



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

Wednesday, March 10, 2021
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

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

Re: Permit Modification Approval for GOUDY 1S-10HM
47-051-02201-00-00

Extended lateral length

TUG HILL OPERATING, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

A handwritten signature in blue ink, appearing to read 'James A. Martin', is positioned above the printed name and title.

James A. Martin
Chief

Operator's Well Number: GOUDY 1S-10HM
Farm Name: TH EXPLORATION III, LLC
U.S. WELL NUMBER: 47-051-02201-00-00
Horizontal 6A New Drill
Date Modification Issued: March 10, 2021

Promoting a healthy environment.

03/12/2021

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 Franklin New Martinsville
Operator ID County District Quadrangle

2) Operator's Well Number: Goudy 1S-10HM Well Pad Name: Goudy

3) Farm Name/Surface Owner: TH Exploration III, LLC Public Road Access: Wells Hill Road (County Route 2/2)

4) Elevation, current ground: 1242' Elevation, proposed post-construction: 1242'

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

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s): 1-14-21
Marcellus is the target formation at a depth of 6372' - 6430' thickness of 58' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,530'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 19,419'

11) Proposed Horizontal Leg Length: 12,075.30'

12) Approximate Fresh Water Strata Depths: 70', 863'

13) Method to Determine Fresh Water Depths: Use shallow offset wells to determine deepest freshwater. Or determine using predrill tests, testing while drilling or petrophysical evaluation of resistivity.

14) Approximate Saltwater Depths: 1,480'

15) Approximate Coal Seam Depths: Sewickly Coal - 762' and Pittsburgh Coal - 857'

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

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

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

Bang Stilly
1-14-21

18)

CASING AND TUBING PROGRAM

TYPE	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</u>
Conductor	30"	NEW	BW	BW	120'	120'	259FT^3(CTS)
Fresh Water	13 3/8"	NEW	H40	48#	970'	970'	1024ft^3(CTS)
Coal	13 3/8"	NEW	H40	48#	970'	970'	1024ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,652'	2,652'	878ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	19,419'	19,419'	4957ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		7,330'	
Liners							

Bony Stiller 1/14/21

TYPE	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17 1/2"	.33	2,740	2,740	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.33	2,740	2,740	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.

Bang Sllg 1/14/21

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

Well to be completed with approximately 26,412,500 lb. proppant and 408,357 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 11.56 acres

22) Area to be disturbed for well pad only, less access road (acres): 5.81 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

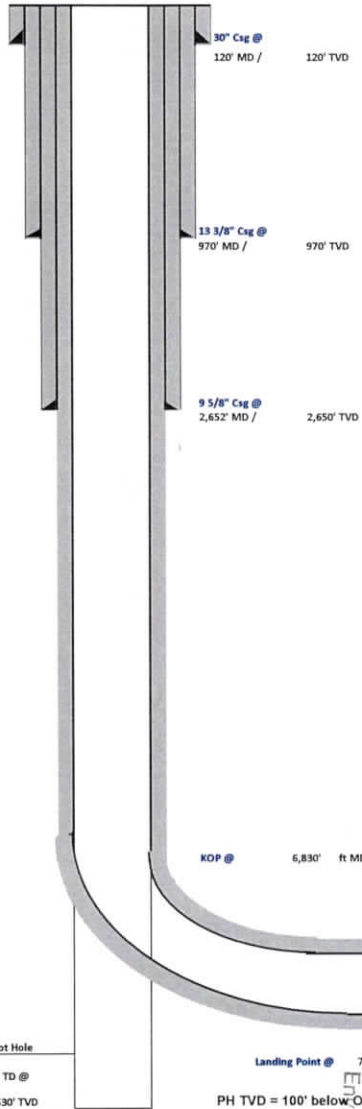
25) Proposed borehole conditioning procedures:

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

*Note: Attach additional sheets as needed.



WELL NAME: Goudy 15-10HM
 STATE: WV COUNTY: Marshall
 DISTRICT: Franklin
 DF Elev: 1,242' GL Elev: 1,242'
 TD: 19,419'
 TH Latitude: 39.73701788
 TH Longitude: -80.8286945
 BH Latitude: 39.70176901
 BH Longitude: -80.80484101



FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	863
Sewickley Coal	762
Pittsburgh Coal	857
Big Lime	1915
Weir	2303
Berea	2458
Gordon	2804
Rhinestreet	5810
Genesee/Burkett	6323
Tully	6343
Hamilton	6363
Marcellus	6372
Landing Depth	6407
Onondaga	6430
Pilot Hole Depth	6530

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	970'	970'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	2,652'	2,650'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	19,419'	6,619'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,030	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	885	A	15	Air	1 Centralizer every other jt
Production	4,557	A	14.5	Air / SOBMM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to sfc

Pilot Hole
 PH TD @ 6,530' TVD
 Landing Point @ 7,346' MD / 6,407' TVD
 PH TVD = 100' below Onondaga Top

Lateral TD @ 19,419' ft MD
 6,619' ft TVD

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Tug Hill Operating, LLC Casing and Cement Program

Goudy 1S-10HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	970'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,652'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	19,419'	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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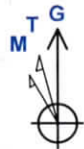
Well: Goudy 1S-10HM (J)
 Site: Goudy
 Project: Marshall County, West Virginia.
 Design: rev5

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	0.00	0.00	
2	1300.00	0.00	0.00	1300.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 1°/100' build
3	1600.00	3.00	120.00	1599.86	-3.93	6.80	1.00	120.00	6.64	Begin 3.00° tangent
4	2801.78	3.00	120.00	2800.00	-35.37	61.27	0.00	0.00	59.81	Begin 2°/100' build/turn
5	2913.82	5.00	135.00	2911.76	-40.29	67.26	2.00	35.24	66.95	Begin 2°/100' build
6	3213.82	11.00	135.00	3208.70	-69.80	96.77	2.00	0.00	106.79	Begin 2°/100' build/turn
7	3700.00	19.14	156.36	3678.11	-175.86	161.68	2.00	45.00	230.87	Begin 2°/100' build
8	3893.15	23.00	156.36	3858.31	-239.46	189.51	2.00	0.00	300.12	Begin 2°/100' build/turn
9	4790.14	40.00	145.00	4620.97	-639.43	427.06	2.00	-24.28	764.67	Begin 40.00° tangent
10	5790.14	40.00	145.00	5387.01	-1165.97	795.75	0.00	0.00	1402.26	Begin 2°/100' turn
11	6690.14	40.00	172.99	6076.45	-1700.68	1001.06	2.00	90.00	1971.12	Begin 40.00° tangent
12	6830.14	40.00	172.99	6183.70	-1790.00	1012.05	0.00	0.00	2055.30	Begin 8°/100' build/turn
13	6956.38	50.00	175.00	6272.86	-1878.67	1021.23	8.00	8.81	2138.08	Begin 10°/100' build
14	7346.38	89.00	175.00	6406.81	-2235.59	1052.46	10.00	0.00	2468.59	Begin 89.00° lateral
15	7601.38	89.00	175.00	6411.26	-2489.58	1074.68	0.00	0.00	2703.79	Begin 2°/100' turn
16	8852.10	88.99	149.98	6433.51	-3672.71	1447.93	2.00	-90.24	3924.79	Begin 89.00° lateral
17	19419.45	88.99	149.98	6619.00	-12821.22	6733.69	0.00	0.0014481.93		PBHL/TD 19419.45 MD /6619.00 TVD

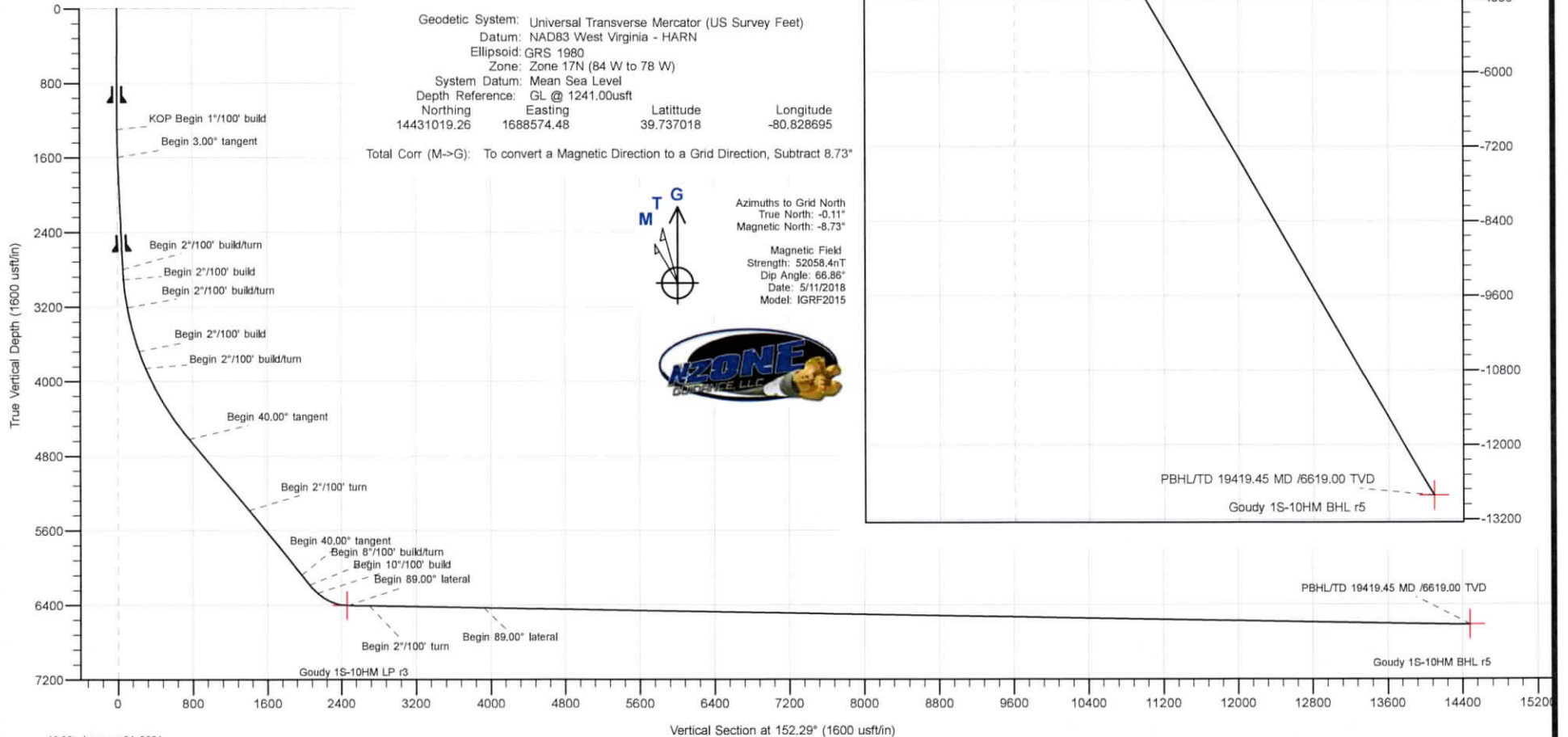
Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1980
 Zone: Zone 17N (84 W to 78 W)
 System Datum: Mean Sea Level
 Depth Reference: GL @ 1241.00usft
 Northing: 14431019.26 Easting: 1688574.48 Latitude: 39.737018 Longitude: -80.828695

