



west virginia department of environmental protection

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

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

Wednesday, May 09, 2018
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

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

Re: Permit Modification Approval for HEAVEN HILL 3-1HM
47-051-01935-00-00

Modified to Extend Lateral

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.

James A. Martin
Chief

Operator's Well Number: HEAVEN HILL 3-1HM
Farm Name: WHITLATCH, RICKY L.
U.S. WELL NUMBER: 47-051-01935-00-00
Horizontal 6A New Drill
Date Modification Issued: May 9, 2018

Promoting a healthy environment.

05/11/2018

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 Meade Glen Easton 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Heaven Hill 3-1HM Well Pad Name: Heaven Hill 3

3) Farm Name/Surface Owner: Ricky L. Whitlatch Public Road Access: Yeater Lane CR 21/11

4) Elevation, current ground: 1326' Elevation, proposed post-construction: 1326'

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

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No Yes

J
3/28/18

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus is the target formation at a depth of 6724 - 6776' thickness of 52' and anticipated pressure of approx. 3800 psi

8) Proposed Total Vertical Depth: 6,876'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 19,500'

11) Proposed Horizontal Leg Length: 11,471'

12) Approximate Fresh Water Strata Depths: 70', 1038'

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: 2,167'

15) Approximate Coal Seam Depths: Sewickly Coal - 946' and Pittsburgh Coal - 1031'

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: 1031' TVD and 308' subsea level
Seam: Pittsburgh #8
Owner: Murray Energy / Consolidated Coal Co.

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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	13 3/8"	NEW	H40	48#	1,120'	1,120'	1128ft^3(CTS)
Coal	13 3/8"	NEW	H40	48#	1,120'	1,120'	1128ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	36#	2,804'	2,804'	918ft^3(CTS)
Production	5 1/2"	NEW	P110	20#	19,500'	19,500'	4972ft^3(CTS)
Tubing	2 3/8"	NEW	N80	4.7#		7,875'	
Liners							

JM
3/28/18

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water	13 3/8"	17 1/2"	.33	1,730	1,384	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.33	1,730	1,384	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	9,000	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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WW-6B
(10/14)

API NO. 47- 051 - 01935 MDD
OPERATOR WELL NO. Heaven Hill 3-1HM
Well Pad Name: Heaven Hill 3

JL
3/28/18

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

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

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

Well to be completed with approximately 28,677,500 lb proppant and 443,375 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 18.43

22) Area to be disturbed for well pad only, less access road (acres): 7.15

23) Describe centralizer placement for each casing string:

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

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

*See Attachment

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25) Proposed borehole conditioning procedures:

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

*Note: Attach additional sheets as needed.

WW-6B Attachment to #24

Conductor, Coal and Fresh Water Casing Cement:*Premium NE-1 + 2% CaCl*

- Premium NE-1 – Class A Portland API Spec
- CaCl – Calcium Chloride

Intermediate Casing:*Premium NE-1 + 2% bwoc CaCl₂ + 46.5% Fresh Water*

- Premium NE-1 – Class A Portland API spec
- CaCl₂ – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

Kick Off Plug:*Class H Cement + 1% CD-32 + .7% Sodium Metasilicate + .1% R-3 + .75 gal/100sk FP-13L + 38% Fresh Water*

- Class H – Increased Compressive Strength Cement
- Sodium Metasilicate – Free Water Control; Early Strength Additive
- R-3 – Cement Retarder
- FP-13L – Anti-Foaming Agent
- CaCl₂ – Calcium Chloride
- Cello Flake – Fluid Loss Preventer

Production Casing Cement:*Lead: 50:50 (Poz:Premium NE-1) + .2% R-3 + .2% MPA-170 + .75 gal/100sk FP-13L**Tail: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L*

- Poz – Fly Ash
- Premium NE-1 – Class A Portland API spec
- R-3 – Cement Retarder
- MPA-170 – Gelling Agent
- FP-13L – Anti-Foaming Agent
- ASA-301 – Free Water Control Agent
- BA-10A – Bonding Agent
- ASCA-1 – Solubility Additive

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Tug Hill Operating, LLC Casing and Cement Program

Heaven Hill 3-1HM

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	H40	17 1/2"	1,120'	CTS
Intermediate	9 5/8"	J55	12 1/4"	2,804'	CTS
Production	5 1/2"	P110	8 7/8 x 8 3/4"	19,500'	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

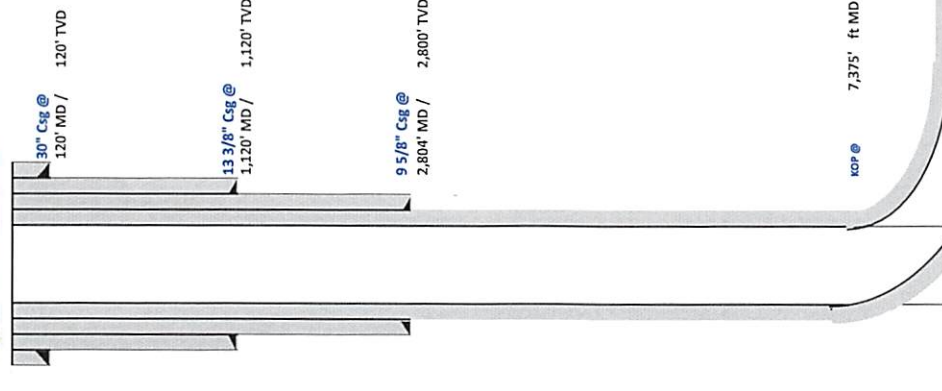
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05/11/2018

51-01935MOD



WELL NAME: Heaven Hill 3-1HM
 STATE: West Virginia COUNTY: Marshall
 DISTRICT: Meade
 OF Elev: 1,326'
 TD: 19,500'
 TH Latitude: 39.80859972
 TH Longitude: -80.69332114
 BH Latitude: 39.77284284
 BH Longitude: -80.67625062



Formation	Depth TVD
Deepest Fresh Water	1038
Swickley Coal	946
Pittsburgh Coal	1031
Big Lime	2060
Well	2486
Berea	2684
Gordon	2946
Rhinestreet	6068
Genesee/Burkett	6586
Tully	6617
Hamilton	6650
Marcellus	6724
Landing Depth	6769
Onondaga	6776
Pilot Hole Depth	6876

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	1,120'	1,120'	48	H40	Surface
Intermediate 1	12.1/4	9 5/8	2,804'	2,800'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	19,500'	6,970'	20	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
Sacks	Class	Density	Fluid Type	Centralizer Notes	
338	A	15.6	Air	None	
1,442	A	15.6	Air	3 Centralizers at equal distance	
897	A	15	Air	1 Centralizer every other ft	
4,388	A	14.5	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other ft to sfc	

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Lateral TD @ 19,500' ft MD
 6,970 ft TVD

Landing Point @ 8,029' MD / 6,769' TVD
 PH TVD = 100' below Onondaga Top

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Pilot Hole
 P110 @ 6,970' TVD
 4/1/2018

51-0193540D

Well: Heaven Hill 3-1 HM (L)
Site: Heaven Hill 3
Project: Marshall County, West Virginia
Design: rev6



SECTION DETAILS

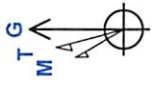
Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dleg	TFace	Vsect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1800.00	0.00	0.00	1800.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 27'100' build
3	1850.00	5.00	200.00	1849.69	-10.24	-3.73	2.00	200.00	8.30	Begin 5.00° tangent
4	2904.33	5.00	200.00	2900.00	-98.59	-35.16	0.00	0.00	78.29	Begin 37'100' build
5	4071.00	40.00	200.00	3981.18	-509.64	-185.49	0.00	0.00	78.29	Begin 40.00° tangent
6	6171.00	40.00	200.00	5569.87	-1778.09	-647.17	0.00	0.00	412.89	Begin 40.66° tangent
7	6223.32	40.66	202.20	5609.76	-1809.67	-659.36	0.00	0.00	1440.55	Begin 107'100' turn
8	7374.56	40.66	202.20	6483.03	-2504.24	-942.78	0.00	0.00	65.85	Begin 107'100' build/turn
9	8029.47	89.00	150.25	6769.00	-3046.39	-850.66	0.00	-59.92	2558.16	Begin 89.00° lateral section
10	19500.04	89.00	150.25	6970.00	-13003.21	-4841.03	0.00	0.00	3875.12	PBHLTD 19500.03 MD/6970.00 TVD

Geocentric System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARR
 Ellipsoid: GRS 1990
 Zone: Zone 17N (84 W to 78 W)

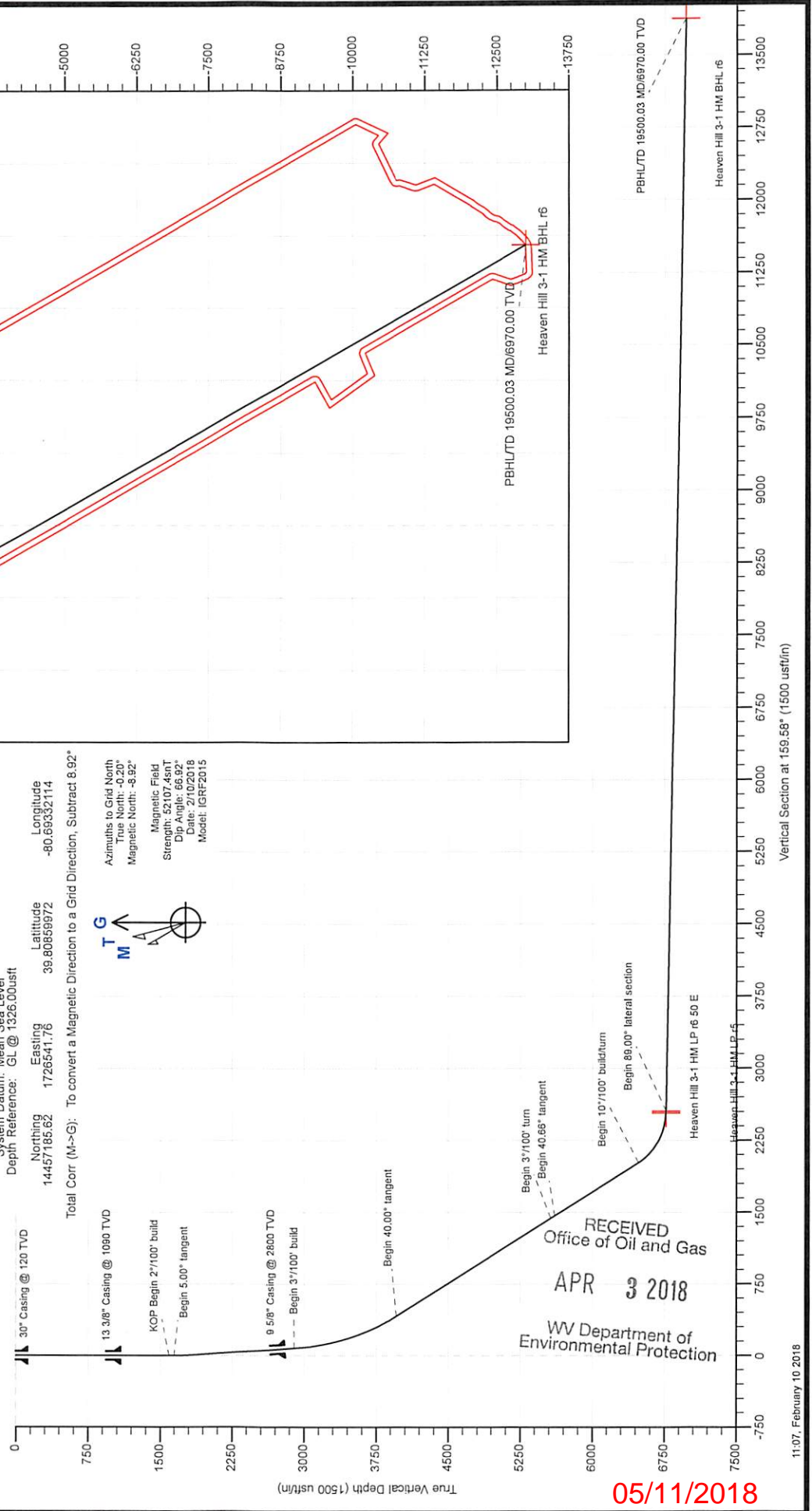
System Datum: Mean Sea Level
 Depth Reference: GL @ 1326.00usft

Northing 14457185.62
 Easting 1726541.76
 Latitude 39.80659972
 Longitude -80.69332114

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.92°



Azimuths to Grid North
 True North: -0.20°
 Magnetic North: -8.92°
 Magnetic Field
 Strength: 52107.4srT
 Dip Angle: 66.92°
 Date: 2/10/2018
 Model: IGRF2015



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Planning Report - Geographic

51-01935H0D

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-1 HM (L)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-1 HM (L)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev6		

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	Heaven Hill 3				
Site Position:		Northing:	14,457,178.77 usft	Latitude:	39.80858060
From:	Lat/Long	Easting:	1,726,571.98 usft	Longitude:	-80.69321360
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.20 °

Well	Heaven Hill 3-1 HM (L)					
Well Position	+N/-S	0.00 usft	Northing:	14,457,185.62 usft	Latitude:	39.80859972
	+E/-W	0.00 usft	Easting:	1,726,541.76 usft	Longitude:	-80.69332114
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	1,326.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2/10/2018	-8.72	66.92	52,107.41472264

Design	rev6			
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	159.58

Plan Survey Tool Program	Date	2/10/2018		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	19,500.04 rev6 (Original Hole)	MWD	MWD - Standard

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Planning Report - Geographic

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Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-1 HM (L)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev6		

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		
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00		
1,850.00	5.00	200.00	1,849.68	-10.24	-3.73	2.00	2.00	0.00	200.00		
2,904.33	5.00	200.00	2,900.00	-96.59	-35.16	0.00	0.00	0.00	0.00		
4,071.00	40.00	200.00	3,961.18	-509.64	-185.49	3.00	3.00	0.00	0.00		
6,171.00	40.00	200.00	5,569.87	-1,778.09	-647.17	0.00	0.00	0.00	0.00		
6,223.32	40.66	202.20	5,609.76	-1,809.67	-659.36	3.00	1.27	4.20	65.85		
7,374.56	40.66	202.20	6,483.03	-2,504.24	-942.78	0.00	0.00	0.00	0.00		
8,029.47	89.00	150.25	6,769.00	-3,046.39	-850.66	10.00	7.38	-7.93	-59.92	Heaven Hill 3-1 HM L	
19,500.04	89.00	150.25	6,970.00	-13,003.21	4,841.03	0.00	0.00	0.00	0.00	Heaven Hill 3-1 HM B	

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Planning Report - Geographic

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Database: DB_Jul2216dt_v14
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Site: Heaven Hill 3
Well: Heaven Hill 3-1 HM (L)
Wellbore: Original Hole
Design: rev6

Local Co-ordinate Reference: Well Heaven Hill 3-1 HM (L)
TVD Reference: GL @ 1326.00usft
MD Reference: GL @ 1326.00usft
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	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
100.00	0.00	0.00	100.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
200.00	0.00	0.00	200.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
300.00	0.00	0.00	300.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
400.00	0.00	0.00	400.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
500.00	0.00	0.00	500.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
600.00	0.00	0.00	600.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
700.00	0.00	0.00	700.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
800.00	0.00	0.00	800.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
900.00	0.00	0.00	900.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,457,185.62	1,726,541.76	39.80859972	-80.69332114	
KOP Begin 2°/100' build										
1,650.00	1.00	200.00	1,650.00	-0.41	-0.15	14,457,185.21	1,726,541.61	39.80859860	-80.69332168	
Begin 5.00° tangent										
1,700.00	2.00	200.00	1,699.98	-1.64	-0.60	14,457,183.98	1,726,541.16	39.80859522	-80.69332329	
1,800.00	4.00	200.00	1,799.84	-6.56	-2.39	14,457,179.07	1,726,539.37	39.80858174	-80.69332972	
1,850.00	5.00	200.00	1,849.68	-10.24	-3.73	14,457,175.38	1,726,538.03	39.80857162	-80.69333454	
1,900.00	5.00	200.00	1,899.49	-14.34	-5.22	14,457,171.29	1,726,536.54	39.80856039	-80.69333990	
2,000.00	5.00	200.00	1,999.11	-22.53	-8.20	14,457,163.10	1,726,533.56	39.80853793	-80.69335061	
2,100.00	5.00	200.00	2,098.73	-30.72	-11.18	14,457,154.91	1,726,530.58	39.80851547	-80.69336133	
2,200.00	5.00	200.00	2,198.35	-38.91	-14.16	14,457,146.72	1,726,527.60	39.80849300	-80.69337204	
2,300.00	5.00	200.00	2,297.97	-47.10	-17.14	14,457,138.53	1,726,524.62	39.80847054	-80.69338276	
2,400.00	5.00	200.00	2,397.59	-55.29	-20.12	14,457,130.34	1,726,521.64	39.80844807	-80.69339347	
2,500.00	5.00	200.00	2,497.21	-63.48	-23.10	14,457,122.15	1,726,518.65	39.80842561	-80.69340418	
2,600.00	5.00	200.00	2,596.83	-71.67	-26.09	14,457,113.96	1,726,515.67	39.80840315	-80.69341490	
2,700.00	5.00	200.00	2,696.45	-79.86	-29.07	14,457,105.77	1,726,512.69	39.80838068	-80.69342561	
2,800.00	5.00	200.00	2,796.07	-88.05	-32.05	14,457,097.58	1,726,509.71	39.80835822	-80.69343633	
2,900.00	5.00	200.00	2,895.69	-96.24	-35.03	14,457,089.39	1,726,506.73	39.80833576	-80.69344704	
2,904.33	5.00	200.00	2,900.00	-96.59	-35.16	14,457,089.03	1,726,506.60	39.80833478	-80.69344751	
Begin 3°/100' build										
3,000.00	7.87	200.00	2,995.06	-106.67	-38.82	14,457,078.96	1,726,502.93	39.80830715	-80.69346069	
3,100.00	10.87	200.00	3,093.71	-121.97	-44.39	14,457,063.66	1,726,497.37	39.80826519	-80.69348070	
3,200.00	13.87	200.00	3,191.38	-142.09	-51.72	14,457,043.53	1,726,490.04	39.80820998	-80.69350703	
3,300.00	16.87	200.00	3,287.79	-167.00	-60.78	14,457,018.63	1,726,480.98	39.80814168	-80.69353961	
3,400.00	19.87	200.00	3,382.89	-196.61	-71.56	14,456,989.02	1,726,470.20	39.80806046	-80.69357835	
3,500.00	22.87	200.00	3,475.80	-230.85	-84.02	14,456,954.78	1,726,457.74	39.80796655	-80.69362314	
3,600.00	25.87	200.00	3,566.88	-269.62	-98.13	14,456,916.01	1,726,443.63	39.80786021	-80.69367386	
3,700.00	28.87	200.00	3,655.67	-312.81	-113.85	14,456,872.81	1,726,427.90	39.80774173	-80.69373037	
3,800.00	31.87	200.00	3,741.94	-360.32	-131.14	14,456,825.31	1,726,410.61	39.80761144	-80.69379251	
3,900.00	34.87	200.00	3,825.45	-412.00	-149.96	14,456,773.63	1,726,391.80	39.80746968	-80.69386012	
4,000.00	37.87	200.00	3,905.96	-467.72	-170.23	14,456,717.91	1,726,371.52	39.80731686	-80.69393301	
4,071.00	40.00	200.00	3,961.18	-509.64	-185.49	14,456,675.98	1,726,356.26	39.80720186	-80.69398786	
Begin 40.00° tangent										
4,100.00	40.00	200.00	3,983.40	-527.16	-191.87	14,456,658.47	1,726,349.89	39.80715382	-80.69401077	
4,200.00	40.00	200.00	4,060.00	-587.56	-213.85	14,456,598.06	1,726,327.90	39.80698815	-80.69408979	
4,300.00	40.00	200.00	4,136.61	-647.96	-235.84	14,456,537.66	1,726,305.92	39.80682247	-80.69416880	
4,400.00	40.00	200.00	4,213.21	-708.37	-257.82	14,456,477.26	1,726,283.93	39.80665680	-80.69424782	
4,500.00	40.00	200.00	4,289.82	-768.77	-279.81	14,456,416.86	1,726,261.95	39.80649113	-80.69432683	

