



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, February 28, 2018
WELL WORK PERMIT
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC
1320 SOUTH UNIVERSITY DRIVE, SUITE 500

FORT WORTH , TX 76107

Re: Permit approval for HEAVEN HILL 3-7HU
47-051-01969-00-00

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926- 0450.


James A. Martin
Chief

Operator's Well Number: HEAVEN HILL 3-7HU
Farm Name: RICKY L WHITLATCH
U.S. WELL NUMBER: 47-051-01969-00-00
Horizontal 6A / New Drill
Date Issued: 2/28/2018

Promoting a healthy environment.

PERMIT CONDITIONS

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

CONDITIONS

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

PERMIT CONDITIONS

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



west virginia department of environmental protection

Oil and Gas Conservation Commission
601 57th Street, SE Charleston, WV 25304
(304)926-0499, Ext 1656

Barry K. Lay, Chairman
ogcc.wv.gov

February 5, 2018

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

RE: Application for Deep Well Permit – API #47-051-01969

COMPANY: Tug Hill Operating, LLC

FARM: Tug Hill Operating, LLC Heaven Hill 3-7HU

COUNTY: Marshall DISTRICT: Meade QUAD: Glen Easton 7 ½'

The deep well review of the application for the above company is Approved to drill to Trenton for Point Pleasant completion.

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

1. Comments to Notice of Deviation filed? No.
2. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners? Yes
3. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells: 47-051-01910.
4. Provided a plat showing that the proposed location is a distance of 400+ feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Susan Rose
Administrator

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 3-7HU Well Pad Name: Heaven Hill 3

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

4) Elevation, current ground: 1340' 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 No

Handwritten signature and date: jlc 1/26/18

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Point Pleasant is the target formation at a depth of 11545' - 11679' thickness of 134' and anticipated pressure of approx. 7500 psi

8) Proposed Total Vertical Depth: 11,829'

9) Formation at Total Vertical Depth: Trenton

10) Proposed Total Measured Depth: 19,282'

11) Proposed Horizontal Leg Length: 7,037'

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 309' subsea level
Seam: Pittsburgh #8
Owner: Murray Energy / Consolidated Coal Co.

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	20"	NEW	J55	106.5#	1,120'	1,120'	1794ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	2,875'	2,875'	2033ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	47#	10,515'	10,515'	3436ft^3(CTS)
Production	5 1/2"	NEW	HPP110	23#	19,282'	19,282'	4596ft^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		11,255'	
Liners							

John
1/26/18

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	20"	26"	.5	2,410	1,928	SEE #24	1.2
Coal	13 3/8"	17 1/2"	.38	2,740	2,192	SEE#24	1.2
Intermediate	9 5/8"	12 1/4"	.472	10,730	6,968	SEE#24	1.99
Production	5 1/2"	8 1/2"	.415	13,580	10,864	SEE#24	1.18
Tubing	2 3/8"			14,530	11,624		
Liners							

PACKERS

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

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1/26/18

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

Drill through the Point Pleasant and TD Pilot Hole 150' into the Trenton. Log vertical section and run a solid cement plug back to proposed KOP. 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 17,592,500 lb proppant and 271,993 bbl of water. Max rate = 80 bpm; max psi = 12,000#.

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. Intermediates 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

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.

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

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

Coal Casing Cement:*Premium NE-1 + 1.5% CaCL + Flake*

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

Intermediate Casing Cement:*Lead: Premium NE-1 + 5% BA-90 + .85% R-3 + 3% KCl + .75 gals/100sk FP-13L + 1% MPA-170**Tail: Premium NE-1 + .1% R-3 + 5% KCl + 1% CD-32 + .4% FL-52 + .2% ASA-301 + .6% Sodium Metasilicate*

- Premium NE-1 – Class A Portland API spec
- BA-90 – Gas Migration Mitigator
- R-3 – Cement Retarder
- KCl – Potassium Chloride
- FP-13L – Anti-Foaming Agent
- MPA-170 – Gelling Agent
- CD-32 – Dispersant
- FL-52 – Fluid Loss Agent
- ASA-301 – Free Water Control Agent
- Sodium Metasilicate – Extending Agent

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

- CD-32 – Dispersant
- Sodium Metasilicate – Extending Agent
- R-3 – Cement Retarder
- FP-13L – Anti-Foaming Agent

Production Casing Cement:*Lead: 50:50 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .75 gal/100sk FP-13L**Tail: 25:75 (Poz:Class H) + .3% R-3 + .3% MPA-250 + .375 gal/100sk FP-13L*

- R-3 – Cement Retarder
- MPA-250 – Gelling Agent
- FP-13L – Anti-Foaming Agent



Tug Hill Operating, LLC Casing and Cement Program

Heaven Hill 3-7HU

Casing

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	20"	J55	26"	1,120'	CTS
Intermediate 1	13 3/8"	J55	17 1/2"	2,875'	CTS
Intermediate 2	9 5/8"	HP110	12 1/4"	10,515'	CTS
Production	5 1/2"	P110	8 1/2"	19,282'	CTS

Cement

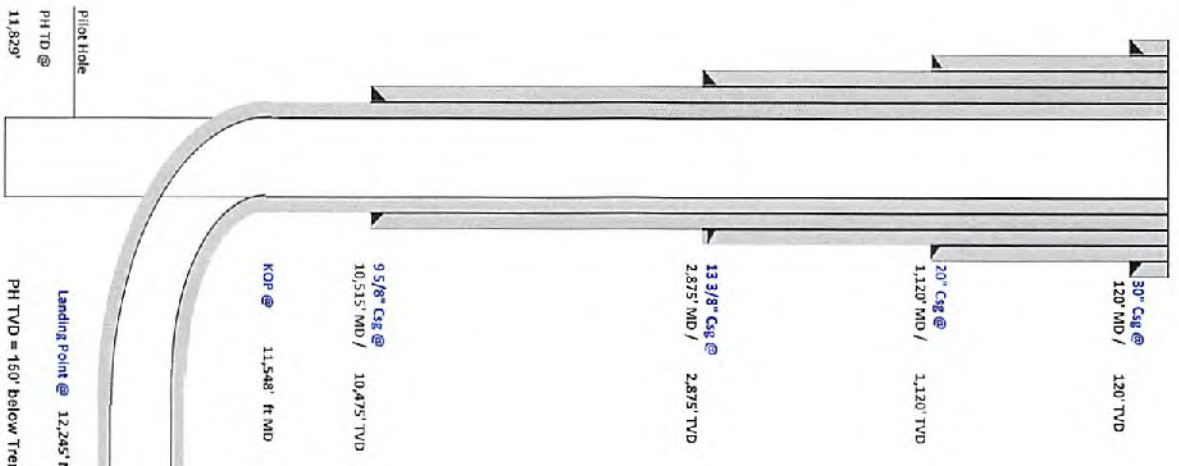
Surface: Premium NE-1 + 2% bwoc CaC12 + 46.5% Fresh Water – Surface Cement mixed at 15.6 ppg, Y=1.2

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

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

Production: 50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + 35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 15.2ppg, Y = 1.18

51-01969



WELL NAME:	Heaven Hill 3-7HU	COUNTY:	Marshall
STATE:	West Virginia		
DISTRICT:	Meadle	GL Elev:	1,335'
OP Elev:	1,326'		
TD:	19,282'		
1st Landed:	39,808-4817		
1st Landed:	-80,693-26095		
2nd Landed:	39,755-93618		
3rd Landed:	-80,679-99693		

FORMATION TOPS	Depth TVD
Formation	1,038'
Deepst Fresh Water	946'
Sewidder Coal	1,031'
Proberth Coal	2,060'
Big Lime	2,684'
Bees	6,617'
Tully	6,724'
Marcellus	6,776'
Onondaga	7,493'
Silina	8,553'
Lockport	11,374'
Utica	11,545'
Point Pleasant	11,602'
Landing Depth	11,679'
Trenon	11,829'
Pilot Hole TD	11,829'

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'	8W	Surface			
Surface	28	20	1,120'	1,120'	106.5	Surface			
Intermediate 1	17 1/2	13 3/8	2,875'	2,875'	54.5	Surface			
Intermediate 2	12 1/4	9 5/8	10,515'	10,475'	47	Surface			
Production	8 1/2	5 1/2	19,282'	11,725'	23	Surface			

CEMENT SUMMARY				DRILLING DETAILS	
Sacks	Class	Density	Fluid Type	Centralizer Notes	
338	A	15.6	Air	None	
1,937	A	15.6	Air	3 Centralizers at equal distance	
2,202	A	15	Air	1 Centralizer every other ft	
2,796	A	14.5	Air	1 Centralizer every other ft	
3,990	A	15	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other ft to site	

[Handwritten signature]
1/26/18

Pilot Hole
PH TD @ 11,829'

Landing Point @ 12,245' MD / 11,602' TVD
PH TVD = 150' below Trenton Top

Lateral TD @ 19,282' ft MD
11,725' ft TVD

Area of Review

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

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

Data Sources Reviewed:

1. IHS Well Data service: Public nationwide data service that pulls directly from State agency Oil and Gas databases
2. Farm Maps
3. Topo Maps: Recent and older (contact WVGES)
4. Check with DPS

Contacted Devin Ducoeur 724-705-0444, dducoeur@dpslandservices.com DPS GIS (12/19/2016) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it as the best publicly available. See attached map he provided.

Request maps for:

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

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


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

Permit well - Heaven Hill 3-7HU

Wells within 500' Buffer

Note: Well spots depicted on Area of Review map (page 3) are derived from State held coordinates. The spots may differ from those depicted on the Well Plat because the Plat locations represent actual field surveyed locations. Please refer to the Plat for surveyed well spots

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705101934	Tug Hill	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101962	Tug Hill	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101963	Tug Hill	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101947	Tug Hill	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705101948	Tug Hill	6737' TVD planned	None	None	No, Permitted Marcellus well	Permitted Marcellus well. Not yet drilled
4705100855	Consolidation Coal Co	Unknown	Unknown	Unknown	Unknown but unlikely. Probably an old shallow well that is too shallow to be within Range of potential Fracture propagation from Marcellus wells. Well has been plugged	Plug date 10/10/2000. A field survey was conducted to locate this well and this well was found plugged at the location shown on the well plat.



