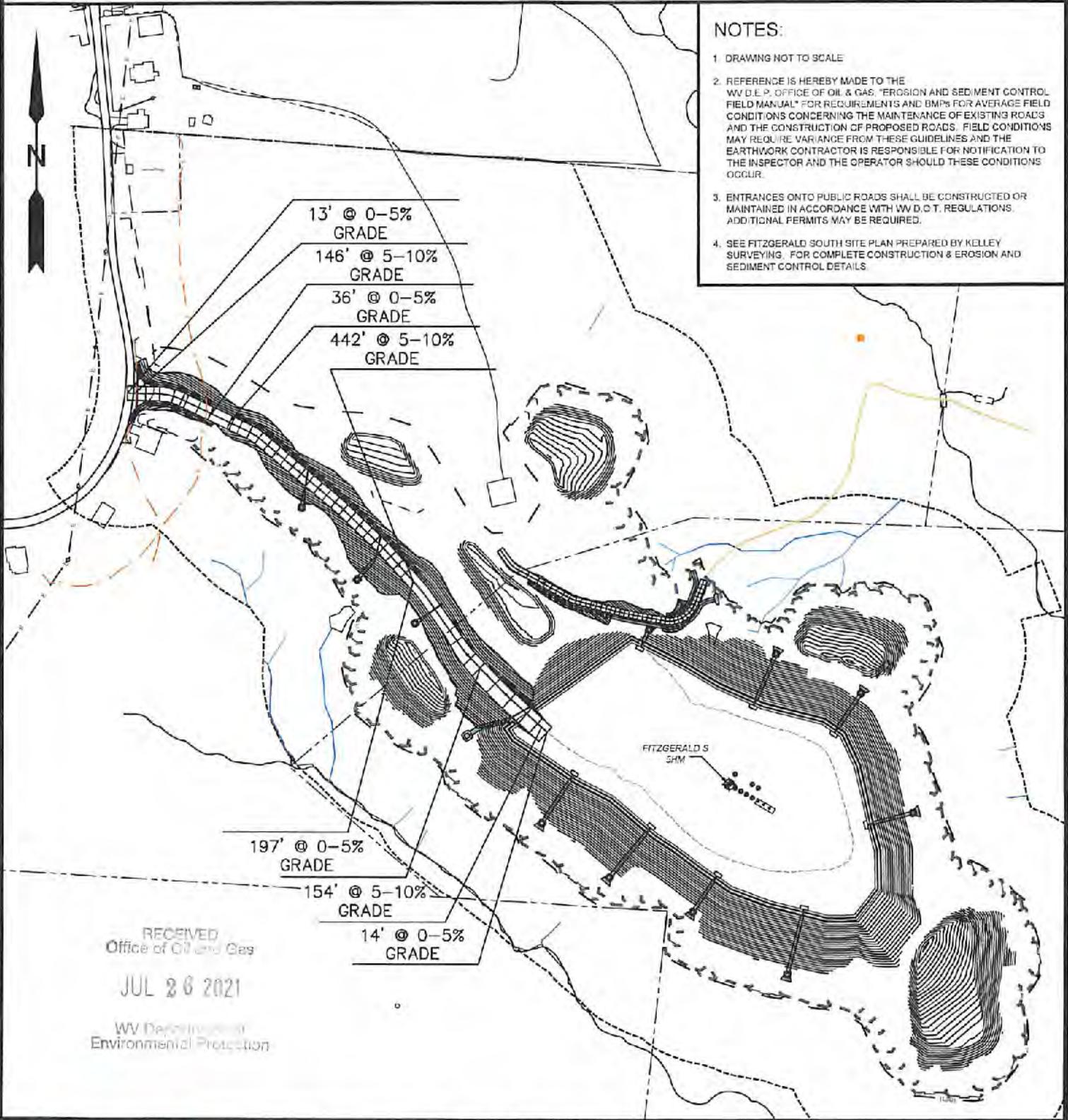
Plan Approved by: *Bary Stillep*

Comments: _____

Title: Oil and Gas Inspector Date: 5-27-21

Field Reviewed? Yes No

PROPOSED FITZGERALD S - 5HM



NOTES:

1. DRAWING NOT TO SCALE
2. REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.
3. ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.
4. SEE FITZGERALD SOUTH SITE PLAN PREPARED BY KELLEY SURVEYING FOR COMPLETE CONSTRUCTION & EROSION AND SEDIMENT CONTROL DETAILS

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12 Vinhorn Drive | P.O. Box 190 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slswv.com

TOPO SECTION:

GLEN EASTON 7.5'

COUNTY

DISTRICT

MARSHALL

LIBERTY

DRAWN BY

JOB NO.

DATE

SCALE

K.G.M.

8910

05/18/21

NONE

OPERATOR:

PREPARED FOR:
TUG HILL OPERATING, LLC
380 SOUTHPONTE BLVD
SUITE 200
CANONSBURG, PA 15317



**TUG HILL
OPERATING**

08/27/2021



Well: **Fitzgerald 05 HM (slot T)**
 Site: **Fitzgerald**
 Project: **Marshall County, West Virginia**
 Design: **rev5**



Azimuths to Grid North
 True North: -0.23°
 Magnetic North: -8.93°
 Magnetic Field
 Strength: 51812.0nT
 Dip Angle: 66.50°
 Date: 11/1/2020
 Model: IGRF2020

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

System Datum: Mean Sea Level
 Depth Reference: GL @ 1292.91ft

Northing	Easting	Latitude	Longitude
14454566.64	1741143.97	39.80125932	-80.64136307

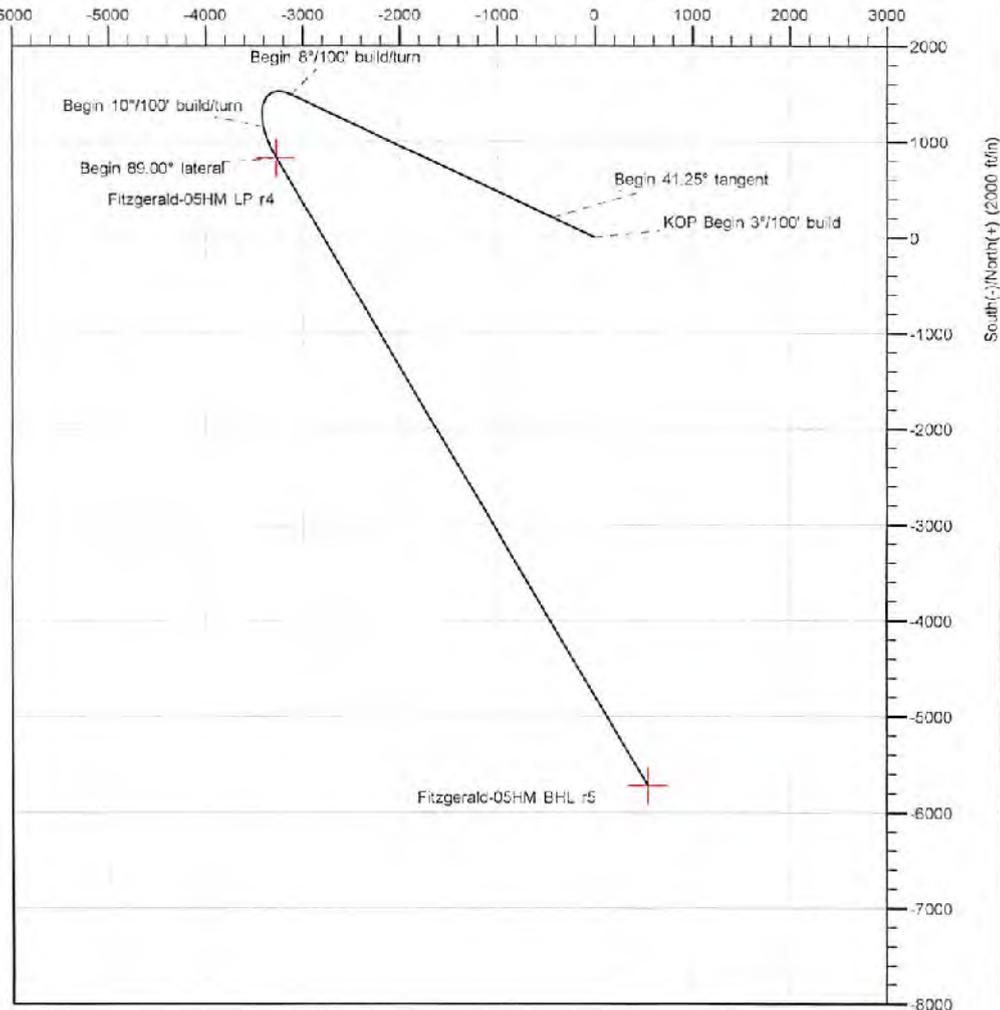
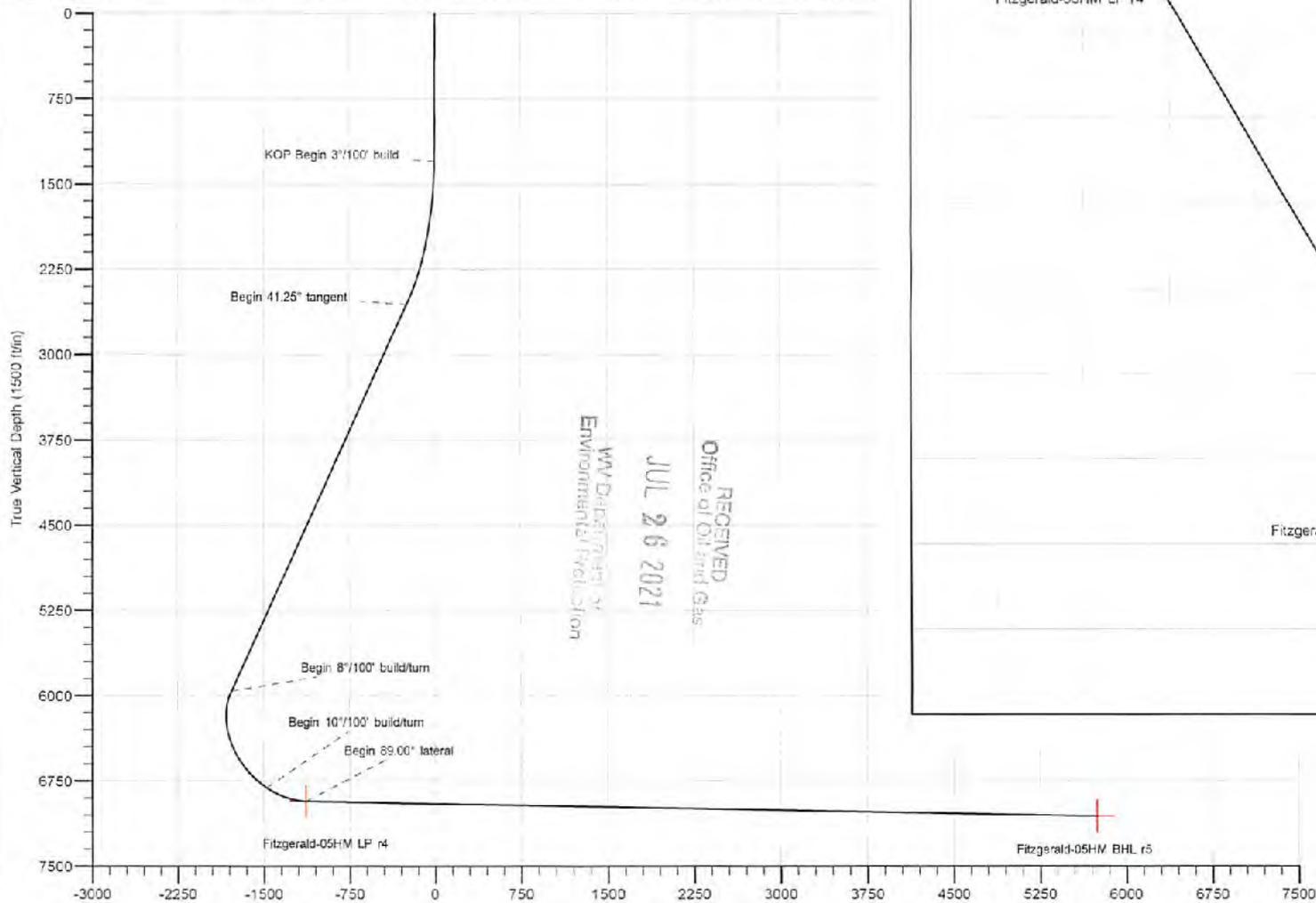
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	
2	1300.00	0.00	0.00	1300.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 3°/100' build
3	2674.98	41.25	295.56	2559.24	204.46	-127.57	3.00	295.556	-244.07	Begin 41.25° tangent
4	7198.78	41.25	295.56	5960.45	1491.19	-3118.46	0.00	0.000	-1780.13	Begin 8°/100' build/turn
5	8244.22	55.00	169.17	6809.71	1157.92	-3401.00	8.00	-138.428	-1475.15	Begin 10°/100' build/turn
6	8629.32	89.00	149.77	6927.99	323.99	-3269.45	10.00	-32.242	-1130.25	Begin 69.00° lateral
7	16205.74	89.00	149.77	7060.00	-5721.04	544.53	0.00	0.000	5745.91	

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 0.93°

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Fitzgerald-05HM LP r4	8628.00	824.14	-3269.38	14455390.78	1737874.60	39.80355700	-80.65299200
Fitzgerald-05HM BHL r5	7060.00	-5721.04	544.63	14448845.61	1741688.60	39.78554100	-80.63950600



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Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Fitzgerald 05 HM (slot T)
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 05 HM (slot T)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

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

Site	Fitzgerald				
Site Position:		Northing:	14,454,567.73 usft	Latitude:	39.80126184
From:	Lat/Long	Easting:	1,741,095.26 usft	Longitude:	-80.64153292
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "		

Well	Fitzgerald 05 HM (slot T)					
Well Position	+N-S	0.00 ft	Northing:	14,454,566.64 usft	Latitude:	39.80125832
	+E-W	0.00 ft	Easting:	1,741,143.97 usft	Longitude:	-80.64136307
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	1,292.91 ft
Grid Convergence:		0.230 °				

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	11/1/2020	-8.705	66.601	51,811.96703925

Design	rev5			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N-S (ft)	+E-W (ft)	Direction (°)
	0.00	0.00	0.00	174.56

Plan Survey Tool Program	Date	4/28/2021		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	16,205.74 rev5 (Original Hole)	MWD	
			MWD - Standard	

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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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.000	
2,674.98	41.25	295.56	2,559.24	204.46	-427.57	3.00	3.00	0.00	295.556	
7,198.78	41.25	295.56	5,960.45	1,491.19	-3,118.48	0.00	0.00	0.00	0.000	
8,244.22	55.00	169.17	6,809.71	1,157.92	-3,401.00	8.00	1.32	-12.09	-138.428	
8,629.32	89.00	149.77	6,927.99	823.99	-3,269.45	10.00	6.83	-5.04	-32.242	
16,205.74	89.00	149.77	7,060.00	-5,721.04	544.63	0.00	0.00	0.00	0.000	Fitzgerald-05HM BHL



Planning Report - Geographic

Database: DB_Dec2220_v16
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Fitzgerald
 Well: Fitzgerald 05 HM (slot T)
 Wellbore: Original Hole
 Design: rev5

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

Well Fitzgerald 05 HM (slot T)
 GL @ 1292.91ft
 GL @ 1292.91ft
 Grid
 Minimum Curvature