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.73°



Azimuths to Grid North
 True North: -0.11°
 Magnetic North: -8.73°

Magnetic Field
 Strength: 52058.4nT
 Dip Angle: 66.86°
 Date: 5/11/2018
 Model: IGRF2015





Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Goudy 1S-10HM (J)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1241.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1241.00usft
Site:	Goudy	North Reference:	Grid
Well:	Goudy 1S-10HM (J)	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	Goudy				
Site Position:		Northing:	14,430,942.40 usft	Latitude:	39.736807
From:	Lat/Long	Easting:	1,688,559.77 usft	Longitude:	-80.828748
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "		

Well	Goudy 1S-10HM (J)					
Well Position	+N/-S	0.00 usft	Northing:	14,431,019.26 usft	Latitude:	39.737018
	+E/-W	0.00 usft	Easting:	1,688,574.48 usft	Longitude:	-80.828695
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level:	1,241.00 usft
Grid Convergence:	0.11 °					

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/11/2018	-8.62	66.86	52,058.41136666

Design	rev5			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	152.29

Plan Survey Tool Program	Date	1/4/2021		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	19,419.45 rev5 (Original Hole)	MWD MWD - Standard	

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Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1241.00usft
Site:	Goudy	North Reference:	Grid
Well:	Goudy 1S-10HM (J)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,600.00	3.00	120.00	1,599.86	-3.93	6.80	1.00	1.00	0.00	120.00	
2,801.78	3.00	120.00	2,800.00	-35.37	61.27	0.00	0.00	0.00	0.00	
2,913.82	5.00	135.00	2,911.76	-40.29	67.26	2.00	1.79	13.39	35.24	
3,213.82	11.00	135.00	3,208.70	-69.80	96.77	2.00	2.00	0.00	0.00	
3,700.00	19.14	156.36	3,678.11	-175.86	161.68	2.00	1.67	4.39	45.00	
3,893.15	23.00	156.36	3,858.31	-239.46	189.51	2.00	2.00	0.00	0.00	
4,790.14	40.00	145.00	4,620.97	-639.43	427.06	2.00	1.90	-1.27	-24.28	
5,790.14	40.00	145.00	5,387.01	-1,165.97	795.75	0.00	0.00	0.00	0.00	
6,690.14	40.00	172.99	6,076.45	-1,700.68	1,001.06	2.00	0.00	3.11	90.00	
6,830.14	40.00	172.99	6,183.70	-1,790.00	1,012.05	0.00	0.00	0.00	0.00	
6,956.38	50.00	175.00	6,272.86	-1,878.67	1,021.23	8.00	7.92	1.59	8.81	
7,346.38	89.00	175.00	6,406.81	-2,235.59	1,052.46	10.00	10.00	0.00	0.00	
7,601.38	89.00	175.00	6,411.26	-2,489.58	1,074.68	0.00	0.00	0.00	0.00	
8,852.10	88.99	149.98	6,433.51	-3,672.71	1,447.93	2.00	0.00	-2.00	-90.24	
19,419.45	88.99	149.98	6,619.00	-12,821.22	6,733.69	0.00	0.00	0.00	0.00	Goudy 1S-10HM BHL

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Planning Report - Geographic

Database: DB_Dec2220_v16
 Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia.
 Site: Goudy
 Well: Goudy 1S-10HM (J)
 Wellbore: Original Hole
 Design: rev5

Local Co-ordinate Reference: Well Goudy 1S-10HM (J)
 TVD Reference: GL @ 1241.00usft
 MD Reference: GL @ 1241.00usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
100.00	0.00	0.00	100.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
200.00	0.00	0.00	200.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
300.00	0.00	0.00	300.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
400.00	0.00	0.00	400.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
500.00	0.00	0.00	500.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
600.00	0.00	0.00	600.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
700.00	0.00	0.00	700.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
800.00	0.00	0.00	800.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
900.00	0.00	0.00	900.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,431,019.26	1,688,574.48	39.737018	-80.828695	
KOP Begin 1°/100' build										
1,400.00	1.00	120.00	1,399.99	-0.44	0.76	14,431,018.82	1,688,575.23	39.737017	-80.828692	
1,500.00	2.00	120.00	1,499.96	-1.75	3.02	14,431,017.52	1,688,577.50	39.737013	-80.828684	
1,600.00	3.00	120.00	1,599.86	-3.93	6.80	14,431,015.33	1,688,581.28	39.737007	-80.828671	
Begin 3.00° tangent										
1,700.00	3.00	120.00	1,699.73	-6.54	11.33	14,431,012.72	1,688,585.81	39.737000	-80.828654	
1,800.00	3.00	120.00	1,799.59	-9.16	15.87	14,431,010.10	1,688,590.34	39.736993	-80.828638	
1,900.00	3.00	120.00	1,899.45	-11.78	20.40	14,431,007.48	1,688,594.87	39.736986	-80.828622	
2,000.00	3.00	120.00	1,999.31	-14.39	24.93	14,431,004.87	1,688,599.41	39.736978	-80.828606	
2,100.00	3.00	120.00	2,099.18	-17.01	29.46	14,431,002.25	1,688,603.94	39.736971	-80.828590	
2,200.00	3.00	120.00	2,199.04	-19.63	33.99	14,430,999.63	1,688,608.47	39.736964	-80.828574	
2,300.00	3.00	120.00	2,298.90	-22.24	38.53	14,430,997.02	1,688,613.00	39.736957	-80.828558	
2,400.00	3.00	120.00	2,398.77	-24.86	43.06	14,430,994.40	1,688,617.54	39.736949	-80.828542	
2,500.00	3.00	120.00	2,498.63	-27.48	47.59	14,430,991.78	1,688,622.07	39.736942	-80.828526	
2,600.00	3.00	120.00	2,598.49	-30.09	52.12	14,430,989.17	1,688,626.60	39.736935	-80.828509	
2,700.00	3.00	120.00	2,698.36	-32.71	56.66	14,430,986.55	1,688,631.13	39.736928	-80.828493	
2,800.00	3.00	120.00	2,798.22	-35.33	61.19	14,430,983.93	1,688,635.67	39.736921	-80.828477	
2,801.78	3.00	120.00	2,800.00	-35.37	61.27	14,430,983.89	1,688,635.75	39.736921	-80.828477	
Begin 2°/100' build/turn										
2,900.00	4.74	133.84	2,897.99	-39.47	66.42	14,430,979.79	1,688,640.90	39.736909	-80.828459	
2,913.82	5.00	135.00	2,911.76	-40.29	67.26	14,430,978.97	1,688,641.74	39.736907	-80.828456	
Begin 2°/100' build										
3,000.00	6.72	135.00	2,997.49	-46.52	73.49	14,430,972.74	1,688,647.96	39.736890	-80.828434	
3,100.00	8.72	135.00	3,096.57	-56.02	82.99	14,430,963.24	1,688,657.46	39.736864	-80.828400	
3,200.00	10.72	135.00	3,195.13	-67.96	94.93	14,430,951.30	1,688,669.41	39.736831	-80.828357	
3,213.82	11.00	135.00	3,208.70	-69.80	96.77	14,430,949.46	1,688,671.25	39.736826	-80.828351	
Begin 2°/100' build/turn										
3,300.00	12.28	140.74	3,293.11	-82.71	108.39	14,430,936.55	1,688,682.86	39.736790	-80.828310	
3,400.00	13.88	146.03	3,390.52	-100.90	121.82	14,430,918.36	1,688,696.30	39.736740	-80.828262	
3,500.00	15.58	150.23	3,487.23	-122.50	135.19	14,430,896.76	1,688,709.67	39.736681	-80.828215	
3,600.00	17.33	153.60	3,583.14	-147.50	148.48	14,430,871.76	1,688,722.96	39.736612	-80.828168	
3,700.00	19.14	156.36	3,678.11	-175.86	161.68	14,430,843.40	1,688,736.15	39.736534	-80.828121	
Begin 2°/100' build										
3,800.00	21.14	156.36	3,771.99	-207.40	175.48	14,430,811.86	1,688,749.95	39.736447	-80.828072	
3,893.15	23.00	156.36	3,858.31	-239.46	189.51	14,430,779.80	1,688,763.98	39.736359	-80.828022	
Begin 2°/100' build/turn										
3,900.00	23.12	156.22	3,864.62	-241.92	190.59	14,430,777.34	1,688,765.06	39.736353	-80.828018	
4,000.00	24.96	154.28	3,955.94	-278.90	207.66	14,430,740.36	1,688,782.14	39.736251	-80.827958	
4,100.00	26.82	152.59	4,045.90	-317.95	227.21	14,430,701.31	1,688,801.68	39.736144	-80.827889	
4,200.00	28.70	151.11	4,134.39	-359.00	249.19	14,430,660.26	1,688,823.67	39.736031	-80.827811	

03/12/2021



Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Goudy 1S-10HM (J)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1241.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1241.00usft
Site:	Goudy	North Reference:	Grid
Well:	Goudy 1S-10HM (J)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