51-01935
L009



Planning Report - Geographic

Database: DB_Jul2216dt_v14
Company: Tug Hill Operating LLC
Project: Marshall County, West Virginia
Site: Heaven Hill 3
Well: Heaven Hill 3-1 HM (L)
Wellbore: Original Hole
Design: rev6

Local Co-ordinate Reference: Well Heaven Hill 3-1 HM (L)
TVD Reference: GL @ 1326.00usft
MD Reference: GL @ 1326.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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Environmental Protection

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,600.00	40.00	200.00	4,366.42	-829.17	-301.79	14,456,356.45	1,726,239.97	39.80632545	-80.69440585
4,700.00	40.00	200.00	4,443.02	-889.57	-323.78	14,456,296.05	1,726,217.98	39.80615978	-80.69448486
4,800.00	40.00	200.00	4,519.63	-949.97	-345.76	14,456,235.65	1,726,196.00	39.80599411	-80.69456388
4,900.00	40.00	200.00	4,596.23	-1,010.38	-367.75	14,456,175.25	1,726,174.01	39.80582843	-80.69464289
5,000.00	40.00	200.00	4,672.84	-1,070.78	-389.73	14,456,114.85	1,726,152.03	39.80566276	-80.69472191
5,100.00	40.00	200.00	4,749.44	-1,131.18	-411.72	14,456,054.44	1,726,130.04	39.80549709	-80.69480092
5,200.00	40.00	200.00	4,826.05	-1,191.58	-433.70	14,455,994.04	1,726,108.06	39.80533141	-80.69487993
5,300.00	40.00	200.00	4,902.65	-1,251.99	-455.69	14,455,933.64	1,726,086.07	39.80516574	-80.69495894
5,400.00	40.00	200.00	4,979.26	-1,312.39	-477.67	14,455,873.24	1,726,064.09	39.80500006	-80.69503796
5,500.00	40.00	200.00	5,055.86	-1,372.79	-499.65	14,455,812.83	1,726,042.10	39.80483439	-80.69511697
5,600.00	40.00	200.00	5,132.46	-1,433.19	-521.64	14,455,752.43	1,726,020.12	39.80466872	-80.69519598
5,700.00	40.00	200.00	5,209.07	-1,493.59	-543.62	14,455,692.03	1,725,998.13	39.80450304	-80.69527499
5,800.00	40.00	200.00	5,285.67	-1,554.00	-565.61	14,455,631.63	1,725,976.15	39.80433737	-80.69535400
5,900.00	40.00	200.00	5,362.28	-1,614.40	-587.59	14,455,571.23	1,725,954.17	39.80417169	-80.69543301
6,000.00	40.00	200.00	5,438.88	-1,674.80	-609.58	14,455,510.82	1,725,932.18	39.80400602	-80.69551202
6,100.00	40.00	200.00	5,515.49	-1,735.20	-631.56	14,455,450.42	1,725,910.20	39.80384035	-80.69559103
6,171.00	40.00	200.00	5,569.88	-1,778.09	-647.17	14,455,407.54	1,725,894.59	39.80372272	-80.69564712
Begin 3°/100' turn									
6,200.00	40.36	201.23	5,592.03	-1,795.60	-653.76	14,455,390.02	1,725,888.00	39.80367469	-80.69567079
6,223.32	40.66	202.20	5,609.76	-1,809.68	-659.36	14,455,375.95	1,725,882.39	39.80363609	-80.69569092
Begin 40.66° tangent									
6,300.00	40.66	202.20	5,667.93	-1,855.94	-678.24	14,455,329.69	1,725,863.52	39.80350922	-80.69575869
6,400.00	40.66	202.20	5,743.78	-1,916.27	-702.86	14,455,269.36	1,725,838.90	39.80334376	-80.69584708
6,500.00	40.66	202.20	5,819.64	-1,976.60	-727.48	14,455,209.02	1,725,814.28	39.80317830	-80.69593546
6,600.00	40.66	202.20	5,895.49	-2,036.93	-752.10	14,455,148.69	1,725,789.66	39.80301285	-80.69602385
6,700.00	40.66	202.20	5,971.35	-2,097.26	-776.72	14,455,088.36	1,725,765.04	39.80284739	-80.69611224
6,800.00	40.66	202.20	6,047.20	-2,157.60	-801.34	14,455,028.03	1,725,740.42	39.80268194	-80.69620062
6,900.00	40.66	202.20	6,123.06	-2,217.93	-825.95	14,454,967.70	1,725,715.80	39.80251648	-80.69628900
7,000.00	40.66	202.20	6,198.91	-2,278.26	-850.57	14,454,907.37	1,725,691.19	39.80235102	-80.69637739
7,100.00	40.66	202.20	6,274.77	-2,338.59	-875.19	14,454,847.03	1,725,666.57	39.80218557	-80.69646577
7,200.00	40.66	202.20	6,350.62	-2,398.92	-899.81	14,454,786.70	1,725,641.95	39.80202011	-80.69655415
7,300.00	40.66	202.20	6,426.48	-2,459.25	-924.43	14,454,726.37	1,725,617.33	39.80185465	-80.69664253
7,374.56	40.66	202.20	6,483.04	-2,504.24	-942.78	14,454,681.39	1,725,598.97	39.80173129	-80.69670843
Begin 10°/100' build/turn									
7,400.00	41.99	198.91	6,502.14	-2,519.96	-948.67	14,454,665.66	1,725,593.08	39.80168816	-80.69672959
7,500.00	47.97	187.54	6,572.96	-2,588.60	-964.43	14,454,597.02	1,725,577.33	39.80149981	-80.69678650
7,600.00	54.87	178.27	6,635.37	-2,666.49	-968.07	14,454,519.13	1,725,573.69	39.80128593	-80.69680043
7,700.00	62.37	170.50	6,687.46	-2,751.27	-959.50	14,454,434.35	1,725,582.25	39.80105302	-80.69677094
7,800.00	70.24	163.76	6,727.65	-2,840.37	-938.98	14,454,345.26	1,725,602.78	39.80080815	-80.69669894
7,900.00	78.34	157.66	6,754.72	-2,931.07	-907.12	14,454,254.55	1,725,634.64	39.80055877	-80.69658661
8,000.00	86.56	151.91	6,767.86	-3,020.62	-864.90	14,454,165.00	1,725,676.86	39.80031244	-80.69643736
8,029.47	89.00	150.25	6,769.00	-3,046.39	-850.66	14,454,139.23	1,725,691.10	39.80024154	-80.69638697
Begin 89.00° lateral section									
8,100.00	89.00	150.25	6,770.24	-3,107.62	-815.66	14,454,078.01	1,725,726.10	39.80007308	-80.69626311
8,200.00	89.00	150.25	6,771.99	-3,194.42	-766.04	14,453,991.21	1,725,775.72	39.79983423	-80.69608750
8,300.00	89.00	150.25	6,773.74	-3,281.22	-716.42	14,453,904.40	1,725,825.34	39.79959539	-80.69591188
8,400.00	89.00	150.25	6,775.49	-3,368.03	-666.80	14,453,817.60	1,725,874.96	39.79935654	-80.69573627
8,500.00	89.00	150.25	6,777.25	-3,454.83	-617.18	14,453,730.80	1,725,924.58	39.79911769	-80.69556065
8,600.00	89.00	150.25	6,779.00	-3,541.63	-567.56	14,453,643.99	1,725,974.20	39.79887885	-80.69538504
8,700.00	89.00	150.25	6,780.75	-3,628.44	-517.94	14,453,557.19	1,726,023.82	39.79864000	-80.69520943
8,800.00	89.00	150.25	6,782.50	-3,715.24	-468.32	14,453,470.39	1,726,073.44	39.79840115	-80.69503382
8,900.00	89.00	150.25	6,784.25	-3,802.04	-418.70	14,453,383.58	1,726,123.06	39.79816230	-80.69485822
9,000.00	89.00	150.25	6,786.01	-3,888.84	-369.08	14,453,296.78	1,726,172.68	39.79792346	-80.69468261
9,100.00	89.00	150.25	6,787.76	-3,975.65	-319.46	14,453,209.98	1,726,222.30	39.79768461	-80.69450701

51-01935
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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-1 HM (L)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-1 HM (L)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev6		

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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	
9,200.00	89.00	150.25	6,789.51	-4,062.45	-269.84	14,453,123.17	1,726,271.92	39.79744576	-80.69433140	
9,300.00	89.00	150.25	6,791.26	-4,149.25	-220.22	14,453,036.37	1,726,321.54	39.79720691	-80.69415580	
9,400.00	89.00	150.25	6,793.02	-4,236.06	-170.60	14,452,949.57	1,726,371.16	39.79696806	-80.69398020	
9,500.00	89.00	150.25	6,794.77	-4,322.86	-120.98	14,452,862.76	1,726,420.78	39.79672921	-80.69380460	
9,600.00	89.00	150.25	6,796.52	-4,409.66	-71.36	14,452,775.96	1,726,470.40	39.79649036	-80.69362900	
9,700.00	89.00	150.25	6,798.27	-4,496.47	-21.74	14,452,689.16	1,726,520.02	39.79625151	-80.69345340	
9,800.00	89.00	150.25	6,800.03	-4,583.27	27.88	14,452,602.35	1,726,569.64	39.79601266	-80.69327780	
9,900.00	89.00	150.25	6,801.78	-4,670.07	77.50	14,452,515.55	1,726,619.26	39.79577381	-80.69310221	
10,000.00	89.00	150.25	6,803.53	-4,756.88	127.12	14,452,428.75	1,726,668.88	39.79553496	-80.69292661	
10,100.00	89.00	150.25	6,805.28	-4,843.68	176.74	14,452,341.95	1,726,718.50	39.79529611	-80.69275102	
10,200.00	89.00	150.25	6,807.03	-4,930.48	226.36	14,452,255.14	1,726,768.12	39.79505726	-80.69257543	
10,300.00	89.00	150.25	6,808.79	-5,017.29	275.98	14,452,168.34	1,726,817.74	39.79481841	-80.69239984	
10,400.00	89.00	150.25	6,810.54	-5,104.09	325.60	14,452,081.54	1,726,867.36	39.79457956	-80.69222425	
10,500.00	89.00	150.25	6,812.29	-5,190.89	375.22	14,451,994.73	1,726,916.98	39.79434071	-80.69204866	
10,600.00	89.00	150.25	6,814.04	-5,277.70	424.84	14,451,907.93	1,726,966.60	39.79410185	-80.69187307	
10,700.00	89.00	150.25	6,815.80	-5,364.50	474.46	14,451,821.13	1,727,016.22	39.79386300	-80.69169749	
10,800.00	89.00	150.25	6,817.55	-5,451.30	524.08	14,451,734.32	1,727,065.84	39.79362415	-80.69152190	
10,900.00	89.00	150.25	6,819.30	-5,538.10	573.70	14,451,647.52	1,727,115.46	39.79338530	-80.69134632	
11,000.00	89.00	150.25	6,821.05	-5,624.91	623.32	14,451,560.72	1,727,165.08	39.79314644	-80.69117074	
11,100.00	89.00	150.25	6,822.81	-5,711.71	672.94	14,451,473.91	1,727,214.70	39.79290759	-80.69099516	
11,200.00	89.00	150.25	6,824.56	-5,798.51	722.56	14,451,387.11	1,727,264.32	39.79266874	-80.69081958	
11,300.00	89.00	150.25	6,826.31	-5,885.32	772.18	14,451,300.31	1,727,313.94	39.79242988	-80.69064400	
11,400.00	89.00	150.25	6,828.06	-5,972.12	821.80	14,451,213.50	1,727,363.56	39.79219103	-80.69046842	
11,500.00	89.00	150.25	6,829.81	-6,058.92	871.42	14,451,126.70	1,727,413.18	39.79195217	-80.69029285	
11,600.00	89.00	150.25	6,831.57	-6,145.73	921.04	14,451,039.90	1,727,462.80	39.79171332	-80.69011727	
11,700.00	89.00	150.25	6,833.32	-6,232.53	970.66	14,450,953.10	1,727,512.42	39.79147446	-80.68994170	
11,800.00	89.00	150.25	6,835.07	-6,319.33	1,020.28	14,450,866.29	1,727,562.04	39.79123561	-80.68976613	
11,900.00	89.00	150.25	6,836.82	-6,406.14	1,069.90	14,450,779.49	1,727,611.66	39.79099675	-80.68959055	
12,000.00	89.00	150.25	6,838.58	-6,492.94	1,119.52	14,450,692.69	1,727,661.28	39.79075790	-80.68941498	
12,100.00	89.00	150.25	6,840.33	-6,579.74	1,169.14	14,450,605.88	1,727,710.90	39.79051904	-80.68923942	
12,200.00	89.00	150.25	6,842.08	-6,666.55	1,218.76	14,450,519.08	1,727,760.52	39.79028018	-80.68906385	
12,300.00	89.00	150.25	6,843.83	-6,753.35	1,268.38	14,450,432.28	1,727,810.14	39.79004133	-80.68888828	
12,400.00	89.00	150.25	6,845.59	-6,840.15	1,318.00	14,450,345.47	1,727,859.76	39.78980247	-80.68871272	
12,500.00	89.00	150.25	6,847.34	-6,926.95	1,367.62	14,450,258.67	1,727,909.38	39.78956361	-80.68853715	
12,600.00	89.00	150.25	6,849.09	-7,013.76	1,417.24	14,450,171.87	1,727,959.00	39.78932475	-80.68836159	
12,700.00	89.00	150.25	6,850.84	-7,100.56	1,466.86	14,450,085.06	1,728,008.62	39.78908590	-80.68818603	
12,800.00	89.00	150.25	6,852.59	-7,187.36	1,516.48	14,449,998.26	1,728,058.24	39.78884704	-80.68801047	
12,900.00	89.00	150.25	6,854.35	-7,274.17	1,566.10	14,449,911.46	1,728,107.86	39.78860818	-80.68783491	
13,000.00	89.00	150.25	6,856.10	-7,360.97	1,615.72	14,449,824.65	1,728,157.48	39.78836932	-80.68765935	
13,100.00	89.00	150.25	6,857.85	-7,447.77	1,665.34	14,449,737.85	1,728,207.10	39.78813046	-80.68748379	
13,200.00	89.00	150.25	6,859.60	-7,534.58	1,714.96	14,449,651.05	1,728,256.72	39.78789160	-80.68730824	
13,300.00	89.00	150.25	6,861.36	-7,621.38	1,764.58	14,449,564.24	1,728,306.34	39.78765274	-80.68713268	
13,400.00	89.00	150.25	6,863.11	-7,708.18	1,814.20	14,449,477.44	1,728,355.96	39.78741388	-80.68695713	
13,500.00	89.00	150.25	6,864.86	-7,794.99	1,863.82	14,449,390.64	1,728,405.58	39.78717502	-80.68678158	
13,600.00	89.00	150.25	6,866.61	-7,881.79	1,913.44	14,449,303.84	1,728,455.20	39.78693616	-80.68660603	
13,700.00	89.00	150.25	6,868.37	-7,968.59	1,963.06	14,449,217.03	1,728,504.82	39.78669730	-80.68643048	
13,800.00	89.00	150.25	6,870.12	-8,055.40	2,012.68	14,449,130.23	1,728,554.44	39.78645844	-80.68625493	
13,900.00	89.00	150.25	6,871.87	-8,142.20	2,062.30	14,449,043.43	1,728,604.06	39.78621958	-80.68607938	
14,000.00	89.00	150.25	6,873.62	-8,229.00	2,111.92	14,448,956.62	1,728,653.68	39.78598072	-80.68590384	
14,100.00	89.00	150.25	6,875.37	-8,315.81	2,161.54	14,448,869.82	1,728,703.30	39.78574186	-80.68572829	
14,200.00	89.00	150.25	6,877.13	-8,402.61	2,211.16	14,448,783.02	1,728,752.92	39.78550300	-80.68555275	
14,300.00	89.00	150.25	6,878.88	-8,489.41	2,260.78	14,448,696.21	1,728,802.54	39.78526413	-80.68537721	
14,400.00	89.00	150.25	6,880.63	-8,576.21	2,310.40	14,448,609.41	1,728,852.16	39.78502527	-80.68520167	
14,500.00	89.00	150.25	6,882.38	-8,663.02	2,360.02	14,448,522.61	1,728,901.78	39.78478641	-80.68502613	
14,600.00	89.00	150.25	6,884.14	-8,749.82	2,409.64	14,448,435.80	1,728,951.40	39.78454755	-80.68485059	