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 JUL 26 2021

WV Department of Environmental Protection

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
100.00	0.00	0.00	100.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
200.00	0.00	0.00	200.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
300.00	0.00	0.00	300.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
400.00	0.00	0.00	400.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
500.00	0.00	0.00	500.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
600.00	0.00	0.00	600.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
700.00	0.00	0.00	700.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
800.00	0.00	0.00	800.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
900.00	0.00	0.00	900.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,454,566.64	1,741,143.97	39.80125832	-80.64136307
KOP Begin 3°/100' build									
1,400.00	3.00	295.56	1,399.96	1.13	-2.36	14,454,567.77	1,741,141.61	39.80126145	-80.64137146
1,500.00	6.00	295.56	1,499.64	4.51	-9.44	14,454,571.16	1,741,134.53	39.80127082	-80.64139661
1,600.00	9.00	295.56	1,598.77	10.14	-21.21	14,454,576.79	1,741,122.75	39.80126641	-80.64143845
1,700.00	12.00	295.56	1,697.09	18.00	-37.55	14,454,584.65	1,741,106.32	39.80130818	-80.64149667
1,800.00	15.00	295.56	1,794.31	28.07	-58.71	14,454,594.72	1,741,085.26	39.80133607	-80.64157170
1,900.00	18.00	295.56	1,890.18	40.33	-84.33	14,454,606.97	1,741,059.64	39.80136999	-80.64166275
2,000.00	21.00	295.56	1,984.44	54.72	-114.44	14,454,621.37	1,741,029.53	39.80140987	-80.64176975
2,100.00	24.00	295.56	2,076.81	71.23	-148.96	14,454,637.88	1,740,995.01	39.80145558	-80.64189242
2,200.00	27.00	295.56	2,167.06	89.80	-187.80	14,454,656.45	1,740,956.17	39.80150700	-80.64203043
2,300.00	30.00	295.56	2,254.93	110.38	-230.84	14,454,677.03	1,740,913.13	39.80156400	-80.64218338
2,400.00	33.00	295.56	2,340.19	132.92	-277.97	14,454,699.57	1,740,866.00	39.80162641	-80.64235088
2,500.01	36.00	295.56	2,422.59	157.35	-329.07	14,454,724.00	1,740,814.90	39.80169407	-80.64253244
2,600.01	39.00	295.56	2,501.92	183.61	-383.98	14,454,750.26	1,740,759.99	39.80176678	-80.64272759
2,674.98	41.25	295.56	2,559.24	204.46	-427.57	14,454,771.10	1,740,716.40	39.80182450	-80.64288248
Begin 41.25° tangent									
2,700.01	41.25	295.56	2,578.06	211.57	-442.45	14,454,778.22	1,740,701.51	39.80184421	-80.64293538
2,800.01	41.25	295.56	2,653.24	240.02	-501.94	14,454,806.66	1,740,642.03	39.80192298	-80.64314676
2,900.01	41.25	295.56	2,728.43	268.46	-561.42	14,454,835.11	1,740,582.55	39.80200174	-80.64335814
3,000.01	41.25	295.56	2,803.61	296.91	-620.90	14,454,863.55	1,740,523.07	39.80208050	-80.64356953
3,100.01	41.25	295.56	2,878.80	325.35	-680.39	14,454,891.99	1,740,463.58	39.80215927	-80.64378091
3,200.01	41.25	295.56	2,953.98	353.79	-739.87	14,454,920.44	1,740,404.10	39.80223803	-80.64399229
3,300.01	41.25	295.56	3,029.17	382.24	-799.35	14,454,948.88	1,740,344.62	39.80231679	-80.64420368
3,400.01	41.25	295.56	3,104.35	410.68	-858.84	14,454,977.32	1,740,285.13	39.80239555	-80.64441506
3,500.01	41.25	295.56	3,179.54	439.12	-918.32	14,455,005.77	1,740,225.65	39.80247432	-80.64462645
3,600.01	41.25	295.56	3,254.72	467.57	-977.80	14,455,034.21	1,740,166.17	39.80255308	-80.64483783
3,700.01	41.25	295.56	3,329.91	496.01	-1,037.28	14,455,062.65	1,740,106.68	39.80263184	-80.64504922
3,800.01	41.25	295.56	3,405.09	524.46	-1,096.77	14,455,091.10	1,740,047.20	39.80271060	-80.64526060
3,900.01	41.25	295.56	3,480.28	552.90	-1,156.25	14,455,119.54	1,739,987.72	39.80278936	-80.64547199
4,000.01	41.25	295.56	3,555.46	581.34	-1,215.73	14,455,147.99	1,739,928.24	39.80286812	-80.64568338
4,100.01	41.25	295.56	3,630.65	609.79	-1,275.22	14,455,176.43	1,739,868.75	39.80294688	-80.64589477
4,200.01	41.25	295.56	3,705.83	638.23	-1,334.70	14,455,204.87	1,739,809.27	39.80302564	-80.64610615
4,300.01	41.25	295.56	3,781.02	666.67	-1,394.18	14,455,233.32	1,739,749.79	39.80310440	-80.64631754
4,400.01	41.25	295.56	3,856.20	695.12	-1,453.67	14,455,261.76	1,739,690.30	39.80318316	-80.64652893
4,500.01	41.25	295.56	3,931.39	723.56	-1,513.15	14,455,290.20	1,739,630.82	39.80326191	-80.64674032
4,600.01	41.25	295.56	4,006.57	752.01	-1,572.63	14,455,318.65	1,739,571.34	39.80334067	-80.64695171
4,700.01	41.25	295.56	4,081.75	780.45	-1,632.12	14,455,347.09	1,739,511.86	39.80341943	-80.64716310
4,800.01	41.25	295.56	4,156.94	808.89	-1,691.60	14,455,375.54	1,739,452.37	39.80349819	-80.64737449
4,900.01	41.25	295.56	4,232.12	837.34	-1,751.08	14,455,403.98	1,739,392.89	39.80357694	-80.64758589
5,000.01	41.25	295.56	4,307.31	865.78	-1,810.56	14,455,432.42	1,739,333.41	39.80365570	-80.64779728



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 Wellbore: Original Hole
 Design: rev5

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Well Fitzgerald 05 HM (slot T)
 GL @ 1292.91ft
 GL @ 1292.91ft
 Grid
 Minimum Curvature
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Planned Survey										WV Department of Environmental Protection	
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude		
5,100.01	41.25	295.56	4,382.49	894.22	-1,870.05	14,455,450.87	1,739,273.92	39.80373445	-80.64800367		
5,200.01	41.25	295.56	4,457.68	922.67	-1,929.53	14,455,489.31	1,739,214.44	39.80381321	-80.64822006		
5,300.01	41.25	295.56	4,532.86	951.11	-1,989.01	14,455,517.75	1,739,154.96	39.80389197	-80.64843146		
5,400.01	41.25	295.56	4,608.05	979.56	-2,048.50	14,455,546.20	1,739,095.48	39.80397072	-80.64864285		
5,500.01	41.25	295.56	4,683.23	1,008.00	-2,107.98	14,455,574.64	1,739,035.99	39.80404647	-80.64885425		
5,600.01	41.25	295.56	4,758.42	1,036.44	-2,167.45	14,455,603.09	1,738,976.51	39.80412823	-80.64906564		
5,700.01	41.25	295.56	4,833.60	1,064.89	-2,226.95	14,455,631.53	1,738,917.03	39.80420698	-80.64927704		
5,800.01	41.25	295.56	4,908.79	1,093.33	-2,286.43	14,455,659.97	1,738,857.54	39.80428573	-80.64948843		
5,900.01	41.25	295.56	4,983.97	1,121.77	-2,345.91	14,455,688.42	1,738,798.06	39.80436449	-80.64969983		
6,000.01	41.25	295.56	5,059.16	1,150.22	-2,405.39	14,455,716.86	1,738,738.58	39.80444324	-80.64991123		
6,100.01	41.25	295.56	5,134.34	1,178.66	-2,464.88	14,455,745.30	1,738,679.09	39.80452199	-80.65012263		
6,200.01	41.25	295.56	5,209.53	1,207.11	-2,524.36	14,455,773.75	1,738,619.61	39.80460074	-80.65033402		
6,300.01	41.25	295.56	5,284.71	1,235.55	-2,583.84	14,455,802.19	1,738,560.13	39.80467949	-80.65054542		
6,400.01	41.25	295.56	5,359.90	1,263.99	-2,643.33	14,455,830.64	1,738,500.65	39.80475824	-80.65075682		
6,500.01	41.25	295.56	5,435.08	1,292.44	-2,702.81	14,455,859.08	1,738,441.16	39.80483699	-80.65096822		
6,600.01	41.25	295.56	5,510.27	1,320.88	-2,762.29	14,455,887.52	1,738,381.68	39.80491574	-80.65117962		
6,700.01	41.25	295.56	5,585.45	1,349.33	-2,821.78	14,455,915.97	1,738,322.20	39.80499449	-80.65139102		
6,800.01	41.25	295.56	5,660.64	1,377.77	-2,881.26	14,455,944.41	1,738,262.71	39.80507324	-80.65160242		
6,900.01	41.25	295.56	5,735.82	1,406.21	-2,940.74	14,455,972.85	1,738,203.23	39.80515199	-80.65181382		
7,000.01	41.25	295.56	5,811.01	1,434.66	-3,000.23	14,456,001.30	1,738,143.75	39.80523074	-80.65202523		
7,100.01	41.25	295.56	5,886.19	1,463.10	-3,059.71	14,456,029.74	1,738,084.27	39.80530949	-80.65223663		
7,198.78	41.25	295.56	5,960.45	1,491.19	-3,118.46	14,456,057.83	1,738,025.52	39.80538727	-80.65244543		
Begin 8°/100' build/turn											
7,200.01	41.18	295.45	5,961.38	1,491.54	-3,119.19	14,456,058.18	1,738,024.78	39.80533623	-80.65244803		
7,300.01	35.53	286.30	6,039.83	1,513.88	-3,176.89	14,456,080.52	1,737,967.08	39.80545020	-80.65265318		
7,400.01	30.78	274.49	6,123.62	1,524.05	-3,230.38	14,456,090.69	1,737,913.60	39.80547870	-80.65284347		
7,500.02	27.41	259.51	6,211.10	1,521.66	-3,278.60	14,456,088.50	1,737,865.38	39.80547318	-80.65301520		
7,600.02	25.97	241.93	6,300.58	1,507.34	-3,320.62	14,456,073.98	1,737,823.36	39.80543375	-80.65316502		
7,700.02	26.77	223.94	6,390.32	1,480.77	-3,355.62	14,456,047.41	1,737,788.35	39.80536118	-80.65329001		
7,800.02	29.63	208.07	6,478.57	1,442.69	-3,382.92	14,456,009.33	1,737,761.05	39.80525687	-80.65338776		
7,900.02	34.03	195.38	6,563.61	1,393.82	-3,402.00	14,455,960.46	1,737,741.98	39.80512285	-80.65345634		
8,000.02	39.45	185.50	6,643.79	1,335.11	-3,412.47	14,455,901.75	1,737,731.51	39.80496176	-80.65349443		
8,100.02	45.53	177.78	6,717.54	1,267.72	-3,414.13	14,455,834.36	1,737,729.84	39.80477670	-80.65350128		
8,200.02	52.03	171.57	6,783.43	1,192.95	-3,406.96	14,455,759.59	1,737,737.02	39.80457129	-80.65347677		
8,244.22	55.00	169.17	6,809.71	1,157.92	-3,401.00	14,455,724.56	1,737,742.97	39.80447503	-80.65345604		
Begin 10°/100' build/turn											
8,300.02	59.77	165.73	6,839.78	1,112.08	-3,390.76	14,455,678.72	1,737,753.22	39.80434902	-80.65342021		
8,400.02	68.50	160.32	6,883.39	1,026.19	-3,364.37	14,455,592.83	1,737,779.60	39.80411287	-80.65332744		
8,500.02	77.39	155.52	6,912.70	937.75	-3,328.39	14,455,504.39	1,737,815.58	39.80386962	-80.65320055		
8,600.02	86.37	151.05	6,926.81	849.45	-3,283.91	14,455,416.09	1,737,860.07	39.80362666	-80.65304338		
8,629.30	89.00	149.77	6,927.99	824.01	-3,269.46	14,455,390.66	1,737,874.51	39.80355664	-80.65299229		
Begin 89.00° lateral											
8,629.32	89.00	149.77	6,927.99	823.99	-3,269.45	14,455,390.64	1,737,874.53	39.80355659	-80.65299226		
8,700.02	89.00	149.77	6,929.23	762.92	-3,233.66	14,455,329.56	1,737,910.12	39.80338849	-80.65286638		
8,800.02	89.00	149.77	6,930.97	676.53	-3,183.52	14,455,243.18	1,737,960.46	39.80315072	-80.65268833		
8,900.02	89.00	149.77	6,932.71	590.15	-3,133.18	14,455,156.79	1,738,010.80	39.80291294	-80.65251028		
9,000.02	89.00	149.77	6,934.45	503.76	-3,082.83	14,455,070.40	1,738,061.14	39.80267517	-80.65233224		
9,100.02	89.00	149.77	6,936.20	417.37	-3,032.48	14,454,984.02	1,738,111.48	39.80243739	-80.65215419		
9,200.02	89.00	149.77	6,937.94	330.99	-2,982.15	14,454,897.63	1,738,161.82	39.80219961	-80.65197615		
9,300.02	89.00	149.77	6,939.68	244.60	-2,931.81	14,454,811.24	1,738,212.16	39.80196184	-80.65179611		
9,400.02	89.00	149.77	6,941.42	158.21	-2,881.47	14,454,724.85	1,738,262.51	39.80172406	-80.65162007		
9,500.02	89.00	149.77	6,943.16	71.82	-2,831.13	14,454,638.47	1,738,312.85	39.80148628	-80.65144203		
9,600.02	89.00	149.77	6,944.91	-14.56	-2,780.79	14,454,552.08	1,738,363.19	39.80124850	-80.65126399		
9,700.02	89.00	149.77	6,946.65	-100.95	-2,730.44	14,454,465.69	1,738,413.53	39.80101073	-80.65106595		