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Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
4,300.00	30.59	149.80	4,221.29	-402.02	273.60	14,430,617.24	1,688,848.07	39.735912	-80.827724	
4,400.00	32.49	148.62	4,306.52	-446.95	300.38	14,430,572.31	1,688,874.86	39.735789	-80.827629	
4,500.00	34.41	147.56	4,389.95	-493.73	329.53	14,430,525.53	1,688,904.00	39.735660	-80.827526	
4,600.00	36.33	146.60	4,471.49	-542.31	360.99	14,430,476.95	1,688,935.47	39.735527	-80.827414	
4,700.00	38.26	145.73	4,551.04	-592.63	394.73	14,430,426.63	1,688,969.21	39.735388	-80.827295	
4,790.14	40.00	145.00	4,620.97	-639.43	427.06	14,430,379.84	1,689,001.54	39.735260	-80.827180	
Begin 40.00° tangent										
4,800.00	40.00	145.00	4,628.52	-644.62	430.70	14,430,374.64	1,689,005.18	39.735245	-80.827167	
4,900.00	40.00	145.00	4,705.12	-697.27	467.57	14,430,321.99	1,689,042.04	39.735101	-80.827036	
5,000.00	40.00	145.00	4,781.73	-749.93	504.44	14,430,269.34	1,689,078.91	39.734956	-80.826905	
5,100.00	40.00	145.00	4,858.33	-802.58	541.31	14,430,216.68	1,689,115.78	39.734811	-80.826775	
5,200.00	40.00	145.00	4,934.94	-855.23	578.17	14,430,164.03	1,689,152.65	39.734666	-80.826644	
5,300.00	40.00	145.00	5,011.54	-907.89	615.04	14,430,111.37	1,689,189.52	39.734521	-80.826513	
5,400.00	40.00	145.00	5,088.15	-960.54	651.91	14,430,058.72	1,689,226.39	39.734377	-80.826382	
5,500.00	40.00	145.00	5,164.75	-1,013.20	688.78	14,430,006.07	1,689,263.26	39.734232	-80.826252	
5,600.00	40.00	145.00	5,241.35	-1,065.85	725.65	14,429,953.41	1,689,300.13	39.734087	-80.826121	
5,700.00	40.00	145.00	5,317.96	-1,118.50	762.52	14,429,900.76	1,689,337.00	39.733942	-80.825990	
5,790.14	40.00	145.00	5,387.01	-1,165.97	795.75	14,429,853.29	1,689,370.23	39.733812	-80.825872	
Begin 2°/100' turn										
5,800.00	40.00	145.31	5,394.56	-1,171.17	799.37	14,429,848.09	1,689,373.85	39.733797	-80.825859	
5,900.00	40.00	148.42	5,471.17	-1,224.98	834.51	14,429,794.28	1,689,408.98	39.733649	-80.825735	
6,000.00	40.00	151.53	5,547.77	-1,280.63	866.67	14,429,738.63	1,689,441.15	39.733496	-80.825621	
6,100.00	40.00	154.64	5,624.38	-1,337.94	895.77	14,429,681.32	1,689,470.24	39.733339	-80.825518	
6,200.00	40.00	157.75	5,700.98	-1,396.74	921.71	14,429,622.52	1,689,496.19	39.733177	-80.825426	
6,300.00	40.00	160.86	5,777.59	-1,456.86	944.43	14,429,562.40	1,689,518.91	39.733012	-80.825345	
6,400.00	40.00	163.97	5,854.19	-1,518.13	963.85	14,429,501.13	1,689,538.33	39.732844	-80.825277	
6,500.00	40.00	167.08	5,930.79	-1,580.36	979.92	14,429,438.90	1,689,554.40	39.732673	-80.825220	
6,600.00	40.00	170.19	6,007.40	-1,643.37	992.59	14,429,375.89	1,689,567.06	39.732500	-80.825175	
6,690.14	40.00	172.99	6,076.46	-1,700.67	1,001.06	14,429,318.59	1,689,575.54	39.732342	-80.825146	
Begin 40.00° tangent										
6,700.00	40.00	172.99	6,084.00	-1,706.97	1,001.84	14,429,312.29	1,689,576.31	39.732325	-80.825143	
6,800.00	40.00	172.99	6,160.61	-1,770.77	1,009.68	14,429,248.49	1,689,584.16	39.732150	-80.825115	
6,830.14	40.00	172.99	6,183.70	-1,790.00	1,012.05	14,429,229.27	1,689,586.52	39.732097	-80.825107	
Begin 8°/100' build/turn										
6,900.00	45.53	174.19	6,234.96	-1,837.12	1,017.31	14,429,182.14	1,689,591.79	39.731967	-80.825089	
6,956.38	50.00	175.00	6,272.86	-1,878.67	1,021.23	14,429,140.59	1,689,595.71	39.731853	-80.825075	
Begin 10°/100' build										
7,000.00	54.36	175.00	6,299.59	-1,912.98	1,024.24	14,429,106.28	1,689,598.71	39.731759	-80.825065	
7,100.00	64.36	175.00	6,350.49	-1,998.59	1,031.73	14,429,020.68	1,689,606.20	39.731524	-80.825039	
7,200.00	74.36	175.00	6,385.69	-2,091.69	1,039.87	14,428,927.57	1,689,614.35	39.731268	-80.825010	
7,300.00	84.36	175.00	6,404.13	-2,189.48	1,048.43	14,428,829.78	1,689,622.90	39.730999	-80.824980	
7,346.38	89.00	175.00	6,406.81	-2,235.59	1,052.46	14,428,783.67	1,689,626.94	39.730873	-80.824966	
Begin 89.00° lateral										
7,400.00	89.00	175.00	6,407.75	-2,289.00	1,057.13	14,428,730.26	1,689,631.61	39.730726	-80.824950	
7,500.00	89.00	175.00	6,409.50	-2,388.60	1,065.85	14,428,630.66	1,689,640.33	39.730452	-80.824920	
7,600.00	89.00	175.00	6,411.24	-2,488.21	1,074.56	14,428,531.05	1,689,649.04	39.730179	-80.824890	
7,601.38	89.00	175.00	6,411.26	-2,489.58	1,074.68	14,428,529.68	1,689,649.16	39.730175	-80.824889	
Begin 2°/100' turn										
7,700.00	88.99	173.03	6,412.99	-2,587.64	1,084.97	14,428,431.62	1,689,659.44	39.729906	-80.824853	
7,800.00	88.99	171.03	6,414.76	-2,686.66	1,098.83	14,428,332.60	1,689,673.31	39.729634	-80.824805	
7,900.00	88.98	169.03	6,416.53	-2,785.12	1,116.15	14,428,234.14	1,689,690.62	39.729363	-80.824744	
8,000.00	88.98	167.03	6,418.31	-2,882.93	1,136.89	14,428,136.33	1,689,711.37	39.729095	-80.824671	
8,100.00	88.97	165.03	6,420.10	-2,979.95	1,161.03	14,428,039.31	1,689,735.51	39.728828	-80.824585	
8,200.00	88.97	163.03	6,421.89	-3,076.07	1,188.55	14,427,943.19	1,689,763.02	39.728564	-80.824488	

WV Department of Environmental Protection

03/12/2021



Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Goudy 1S-10HM (J)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1241.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1241.00usft
Site:	Goudy	North Reference:	Grid
Well:	Goudy 1S-10HM (J)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
8,300.00	88.97	161.03	6,423.69	-3,171.17	1,219.40	14,427,848.09	1,689,793.88	39.728303	-80.824379	
8,400.00	88.97	159.03	6,425.48	-3,265.13	1,253.55	14,427,754.13	1,689,828.03	39.728044	-80.824258	
8,500.00	88.98	157.02	6,427.27	-3,357.85	1,290.96	14,427,661.41	1,689,865.44	39.727789	-80.824126	
8,600.00	88.98	155.02	6,429.05	-3,449.20	1,331.59	14,427,570.06	1,689,906.07	39.727538	-80.823982	
8,700.00	88.98	153.02	6,430.83	-3,539.08	1,375.38	14,427,480.18	1,689,949.86	39.727291	-80.823827	
8,800.00	88.99	151.02	6,432.59	-3,627.37	1,422.28	14,427,391.89	1,689,996.76	39.727049	-80.823661	
8,852.10	88.99	149.98	6,433.51	-3,672.71	1,447.93	14,427,346.55	1,690,022.41	39.726924	-80.823570	
Begin 89.00° lateral										
8,900.00	88.99	149.98	6,434.35	-3,714.18	1,471.89	14,427,305.08	1,690,046.37	39.726810	-80.823485	
9,000.00	88.99	149.98	6,436.11	-3,800.76	1,521.91	14,427,218.50	1,690,096.39	39.726572	-80.823308	
9,100.00	88.99	149.98	6,437.86	-3,887.33	1,571.93	14,427,131.93	1,690,146.40	39.726334	-80.823130	
9,200.00	88.99	149.98	6,439.62	-3,973.90	1,621.95	14,427,045.36	1,690,196.42	39.726096	-80.822953	
9,300.00	88.99	149.98	6,441.37	-4,060.48	1,671.97	14,426,958.78	1,690,246.44	39.725858	-80.822776	
9,400.00	88.99	149.98	6,443.13	-4,147.05	1,721.99	14,426,872.21	1,690,296.46	39.725620	-80.822599	
9,500.00	88.99	149.98	6,444.88	-4,233.62	1,772.01	14,426,785.64	1,690,346.48	39.725382	-80.822421	
9,600.00	88.99	149.98	6,446.64	-4,320.20	1,822.03	14,426,699.06	1,690,396.50	39.725144	-80.822244	
9,700.00	88.99	149.98	6,448.39	-4,406.77	1,872.05	14,426,612.49	1,690,446.52	39.724906	-80.822067	
9,800.00	88.99	149.98	6,450.15	-4,493.34	1,922.07	14,426,525.92	1,690,496.54	39.724668	-80.821889	
9,900.00	88.99	149.98	6,451.90	-4,579.92	1,972.09	14,426,439.34	1,690,546.56	39.724430	-80.821712	
10,000.00	88.99	149.98	6,453.66	-4,666.49	2,022.11	14,426,352.77	1,690,596.58	39.724192	-80.821535	
10,100.00	88.99	149.98	6,455.41	-4,753.06	2,072.13	14,426,266.20	1,690,646.60	39.723953	-80.821358	
10,200.00	88.99	149.98	6,457.17	-4,839.64	2,122.15	14,426,179.62	1,690,696.62	39.723715	-80.821180	
10,300.00	88.99	149.98	6,458.93	-4,926.21	2,172.17	14,426,093.05	1,690,746.64	39.723477	-80.821003	
10,400.00	88.99	149.98	6,460.68	-5,012.78	2,222.19	14,426,006.48	1,690,796.66	39.723239	-80.820826	
10,500.00	88.99	149.98	6,462.44	-5,099.36	2,272.21	14,425,919.90	1,690,846.68	39.723001	-80.820648	
10,600.00	88.99	149.98	6,464.19	-5,185.93	2,322.22	14,425,833.33	1,690,896.70	39.722763	-80.820471	
10,700.00	88.99	149.98	6,465.95	-5,272.50	2,372.24	14,425,746.76	1,690,946.72	39.722525	-80.820294	
10,800.00	88.99	149.98	6,467.70	-5,359.08	2,422.26	14,425,660.18	1,690,996.74	39.722287	-80.820117	
10,900.00	88.99	149.98	6,469.46	-5,445.65	2,472.28	14,425,573.61	1,691,046.76	39.722049	-80.819939	
11,000.00	88.99	149.98	6,471.21	-5,532.22	2,522.30	14,425,487.04	1,691,096.78	39.721811	-80.819762	
11,100.00	88.99	149.98	6,472.97	-5,618.80	2,572.32	14,425,400.46	1,691,146.80	39.721573	-80.819585	
11,200.00	88.99	149.98	6,474.72	-5,705.37	2,622.34	14,425,313.89	1,691,196.82	39.721335	-80.819408	
11,300.00	88.99	149.98	6,476.48	-5,791.94	2,672.36	14,425,227.32	1,691,246.84	39.721097	-80.819230	
11,400.00	88.99	149.98	6,478.23	-5,878.52	2,722.38	14,425,140.74	1,691,296.86	39.720859	-80.819053	
11,500.00	88.99	149.98	6,479.99	-5,965.09	2,772.40	14,425,054.17	1,691,346.88	39.720621	-80.818876	
11,600.00	88.99	149.98	6,481.74	-6,051.66	2,822.42	14,424,967.60	1,691,396.90	39.720383	-80.818698	
11,700.00	88.99	149.98	6,483.50	-6,138.24	2,872.44	14,424,881.02	1,691,446.92	39.720145	-80.818521	
11,800.00	88.99	149.98	6,485.26	-6,224.81	2,922.46	14,424,794.45	1,691,496.94	39.719907	-80.818344	
11,900.00	88.99	149.98	6,487.01	-6,311.38	2,972.48	14,424,707.88	1,691,546.96	39.719669	-80.818167	
12,000.00	88.99	149.98	6,488.77	-6,397.96	3,022.50	14,424,621.30	1,691,596.98	39.719431	-80.817989	
12,100.00	88.99	149.98	6,490.52	-6,484.53	3,072.52	14,424,534.73	1,691,647.00	39.719193	-80.817812	
12,200.00	88.99	149.98	6,492.28	-6,571.10	3,122.54	14,424,448.16	1,691,697.02	39.718955	-80.817635	
12,300.00	88.99	149.98	6,494.03	-6,657.68	3,172.56	14,424,361.58	1,691,747.04	39.718717	-80.817458	
12,400.00	88.99	149.98	6,495.79	-6,744.25	3,222.58	14,424,275.01	1,691,797.06	39.718479	-80.817280	
12,500.00	88.99	149.98	6,497.54	-6,830.82	3,272.60	14,424,188.44	1,691,847.08	39.718241	-80.817103	
12,600.00	88.99	149.98	6,499.30	-6,917.40	3,322.62	14,424,101.86	1,691,897.10	39.718003	-80.816926	
12,700.00	88.99	149.98	6,501.05	-7,003.97	3,372.64	14,424,015.29	1,691,947.12	39.717765	-80.816749	
12,800.00	88.99	149.98	6,502.81	-7,090.54	3,422.66	14,423,928.72	1,691,997.14	39.717527	-80.816571	
12,900.00	88.99	149.98	6,504.56	-7,177.12	3,472.68	14,423,842.14	1,692,047.16	39.717289	-80.816394	
13,000.00	88.99	149.98	6,506.32	-7,263.69	3,522.70	14,423,755.57	1,692,097.18	39.717050	-80.816217	
13,100.00	88.99	149.98	6,508.07	-7,350.26	3,572.72	14,423,669.00	1,692,147.20	39.716812	-80.816040	
13,200.00	88.99	149.98	6,509.83	-7,436.84	3,622.74	14,423,582.42	1,692,197.22	39.716574	-80.815862	
13,300.00	88.99	149.98	6,511.58	-7,523.41	3,672.76	14,423,495.85	1,692,247.24	39.716336	-80.815685	
13,400.00	88.99	149.98	6,513.34	-7,609.98	3,722.78	14,423,409.28	1,692,297.25	39.716098	-80.815508	