Select County: (051) Marshall (Check All)

Select datatypes: Location Production Plugging
 Owner/Completion Stratigraphy Sample
 Pay/Show/Water Logs Btm Hole Loc

Enter Permit #: 00855

Get Data Reset

"Pipeline"

Well: County = 61 Permit = 00855

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
61	70790	61	855

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_76	QUAD_16	LAT_DD	LONG_DD	UTME	UTBN
4705100855	Marshall	855	Ueade	Qm Easton	Cameron	39.790429	-90.800762	527333.2	4404247.2

There is no Bottom Hole Location data for this well

Owner Information

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR	AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_L1
4705100855	10/10/2000		Plugging	Completed K H & D R Nicolare	14-09	61			Consolidation Coal Co	Consolidation Coal Co				
4705100855	-/-		unknown	Pggy M80 Samuel Roggs						Hope Natural Gas Company				

Completion Information

API	CMP_DT	SPUD_DT	ELV DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	G_BEF	G_AFT
4705100855	10/10/2000	09/14/2000	1250	Ground Level			unclassified	unclassified	not available	unknown	unknown					
4705100855	-/-	-/-	-/-						not available	unknown	unknown					

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

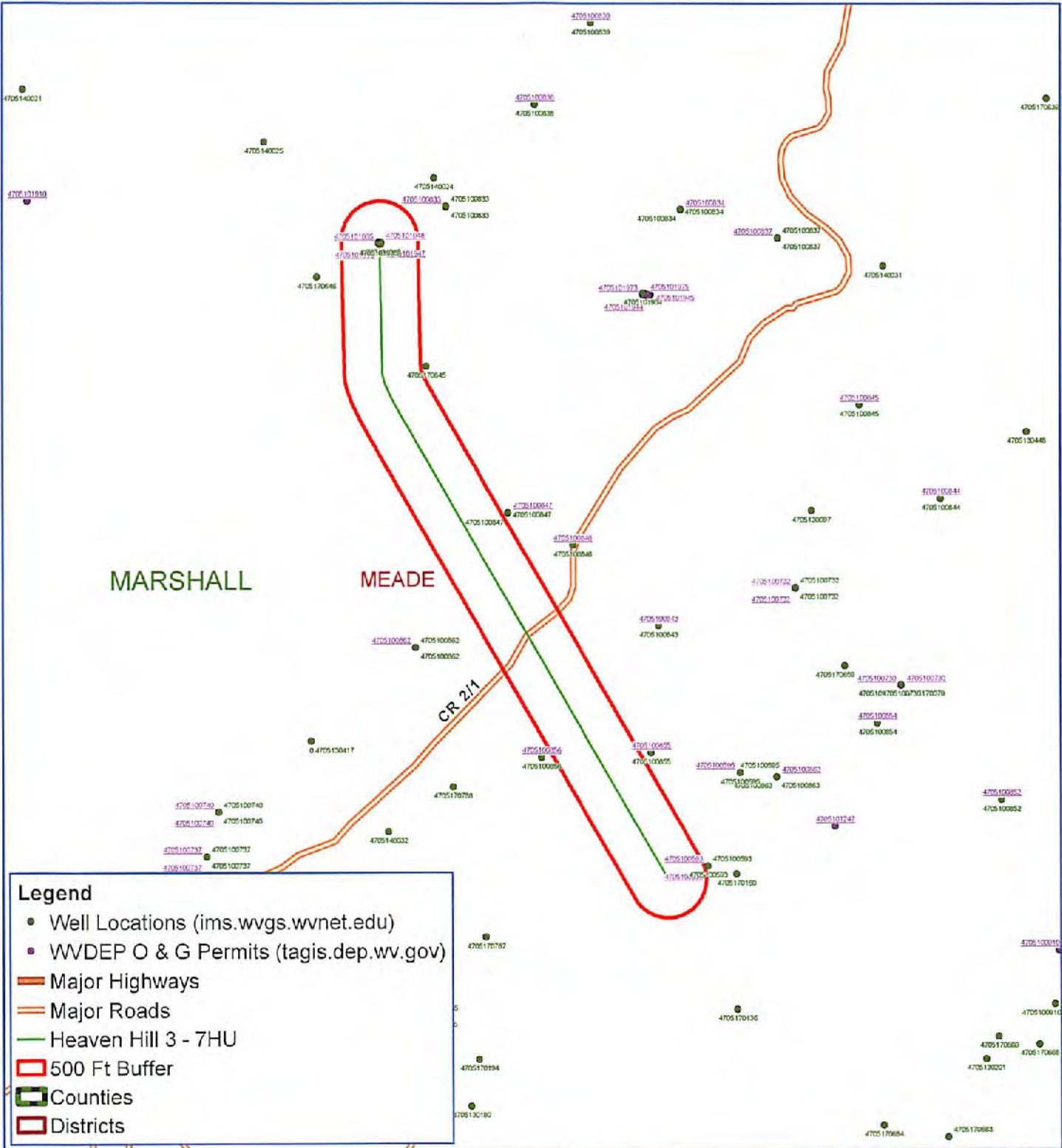
There is no Stratigraphy data for this well

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100855	10/10/2000	0

There is no Sample data for this well

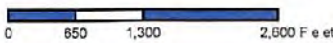


Legend

- Well Locations (ims.wvgs.wvnet.edu)
- WVDEP O & G Permits (tagis.dep.wv.gov)
- Major Highways
- Major Roads
- Heaven Hill 3 - 7HU
- 500 Ft Buffer
- Counties
- Districts