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 Office of Oil and Gas
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9,800.02	89.00	149.77	6,948.39	-187.34	-2,680.10	14,454,379.31	1,738,463.87	39.80077295	-80.55090792
9,900.02	89.00	149.77	6,950.13	-273.72	-2,629.76	14,454,292.92	1,738,514.21	39.80053517	-80.55072988
10,000.02	89.00	149.77	6,951.88	-360.11	-2,579.42	14,454,206.53	1,738,564.55	39.80029739	-80.55055185
10,100.02	89.00	149.77	6,953.62	-446.50	-2,529.08	14,454,120.15	1,738,614.90	39.80005961	-80.55037382
10,200.02	89.00	149.77	6,955.36	-532.89	-2,478.74	14,454,033.76	1,738,665.24	39.79982183	-80.55019578
10,300.02	89.00	149.77	6,957.10	-619.27	-2,428.39	14,453,947.37	1,738,715.58	39.79958405	-80.54991775
10,400.02	89.00	149.77	6,958.85	-705.68	-2,378.05	14,453,860.99	1,738,765.92	39.79934627	-80.54983973
10,500.02	89.00	149.77	6,960.59	-792.05	-2,327.71	14,453,774.60	1,738,816.26	39.79910849	-80.54966170
10,600.02	89.00	149.77	6,962.33	-878.43	-2,277.37	14,453,688.21	1,738,866.60	39.79887071	-80.54948367
10,700.02	89.00	149.77	6,964.07	-964.82	-2,227.03	14,453,601.82	1,738,916.94	39.79863293	-80.54930565
10,800.02	89.00	149.77	6,965.81	-1,051.21	-2,176.69	14,453,515.44	1,738,967.29	39.79839515	-80.54912762
10,900.02	89.00	149.77	6,967.56	-1,137.60	-2,126.35	14,453,429.05	1,739,017.63	39.79815737	-80.54894960
11,000.02	89.00	149.77	6,969.30	-1,223.98	-2,076.00	14,453,342.66	1,739,067.97	39.79791959	-80.54877158
11,100.02	89.00	149.77	6,971.04	-1,310.37	-2,025.66	14,453,256.28	1,739,118.31	39.79768181	-80.54859356
11,200.02	89.00	149.77	6,972.78	-1,396.76	-1,975.32	14,453,169.89	1,739,168.65	39.79744403	-80.54841554
11,300.02	89.00	149.77	6,974.53	-1,483.14	-1,924.98	14,453,083.50	1,739,218.99	39.79720624	-80.54823752
11,400.02	89.00	149.77	6,976.27	-1,569.53	-1,874.64	14,452,997.12	1,739,269.33	39.79696846	-80.54805951
11,500.02	89.00	149.77	6,978.01	-1,655.92	-1,824.30	14,452,910.73	1,739,319.68	39.79673068	-80.54788149
11,600.02	89.00	149.77	6,979.75	-1,742.31	-1,773.95	14,452,824.34	1,739,370.02	39.79649290	-80.54770348
11,700.02	89.00	149.77	6,981.50	-1,828.69	-1,723.61	14,452,737.95	1,739,420.36	39.79625511	-80.54752547
11,800.02	89.00	149.77	6,983.24	-1,915.08	-1,673.27	14,452,651.57	1,739,470.70	39.79601733	-80.54734745
11,900.02	89.00	149.77	6,984.98	-2,001.47	-1,622.93	14,452,565.18	1,739,521.04	39.79577954	-80.54716944
12,000.02	89.00	149.77	6,986.72	-2,087.85	-1,572.59	14,452,478.79	1,739,571.38	39.79554176	-80.54699143
12,100.02	89.00	149.77	6,988.47	-2,174.24	-1,522.25	14,452,392.41	1,739,621.72	39.79530398	-80.54681343
12,200.02	89.00	149.77	6,990.21	-2,260.63	-1,471.91	14,452,306.02	1,739,672.07	39.79506619	-80.54663542
12,300.02	89.00	149.77	6,991.95	-2,347.02	-1,421.56	14,452,219.63	1,739,722.41	39.79482841	-80.54645741
12,400.03	89.00	149.77	6,993.69	-2,433.40	-1,371.22	14,452,133.25	1,739,772.75	39.79459062	-80.54627941
12,500.03	89.00	149.77	6,995.43	-2,519.79	-1,320.88	14,452,046.86	1,739,823.09	39.79435283	-80.54610141
12,600.03	89.00	149.77	6,997.18	-2,606.18	-1,270.54	14,451,960.47	1,739,873.43	39.79411505	-80.54592341
12,700.03	89.00	149.77	6,998.92	-2,692.56	-1,220.20	14,451,874.09	1,739,923.77	39.79387726	-80.54574540
12,800.03	89.00	149.77	7,000.66	-2,778.95	-1,169.86	14,451,787.70	1,739,974.11	39.79363948	-80.54556741
12,900.03	89.00	149.77	7,002.40	-2,865.34	-1,119.51	14,451,701.31	1,740,024.46	39.79340169	-80.54538941
13,000.03	89.00	149.77	7,004.15	-2,951.73	-1,069.17	14,451,614.92	1,740,074.80	39.79316390	-80.54521141
13,100.03	89.00	149.77	7,005.89	-3,038.11	-1,018.83	14,451,528.54	1,740,125.14	39.79292612	-80.54503342
13,200.03	89.00	149.77	7,007.63	-3,124.50	-968.49	14,451,442.15	1,740,175.48	39.79268833	-80.54485542
13,300.03	89.00	149.77	7,009.37	-3,210.89	-918.15	14,451,355.76	1,740,225.82	39.79245054	-80.54467743
13,400.03	89.00	149.77	7,011.12	-3,297.27	-867.81	14,451,269.38	1,740,276.16	39.79221275	-80.54449944
13,500.03	89.00	149.77	7,012.86	-3,383.66	-817.47	14,451,182.99	1,740,326.50	39.79197496	-80.54432144
13,600.03	89.00	149.77	7,014.60	-3,470.05	-767.12	14,451,096.60	1,740,376.85	39.79173718	-80.54414346
13,700.03	89.00	149.77	7,016.34	-3,556.44	-716.78	14,451,010.22	1,740,427.19	39.79149939	-80.54396547
13,800.03	89.00	149.77	7,018.08	-3,642.82	-666.44	14,450,923.83	1,740,477.53	39.79126160	-80.54378748
13,900.03	89.00	149.77	7,019.83	-3,729.21	-616.10	14,450,837.44	1,740,527.87	39.79102381	-80.54360949
14,000.03	89.00	149.77	7,021.57	-3,815.60	-565.76	14,450,751.05	1,740,578.21	39.79078602	-80.54343151
14,100.03	89.00	149.77	7,023.31	-3,901.98	-515.42	14,450,664.67	1,740,628.55	39.79054823	-80.54325353
14,200.03	89.00	149.77	7,025.05	-3,988.37	-465.07	14,450,578.28	1,740,678.89	39.79031044	-80.54307554
14,300.03	89.00	149.77	7,026.80	-4,074.76	-414.73	14,450,491.89	1,740,729.24	39.79007265	-80.54289756
14,400.03	89.00	149.77	7,028.54	-4,161.15	-364.39	14,450,405.51	1,740,779.58	39.78983486	-80.54271958
14,500.03	89.00	149.77	7,030.28	-4,247.53	-314.05	14,450,319.12	1,740,829.92	39.78959706	-80.54254160
14,600.03	89.00	149.77	7,032.02	-4,333.92	-263.71	14,450,232.73	1,740,880.26	39.78935927	-80.54236363
14,700.03	89.00	149.77	7,033.77	-4,420.31	-213.37	14,450,146.35	1,740,930.60	39.78912148	-80.54218565
14,800.03	89.00	149.77	7,035.51	-4,506.69	-163.03	14,450,059.96	1,740,980.94	39.78888369	-80.54200768
14,900.03	89.00	149.77	7,037.25	-4,593.08	-112.69	14,449,973.57	1,741,031.28	39.78864590	-80.54182970
15,000.03	89.00	149.77	7,038.99	-4,679.47	-62.34	14,449,887.19	1,741,081.63	39.78840810	-80.54165173
15,100.03	89.00	149.77	7,040.74	-4,765.85	-12.00	14,449,800.80	1,741,131.97	39.78817031	-80.54147376
15,200.03	89.00	149.77	7,042.48	-4,852.24	38.34	14,449,714.41	1,741,182.31	39.78793252	-80.54129579

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Fitzgerald 05 HM (slot T)
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 05 HM (slot T)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

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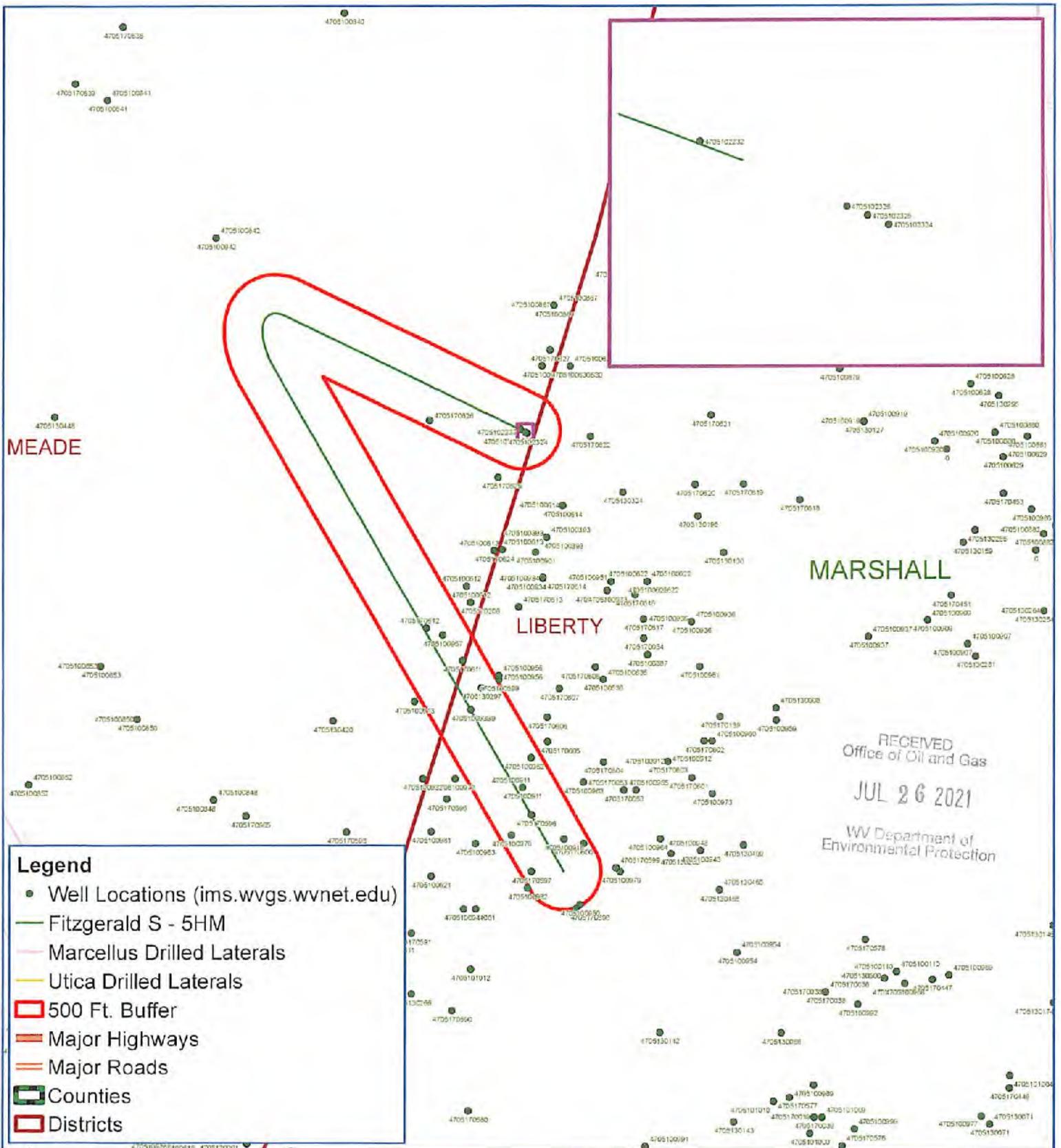
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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,300.03	89.00	149.77	7,044.22	-4,938.63	88.68	14,449,628.02	1,741,232.65	39.78769473	-80.64111782
15,400.03	89.00	149.77	7,045.96	-5,025.02	139.02	14,449,541.64	1,741,282.99	39.78745693	-80.64093985
15,500.03	89.00	149.77	7,047.70	-5,111.40	189.36	14,449,455.25	1,741,333.33	39.78721914	-80.64076189
15,600.03	89.00	149.77	7,049.45	-5,197.79	239.71	14,449,368.86	1,741,383.67	39.78698134	-80.64058392
15,700.03	89.00	149.77	7,051.19	-5,284.18	290.05	14,449,282.48	1,741,434.02	39.78674355	-80.64040596
15,800.03	89.00	149.77	7,052.93	-5,370.57	340.39	14,449,196.09	1,741,484.36	39.78650575	-80.64022799
15,900.03	89.00	149.77	7,054.67	-5,456.95	390.73	14,449,109.70	1,741,534.70	39.78626796	-80.64005003
16,000.03	89.00	149.77	7,056.42	-5,543.34	441.07	14,449,023.32	1,741,585.04	39.78603016	-80.63987207
16,100.03	89.00	149.77	7,058.16	-5,629.73	491.41	14,448,936.93	1,741,635.38	39.78579237	-80.63969411
16,200.03	89.00	149.77	7,059.90	-5,716.11	541.76	14,448,850.54	1,741,685.72	39.78555457	-80.63951616
16,205.74	89.00	149.77	7,060.00	-5,721.04	544.63	14,448,845.61	1,741,688.60	39.78554100	-80.63950600

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Fitzgerald-05HM LP r4 - hit/miss target - Shape	0.00	0.00	6,928.00	824.14	-3,269.38	14,455,390.79	1,737,874.60	39.80355700	-80.65299200
- plan misses target center by 0.14ft at 8629.23ft MD (6927.99 TVD, 824.08 N, -3269.50 E)									
- Point									
Fitzgerald-05HM BHL r5 - plan hits target center - Point	0.00	0.00	7,060.00	-5,721.04	544.63	14,448,845.61	1,741,688.60	39.78554100	-80.63950600

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
16,206.28	7,060.01	20" Casing	20	24

Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
1,300.00	1,300.00	0.00	0.00	KOP Begin 3°/100' build
2,674.98	2,559.24	204.46	-427.57	Begin 41.25° tangent
7,198.78	5,990.45	1,491.19	-3,118.46	Begin 8°/100' build/turn
8,244.22	6,809.71	1,157.92	-3,401.00	Begin 10°/100' build/turn
8,629.30	6,927.99	824.01	-3,269.46	Begin 89.00° lateral
17,794.02				PBHL/TD 17794.02 MD/7088.00 TVD



Fitzgerald S - 5HM Meade District Marshall County, WV



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

Map Prepared by:
PS
LAND SERVICES
08/27/2021

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. Enverus and RS Energy Group 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 Adam Picard 724-485-9331, apicard@dpslandservices.com, DPS GIS (5/14/2021) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it is the best publicly available. See attached map he provided.

Request maps for:

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

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

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

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Wells within 500' Buffer

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705102232	Tug Hill Operating, LLC	7070' TVD (proposed)	None	None	No, this well is a proposed well. The well was not drilled. This is a canceled permit.	A canceled permit by Tug Hill Operating, LLC.
4705102324	Tug Hill Operating, LLC	12064' TVD	Point Pleasant	None	No, this is a Point Pleasant well. Once completed this well will be too deep to be within the expected fracture propagation from a Marcellus stimulation.	A Point Pleasant well drilled by Tug Hill Operating, LLC on the Fitzgerald pad. Well is currently drilled but uncompleted.
4705102325	Tug Hill Operating, LLC	12080' TVD	Point Pleasant	None	No, this is a Point Pleasant well. Once completed this well will be too deep to be within the expected fracture propagation from a Marcellus stimulation.	A Point Pleasant well drilled by Tug Hill Operating, LLC on the Fitzgerald pad. Well is currently drilled but uncompleted.
4705102326	Tug Hill Operating, LLC	12076' TVD	Point Pleasant	None	No, this is a Point Pleasant well. Once completed this well will be too deep to be within the expected fracture propagation from a Marcellus stimulation.	A Point Pleasant well drilled by Tug Hill Operating, LLC on the Fitzgerald pad. Well is currently drilled but uncompleted.

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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
4705170626	unknown	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well.	State records are incomplete.
4705100957	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well.	State records are incomplete.
4705170611	unknown	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well.	State records are incomplete.
4705170612	unknown	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well.	State records are incomplete.
4705100939	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Reassigned from 4705170609. Well was plugged 10/20/2005.

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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
4705130297	Consolidation Coal Co.	3121' TVD	Big Injun Gordon	unknown	No, this well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation. Well is plugged.	Reassigned to 4705100956. Well was plugged 8/19/1949.
4705100599	CNX Gas Co. LLC (North)	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 1/7/2004.
4705100911	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well.	Reassigned from 4705170605. State records are incomplete.
4705100918	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Reassigned from 4705170600. Well was plugged 1/7/2004.
4705100962	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 9/8/2005.

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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
4705100978	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 3/24/2006.
4705170596	unknown	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well.	State records are incomplete.
4705170597	unknown	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well.	State records are incomplete.
4705170600	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Reassigned to 4705100918. Well was plugged 1/7/2004.
4705100980	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 1/24/2006.

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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
4705170598	unknown	unknown	unknown	unknown	Unknown but unlikely. This well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well.	State records are incomplete.