03/12/2021



Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Goudy 1S-10HM (J)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1241.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1241.00usft
Site:	Goudy	North Reference:	Grid
Well:	Goudy 1S-10HM (J)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
13,500.00	88.99	149.98	6,515.10	-7,696.56	3,772.80	14,423,322.70	1,692,347.27	39.715860	-80.815331	
13,600.00	88.99	149.98	6,516.85	-7,783.13	3,822.82	14,423,236.13	1,692,397.29	39.715622	-80.815153	
13,700.00	88.99	149.98	6,518.61	-7,869.70	3,872.84	14,423,149.56	1,692,447.31	39.715384	-80.814976	
13,800.00	88.99	149.98	6,520.36	-7,956.28	3,922.86	14,423,062.98	1,692,497.33	39.715146	-80.814799	
13,900.00	88.99	149.98	6,522.12	-8,042.85	3,972.88	14,422,976.41	1,692,547.35	39.714908	-80.814622	
14,000.00	88.99	149.98	6,523.87	-8,129.42	4,022.90	14,422,889.84	1,692,597.37	39.714670	-80.814445	
14,100.00	88.99	149.98	6,525.63	-8,216.00	4,072.92	14,422,803.26	1,692,647.39	39.714432	-80.814267	
14,200.00	88.99	149.98	6,527.38	-8,302.57	4,122.94	14,422,716.69	1,692,697.41	39.714194	-80.814090	
14,300.00	88.99	149.98	6,529.14	-8,389.14	4,172.96	14,422,630.12	1,692,747.43	39.713956	-80.813913	
14,400.00	88.99	149.98	6,530.89	-8,475.72	4,222.98	14,422,543.54	1,692,797.45	39.713718	-80.813736	
14,500.00	88.99	149.98	6,532.65	-8,562.29	4,273.00	14,422,456.97	1,692,847.47	39.713480	-80.813558	
14,600.00	88.99	149.98	6,534.40	-8,648.86	4,323.02	14,422,370.40	1,692,897.49	39.713242	-80.813381	
14,700.00	88.99	149.98	6,536.16	-8,735.44	4,373.04	14,422,283.82	1,692,947.51	39.713004	-80.813204	
14,800.00	88.99	149.98	6,537.91	-8,822.01	4,423.06	14,422,197.25	1,692,997.53	39.712766	-80.813027	
14,900.00	88.99	149.98	6,539.67	-8,908.58	4,473.07	14,422,110.68	1,693,047.55	39.712528	-80.812849	
15,000.00	88.99	149.98	6,541.43	-8,995.16	4,523.09	14,422,024.10	1,693,097.57	39.712290	-80.812672	
15,100.00	88.99	149.98	6,543.18	-9,081.73	4,573.11	14,421,937.53	1,693,147.59	39.712052	-80.812495	
15,200.00	88.99	149.98	6,544.94	-9,168.30	4,623.13	14,421,850.96	1,693,197.61	39.711814	-80.812318	
15,300.00	88.99	149.98	6,546.69	-9,254.88	4,673.15	14,421,764.38	1,693,247.63	39.711576	-80.812141	
15,400.00	88.99	149.98	6,548.45	-9,341.45	4,723.17	14,421,677.81	1,693,297.65	39.711337	-80.811963	
15,500.00	88.99	149.98	6,550.20	-9,428.02	4,773.19	14,421,591.24	1,693,347.67	39.711099	-80.811786	
15,600.00	88.99	149.98	6,551.96	-9,514.60	4,823.21	14,421,504.66	1,693,397.69	39.710861	-80.811609	
15,700.00	88.99	149.98	6,553.71	-9,601.17	4,873.23	14,421,418.09	1,693,447.71	39.710623	-80.811432	
15,800.00	88.99	149.98	6,555.47	-9,687.74	4,923.25	14,421,331.52	1,693,497.73	39.710385	-80.811254	
15,900.00	88.99	149.98	6,557.22	-9,774.32	4,973.27	14,421,244.94	1,693,547.75	39.710147	-80.811077	
16,000.00	88.99	149.98	6,558.98	-9,860.89	5,023.29	14,421,158.37	1,693,597.77	39.709909	-80.810900	
16,100.00	88.99	149.98	6,560.73	-9,947.46	5,073.31	14,421,071.80	1,693,647.79	39.709671	-80.810723	
16,200.00	88.99	149.98	6,562.49	-10,034.04	5,123.33	14,420,985.22	1,693,697.81	39.709433	-80.810546	
16,300.00	88.99	149.98	6,564.24	-10,120.61	5,173.35	14,420,898.65	1,693,747.83	39.709195	-80.810368	
16,400.00	88.99	149.98	6,566.00	-10,207.18	5,223.37	14,420,812.08	1,693,797.85	39.708957	-80.810191	
16,500.00	88.99	149.98	6,567.75	-10,293.76	5,273.39	14,420,725.50	1,693,847.87	39.708719	-80.810014	
16,600.00	88.99	149.98	6,569.51	-10,380.33	5,323.41	14,420,638.93	1,693,897.89	39.708481	-80.809837	
16,700.00	88.99	149.98	6,571.27	-10,466.90	5,373.43	14,420,552.36	1,693,947.91	39.708243	-80.809660	
16,800.00	88.99	149.98	6,573.02	-10,553.48	5,423.45	14,420,465.78	1,693,997.93	39.708005	-80.809482	
16,900.00	88.99	149.98	6,574.78	-10,640.05	5,473.47	14,420,379.21	1,694,047.95	39.707767	-80.809305	
17,000.00	88.99	149.98	6,576.53	-10,726.62	5,523.49	14,420,292.64	1,694,097.97	39.707529	-80.809128	
17,100.00	88.99	149.98	6,578.29	-10,813.20	5,573.51	14,420,206.06	1,694,147.99	39.707291	-80.808951	
17,200.00	88.99	149.98	6,580.04	-10,899.77	5,623.53	14,420,119.49	1,694,198.01	39.707053	-80.808774	
17,300.00	88.99	149.98	6,581.80	-10,986.34	5,673.55	14,420,032.92	1,694,248.03	39.706815	-80.808596	
17,400.00	88.99	149.98	6,583.55	-11,072.92	5,723.57	14,419,946.34	1,694,298.05	39.706576	-80.808419	
17,500.00	88.99	149.98	6,585.31	-11,159.49	5,773.59	14,419,859.77	1,694,348.07	39.706338	-80.808242	
17,600.00	88.99	149.98	6,587.06	-11,246.06	5,823.61	14,419,773.20	1,694,398.09	39.706100	-80.808065	
17,700.00	88.99	149.98	6,588.82	-11,332.64	5,873.63	14,419,686.62	1,694,448.10	39.705862	-80.807888	
17,800.00	88.99	149.98	6,590.57	-11,419.21	5,923.65	14,419,600.05	1,694,498.12	39.705624	-80.807711	
17,900.00	88.99	149.98	6,592.33	-11,505.78	5,973.67	14,419,513.48	1,694,548.14	39.705386	-80.807533	
18,000.00	88.99	149.98	6,594.08	-11,592.36	6,023.69	14,419,426.90	1,694,598.16	39.705148	-80.807356	
18,100.00	88.99	149.98	6,595.84	-11,678.93	6,073.71	14,419,340.33	1,694,648.18	39.704910	-80.807179	
18,200.00	88.99	149.98	6,597.59	-11,765.50	6,123.73	14,419,253.76	1,694,698.20	39.704672	-80.807002	
18,300.00	88.99	149.98	6,599.35	-11,852.08	6,173.75	14,419,167.18	1,694,748.22	39.704434	-80.806825	
18,400.00	88.99	149.98	6,601.11	-11,938.65	6,223.77	14,419,080.61	1,694,798.24	39.704196	-80.806647	
18,500.00	88.99	149.98	6,602.86	-12,025.22	6,273.79	14,418,994.04	1,694,848.26	39.703958	-80.806470	
18,600.00	88.99	149.98	6,604.62	-12,111.80	6,323.81	14,418,907.46	1,694,898.28	39.703720	-80.806293	
18,700.00	88.99	149.98	6,606.37	-12,198.37	6,373.83	14,418,820.89	1,694,948.30	39.703482	-80.806116	
18,800.00	88.99	149.98	6,608.13	-12,284.94	6,423.85	14,418,734.32	1,694,998.32	39.703244	-80.805939	
18,900.00	88.99	149.98	6,609.88	-12,371.52	6,473.87	14,418,647.74	1,695,048.34	39.703006	-80.805762	