Heaven Hill 3-7HU Meade District Marshall County, WV



Map Created: January 26, 2018
Map Current As Of: January 26, 2018

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

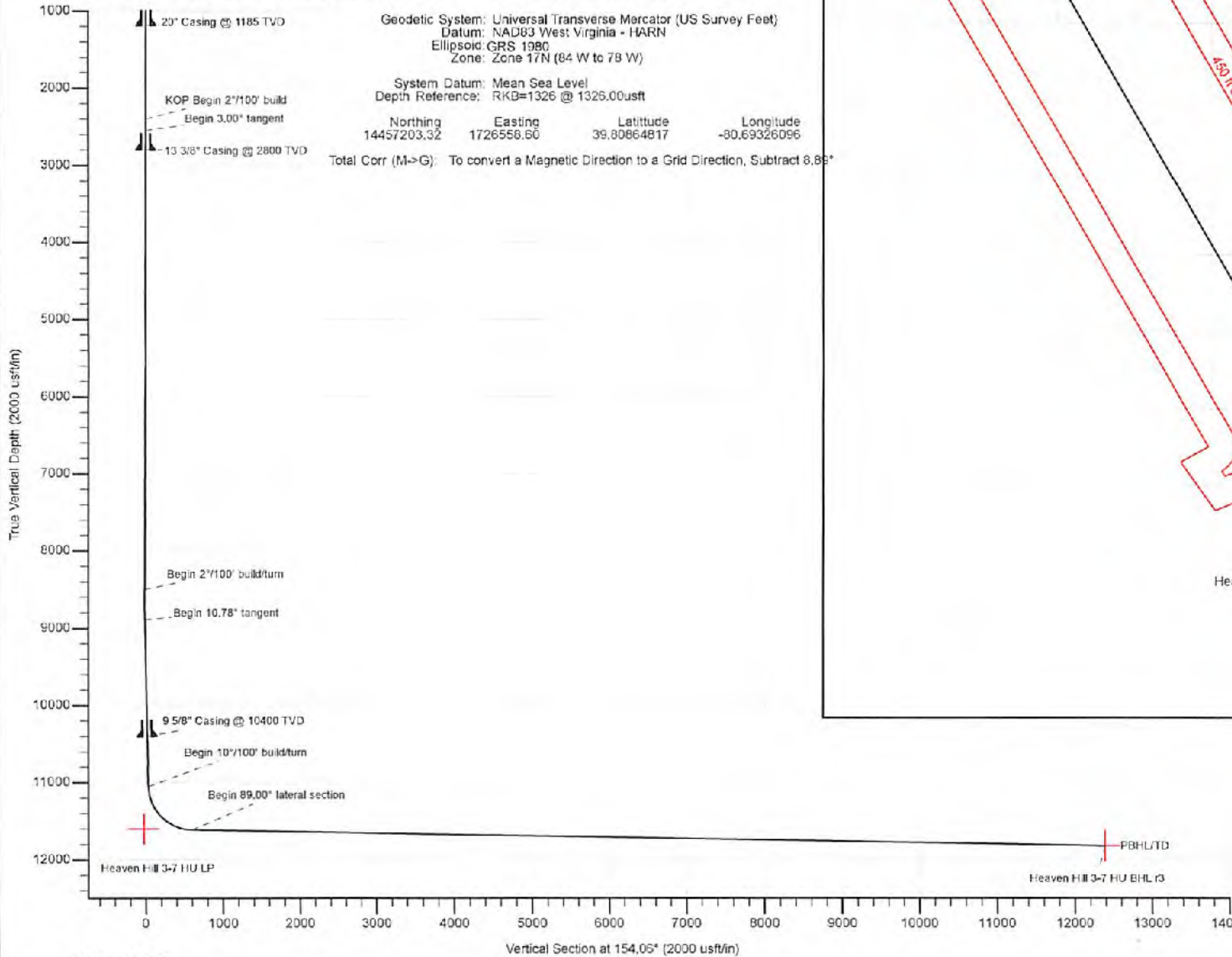


TUG HILL
OPERATING

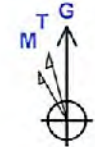
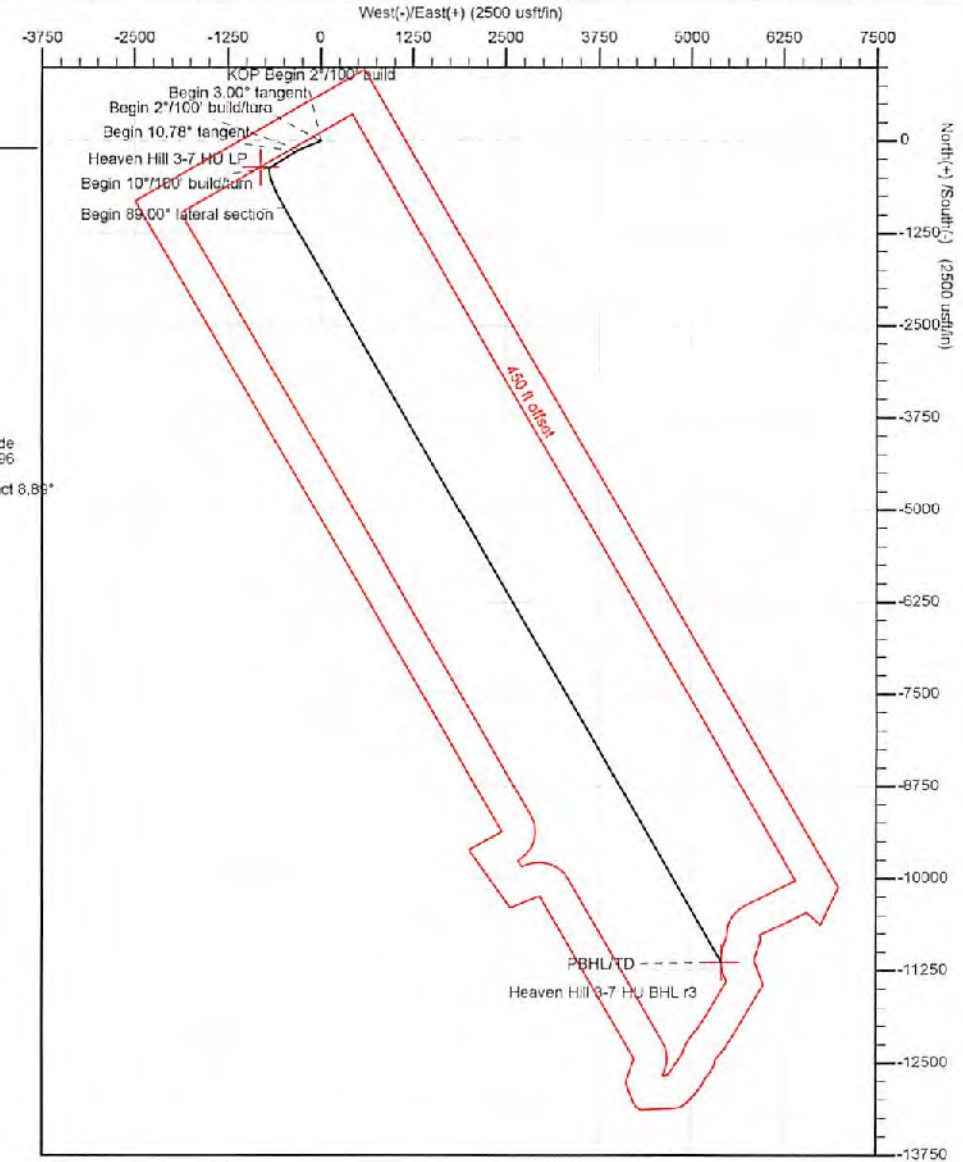
Well: Heaven Hill 3-7 HU
Site: Heaven Hill 3
Project: Marshall County, West Virginia
Design: rev3

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	2400.00	0.00	0.00	2400.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2'/100' build
3	2550.00	3.00	247.00	2549.93	-1.53	-3.51	2.00	247.00	-0.20	Begin 3.00' tangent
4	8508.23	3.00	247.00	8500.00	-123.38	-290.65	0.00	0.00	-16.19	Begin 2'/100' build/turn
5	8699.98	10.78	238.00	8888.62	-146.84	-331.24	2.00	-12.39	-12.84	Begin 10.78' tangent
6	11104.61	10.78	238.00	11054.32	-365.41	-681.07	0.00	0.00	30.69	Begin 10'/100' build/turn
7	11991.05	89.00	150.00	11613.76	-905.41	-490.13	10.00	-88.23	599.81	Begin 89.00° lateral section
8	23608.55	89.00	150.00	11820.00-11138.10	5417.72	0.00	0.00	2385.84		PBHL/TD



Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD83 West Virginia - HARN
Ellipsoid: GRS 1980
Zone: Zone 17N (84 W to 78 W)
System Datum: Mean Sea Level
Depth Reference: RKB=1326 @ 1326.00usft
Northing: 14457203.32 Easting: 1726556.60 Latitude: 39.80864817 Longitude: -80.69326096
Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.89°



Azimuths to Grid North
True North: -0.20°
Magnetic North: -8.89°
Magnetic Field
Strength: 52225.1nT
Dip Angle: 67.00°
Date: 2/3/2017
Model: IGRF2015



S1-019069

51-01969



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

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 3-7 HU					
Well Position	+N/-S	0.00 usft	Northing:	14,457,203.32 usft	Latitude:	39.80864817
	+E/-W	0.00 usft	Easting:	1,726,558.60 usft	Longitude:	-80.69326096
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	2/3/2017	-8.69	67.00	52,225.10345639

Design	rev3			
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	154.06

Plan Survey Tool Program	Date	5/17/2017		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	23,808.55 rev3 (Original Hole)	MWD	MWD - Standard

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	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,550.00	3.00	247.00	2,549.93	-1.53	-3.61	2.00	2.00	0.00	247.00	
8,508.23	3.00	247.00	8,500.00	-123.38	-290.65	0.00	0.00	0.00	0.00	
8,899.98	10.78	238.00	8,888.62	-146.84	-331.24	2.00	1.99	-2.30	-12.39	
11,104.61	10.78	238.00	11,054.32	-365.41	-681.07	0.00	0.00	0.00	0.00	
11,991.05	89.00	150.00	11,813.76	-905.41	-490.13	10.00	8.82	-9.93	-88.23	
23,808.55	89.00	150.00	11,820.00	-11,138.10	5,417.72	0.00	0.00	0.00	0.00	Heaven Hill 3-7 HU B



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

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	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
100.00	0.00	0.00	100.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
200.00	0.00	0.00	200.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
300.00	0.00	0.00	300.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
400.00	0.00	0.00	400.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
500.00	0.00	0.00	500.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
600.00	0.00	0.00	600.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
700.00	0.00	0.00	700.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
800.00	0.00	0.00	800.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
900.00	0.00	0.00	900.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,700.00	0.00	0.00	1,700.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,900.00	0.00	0.00	1,900.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
2,100.00	0.00	0.00	2,100.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
2,300.00	0.00	0.00	2,300.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
KOP Begin 2°/100' build										
2,500.00	2.00	247.00	2,489.98	-0.68	-1.61	14,457,202.64	1,726,556.99	39.80864631	-80.69326669	
2,550.00	3.00	247.00	2,549.93	-1.53	-3.61	14,457,201.79	1,726,554.98	39.80864399	-80.69327385	
Begin 3.00° tangent										
2,600.00	3.00	247.00	2,599.86	-2.56	-6.02	14,457,200.77	1,726,552.58	39.80864121	-80.69328244	
2,700.00	3.00	247.00	2,699.73	-4.60	-10.84	14,457,198.72	1,726,547.78	39.80863564	-80.69329962	
2,800.00	3.00	247.00	2,799.59	-6.65	-15.66	14,457,196.68	1,726,542.94	39.80863007	-80.69331680	
2,900.00	3.00	247.00	2,899.45	-8.69	-20.48	14,457,194.63	1,726,538.12	39.80862450	-80.69333398	
3,000.00	3.00	247.00	2,999.31	-10.74	-25.29	14,457,192.59	1,726,533.31	39.80861893	-80.69335115	
3,100.00	3.00	247.00	3,099.18	-12.78	-30.11	14,457,190.54	1,726,528.49	39.80861336	-80.69336833	
3,200.00	3.00	247.00	3,199.04	-14.83	-34.93	14,457,188.50	1,726,523.67	39.80860778	-80.69338551	
3,300.00	3.00	247.00	3,298.90	-16.87	-39.75	14,457,186.45	1,726,518.85	39.80860221	-80.69340269	
3,400.00	3.00	247.00	3,398.77	-18.92	-44.56	14,457,184.41	1,726,514.04	39.80859664	-80.69341987	
3,500.00	3.00	247.00	3,498.63	-20.96	-49.38	14,457,182.36	1,726,509.22	39.80859107	-80.69343705	
3,600.00	3.00	247.00	3,598.49	-23.01	-54.20	14,457,180.32	1,726,504.40	39.80858550	-80.69345423	
3,700.00	3.00	247.00	3,698.36	-25.05	-59.02	14,457,178.27	1,726,499.58	39.80857993	-80.69347141	
3,800.00	3.00	247.00	3,798.22	-27.10	-63.83	14,457,176.23	1,726,494.77	39.80857436	-80.69348859	
3,900.00	3.00	247.00	3,898.08	-29.14	-68.65	14,457,174.18	1,726,489.95	39.80856879	-80.69350577	
4,000.00	3.00	247.00	3,997.94	-31.19	-73.47	14,457,172.14	1,726,485.13	39.80856322	-80.69352295	
4,100.00	3.00	247.00	4,097.81	-33.23	-78.29	14,457,170.09	1,726,480.31	39.80855765	-80.69354013	
4,200.00	3.00	247.00	4,197.67	-35.28	-83.10	14,457,168.05	1,726,475.50	39.80855208	-80.69355731	
4,300.00	3.00	247.00	4,297.53	-37.32	-87.92	14,457,166.00	1,726,470.68	39.80854651	-80.69357449	
4,400.00	3.00	247.00	4,397.40	-39.37	-92.74	14,457,163.96	1,726,465.86	39.80854094	-80.69359166	
4,500.00	3.00	247.00	4,497.26	-41.41	-97.56	14,457,161.91	1,726,461.04	39.80853537	-80.69360884	
4,600.00	3.00	247.00	4,597.12	-43.46	-102.37	14,457,159.87	1,726,456.23	39.80852980	-80.69362602	
4,700.00	3.00	247.00	4,696.99	-45.50	-107.19	14,457,157.82	1,726,451.41	39.80852423	-80.69364320	
4,800.00	3.00	247.00	4,796.85	-47.54	-112.01	14,457,155.78	1,726,446.59	39.80851866	-80.69366038	
4,900.00	3.00	247.00	4,896.71	-49.59	-116.83	14,457,153.73	1,726,441.77	39.80851308	-80.69367756	
5,000.00	3.00	247.00	4,996.57	-51.63	-121.64	14,457,151.69	1,726,436.95	39.80850751	-80.69369474	