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WV Geological & Economic Survey:

Well: County = 51 Permit = 02232

Report Time: Monday, May 17, 2021 1:32:12 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705102232	Marshall	2232	Liberty	Glen Easton	Cameron	39.801291	-80.641437	530695.4	4405764.3

Bottom Hole Location Information:

API	EP_FLAG	UTME	UTMN	LON_DD	LAT_DD
4705102232	1 As Proposed	531240.4	4404738.7	-80.63512	39.79203

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705102232	-/-	Dvtd Orgnl Loc	Cancelled	Danny R Kerns		S-8HM	Fitzgerald		Danny S Kerns et al	Tug Hill Operating, LLC	7070	Marcellus Fm	

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AFT	NGL_BE	
4705102232	-/-	-/-	1317	Ground Level																		

WV Geological & Economic Survey:

Well: County = 51 Permit = 02324

Report Time: Monday, May 17, 2021 1:33:38 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705102324	Marshall	2324	Liberty	Glen Easton	Cameron	39.801145	-80.641103	530724.1	4405748.2

Bottom Hole Location Information:

API	EP_FLAG	UTME	UTMN	LON_DD	LAT_DD
4705102324	1 As Proposed	530498.3	4403183.5	-80.64388	39.777865

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705102324	-/-	Dvtd Orgnl Loc	Permitted	Danny and Frances Kerns Estate		S-17HU	Fitzgerald		Danny S Kerns et al	Tug Hill Operating, LLC	12064	PI Pleasant Fm	

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AFT	NGL_BE	
4705102324	-/-	-/-	1318	Ground Level																		

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WV Geological & Economic Survey

Well: County = 51 Permit = 02325

Report Time: Monday, May 17, 2021 1:34:08 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_16	LAT_DD	LON_DD	UTME	UTMN
4705102325	Marshall	2325	Liberty	Glen Easton	Cameron	39.801161	-80.64114	530720.9	4405750

Bottom Hole Location Information:

API	EP_FLAG	UTME	UTMN	LON_DD	LAT_DD
4705102325	1 As Proposed	530776.1	4403445	-80.640603	39.780391

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PI
4705102325	-/-	Dvtd Orgnl Loc	Permitted	Danny and Frances Kerns Estate		S-18HU	Fitzgerald		Danny S Kerns et al	Tug Hill Operating, LLC		12080	PI Pleasant Fm

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AFT	NGL_BE	
4705102325	-/-	-/-	1319	Ground Level																		

WV Geological & Economic Survey

Well: County = 51 Permit = 02326

Report Time: Monday, May 17, 2021 1:34:51 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_76	QUAD_16	LAT_DD	LON_DD	UTME	UTMN
4705102326	Marshall	2326	Liberty	Glen Easton	Cameron	39.801177	-80.641177	530717.7	4405751.8

Bottom Hole Location Information:

API	EP_FLAG	UTME	UTMN	LON_DD	LAT_DD
4705102326	1 As Proposed	531067.9	4403702.4	-80.637183	39.7827

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PI
4705102326	-/-	Dvtd Orgnl Loc	Permitted	Danny and Frances Kerns Estate		S-19HU	Fitzgerald		Danny S Kerns et al	Tug Hill Operating, LLC		12076	PI Pleasant Fm

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AFT	NGL_BE	
4705102326	-/-	-/-	1320	Ground Level																		

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WV Geological & Economic Survey

Well: County = 51 Permit = 70626

Report Time: Monday, May 17, 2021 1:45:34 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705170626	Marshall	70626	Liberty	Glen Easton	Cameron	39.801627	-80.645675	530332.5	4405800.1

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170626	---	unknown	Prpty Map	W H Dobbs	2					----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AFT	NG
4705170626	---	---						unclassified	unclassified	not available	unknown	unknown									

WV Geological & Economic Survey

Well: County = 51 Permit = 00957

Report Time: Monday, May 17, 2021 1:46:21 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100957	Marshall	957	Liberty	Glen Easton	Cameron	39.793971	-80.645106	530384.6	4404950.6

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100957	6/9/2005	Plugging	Completed	David & Carole Whipkey			M-311	David L Whipkey		Consolidation Coal Co.			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AFT	NG
4705100957	6/9/2005	5/26/2005	1221	Ground Level				unclassified	unclassified	not available	unknown	unknown									

WV Geological & Economic Survey

Well: County = 51 Permit = 70611

Report Time: Monday, May 17, 2021 1:46:43 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705170611	Marshall	70611	Liberty	Glen Easton	Cameron	39.793063	-80.64417	530465	4404850.2

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170611	---	unknown	Prpty Map	Irene Simpson						----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AFT	NG
4705170611	---	---						unclassified	unclassified	not available	unknown	unknown									

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WV Geological & Economic Survey:

Well: County = 51 Permit = 70612

Report Time: Monday, May 17, 2021 1:47:01 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705170612	Marshall	70612	Liberty	Glen Easton	Cameron	39.794225	-80.645863	530319.6	4404978.5

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170612	-/-		unknown	Prpty Map Irene Simpson						----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AFT	NG
4705170612	-/-	-/-						unclassified	unclassified	not available	unknown	unknown									

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WV Geological & Economic Survey

Well: County = 51 Permit = 00939

Report Time: Monday, May 17, 2021 1:47:22 PM

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	70609	51	939

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100939	Marshall	939	Liberty	Glen Easton	Cameron	39.79131	-80.643795	530497.9	4404655.7

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100939	10/20/2005	Plugging	Completed	Virginia McIlvain		M-302				Consolidation Coal Co.			
4705100939	-/-	unknown	Prpty Map	J C McIlvain						----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	Q	
4705100939	10/20/2005	10/5/2005	1300 Ground Level	Cameron-Garner															
4705100939	-/-	-/-					unclassified	unclassified	not available	unknown	unknown								

Comment: 10/20/2005 elevation estimated from topo.

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV DATUM
4705100939	Original Loc	Pittsburgh coal	Well Record	990	Qstable Pick	5	Reasonable	1300 Ground Level

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100939	10/20/2005	0

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WV Geological & Economic Survey

Well: County = 51 Permit = 30297

Report Time: Monday, May 17, 2021 1:47:40 PM

Well Reassignment Information: Reassigned To

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	30297	51	956

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_76	QUAD_16	LAT_DD	LON_DD	UTME	UTMN
4705130297	Marshall	30297	Meade	Glen Easton	Cameron	39.792086	-80.643286	530541.2	4404742

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705130297	--	unknown	Reassign							Raad Supply Company			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AFT	NGL_BEF	NC
4705130297	--	--																				

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WV Geological & Economic Survey

Well: County = 51 Permit = 956

Report Time: Monday, May 17, 2021 3:48:39 PM

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	30297	51	956

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LONG_DD	UTME	UTMN
4705100956	Marshall	956	Meade	Glen Easton	Cameron	39.792521	-80.642474	530610.5	4404790.6

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_E
4705100956	6/8/1903	Original Loc	Completed	J F Dobbs Heirs/Rosella Dobbs	2		Jacob Standiford		Grave Creek Fuel Co	Raad Supply Company			
4705100956	6/8/2005	Plugging	Completed	John A & Leora J Dobbs		M-316				Consolidation Coal Co.			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FTM	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AI
4705100956	6/8/1903	J-J	1397	Ground Level	Cameron-Garner	Gordon	Gordon	Development Well	Development Well	Oil	Cable Tool	unknown	3121		3121			0
4705100956	6/8/2005	6/11/2005	1388	Ground Level				unclassified	unclassified	not available	unknown	unknown						

Pay/Show/Water Information:

API	CMP_DT	ACTIVITY	PRODUCT	SECTION	DEPTH_TOP	FM_TOP	DEPTH_BOT	FM_BOT	G_BEF	G_AFT	O_BEF	O_AFT	WATER_QNTY
4705100956	6/8/1903	Pay	Gas	Vertical	2214	Big Injun (undiff)	2218	Big Injun (undiff)	0	0			
4705100956	6/8/1903	Pay	Oil	Vertical	3103	Gordon	3110	Gordon	0	0			

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV	DATUM
4705100956	Original Loc	Sewickley coal	Well Record	1010	Reasonable	4	Reasonable	1388	Ground Level
4705100956	Original Loc	Pittsburgh coal	Well Record	1118	Reasonable	6	Reasonable	1388	Ground Level
4705100956	Original Loc	Salt Sands (undiff)	Well Record	2212	Reasonable	338	Reasonable	1388	Ground Level
4705100956	Original Loc	Gordon Stray	Well Record	3050	Reasonable	8	Reasonable	1388	Ground Level
4705100956	Original Loc	Gordon	Well Record	3091	Reasonable	30	Reasonable	1388	Ground Level

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100956	8/19/1949	0

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VW Geological & Economic Survey

Well: County = 64 Permit = 00589

Report Time: Monday, May 17, 2021 1:48:16 PM

Location Information: View Map

API	COUNTY	PERMIT	TAX_INSTRCT	QUAD_75	QUAD_76	LAT_DD	LCN_DD	UTNE	UTRM
4705100589	Marshall	589	None	Green	Estion	39.792376	-90.624274	550510.0	4404774.5

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SPUD_DT	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE_LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TRM_EST_PIR
4705100589	17/2004	17/2004	Producing	Completed	Virgates	Medison	5	M-256	Consolidation Coal Co	Consolidation Coal Co	Ferracis Company	
4705100589	J-L	J-L	Original Loc	Completed	J C Melvian				Ferracis Company			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FIG	KOD	G_BEF	G_AFT	O_BEF
4705100589	J-L	J-L	1400	Ground Level	Unmanned		undassified	unclassified	not available	unknown	unknown	0	0	0	0	0	0	0
4705100589	J-L	J-L	1400	Ground Level	Unmanned		undassified	unclassified	not available	unknown	unknown	0	0	0	0	0	0	0

There is no Pay data for this well

Production Gas Information: (Volumes in Mcf) * 2020 data for HSA wells only. Other wells are incomplete at this time.

API	PRD_QTR	PRD_YEAR	ANM_GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705100589	Ferracis Company	1981	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Company	1982	12	4	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Company	1983	18	2	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Company	1984	833	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Products Company	1987	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Products Company	1989	31	8	17	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Products Company	1990	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Products Company	1991	677	48	38	12	63	111	23	37	35	32	36	45	65
4705100589	Ferracis Products Company	1992	408	44	33	57	58	57	51	52	54	56	48	47	44
4705100589	Ferracis Products Company	1994	985	35	45	68	52	113	134	65	105	116	97	112	109
4705100589	Ferracis Products Company	1995	1,257	64	110	87	110	135	131	125	134	114	105	34	
4705100589	Ferracis Products Company	1996	83	0	0	0	40	28	16	0	0	0	0	0	0
4705100589	Ferracis Products Company	1997	1	0	0	0	1	0	0	0	0	0	0	0	0
4705100589	Ferracis Products Company	1998	51	4	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Products Company	1999	19	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Products Company	2000	109	32	38	25	87	88	99	88	0	0	49	59	144
4705100589	E&M Resources Inc	2002	862	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	E&M Resources Inc	2003	542	31	48	48	168	109	175	66	120	162	168	140	0
4705100589	E&M Resources Inc	2004	1,489	229	118	169	129	128	153	112	109	141	103	0	65
4705100589	CHX Gas Co LLC (North)	2005	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2006	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2007	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2008	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2009	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2010	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2011	0	0	0	0	0	0	0	0	0	0	0	0	0

Production Oil Information: (Volumes in Bbl) ** some operators may have reported NGL under Oil * 2020 data for HSA wells only. Other wells are incomplete at this time.

API	PRD_QTR	PRD_YEAR	ANM_OIL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705100586	Ferracis Company	1981	380	0	0	0	0	0	0	0	0	0	0	0	0
4705100586	Ferracis Company	1982	307	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Company	1983	354	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Company	1984	469	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Products Company	1987	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Products Company	1988	4	32	72	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Products Company	1989	337	35	28	24	56	41	34	31	28	31	32	28	0
4705100589	Ferracis Products Company	1990	1,382	35	28	31	32	27	24	34	26	32	31	40	34
4705100589	Ferracis Products Company	1991	440	26	28	28	35	28	28	70	32	46	36	29	40
4705100589	Ferracis Products Company	1994	376	25	26	40	31	30	36	32	32	34	29	32	28
4705100589	Ferracis Products Company	1995	245	28	27	35	26	31	34	29	15	24	0	0	0
4705100589	Ferracis Products Company	1997	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Products Company	1998	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	Ferracis Products Company	1999	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	E&M Resources Inc	2000	215	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	E&M Resources Inc	2001	410	36	27	37	36	59	55	57	36	40	45	59	34
4705100589	CHX Gas Co LLC (North)	2002	154	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2003	315	95	98	87	41	41	43	42	40	43	39	41	36
4705100589	CHX Gas Co LLC (North)	2004	395	34	32	37	36	38	40	40	43	43	31	36	0
4705100589	CHX Gas Co LLC (North)	2005	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2006	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2007	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2008	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2009	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2010	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100589	CHX Gas Co LLC (North)	2011	0	0	0	0	0	0	0	0	0	0	0	0	0

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

There is no Stratigraphy Water data for this well

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100589	17/2004	0

There is no Sample data for this well

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WV Geological & Economic Survey:

Well: County = 51 Permit = 00911

Report Time: Monday, May 17, 2021 1:49:37 PM

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	70605	51	911

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100911	Marshall	911	Liberty	Glen Easton	Cameron	39.788513	-80.641385	530705.5	4404346.2

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100911	-/-	Plugging	Cancelled	John A & Leora J Dobbs		M-403	Dobbs/J Standiford		Dobbs	Consolidation Coal Co.			
4705100911	-/-	unknown	Prpty Map	R F Dobbs	3					----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEf	G_AFT	O_BEf	O_AF
4705100911	-/-	-/-	1343	Ground Level																
4705100911	-/-	-/-	1343	Ground Level				unclassified	unclassified	not available	unknown	unknown								

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 Office of the
 JUL 26 2021
 WV Dept. of
 Environmental Protection

WV Geological & Economic Survey:

Well: County = 51 Permit = 00918

Report Time: Monday, May 17, 2021 1:50:08 PM

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	70800	51	918

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100918	Marshall	918	Meade	Glen Easton	Cameron	39.788671	-80.639465	530870.7	4404142.3

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100918	4/7/2004	Plugging	Completed	John A Dobbs		M-273			Consolidation Coal Co	Consolidation Coal Co.			
4705100918	-/-	Original Loc	Prpty Map	R F Dobbs		2				----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AF
4705100918	4/7/2004	3/29/2004	1263	Ground Level				unclassified	unclassified	not available	unknown	unknown								
4705100918	-/-	-/-	1263	Ground Level				unclassified	unclassified	not available	unknown	unknown								

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

There is no Stratigraphy data for this well

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100918	4/14/2004	0

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 Office of Oil and Gas
JUL 26 2021
 WV Department of Environmental Protection

WV Geological & Economic Survey

Well: County = 51 Permit = 00962

Report Time: Monday, May 17, 2021 1:50:26 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100962	Marshall	962	Liberty	Glen Easton	Cameron	39.789571	-80.640969	530740.7	4404463.7

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100962	9/8/2005	Plugging	Completed	John A & Leora J Dobbs			M-271			Consolidation Coal Co.			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AF
4705100962	9/8/2005	8/23/2005	1309 Ground Level				unclassified	unclassified	not available	unknown	UnFin/W/Stm								

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV DATUM
4705100962	Original Loc	Pittsburgh coal	Well Record	1057	Reasonable	6	Reasonable	Ground Level

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100962	9/8/2005	0

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WV Department of
Environmental Protection

WV Geological & Economic Survey:

Well: County = 51 Permit = 00978

Report Time: Monday, May 17, 2021 1:50:50 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LO_N_DD	UTME	UTMN
4705100978	Marshall	978	Liberty	Glen Easton	Cameron	39.786815	-80.641909	530661.5	4404157.6

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100978	3/24/2006	Plugging	Completed	Consolidation Coal Company			M-264		Consolidation Coal Company	Consolidation Coal Co.			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BE_F	G_AFT	O_BE_F	O_AFT
4705100978	3/24/2006	3/9/2006	1266 Ground Level				Pittsburgh coal	unclassified	unclassified	not available	unknown	unknown							

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV DATUM
4705100978	Plugging	Pittsburgh coal	Well Record	1012	Reasonable	5	Reasonable	1266 Ground Level