03/12/2021



Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Goudy 1S-10HM (J)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1241.00usft
Project:	Marshall County, West Virginia.	MD Reference:	GL @ 1241.00usft
Site:	Goudy	North Reference:	Grid
Well:	Goudy 1S-10HM (J)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
19,000.00	88.99	149.98	6,611.64	-12,458.09	6,523.89	14,418,561.17	1,695,098.36	39.702768	-80.805584
19,100.00	88.99	149.98	6,613.39	-12,544.66	6,573.91	14,418,474.60	1,695,148.38	39.702530	-80.805407
19,200.00	88.99	149.98	6,615.15	-12,631.24	6,623.92	14,418,388.02	1,695,198.40	39.702292	-80.805230
19,300.00	88.99	149.98	6,616.90	-12,717.81	6,673.94	14,418,301.45	1,695,248.42	39.702053	-80.805053
19,400.00	88.99	149.98	6,618.66	-12,804.38	6,723.96	14,418,214.88	1,695,298.44	39.701815	-80.804876
19,419.45	88.99	149.98	6,619.00	-12,821.22	6,733.69	14,418,198.04	1,695,308.17	39.701769	-80.804841
PBHL/TD 19419.45 MD /6619.00 TVD									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Goudy 1S-10HM LP r3 - hit/miss target - Shape - Point	0.00	0.00	6,408.00	-2,404.72	714.92	14,428,614.54	1,689,289.40	39.730410	-80.826168
- plan misses target center by 351.00usft at 7485.45usft MD (6409.24 TVD, -2374.11 N, 1064.58 E)									
Goudy 1S-10HM BHL r5 - plan hits target center - Point	0.00	0.01	6,619.00	-12,821.22	6,733.69	14,418,198.04	1,695,308.17	39.701769	-80.804841

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,000.00	1,000.00	13 3/8" Casing	13-3/8	17
2,601.51	2,600.00	9 5/8" Casing	9-5/8	12-1/4

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
1,300.00	1,300.00	0.00	0.00	KOP Begin 1°/100' build
1,600.00	1,599.86	-3.93	6.80	Begin 3.00° tangent
2,801.78	2,800.00	-35.37	61.27	Begin 2°/100' build/turn
2,913.82	2,911.76	-40.29	67.26	Begin 2°/100' build
3,213.82	3,208.70	-69.80	96.77	Begin 2°/100' build/turn
3,700.00	3,678.11	-175.86	161.68	Begin 2°/100' build
3,893.15	3,858.31	-239.46	189.51	Begin 2°/100' build/turn
4,790.14	4,620.97	-639.43	427.06	Begin 40.00° tangent
5,790.14	5,387.01	-1,165.97	795.75	Begin 2°/100' turn
6,690.14	6,076.46	-1,700.67	1,001.06	Begin 40.00° tangent
6,830.14	6,183.70	-1,790.00	1,012.05	Begin 8°/100' build/turn
6,956.38	6,272.86	-1,878.67	1,021.23	Begin 10°/100' build
7,346.38	6,406.81	-2,235.59	1,052.46	Begin 89.00° lateral
7,601.38	6,411.26	-2,489.58	1,074.68	Begin 2°/100' turn
8,852.10	6,433.51	-3,672.71	1,447.93	Begin 89.00° lateral
19,419.45	6,619.00	-12,821.22	6,733.69	PBHL/TD 19419.45 MD /6619.00 TVD

RECEIVED
Office of Oil and Gas
FEB 25 2021
WV Department of
Environmental Protection



Well Site Safety Plan

Tug Hill Operating, LLC

1-14-21
Randy Stoltz

Well Name: Goudy 1S-10HM

Pad Location: Goudy Pad

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing: 4,398,583.47

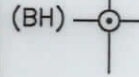
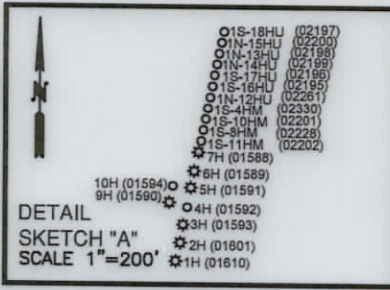
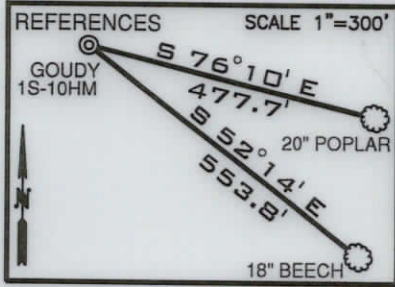
Easting: 514,678.53

January 2021

03/12/2021

**GOUDY LEASE
WELL 1S-10HM
781.6183± ACRES**

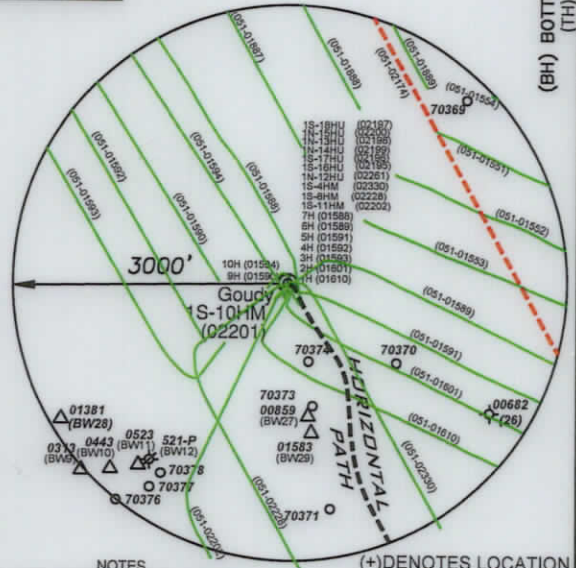
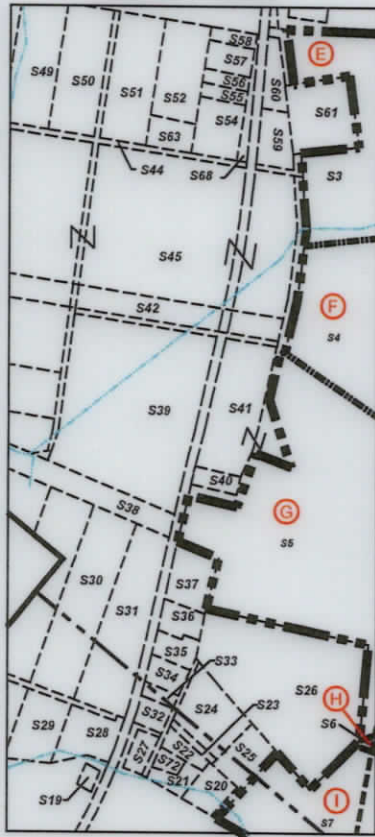
TOP HOLE LATITUDE: 39°45'00"
BOTTOM HOLE LATITUDE: 39°42'30"



(BH) BOTTOM HOLE LONGITUDE: 80°47'30"
(TH) TOP HOLE LONGITUDE: 80°47'30"
(BH) 2,411'
(TH) 4,748'

SURFACE HOLE UTM. NAD83, ZONE 17 IN METERS N) 4,398,583.47 E) 514,678.53
LANDING POINT 1 UTM. NAD83, ZONE 17 IN METERS N) 4,397,902.06 E) 514,999.32
AZIMUTH POINT 1 UTM. NAD83, ZONE 17 IN METERS N) 4,397,824.64 E) 515,006.10
AZIMUTH POINT 2 UTM. NAD83, ZONE 17 IN METERS N) 4,397,464.02 E) 515,119.86
BOTTOM HOLE UTM. NAD83, ZONE 17 IN METERS N) 4,394,675.55 E) 516,730.96

**Detail "A"
SCALE 1"=1000'**



(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

- NOTES**
1. BORE PATH BASED ON GRID NORTH.
 2. NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.
 3. OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN MARCH, 2019. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.
 4. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.
 5. BOUNDARIES ALONG ROADWAYS ARE BASED UPON MEMORANDUM BY DICKIE, MCCAMEY & CHILCOTE, P.C. FILE 0058304.0401147

LINE	BEARING	DISTANCE
L1	N 11°54' W	2277.52'
L2	S 52°31' E	1756.43'
L3	S 59°02' E	70.77'
L4	S 34°03' E	643.00'
L5	S 06°03' E	90.03'
L6	S 04°03' E	358.41'
L7	S 04°03' E	255.06'
L8	S 29°04' E	10569.30'

CURVE	CHORD BEARING	CHORD LENGTH	RADIUS	ARC LENGTH
C1	S 41°47' E	89.24'	426.18'	89.41'
C2	S 25°47' E	119.29'	620.80'	119.48'
C3	S 26°35' E	270.25'	1,665.59'	270.55'
C4	S 32°24' E	230.50'	3,678.87'	230.54'
C5	S 20°03' E	572.96'	1,184.53'	578.70'
C6	S 04°58' E	89.17'	2,587.85'	89.18'
C7	S 16°33' E	1,241.03'	2,864.90'	1,250.94'

LEGEND

- LEASE TRACTS
- - - SURFACE TRACTS
- - - WELL LATERAL
- - - POINT PLEASANT LEGS
- - - MARCELLUS LEGS
- UNIT BOUNDARY
- (A) LEASE # (SEE 6A1 FORM)