51-01969



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey

Measured Depth (usft)	Inclination (")	Azimuth (")	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,100.00	3.00	247.00	5,096.44	-53.68	-126.46	14,457,149.65	1,726,432.14	39.80850194	-80.69371192
5,200.00	3.00	247.00	5,196.30	-55.72	-131.28	14,457,147.60	1,726,427.32	39.80849637	-80.69372910
5,300.00	3.00	247.00	5,296.16	-57.77	-136.10	14,457,145.56	1,726,422.50	39.80849080	-80.69374628
5,400.00	3.00	247.00	5,396.03	-59.81	-140.91	14,457,143.51	1,726,417.68	39.80848523	-80.69376346
5,500.00	3.00	247.00	5,495.89	-61.86	-145.73	14,457,141.47	1,726,412.87	39.80847966	-80.69378064
5,600.00	3.00	247.00	5,595.75	-63.90	-150.55	14,457,139.42	1,726,408.05	39.80847409	-80.69379782
5,700.00	3.00	247.00	5,695.61	-65.95	-155.37	14,457,137.38	1,726,403.23	39.80846852	-80.69381500
5,800.00	3.00	247.00	5,795.48	-67.99	-160.18	14,457,135.33	1,726,398.41	39.80846295	-80.69383217
5,900.00	3.00	247.00	5,895.34	-70.04	-165.00	14,457,133.29	1,726,393.60	39.80845738	-80.69384935
6,000.00	3.00	247.00	5,995.20	-72.08	-169.82	14,457,131.24	1,726,388.78	39.80845181	-80.69386653
6,100.00	3.00	247.00	6,095.07	-74.13	-174.64	14,457,129.20	1,726,383.96	39.80844624	-80.69388371
6,200.00	3.00	247.00	6,194.93	-76.17	-179.45	14,457,127.15	1,726,379.14	39.80844067	-80.69389089
6,300.00	3.00	247.00	6,294.79	-78.22	-184.27	14,457,125.11	1,726,374.33	39.80843510	-80.69391807
6,400.00	3.00	247.00	6,394.66	-80.26	-189.09	14,457,123.06	1,726,369.51	39.80842953	-80.69393525
6,500.00	3.00	247.00	6,494.52	-82.31	-193.91	14,457,121.02	1,726,364.69	39.80842396	-80.69395243
6,600.00	3.00	247.00	6,594.38	-84.35	-198.72	14,457,118.97	1,726,359.87	39.80841838	-80.69396961
6,700.00	3.00	247.00	6,694.24	-86.40	-203.54	14,457,116.93	1,726,355.06	39.80841281	-80.69398679
6,800.00	3.00	247.00	6,794.11	-88.44	-208.36	14,457,114.88	1,726,350.24	39.80840724	-80.69400397
6,900.00	3.00	247.00	6,893.97	-90.49	-213.18	14,457,112.84	1,726,345.42	39.80840167	-80.69402115
7,000.00	3.00	247.00	6,993.83	-92.53	-217.99	14,457,110.79	1,726,340.60	39.80839610	-80.69403833
7,100.00	3.00	247.00	7,093.70	-94.58	-222.81	14,457,108.75	1,726,335.79	39.80839053	-80.69405550
7,200.00	3.00	247.00	7,193.56	-96.62	-227.63	14,457,106.70	1,726,330.97	39.80838496	-80.69407268
7,300.00	3.00	247.00	7,293.42	-98.67	-232.45	14,457,104.66	1,726,326.15	39.80837939	-80.69408986
7,400.00	3.00	247.00	7,393.28	-100.71	-237.27	14,457,102.61	1,726,321.33	39.80837382	-80.69410704
7,500.00	3.00	247.00	7,493.15	-102.76	-242.08	14,457,100.57	1,726,316.52	39.80836825	-80.69412422
7,600.00	3.00	247.00	7,593.01	-104.80	-246.90	14,457,098.52	1,726,311.70	39.80836268	-80.69414140
7,700.00	3.00	247.00	7,692.87	-106.85	-251.72	14,457,096.48	1,726,306.88	39.80835711	-80.69415858
7,800.00	3.00	247.00	7,792.74	-108.89	-256.54	14,457,094.43	1,726,302.06	39.80835154	-80.69417576
7,900.00	3.00	247.00	7,892.60	-110.94	-261.35	14,457,092.39	1,726,297.25	39.80834597	-80.69419294
8,000.00	3.00	247.00	7,992.46	-112.98	-266.17	14,457,090.34	1,726,292.43	39.80834040	-80.69421012
8,100.00	3.00	247.00	8,092.33	-115.03	-270.99	14,457,088.30	1,726,287.61	39.80833482	-80.69422730
8,200.00	3.00	247.00	8,192.19	-117.07	-275.81	14,457,086.25	1,726,282.79	39.80832925	-80.69424448
8,300.00	3.00	247.00	8,292.05	-119.12	-280.62	14,457,084.21	1,726,277.98	39.80832368	-80.69426165
8,400.00	3.00	247.00	8,391.91	-121.16	-285.44	14,457,082.16	1,726,273.16	39.80831811	-80.69427883
8,500.00	3.00	247.00	8,491.78	-123.21	-290.26	14,457,080.12	1,726,268.34	39.80831254	-80.69429601
8,508.23	3.00	247.00	8,500.00	-123.38	-290.65	14,457,079.95	1,726,267.94	39.80831208	-80.69429743
Begin 2°/100' build/turn									
8,600.00	4.81	242.30	8,591.55	-126.10	-296.27	14,457,077.22	1,726,262.33	39.80830465	-80.69431746
8,700.00	6.80	240.03	8,691.03	-131.01	-305.11	14,457,072.32	1,726,253.49	39.80829126	-80.69434899
8,800.00	8.79	238.79	8,790.10	-137.92	-316.77	14,457,065.40	1,726,241.83	39.80827238	-80.69439059
8,899.98	10.78	238.00	8,888.62	-146.84	-331.24	14,457,056.49	1,726,227.36	39.80824803	-80.69444221
Begin 10.78° tangent									
8,900.00	10.78	238.00	8,888.64	-146.84	-331.24	14,457,056.49	1,726,227.36	39.80824803	-80.69444223
9,000.00	10.78	238.00	8,986.88	-156.75	-347.11	14,457,046.57	1,726,211.49	39.80822095	-80.69449885
9,100.00	10.78	238.00	9,085.11	-166.67	-362.98	14,457,036.66	1,726,195.62	39.80819387	-80.69455547
9,200.00	10.78	238.00	9,183.35	-176.58	-378.84	14,457,026.74	1,726,179.75	39.80816679	-80.69461210
9,300.00	10.78	238.00	9,281.58	-186.50	-394.71	14,457,016.83	1,726,163.89	39.80813971	-80.69466872
9,400.00	10.78	238.00	9,379.81	-196.41	-410.58	14,457,006.91	1,726,148.02	39.80811263	-80.69472534
9,500.00	10.78	238.00	9,478.05	-206.33	-426.45	14,456,997.00	1,726,132.15	39.80808556	-80.69478197
9,600.00	10.78	238.00	9,576.28	-216.24	-442.32	14,456,987.08	1,726,116.28	39.80805848	-80.69483859
9,700.00	10.78	238.00	9,674.52	-226.15	-458.18	14,456,977.17	1,726,100.41	39.80803140	-80.69489521
9,800.00	10.78	238.00	9,772.75	-236.07	-474.05	14,456,967.26	1,726,084.55	39.80800432	-80.69495184
9,900.00	10.78	238.00	9,870.98	-245.98	-489.92	14,456,957.34	1,726,068.68	39.80797724	-80.69500846
10,000.00	10.78	238.00	9,969.22	-255.90	-505.79	14,456,947.43	1,726,052.81	39.80795016	-80.69506508