WV Department of Environmental Protection



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-1 HM (L)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-1 HM (L)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev6		

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Planned Survey

WV Department of
Environmental Protection

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,700.00	89.00	150.25	6,885.89	-8,836.62	2,459.26	14,448,349.00	1,729,001.02	39.78430868	-80.68467505
14,800.00	89.00	150.25	6,887.64	-8,923.43	2,508.88	14,448,262.20	1,729,050.64	39.78406982	-80.68449952
14,900.00	89.00	150.25	6,889.39	-9,010.23	2,558.50	14,448,175.39	1,729,100.26	39.78383096	-80.68432398
15,000.00	89.00	150.25	6,891.15	-9,097.03	2,608.12	14,448,088.59	1,729,149.88	39.78359209	-80.68414845
15,100.00	89.00	150.25	6,892.90	-9,183.84	2,657.74	14,448,001.79	1,729,199.50	39.78335323	-80.68397291
15,200.00	89.00	150.25	6,894.65	-9,270.64	2,707.36	14,447,914.98	1,729,249.12	39.78311436	-80.68379738
15,300.00	89.00	150.25	6,896.40	-9,357.44	2,756.98	14,447,828.18	1,729,298.74	39.78287550	-80.68362185
15,400.00	89.00	150.25	6,898.15	-9,444.25	2,806.60	14,447,741.38	1,729,348.36	39.78263663	-80.68344632
15,500.00	89.00	150.25	6,899.91	-9,531.05	2,856.22	14,447,654.58	1,729,397.98	39.78239777	-80.68327080
15,600.00	89.00	150.25	6,901.66	-9,617.85	2,905.84	14,447,567.77	1,729,447.60	39.78215890	-80.68309527
15,700.00	89.00	150.25	6,903.41	-9,704.66	2,955.46	14,447,480.97	1,729,497.22	39.78192003	-80.68291974
15,800.00	89.00	150.25	6,905.16	-9,791.46	3,005.08	14,447,394.17	1,729,546.84	39.78168117	-80.68274422
15,900.00	89.00	150.25	6,906.92	-9,878.26	3,054.70	14,447,307.36	1,729,596.45	39.78144230	-80.68256870
16,000.00	89.00	150.25	6,908.67	-9,965.07	3,104.32	14,447,220.56	1,729,646.07	39.78120344	-80.68239318
16,100.00	89.00	150.25	6,910.42	-10,051.87	3,153.94	14,447,133.76	1,729,695.69	39.78096457	-80.68221766
16,200.00	89.00	150.25	6,912.17	-10,138.67	3,203.56	14,447,046.95	1,729,745.31	39.78072570	-80.68204214
16,300.00	89.00	150.25	6,913.93	-10,225.47	3,253.18	14,446,960.15	1,729,794.93	39.78048683	-80.68186662
16,400.00	89.00	150.25	6,915.68	-10,312.28	3,302.80	14,446,873.35	1,729,844.55	39.78024797	-80.68169110
16,500.00	89.00	150.25	6,917.43	-10,399.08	3,352.42	14,446,786.54	1,729,894.17	39.78000910	-80.68151559
16,600.00	89.00	150.25	6,919.18	-10,485.88	3,402.04	14,446,699.74	1,729,943.79	39.77977023	-80.68134007
16,700.00	89.00	150.25	6,920.93	-10,572.69	3,451.66	14,446,612.94	1,729,993.41	39.77953136	-80.68116456
16,800.00	89.00	150.25	6,922.69	-10,659.49	3,501.28	14,446,526.13	1,730,043.03	39.77929249	-80.68098905
16,900.00	89.00	150.25	6,924.44	-10,746.29	3,550.90	14,446,439.33	1,730,092.65	39.77905362	-80.68081354
17,000.00	89.00	150.25	6,926.19	-10,833.10	3,600.52	14,446,352.53	1,730,142.27	39.77881475	-80.68063803
17,100.00	89.00	150.25	6,927.94	-10,919.90	3,650.14	14,446,265.73	1,730,191.89	39.77857588	-80.68046252
17,200.00	89.00	150.25	6,929.70	-11,006.70	3,699.76	14,446,178.92	1,730,241.51	39.77833701	-80.68028701
17,300.00	89.00	150.25	6,931.45	-11,093.51	3,749.38	14,446,092.12	1,730,291.13	39.77809814	-80.68011151
17,400.00	89.00	150.25	6,933.20	-11,180.31	3,799.00	14,446,005.32	1,730,340.75	39.77785927	-80.67993600
17,500.00	89.00	150.25	6,934.95	-11,267.11	3,848.62	14,445,918.51	1,730,390.37	39.77762040	-80.67976050
17,600.00	89.00	150.25	6,936.71	-11,353.92	3,898.24	14,445,831.71	1,730,439.99	39.77738153	-80.67958500
17,700.00	89.00	150.25	6,938.46	-11,440.72	3,947.86	14,445,744.91	1,730,489.61	39.77714266	-80.67940949
17,800.00	89.00	150.25	6,940.21	-11,527.52	3,997.48	14,445,658.10	1,730,539.23	39.77690379	-80.67923399
17,900.00	89.00	150.25	6,941.96	-11,614.32	4,047.10	14,445,571.30	1,730,588.85	39.77666492	-80.67905850
18,000.00	89.00	150.25	6,943.71	-11,701.13	4,096.72	14,445,484.50	1,730,638.47	39.77642604	-80.67888300
18,100.00	89.00	150.25	6,945.47	-11,787.93	4,146.34	14,445,397.69	1,730,688.09	39.77618717	-80.67870750
18,200.00	89.00	150.25	6,947.22	-11,874.73	4,195.96	14,445,310.89	1,730,737.71	39.77594830	-80.67853201
18,300.00	89.00	150.25	6,948.97	-11,961.54	4,245.58	14,445,224.09	1,730,787.33	39.77570942	-80.67835651
18,400.00	89.00	150.25	6,950.72	-12,048.34	4,295.20	14,445,137.28	1,730,836.95	39.77547055	-80.67818102
18,500.00	89.00	150.25	6,952.48	-12,135.14	4,344.82	14,445,050.48	1,730,886.57	39.77523168	-80.67800553
18,600.00	89.00	150.25	6,954.23	-12,221.95	4,394.44	14,444,963.68	1,730,936.19	39.77499280	-80.67783004
18,700.00	89.00	150.25	6,955.98	-12,308.75	4,444.06	14,444,876.87	1,730,985.81	39.77475393	-80.67765455
18,800.00	89.00	150.25	6,957.73	-12,395.55	4,493.68	14,444,790.07	1,731,035.43	39.77451506	-80.67747906
18,900.00	89.00	150.25	6,959.49	-12,482.36	4,543.30	14,444,703.27	1,731,085.05	39.77427618	-80.67730358
19,000.00	89.00	150.25	6,961.24	-12,569.16	4,592.92	14,444,616.47	1,731,134.67	39.77403731	-80.67712809
19,100.00	89.00	150.25	6,962.99	-12,655.96	4,642.54	14,444,529.66	1,731,184.29	39.77379843	-80.67695261
19,200.00	89.00	150.25	6,964.74	-12,742.77	4,692.16	14,444,442.86	1,731,233.91	39.77355956	-80.67677712
19,300.00	89.00	150.25	6,966.49	-12,829.57	4,741.78	14,444,356.06	1,731,283.53	39.77332068	-80.67660164
19,400.00	89.00	150.25	6,968.25	-12,916.37	4,791.40	14,444,269.25	1,731,333.15	39.77308180	-80.67642616
19,500.00	89.00	150.25	6,970.00	-13,003.18	4,841.02	14,444,182.45	1,731,382.77	39.77284293	-80.67625068
19,500.03	89.00	150.25	6,970.00	-13,003.20	4,841.03	14,444,182.42	1,731,382.79	39.77284286	-80.67625063
PBHL/TD 19500.03 MD/6970.00 TVD									
19,500.04	89.00	150.25	6,970.00	-13,003.21	4,841.03	14,444,182.42	1,731,382.79	39.77284284	-80.67625062

51-01935
MOD



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-1 HM (L)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-1 HM (L)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev6		

Design Targets										
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)			
- Shape										
Heaven Hill 3-1 HM LP r - plan hits target center - Point	0.00	0.01	6,769.00	-3,046.39	-850.66	14,454,139.23	1,725,691.10	39.80024154	-80.69638697	
Heaven Hill 3-1 HM LP r - plan misses target center by 43.71usft at 8005.30usft MD (6768.16 TVD, -3025.29 N, -862.39 E) - Point	0.00	0.01	6,769.00	-3,046.39	-900.66	14,454,139.23	1,725,641.10	39.80024200	-80.69656500	
Heaven Hill 3-1 HM BHL - plan hits target center - Point	0.00	0.01	6,970.00	-13,003.21	4,841.03	14,444,182.42	1,731,382.79	39.77284284	-80.67625062	

Casing Points					
Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter	
(usft)	(usft)		(")	(")	
120.00	120.00	30" Casing @ 120 TVD	30	36	
1,090.00	1,090.00	13 3/8" Casing @ 1090 TVD	13-3/8	17	
2,803.95	2,800.00	9 5/8" Casing @ 2800 TVD	9-5/8	12-1/4	

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
(usft)	(usft)	(usft)	(usft)		
1,600.00	1,600.00	0.00	0.00	KOP Begin 2°/100' build	
1,650.00	1,650.00	-0.41	-0.15	Begin 5.00° tangent	
2,904.33	2,900.00	-96.59	-35.16	Begin 3°/100' build	
4,071.00	3,961.18	-509.64	-185.49	Begin 40.00° tangent	
6,171.00	5,569.88	-1,778.09	-647.17	Begin 3°/100' turn	
6,223.32	5,609.76	-1,809.68	-659.36	Begin 40.66° tangent	
7,374.56	6,483.04	-2,504.24	-942.78	Begin 10°/100' build/turn	
8,029.47	6,769.00	-3,046.39	-850.66	Begin 89.00° lateral section	
19,500.03	6,970.00	-13,003.20	4,841.03	PBHL/TD 19500.03 MD/6970.00 TVD	

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Environmental Protection



Well Site Safety Plan

Tug Hill Operating, LLC

Joe
3/28/18

Well Name: Heaven Hill 3-1HM

Pad Location: Heaven Hill 3

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

Northing-4,406,558.99

Easting -526,250.98

March 2018

05/11/2018

WW-6A1
(5/13)

Operator's Well No. Heaven Hill 3-1HM

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

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

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

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

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

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

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

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WV Department of
Environmental Protection

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

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

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*15557	A	9-7-30	RICKY L WHITLATCH ET AL	CHEVRON USA INC	1/8+	780 226	N/A	N/A	N/A	N/A	N/A	N/A
10*15557	B	9-7-21	RICKY L WHITLATCH ET AL	CHEVRON USA INC	1/8+	780 226	N/A	N/A	N/A	N/A	N/A	N/A
10*15667	C	9-7-18	KEVIN E MCGILTON ET UX	CHEVRON USA INC	1/8+	850 351	N/A	N/A	N/A	N/A	N/A	N/A
10*15698	C	9-7-18	ROBERT A EDGE AND SHERRIE N EDGE	TH EXPLORATION LLC	1/8+	900 363	N/A	N/A	N/A	N/A	N/A	N/A
10*15720	C	9-7-18	KAREN L GREATHOUSE AND FLOYD GREATHOUSE	TH EXPLORATION LLC	1/8+	905 458	N/A	N/A	N/A	N/A	N/A	N/A
10*15721	C	9-7-18	TINA L EDGE MONTI AND THOMAS MONTI	TH EXPLORATION LLC	1/8+	905 456	N/A	N/A	N/A	N/A	N/A	N/A
10*16020	C	9-7-18	SHARON HINERMAN MAY & DANIEL G MAY	TH EXPLORATION LLC	1/8+	905 464	N/A	N/A	N/A	N/A	N/A	N/A
10*16028	C	9-7-18	ROSEMARY PARKINS AND STEPHEN PARKINS	TH EXPLORATION LLC	1/8+	905 460	N/A	N/A	N/A	N/A	N/A	N/A
10*16051	C	9-7-18	DONNA JEAN SNIDER AND DAVID SNIDER	TH EXPLORATION LLC	1/8+	905 462	N/A	N/A	N/A	N/A	N/A	N/A
10*16053	C	9-7-18	GARY D HINERMAN AND JUDY ANN HINERMAN	TH EXPLORATION LLC	1/8+	905 466	N/A	N/A	N/A	N/A	N/A	N/A
10*16289	C	9-7-18	BRENDA HINERMAN WILLIAMSON AND BRIAN K WILLIAMSON	TH EXPLORATION LLC	1/8+	905 468	N/A	N/A	N/A	N/A	N/A	N/A
10*16412	C	9-7-18	ELIZABETH ANN BLAZER AND PAUL R BLAZER	TH EXPLORATION LLC	1/8+	905 452	N/A	N/A	N/A	N/A	N/A	N/A
10*16413	C	9-7-18	RONALD H EDGE JR	TH EXPLORATION LLC	1/8+	905 454	N/A	N/A	N/A	N/A	N/A	N/A
10*15667	D	9-7-20	KEVIN E MCGILTON ET UX	CHEVRON USA INC	1/8+	850 351	N/A	N/A	N/A	N/A	N/A	N/A
10*15698	D	9-7-20	ROBERT A EDGE AND SHERRIE N EDGE	TH EXPLORATION LLC	1/8+	900 363	N/A	N/A	N/A	N/A	N/A	N/A
10*15720	D	9-7-20	KAREN L GREATHOUSE AND FLOYD GREATHOUSE	TH EXPLORATION LLC	1/8+	905 458	N/A	N/A	N/A	N/A	N/A	N/A
10*15721	D	9-7-20	TINA L EDGE MONTI AND THOMAS MONTI	TH EXPLORATION LLC	1/8+	905 456	N/A	N/A	N/A	N/A	N/A	N/A
10*16020	D	9-7-20	SHARON HINERMAN MAY & DANIEL G MAY	TH EXPLORATION LLC	1/8+	905 464	N/A	N/A	N/A	N/A	N/A	N/A
10*16028	D	9-7-20	ROSEMARY PARKINS AND STEPHEN PARKINS	TH EXPLORATION LLC	1/8+	905 460	N/A	N/A	N/A	N/A	N/A	N/A
10*16051	D	9-7-20	DONNA JEAN SNIDER AND DAVID SNIDER	TH EXPLORATION LLC	1/8+	905 462	N/A	N/A	N/A	N/A	N/A	N/A
10*16053	D	9-7-20	GARY D HINERMAN AND JUDY ANN HINERMAN	TH EXPLORATION LLC	1/8+	905 466	N/A	N/A	N/A	N/A	N/A	N/A
10*16289	D	9-7-20	BRENDA HINERMAN WILLIAMSON AND BRIAN K WILLIAMSON	TH EXPLORATION LLC	1/8+	905 468	N/A	N/A	N/A	N/A	N/A	N/A
10*16412	D	9-7-20	ELIZABETH ANN BLAZER AND PAUL R BLAZER	TH EXPLORATION LLC	1/8+	905 452	N/A	N/A	N/A	N/A	N/A	N/A
10*16413	D	9-7-20	RONALD H EDGE JR	TH EXPLORATION LLC	1/8+	905 454	N/A	N/A	N/A	N/A	N/A	N/A
10*15667	E	9-7-19	KEVIN E MCGILTON ET UX	CHEVRON USA INC	1/8+	850 351	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.256.1	F	9-11-6.1	BRENDA J WHETZEL	TH EXPLORATION LLC	1/8+	881 145	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.256.2	F	9-11-6.1	CAROL JEAN ANDERSON	TH EXPLORATION LLC	1/8+	879 299	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.256.3	F	9-11-6.1	BRENDA S DYKHOUSE	TH EXPLORATION LLC	1/8+	881 148	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.256.4	F	9-11-6.1	GLEN A BONAR	TH EXPLORATION LLC	1/8+	881 151	N/A	N/A	N/A	N/A	N/A	N/A
10*15560	G	9-11-6.2	WILLIAM F KERNS ET UX	CHESAPEAKE APPALACHIA LLC	1/8+	677 561	N/A	N/A	N/A	N/A	Chesapeake to Chevron: 30/461	36/148
10*47051.256.2	G	9-11-6.2	CAROL JEAN ANDERSON	TH EXPLORATION LLC	1/8+	879 299	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.256.3	G	9-11-6.2	BRENDA S DYKHOUSE	TH EXPLORATION LLC	1/8+	881 148	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.256.4	G	9-11-6.2	GLEN A BONAR	TH EXPLORATION LLC	1/8+	881 151	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.256.1	H	9-11-6	BRENDA J WHETZEL	TH EXPLORATION LLC	1/8+	881 145	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.256.2	H	9-11-6	CAROL JEAN ANDERSON	TH EXPLORATION LLC	1/8+	879 299	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.256.3	H	9-11-6	BRENDA S DYKHOUSE	TH EXPLORATION LLC	1/8+	881 148	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.256.4	H	9-11-6	GLEN A BONAR	TH EXPLORATION LLC	1/8+	881 151	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.108.1	I	9-11-9	MICHAEL A WHETZEL	TH EXPLORATION LLC	1/8+	885 51	N/A	N/A	N/A	N/A	N/A	N/A
10*15582	J	9-11-10	ROBERT L CLARK	CHESAPEAKE APPALACHIA LLC	1/8+	685 239	N/A	N/A	N/A	N/A	Chesapeake to Chevron: 30/461	36/148
10*15559	K	9-11-11	KENNETH M MCCARDLE ET UX REV LT	CHEVRON USA INC	1/8+	816 499	N/A	N/A	N/A	N/A	N/A	N/A
10*15510	L	9-11-12	ELAINE PHELPS ET VIR	TRIENERGY HOLDINGS LLC	1/8+	718 326	N/A	N/A	N/A	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 756/332
10*15511	L	9-11-12	DAVID E CROW	TRIENERGY HOLDINGS LLC	1/8+	718 376	N/A	N/A	N/A	N/A	TriEnergy to NPAR: 25/463	NPAR to Chevron: 26/269
10*15512	L	9-11-12	FRANCES COFFEY	TRIENERGY HOLDINGS LLC	1/8+	718 378	N/A	N/A	N/A	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 756/332
10*15513	L	9-11-12	KAY KEYES	TRIENERGY HOLDINGS LLC	1/8+	718 330	N/A	N/A	N/A	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 756/332
10*15514	L	9-11-12	L PAUL CROW	TRIENERGY HOLDINGS LLC	1/8+	718 336	N/A	N/A	N/A	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 756/332
10*15515	L	9-11-12	DESIRE L CROW	TRIENERGY HOLDINGS LLC	1/8+	718 334	N/A	N/A	N/A	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 756/332