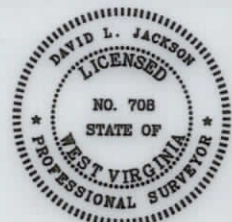
FILE NUMBER _____
DRAWING NUMBER **GOUDY_1S-10HM_REVS**
SCALE **1" = 2000'**
MINIMUM DEGREE OF ACCURACY **1/200**
PROVEN SOURCE OF ELEVATION **SUBMETER MAPPING**
GRADE GPS

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

P.S. 708

David L Jackson

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



SEAL

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



DATE: **MARCH 25, 2019**
REVISED: **FEBRUARY 02, 2021**
OPERATORS WELL NO. **GOUDY 1S-10HM**
API WELL NO. **47-051-02201**
STATE COUNTY PERMIT

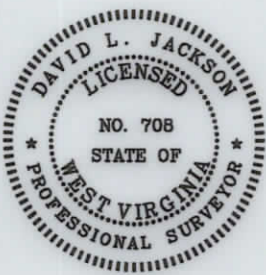
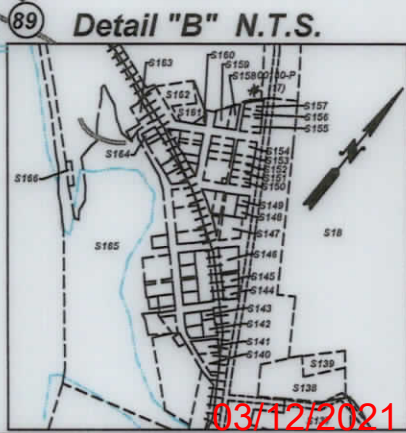
WELL TYPE: OIL ___ GAS **X** LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION **X** STORAGE ___ DEEP ___ SHALLOW **X**

LOCATION ELEVATION **1242.0'** WATERSHED (HUC 10) **FRENCH CREEK - OHIO RIVER**
DISTRICT **FRANKLIN** COUNTY **MARSHALL**
QUADRANGLE **NEW MARTINSVILLE 7.5'** LEASE NUMBER **SEE WW-6A1 FORM**

SURFACE OWNER **TH EXPLORATION III, LLC.** ACREAGE **03/12/2021**
OIL & GAS ROYALTY OWNER **PPG INDUSTRIES, INC., ET AL. THEIR SUCCESSORS OR ASSIGNS.** LEASE ACREAGE **70.0**
PROPOSED WORK: DRILL **X** CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE **X** PLUG OFF OLD FORMATION ___
PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE (SPECIFY) _____
PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
TARGET FORMATION **Marcellus** ESTIMATED DEPTH **TVD 6,530' TMD: 19,419'**
WELL OPERATOR **TUG HILL OPERATING, LLC** DESIGNATED AGENT **DIANNA STAMPER**
CT CORPORATION SYSTEM
ADDRESS **1320 SOUTH UNIVERSITY DRIVE, SUITE 500** ADDRESS **5400 D BIG TYLER ROAD**
FORT WORTH, TX 76107 **CHARLESTON, WV 25313**

GOUDY LEASE WELL 1S-10HM 781.6183± ACRES

GRID NORTH



P.S. 708

David L Jackson

Scale
1" = 2000'



TUG HILL OPERATING

OPERATOR'S
WELL #: Goudy 1S-10HM
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV
API # 47-051-02201

WELL PLAT
PAGE 2 OF 4
DATE: 03/25/2019
REVISED: 02/02/2021

**GOUDY LEASE
WELL 1S-10HM
781.6183± ACRES**

Number	TAX MAP -PARCEL	SURFACE OWNER	ACRES
S98	12-06-16	Brock T. & Emma J. Conners	27.0
S99	12-6A-01	Ronald E. McCoy	6.51
S100	12-06-05	Steven & Susan Louis Hafer	9.0
S101	12-06-04	Steven & Susan Hafer	6.5
S102	12-01-27	Steven J. & Susan Hafer	83.69
S103	12-01-26	William Joseph Blake	13.83
S104	12-01-25	Jack R. & Linda S. Blake	17.42
S105	12-01-15.3	Daniel L. & Vickie L Williams	7.0
S106	12-01-1.1	W.V. D.O.H	10.59
S107	12-01-15.2	Michael Goddard	1.09
S108	12-01-15.1	Marshall & Tara Cecil (L/C), Roy Yoho	1.46
S109	12-01-22	William D. Glover	18.84
S110	12-01-23.2	Raymond L. Pribble	0.782
S111	12-01-23	Raymond L. Pribble	1.55
S112	12-01-23.1	RHL Properties, LLC	34.17
S113	12-01-25.1	Timothy Q. & Ronda K. Bohrer	1.2
S114	12-01-24	Mitzilou Cecil, Trustee of the Tiger Cecil Irrevocable	0.85
S115	12-06-02	Brock T. Conner	23.83
S116	12-06-49	Kirkland Enterprises, LLC.	10.32
S117	12-06-51	Steven & Susan Hafer	0.599
S118	12-06-48	Ronald E. & Susan L. McCoy	0.36
S119	05-27-39	Covestro, LLC	3.74
S120	12-23-04	Pittsburgh Plate Glass Corp.	2.41
S121	12-23-09	Covestro, LLC	3.95
S122	12-23-08	Dora N. Moore Hrs., Et al	6.95
S123	12-01-1.5	United States of America	7.14
S124	12-23-02	Covestro, LLC	1.27
S125	12-23-03	Covestro, LLC	4.67
S126	12-27-38	Covestro, LLC	2.72
S127	12-27-37	Covestro, LLC	3.20
S128	12-27-35	Covestro, LLC	1.79
S129	12-27-34	Covestro, LLC	1.91
S130	12-27-36	Covestro, LLC	1.58
S131	12-27-33	Covestro, LLC	1.95
S137	12-01-1.2	West Virginia Dept. of Transportation	0.27
S138	12-22-59	Kenneth R. Morris	2.00
S139	12-22-60	Franklin W. & Barabara J. Cogar	0.5
S140	12-22-09	M.B. Investment	0.20
S141	12-22-10	M.B. Investment	0.24
S142	12-22-12	Jack Ray & Linda S. Blake	0.16
S143	12-22-13	Dewayne E. & Patricia A. Yost	0.07
S144	12-22-28	Kenneth R. Morris	0.12
S145	12-22-29	Jack R. & Linda S. Blake	0.50
S146	12-22-30	Jack R. & Linda S. Blake	0.24
S147	12-22-32	Ren Realty, LLC.	0.27
S148	12-22-33	Ren Realty, LLC.	0.08
S149	12-22-34	Ren Realty, LLC.	0.08
S150	12-22-51	Eric R. & Debra S. Sims	0.10
S151	12-22-52	Eric R. & Debra S. Sims	0.10
S152	12-22-53	Eric R. & Debra S. Sims	0.10
S153	12-22-54	Eric R. & Debra S. Sims	0.10
S154	12-22-55	Eric R. & Debra S. Sims	0.19
S155	12-22-56	Michael L. & Joyce D. Durig	0.22
S156	12-22-57	Michael L. & Joyce D. Durig	0.11
S157	12-22-58	Michael L. & Joyce D. Durig	0.15
S158	12-22-50	Michael L. & Joyce D. Durig	0.17
S159	12-22-49	Daniel J. Stillwagoner	0.13
S160	12-22-62	Virginia Bohrer, et al	0.05
S161	12-22-62.1	John R. & Toni Wright	0.314
S162	12-22-44	John R. & Toni Wright	0.52
S163	12-01-1.9	Grandview Doolin Public Service District	0.13
S164	12-22-27	Grandview Doolin Public Service District	0.27
S165	12-01-1.12	United States of America	22.55
S166	12-01-1.8	Grandview Doolin Public Service District	0.0895



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03/12/2021



**TUG HILL
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WELL PLAT
PAGE 4 OF 4
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**GOUDY LEASE
WELL 1S-10HM
781.6183± ACRES**

Number	TAX MAP -PARCEL	SURFACE OWNER	ACRES
S1	C 05-28-12	TH Exploration III, LLC	20.226
S2	D 05-28-11	Carol A. Martin	24.681
S3	E 05-27-19	Covestro, LLC	33.786
S4	F 05-27-20	Covestro LLC	93.027
S5	G 05-27-20.1	Appalachian Power Co.	43.973
S6	H 05-27-27	James Andrew & Karen Lynne Richmond	8.9353
S7	I 05-27-25	James Andrew & Karen Lynne Richmond	41.35
S8	12-01-31	Steven Jack & Susan Louise Hafer	20.0
S9	12-01-29	Baxter Farm, LLC	2.0
S10	O 12-01-28	Steven J. & Susan L. Hafer	88.39
S11	12-01-7.1	Harry Wayman Estate	2.0
S12	12-01-04	Robert F. Rothlisberger	6.0
S13	J 12-01-03	Charles D. & Edith Feenerly Harrison	7.8
S14	12-01-02	James Andrew & Karen L. Richmond	2.7
S15	K 12-01-05	Irvin L. Hoyt, Jr. & David L. Hoyt	36.8
S16	L 12-01-06	Mona Parsons, et al	52.75
S17	12-01-16	Vivian A. Parsons, et al	5.125
S18	12-01-01	Covestro, LLC	135.0
S19	12-01-1.7	Colombia Gas Transmission, Corp.	0.15
S20	12-23-15	Donna Jo Cain	0.70
S21	12-23-15.1	Robert F. Rothlisberger	0.47
S22	12-23-13	Donna Jo Cain	0.38
S23	05-27-27.2	Donna Jo Cain	0.1767
S24	05-27-27.1	Donald P. Cain	1.645
S25	05-27-27.3	Donna Jo. Cain	1.018
S26	05-27-28	Covestro, LLC	8.0
S27	12-23-12	Donna Jo Cain	0.37
S28	12-23-11	Covestro, LLC	1.25
S29	12-23-10	Covestro, LLC	1.28
S30	12-23-05	Covestro, LLC	3.69
S31	05-27-40	Covestro, LLC	3.36
S32	12-23-06	Covestro, LLC	0.34
S33	12-27-44	Covestro, LLC	0.21
S34	05-27-43	Covestro, LLC	0.63
S35	05-27-42	Covestro, LLC	0.52
S36	05-27-42.1	Covestro, LLC	0.52
S37	05-27-41	Martha Jean Arrick	0.99
S38	05-27-31.2	Appalachian Power Co.	3.33
S39	05-27-31	Covestro, LLC	16.1
S40	05-27-30	Covestro, LLC	0.371
S41	05-27-31.1	Covestro, LLC	3.0
S42	05-27-32.2	Covestro, LLC	3.95
S43	05-27-29	Covestro, LLC	9.0
S44	05-27-45	Covestro, LLC	0.3627
S45	05-27-32	Covestro, LLC	33.53
S46	05-27-03	Covestro, LLC	1.27
S47	05-27-04	Covestro, LLC	2.52
S48	05-27-05	Covestro, LLC	2.52
S49	05-27-06	Covestro, LLC	2.52
S50	05-27-07	Covestro, LLC	2.52
S51	05-27-08	Covestro, LLC	2.52
S52	05-27-09	Covestro, LLC	1.87
S53	05-27-10	Covestro, LLC	0.52
S54	05-27-12	Covestro, LLC	1.0
S55	05-27-13	Covestro, LLC	0.34
S56	05-27-14	Covestro, LLC	0.25
S57	05-27-15	Covestro, LLC	0.47
S58	05-27-16	Covestro, LLC	0.23
S59	05-27-18	Covestro, LLC	0.97
S60	05-27-17	Covestro, LLC	0.88
S61	05-27-19.3	Cemetery	2.0
S62	05-27-02	Covestro, LLC	28.099
S63	05-27-19.2	Wheeling Electric Co.	0.75
S64	05-28-12.2	Covestro, LLC	3.1
S65	05-28-12.3	Covestro, LLC	18.784
S66	05-28-13.1	Air Products & Chemicals, Inc	5.522
S67	05-27-19.1	Covestro, LLC	21.267
S68	05-27-11	Covestro, LLC	0.03
S69	A 05-28-13	TH Exploration III, LLC	70.0
S70	05-28-13.2	Covestro, LLC	11.02
S71	05-28-1.1	Covestro, LLC	5.2217
S72	12-23-14	Robert E. Rothlisberger	0.27
S73	05-21-3.1	Eagle Natrium, LLC	98.613
S74	12-01-19	Steven J. & Susan L. Hafer	36.5
S75	12-01-27	Steven J. & Susan L. Hafer	83.69
S76	N 12-01-18	Travis Darrell Blake & Angela Dawn Mitchell	48.4