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,100.00	10.78	238.00	10,067.45	-265.81	-521.66	14,456,937.51	1,726,038.94	39.80792308	-80.69512171
10,200.00	10.78	238.00	10,165.68	-275.73	-537.53	14,456,927.60	1,726,021.07	39.80789600	-80.69517833
10,300.00	10.78	238.00	10,263.92	-285.64	-553.39	14,456,917.68	1,726,005.20	39.80786892	-80.69523495
10,400.00	10.78	238.00	10,362.15	-295.56	-569.26	14,456,907.77	1,725,989.34	39.80784185	-80.69529158
10,500.00	10.78	238.00	10,460.39	-305.47	-585.13	14,456,897.86	1,725,973.47	39.80781477	-80.69534820
10,600.00	10.78	238.00	10,558.62	-315.38	-601.00	14,456,887.94	1,725,957.60	39.80778769	-80.69540482
10,700.00	10.78	238.00	10,656.85	-325.30	-616.87	14,456,878.03	1,725,941.73	39.80776061	-80.69546145
10,800.00	10.78	238.00	10,755.09	-335.21	-632.74	14,456,868.11	1,725,925.86	39.80773353	-80.69551807
10,900.00	10.78	238.00	10,853.32	-345.13	-648.60	14,456,858.20	1,725,910.00	39.80770645	-80.69557469
11,000.00	10.78	238.00	10,951.56	-355.04	-664.47	14,456,848.28	1,725,894.13	39.80767937	-80.69563132
11,100.00	10.78	238.00	11,049.79	-364.96	-680.34	14,456,838.37	1,725,878.26	39.80765229	-80.69568794
11,104.61	10.78	238.00	11,054.32	-365.41	-681.07	14,456,837.91	1,725,877.53	39.80765104	-80.69569055
Begin 10°/100' build/turn									
11,200.00	14.58	196.86	11,147.55	-381.67	-692.15	14,456,821.65	1,725,866.45	39.80760650	-80.69573018
11,300.00	22.51	177.16	11,242.37	-412.91	-694.86	14,456,790.41	1,725,863.74	39.80752073	-80.69574021
11,400.00	31.59	167.84	11,331.38	-457.75	-688.37	14,456,745.58	1,725,870.22	39.80739754	-80.69571787
11,500.00	41.07	162.43	11,411.86	-514.82	-672.90	14,456,688.51	1,725,885.70	39.80724067	-80.69566326
11,600.00	50.72	158.77	11,481.39	-582.38	-648.90	14,456,620.94	1,725,909.70	39.80705489	-80.69557883
11,700.00	60.48	156.00	11,537.83	-658.40	-617.11	14,456,544.93	1,725,941.49	39.80684584	-80.69546636
11,800.00	70.25	153.73	11,579.49	-740.54	-578.49	14,456,462.78	1,725,980.10	39.80661988	-80.69532984
11,900.00	80.05	151.72	11,605.08	-825.33	-534.22	14,456,376.99	1,726,024.38	39.80636388	-80.69517324
11,991.05	89.00	150.00	11,613.76	-905.41	-490.13	14,456,297.92	1,726,068.47	39.80616630	-80.69501719
Begin 89.00° lateral section									
12,000.00	89.00	150.00	11,613.81	-913.16	-485.65	14,456,290.17	1,726,072.95	39.80614498	-80.69500135
12,100.00	89.00	150.00	11,615.66	-999.75	-435.66	14,456,203.58	1,726,122.94	39.80590671	-80.69482440
12,200.00	89.00	150.00	11,617.40	-1,086.34	-385.67	14,456,116.99	1,726,172.93	39.80566845	-80.69464744
12,300.00	89.00	150.00	11,619.15	-1,172.92	-335.67	14,456,030.40	1,726,222.92	39.80543019	-80.69447049
12,400.00	89.00	150.00	11,620.89	-1,259.51	-285.68	14,455,943.81	1,726,272.92	39.80519192	-80.69429354
12,500.00	89.00	150.00	11,622.64	-1,346.10	-235.69	14,455,857.22	1,726,322.91	39.80495366	-80.69411659
12,600.00	89.00	150.00	11,624.38	-1,432.69	-185.70	14,455,770.63	1,726,372.90	39.80471539	-80.69393864
12,700.00	89.00	150.00	11,626.13	-1,519.28	-135.71	14,455,684.04	1,726,422.89	39.80447713	-80.69376269
12,800.00	89.00	150.00	11,627.87	-1,605.87	-85.71	14,455,597.45	1,726,472.89	39.80423886	-80.69358574
12,900.00	89.00	150.00	11,629.62	-1,692.46	-35.72	14,455,510.86	1,726,522.88	39.80400059	-80.69340880
13,000.00	89.00	150.00	11,631.37	-1,779.05	14.27	14,455,424.27	1,726,572.87	39.80376233	-80.69323185
13,100.00	89.00	150.00	11,633.11	-1,865.64	84.26	14,455,337.69	1,726,622.86	39.80352406	-80.69305491
13,200.00	89.00	150.00	11,634.86	-1,952.23	114.26	14,455,251.10	1,726,672.86	39.80328579	-80.69287797
13,300.00	89.00	150.00	11,636.60	-2,038.82	164.25	14,455,164.51	1,726,722.85	39.80304753	-80.69270103
13,400.00	89.00	150.00	11,638.35	-2,125.41	214.24	14,455,077.92	1,726,772.84	39.80280926	-80.69252409
13,500.00	89.00	150.00	11,640.09	-2,212.00	264.23	14,454,991.33	1,726,822.83	39.80257099	-80.69234715
13,600.00	89.00	150.00	11,641.84	-2,298.59	314.23	14,454,904.74	1,726,872.83	39.80233272	-80.69217021
13,700.00	89.00	150.00	11,643.58	-2,385.18	364.22	14,454,818.15	1,726,922.82	39.80209446	-80.69199328
13,800.00	89.00	150.00	11,645.33	-2,471.77	414.21	14,454,731.56	1,726,972.81	39.80185619	-80.69181634
13,900.00	89.00	150.00	11,647.07	-2,558.35	464.20	14,454,644.97	1,727,022.80	39.80161792	-80.69163941
14,000.00	89.00	150.00	11,648.82	-2,644.94	514.20	14,454,558.38	1,727,072.79	39.80137965	-80.69146248
14,100.00	89.00	150.00	11,650.56	-2,731.53	564.19	14,454,471.79	1,727,122.79	39.80114138	-80.69128554
14,200.00	89.00	150.00	11,652.31	-2,818.12	614.18	14,454,385.20	1,727,172.78	39.80090311	-80.69110861
14,300.00	89.00	150.00	11,654.05	-2,904.71	664.17	14,454,298.61	1,727,222.77	39.80066484	-80.69093169
14,400.00	89.00	150.00	11,655.80	-2,991.30	714.17	14,454,212.02	1,727,272.76	39.80042657	-80.69075476
14,500.00	89.00	150.00	11,657.54	-3,077.89	764.16	14,454,125.43	1,727,322.76	39.80018830	-80.69057783
14,600.00	89.00	150.00	11,659.29	-3,164.48	814.15	14,454,038.84	1,727,372.75	39.79995003	-80.69040091
14,700.00	89.00	150.00	11,661.03	-3,251.07	864.14	14,453,952.26	1,727,422.74	39.79971176	-80.69022398
14,800.00	89.00	150.00	11,662.78	-3,337.66	914.14	14,453,865.67	1,727,472.73	39.79947349	-80.69004705
14,900.00	89.00	150.00	11,664.52	-3,424.25	964.13	14,453,779.08	1,727,522.73	39.79923522	-80.68987014
15,000.00	89.00	150.00	11,666.27	-3,510.84	1,014.12	14,453,692.49	1,727,572.72	39.79899695	-80.68969322



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,100.00	89.00	150.00	11,688.02	-3,597.43	1,064.11	14,453,605.90	1,727,622.71	39.79875867	-80.68951630
15,200.00	89.00	150.00	11,669.76	-3,684.02	1,114.10	14,453,519.31	1,727,672.70	39.79852040	-80.68933938
15,300.00	89.00	150.00	11,671.51	-3,770.61	1,164.10	14,453,432.72	1,727,722.70	39.79828213	-80.68916247
15,400.00	89.00	150.00	11,673.25	-3,857.19	1,214.09	14,453,346.13	1,727,772.69	39.79804386	-80.68898555
15,500.00	89.00	150.00	11,675.00	-3,943.78	1,264.08	14,453,259.54	1,727,822.68	39.79780558	-80.68880864
15,600.00	89.00	150.00	11,676.74	-4,030.37	1,314.07	14,453,172.95	1,727,872.67	39.79756731	-80.68863172
15,700.00	89.00	150.00	11,678.49	-4,116.96	1,364.07	14,453,086.36	1,727,922.67	39.79732904	-80.68845481
15,800.00	89.00	150.00	11,680.23	-4,203.55	1,414.06	14,452,999.77	1,727,972.66	39.79709076	-80.68827790
15,900.00	89.00	150.00	11,681.98	-4,290.14	1,464.05	14,452,913.18	1,728,022.65	39.79685249	-80.68810099
16,000.00	89.00	150.00	11,683.72	-4,376.73	1,514.04	14,452,826.59	1,728,072.64	39.79661421	-80.68792408
16,100.00	89.00	150.00	11,685.47	-4,463.32	1,564.04	14,452,740.00	1,728,122.63	39.79637594	-80.68774718
16,200.00	89.00	150.00	11,687.21	-4,549.91	1,614.03	14,452,653.42	1,728,172.63	39.79613766	-80.68757027
16,300.00	89.00	150.00	11,688.96	-4,636.50	1,664.02	14,452,566.83	1,728,222.62	39.79589939	-80.68739337
16,400.00	89.00	150.00	11,690.70	-4,723.09	1,714.01	14,452,480.24	1,728,272.61	39.79566111	-80.68721646
16,500.00	89.00	150.00	11,692.45	-4,809.68	1,764.01	14,452,393.65	1,728,322.60	39.79542284	-80.68703956
16,600.00	89.00	150.00	11,694.19	-4,896.27	1,814.00	14,452,307.06	1,728,372.60	39.79518456	-80.68686266
16,700.00	89.00	150.00	11,695.94	-4,982.86	1,863.99	14,452,220.47	1,728,422.59	39.79494629	-80.68668576
16,800.00	89.00	150.00	11,697.68	-5,069.45	1,913.98	14,452,133.88	1,728,472.58	39.79470801	-80.68650886
16,900.00	89.00	150.00	11,699.43	-5,156.04	1,963.98	14,452,047.29	1,728,522.57	39.79446973	-80.68633197
17,000.00	89.00	150.00	11,701.17	-5,242.62	2,013.97	14,451,960.70	1,728,572.57	39.79423145	-80.68615507
17,100.00	89.00	150.00	11,702.92	-5,329.21	2,063.96	14,451,874.11	1,728,622.56	39.79399318	-80.68597818
17,200.00	89.00	150.00	11,704.67	-5,415.80	2,113.95	14,451,787.52	1,728,672.55	39.79375490	-80.68580128
17,300.00	89.00	150.00	11,706.41	-5,502.39	2,163.94	14,451,700.93	1,728,722.54	39.79351662	-80.68562439
17,400.00	89.00	150.00	11,708.16	-5,588.98	2,213.94	14,451,614.34	1,728,772.54	39.79327834	-80.68544750
17,500.00	89.00	150.00	11,709.90	-5,675.57	2,263.93	14,451,527.75	1,728,822.53	39.79304006	-80.68527061
17,600.00	89.00	150.00	11,711.65	-5,762.16	2,313.92	14,451,441.16	1,728,872.52	39.79280179	-80.68509372
17,700.00	89.00	150.00	11,713.39	-5,848.75	2,363.91	14,451,354.57	1,728,922.51	39.79256351	-80.68491683
17,800.00	89.00	150.00	11,715.14	-5,935.34	2,413.91	14,451,267.99	1,728,972.51	39.79232523	-80.68473995
17,900.00	89.00	150.00	11,716.88	-6,021.93	2,463.90	14,451,181.40	1,729,022.50	39.79208695	-80.68456306
18,000.00	89.00	150.00	11,718.63	-6,108.52	2,513.89	14,451,094.81	1,729,072.49	39.79184867	-80.68438616
18,100.00	89.00	150.00	11,720.37	-6,195.11	2,563.88	14,451,008.22	1,729,122.48	39.79161039	-80.68420930
18,200.00	89.00	150.00	11,722.12	-6,281.70	2,613.88	14,450,921.63	1,729,172.47	39.79137211	-80.68403241
18,300.00	89.00	150.00	11,723.86	-6,368.29	2,663.87	14,450,835.04	1,729,222.47	39.79113383	-80.68385553
18,400.00	89.00	150.00	11,725.61	-6,454.88	2,713.86	14,450,748.45	1,729,272.46	39.79089555	-80.68367866
18,500.00	89.00	150.00	11,727.35	-6,541.46	2,763.85	14,450,661.86	1,729,322.45	39.79065726	-80.68350178
18,600.00	89.00	150.00	11,729.10	-6,628.05	2,813.85	14,450,575.27	1,729,372.44	39.79041898	-80.68332490
18,700.00	89.00	150.00	11,730.84	-6,714.64	2,863.84	14,450,488.68	1,729,422.44	39.79018070	-80.68314803
18,800.00	89.00	150.00	11,732.59	-6,801.23	2,913.83	14,450,402.09	1,729,472.43	39.78994242	-80.68297115
18,900.00	89.00	150.00	11,734.33	-6,887.82	2,963.82	14,450,315.50	1,729,522.42	39.78970414	-80.68279428
19,000.00	89.00	150.00	11,736.08	-6,974.41	3,013.82	14,450,228.91	1,729,572.41	39.78946585	-80.68261741
19,100.00	89.00	150.00	11,737.82	-7,061.00	3,063.81	14,450,142.32	1,729,622.41	39.78922757	-80.68244054
19,200.00	89.00	150.00	11,739.57	-7,147.59	3,113.80	14,450,055.73	1,729,672.40	39.78898929	-80.68226367
19,300.00	89.00	150.00	11,741.32	-7,234.18	3,163.79	14,449,969.15	1,729,722.39	39.78875100	-80.68208680
19,400.00	89.00	150.00	11,743.06	-7,320.77	3,213.78	14,449,882.56	1,729,772.38	39.78851272	-80.68190993
19,500.00	89.00	150.00	11,744.81	-7,407.36	3,263.78	14,449,795.97	1,729,822.38	39.78827444	-80.68173307
19,600.00	89.00	150.00	11,746.55	-7,493.95	3,313.77	14,449,709.38	1,729,872.37	39.78803615	-80.68155620
19,700.00	89.00	150.00	11,748.30	-7,580.54	3,363.76	14,449,622.79	1,729,922.36	39.78779787	-80.68137934
19,800.00	89.00	150.00	11,750.04	-7,667.13	3,413.75	14,449,536.20	1,729,972.35	39.78755958	-80.68120248
19,900.00	89.00	150.00	11,751.79	-7,753.72	3,463.75	14,449,449.61	1,730,022.35	39.78732130	-80.68102562
20,000.00	89.00	150.00	11,753.53	-7,840.30	3,513.74	14,449,363.02	1,730,072.34	39.78708301	-80.68084876
20,100.00	89.00	150.00	11,755.28	-7,926.89	3,563.73	14,449,276.43	1,730,122.33	39.78684473	-80.68067190
20,200.00	89.00	150.00	11,757.02	-8,013.48	3,613.72	14,449,189.84	1,730,172.32	39.78660644	-80.68049504
20,300.00	89.00	150.00	11,758.77	-8,100.07	3,663.72	14,449,103.25	1,730,222.32	39.78636815	-80.68031819
20,400.00	89.00	150.00	11,760.51	-8,186.66	3,713.71	14,449,016.66	1,730,272.31	39.78612987	-80.68014133
20,500.00	89.00	150.00	11,762.25	-8,273.25	3,763.70	14,448,930.07	1,730,322.30	39.78589158	-80.67996448