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10*15516	L	9-11-12	ROSE MARIE KIELGCZEWSKI	TRIENERGY HOLDINGS LLC	1/8+	718 354	N/A	N/A	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15517	L	9-11-12	DIANNE GELLNER & GARY GELLNER	TRIENERGY HOLDINGS LLC	1/8+	718 345	N/A	N/A	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15518	L	9-11-12	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TRIENERGY HOLDINGS LLC	1/8+	718 347	N/A	N/A	N/A	TriEnergy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15519	L	9-11-12	JOHN CROW	TRIENERGY HOLDINGS LLC	1/8+	726 580	N/A	N/A	N/A	TriEnergy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
	L	9-11-12	TIMOTHY CROW	TRIENERGY HOLDINGS LLC	1/8+	726 582	N/A	N/A	N/A	TriEnergy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*47051.123.1	L	9-11-12	LLOYD G BAKER	TH EXPLORATION LLC	1/8+	865 389	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.123.2	L	9-11-12	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TH EXPLORATION LLC	1/8+	873 143	N/A	N/A	N/A	N/A	N/A	N/A
10*15458	M	9-14-16	JOANN MERCER	TH EXPLORATION LLC	1/8+	921 273	N/A	N/A	N/A	N/A	N/A	N/A
10*15469	M	9-14-16	HARRIET J ANDERSON	TH EXPLORATION LLC	1/8+	920 11	N/A	N/A	N/A	N/A	N/A	N/A
10*15470	M	9-14-16	BETTY L LOGES	TH EXPLORATION LLC	1/8+	921 286	N/A	N/A	N/A	N/A	N/A	N/A
10*15472	M	9-14-16	DONALD & SANDRA GRIZZEL	TH EXPLORATION LLC	1/8+	920 70	N/A	N/A	N/A	N/A	N/A	N/A
10*15473	M	9-14-16	WILLIAM F MCDONALD AND SHIRLEY MCDONALD	TH EXPLORATION LLC	1/8+	921 198	N/A	N/A	N/A	N/A	N/A	N/A
10*15476	M	9-14-16	CURRITS W WEST JR AND DIANE WEST	TH EXPLORATION LLC	1/8+	921 263	N/A	N/A	N/A	N/A	N/A	N/A
10*15488	M	9-14-16	NANCY F FYE & STEPHEN M FYE	TH EXPLORATION LLC	1/8+	921 226	N/A	N/A	N/A	N/A	N/A	N/A
10*15495	M	9-14-16	WALTER LEE BARNHART AND BARBARA L HEATH	TH EXPLORATION LLC	1/8+	921 222	N/A	N/A	N/A	N/A	N/A	N/A
10*15694	M	9-14-16	DEBORAH L MERCER	TH EXPLORATION LLC	1/8+	921 271	N/A	N/A	N/A	N/A	N/A	N/A
10*15695	M	9-14-16	JOHN R AND LOIS L GORBY	TH EXPLORATION LLC	1/8+	929 259	N/A	N/A	N/A	N/A	N/A	N/A
10*15696	M	9-14-16	JOSEPH JEREMY PALMER	TH EXPLORATION LLC	1/8+	921 275	N/A	N/A	N/A	N/A	N/A	N/A
10*15741	M	9-14-16	LOHRN S GORBY	TH EXPLORATION LLC	1/8+	929 641	N/A	N/A	N/A	N/A	N/A	N/A
10*16152	M	9-14-16	CONNIE HECKLE	TH EXPLORATION LLC	1/8+	920 29	N/A	N/A	N/A	N/A	N/A	N/A
10*16153	M	9-14-16	LARRY JACK EMERY	TH EXPLORATION LLC	1/8+	920 13	N/A	N/A	N/A	N/A	N/A	N/A
10*16186	M	9-14-16	DEBORAH KAY COOLEY AND ROBERT T BECK	TH EXPLORATION LLC	1/8+	920 65	N/A	N/A	N/A	N/A	N/A	N/A
10*16187	M	9-14-16	PATRICIA D BABL AND JOHN J BABL	TH EXPLORATION LLC	1/8+	920 31	N/A	N/A	N/A	N/A	N/A	N/A
10*16191	M	9-14-16	MADELYN E MOSSOR	TH EXPLORATION LLC	1/8+	920 76	N/A	N/A	N/A	N/A	N/A	N/A
10*16403	M	9-14-16	WILLIAM C EDGAR AND CHRISTY E EDGAR	TH EXPLORATION LLC	1/8+	920 61	N/A	N/A	N/A	N/A	N/A	N/A
10*16404	M	9-14-16	KATHRYN M WHIPKEY	TH EXPLORATION LLC	1/8+	921 194	N/A	N/A	N/A	N/A	N/A	N/A
10*16406	M	9-14-16	ARLENA B HORNER AND QUAY ALLEN HORNER	TH EXPLORATION LLC	1/8+	921 240	N/A	N/A	N/A	N/A	N/A	N/A
10*16407	M	9-14-16	JANICE F BROOKOVER	TH EXPLORATION LLC	1/8+	920 74	N/A	N/A	N/A	N/A	N/A	N/A
10*16408	M	9-14-16	KATHLEEN I FRANCIS	TH EXPLORATION LLC	1/8+	921 196	N/A	N/A	N/A	N/A	N/A	N/A
10*16409	M	9-14-16	JEANETTE M HEATH	TH EXPLORATION LLC	1/8+	920 72	N/A	N/A	N/A	N/A	N/A	N/A
10*16425	M	9-14-16	WILLIAM A MASON JR AND ROBIN MASON	TH EXPLORATION LLC	1/8+	920 25	N/A	N/A	N/A	N/A	N/A	N/A
10*16428	M	9-14-16	BRUCE LYNN JOHNSON AND KIMBERLY A JOHNSON	TH EXPLORATION LLC	1/8+	920 50	N/A	N/A	N/A	N/A	N/A	N/A
10*16438	M	9-14-16	ALICE MARLENE PERSINGER	TH EXPLORATION LLC	1/8+	921 236	N/A	N/A	N/A	N/A	N/A	N/A
10*16468	M	9-14-16	LARRY W JOHNSON	TH EXPLORATION LLC	1/8+	920 57	N/A	N/A	N/A	N/A	N/A	N/A
10*16469	M	9-14-16	JAMES EARL AND MARGARET L SIBURT	TH EXPLORATION LLC	1/8+	921 245	N/A	N/A	N/A	N/A	N/A	N/A
10*16470	M	9-14-16	CAROLYN SUE FRANKLIN AND RAYMOND EUGENE FRANKLIN	TH EXPLORATION LLC	1/8+	921 219	N/A	N/A	N/A	N/A	N/A	N/A
10*16472	M	9-14-16	JUDY DELORIS SIBURT	TH EXPLORATION LLC	1/8+	929 643	N/A	N/A	N/A	N/A	N/A	N/A
10*16473	M	9-14-16	LINDA ELAINE AND RICHARD LEROY LITTELL	TH EXPLORATION LLC	1/8+	929 256	N/A	N/A	N/A	N/A	N/A	N/A
10*16474	M	9-14-16	BARBARA KAY SIBURT	TH EXPLORATION LLC	1/8+	921 266	N/A	N/A	N/A	N/A	N/A	N/A
10*16475	M	9-14-16	MARY LOUISE GORBY	TH EXPLORATION LLC	1/8+	921 234	N/A	N/A	N/A	N/A	N/A	N/A
10*16476	M	9-14-16	ROGER ALLAN AND CYNTHIA L JOHNSON	TH EXPLORATION LLC	1/8+	921 257	N/A	N/A	N/A	N/A	N/A	N/A
10*16477	M	9-14-16	BRENDA K YOHO	TH EXPLORATION LLC	1/8+	921 228	N/A	N/A	N/A	N/A	N/A	N/A
10*16550	M	9-14-16	CHARLES LEROY AND MARTHA G LEACH	TH EXPLORATION LLC	1/8+	920 19	N/A	N/A	N/A	N/A	N/A	N/A
10*16551	M	9-14-16	JACK L JR & VIRGINIA L CROW	TH EXPLORATION LLC	1/8+	921 260	N/A	N/A	N/A	N/A	N/A	N/A
10*16867	M	9-14-16	APRIL M WEED	TH EXPLORATION LLC	1/8+	921 279	N/A	N/A	N/A	N/A	N/A	N/A
10*16883	M	9-14-16	VICKIE LYNN PAPE AND JOHN EDWARD PAPE	TH EXPLORATION LLC	1/8+	921 248	N/A	N/A	N/A	N/A	N/A	N/A
10*16884	M	9-14-16	DELORES A AND LEONARD B BOWERS	TH EXPLORATION LLC	1/8+	921 281	N/A	N/A	N/A	N/A	N/A	N/A
10*16916	M	9-14-16	ROGER LEE WEST	TH EXPLORATION LLC	1/8+	921 277	N/A	N/A	N/A	N/A	N/A	N/A
10*16971	M	9-14-16	LEONA M SIBURT	TH EXPLORATION LLC	1/8+	921 238	N/A	N/A	N/A	N/A	N/A	N/A
10*16972	M	9-14-16	SCOTT BRADLEY AND SHERRY ANN GRIMM	TH EXPLORATION LLC	1/8+	921 242	N/A	N/A	N/A	N/A	N/A	N/A
10*16973	M	9-14-16	NANCY C AND CARL E KESSELRING	TH EXPLORATION LLC	1/8+	920 22	N/A	N/A	N/A	N/A	N/A	N/A
10*17358	M	9-14-16	KAREN LOUISE AND ROGER L DUNHAM	TH EXPLORATION LLC	1/8+	921 254	N/A	N/A	N/A	N/A	N/A	N/A
10*17359	M	9-14-16	TH EXPLORATION LLC	TH EXPLORATION LLC	1/8+	921 224	N/A	N/A	N/A	N/A	N/A	N/A
10*17361	M	9-14-16	SHEILA RAMONA CROW	TH EXPLORATION LLC	1/8+	920 78	N/A	N/A	N/A	N/A	N/A	N/A
10*17362	M	9-14-16	NILA VIRGINIA AND FREDERICK EUGENE STREIGHT	TH EXPLORATION LLC	1/8+	921 251	N/A	N/A	N/A	N/A	N/A	N/A
10*17366	M	9-14-16	SYLVIA DEE WOOD	TH EXPLORATION, LLC	1/8+	921 230	N/A	N/A	N/A	N/A	N/A	N/A