P.S. 708

David L Jackson

03/12/2021



**TUG HILL
OPERATING**

OPERATOR'S
WELL #: Goudy 1S-10HM
DISTRICT: Franklin
COUNTY: Marshall
STATE: WV
API # 47-051-02201

WELL PLAT
PAGE 3 OF 4
DATE: 03/25/2019
REVISED: 02/02/2021

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

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

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

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

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

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

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

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	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
10*14300	5-28-13	A	PPG INDUSTRIES INC	GASTAR EXPLORATION USA INC	1/8+	725	123	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 24/332	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14498	5-28-2	B	BAYER MATERIALSCIENCE LLC	GASTAR EXPLORATION USA INC	1/8+	757	340	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14300	5-28-12	C	PPG INDUSTRIES INC	GASTAR EXPLORATION USA INC	1/8+	725	123	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 24/332	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14658	5-28-12	C	THOMAS WILLIAM ABERSOLD	GASTAR EXPLORATION USA INC	1/8+	775	314	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 28/499	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14659	5-28-12	C	JUDITH LEE ABERSOLD	GASTAR EXPLORATION USA INC	1/8+	781	609	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 28/499	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14565	5-28-11	D	HARRY LEE GOUDY	CENTRAL MICHIGAN EXPLORATION LLC	1/8+	670	59	N/A	N/A	N/A	Central Michigan Exploration LLC to Stone Energy Corp: 21/288 & 21/356	Stone Energy Corp to Gastar Exploration USA Inc & Atinum Marcellus I LLC: 27/160	Gastar Exploration USA Inc merged into Gastar Exploration Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14493	5-27-19	E	BETTY JEAN NEELY	GASTAR EXPLORATION USA INC	1/8+	748	468	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563

Lease ID	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
10*14494	5-27-19	E	MARY LOU WILSON	GASTAR EXPLORATION USA INC	1/8+	748	471	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14495	5-27-19	E	PATRICIA HARTMAN	GASTAR EXPLORATION USA INC	1/8+	752	197	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14496	5-27-19	E	STEPHANIE L BATES	GASTAR EXPLORATION USA INC	1/8+	752	215	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14497	5-27-19	E	CAROL DEEN GARDNER	GASTAR EXPLORATION USA INC	1/8+	752	212	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14498	5-27-19	E	BAYER MATERIALSCIENCE LLC	GASTAR EXPLORATION USA INC	1/8+	757	340	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*22926	5-27-19	E	COVESTRO LLC	TH EXPLORATION LLC	1/8+	976	27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*14493	5-27-20	F	BETTY JEAN NEELY	GASTAR EXPLORATION USA INC	1/8+	748	468	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563

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10*14494	5-27-20	F	MARY LOU WILSON	GASTAR EXPLORATION USA INC	1/8+	748	471	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14495	5-27-20	F	PATRICIA HARTMAN	GASTAR EXPLORATION USA INC	1/8+	752	197	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14496	5-27-20	F	STEPHANIE L BATES	GASTAR EXPLORATION USA INC	1/8+	752	215	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14497	5-27-20	F	CAROL DEEN GARDNER	GASTAR EXPLORATION USA INC	1/8+	752	212	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14498	5-27-20	F	BAYER MATERIALSCIENCE LLC	GASTAR EXPLORATION USA INC	1/8+	757	340	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*22926	5-27-20	F	COVESTRO LLC	TH EXPLORATION LLC	1/8+	976	27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*14493	5-27-20.1	G	BETTY JEAN NEELY	GASTAR EXPLORATION USA INC	1/8+	748	468	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563

Lease ID	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page		Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
10*14494	5-27-20.1	G	MARY LOU WILSON	GASTAR EXPLORATION USA INC	1/8+	748	471	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14495	5-27-20.1	G	PATRICIA HARTMAN	GASTAR EXPLORATION USA INC	1/8+	752	197	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14496	5-27-20.1	G	STEPHANIE L BATES	GASTAR EXPLORATION USA INC	1/8+	752	215	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14497	5-27-20.1	G	CAROL DEEN GARDNER	GASTAR EXPLORATION USA INC	1/8+	752	212	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14499	5-27-20.1	G	UNION CARBIDE CORPORATION	GASTAR EXPLORATION USA INC	1/8+	815	221	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14505	5-27-27	H	JAMES ANDREW & KAREN RICHMOND	GASTAR EXPLORATION USA INC	1/8+	752	447	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*14505	5-27-25	I	JAMES ANDREW & KAREN RICHMOND	GASTAR EXPLORATION USA INC	1/8+	752	447	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 26/639	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 21/41	Gastar Exploration Inc to TH Exploration II LLC: 36/9	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 34/277	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563

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10*29667	12-1-3	J	EDITH F & CHARLES D HARRISON	TH EXPLORATION LLC	1/8+	251A	386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*15075	12-1-5	K	BARBARA P MAZER AS TRSTEE OF THE BARBARA MAZER TRST UNDER AGMT DTD APR 17 2013	GASTAR EXPLORATION USA INC	1/8+	129A	693	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 135A/284	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 13/270	Gastar Exploration Inc to TH Exploration II LLC: 173A/431	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 227A/835	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*15076	12-1-5	K	EDWARD PENNINGTON	GASTAR EXPLORATION USA INC	1/8+	130A	979	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 135A/284	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 13/270	Gastar Exploration Inc to TH Exploration II LLC: 173A/431	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 227A/835	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*15079	12-1-5	K	JAMES K. HALL	GASTAR EXPLORATION USA INC	1/8+	132A	704	N/A	N/A	N/A	N/A	Gastar Exploration USA Inc to Atinum Marcellus I LLC: 135A/284	Merger of Gastar Exploration Inc and Gastar Exploration USA Inc: 13/270	Gastar Exploration Inc to TH Exploration II LLC: 173A/431	Memorandum of Operating Agreement between TH Exploration LLC and Atinum Marcellus I LLC & TH Exploration II LLC: 227A/835	Atinum Marcellus I LLC to TH Exploration II LLC: 43/563
10*18122	12-1-5	K	ANNE L HALL AND RICHARD S WURST	TH EXPLORATION LLC	1/8+	187A	626	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18175	12-1-5	K	STONE HILL MINERALS HOLDINGS LLC	TH EXPLORATION LLC	1/8+	188A	791	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18177	12-1-5	K	STONE HILL MINERALS HOLDINGS LLC	TH EXPLORATION LLC	1/8+	188A	793	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18233	12-1-5	K	SUSAN G HALL	TH EXPLORATION LLC	1/8+	188A	429	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18286	12-1-5	K	ELIZABETH H HALL	TH EXPLORATION LLC	1/8+	188A	431	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18376	12-1-6	L	VICTORIA K MCCLINTOCK	TH EXPLORATION LLC	1/8+	189A	492	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18377	12-1-6	L	TERRY W GILBERT	TH EXPLORATION LLC	1/8+	189A	494	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18378	12-1-6	L	CARL J GILBERT SR AND LAURA A GILBERT	TH EXPLORATION LLC	1/8+	189A	496	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*18817	12-1-6	L	JUDITH R WHITE AND FRANKIE D WHITE	TH EXPLORATION LLC	1/8+	192A	518	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19682	12-1-6	L	NEIL D PATTERSON JR & THERESA PATTERSON	TH EXPLORATION LLC	1/8+	195A	279	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*19998	12-1-6	L	MALISSA D PATTERSON AS AIF FOR CLARK ELWOOD PATTERSON	TH EXPLORATION LLC	1/8+	196A	577	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*24538	12-1-6	L	BRC MINERALS, LP	BRC WORKING INTEREST COMPANY LLC	1/8+	103A	320	BRC Working Interest Company LLC to Chesapeake Appalachia LLC: 103A/470	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: 120A/109	Chesapeake Appalachia LLC to SWN Production Company: 157A/540	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC: 158A/801	SWN Exchange Titleholder LLC merged with and into SWN Production Company LLC: 13/296	SWN Production Company LLC to Antero Exchange Properties LLC: 177A/533	Statoil USA Onshore Properties Inc to Antero Exchange Properties LLC: 177A/738	Antero Exchange Properties LLC merged with and into Antero Resources Corporation: 13/311	Antero Resources Corporation to TH Exploration LLC: 218A/755