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100978	3/24/2006	0

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 Environmental Protection

WV Geological & Economic Survey:

Well: County = 51 Permit = 70596

Report Time: Monday, May 17, 2021 1:51:09 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LO_N_DD	UTME	UTMN
4705170596	Marshall	70596	Liberty	Glen Easton	Cameron	39.787537	-80.640974	530741.1	4404238

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170596	--	unknown	Prpty Map	J C McIlvain						----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BE_F	G_AFT	O_BE_F	O_AFT	NC
4705170596	--	--					unclassified	unclassified	not available	unknown	unknown									

WV Geological & Economic Survey:

Well: County = 51 Permit = 70597

Report Time: Monday, May 17, 2021 1:51:25 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_16	LAT_DD	LON_DD	UTME	UTMN
4705170597	Marshall	70597	Liberty	Glen Easton	Cameron	39.785505	-80.640974	530742	4404012.5

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170597	--	unknown	Prpty Map	H E Gray	2					----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AFT	NC
4705170597	--	--						unclassified	unclassified	not available	unknown	unknown									

WV Geological & Economic Survey:

Well: County = 51 Permit = 70600

Report Time: Monday, May 17, 2021 1:51:42 PM

Well Reassignment Information: Reassigned To

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	70600	51	918

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_16	LAT_DD	LON_DD	UTME	UTMN
4705170600	Marshall	70600	Liberty	Glen Easton	Cameron	39.786526	-80.638525	530951.3	4404126.6

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170600	--	unknown	Reassign							----- unknown -----			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF	O_AFT	NGL_BEF	NC
4705170600	--	--																				

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 WV Department of
 Environmental Protection

WV Geological & Economic Survey

Well: County = 51 Permit = 00980

Report Time: Monday, May 17, 2021 1:52:04 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100980	Marshall	980	Liberty	Glen Easton	Cameron	39.78435	-80.638713	530938.2	4403885.1

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100980	1/24/2006	Plugging	Completed	Jchn A & Leora j Dobbs			M-275			Consolidation Coal Co.			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEf	G_AFT	O_BEf	O_Af
4705100980	1/24/2006	1/9/2006	1211	Ground Level				unclassified	unclassified	not available	unknown	unknown								

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

There is no Stratigraphy data for this well

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100980	1/24/2006	0

WV Geological & Economic Survey

Well: County = 51 Permit = 70598

Report Time: Monday, May 17, 2021 1:52:19 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705170598	Marshall	70598	Liberty	Glen Easton	Cameron	39.784199	-80.638906	530919.7	4403866.2

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170598	-/-	unknown	Prpty Map	Charles Sampson	3					unknown			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEf	G_AFT	O_BEf	O_AFT	NG
4705170598	-/-	-/-						unclassified	unclassified	not available	unknown	unknown									

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WV Department of
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TUG HILL
OPERATING

B.S. 5-27-21

Well Site Safety Plan
Part A – Site Specific Data and Figures

Well Name: Fitzgerald S-5HM

Pad Name: Fitzgerald

County: Marshall

UTM (meters), NAD83, Zone 17

Northing: 4,405,760.72

Easting: 530,701.74

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JUL 26 2021

WV Department of
Environmental Protection

**KEY CONTACT FOR WELL SITE SAFETY PLAN
DEVELOPMENT AND MAINTENANCE**

Jerry V. DeRosa, Director EH&S Affairs

(724) 338-2029 (office)

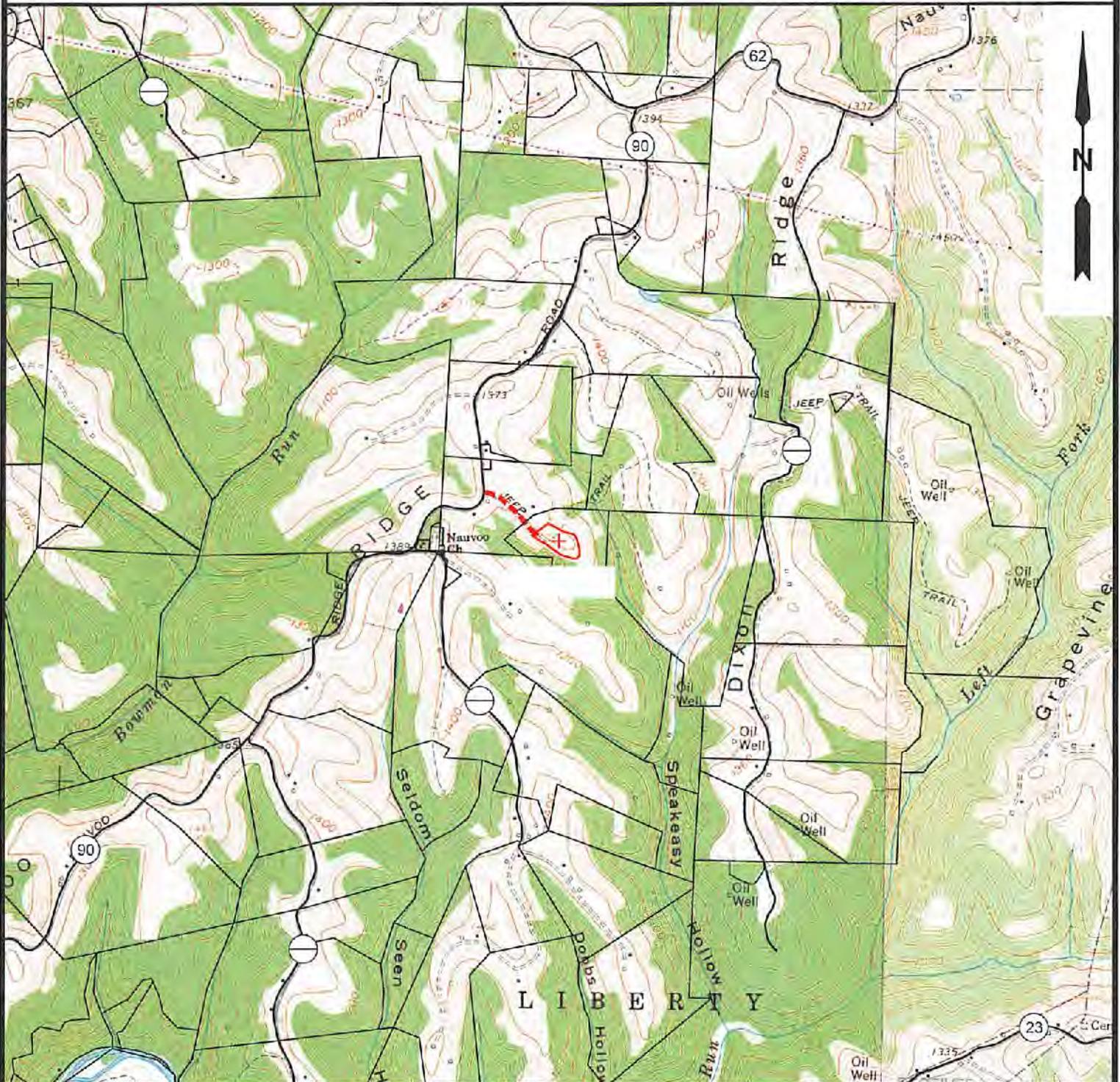
(412) 736-5767 (cellular)

24-HOUR EMERGENCY PHONE NUMBER

(800) 921-9745

08/27/2021

PROPOSED FITZGERALD S - 5HM



NOTE: CLOSEST WATER PURVEYOR
CITY OF CAMERON - FRANK WALKER RESERVOIR
CAMDEN, WV

LAT 39.829885
LON -80.573724
LOCATED: N 62°00'46" E AT 21,684.26' FROM THE CENTER OF FITZGERALD SWELL PAD LOCATION.

Office of Oil and Gas

JUL 26 2021



12 Ventnor Drive | P.O. Box 150 | Glenville, WV 26031 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.546.3952
254 East Backley Bypass | Beckley, WV 25801 | 304.295.5296
slswv.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5' & CAMERON 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT		
MARSHALL	LIBERTY & MEADE		
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8910	03/03/2020	1" = 2000'



WV Department of Environmental Protection
**TUG HILL
OPERATING**
08/27/2021

**FITZGERALD S LEASE
WELL 5HM
TUG HILL OPERATING**

T.H. LATITUDE 39°50'00"
B.H. LATITUDE 39°47'30"



T.H. LONGITUDE 80°37'30"
B.H. LONGITUDE 80°37'30"

2,232' B.H.

TAG	SURFACE OWNER	PARCEL	ACRES
A	DANNY R. & FRANCES V. KERNS ESTATE	7-8-1	27.00
B	DANNY R. & FRANCES V. KERNS ESTATE	9-9-14	48.308
C	TODD L. SCHERICH, ET AL	9-9-16	168.204
D	MARK D. & SHERYL CHAMBERS	9-12-11	91.00
E	DAVID L. WHIPKEY & DAVID MATTHEW WHIPKEY	9-12-12	61.00
F	JOHN ALFRED & LEORA JEAN DOBBS (L/E)	7-8-4	65.65
G	DAVID & CAROL WHIPKEY TRUST, ET AL	9-12-17	37.27
H	JOHN ALFRED & LEORA JEAN DOBBS (L/E)	7-8-8	51.97

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'83 S.P.C.(FT)	N. 475,996.13	E. 1,647,833.31
NAD'83 GEO.	LAT-(N) 39.801258	LONG-(W) 80.641363
NAD'83 UTM (M)	N. 4,405,760.72	E. 530,701.74
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 476,875.0	E. 1,644,577.0
NAD'83 GEO.	LAT-(N) 39.803557	LONG-(W) 80.652992
NAD'83 UTM (M)	N. 4,406,011.9	E. 529,705.2
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 470,264.9	E. 1,643,282.4
NAD'83 GEO.	LAT-(N) 39.785541	LONG-(W) 80.639506
NAD'83 UTM (M)	N. 4,404,017.0	E. 530,667.7

NOTES ON SURVEY

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS OR DWELLINGS > 2500 SQ. FT. WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
- WELL SPOT CIRCLE & TOPO MARK SCALE IS 1"=2000'.



12 Vainorn Drive | P.O. Box 150 | Glenville, WV 26031 | 304.462.5654
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3352
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5195
slsw.com

REFERENCES



I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.



P.S. 677 *Gregory A. Smith*

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE FEBRUARY 20, 20 20
REVISED MAY 19, 2021, JULY 15, 2021
OPERATORS WELL NO. FITZGERALD S 5HM
API WELL NO. 47 - 051 - 02395 H6A
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8910P5HMR2.dwg
FITZGERALD S 5HM REV5
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW

LOCATION: ELEVATION 1,293.00' WATERSHED SPEAKEASY HOLLOW OF MAGGOTY RUN
DISTRICT LIBERTY COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER DANNY AND FRANCES KERNS ESTATE ACREAGE 27.00±
ROYALTY OWNER DANNY S. KERNS, ET AL ACREAGE 08/27/2021

PROPOSED WORK: LEASE NO. SEE WW-6A1
DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER

PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION MARCELLUS
ESTIMATED DEPTH TVD: 7,025' / TMD: 16,206'

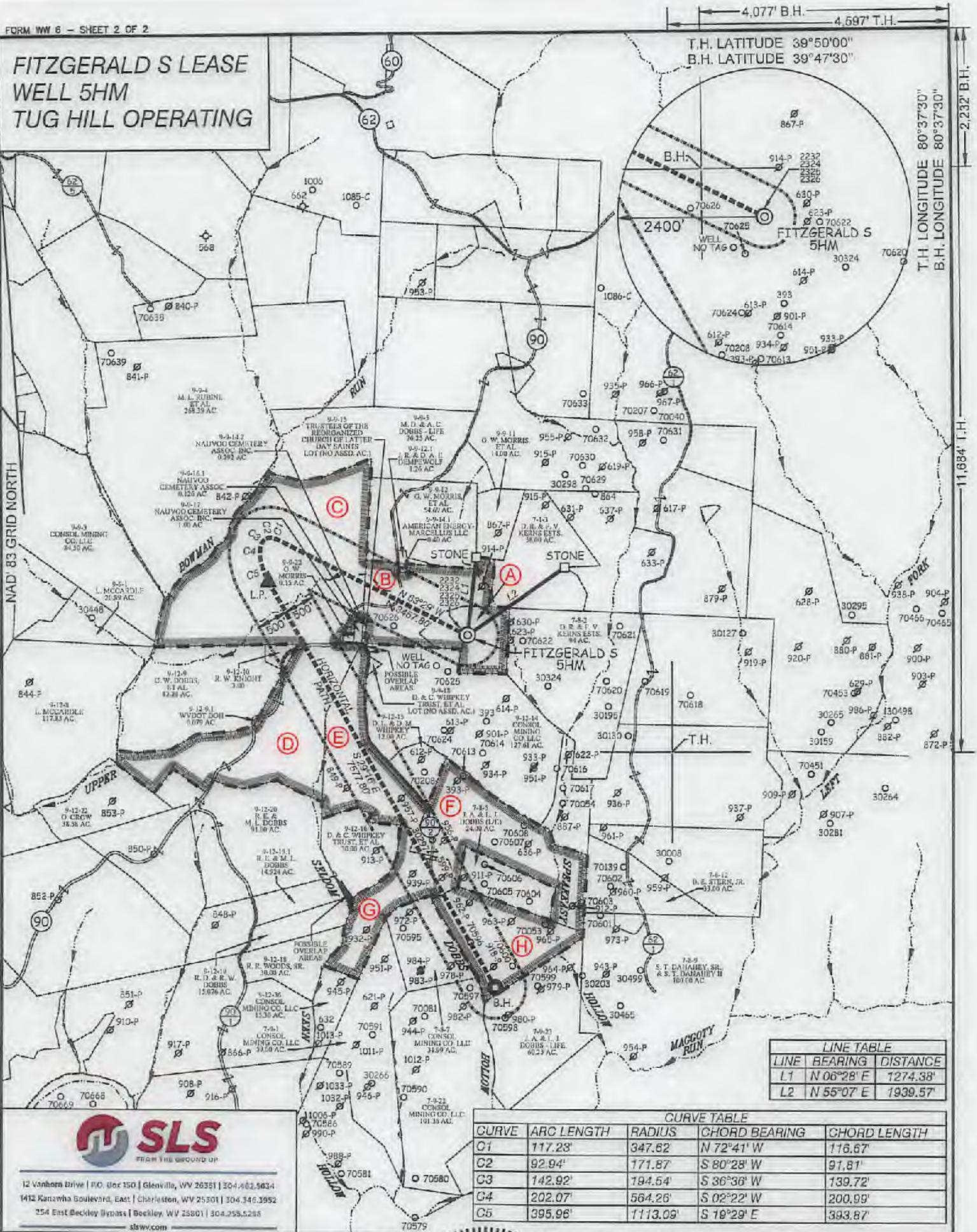
WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DARREN BROWN
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS CT CORPORATION
FORT WORTH, TX 76107 ADDRESS 5098 WASHINGTON ST. W, STE 407
CHARLESTON, WV 25313-1561

COUNTY NAME PERMIT

**FITZGERALD S LEASE
WELL 5HM
TUG HILL OPERATING**

T.H. LATITUDE 39°50'00"
B.H. LATITUDE 39°47'30"

T.H. LONGITUDE 80°37'30"
B.H. LONGITUDE 80°37'30"



LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 06°28' E	1274.38'
L2	N 55°07' E	1939.57'

CURVE TABLE				
CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	117.23'	347.62	N 72°41' W	116.67'
C2	92.94'	171.87	S 80°28' W	91.81'
C3	142.92'	194.54	S 36°36' W	139.72'
C4	202.07'	564.26	S 02°22' W	200.99'
C5	395.96'	1113.09'	S 19°29' E	393.87'



12 Vanhorne Drive | P.O. Box 150 | Glenville, WV 26031 | 304.463.5634
 1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.2952
 254 East Beckley Bypass | Beckley, WV 26801 | 304.255.5288
 slsw.com