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10*17367	M	9-14-16	JERRY HOWELL	TH EXPLORATION LLC	1/8+	920 37	N/A	N/A	N/A	N/A	N/A	N/A
10*17368	M	9-14-16	DONALD PAUL CROW AND CRYSTAL LYNN CROW	TH EXPLORATION LLC	1/8+	921 201	N/A	N/A	N/A	N/A	N/A	N/A
10*17369	M	9-14-16	DELORES A WALLACE	TH EXPLORATION LLC	1/8+	920 63	N/A	N/A	N/A	N/A	N/A	N/A
10*17371	M	9-14-16	MACK A AND CAROL A CROW	TH EXPLORATION LLC	1/8+	921 204	N/A	N/A	N/A	N/A	N/A	N/A
10*17372	M	9-14-16	DONNIE JASON HEDGEPEETH AND KAREN L HEDGEPEETH	TH EXPLORATION LLC	1/8+	920 42	N/A	N/A	N/A	N/A	N/A	N/A
10*17373	M	9-14-16	NILA F HEDGEPEETH	TH EXPLORATION LLC	1/8+	920 45	N/A	N/A	N/A	N/A	N/A	N/A
10*17374	M	9-14-16	EZRA HOWARD COCHRAN	TH EXPLORATION LLC	1/8+	920 27	N/A	N/A	N/A	N/A	N/A	N/A
10*17380	M	9-14-16	DEBORAH IRENE PIERCE AND BARRETT LEE PIERCE	TH EXPLORATION LLC	1/8+	920 34	N/A	N/A	N/A	N/A	N/A	N/A
10*17381	M	9-14-16	CINDY J AND DARNELL L FULKS	TH EXPLORATION LLC	1/8+	921 268	N/A	N/A	N/A	N/A	N/A	N/A
10*17382	M	9-14-16	HELEN MARIE AND DAVID E MCCRAY	TH EXPLORATION LLC	1/8+	920 147	N/A	N/A	N/A	N/A	N/A	N/A
10*17389	M	9-14-16	MELBA EILEEN HUDDLESTUN	TH EXPLORATION, LLC	1/8+	920 53	N/A	N/A	N/A	N/A	N/A	N/A
10*17390	M	9-14-16	HAROLD B CROW AND CONNIE SUE CROW	TH EXPLORATION LLC	1/8+	921 207	N/A	N/A	N/A	N/A	N/A	N/A
10*17391	M	9-14-16	BETTY L HUFF AND OLLIE C HUGGINS	TH EXPLORATION, LLC	1/8+	921 210	N/A	N/A	N/A	N/A	N/A	N/A
10*17392	M	9-14-16	BEVERLY KATHRYN GODDARD	TH EXPLORATION, LLC	1/8+	920 55	N/A	N/A	N/A	N/A	N/A	N/A
10*17393	M	9-14-16	CHARLIE M TURNER AND BESSIE M TURNER	TH EXPLORATION LLC	1/8+	920 39	N/A	N/A	N/A	N/A	N/A	N/A
10*17394	M	9-14-16	JUDY LOUISE GLOVER	TH EXPLORATION LLC	1/8+	921 232	N/A	N/A	N/A	N/A	N/A	N/A
10*17397	M	9-14-16	PAT DARRELL TURNER AND TINA DENISE TURNER	TH EXPLORATION LLC	1/8+	925 117	N/A	N/A	N/A	N/A	N/A	N/A
10*17399	M	9-14-16	RONALD EDWARD WATSON AND DIANA L WATSON	TH EXPLORATION LLC	1/8+	925 120	N/A	N/A	N/A	N/A	N/A	N/A
10*17401	M	9-14-16	JOHN M HAUGHT JR AND CHERYL A HAUGHT	TH EXPLORATION LLC	1/8+	925 182	N/A	N/A	N/A	N/A	N/A	N/A
10*17402	M	9-14-16	DIANA LYNN BUMGARDNER	TH EXPLORATION LLC	1/8+	920 68	N/A	N/A	N/A	N/A	N/A	N/A
10*17403	M	9-14-16	JAMES B AND PENNY G CROW	TH EXPLORATION, LLC	1/8+	925 187	N/A	N/A	N/A	N/A	N/A	N/A
10*17404	M	9-14-16	BRIAN K CROW	TH EXPLORATION LLC	1/8+	925 185	N/A	N/A	N/A	N/A	N/A	N/A
10*17405	M	9-14-16	ORVELLA L AND LARRY L NEFF	TH EXPLORATION, LLC	1/8+	925 114	N/A	N/A	N/A	N/A	N/A	N/A
10*17408	M	9-14-16	WILLIAM JAMES HEDGEPEETH AND ERIN ELIZABETH HEDGEPEETH	TH EXPLORATION LLC	1/8+	924 572	N/A	N/A	N/A	N/A	N/A	N/A
10*17409	M	9-14-16	JUDY A AND CLYDE E ELLZEY	TH EXPLORATION LLC	1/8+	924 569	N/A	N/A	N/A	N/A	N/A	N/A
10*17410	M	9-14-16	LILLIE L GAREY	TH EXPLORATION, LLC	1/8+	924 567	N/A	N/A	N/A	N/A	N/A	N/A
10*17420	M	9-14-16	DAVID LEE AND ANN F BAKER	TH EXPLORATION LLC	1/8+	924 564	N/A	N/A	N/A	N/A	N/A	N/A
10*17490	M	9-14-16	CONNIE SUE DOUGLAS AND RONNIE J DOUGLAS	TH EXPLORATION LLC	1/8+	924 578	N/A	N/A	N/A	N/A	N/A	N/A
10*17491	M	9-14-16	THOMAS LEE AND CLARA J HAUGHT	TH EXPLORATION LLC	1/8+	924 575	N/A	N/A	N/A	N/A	N/A	N/A
10*17598	M	9-14-16	TERRY LEE PETTIT AND STEPHANIE LYNN PETIT	TH EXPLORATION LLC	1/8+	921 288	N/A	N/A	N/A	N/A	N/A	N/A
10*17710	M	9-14-16	DEBRA J & DARRELL R LANCASTER	TH EXPLORATION, LLC	1/8+	929 634	N/A	N/A	N/A	N/A	N/A	N/A
10*17811	M	9-14-16	PANSY M ASTON AND ELMER L ASTON	TH EXPLORATION LLC	1/8+	921 216	N/A	N/A	N/A	N/A	N/A	N/A
10*17821	M	9-14-16	GREGORY S CROW	TH EXPLORATION LLC	1/8+	929 639	N/A	N/A	N/A	N/A	N/A	N/A
10*17902	M	9-14-16	SUSAN LYNN SEDGMER	TH EXPLORATION LLC	1/8+	920 59	N/A	N/A	N/A	N/A	N/A	N/A
10*17904	M	9-14-16	RICKY LEE AND TAMMY J WATSON	TH EXPLORATION LLC	1/8+	921 213	N/A	N/A	N/A	N/A	N/A	N/A
10*17958	M	9-14-16	SANDRA KAY RICHMOND	TH EXPLORATION LLC	1/8+	929 632	N/A	N/A	N/A	N/A	N/A	N/A
10*17929	N	9-14-17	STONE HILL MINERALS HOLDINGS LLC	TH EXPLORATION LLC	1/8+	921 320	N/A	N/A	N/A	N/A	N/A	N/A
10*15477	O	9-14-18	RONALD A WYCINSKI	TH EXPLORATION LLC	1/8+	906 241	N/A	N/A	N/A	N/A	N/A	N/A
10*15730	O	9-14-18	FRANCES V CARPENTER	TH EXPLORATION LLC	1/8+	906 256	N/A	N/A	N/A	N/A	N/A	N/A
10*15752	O	9-14-18	KIM O CHAMBERS AND DEBRA CHAMBERS	TH EXPLORATION LLC	1/8+	906 258	N/A	N/A	N/A	N/A	N/A	N/A
10*16017	O	9-14-18	FLOYD A MCFADDEN	TH EXPLORATION LLC	1/8+	906 260	N/A	N/A	N/A	N/A	N/A	N/A
10*16018	O	9-14-18	BARBARA MCFADDEN ALBRIGHT	TH EXPLORATION LLC	1/8+	906 262	N/A	N/A	N/A	N/A	N/A	N/A
10*16030	O	9-14-18	JOSEPH F CHMIELEWSKI AND SANDRA CHMIELEWSKI	TH EXPLORATION LLC	1/8+	906 264	N/A	N/A	N/A	N/A	N/A	N/A
10*16031	O	9-14-18	CARL J CHMIELEWSKI AND KATHLEEN A CHMIELEWSKI	TH EXPLORATION LLC	1/8+	906 266	N/A	N/A	N/A	N/A	N/A	N/A
10*16083	O	9-14-18	CECIL HARRY LILLY, III AND PAMELA KAY KNIGHT LILLY	TH EXPLORATION LLC	1/8+	912 47	N/A	N/A	N/A	N/A	N/A	N/A
10*16085	O	9-14-18	KATHARYN ANNETTE LILLY LAING AND FREDDIE JOE LAING	TH EXPLORATION LLC	1/8+	912 45	N/A	N/A	N/A	N/A	N/A	N/A
10*16086	O	9-14-18	KATHARYN DAY LILLY	TH EXPLORATION LLC	1/8+	906 272	N/A	N/A	N/A	N/A	N/A	N/A
10*16087	O	9-14-18	MARY PENELOPE LILLY MURPHY	TH EXPLORATION LLC	1/8+	912 41	N/A	N/A	N/A	N/A	N/A	N/A
10*16131	O	9-14-18	ERIC S DOBBS	TH EXPLORATION LLC	1/8+	902 68	N/A	N/A	N/A	N/A	N/A	N/A
10*16144	O	9-14-18	PATTIE S MADRID	TH EXPLORATION LLC	1/8+	906 278	N/A	N/A	N/A	N/A	N/A	N/A
10*16180	O	9-14-18	LARRY L CHAMBERS	TH EXPLORATION LLC	1/8+	906 280	N/A	N/A	N/A	N/A	N/A	N/A
10*16181	O	9-14-18	NORMA CHRISTINE WHIPP AND GERALD WAYNE BLACK	TH EXPLORATION LLC	1/8+	906 281	N/A	N/A	N/A	N/A	N/A	N/A
10*16182	O	9-14-18	FIRST CHRISTIAN CHURCH OF MOUNDSVILLE BY ROGER FRANCIS AND ROBERT ALBERT TRUSTEES	TH EXPLORATION LLC	1/8+	906 283	N/A	N/A	N/A	N/A	N/A	N/A
10*16183	O	9-14-18	ALLEN R L DAVIS AND DIANA LEE PATTERSON	TH EXPLORATION LLC	1/8+	906 285	N/A	N/A	N/A	N/A	N/A	N/A
10*16239	O	9-14-18	ANGELA L OLDFIELD AND KENNETH W OLDFIELD	TH EXPLORATION LLC	1/8+	906 287	N/A	N/A	N/A	N/A	N/A	N/A
10*16240	O	9-14-18	BONNIE SUE PATTERSON SWISHER	TH EXPLORATION LLC	1/8+	906 289	N/A	N/A	N/A	N/A	N/A	N/A
10*16285	O	9-14-18	JOHN A SHUTZ AND CYNTHIA J SHUTZ	TH EXPLORATION LLC	1/8+	906 291	N/A	N/A	N/A	N/A	N/A	N/A
10*16441	O	9-14-18	GEORGE FRANKLIN AND NANCY ANN REED	TH EXPLORATION LLC	1/8+	924 619	N/A	N/A	N/A	N/A	N/A	N/A
10*16442	O	9-14-18	FRED T AND JERRY L CHAMBERS	TH EXPLORATION LLC	1/8+	924 174	N/A	N/A	N/A	N/A	N/A	N/A
10*16443	O	9-14-18	BARBARA BROWN CHAMBERS	TH EXPLORATION LLC	1/8+	924 621	N/A	N/A	N/A	N/A	N/A	N/A

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Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*16444	0	9-14-18	CATHERINE ELLEN CHAMBERS	TH EXPLORATION LLC	1/8+	924 623	N/A	N/A	N/A	N/A	N/A	N/A
10*16445	0	9-14-18	DOUGLAS C AND GWENDLYN D LEWTON	TH EXPLORATION LLC	1/8+	925 123	N/A	N/A	N/A	N/A	N/A	N/A
10*16483	0	9-14-18	JOHN C AND BARBARA H WINTER	TH EXPLORATION LLC	1/8+	924 178	N/A	N/A	N/A	N/A	N/A	N/A
10*16486	0	9-14-18	DAVID ALAN WILKINSON AND PATRICIA LYNN WILKINSON	TH EXPLORATION LLC	1/8+	924 180	N/A	N/A	N/A	N/A	N/A	N/A
10*16490	0	9-14-18	WILLIAM H AND MERRY C COTTON	TH EXPLORATION LLC	1/8+	924 176	N/A	N/A	N/A	N/A	N/A	N/A
10*16498	0	9-14-18	SHELLY YEATER	TH EXPLORATION LLC	1/8+	925 283	N/A	N/A	N/A	N/A	N/A	N/A
10*16511	0	9-14-18	DOUGLAS R BOWEN	TH EXPLORATION LLC	1/8+	906 475	N/A	N/A	N/A	N/A	N/A	N/A
10*16531	0	9-14-18	KATHY DOBBS WELLS	TH EXPLORATION LLC	1/8+	906 472	N/A	N/A	N/A	N/A	N/A	N/A
10*16532	0	9-14-18	JEAN ANN MCFADDEN	TH EXPLORATION LLC	1/8+	906 459	N/A	N/A	N/A	N/A	N/A	N/A
10*16533	0	9-14-18	SHIRLEY ANN DOBBS	TH EXPLORATION LLC	1/8+	906 469	N/A	N/A	N/A	N/A	N/A	N/A
10*16534	0	9-14-18	TERRY LEE LASAVAGE	TH EXPLORATION LLC	1/8+	906 443	N/A	N/A	N/A	N/A	N/A	N/A
10*16535	0	9-14-18	CHARLES E CARSON AND MARY KAY CARSON	TH EXPLORATION LLC	1/8+	906 420	N/A	N/A	N/A	N/A	N/A	N/A
10*16537	0	9-14-18	KIM D BOWEN AND MADONNA M BOWEN	TH EXPLORATION LLC	1/8+	907 415	N/A	N/A	N/A	N/A	N/A	N/A
10*16540	0	9-14-18	JAMES A WINTER AND CONNIE G WINTER	TH EXPLORATION LLC	1/8+	924 184	N/A	N/A	N/A	N/A	N/A	N/A
10*16569	0	9-14-18	JANICE C BALE	TH EXPLORATION LLC	1/8+	907 425	N/A	N/A	N/A	N/A	N/A	N/A
10*16570	0	9-14-18	ROBERT D BOWEN AND MARCIA M R BOWEN	TH EXPLORATION LLC	1/8+	907 420	N/A	N/A	N/A	N/A	N/A	N/A
10*16576	0	9-14-18	LINDA A MINER AND MICHAEL W MINER	TH EXPLORATION LLC	1/8+	907 484	N/A	N/A	N/A	N/A	N/A	N/A
10*16580	0	9-14-18	HAROLD C MCFADDEN	TH EXPLORATION LLC	1/8+	907 480	N/A	N/A	N/A	N/A	N/A	N/A
10*16581	0	9-14-18	HELEN L SCHILLING	TH EXPLORATION LLC	1/8+	907 489	N/A	N/A	N/A	N/A	N/A	N/A
10*16582	0	9-14-18	DORA BROCK BRAMMER	TH EXPLORATION LLC	1/8+	907 429	N/A	N/A	N/A	N/A	N/A	N/A
10*16680	0	9-14-18	RONALD J AND JENNIFER CHAMBERS FICCA	TH EXPLORATION LLC	1/8+	924 186	N/A	N/A	N/A	N/A	N/A	N/A
10*16726	0	9-14-18	LESLY K WHITE	TH EXPLORATION LLC	1/8+	924 182	N/A	N/A	N/A	N/A	N/A	N/A
10*16733	0	9-14-18	SARAH L BISHOP	TH EXPLORATION LLC	1/8+	924 172	N/A	N/A	N/A	N/A	N/A	N/A
10*16835	0	9-14-18	ERNEST CARL AUGUSTINE JR	TH EXPLORATION LLC	1/8+	924 188	N/A	N/A	N/A	N/A	N/A	N/A
10*16882	0	9-14-18	JAMES LEROY AND DARLENE DOBBS OWENS	TH EXPLORATION LLC	1/8+	924 190	N/A	N/A	N/A	N/A	N/A	N/A
10*16948	0	9-14-18	FREDERICK M LEWTON	TH EXPLORATION LLC	1/8+	924 136	N/A	N/A	N/A	N/A	N/A	N/A
10*16949	0	9-14-18	STEVEN R AND BRIANNE L UTT	TH EXPLORATION LLC	1/8+	924 138	N/A	N/A	N/A	N/A	N/A	N/A
10*16950	0	9-14-18	JAY E AND CECILIA E LEWTON	TH EXPLORATION LLC	1/8+	924 134	N/A	N/A	N/A	N/A	N/A	N/A
10*16952	0	9-14-18	RUSSELL D HERVEY	TH EXPLORATION LLC	1/8+	924 132	N/A	N/A	N/A	N/A	N/A	N/A
10*16953	0	9-14-18	DONALD T AND JEAN K HOGAN	TH EXPLORATION LLC	1/8+	924 140	N/A	N/A	N/A	N/A	N/A	N/A
10*16965	0	9-14-18	WILLIAM L WRIGHT AND CAROLINA WRIGHT	TH EXPLORATION LLC	1/8+	914 524	N/A	N/A	N/A	N/A	N/A	N/A
10*16966	0	9-14-18	JOHN GILLETTE AND BARBARA GILLETTE	TH EXPLORATION LLC	1/8+	913 377	N/A	N/A	N/A	N/A	N/A	N/A
10*16967	0	9-14-18	TARA JEANNE MINOR AND JENNIFER A KNAPP	TH EXPLORATION LLC	1/8+	914 612	N/A	N/A	N/A	N/A	N/A	N/A
10*16990	0	9-14-18	ROSEMARY H BEAVERS	TH EXPLORATION LLC	1/8+	924 152	N/A	N/A	N/A	N/A	N/A	N/A
10*16992	0	9-14-18	LINDA C ABRAHAM	TH EXPLORATION LLC	1/8+	924 148	N/A	N/A	N/A	N/A	N/A	N/A
10*16993	0	9-14-18	JULIA HOOVER	TH EXPLORATION LLC	1/8+	924 150	N/A	N/A	N/A	N/A	N/A	N/A
10*16995	0	9-14-18	DIANE ELSIE RAMSEY	TH EXPLORATION LLC	1/8+	924 146	N/A	N/A	N/A	N/A	N/A	N/A
10*17129	0	9-14-18	ROBERTA JANE PARKINSON	TH EXPLORATION LLC	1/8+	924 142	N/A	N/A	N/A	N/A	N/A	N/A
10*17131	0	9-14-18	LAURA E TOTTEN AND LONNIE R TOTTEN	TH EXPLORATION LLC	1/8+	924 154	N/A	N/A	N/A	N/A	N/A	N/A
10*17134	0	9-14-18	UNITED CHRISTIAN MISSIONARY SOCIETY	TH EXPLORATION LLC	1/8+	924 144	N/A	N/A	N/A	N/A	N/A	N/A
10*17139	0	9-14-18	ALICE G WEINER AND GERALD S WEINER	TH EXPLORATION LLC	1/8+	915 131	N/A	N/A	N/A	N/A	N/A	N/A
10*17209	0	9-14-18	GAYLE S SHANNON	TH EXPLORATION LLC	1/8+	924 168	N/A	N/A	N/A	N/A	N/A	N/A
10*17289	0	9-14-18	HAROLD R HUNT JR AND ELIZABETH A HUNT	TH EXPLORATION LLC	1/8+	924 170	N/A	N/A	N/A	N/A	N/A	N/A
10*17396	0	9-14-18	CHRISTINE L KIDD	TH EXPLORATION LLC	1/8+	924 158	N/A	N/A	N/A	N/A	N/A	N/A
10*17413	0	9-14-18	ROBERT M CHAMBERS AND CHARLOTTE A CHAMBERS	TH EXPLORATION LLC	1/8+	924 160	N/A	N/A	N/A	N/A	N/A	N/A
10*17436	0	9-14-18	ANDREW M HOOVER AND DINAH R HOOVER	TH EXPLORATION LLC	1/8+	924 156	N/A	N/A	N/A	N/A	N/A	N/A
10*17448	0	9-14-18	FREDERICK L HERVEY AND CATHY J HERVEY	TH EXPLORATION LLC	1/8+	924 162	N/A	N/A	N/A	N/A	N/A	N/A
10*17452	0	9-14-18	ALAN H & MARY K DEGARMO	TH EXPLORATION, LLC	1/8+	924 164	N/A	N/A	N/A	N/A	N/A	N/A
10*17486	0	9-14-18	JOSELYN M KEELY	TH EXPLORATION LLC	1/8+	929 364	N/A	N/A	N/A	N/A	N/A	N/A
10*17487	0	9-14-18	DEBORAH R MOKOSH	TH EXPLORATION LLC	1/8+	924 166	N/A	N/A	N/A	N/A	N/A	N/A
10*17503	0	9-14-18	JANICE L KUHN	TH EXPLORATION LLC	1/8+	924 122	N/A	N/A	N/A	N/A	N/A	N/A
10*17504	0	9-14-18	GREGG ALAN MILLER AND BETH ANN MILLER	TH EXPLORATION LLC	1/8+	924 118	N/A	N/A	N/A	N/A	N/A	N/A
10*17505	0	9-14-18	MICHAEL R & LEANNE DOBBS	TH EXPLORATION, LLC	1/8+	924 116	N/A	N/A	N/A	N/A	N/A	N/A
10*17515	0	9-14-18	GLADYS E DOBBS	TH EXPLORATION LLC	1/8+	923 541	N/A	N/A	N/A	N/A	N/A	N/A
10*17516	0	9-14-18	MARY V DOBBS	TH EXPLORATION LLC	1/8+	923 539	N/A	N/A	N/A	N/A	N/A	N/A
10*17517	0	9-14-18	JULIO ENRIQUE & DEBRA K TORRES	TH EXPLORATION, LLC	1/8+	923 537	N/A	N/A	N/A	N/A	N/A	N/A
10*17520	0	9-14-18	LUCY P SULLIVAN	TH EXPLORATION LLC	1/8+	923 533	N/A	N/A	N/A	N/A	N/A	N/A
10*17528	0	9-14-18	DEAN E GARRISON	TH EXPLORATION LLC	1/8+	923 535	N/A	N/A	N/A	N/A	N/A	N/A
10*17555	0	9-14-18	AARON AND JANA K PARRY	TH EXPLORATION LLC	1/8+	924 113	N/A	N/A	N/A	N/A	N/A	N/A
10*17559	0	9-14-18	MARVIN JERRY BLAKE AND LINDA D BLAKE	TH EXPLORATION LLC	1/8+	923 528	N/A	N/A	N/A	N/A	N/A	N/A
10*17560	0	9-14-18	TREVOR HOOKS	TH EXPLORATION LLC	1/8+	924 110	N/A	N/A	N/A	N/A	N/A	N/A