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
20,600.00	89.00	150.00	11,764.00	-8,359.84	3,813.69	14,448,843.48	1,730,372.29	39.78565329	-80.67978763
20,700.00	89.00	150.00	11,765.75	-8,446.43	3,863.69	14,448,756.89	1,730,422.28	39.78541501	-80.67981078
20,800.00	89.00	150.00	11,767.49	-8,533.02	3,913.68	14,448,670.30	1,730,472.28	39.78517672	-80.67943393
20,900.00	89.00	150.00	11,769.24	-8,619.61	3,963.67	14,448,583.72	1,730,522.27	39.78493843	-80.67925708
21,000.00	89.00	150.00	11,770.98	-8,706.20	4,013.66	14,448,497.13	1,730,572.26	39.78470014	-80.67908023
21,100.00	89.00	150.00	11,772.73	-8,792.79	4,063.66	14,448,410.54	1,730,622.25	39.78446185	-80.67890339
21,200.00	89.00	150.00	11,774.47	-8,879.38	4,113.65	14,448,323.95	1,730,672.25	39.78422356	-80.67872654
21,300.00	89.00	150.00	11,776.22	-8,965.97	4,163.64	14,448,237.36	1,730,722.24	39.78396526	-80.67854970
21,400.00	89.00	150.00	11,777.97	-9,052.56	4,213.63	14,448,150.77	1,730,772.23	39.78374899	-80.67837286
21,500.00	89.00	150.00	11,779.71	-9,139.15	4,263.62	14,448,064.18	1,730,822.22	39.78350870	-80.67819601
21,600.00	89.00	150.00	11,781.46	-9,225.73	4,313.62	14,447,977.59	1,730,872.22	39.78327041	-80.67801917
21,700.00	89.00	150.00	11,783.20	-9,312.32	4,363.61	14,447,891.00	1,730,922.21	39.78303212	-80.67784234
21,800.00	89.00	150.00	11,784.95	-9,398.91	4,413.60	14,447,804.41	1,730,972.20	39.78279383	-80.67766550
21,900.00	89.00	150.00	11,786.69	-9,485.50	4,463.59	14,447,717.82	1,731,022.19	39.78255554	-80.67748866
22,000.00	89.00	150.00	11,788.44	-9,572.09	4,513.58	14,447,631.23	1,731,072.19	39.78231725	-80.67731183
22,100.00	89.00	150.00	11,790.18	-9,658.68	4,563.58	14,447,544.64	1,731,122.18	39.78207895	-80.67713499
22,200.00	89.00	150.00	11,791.93	-9,745.27	4,613.57	14,447,458.05	1,731,172.17	39.78184066	-80.67695816
22,300.00	89.00	150.00	11,793.67	-9,831.86	4,663.56	14,447,371.46	1,731,222.16	39.78160237	-80.67678133
22,400.00	89.00	150.00	11,795.42	-9,918.45	4,713.56	14,447,284.88	1,731,272.16	39.78136408	-80.67660450
22,500.00	89.00	150.00	11,797.16	-10,005.04	4,763.55	14,447,198.29	1,731,322.15	39.78112579	-80.67642767
22,600.00	89.00	150.00	11,798.91	-10,091.63	4,813.54	14,447,111.70	1,731,372.14	39.78088749	-80.67625084
22,700.00	89.00	150.00	11,800.65	-10,178.22	4,863.53	14,447,025.11	1,731,422.13	39.78064920	-80.67607402
22,800.00	89.00	150.00	11,802.40	-10,264.81	4,913.53	14,446,938.52	1,731,472.12	39.78041091	-80.67589719
22,900.00	89.00	150.00	11,804.14	-10,351.40	4,963.52	14,446,851.93	1,731,522.12	39.78017261	-80.67572037
23,000.00	89.00	150.00	11,805.89	-10,437.99	5,013.51	14,446,765.34	1,731,572.11	39.77993432	-80.67554354
23,100.00	89.00	150.00	11,807.63	-10,524.57	5,063.50	14,446,678.75	1,731,622.10	39.77969603	-80.67536672
23,200.00	89.00	150.00	11,809.38	-10,611.16	5,113.50	14,446,592.16	1,731,672.09	39.77945773	-80.67518990
23,300.00	89.00	150.00	11,811.12	-10,697.75	5,163.49	14,446,505.57	1,731,722.09	39.77921944	-80.67501308
23,400.00	89.00	150.00	11,812.87	-10,784.34	5,213.48	14,446,418.98	1,731,772.08	39.77898114	-80.67483626
23,500.00	89.00	150.00	11,814.62	-10,870.93	5,263.47	14,446,332.39	1,731,822.07	39.77874285	-80.67465945
23,600.00	89.00	150.00	11,816.36	-10,957.52	5,313.46	14,446,245.80	1,731,872.06	39.77850455	-80.67448263
23,700.00	89.00	150.00	11,818.11	-11,044.11	5,363.46	14,446,159.21	1,731,922.06	39.77826626	-80.67430582
23,800.00	89.00	150.00	11,819.85	-11,130.70	5,413.45	14,446,072.62	1,731,972.05	39.77802796	-80.67412900
23,808.54	89.00	150.00	11,820.00	-11,138.10	5,417.72	14,446,065.23	1,731,976.32	39.77800761	-80.67411390
PBHL/TD									
23,808.55	89.00	150.00	11,820.00	-11,138.10	5,417.72	14,446,065.22	1,731,976.32	39.77800759	-80.67411389

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Heaven Hill 3-7 HU LP - hit/miss target - Shape - Point	0.00	0.01	11,602.00	-359.33	-805.56	14,456,844.00	1,725,753.04	39.80766891	-80.69613375
- plan misses target center by 279.15usft at 11500.00usft MD (11411.86 TVD, -514.82 N, -672.90 E)									
Heaven Hill 3-7 HU BHL - plan hits target center - Point	0.00	0.00	11,820.00	-11,138.10	5,417.72	14,446,065.22	1,731,976.32	39.77800759	-80.67411389

51-01969



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
120.00	120.00	30" Casing @ 120 TVD	30	36	
1,185.00	1,185.00	20" Casing @ 1185 TVD	20	24	
2,800.41	2,800.00	13 3/8" Casing @ 2800 TVD	13-3/8	17	
10,438.53	10,400.00	9 5/8" Casing @ 10400 TVD	9-5/8	12-1/4	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
2,400.00	2,400.00	0.00	0.00	KOP Begin 2"/100' build	
2,550.00	2,549.93	-1.53	-3.61	Begin 3.00" tangent	
8,508.23	8,500.00	-123.38	-290.65	Begin 2"/100' build/turn	
8,899.88	8,888.62	-146.84	-331.24	Begin 10.78° tangent	
11,104.61	11,054.32	-365.41	-681.07	Begin 10"/100' build/turn	
11,991.05	11,613.76	-805.41	-490.13	Begin 89.00° lateral section	
23,808.54	11,820.00	-11,138.10	5,417.72	PBHL/TD	