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10*22580	12-1-17	M	JAMES H PARSONS JR	TH EXPLORATION LLC	1/8+	209A	265	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23524	12-1-17	M	HAMMETT LAND & MINERALS LLC	TH EXPLORATION LLC	1/8+	210A	807	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23525	12-1-17	M	HAMMETT LAND & MINERALS LLC	TH EXPLORATION LLC	1/8+	210A	809	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23906	12-1-17	M	JOHN M PARSONS & ANTOINETTE L COSTANTINO	TH EXPLORATION LLC	1/8+	214A	675	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*24090	12-1-17	M	VIVIAN A PARSONS	TH EXPLORATION LLC	1/8+	216A	371	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*24317	12-1-17	M	ROY C PARSONS	TH EXPLORATION LLC	1/8+	218A	480	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*25450	12-1-17	M	MURIEL A MILLER	TH EXPLORATION LLC	1/8+	222A	465	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*25644	12-1-17	M	JOHN P SNYDER	TH EXPLORATION LLC	1/8+	222A	434	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*26612	12-1-17	M	DOROTHY J HAAS	TH EXPLORATION LLC	1/8+	224A	549	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21141	12-1-18	N	SHARON S ANDREWS AND GERARD S ANDREWS	TH EXPLORATION LLC	1/8+	200A	443	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21366	12-1-18	N	BONNIE BOLDEN	TH EXPLORATION LLC	1/8+	201A	434	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21672	12-1-18	N	VICKIE L BOLDEN	TH EXPLORATION LLC	1/8+	201A	436	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21676	12-1-18	N	CLAUDIA R SCHEEHLE	TH EXPLORATION LLC	1/8+	212A	66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21677	12-1-18	N	SHARON E YOHO	TH EXPLORATION LLC	1/8+	209A	257	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21682	12-1-18	N	CHARLES ROBERT MYERS	TH EXPLORATION LLC	1/8+	219A	268	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21683	12-1-18	N	RICHARD S WHITE II	TH EXPLORATION LLC	1/8+	210A	173	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21684	12-1-18	N	SHIRLEY DORSEY	TH EXPLORATION LLC	1/8+	201A	430	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21692	12-1-18	N	GREGG D MINOR	TH EXPLORATION LLC	1/8+	201A	421	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21697	12-1-18	N	CONNIE SIMS	TH EXPLORATION LLC	1/8+	214A	364	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21699	12-1-18	N	PATRICIA M LEOHR	TH EXPLORATION LLC	1/8+	212A	35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21700	12-1-18	N	NANCY SELLERS	TH EXPLORATION LLC	1/8+	213A	408	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22067	12-1-18	N	SHIRLEY K WHITE	TH EXPLORATION LLC	1/8+	212A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22069	12-1-18	N	RUTH ANN SHINGLETON	TH EXPLORATION LLC	1/8+	210A	170	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22071	12-1-18	N	SALLY BROKKEN AND TOM BROKKEN	TH EXPLORATION LLC	1/8+	202A	820	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22072	12-1-18	N	HAROLD E SELLERS	TH EXPLORATION LLC	1/8+	213A	682	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22081	12-1-18	N	ROBERT J WITTMAN FIVE STAR RESOURCES	TH EXPLORATION LLC	1/8+	202A	816	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22204	12-1-18	N	JAMES A MAIBACH & MELISSA F MAIBACH	TH EXPLORATION LLC	1/8+	216A	169	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22211	12-1-18	N	DENVER J MINOR GREGG D MINOR TRUSTEE	TH EXPLORATION LLC	1/8+	202A	798	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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10*22231	12-1-18	N	MARILYN SLATER	TH EXPLORATION LLC	1/8+	204A	144	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23038	12-1-18	N	SHIRLEY JANE MILLIKEN	TH EXPLORATION LLC	1/8+	220A	280	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23044	12-1-18	N	DONNA R WOLFE AND DWIGHT WOLFE	TH EXPLORATION LLC	1/8+	204A	160	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23344	12-1-18	N	JEFFREY S MAIBACH	TH EXPLORATION LLC	1/8+	214A	678	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23346	12-1-18	N	EMILY B MORRIS	TH EXPLORATION LLC	1/8+	214A	682	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*23671	12-1-18	N	BETTY JEAN FLANAGAN	TH EXPLORATION LLC	1/8+	212A	846	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*24021	12-1-18	N	KELLI PAGE MARTI	TH EXPLORATION LLC	1/8+	215A	884	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*24081	12-1-18	N	DON MATTHEW PAGE	TH EXPLORATION LLC	1/8+	216A	401	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*24318	12-1-18	N	LORI PAGE ESBORN AND MICHAEL ESBORN	TH EXPLORATION LLC	1/8+	217A	164	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*24356	12-1-18	N	BEATRICE TORRES	TH EXPLORATION LLC	1/8+	218A	179	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*25516	12-1-18	N	GOLDEN EAGLE RESOURCES II LLC	AMERICAN PETROLEUM PARTNERS LLC	1/8+	215A	250	N/A	N/A	N/A	N/A	N/A	N/A	N/A	American Petroleum Partners LLC to TH Exploration LLC: 224A/459	
10*24538	12-1-18	N	BRC MINERALS, LP	BRC WORKING INTEREST COMPANY LLC	1/8+	103A	320	BRC Working Interest Company LLC to Chesapeake Appalachia LLC: 103A/470	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: 120A/109	Chesapeake Appalachia LLC to SWN Production Company: 157A/540	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC: 158A/801	SWN Exchange Titleholder LLC merged with and into SWN Production Company LLC: 13/296	SWN Production Company LLC to Antero Exchange Properties LLC: 177A/533	Statoil USA Onshore Properties Inc to Antero Exchange Properties LLC: 177A/738	Antero Exchange Properties LLC merged with and into Antero Resources Corporation: 13/311	Antero Resources Corporation to TH Exploration LLC: 256A/812
10*26681	12-1-18	N	DENVER J MINOR GREGG D MINOR TRUSTEE	TH EXPLORATION LLC	1/8+	225A	495	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
PENDING	12-1-18	N	ANGELA SHADD	STONE ENERGY CORPORATION	1/8+	161A	551	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 183A/305**	
PENDING	12-1-18	N	TRAVIS DARRELL BLAKE	STONE ENERGY CORPORATION	1/8+	161A	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Stone Energy Corporation to EQT Production Company: 183A/305**	
10*21141	12-1-28	O	SHARON S ANDREWS AND GERARD S ANDREWS	TH EXPLORATION LLC	1/8+	200A	443	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21299	12-1-28	O	BOUNTY MINERALS LLC	TH EXPLORATION LLC	1/8+	200A	361	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21366	12-1-28	O	BONNIE BOLDEN	TH EXPLORATION LLC	1/8+	201A	434	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21672	12-1-28	O	VICKIE L BOLDEN	TH EXPLORATION LLC	1/8+	201A	436	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21676	12-1-28	O	CLAUDIA R SCHEEHLE	TH EXPLORATION LLC	1/8+	212A	66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21677	12-1-28	O	SHARON E YOHO	TH EXPLORATION LLC	1/8+	209A	257	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21682	12-1-28	O	CHARLES ROBERT MYERS	TH EXPLORATION LLC	1/8+	219A	268	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*21683	12-1-28	O	RICHARD S WHITE II	TH EXPLORATION LLC	1/8+	210a	173	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

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10*21684	12-1-28	O	SHIRLEY DORSEY	TH EXPLORATION LLC	1/8+	201A	430	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21692	12-1-28	O	GREGG D MINOR	TH EXPLORATION LLC	1/8+	201A	421	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21697	12-1-28	O	CONNIE SIMS	TH EXPLORATION LLC	1/8+	214A	364	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21699	12-1-28	O	PATRICIA M LEOHR	TH EXPLORATION LLC	1/8+	212A	35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*21700	12-1-28	O	NANCY SELLERS	TH EXPLORATION LLC	1/8+	213A	408	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22067	12-1-28	O	SHIRLEY K WHITE	TH EXPLORATION LLC	1/8+	212A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22069	12-1-28	O	RUTH ANN SHINGLETON	TH EXPLORATION LLC	1/8+	210A	170	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22071	12-1-28	O	SALLY BROKKEN AND TOM BROKKEN	TH EXPLORATION LLC	1/8+	202A	820	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22072	12-1-28	O	HAROLD E SELLERS	TH EXPLORATION LLC	1/8+	213A	682	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22081	12-1-28	O	ROBERT J WITTMAN FIVE STAR RESOURCES	TH EXPLORATION LLC	1/8+	202A	816	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22204	12-1-28	O	JAMES A MAIBACH & MELISSA F MAIBACH	TH EXPLORATION LLC	1/8+	216A	169	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22211	12-1-28	O	DENVER J MINOR GREGG D MINOR TRUSTEE	TH EXPLORATION LLC	1/8+	202A	798	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22218	12-1-28	O	SANDRA L SCHAFER	TH EXPLORATION LLC	1/8+	202A	788	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22231	12-1-28	O	MARILYN SLATER	TH EXPLORATION LLC	1/8+	204A	144	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23038	12-1-28	O	SHIRLEY JANE MILLIKEN	TH EXPLORATION LLC	1/8+	220A	280	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23044	12-1-28	O	DONNA R WOLFE AND DWIGHT WOLFE	TH EXPLORATION LLC	1/8+	204A	160	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23344	12-1-28	O	JEFFREY S MAIBACH	TH EXPLORATION LLC	1/8+	214A	678	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23346	12-1-28	O	EMILY B MORRIS	TH EXPLORATION LLC	1/8+	214A	682	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23442	12-1-28	O	FTC LLC	TH EXPLORATION LLC	1/8+	212A	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23443	12-1-28	O	LOST RIVER TRADING COMPANY LLC	TH EXPLORATION LLC	1/8+	212A	45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23445	12-1-28	O	ARBOR MINERAL COMPANY LLC	TH EXPLORATION LLC	1/8+	212A	41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*24021	12-1-28	O	KELLI PAGE MARTI	TH EXPLORATION LLC	1/8+	215A	884	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*24081	12-1-28	O	DON MATTHEW PAGE	TH EXPLORATION LLC	1/8+	216A	401	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*24318	12-1-28	O	LORI PAGE ESBORN AND MICHAEL ESBORN	TH EXPLORATION LLC	1/8+	217A	164	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*24356	12-1-28	O	BEATRICE TORRES	TH EXPLORATION LLC	1/8+	218A	179	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*25516	12-1-28	O	GOLDEN EAGLE RESOURCES II LLC	AMERICAN PETROLEUM PARTNERS LLC	1/8+	215A	250	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Partners LLC to TH Exploration LLC: 224A/459
10*26681	12-1-28	O	DENVER J MINOR GREGG D MINOR TRUSTEE	TH EXPLORATION LLC	1/8+	225A	495	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**Permitting Agreement with EQT Production Company

Kees, Kelly L

From: Kees, Kelly L
Sent: Wednesday, March 10, 2021 2:19 PM
To: Amy Morris
Cc: Brewer, Charles T; Stansberry, Wade A; Stollings, Barry W
Subject: Expedited Modification - Well Work Permit (API: 47-051-02201)
Attachments: 51-02201 mod_1.pdf; 51-02201 SSP_Goudy 1S-10HM.pdf

I have attached a copy of the newly issued modification to number "GOUDY 1S-10HM" (API 47-051-02201) This will serve as your copy. If you have any questions, then please contact us here at the Office of Oil and Gas.