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Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*16444	0	9-14-18	CATHERINE ELLEN CHAMBERS	TH EXPLORATION LLC	1/8+	924 623	N/A	N/A	N/A	N/A	N/A	N/A
10*16445	0	9-14-18	DOUGLAS C AND GWENDLYN D LEWTON	TH EXPLORATION LLC	1/8+	925 123	N/A	N/A	N/A	N/A	N/A	N/A
10*16483	0	9-14-18	JOHN C AND BARBARA H WINTER	TH EXPLORATION LLC	1/8+	924 178	N/A	N/A	N/A	N/A	N/A	N/A
10*16486	0	9-14-18	DAVID ALAN WILKINSON AND PATRICIA LYNN WILKINSON	TH EXPLORATION LLC	1/8+	924 180	N/A	N/A	N/A	N/A	N/A	N/A
10*16490	0	9-14-18	WILLIAM H AND MERRY C COTTON	TH EXPLORATION LLC	1/8+	924 176	N/A	N/A	N/A	N/A	N/A	N/A
10*16498	0	9-14-18	SHELLY YEATER	TH EXPLORATION LLC	1/8+	925 283	N/A	N/A	N/A	N/A	N/A	N/A
10*16511	0	9-14-18	DOUGLAS R BOWEN	TH EXPLORATION LLC	1/8+	906 475	N/A	N/A	N/A	N/A	N/A	N/A
10*16531	0	9-14-18	KATHY DOBBS WELLS	TH EXPLORATION LLC	1/8+	906 472	N/A	N/A	N/A	N/A	N/A	N/A
10*16532	0	9-14-18	JEAN ANN MCFADDEN	TH EXPLORATION LLC	1/8+	906 459	N/A	N/A	N/A	N/A	N/A	N/A
10*16533	0	9-14-18	SHIRLEY ANN DOBBS	TH EXPLORATION LLC	1/8+	906 469	N/A	N/A	N/A	N/A	N/A	N/A
10*16534	0	9-14-18	TERRY LEE LASAVAGE	TH EXPLORATION LLC	1/8+	906 443	N/A	N/A	N/A	N/A	N/A	N/A
10*16535	0	9-14-18	CHARLES E CARSON AND MARY KAY CARSON	TH EXPLORATION LLC	1/8+	906 420	N/A	N/A	N/A	N/A	N/A	N/A
10*16537	0	9-14-18	KIM D BOWEN AND MADONNA M BOWEN	TH EXPLORATION LLC	1/8+	907 415	N/A	N/A	N/A	N/A	N/A	N/A
10*16540	0	9-14-18	JAMES A WINTER AND CONNIE G WINTER	TH EXPLORATION LLC	1/8+	924 184	N/A	N/A	N/A	N/A	N/A	N/A
10*16569	0	9-14-18	JANICE C BALE	TH EXPLORATION LLC	1/8+	907 425	N/A	N/A	N/A	N/A	N/A	N/A
10*16570	0	9-14-18	ROBERT D BOWEN AND MARCIA M R BOWEN	TH EXPLORATION LLC	1/8+	907 420	N/A	N/A	N/A	N/A	N/A	N/A
10*16576	0	9-14-18	LINDA A MINER AND MICHAEL W MINER	TH EXPLORATION LLC	1/8+	907 484	N/A	N/A	N/A	N/A	N/A	N/A
10*16580	0	9-14-18	HAROLD C MCFADDEN	TH EXPLORATION LLC	1/8+	907 480	N/A	N/A	N/A	N/A	N/A	N/A
10*16581	0	9-14-18	HELEN L SCHILLING	TH EXPLORATION LLC	1/8+	907 489	N/A	N/A	N/A	N/A	N/A	N/A
10*16582	0	9-14-18	DORA BROCK BRAMMER	TH EXPLORATION LLC	1/8+	907 429	N/A	N/A	N/A	N/A	N/A	N/A
10*16680	0	9-14-18	RONALD J AND JENNIFER CHAMBERS FICCA	TH EXPLORATION LLC	1/8+	924 186	N/A	N/A	N/A	N/A	N/A	N/A
10*16726	0	9-14-18	LESLY K WHITE	TH EXPLORATION LLC	1/8+	924 182	N/A	N/A	N/A	N/A	N/A	N/A
10*16733	0	9-14-18	SARAH L BISHOP	TH EXPLORATION LLC	1/8+	924 172	N/A	N/A	N/A	N/A	N/A	N/A
10*16835	0	9-14-18	ERNEST CARL AUGUSTINE JR	TH EXPLORATION LLC	1/8+	924 188	N/A	N/A	N/A	N/A	N/A	N/A
10*16882	0	9-14-18	JAMES LEROY AND DARLENE DOBBS OWENS	TH EXPLORATION LLC	1/8+	924 190	N/A	N/A	N/A	N/A	N/A	N/A
10*16948	0	9-14-18	FREDERICK M LEWTON	TH EXPLORATION LLC	1/8+	924 136	N/A	N/A	N/A	N/A	N/A	N/A
10*16949	0	9-14-18	STEVEN R AND BRIANNE L UTT	TH EXPLORATION LLC	1/8+	924 138	N/A	N/A	N/A	N/A	N/A	N/A
10*16950	0	9-14-18	JAY E AND CECILIA E LEWTON	TH EXPLORATION LLC	1/8+	924 134	N/A	N/A	N/A	N/A	N/A	N/A
10*16952	0	9-14-18	RUSSELL D HERVEY	TH EXPLORATION LLC	1/8+	924 132	N/A	N/A	N/A	N/A	N/A	N/A
10*16953	0	9-14-18	DONALD T AND JEAN K HOGAN	TH EXPLORATION LLC	1/8+	924 140	N/A	N/A	N/A	N/A	N/A	N/A
10*16965	0	9-14-18	WILLIAM L WRIGHT AND CAROLINA WRIGHT	TH EXPLORATION LLC	1/8+	914 524	N/A	N/A	N/A	N/A	N/A	N/A
10*16966	0	9-14-18	JOHN GILLETTE AND BARBARA GILLETTE	TH EXPLORATION LLC	1/8+	913 377	N/A	N/A	N/A	N/A	N/A	N/A
10*16967	0	9-14-18	TARA JEANNE MINOR AND JENNIFER A KNAPP	TH EXPLORATION LLC	1/8+	914 612	N/A	N/A	N/A	N/A	N/A	N/A
10*16990	0	9-14-18	ROSEMARY H BEAVERS	TH EXPLORATION LLC	1/8+	924 152	N/A	N/A	N/A	N/A	N/A	N/A
10*16992	0	9-14-18	LINDA C ABRAHAM	TH EXPLORATION LLC	1/8+	924 148	N/A	N/A	N/A	N/A	N/A	N/A
10*16993	0	9-14-18	JULIA HOOVER	TH EXPLORATION LLC	1/8+	924 150	N/A	N/A	N/A	N/A	N/A	N/A
10*16995	0	9-14-18	DIANE ELSIE RAMSEY	TH EXPLORATION LLC	1/8+	924 146	N/A	N/A	N/A	N/A	N/A	N/A
10*17129	0	9-14-18	ROBERTA JANE PARKINSON	TH EXPLORATION LLC	1/8+	924 142	N/A	N/A	N/A	N/A	N/A	N/A
10*17131	0	9-14-18	LAURA E TOTTEN AND LONNIE R TOTTEN	TH EXPLORATION LLC	1/8+	924 154	N/A	N/A	N/A	N/A	N/A	N/A
10*17134	0	9-14-18	UNITED CHRISTIAN MISSIONARY SOCIETY	TH EXPLORATION LLC	1/8+	924 144	N/A	N/A	N/A	N/A	N/A	N/A
10*17139	0	9-14-18	ALICE G WEINER AND GERALD S WEINER	TH EXPLORATION LLC	1/8+	915 131	N/A	N/A	N/A	N/A	N/A	N/A
10*17209	0	9-14-18	GAYLE S SHANNON	TH EXPLORATION LLC	1/8+	924 168	N/A	N/A	N/A	N/A	N/A	N/A
10*17289	0	9-14-18	HAROLD R HUNT JR AND ELIZABETH A HUNT	TH EXPLORATION LLC	1/8+	924 170	N/A	N/A	N/A	N/A	N/A	N/A
10*17396	0	9-14-18	CHRISTINE L KIDD	TH EXPLORATION LLC	1/8+	924 158	N/A	N/A	N/A	N/A	N/A	N/A
10*17413	0	9-14-18	ROBERT M CHAMBERS AND CHARLOTTE A CHAMBERS	TH EXPLORATION LLC	1/8+	924 160	N/A	N/A	N/A	N/A	N/A	N/A
10*17436	0	9-14-18	ANDREW M HOOVER AND DINAH R HOOVER	TH EXPLORATION LLC	1/8+	924 156	N/A	N/A	N/A	N/A	N/A	N/A
10*17448	0	9-14-18	FREDERICK L HERVEY AND CATHY J HERVEY	TH EXPLORATION LLC	1/8+	924 162	N/A	N/A	N/A	N/A	N/A	N/A
10*17452	0	9-14-18	ALAN H & MARY K DEGARMO	TH EXPLORATION, LLC	1/8+	924 164	N/A	N/A	N/A	N/A	N/A	N/A
10*17486	0	9-14-18	JOSELYN M KEELY	TH EXPLORATION LLC	1/8+	929 364	N/A	N/A	N/A	N/A	N/A	N/A
10*17487	0	9-14-18	DEBORAH R MOKOSH	TH EXPLORATION LLC	1/8+	924 166	N/A	N/A	N/A	N/A	N/A	N/A
10*17503	0	9-14-18	JANICE L KUHN	TH EXPLORATION LLC	1/8+	924 122	N/A	N/A	N/A	N/A	N/A	N/A
10*17504	0	9-14-18	GREGG ALAN MILLER AND BETH ANN MILLER	TH EXPLORATION LLC	1/8+	924 118	N/A	N/A	N/A	N/A	N/A	N/A
10*17505	0	9-14-18	MICHAEL R & LEANNE DOBBS	TH EXPLORATION, LLC	1/8+	924 116	N/A	N/A	N/A	N/A	N/A	N/A
10*17515	0	9-14-18	GLADYS E DOBBS	TH EXPLORATION LLC	1/8+	923 541	N/A	N/A	N/A	N/A	N/A	N/A
10*17516	0	9-14-18	MARY V DOBBS	TH EXPLORATION LLC	1/8+	923 539	N/A	N/A	N/A	N/A	N/A	N/A
10*17517	0	9-14-18	JULIO ENRIQUE & DEBRA K TORRES	TH EXPLORATION, LLC	1/8+	923 537	N/A	N/A	N/A	N/A	N/A	N/A
10*17520	0	9-14-18	LUCY P SULLIVAN	TH EXPLORATION LLC	1/8+	923 533	N/A	N/A	N/A	N/A	N/A	N/A
10*17528	0	9-14-18	DEAN E GARRISON	TH EXPLORATION LLC	1/8+	923 535	N/A	N/A	N/A	N/A	N/A	N/A
10*17555	0	9-14-18	AARON AND JANA K PARRY	TH EXPLORATION LLC	1/8+	924 113	N/A	N/A	N/A	N/A	N/A	N/A
10*17559	0	9-14-18	MARVIN JERRY BLAKE AND LINDA D BLAKE	TH EXPLORATION LLC	1/8+	923 528	N/A	N/A	N/A	N/A	N/A	N/A
10*17560	0	9-14-18	TREVOR HOOKS	TH EXPLORATION LLC	1/8+	924 110	N/A	N/A	N/A	N/A	N/A	N/A

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10*17563	O	9-14-18	DONALD L WOOD	TH EXPLORATION LLC	1/8+	923 523	N/A	N/A	N/A	N/A	N/A	N/A
10*17579	O	9-14-18	DON COFFIELD & GLENDA DOBBS	TH EXPLORATION, LLC	1/8+	923 525	N/A	N/A	N/A	N/A	N/A	N/A
10*17580	O	9-14-18	PAUL CRAIG CUNNINGHAM	TH EXPLORATION LLC	1/8+	923 530	N/A	N/A	N/A	N/A	N/A	N/A
10*17581	O	9-14-18	PAULA WEIRES	TH EXPLORATION LLC	1/8+	923 486	N/A	N/A	N/A	N/A	N/A	N/A
10*17582	O	9-14-18	JOHN THOMAS ERAZMUS AND JEAN R ERAZMUS	TH EXPLORATION LLC	1/8+	924 124	N/A	N/A	N/A	N/A	N/A	N/A
10*17612	O	9-14-18	BEVERLY A LEDBETTER	TH EXPLORATION, LLC	1/8+	923 480	N/A	N/A	N/A	N/A	N/A	N/A
10*17613	O	9-14-18	CARLTON DOBBS JR AND MIKHAIL PROKOPENKO	TH EXPLORATION LLC	1/8+	924 120	N/A	N/A	N/A	N/A	N/A	N/A
10*17614	O	9-14-18	DAVID DOBBS	TH EXPLORATION, LLC	1/8+	923 489	N/A	N/A	N/A	N/A	N/A	N/A
10*17615	O	9-14-18	PAULA JO WRIGHT	TH EXPLORATION, LLC	1/8+	923 482	N/A	N/A	N/A	N/A	N/A	N/A
10*17616	O	9-14-18	RONALD & ELIZABETH DOBBS	TH EXPLORATION, LLC	1/8+	924 107	N/A	N/A	N/A	N/A	N/A	N/A
10*17617	O	9-14-18	UNITED DISCIPLES OF CHRIST CHURCH	TH EXPLORATION LLC	1/8+	924 129	N/A	N/A	N/A	N/A	N/A	N/A
10*17664	O	9-14-18	RUDOLPH H PARSONS	TH EXPLORATION, LLC	1/8+	923 511	N/A	N/A	N/A	N/A	N/A	N/A
10*17667	O	9-14-18	THOMAS BRIAN WARRICK	TH EXPLORATION, LLC	1/8+	923 509	N/A	N/A	N/A	N/A	N/A	N/A
10*17668	O	9-14-18	KENNETH R DOBBS	TH EXPLORATION, LLC	1/8+	923 503	N/A	N/A	N/A	N/A	N/A	N/A
10*17671	O	9-14-18	JAMES L STOUT	TH EXPLORATION LLC	1/8+	923 484	N/A	N/A	N/A	N/A	N/A	N/A
10*17674	O	9-14-18	HOWARD L & BETH E WOOD	TH EXPLORATION, LLC	1/8+	923 505	N/A	N/A	N/A	N/A	N/A	N/A
10*17675	O	9-14-18	GREGORY D & CAROLYN J WIBLE	TH EXPLORATION, LLC	1/8+	923 507	N/A	N/A	N/A	N/A	N/A	N/A
10*17676	O	9-14-18	JAMES C & DEIDRE G DORIA	TH EXPLORATION, LLC	1/8+	923 513	N/A	N/A	N/A	N/A	N/A	N/A
10*17700	O	9-14-18	ROGER L & MARILYN L GARRISON	TH EXPLORATION, LLC	1/8+	923 472	N/A	N/A	N/A	N/A	N/A	N/A
10*17701	O	9-14-18	SUE ANN WORD	TH EXPLORATION, LLC	1/8+	923 470	N/A	N/A	N/A	N/A	N/A	N/A
10*17702	O	9-14-18	TAMMY BETH RAMSEY	TH EXPLORATION, LLC	1/8+	925 500	N/A	N/A	N/A	N/A	N/A	N/A
10*17703	O	9-14-18	SHIRLEY N COX	TH EXPLORATION, LLC	1/8+	923 498	N/A	N/A	N/A	N/A	N/A	N/A
10*17708	O	9-14-18	BETTY LOU NOBLE	TH EXPLORATION LLC	1/8+	924 127	N/A	N/A	N/A	N/A	N/A	N/A
10*17711	O	9-14-18	DEBRA A WENNEMAN AND KURT J WENNEMAN	TH EXPLORATION LLC	1/8+	923 520	N/A	N/A	N/A	N/A	N/A	N/A
10*17731	O	9-14-18	JAMES J MCGHEE AND JEANNINE CHAMBERS MCGHEE	TH EXPLORATION LLC	1/8+	914 519	N/A	N/A	N/A	N/A	N/A	N/A
10*17766	O	9-14-18	EDWARD S & NANCY A ROSENTHAL	TH EXPLORATION, LLC	1/8+	923 495	N/A	N/A	N/A	N/A	N/A	N/A
10*17767	O	9-14-18	WILLIAM K & LINDA J MERRITT	TH EXPLORATION, LLC	1/8+	923 474	N/A	N/A	N/A	N/A	N/A	N/A
10*17769	O	9-14-18	GLADYS FRAZIER KING	TH EXPLORATION, LLC	1/8+	923 492	N/A	N/A	N/A	N/A	N/A	N/A
10*17771	O	9-14-18	CHARLES AND LISA WARRICK	TH EXPLORATION, LLC	1/8+	923 477	N/A	N/A	N/A	N/A	N/A	N/A
10*17830	O	9-14-18	BRIAN AND MELINDA MASTERS	TH EXPLORATION LLC	1/8+	925 319	N/A	N/A	N/A	N/A	N/A	N/A
10*17833	O	9-14-18	KEVIN W & BONNIE J RANDOLPH	TH EXPLORATION, LLC	1/8+	929 296	N/A	N/A	N/A	N/A	N/A	N/A
10*17836	O	9-14-18	CAREY J & HAZEL M KENDALL	TH EXPLORATION, LLC	1/8+	929 301	N/A	N/A	N/A	N/A	N/A	N/A
10*17837	O	9-14-18	RONALD L & GLENDA F CROW	TH EXPLORATION, LLC	1/8+	929 309	N/A	N/A	N/A	N/A	N/A	N/A
10*17838	O	9-14-18	CHARLOTTE E MARRINER	TH EXPLORATION, LLC	1/8+	929 299	N/A	N/A	N/A	N/A	N/A	N/A
10*17839	O	9-14-18	EDDA JO DOBBS	TH EXPLORATION, LLC	1/8+	930 15	N/A	N/A	N/A	N/A	N/A	N/A
10*17841	O	9-14-18	BARBARA DOBBS GORBY	TH EXPLORATION, LLC	1/8+	929 304	N/A	N/A	N/A	N/A	N/A	N/A
10*17842	O	9-14-18	GARI JO STACKHOUSE	TH EXPLORATION, LLC	1/8+	929 294	N/A	N/A	N/A	N/A	N/A	N/A
10*17878	O	9-14-18	ROBERT E & SARAH M ROUSH	TH EXPLORATION, LLC	1/8+	924 590	N/A	N/A	N/A	N/A	N/A	N/A
10*17879	O	9-14-18	HARRY R WRIGHT JR	TH EXPLORATION, LLC	1/8+	924 588	N/A	N/A	N/A	N/A	N/A	N/A
10*17880	O	9-14-18	ANNA M WRIGHT	TH EXPLORATION, LLC	1/8+	924 586	N/A	N/A	N/A	N/A	N/A	N/A
10*17881	O	9-14-18	WAYLON L & ANGELA J MURPHEE	TH EXPLORATION, LLC	1/8+	924 555	N/A	N/A	N/A	N/A	N/A	N/A
10*17885	O	9-14-18	JOHN RUSSELL BECKER	TH EXPLORATION, LLC	1/8+	924 540	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.1	O	9-14-18	JUDITH A LEWANDOSKY AND ALAN E LEWANDOSKY	TH EXPLORATION LLC	1/8+	906 225	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.2	O	9-14-18	TIMMY LEE STOUT AND DOROTHY MARIE STOUT	TH EXPLORATION LLC	1/8+	906 222	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.3	O	9-14-18	NICHOLAS D PAVLIK AND GLORIA K PAVLIK	TH EXPLORATION LLC	1/8+	906 228	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.4	O	9-14-18	JAMES H WHITE AND RITA FRANKS WHITE	TH EXPLORATION LLC	1/8+	906 230	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.5	O	9-14-18	SAMUEL ALAN MCCORD AND WINIFRED A MCKEE	TH EXPLORATION LLC	1/8+	906 232	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.6	O	9-14-18	THOMAS O MCCORD	TH EXPLORATION LLC	1/8+	906 235	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.7	O	9-14-18	SHERON JONES	TH EXPLORATION LLC	1/8+	906 237	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.8	O	9-14-18	RICK PAVLIK	TH EXPLORATION LLC	1/8+	906 239	N/A	N/A	N/A	N/A	N/A	N/A
10*15752	P	9-15-3	KIM O CHAMBERS AND DEBRA CHAMBERS	TH EXPLORATION LLC	1/8+	906 258	N/A	N/A	N/A	N/A	N/A	N/A
10*16017	P	9-15-3	FLOYD A MCFADDEN	TH EXPLORATION LLC	1/8+	906 260	N/A	N/A	N/A	N/A	N/A	N/A
10*16018	P	9-15-3	BARBARA MCFADDEN ALBRIGHT	TH EXPLORATION LLC	1/8+	906 262	N/A	N/A	N/A	N/A	N/A	N/A
10*16144	P	9-15-3	PATTIE S MADRID	TH EXPLORATION LLC	1/8+	906 278	N/A	N/A	N/A	N/A	N/A	N/A
10*16180	P	9-15-3	LARRY L CHAMBERS	TH EXPLORATION LLC	1/8+	906 280	N/A	N/A	N/A	N/A	N/A	N/A
10*16181	P	9-15-3	NORMA CHRISTINE WHIPP AND GERALD WAYNE BLACK	TH EXPLORATION LLC	1/8+	906 281	N/A	N/A	N/A	N/A	N/A	N/A
10*16182	P	9-15-3	FIRST CHRISTIAN CHURCH OF MOUNDSVILLE BY RESERVER FRANCIS AND ROBERT ALBERT TRUSTEES	TH EXPLORATION LLC	1/8+	906 283	N/A	N/A	N/A	N/A	N/A	N/A
10*16239	P	9-15-3	ANGELA L OLDFIELD AND KENNETH W OLDFIELD	TH EXPLORATION LLC	1/8+	906 287	N/A	N/A	N/A	N/A	N/A	N/A
10*16285	P	9-15-3	JOHN A SHUTZ AND CYNTHIA J SHUTZ	TH EXPLORATION LLC	1/8+	906 291	N/A	N/A	N/A	N/A	N/A	N/A
10*16441	P	9-15-3	GEORGE FRANKLIN AND NANCY ANN REED	TH EXPLORATION LLC	1/8+	924 619	N/A	N/A	N/A	N/A	N/A	N/A