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

P.S. 677 *Gregory A. Smith*

LEGEND

- LEASE LINE
- SURFACE LINE
- WELL LATERAL
- OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- TAX MAP-PARCEL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE WW-8A1)

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)			
NAD 83 S.P.C.(FT)	N. 475,896.13	E. 1,847,833.31	
NAD 83 GEO.	LAT-(N) 39.901258	LONG-(W) 80.841363	
NAD 83 UTM (M)	N. 4,405,760.72	E. 530,701.74	
LANDING POINT			
NAD 83 S.P.C.(FT)	N. 478,875.0	E. 1,544,577.0	
NAD 83 GEO.	LAT-(N) 39.803557	LONG-(W) 80.652992	
NAD 83 UTM (M)	N. 4,406,011.9	E. 529,705.2	
BOTTOM HOLE			
NAD 83 S.P.C.(FT)	N. 470,284.9	E. 1,548,282.4	
NAD 83 GEO.	LAT-(N) 39.785541	LONG-(W) 80.639506	
NAD 83 UTM (M)	N. 4,404,017.0	E. 530,867.7	

SCALE 1" = 2000' FILE NO. 8910P5HMR2.dwg
 FITZGERALD S 5HM REV 5
 DATE FEBRUARY 20, 2020
 REVISED MAY 19, 2021, JULY 15, 2021
 OPERATORS WELL NO. FITZGERALD S 5HM
 API WELL NO. 47-051-02395
 STATE COUNTY PERMIT

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



WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DARREN BROWN
 ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5038 WASHINGTON ST. W, STE 407
 FORT WORTH, TX 76107 CHARLESTON, WV 25313-1561

08/27/2021

COUNTY NAME PERMIT

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

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

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

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

*See attached pages

RECEIVED
Office of Oil and Gas

JUL 26 2021

WV Department of
Environmental Protection

**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. Morris *Amy L. Morris*
 Its: Permitting Specialist - Appalachia Region

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment										
10*25518	7-8-1	A	DANNY S KEARNS	AMERICAN PETROLEUM PARTNERS LLC	1/8+	1010 532	N/A	American Petroleum Partners LLC to TH Exploration LLC: 43/515									
10*25520	7-8-1	A	DIENA J PALOMO	AMERICAN PETROLEUM PARTNERS LLC	1/8+	1009 357	N/A	American Petroleum Partners LLC to TH Exploration LLC: 43/515									
10*25522	7-8-1	A	REGINA D FIGUEROA	AMERICAN PETROLEUM PARTNERS LLC	1/8+	1010 535	N/A	American Petroleum Partners LLC to TH Exploration LLC: 43/515									
10*28697	9-9-14	B	DANNY S KEARNS	TH EXPLORATION LLC	1/8+	1075 134	N/A										
10*28698	9-9-14	B	DIENA JANINE PALOMO	TH EXPLORATION LLC	1/8+	1075 140	N/A										
10*28699	9-9-14	B	REGINA D FIGUEROA	TH EXPLORATION LLC	1/8+	1075 137	N/A										
10*19987	9-9-16	C	LESLEY D BALLA	TH EXPLORATION LLC	1/8+	955 103	N/A										
10*19993	9-9-16	C	DIANA D COSLUK	TH EXPLORATION LLC	1/8+	955 105	N/A										
10*19994	9-9-16	C	ELAINE A FORTES	TH EXPLORATION LLC	1/8+	950 35	N/A										
10*21117	9-9-16	C	JOELLYN JOHNSON	TH EXPLORATION LLC	1/8+	952 392	N/A										
10*21322	9-9-16	C	PHILLIP H WATY AND BILLIE A WATY	TH EXPLORATION LLC	1/8+	953 293	N/A										
10*22199	9-9-16	C	DONALD BROOKS WESLEY	BLUE ROAN RESOURCES LLC	1/8+	926 424	N/A	Blue Roan Resources LLC to TH Exploration LLC: 43/405									
10*22201	9-9-16	C	FREDERICK MAXWELL YEATER	BLUE ROAN RESOURCES LLC	1/8+	926 422	N/A	Blue Roan Resources LLC to TH Exploration LLC: 43/405									
10*22202	9-9-16	C	MARK DAVID HUNT	BLUE ROAN RESOURCES LLC	1/8+	935 109	N/A	Blue Roan Resources LLC to TH Exploration LLC: 43/405									
10*22203	9-9-16	C	MELISSA ELAINE SCHROTH	BLUE ROAN RESOURCES LLC	1/8+	934 471	N/A	Blue Roan Resources LLC to TH Exploration LLC: 43/405									
10*22526	9-9-16	C	BARBARA FURRI	TH EXPLORATION LLC	1/8+	964 528	N/A										
10*22528	9-9-16	C	RONALD DAKAN	TH EXPLORATION LLC	1/8+	964 530	N/A										
10*22553	9-9-16	C	DAVID H DAKAN	TH EXPLORATION LLC	1/8+	966 130	N/A										
10*22783	9-9-16	C	SUZANNE SWIFT	TH EXPLORATION LLC	1/8+	972 85	N/A										
10*23115	9-9-16	C	TIM A WILLIS AND DIANE CLARE WILLIS	TH EXPLORATION LLC	1/8+	988 138	N/A										
10*24047	9-9-16	C	BESSIE CARACHIAEL ET AL SHANE M MALLETT, SP COMM	TH EXPLORATION LLC	1/8+	1021 117	N/A										
10*24397	9-9-16	C	MARK D CHAMBERS AND SHERYL CHAMBERS	TH EXPLORATION LLC	1/8+	1023 163	N/A										
10*24398	9-9-16	C	TODD SCHERICH AND WANDA D SCHERICH	TH EXPLORATION LLC	1/8+	1023 160	N/A										
10*24413	9-9-16	C	BRADLEY S SCHERICH AND LEIGH SCHERICH	TH EXPLORATION LLC	1/8+	1023 157	N/A										
10*25494	9-12-11	D	CHRISTOPHER SINGER AND SHERA SINGER	TH EXPLORATION LLC	1/8+	878 433	N/A										
10*16484	9-12-11	D	PEGGY MARIE SEWOLD	TH EXPLORATION LLC	1/8+	942 445	N/A										
10*16485	9-12-11	D	NICHILLE ANN KNALUF	TH EXPLORATION LLC	1/8+	942 447	N/A										
10*24396	9-12-11	D	ELEANOR CHAMBERS	TH EXPLORATION LLC	1/8+	1023 166	N/A										
10*27847	9-12-11	D	STONE HILL MINERALS HOLDINGS LLC	TH EXPLORATION LLC	1/8+	1063 568	N/A										
10*19557	9-12-12	E	TERRY L BLAKE	TH EXPLORATION LLC	1/8+	944 649	N/A										
10*19558	9-12-12	E	ROBERT C BLAKE AND LYN BLAKE	TH EXPLORATION LLC	1/8+	944 646	N/A										
10*19561	9-12-12	E	JAMES R BLAIR	TH EXPLORATION LLC	1/8+	944 640	N/A										
10*19567	9-12-12	E	JOHN PURDY AND BRENDA S PURDY	TH EXPLORATION LLC	1/8+	944 637	N/A										
10*19569	9-12-12	E	CHARLES W WOOD	TH EXPLORATION LLC	1/8+	944 642	N/A										
10*19570	9-12-12	E	FALICE BUZZARD	TH EXPLORATION LLC	1/8+	947 561	N/A										
10*19571	9-12-12	E	MARLENE GARIN	TH EXPLORATION LLC	1/8+	945 4	N/A										
10*19631	9-12-12	E	BRADLEY S SCHERICH AND LEIGH SCHERICH	TH EXPLORATION LLC	1/8+	946 302	N/A										
10*19632	9-12-12	E	CHARLES W DOBBS AND JUDITH M DOBBS	TH EXPLORATION LLC	1/8+	944 644	N/A										
10*19633	9-12-12	E	TODD SCHERICH AND WANDA D SCHERICH	TH EXPLORATION LLC	1/8+	945 3	N/A										
10*19696	9-12-12	E	GARY F BLAKE AND DORIS E BLAKE	TH EXPLORATION LLC	1/8+	946 395	N/A										
10*21781	9-12-12	E	LINDA SUE BENNETT AND THOMAS BENNETT	TH EXPLORATION LLC	1/8+	958 426	N/A										
10*21882	9-12-12	E	PEGGY ANNETTE GARDNER & ROBERT W GARDNER	TH EXPLORATION LLC	1/8+	960 123	N/A										
10*21890	9-12-12	E	DARLA J KELIAS	TH EXPLORATION LLC	1/8+	960 111	N/A										
10*21896	9-12-12	E	REBECCA LYNN RITZ AND THOMAS A RITZ	TH EXPLORATION LLC	1/8+	960 44	N/A										
10*22396	9-12-12	E	NANCY JO FEINH	TH EXPLORATION LLC	1/8+	963 89	N/A										
10*23227	9-12-12	E	ROGER F CROSS	TH EXPLORATION LLC	1/8+	984 478	N/A										
10*24396	9-12-12	E	ELEANOR CHAMBERS	TH EXPLORATION LLC	1/8+	1023 166	N/A										
10*27709	9-12-12	E	WAVSTO UNCLAIMED PROPERTY	TH EXPLORATION LLC	1/8+	1058 514	N/A										
10*18988	7-8-4	F	MICHAEL R DOBBS AND LEANNE DOBBS	TH EXPLORATION LLC	1/8+	940 238	N/A										
10*18989	7-8-4	F	GREGG ALAN MILLER AND BETH ANN MILLER	TH EXPLORATION LLC	1/8+	940 236	N/A										
10*19499	7-8-4	F	CARLTON DOBBS JR AND MIRIAM PROKOPEKO	TH EXPLORATION LLC	1/8+	943 31	N/A										
10*21875	7-8-4	F	MELVIN J FRANKS	TH EXPLORATION LLC	1/8+	960 113	N/A										
10*21876	7-8-4	F	JAMES I STOLT	TH EXPLORATION LLC	1/8+	960 117	N/A										
10*21877	7-8-4	F	THOMAS BRIAN WARRICK	TH EXPLORATION LLC	1/8+	960 115	N/A										
10*22061	7-8-4	F	WILLIAM A WESTEN AND VICKE D WESTEN	TH EXPLORATION LLC	1/8+	960 54	N/A										
10*22062	7-8-4	F	TIMMY LEE STOUT AND DOROTHY MARIE STOUT	TH EXPLORATION LLC	1/8+	960 50	N/A										
10*22063	7-8-4	F	CHARLOTTE E MARRINER	TH EXPLORATION LLC	1/8+	960 56	N/A										
10*22087	7-8-4	F	CHESTNUT HOLDINGS INC	TH EXPLORATION LLC	1/8+	963 483	N/A										
10*22145	7-8-4	F	WATSON L MURPHREE AND ANGELA J MURPHREE	TH EXPLORATION LLC	1/8+	963 520	N/A										
10*22146	7-8-4	F	CLAUDE E DOBBS	TH EXPLORATION LLC	1/8+	963 522	N/A										
10*22148	7-8-4	F	ROBERT E ROUSH AND SARAH M ROUSH	TH EXPLORATION LLC	1/8+	961 528	N/A										
10*22197	7-8-4	F	GARY DOBBS AND PEGGY LEE DOBBS	TH EXPLORATION LLC	1/8+	953 545	N/A										
10*22251	7-8-4	F	BRIAN WILLIAM DOBBS AND LISA DOBBS	TH EXPLORATION LLC	1/8+	961 530	N/A										
10*22262	7-8-4	F	EDWARD S ROSENTHAL AND NANCY ANN GOLDBERG ROSENTHAL	TH EXPLORATION LLC	1/8+	961 524	N/A										
10*22298	7-8-4	F	JAMES C DORIA AND DEIRDRE G DORIA	TH EXPLORATION LLC	1/8+	961 526	N/A										
10*22299	7-8-4	F	PAUL RUSSELL AND MARY LOU RUSSELL	TH EXPLORATION LLC	1/8+	962 219	N/A										
10*22306	7-8-4	F	KAREN SUE BLAKE	TH EXPLORATION LLC	1/8+	963 416	N/A										
10*22390	7-8-4	F	CHARLES S CURRINGHAM AND CORA CURRINGHAM	TH EXPLORATION LLC	1/8+	962 582	N/A										
10*22391	7-8-4	F	JANA E BARRY	TH EXPLORATION LLC	1/8+	962 580	N/A										
10*22392	7-8-4	F	PAUL CRAIG CURRINGHAM	TH EXPLORATION LLC	1/8+	964 481	N/A										
10*22393	7-8-4	F	KEVIN W RANDOLPH AND BONNIE J RANDOLPH	TH EXPLORATION LLC	1/8+	963 94	N/A										
10*22393	7-8-4	F	CAREY J KENDALL AND HAZEL M KENDALL	TH EXPLORATION LLC	1/8+	962 584	N/A										
10*22398	7-8-4	F	JERRY I AND DONNA J GOLDBERG	TH EXPLORATION LLC	1/8+	963 101	N/A	N/A									