Well: Heaven Hill 3-7 HU
 Site: Heaven Hill 3
 Project: Marshall County, West Virginia
 Design: rev3

SECTION DETAILS

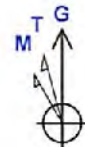
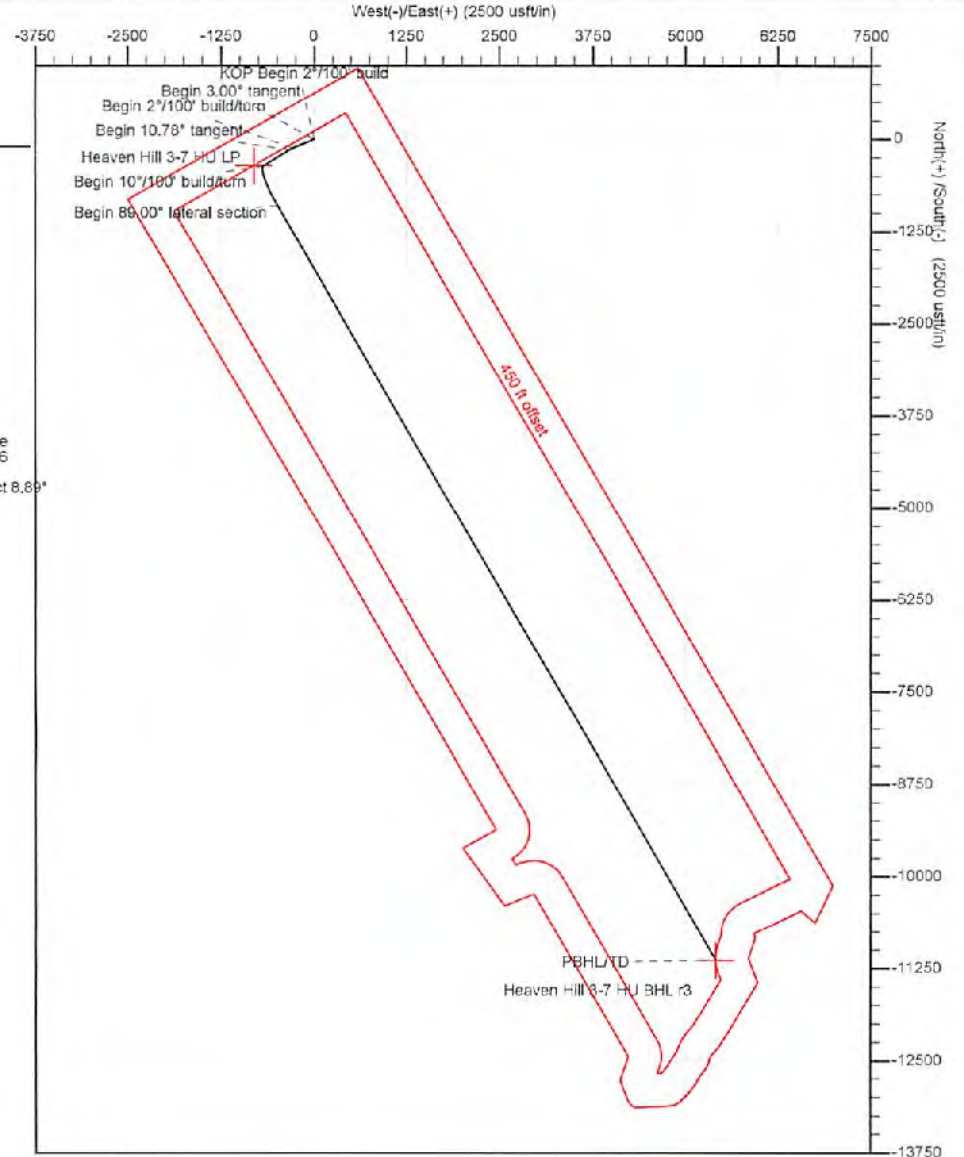
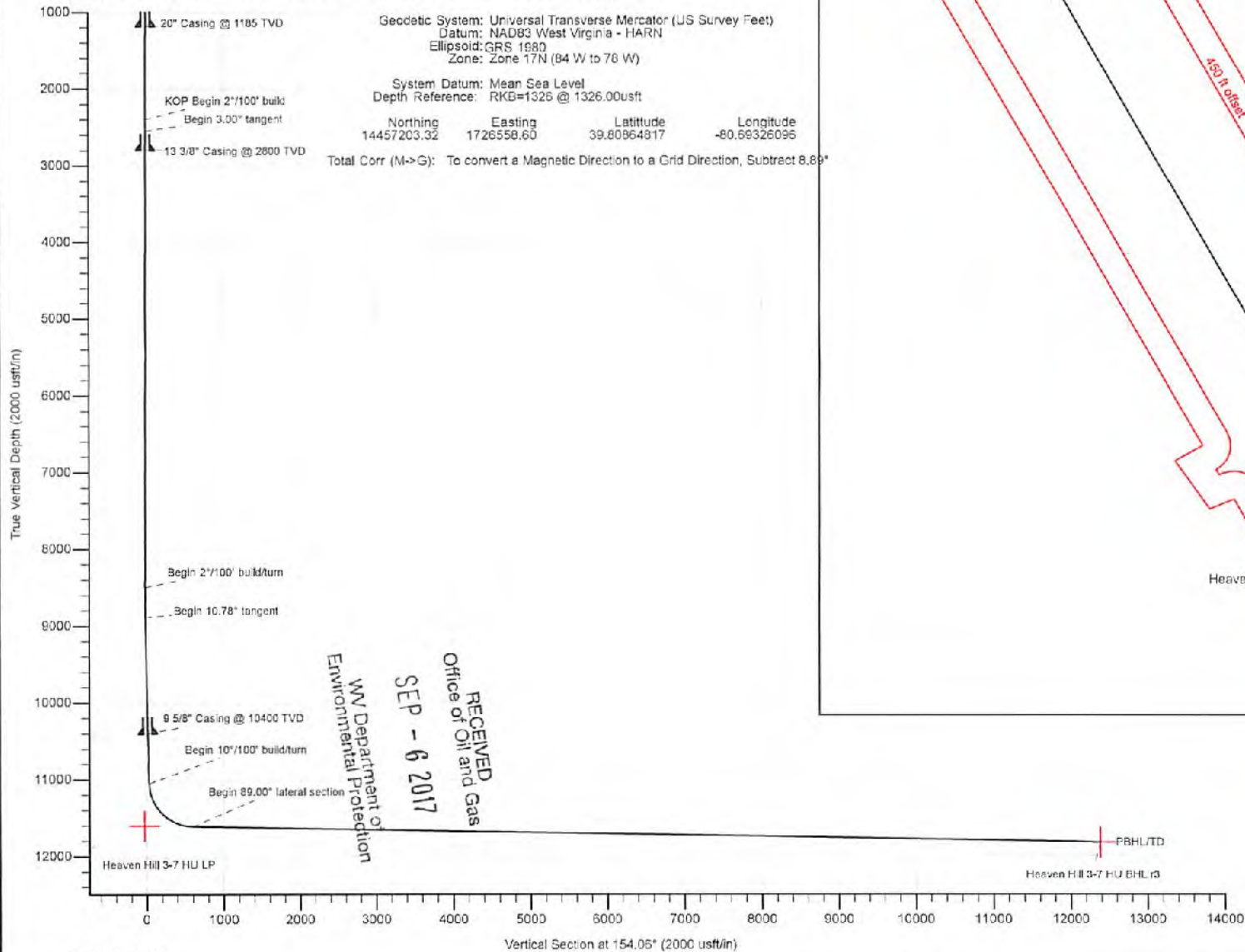
Sec	MD	Inch	Azi	TVD	+N/S	+E/W	Dleg	TFace	VFace	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2400.00	0.00	0.00	2400.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2 1/100' build
3	2550.00	3.00	247.00	2549.93	-1.53	-3.61	2.00	247.00	-0.20	Begin 3.00" tangent
4	8503.23	3.00	247.00	8500.00	-123.38	-290.55	0.00	0.00	-16.19	Begin 2 1/100' build/turn
5	8899.98	10.78	238.00	8888.62	-146.84	-331.24	2.00	-12.39	-12.84	Begin 10.78" tangent
6	11104.51	10.78	238.00	11054.32	-365.41	-681.07	0.00	0.00	30.69	Begin 10 7/100' build/turn
7	11991.05	89.00	150.00	11613.75	-905.41	-490.13	10.00	-88.23	589.81	Begin 89.00" lateral section
8	23803.55	89.00	150.00	11820.00	-11138.10	5417.72	0.00	0.00	2385.84	PBHL/TD

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1980
 Zone: Zone 17N (84 W to 76 W)

System Datum: Mean Sea Level
 Depth Reference: RKB=1325 @ 1326.00usft

Northing	Easting	Latitude	Longitude
14457203.32	1726558.60	39.60964817	-80.69326096

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.88°



Azimuths to Grid North
 True North: -0.20°
 Magnetic North: -8.88°
 Magnetic Field
 Strength: 52225.1snT
 Dip Angle: 87.00°
 Date: 2/3/2017
 Model: IGRF2015



51-01969



Planning Report - Geographic

51-01969

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

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:	39.80856060
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 3-7 HU					
Well Position	+N-S	0.00 usft	Northing:	14,457,203.32 usft	Latitude:	39.80854817
	+E-W	0.00 usft	Easting:	1,726,558.80 usft	Longitude:	-80.69326096
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	1,328.00 usft	

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2/3/2017	-8.69	67.00	52,225.10345639

Design	rev3			
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	154.06

Plan Survey Tool Program	Date	5/17/2017		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	23,808.55 rev3 (Original Hole)	MWD	MWD - Standard

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	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,550.00	3.00	247.00	2,549.93	-1.53	-3.61	2.00	2.00	0.00	247.00	
8,508.23	3.00	247.00	8,500.00	-123.38	-290.65	0.00	0.00	0.00	0.00	
8,899.98	10.78	238.00	8,888.62	-146.84	-331.24	2.00	1.99	-2.30	-12.39	
11,104.61	10.78	238.00	11,054.32	-365.41	-681.07	0.00	0.00	0.00	0.00	
11,991.05	89.00	150.00	11,613.76	-905.41	-490.13	10.00	8.82	-9.93	-88.23	
23,808.55	89.00	150.00	11,820.00	-11,138.10	5,417.72	0.00	0.00	0.00	0.00	Heaven Hill 3-7 HU B