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Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*16442	P	9-15-3	FRED T AND JERRY L CHAMBERS	TH EXPLORATION LLC	1/8+	924 174	N/A	N/A	N/A	N/A	N/A	N/A
10*16443	P	9-15-3	BARBARA BROWN CHAMBERS	TH EXPLORATION LLC	1/8+	924 621	N/A	N/A	N/A	N/A	N/A	N/A
10*16444	P	9-15-3	CATHERINE ELLEN CHAMBERS	TH EXPLORATION LLC	1/8+	924 623	N/A	N/A	N/A	N/A	N/A	N/A
10*16445	P	9-15-3	DOUGLAS C AND GWENDLYN D LEWTON	TH EXPLORATION LLC	1/8+	925 123	N/A	N/A	N/A	N/A	N/A	N/A
10*16483	P	9-15-3	JOHN C AND BARBARA H WINTER	TH EXPLORATION LLC	1/8+	924 178	N/A	N/A	N/A	N/A	N/A	N/A
10*16486	P	9-15-3	DAVID ALAN WILKINSON AND PATRICIA LYNN WILKINSON	TH EXPLORATION LLC	1/8+	924 180	N/A	N/A	N/A	N/A	N/A	N/A
10*16490	P	9-15-3	WILLIAM H AND MERRY C COTTON	TH EXPLORATION LLC	1/8+	924 176	N/A	N/A	N/A	N/A	N/A	N/A
10*16498	P	9-15-3	SHELLY YEATER	TH EXPLORATION LLC	1/8+	925 283	N/A	N/A	N/A	N/A	N/A	N/A
10*16511	P	9-15-3	DOUGLAS R BOWEN	TH EXPLORATION LLC	1/8+	906 475	N/A	N/A	N/A	N/A	N/A	N/A
10*16532	P	9-15-3	JEAN ANN MCFADDEN	TH EXPLORATION LLC	1/8+	906 459	N/A	N/A	N/A	N/A	N/A	N/A
10*16534	P	9-15-3	TERRY LEE LASAVAGE	TH EXPLORATION LLC	1/8+	906 443	N/A	N/A	N/A	N/A	N/A	N/A
10*16535	P	9-15-3	CHARLES E CARSON AND MARY KAY CARSON	TH EXPLORATION LLC	1/8+	906 420	N/A	N/A	N/A	N/A	N/A	N/A
10*16537	P	9-15-3	KIM D BOWEN AND MADONNA M BOWEN	TH EXPLORATION LLC	1/8+	907 415	N/A	N/A	N/A	N/A	N/A	N/A
10*16540	P	9-15-3	JAMES A WINTER AND CONNIE G WINTER	TH EXPLORATION LLC	1/8+	924 184	N/A	N/A	N/A	N/A	N/A	N/A
10*16569	P	9-15-3	JANICE C BALE	TH EXPLORATION LLC	1/8+	907 425	N/A	N/A	N/A	N/A	N/A	N/A
10*16570	P	9-15-3	ROBERT D BOWEN AND MARCIA M R BOWEN	TH EXPLORATION LLC	1/8+	907 420	N/A	N/A	N/A	N/A	N/A	N/A
10*16576	P	9-15-3	LINDA A MINER AND MICHAEL W MINER	TH EXPLORATION LLC	1/8+	907 484	N/A	N/A	N/A	N/A	N/A	N/A
10*16580	P	9-15-3	HAROLD C MCFADDEN	TH EXPLORATION LLC	1/8+	907 480	N/A	N/A	N/A	N/A	N/A	N/A
10*16581	P	9-15-3	HELEN L SCHILLING	TH EXPLORATION LLC	1/8+	907 489	N/A	N/A	N/A	N/A	N/A	N/A
10*16582	P	9-15-3	DORA BROCK BRAMMER	TH EXPLORATION LLC	1/8+	907 429	N/A	N/A	N/A	N/A	N/A	N/A
10*16680	P	9-15-3	RONALD J AND JENNIFER CHAMBERS FICCA	TH EXPLORATION LLC	1/8+	924 186	N/A	N/A	N/A	N/A	N/A	N/A
10*16726	P	9-15-3	LESLY K WHITE	TH EXPLORATION LLC	1/8+	924 182	N/A	N/A	N/A	N/A	N/A	N/A
10*16733	P	9-15-3	SARAH L BISHOP	TH EXPLORATION LLC	1/8+	924 172	N/A	N/A	N/A	N/A	N/A	N/A
10*16835	P	9-15-3	ERNEST CARL AUGUSTINE JR	TH EXPLORATION LLC	1/8+	924 188	N/A	N/A	N/A	N/A	N/A	N/A
10*16948	P	9-15-3	FREDERICK M LEWTON	TH EXPLORATION LLC	1/8+	924 136	N/A	N/A	N/A	N/A	N/A	N/A
10*16949	P	9-15-3	STEVEN R AND BRIANNE L UTT	TH EXPLORATION LLC	1/8+	924 138	N/A	N/A	N/A	N/A	N/A	N/A
10*16950	P	9-15-3	JAY E AND CECILIA E LEWTON	TH EXPLORATION LLC	1/8+	924 134	N/A	N/A	N/A	N/A	N/A	N/A
10*16952	P	9-15-3	RUSSELL D HERVEY	TH EXPLORATION LLC	1/8+	924 132	N/A	N/A	N/A	N/A	N/A	N/A
10*16953	P	9-15-3	DONALD T AND JEAN K HOGAN	TH EXPLORATION LLC	1/8+	924 140	N/A	N/A	N/A	N/A	N/A	N/A
10*16990	P	9-15-3	ROSEMARY H BEAVERS	TH EXPLORATION LLC	1/8+	924 152	N/A	N/A	N/A	N/A	N/A	N/A
10*16992	P	9-15-3	LINDA C ABRAHAM	TH EXPLORATION LLC	1/8+	924 148	N/A	N/A	N/A	N/A	N/A	N/A
10*16993	P	9-15-3	JULIA HOOVER	TH EXPLORATION LLC	1/8+	924 150	N/A	N/A	N/A	N/A	N/A	N/A
10*16995	P	9-15-3	DIANE ELSIE RAMSEY	TH EXPLORATION LLC	1/8+	924 146	N/A	N/A	N/A	N/A	N/A	N/A
10*17129	P	9-15-3	ROBERTA JANE PARKINSON	TH EXPLORATION LLC	1/8+	924 142	N/A	N/A	N/A	N/A	N/A	N/A
10*17131	P	9-15-3	LAURA E TOTTEN AND LONNIE R TOTTEN	TH EXPLORATION LLC	1/8+	924 154	N/A	N/A	N/A	N/A	N/A	N/A
10*17134	P	9-15-3	UNITED CHRISTIAN MISSIONARY SOCIETY	TH EXPLORATION LLC	1/8+	924 144	N/A	N/A	N/A	N/A	N/A	N/A
10*17209	P	9-15-3	GAYLE S SHANNON	TH EXPLORATION LLC	1/8+	924 168	N/A	N/A	N/A	N/A	N/A	N/A
10*17289	P	9-15-3	HAROLD R HUNT JR AND ELIZABETH A HUNT	TH EXPLORATION LLC	1/8+	924 170	N/A	N/A	N/A	N/A	N/A	N/A
10*17396	P	9-15-3	CHRISTINE L KIDD	TH EXPLORATION LLC	1/8+	924 158	N/A	N/A	N/A	N/A	N/A	N/A
10*17413	P	9-15-3	ROBERT M CHAMBERS AND CHARLOTTE A CHAMBERS	TH EXPLORATION LLC	1/8+	924 160	N/A	N/A	N/A	N/A	N/A	N/A
10*17436	P	9-15-3	ANDREW M HOOVER AND DINAH R HOOVER	TH EXPLORATION LLC	1/8+	924 156	N/A	N/A	N/A	N/A	N/A	N/A
10*17448	P	9-15-3	FREDERICK L HERVEY AND CATHY J HERVEY	TH EXPLORATION LLC	1/8+	924 162	N/A	N/A	N/A	N/A	N/A	N/A
10*17452	P	9-15-3	ALAN H & MARY K DEGARMO	TH EXPLORATION, LLC	1/8+	924 164	N/A	N/A	N/A	N/A	N/A	N/A
10*17486	P	9-15-3	JOSELYN M KEELY	TH EXPLORATION LLC	1/8+	929 364	N/A	N/A	N/A	N/A	N/A	N/A
10*17487	P	9-15-3	DEBORAH R MOKOSH	TH EXPLORATION LLC	1/8+	924 166	N/A	N/A	N/A	N/A	N/A	N/A
10*17563	P	9-15-3	DONALD L WOOD	TH EXPLORATION LLC	1/8+	923 523	N/A	N/A	N/A	N/A	N/A	N/A
10*17617	P	9-15-3	UNITED DISCIPLES OF CHRIST CHURCH	TH EXPLORATION LLC	1/8+	924 129	N/A	N/A	N/A	N/A	N/A	N/A
10*17674	P	9-15-3	HOWARD L & BETH E WOOD	TH EXPLORATION, LLC	1/8+	923 505	N/A	N/A	N/A	N/A	N/A	N/A
10*17675	P	9-15-3	GREGORY D & CAROLYN J WIBLE	TH EXPLORATION, LLC	1/8+	923 507	N/A	N/A	N/A	N/A	N/A	N/A
10*17701	P	9-15-3	SUE ANN WORD	TH EXPLORATION, LLC	1/8+	923 470	N/A	N/A	N/A	N/A	N/A	N/A
10*17702	P	9-15-3	TAMMY BETH RAMSEY	TH EXPLORATION, LLC	1/8+	925 500	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.1	P	9-15-3	JUDITH A LEWANDOSKY AND ALAN E LEWANDOSKY	TH EXPLORATION LLC	1/8+	906 705	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.3	P	9-15-3	NICHOLAS D PAVLIK AND GLORIA K PAVLIK	TH EXPLORATION LLC	1/8+	906 228	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.4	P	9-15-3	JAMES H WHITE AND RITA FRANKS WHITE	TH EXPLORATION LLC	1/8+	906 230	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.5	P	9-15-3	SAMUEL ALAN MCCORD AND WINIFRED A MCKE	TH EXPLORATION LLC	1/8+	906 232	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.6	P	9-15-3	THOMAS O MCCORD	TH EXPLORATION LLC	1/8+	906 235	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.7	P	9-15-3	SHERON JONES	TH EXPLORATION LLC	1/8+	906 237	N/A	N/A	N/A	N/A	N/A	N/A
10*47051.325.8	P	9-15-3	RICK PAVLIK	TH EXPLORATION LLC	1/8+	906 239	N/A	N/A	N/A	N/A	N/A	N/A
10*17164	Q	9-15-1	BETTY D VEST	TH EXPLORATION LLC	1/8+	925 141	N/A	N/A	N/A	N/A	N/A	N/A
10*17163	Q	9-15-1	HOLLY JILL COHAGAN	TH EXPLORATION LLC	1/8+	925 130	N/A	N/A	N/A	N/A	N/A	N/A
10*17293	Q	9-15-1	JANICE L PIETERSE	TH EXPLORATION LLC	1/8+	925 149	N/A	N/A	N/A	N/A	N/A	N/A