Lease ID	Parcel	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment										
10*22476	7-8-4	F	ROBERT E WEST	TH EXPLORATION LLC	1/8-	965 517	N/A										
10*22483	7-8-4	F	BEVERLY A LEDBETTER	TH EXPLORATION LLC	1/8-	965 530	N/A										
10*22486	7-8-4	F	RUDOLPH H PARSONS	TH EXPLORATION LLC	1/8-	965 534	N/A										
10*22529	7-8-4	F	MARY V DOBBS	TH EXPLORATION LLC	1/8-	964 483	N/A										
10*22530	7-8-4	F	MARK A CUNNINGHAM AND JOAN CUNNINGHAM	TH EXPLORATION LLC	1/8-	966 179	N/A										
10*22532	7-8-4	F	CHRISTOPHER L WRIGHT	TH EXPLORATION LLC	1/8-	966 181	N/A										
10*22552	7-8-4	F	DENNIS LEE WRIGHT AND MELINDA ANN WRIGHT	TH EXPLORATION LLC	1/8-	966 184	N/A										
10*22554	7-8-4	F	HARRY R WRIGHT JR	TH EXPLORATION LLC	1/8-	966 186	N/A										
10*22555	7-8-4	F	ANNA M WRIGHT	TH EXPLORATION LLC	1/8-	965 507	N/A										
10*22621	7-8-4	F	WILLIAM K MERRITT AND LINDA J MERRITT	TH EXPLORATION LLC	1/8-	965 505	N/A										
10*22622	7-8-4	F	RONALD L CROW AND GLENDA F CROW	TH EXPLORATION LLC	1/8-	965 503	N/A										
10*22623	7-8-4	F	ROGER L GARRISON AND MARYL T GARRISON	TH EXPLORATION LLC	1/8-	965 512	N/A										
10*22624	7-8-4	F	CHARLES WARREN AND LISA WARREN	TH EXPLORATION LLC	1/8-	965 509	N/A										
10*22625	7-8-4	F	MARVIN JERRY BLAKE AND LINDA D BLAKE	TH EXPLORATION LLC	1/8-	965 501	N/A										
10*22626	7-8-4	F	BRIAN K MASTERS AND MELINDA M MASTERS	TH EXPLORATION LLC	1/8-	968 266	N/A										
10*22722	7-8-4	F	DOROTHY L CUNNINGHAM	TH EXPLORATION LLC	1/8-	970 80	N/A										
10*22798	7-8-4	F	TREVOR HOOKS	TH EXPLORATION LLC	1/8-	972 100	N/A										
10*22799	7-8-4	F	ELIZABETH MALEY LEEK	TH EXPLORATION LLC	1/8-	972 91	N/A										
10*22805	7-8-4	F	DOLLEN HENRY	TH EXPLORATION LLC	1/8-	972 94	N/A										
10*22806	7-8-4	F	KIMBERLY HENRY	TH EXPLORATION LLC	1/8-	972 97	N/A										
10*22807	7-8-4	F	DUSTIN HENRY	TH EXPLORATION LLC	1/8-	974 192	N/A										
10*22823	7-8-4	F	RONALD A WYCHINSKI	TH EXPLORATION LLC	1/8-	974 194	N/A										
10*22831	7-8-4	F	JOHN THOMAS ERAZDUS AND JEAN R ERAZDUS	TH EXPLORATION LLC	1/8-	977 344	N/A										
10*22885	7-8-4	F	KURT J WENHMAN & DEBRA A WENHMAN	TH EXPLORATION LLC	1/8-	983 564	N/A										
10*23095	7-8-4	F	CHARLES B MASTERS AND KIMBERLY MASTERS	TH EXPLORATION LLC	1/8-	983 567	N/A										
10*23104	7-8-4	F	STEVEN D MASTERS AND MONICA M MASTERS	TH EXPLORATION LLC	1/8-	983 643	N/A										
10*23147	7-8-4	F	FRANCES V CARPENTER	TH EXPLORATION LLC	1/8-	983 645	N/A										
10*23151	7-8-4	F	BRADY J MCCORT	TH EXPLORATION LLC	1/8-	983 647	N/A										
10*23153	7-8-4	F	BENJAMIN MATHER AND REBECCA MATHER	TH EXPLORATION LLC	1/8-	984 1	N/A										
10*23177	7-8-4	F	JOSEPH F CHMIELEWSKI AND SANDRA CHMIELEWSKI	TH EXPLORATION LLC	1/8-	984 545	N/A										
10*23181	7-8-4	F	SHIRLEY ANN DOBBS	TH EXPLORATION LLC	1/8-	984 534	N/A										
10*23267	7-8-4	F	KATHARYN DAY LILLY	TH EXPLORATION LLC	1/8-	984 543	N/A										
10*23281	7-8-4	F	ALLEN R L DAVIS AND DIANA LEE PATTERSON DAVIS	TH EXPLORATION LLC	1/8-	984 3	N/A										
10*23282	7-8-4	F	CARL J CHMIELEWSKI AND KATHLEEN A CHMIELEWSKI	TH EXPLORATION LLC	1/8-	984 539	N/A										
10*23283	7-8-4	F	DEAN E GARRISON	TH EXPLORATION LLC	1/8-	988 109	N/A										
10*23351	7-8-4	F	BONNIE SUE PATTERSON SWISHER	TH EXPLORATION LLC	1/8-	988 111	N/A										
10*23352	7-8-4	F	KENNETH R DOBBS	TH EXPLORATION LLC	1/8-	984 541	N/A										
10*23354	7-8-4	F	LAWRENCE W CROW JR AND WANDA F CROW	TH EXPLORATION LLC	1/8-	1008 26	N/A										
10*23417	7-8-4	F	JOHN RUSSELL BECKER	TH EXPLORATION LLC	1/8-	1008 28	N/A										
10*23418	7-8-4	F	PAZLA BANKS AND PAUL BANKS	TH EXPLORATION LLC	1/8-	1009 116	N/A										
10*23636	7-8-4	F	JAMES MATHER	TH EXPLORATION LLC	1/8-	1009 114	N/A										
10*23641	7-8-4	F	BARBARA L ANDERSON	TH EXPLORATION LLC	1/8-	1010 334	N/A										
10*23689	7-8-4	F	STEPHEN B LEEK AND CYNTHIA S LEEK	TH EXPLORATION LLC	1/8-	1013 199	N/A										
10*23758	7-8-4	F	LUCY P SULLIVAN	TH EXPLORATION LLC	1/8-	1017 590	N/A										
10*23898	7-8-4	F	JAMES W CUNNINGHAM JR	TH EXPLORATION LLC	1/8-	1017 588	N/A										
10*23899	7-8-4	F	JORDAN LEE CUNNINGHAM	TH EXPLORATION LLC	1/8-	1019 479	N/A										
10*23919	7-8-4	F	EDNA JO DOBBS	TH EXPLORATION LLC	1/8-	1020 362	N/A										
10*23950	7-8-4	F	JUSTIN VAN MEETER	TH EXPLORATION LLC	1/8-	1020 201	N/A										
10*23951	7-8-4	F	CHRISTOPHER VAN MEETER	TH EXPLORATION LLC	1/8-	1019 477	N/A										
10*24015	7-8-4	F	SCOTT D GOLDMAN	TH EXPLORATION LLC	1/8-	1020 203	N/A										
10*24036	7-8-4	F	PAULA JO WRIGHT	TH EXPLORATION LLC	1/8-	1020 205	N/A										
10*24037	7-8-4	F	CHRISTOPHER A KELLY B MICHELLE A WRIGHT	TH EXPLORATION LLC	1/8-	1020 207	N/A										
10*24038	7-8-4	F	CHARLES GREGORY WRIGHT	TH EXPLORATION LLC	1/8-	1020 364	N/A										
10*24084	7-8-4	F	EDWIN M MICHEL AND KIMBERLY B MICHEL	TH EXPLORATION LLC	1/8-	1023 510	N/A										
10*24201	7-8-4	F	PATRICIA BUTTER	TH EXPLORATION LLC	1/8-	1024 307	N/A										
10*24348	7-8-4	F	BARBARA H SMOAKS	TH EXPLORATION LLC	1/8-	1026 215	N/A										
10*24549	7-8-4	F	WILLIAM L LEEK	TH EXPLORATION LLC	1/8-	1026 217	N/A										
10*24560	7-8-4	F	LARRY D FROST AND LORRAINE L FROST	TH EXPLORATION LLC	1/8-	1026 220	N/A										
10*24662	7-8-4	F	RAMONA K SPRINGER AND RICHARD D SPRINGER	TH EXPLORATION LLC	1/8-	1026 224	N/A										
10*24664	7-8-4	F	LISA L SNEAKS AND JAMES C SNEAKS	TH EXPLORATION LLC	1/8-	1026 223	N/A										
10*24670	7-8-4	F	SUZANNE FROST	TH EXPLORATION LLC	1/8-	1027 130	N/A										
10*24692	7-8-4	F	DAVID ROSARIO JR AND JULIE A ROSARIO	TH EXPLORATION LLC	1/8-	1028 594	N/A										
10*24915	7-8-4	F	BETTY G TREMELLING	TH EXPLORATION LLC	1/8-	1028 591	N/A										
10*24916	7-8-4	F	BRENDA L NEUHART	TH EXPLORATION LLC	1/8-	1028 621	N/A										
10*25003	7-8-4	F	LINDA L POTTS AND DONALD D POTTS	TH EXPLORATION LLC	1/8-	1033 121	N/A										
10*25572	7-8-4	F	FRICA S OWEN AND MATTHEW J OWEN	TH EXPLORATION LLC	1/8-	1033 308	N/A										
10*25653	7-8-4	F	GLADYS FRAZIER KING	TH EXPLORATION LLC	1/8-	1034 581	N/A										
10*25717	7-8-4	F	DONALD A FRAZER	TH EXPLORATION LLC	1/8-	1037 444	N/A										
10*26501	7-8-4	F	DAVID GIBSON AND REBECCA FRAZER GIBSON	TH EXPLORATION LLC	1/8-	1038 508	N/A										
10*26561	7-8-4	F	GARI JO STACKHOUSE	TH EXPLORATION LLC	1/8-	1045 446	N/A										
10*26894	7-8-4	F	PATRICK T MCHUELL	TH EXPLORATION LLC	1/8-	1053 500	N/A										
10*27139	7-8-4	F	BRENDA LOU BENTZ	TH EXPLORATION LLC	1/8-	1053 7	N/A										
10*27246	7-8-4	F	CARROLL W FRAZER	TH EXPLORATION LLC	1/8-	1058 393	N/A										
10*27351	7-8-4	F	ELBERT ROBERT FRAZER	TH EXPLORATION LLC	1/8-	1058 526	N/A										

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10*28374	7-8-4	F	DAVID DOBBS	SWN PRODUCTION COMPANY LLC	1/8+	956 122	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28375	7-8-4	F	RONALD D DOBBS SOLE & SEPARATE PROPERTY	SWN PRODUCTION COMPANY LLC	1/8+	956 118	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28530	7-8-4	F	GREGG S GOLDMAN	TH EXPLORATION LLC	1/8+	1071 583	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28574	7-8-4	F	DAWE LACKEY	TH EXPLORATION LLC	1/8+	1071 577	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28576	7-8-4	F	RUSSELL S CONNER AND CATHY SUE CONNER	TH EXPLORATION LLC	1/8+	1071 565	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28578	7-8-4	F	THE BETTY J DOBBS TRUST SUE ELLEN GOLDSTEIN	TH EXPLORATION LLC	1/8+	1071 559	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28580	7-8-4	F	AUGUSTA L SPIHER	TH EXPLORATION LLC	1/8+	1071 553	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28583	7-8-4	F	THE VIRGINIA L RAPOZA LIVING TRUST DOUGLAS J HOLLOBAUGH	TH EXPLORATION LLC	1/8+	1071 589	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28585	7-8-4	F	DAVID J MINOR	TH EXPLORATION LLC	1/8+	1071 571	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*29763	9-12-17	G	GEORGE F POLAND AND MELVA J POLAND	TH EXPLORATION LLC	1/8+	1014 542	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*29764	9-12-17	G	RACHEL A SINGELL AND ROBERT A SINGELL	TH EXPLORATION LLC	1/8+	1014 545	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*29825	9-12-17	G	HEAN A PYLE	TH EXPLORATION LLC	1/8+	1014 548	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*29841	9-12-17	G	SHIRLEY E BURTON AND ORLA D BURTON	TH EXPLORATION LLC	1/8+	1016 604	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*31103	9-12-17	G	J C MCILVAH AND M J MCILVAH	SOUTH PENN OIL COMPANY	1/8+	49 478	South Penn Oil Company to South Penn Natural Gas Company: 209/553	South Penn Oil Company (1968-1977) aka Pennzoil Company (1889-1963) or Pennzoil United Inc	Pennzoil Company to Pennzoil Products Company: 520/328	Penn Energy Exploration and Production Company LLC, formerly Pennzoil, and Devon Energy Production Company LP merger: 18/435	Devon Energy Production Company LP to East Resources Inc: 618/3	East Resources Inc to McElroy Coal Company: 16/74	McElroy Coal Company, Consolidation Coal Company et al to CRX Gas Company LLC: 646/493	CRX Gas Company LLC to Noble Energy Inc: 26/215 & 37/169	Noble Energy Inc to HG Energy B Appalachia LLC: 39/1	HG Energy B Appalachia LLC to TH Exploration LLC: 49/142
10*33442	9-12-17	G	WILSON J AND REGGY ELLEN ADAMS	TH EXPLORATION LLC	1/8+	1016 601	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*33452	9-12-17	G	JAMICE LEE EARNEST	TH EXPLORATION LLC	1/8+	1016 599	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*33554	9-12-17	G	JOSEPH R LOGSDON	TH EXPLORATION LLC	1/8+	1016 597	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*33854	9-12-17	G	PATRICIA CHINHECK AND JOSEPH CHINHECK	TH EXPLORATION LLC	1/8+	1017 605	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*33900	9-12-17	G	PAGE WILLIAM GALLAGHER AND SUZANNE GALLAGHER	TH EXPLORATION LLC	1/8+	1021 108	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*33901	9-12-17	G	DONNA F EARNEST AND LLOYD L EARNEST	TH EXPLORATION LLC	1/8+	1017 611	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*33921	9-12-17	G	MARGARET B JOHNSON AND BRENT JOHNSON	TH EXPLORATION LLC	1/8+	1019 407	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*33922	9-12-17	G	WILLIAM N LOGSDON	TH EXPLORATION LLC	1/8+	1019 481	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*34039	9-12-17	G	JOHN GALLAGHER AND GERALDINE GALLAGHER	TH EXPLORATION LLC	1/8+	1020 209	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*34117	9-12-17	G	IAN MICHEL DUNLAP	TH EXPLORATION LLC	1/8+	1021 140	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*34121	9-12-17	G	CASSANDRA J SHERMAN AND RICHARD SHERMAN	TH EXPLORATION LLC	1/8+	1021 119	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*34268	9-12-17	G	BARBARA RAY DAVIS AND MICHAEL A DAVIS	TH EXPLORATION LLC	1/8+	1023 531	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*34353	9-12-17	G	SHARAE SAMS	TH EXPLORATION LLC	1/8+	1024 301	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*34460	9-12-17	G	KATHRYN R BOWMAN AUF DENNIS B BOWMAN	TH EXPLORATION LLC	1/8+	1025 439	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*34500	9-12-17	G	PATRICIA LYNN GATTS AND HARLEY L GATTS	TH EXPLORATION LLC	1/8+	1025 340	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*34601	9-12-17	G	JACQUELINE BENNETT AND MARVIN R BENNETT	TH EXPLORATION LLC	1/8+	1017 614	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*35175	9-12-17	G	PAUL ALBERT MORTE	TH EXPLORATION LLC	1/8+	1029 461	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*35625	9-12-17	G	WVSTO UNCLAIMED PROPERTY	TH EXPLORATION LLC	1/8+	1072 398	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*36043	9-12-17	G	STONE HILL MINERALS HOLDINGS LLC	TH EXPLORATION LLC	1/8+	1028 366	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*37176	9-12-17	G	CAROL JEAN WHIPKEY	TH EXPLORATION LLC	1/8+	965 566	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*37343	9-12-17	G	THE WHIPKEY TRUST	TH EXPLORATION LLC	1/8+	965 569	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*37399	9-12-17	G	VIRGINIA E HAGIN AND RANDOLPH HAGIN	TH EXPLORATION LLC	1/8+	960 516	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*28320	7-8-8	H	ELIZABETH JANE KELLEY	SWN PRODUCTION COMPANY LLC	1/8+	957 597	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21112	7-8-8	H	CLARENCE C STOVER JR AND LOU E STOVER	TH EXPLORATION LLC	1/8+	952 382	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21113	7-8-8	H	JAMES H STOVER AND LORETTA J STOVER	TH EXPLORATION LLC	1/8+	952 380	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23114	7-8-8	H	JACK G ALEXANDER AND MARIE S ALEXANDER	TH EXPLORATION LLC	1/8+	952 376	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23116	7-8-8	H	CHARLES E RICHARDSON AND SHIRLEY S RICHARDSON	TH EXPLORATION LLC	1/8+	952 378	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23250	7-8-8	H	CATHERINE V GARRISON & VICTOR C GARRISON	TH EXPLORATION LLC	1/8+	961 518	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23237	7-8-8	H	LA MAE MCCONALGHEY	TH EXPLORATION LLC	1/8+	974 196	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23246	7-8-8	H	JAN K GRIMES SIMPACHER	TH EXPLORATION LLC	1/8+	1011 547	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*25555	7-8-8	H	MARGIE M DAVENPORT	TH EXPLORATION LLC	1/8+	1033 124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*26510	7-8-8	H	JOHN ALFRED DOBBS AND LEORA JEAN DOBBS	TH EXPLORATION LLC	1/8+	1037 440	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*27287	7-8-8	H	JULIA ANN WALTON AUF NANCY MARXAR	TH EXPLORATION LLC	1/8+	1058 395	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*29323	7-8-8	H	WV DEPT OF TRANSPORTATION DIV OF HWYS	TH EXPLORATION LLC	1/8+	1090 130	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

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ASSIGNMENT OF OIL AND GAS LEASES

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

WITNESSETH:

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

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

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

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

3. **Successors and Assigns**. The terms of this Assignment shall be binding upon and inure to the benefit of the parties hereto and each of their respective successors and assigns, and such terms shall be covenants running with the land, and with each subsequent transfer or assignment thereof.

4. **Further Assurances**. 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.

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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**

Section 1.1 Assignment. 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 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.

Section 1.2 Assignment Subject to Acreage Trade Agreement. 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 Special Warranty of Title. 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.