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51-01935

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment
10*16480	Q	9-15-1	JOHN D HAYES AND LYNDA SIGMON HAYES	TH EXPLORATION LLC	1/8+	925 164	N/A	N/A	N/A	N/A	N/A	N/A
10*16518	Q	9-15-1	JOHN P AND ROSE HOWELL RICKEY	TH EXPLORATION LLC	1/8+	925 146	N/A	N/A	N/A	N/A	N/A	N/A
10*17165	Q	9-15-1	LAURA A PETTIGREW	TH EXPLORATION LLC	1/8+	925 151	N/A	N/A	N/A	N/A	N/A	N/A
10*16739	Q	9-15-1	MARK M BASSETT	TH EXPLORATION LLC	1/8+	911 78	N/A	N/A	N/A	N/A	N/A	N/A
10*16519	Q	9-15-1	NORMAN B AND JO ELLEN KAUBLE	TH EXPLORATION LLC	1/8+	925 156	N/A	N/A	N/A	N/A	N/A	N/A
10*17132	Q	9-15-1	OTTO J N AND LAUREL ANN KUNST	TH EXPLORATION LLC	1/8+	925 153	N/A	N/A	N/A	N/A	N/A	N/A
10*16246	Q	9-15-1	R RICK HYRE	TH EXPLORATION LLC	1/8+	925 162	N/A	N/A	N/A	N/A	N/A	N/A
10*17168	Q	9-15-1	RANDY K AND ALICE E BOWER	TH EXPLORATION LLC	1/8+	925 135	N/A	N/A	N/A	N/A	N/A	N/A
10*16848	Q	9-15-1	RICHARD W DOUTHITT	TH EXPLORATION LLC	1/8+	925 128	N/A	N/A	N/A	N/A	N/A	N/A
10*16482	Q	9-15-1	SAMUEL J RICKEY	TH EXPLORATION LLC	1/8+	925 143	N/A	N/A	N/A	N/A	N/A	N/A
10*17768	Q	9-15-1	SHERI L EVRAETS	TH EXPLORATION, LLC	1/8+	925 125	N/A	N/A	N/A	N/A	N/A	N/A
10*17332	Q	9-15-1	TODD W BULLARD AND BETH H BULLARD	TH EXPLORATION LLC	1/8+	925 132	N/A	N/A	N/A	N/A	N/A	N/A
10*17621	Q	9-15-1	WILLIAM M BECKER AND KATHARINE B BECKER	TH EXPLORATION LLC	1/8+	925 138	N/A	N/A	N/A	N/A	N/A	N/A
10*16897	Q	9-15-1	WILLIAM W AND NOREEN M HYRE	TH EXPLORATION LLC	1/8+	925 159	N/A	N/A	N/A	N/A	N/A	N/A
10*15813	R	9-14-19	ROBERT B THOMAS	CHESAPEAKE APPALACHIA LLC	1/8+	692 235	Chesapeake to Statoil: 32/247	Chesapeake to SWN Prod: 33/110	33/424	Statoil to SWN Exchange: TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*15814	R	9-14-19	MARY E BASSETT	CHESAPEAKE APPALACHIA LLC	1/8+	694 499	Chesapeake to Statoil: 24/84	Chesapeake to SWN Prod: 33/110	33/424	Statoil to SWN Exchange: TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*15815	R	9-14-19	FORREST M THOMAS	CHESAPEAKE APPALACHIA LLC	1/8+	694 516	Chesapeake to Statoil: 23/479	Chesapeake to SWN Prod: 33/110	33/424	Statoil to SWN Exchange: TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*15816	R	9-14-19	SALLY CYNTHIA HOPKINS	CHESAPEAKE APPALACHIA LLC	1/8+	697 116	Chesapeake to Statoil: 23/512	Chesapeake to SWN Prod: 33/110	33/424	Statoil to SWN Exchange: TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*15817	R	9-14-19	RUTH MEADOWS	CHESAPEAKE APPALACHIA LLC	1/8+	703 583	Chesapeake to Statoil: 29/325	Chesapeake to SWN Prod: 33/110	33/424	Statoil to SWN Exchange: TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*15520	R	9-14-19	ELIZABETH ANN STRAUSBAUGH	CHESAPEAKE APPALACHIA LLC	1/8+	703 578	Chesapeake to Statoil: 29/325	Chesapeake to SWN Prod: 33/110	33/424	Statoil to SWN Exchange: TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*15819	R	9-14-19	JANET LEA BLANKENSHIP	CHESAPEAKE APPALACHIA LLC	1/8+	708 114	Chesapeake to Statoil: 29/325	Chesapeake to SWN Prod: 33/110	33/424	Statoil to SWN Exchange: TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*17445	R	9-14-19	GENEVA BASSETT SANCHEZ	TH EXPLORATION LLC	1/8+	929 292	N/A	N/A	N/A	N/A	N/A	N/A
10*15818	S	9-15-16	ELIZABETH ANN STRAUSBAUGH	CHESAPEAKE APPALACHIA LLC	1/8+	703 578	Chesapeake to Statoil: 29/325	Chesapeake to SWN Prod: 33/110	33/424	Statoil to SWN Exchange: TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*15815	S	9-15-16	FORREST M THOMAS	CHESAPEAKE APPALACHIA LLC	1/8+	694 516	Chesapeake to Statoil: 23/479	Chesapeake to SWN Prod: 33/110	33/424	Statoil to SWN Exchange: TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*17445	S	9-15-16	GENEVA BASSETT SANCHEZ	TH EXPLORATION LLC	1/8+	929 292	N/A	N/A	N/A	N/A	N/A	N/A
10*15819	S	9-15-16	JANET LEA BLANKENSHIP	CHESAPEAKE APPALACHIA LLC	1/8+	708 114	Chesapeake to Statoil: 29/325	Chesapeake to SWN Prod: 33/110	33/424	Statoil to SWN Exchange: TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*15814	S	9-15-16	MARY E BASSETT	CHESAPEAKE APPALACHIA LLC	1/8+	694 499	Chesapeake to Statoil: 24/84	Chesapeake to SWN Prod: 33/110	33/424	Statoil to SWN Exchange: TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431

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WW-6A1 Supplement

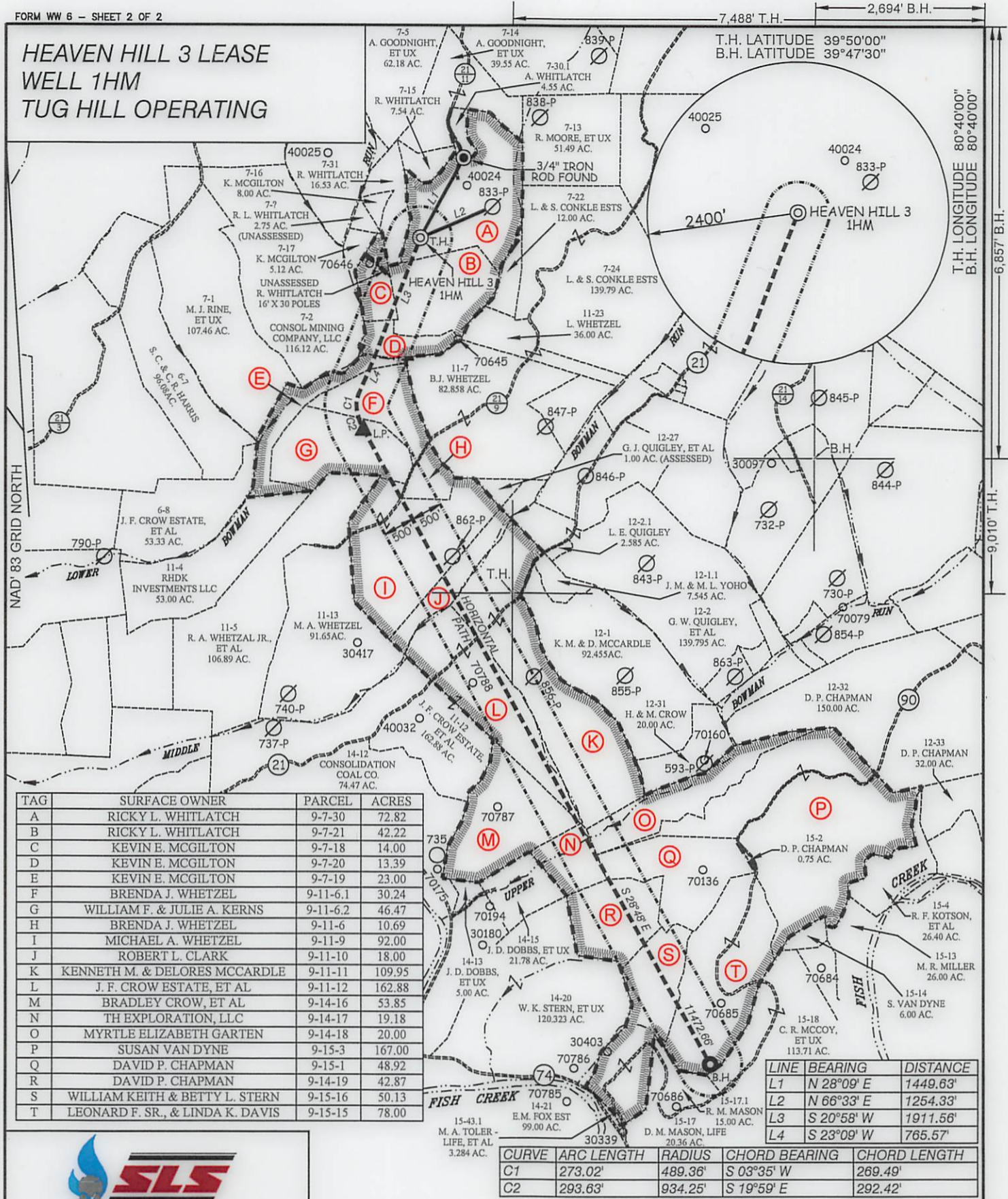
Operator's Well No. Heaven Hill 3 - 1HM

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	
10*15813	S	9-15-16	ROBERT B THOMAS	CHESAPEAKE APPALACHIA LLC	1/8+	692 235	Chesapeake to Statoil: 32/247	Chesapeake to SWN Prod: 33/110	Statoil to SWN Exchange: 33/424	Merger - SWN Exchange TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*15817	S	9-15-16	RUTH MEADOWS	CHESAPEAKE APPALACHIA LLC	1/8+	703 583	Chesapeake to Statoil: 29/325	Chesapeake to SWN Prod: 33/110	Statoil to SWN Exchange: 33/424	Merger - SWN Exchange TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*15816	S	9-15-16	SALLY CYNTHIA HOPKINS	CHESAPEAKE APPALACHIA LLC	1/8+	697 116	Chesapeake to Statoil: 23/512	Chesapeake to SWN Prod: 33/110	Statoil to SWN Exchange: 33/424	Merger - SWN Exchange TitleHolder LLC & SWN Production Company LLC: 19/624	Statoil to Tug Hill: 36/455	SWN Prod to Tug Hill: 36/431
10*19533	T	9-15-15	LEONARD F DAVIS SR AND LINDA K DAVIS	TH EXPLORATION LLC	1/8+	937 308	N/A	N/A	N/A	N/A	N/A	N/A

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**HEAVEN HILL 3 LEASE
WELL 1HM
TUG HILL OPERATING**



TAG	SURFACE OWNER	PARCEL	ACRES
A	RICKY L. WHITLATCH	9-7-30	72.82
B	RICKY L. WHITLATCH	9-7-21	42.22
C	KEVIN E. MCGILTON	9-7-18	14.00
D	KEVIN E. MCGILTON	9-7-20	13.39
E	KEVIN E. MCGILTON	9-7-19	23.00
F	BRENDA J. WHETZEL	9-11-6.1	30.24
G	WILLIAM F. & JULIE A. KERNS	9-11-6.2	46.47
H	BRENDA J. WHETZEL	9-11-6	10.69
I	MICHAEL A. WHETZEL	9-11-9	92.00
J	ROBERT L. CLARK	9-11-10	18.00
K	KENNETH M. & DELORES MCCARDLE	9-11-11	109.95
L	J. F. CROW ESTATE, ET AL	9-11-12	162.88
M	BRADLEY CROW, ET AL	9-14-16	53.85
N	TH EXPLORATION, LLC	9-14-17	19.18
O	MYRTLE ELIZABETH GARTEN	9-14-18	20.00
P	SUSAN VAN DYNE	9-15-3	167.00
Q	DAVID P. CHAPMAN	9-15-1	48.92
R	DAVID P. CHAPMAN	9-14-19	42.87
S	WILLIAM KEITH & BETTY L. STERN	9-15-16	50.13
T	LEONARD F. SR., & LINDA K. DAVIS	9-15-15	78.00

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	273.02'	489.36'	S 03°35' W	269.49'
C2	293.63'	934.25'	S 19°59' E	292.42'

SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 12 Vanhorn Drive • Glenville, WV 26351 • (304) 482-5934
www.slsurveys.com



P.S. 677
Gregory A. Smith

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'83 S.P.C.(FT) N. 478,859.71 E. 1,633,272.01
 NAD'83 GEO. LAT-(N) 39.808600 LONG-(W) 80.693321
 NAD'83 UTM (M) N. 4,406,558.99 E. 526,250.98
LANDING POINT
 NAD'83 S.P.C.(FT) N. 475,826.9 E. 1,632,370.3
 NAD'83 GEO. LAT-(N) 39.800242 LONG-(W) 80.696387
 NAD'83 UTM (M) N. 4,405,630.5 E. 525,991.7
BOTTOM HOLE
 NAD'83 S.P.C.(FT) N. 465,773.0 E. 1,637,896.7
 NAD'83 GEO. LAT-(N) 39.772843 LONG-(W) 80.676251
 NAD'83 UTM (M) N. 4,402,595.6 E. 527,726.5

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

SCALE 1" = 2000' FILE NO. 8654P1HMR4.dwg
 DATE APRIL 20, 20 17
 REVISED 08-30-17, 02-02-18 & 03-22-18
 OPERATORS WELL NO. HEAVEN HILL 3-1HM
 API WELL 47 — 051 — 01935
 NO. STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
 DIVISION OF ENVIRONMENTAL PROTECTION
 OFFICE OF OIL AND GAS
 H6A MOD

LEGEND

- LEASE LINE
- SURFACE LINE
- WELL LATERAL
- OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- TAX MAP-PARCEL
- LEASE # (SEE WW-6A1)
- SURFACE OWNER (SEE TABLE)

05/11/2018

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER
 ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD
 FORT WORTH, TX 76107 CHARLESTON, WV 25313

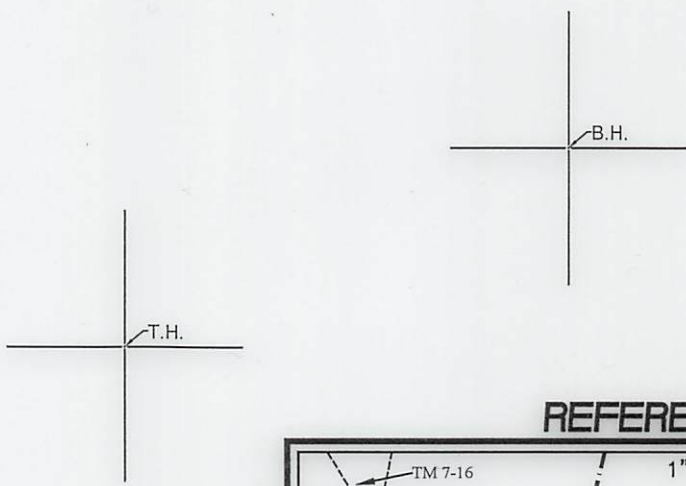
COUNTY NAME PERMIT

**HEAVEN HILL 3 LEASE
WELL 1HM
TUG HILL OPERATING**

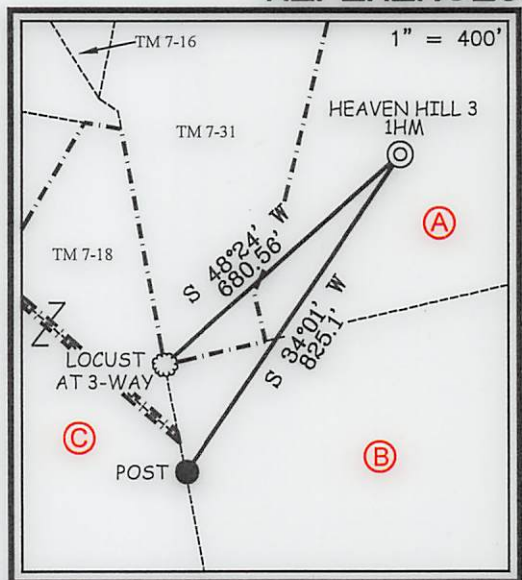
7,488' T.H. 2,694' B.H.
T.H. LATITUDE 39°50'00"
B.H. LATITUDE 39°47'30"

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)		
NAD'83 S.P.C.(FT)	N. 478,859.71	E. 1,633,272.01
NAD'83 GEO.	LAT-(N) 39.808600	LONG-(W) 80.693321
NAD'83 UTM (M)	N. 4,406,558.99	E. 526,250.98
LANDING POINT		
NAD'83 S.P.C.(FT)	N. 475,826.9	E. 1,632,370.3
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NAD'83 UTM (M)	N. 4,405,630.5	E. 525,991.7
BOTTOM HOLE		
NAD'83 S.P.C.(FT)	N. 465,773.0	E. 1,637,896.7
NAD'83 GEO.	LAT-(N) 39.772843	LONG-(W) 80.676251
NAD'83 UTM (M)	N. 4,402,595.6	E. 527,726.5

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°40'00"
6,857' B.H.
9,010' T.H.

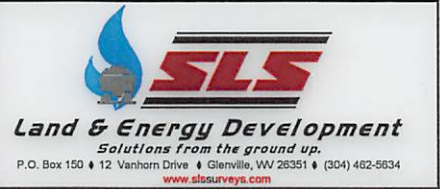


REFERENCES



NOTES ON SURVEY

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



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 APRIL 20, 20 17
REVISED 08-30-17, 02-02-18 & 03-22-18
OPERATORS WELL NO. HEAVEN HILL 3-1HM
API WELL NO. 47 - 051 - 01935
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8654P1HMR4.dwg
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 GROUND = 1,339.40' PROPOSED = 1,326.35' WATERSHED LOWER BOWMAN RUN OF FISH CREEK (HUC 10)
DISTRICT MEADE COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER RICKY L. WHITLATCH ACREAGE 72.82±
ROYALTY OWNER RICKY L. WHITLATCH, ET AL - SEE WW-6A1 ACREAGE 72.82±

PROPOSED WORK: 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: 6,876' / TMD: 19,500'

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD
FORT WORTH, TX 76107 CHARLESTON, WV 25313

COUNTY NAME PERMIT

HoA MOD

05/11/2018