(a) EXCEPT AS EXPRESSLY REPRESENTED OTHERWISE IN SECTION VI 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 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

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EXHIBIT "A"

LEASE(S)

Lessor	Lessee	Lease #	TMP (reference only)	Acreage	Date	Book/ Page	District	County	State
J.C. McIlvain, et ux	South Penn Oil Company	30295-50	9-12-17, 7-8-7	50.00	10/11/1898	49 /478	Meade/Liberty	Marshall	WV

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Marshall County
Jan Post, Clerk
Instrument 1479598
07/21/2021 @ 09:34:53 AM
ASSIGNMENTS
Book 49 @ Page 142
Pages Recorded 7
Recording Cost \$ 14.00

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

Date of Notice Certification: 07/21/2021

API No. 47- 051 - 02395
 Operator's Well No. Fitzgerald S-5HM
 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:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>530,701.74</u>
County:	<u>Marshall</u>		Northing:	<u>4,405,760.72</u>
District:	<u>Liberty</u>	Public Road Access:	<u>Rines Ridge Road (County Route 76)</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>Danny S. Kerns, et al</u>	
Watershed:	<u>Upper Fish Creek</u>			

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

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

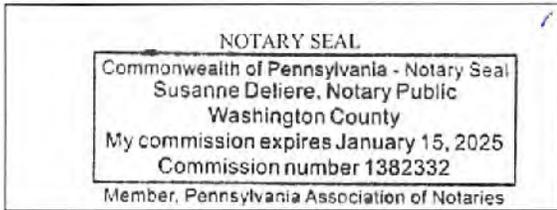
The Operator shall attach to this Notice Certification Form all Notice Forms and Certifications of Notice that have been provided to the required parties and/or any associated written waivers. For the Public Notice, the operator shall attach a copy of the Class II Legal Advertisement with publication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

08/27/2021

Certification of Notice is hereby given:

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

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



Subscribed and sworn before me this 20th day of July 2021.
Susanne Deliere Notary Public
 My Commission Expires 1/15/2025

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.

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**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: 7/20/2021 **Date Permit Application Filed:** 7/23/2021

Notice of:

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

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

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

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

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

SURFACE OWNER(s)

Name: Regina D. Figueroa
Address: 94 E. 700 N
Valparaiso, IN 46383

Name: Danny S. Kerns *See attached list
Address: 3500 West 80th Place
Merrillville, IN 46410

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

Name: Regina D. Figueroa
Address: 94 E. 700 N
Valparaiso, IN 46383

Name: Danny S. Kerns *See attached list
Address: 3500 West 80th Place
Merrillville, IN 46410

SURFACE OWNER(s) (Impoundments or Pits)

Name: _____
Address: _____

COAL OWNER OR LESSEE

Name: Consol Energy
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

COAL OPERATOR

Name: Marshall County Coal Resources, Inc. attn: Steve Blair
Address: 46226 National Road
St. Clairsville, OH 43905

SURFACE OWNER OF WATER WELL AND/OR WATER PURVEYOR(s)

Name: Danny R. Kerns *See attached list
Address: 3500 West 80th Place
Merrillville, IN 46410

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: _____
Address: _____

*Please attach additional forms if necessary

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Office of Oil and Gas

JUL 26 2021

WV Department of
Environmental Protection

JUL 28 2021

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

08/27/2021

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

JUL 26 2021

WV Department of
Environmental 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.**

08/27/2021

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

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WW-6A
(8-13)

API NO. 47- 051 - 02395
OPERATOR WELL NO. Fitzgerald S-6HM
Well Pad Name: Fitzgerald

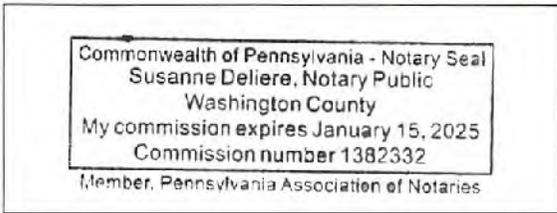
Notice is hereby given by:

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

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

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 20th day of July, 2021.
Susanne Deliere Notary Public
My Commission Expires 1/15/2025

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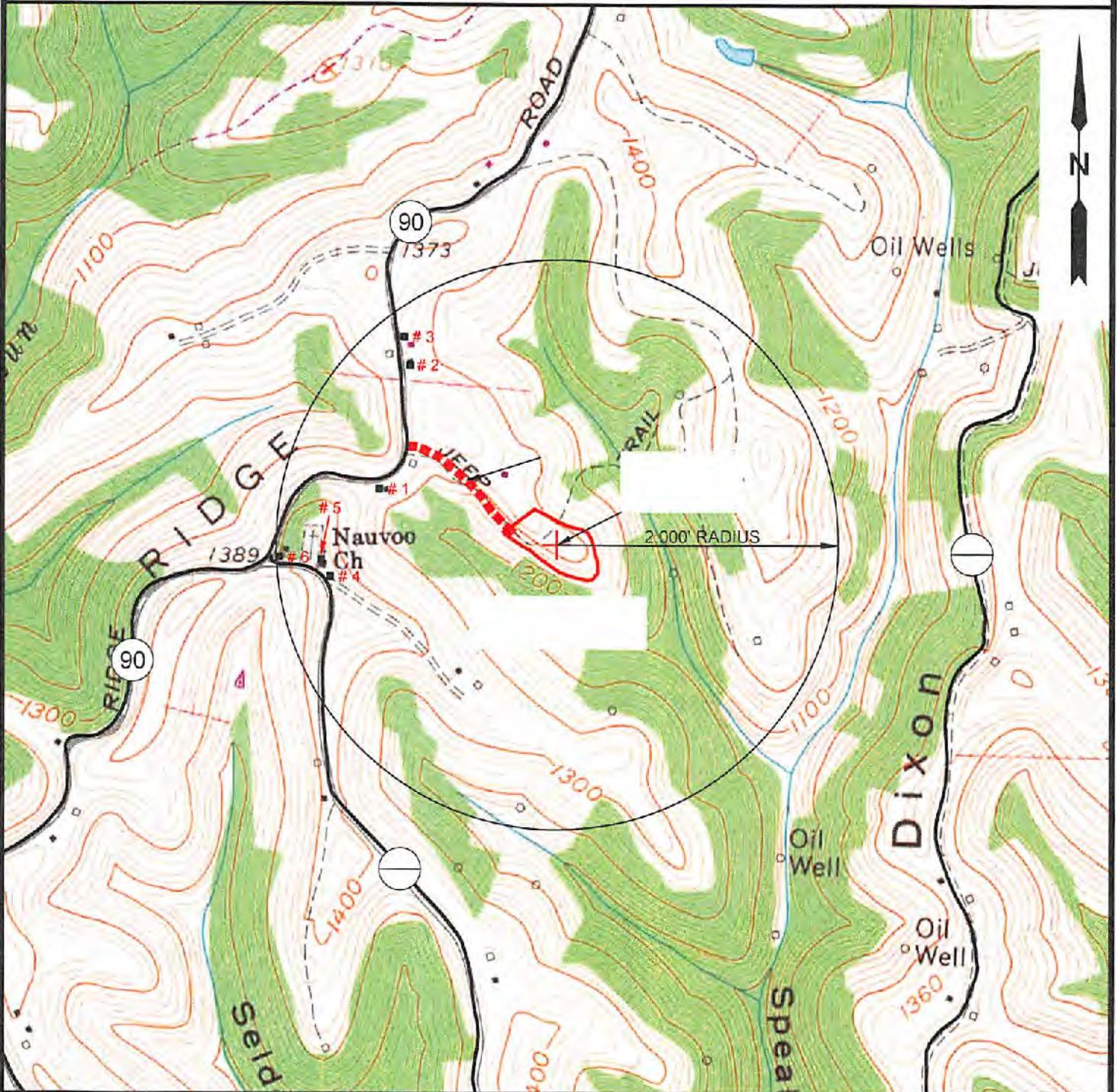
08/27/2021

47051 02395

WW-6A

PROPOSED FITZGERALD S - 5HM

SUPPLEMENT PG. 1B



NOTE: THERE APPEARS TO BE FIVE (5) POSSIBLE WATER SOURCES WITHIN 2,000'.

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12 Vanhook Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5634
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296
slswv.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5' & CAMERON 7.5'		PREPARED FOR: TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	
COUNTY	DISTRICT		
MARSHALL	LIBERTY & MEADE		
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8910	03/03/2020	1" = 1000'



WV Department of Environmental Protection
TUG HILL
OPERATING

08/27/2021

4705102395

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 – 5HM
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.

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

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WW-6A NOTICE OF APPLICATION

FITZGERALD PAD

ADDITIONAL PARTIES TO NOTICE

Surface Owner (Pad and Access Road)

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

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Operator Well No. Fitzgerald S-5HM

WW-6A3
(1/12)

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:** 6/3/2019

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

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

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

Notice is hereby provided to:

SURFACE OWNER(s)

Name: Regina D. Figueroa
Address: 94 E 700 N
Valparaiso, IN 46383

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

Name: Deena J. Palomo
Address: 20 Maxwell St., Apt. 4
Hebron, IN 46341

COAL OWNER OR LESSEE

Name: Consol Energy Attn: Casey Saunders
Address: 1000 Consol Energy Drive
Canonsburg, PA 15317

MINERAL OWNER(s)

Name: Regina D. Figueroa
Address: 94 E 700 N
Valparaiso, IN 46383 *See attached list
*please attach additional forms if necessary

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JUL 26 2021
WV Department of Environmental Protection

Notice is hereby given:

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

State: <u>West Virginia</u>	Approx. Latitude & Longitude: <u>39.80120264; -80.64143991</u>
County: <u>Marshall</u>	Public Road Access: <u>County Route 90</u>
District: <u>Liberty</u>	Watershed: <u>Upper Fish Creek</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Danny & Frances Kerns Estate</u>

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

Notice is hereby given by:

Well Operator: Tug Hill Operating, LLC

Telephone: 724-749-8388

Email: amiller@tug-hilltop.com

Address: 380 Southpointe Boulevard, Plaza II, Suite 200
Canonsburg, PA 15317

Facsimile: 724-338-2030

Oil and Gas Privacy Notice:

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

08/27/2021

**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

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WW-6A5
(1/12)

Operator Well No. Fitzgerald S-5HM

**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: 07/20/2021 **Date Permit Application Filed:** 07/23/2021

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

CERTIFIED MAIL HAND
RETURN RECEIPT REQUESTED DELIVERY

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

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

Name: Regina D. Figueroa
Address: 94 E 700 N
Valparaiso, IN 46383

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

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JUL 26 2021
WV Department of
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Notice is hereby given:

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

State:	<u>West Virginia</u>	UTM NAD 83	Easting:	<u>530,701.74</u>
County:	<u>Marshall</u>		Northing:	<u>4,405,760.72</u>
District:	<u>Liberty</u>	Public Road Access:	<u>Rines Ridge Road (County Route 76)</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>Danny R. Kerns, et al</u>	
Watershed:	<u>Upper Fish Creek (HUC 10)</u>			

This Notice Shall Include:

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

Well Operator: Tug Hill Operating, LLC
Telephone: 724-749-9398
Email: amorris@tug-hill-op.com

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

Oil and Gas Privacy Notice:

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

08/27/2021

4705102395

WW-6A5 NOTICE OF PLANNED OPERATION

FITZGERALD PAD

ADDITIONAL PARTIES TO NOTICE

Surface Owner (Pad and Access Road)

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

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

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

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

June 2, 2021

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

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JUL 26 2021
WV Department of
Environmental Protection

Subject: DOH Permit for the Fitzgerald Pad, Marshall County
Fitzgerald S-5HM 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 at MP 4.42.

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. This letter is valid for permitting purposes for one year from the date of this letter.

Very Truly Yours,

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

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



PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Fitzgerald Wells

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

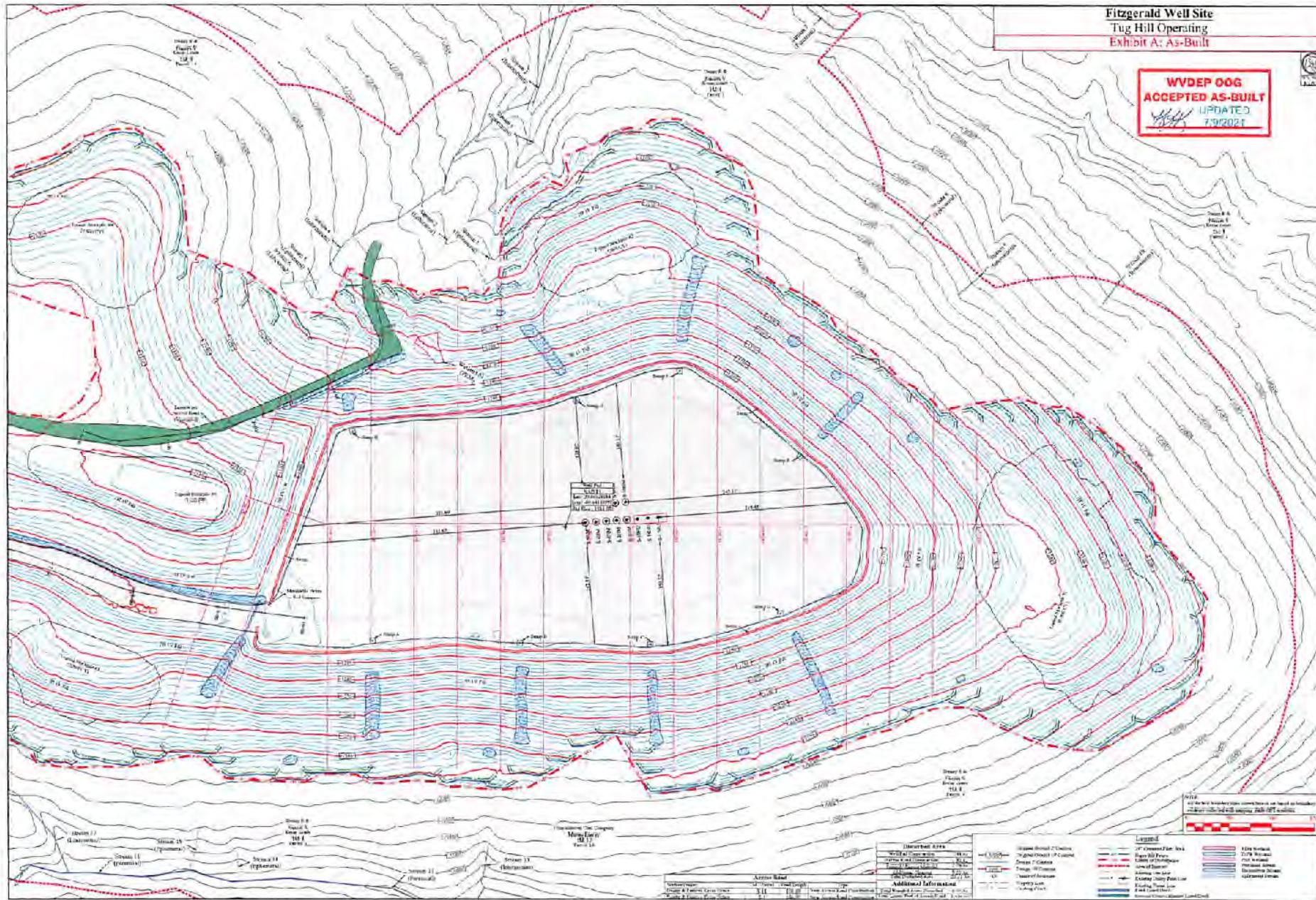
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Office of Oil and Gas

JUL 26 2021

WV Department of
Environmental Protection

Fitzgerald Well Site
Tug Hill Operating
Exhibit A: As-Built

WVDEP O&G
ACCEPTED AS-BUILT
UPDATED
7/9/2021



TUG HILL
O&G OPERATIONS

 THIS DOCUMENT PREPARED FOR
TUG HILL OPERATING

 Fitzgerald Well Site
Liberty District
Marshall County, WV
 Date: 06/15/21
 Scale: As Shown
 Drawn By: JSE
 File No.:
 Sheet 06 of 10

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