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Planning Report - Geographic

51-01969

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

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	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
100.00	0.00	0.00	100.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
200.00	0.00	0.00	200.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
300.00	0.00	0.00	300.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
400.00	0.00	0.00	400.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
500.00	0.00	0.00	500.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
600.00	0.00	0.00	600.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
700.00	0.00	0.00	700.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
800.00	0.00	0.00	800.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
900.00	0.00	0.00	900.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,700.00	0.00	0.00	1,700.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
1,900.00	0.00	0.00	1,900.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
2,100.00	0.00	0.00	2,100.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
2,300.00	0.00	0.00	2,300.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	14,457,203.32	1,726,558.60	39.80864817	-80.69326096	
KOP Begin 2°/100' build										
2,500.00	2.00	247.00	2,499.98	-0.68	-1.61	14,457,202.84	1,726,556.99	39.80864631	-80.69326669	
2,550.00	3.00	247.00	2,549.93	-1.53	-3.61	14,457,201.79	1,726,554.98	39.80864399	-80.69327385	
Begin 3.00° tangent										
2,600.00	3.00	247.00	2,599.86	-2.56	-6.02	14,457,200.77	1,726,552.58	39.80864121	-80.69328244	
2,700.00	3.00	247.00	2,699.73	-4.60	-10.84	14,457,198.72	1,726,547.78	39.80863564	-80.69329962	
2,800.00	3.00	247.00	2,799.59	-6.65	-15.66	14,457,196.68	1,726,542.94	39.80863007	-80.69331680	
2,900.00	3.00	247.00	2,899.45	-8.69	-20.48	14,457,194.63	1,726,538.12	39.80862450	-80.69333398	
3,000.00	3.00	247.00	2,999.31	-10.74	-25.29	14,457,192.59	1,726,533.31	39.80861893	-80.69335115	
3,100.00	3.00	247.00	3,099.18	-12.78	-30.11	14,457,190.54	1,726,528.49	39.80861336	-80.69336833	
3,200.00	3.00	247.00	3,199.04	-14.83	-34.93	14,457,188.50	1,726,523.67	39.80860778	-80.69338551	
3,300.00	3.00	247.00	3,298.90	-16.87	-39.75	14,457,186.45	1,726,518.85	39.80860221	-80.69340269	
3,400.00	3.00	247.00	3,398.77	-18.92	-44.58	14,457,184.41	1,726,514.04	39.80859664	-80.69341987	
3,500.00	3.00	247.00	3,498.63	-20.96	-49.38	14,457,182.36	1,726,509.22	39.80859107	-80.69343705	
3,600.00	3.00	247.00	3,598.49	-23.01	-54.20	14,457,180.32	1,726,504.40	39.80858550	-80.69345423	
3,700.00	3.00	247.00	3,698.36	-25.05	-59.02	14,457,178.27	1,726,499.58	39.80857993	-80.69347141	
3,800.00	3.00	247.00	3,798.22	-27.10	-63.83	14,457,176.23	1,726,494.77	39.80857436	-80.69348859	
3,900.00	3.00	247.00	3,898.08	-29.14	-68.65	14,457,174.18	1,726,489.95	39.80856879	-80.69350577	
4,000.00	3.00	247.00	3,997.94	-31.18	-73.47	14,457,172.14	1,726,485.13	39.80856322	-80.69352295	
4,100.00	3.00	247.00	4,097.81	-33.23	-78.29	14,457,170.09	1,726,480.31	39.80855765	-80.69354013	
4,200.00	3.00	247.00	4,197.67	-35.28	-83.10	14,457,168.05	1,726,475.50	39.80855208	-80.69355731	
4,300.00	3.00	247.00	4,297.53	-37.32	-87.92	14,457,166.00	1,726,470.68	39.80854651	-80.69357449	
4,400.00	3.00	247.00	4,397.40	-39.37	-92.74	14,457,163.96	1,726,465.86	39.80854094	-80.69359166	
4,500.00	3.00	247.00	4,497.26	-41.41	-97.56	14,457,161.91	1,726,461.04	39.80853537	-80.69360884	
4,600.00	3.00	247.00	4,597.12	-43.46	-102.37	14,457,159.87	1,726,456.23	39.80852980	-80.69362602	
4,700.00	3.00	247.00	4,696.99	-45.50	-107.19	14,457,157.82	1,726,451.41	39.80852423	-80.69364320	
4,800.00	3.00	247.00	4,796.85	-47.54	-112.01	14,457,155.78	1,726,446.59	39.80851866	-80.69366038	
4,900.00	3.00	247.00	4,896.71	-49.59	-116.83	14,457,153.73	1,726,441.77	39.80851308	-80.69367756	
5,000.00	3.00	247.00	4,996.57	-51.63	-121.64	14,457,151.69	1,726,436.95	39.80850751	-80.69369474	

Office of Oil and Gas

51-01969



Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1325.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,100.00	3.00	247.00	5,096.44	-53.68	-126.46	14,457,149.65	1,726,432.14	39.80650194	-80.69371192	
5,200.00	3.00	247.00	5,196.30	-55.72	-131.28	14,457,147.60	1,726,427.32	39.80849637	-80.69372910	
5,300.00	3.00	247.00	5,296.16	-57.77	-136.10	14,457,145.56	1,726,422.50	39.80849080	-80.69374628	
5,400.00	3.00	247.00	5,396.03	-59.81	-140.91	14,457,143.51	1,726,417.68	39.80848523	-80.69376346	
5,500.00	3.00	247.00	5,495.89	-61.86	-145.73	14,457,141.47	1,726,412.87	39.80847966	-80.69378064	
5,600.00	3.00	247.00	5,595.75	-63.90	-150.55	14,457,139.42	1,726,408.05	39.80847409	-80.69379782	
5,700.00	3.00	247.00	5,695.61	-65.95	-155.37	14,457,137.38	1,726,403.23	39.80846852	-80.69381500	
5,800.00	3.00	247.00	5,795.48	-67.99	-160.18	14,457,135.33	1,726,398.41	39.80846295	-80.69383217	
5,900.00	3.00	247.00	5,895.34	-70.04	-165.00	14,457,133.29	1,726,393.60	39.80845738	-80.69384935	
6,000.00	3.00	247.00	5,995.20	-72.08	-169.82	14,457,131.24	1,726,388.78	39.80845181	-80.69386653	
6,100.00	3.00	247.00	6,095.07	-74.13	-174.64	14,457,129.20	1,726,383.96	39.80844624	-80.69388371	
6,200.00	3.00	247.00	6,194.93	-76.17	-179.45	14,457,127.15	1,726,379.14	39.80844067	-80.69390089	
6,300.00	3.00	247.00	6,294.79	-78.22	-184.27	14,457,125.11	1,726,374.33	39.80843510	-80.69391807	
6,400.00	3.00	247.00	6,394.66	-80.26	-189.09	14,457,123.06	1,726,369.51	39.80842953	-80.69393525	
6,500.00	3.00	247.00	6,494.52	-82.31	-193.91	14,457,121.02	1,726,364.69	39.80842396	-80.69395243	
6,600.00	3.00	247.00	6,594.38	-84.35	-198.72	14,457,118.97	1,726,359.87	39.80841838	-80.69396961	
6,700.00	3.00	247.00	6,694.24	-86.40	-203.54	14,457,116.93	1,726,355.06	39.80841281	-80.69398679	
6,800.00	3.00	247.00	6,794.11	-88.44	-208.36	14,457,114.88	1,726,350.24	39.80840724	-80.69400397	
6,900.00	3.00	247.00	6,893.97	-90.49	-213.18	14,457,112.84	1,726,345.42	39.80840167	-80.69402115	
7,000.00	3.00	247.00	6,993.83	-92.53	-217.99	14,457,110.79	1,726,340.60	39.80839610	-80.69403833	
7,100.00	3.00	247.00	7,093.70	-94.58	-222.81	14,457,108.75	1,726,335.79	39.80839053	-80.69405550	
7,200.00	3.00	247.00	7,193.56	-96.62	-227.63	14,457,106.70	1,726,330.97	39.80838496	-80.69407268	
7,300.00	3.00	247.00	7,293.42	-98.67	-232.45	14,457,104.66	1,726,326.15	39.80837939	-80.69408986	
7,400.00	3.00	247.00	7,393.28	-100.71	-237.27	14,457,102.61	1,726,321.33	39.80837382	-80.69410704	
7,500.00	3.00	247.00	7,493.15	-102.76	-242.08	14,457,100.57	1,726,316.52	39.80836825	-80.69412422	
7,600.00	3.00	247.00	7,593.01	-104.80	-246.90	14,457,098.52	1,726,311.70	39.80836268	-80.69414140	
7,700.00	3.00	247.00	7,692.87	-106.85	-251.72	14,457,096.48	1,726,306.88	39.80835711	-80.69415858	
7,800.00	3.00	247.00	7,792.74	-108.89	-256.54	14,457,094.43	1,726,302.06	39.80835154	-80.69417576	
7,900.00	3.00	247.00	7,892.60	-110.94	-261.35	14,457,092.39	1,726,297.25	39.80834597	-80.69419294	
8,000.00	3.00	247.00	7,992.46	-112.98	-266.17	14,457,090.34	1,726,292.43	39.80834040	-80.69421012	
8,100.00	3.00	247.00	8,092.33	-115.03	-270.99	14,457,088.30	1,726,287.61	39.80833482	-80.69422730	
8,200.00	3.00	247.00	8,192.19	-117.07	-275.81	14,457,086.25	1,726,282.79	39.80832925	-80.69424448	
8,300.00	3.00	247.00	8,292.05	-119.12	-280.62	14,457,084.21	1,726,277.98	39.80832368	-80.69426165	
8,400.00	3.00	247.00	8,391.91	-121.16	-285.44	14,457,082.16	1,726,273.16	39.80831811	-80.69427883	
8,500.00	3.00	247.00	8,491.78	-123.21	-290.26	14,457,080.12	1,726,268.34	39.80831254	-80.69429601	
8,508.23	3.00	247.00	8,500.00	-123.38	-290.65	14,457,079.95	1,726,267.94	39.80831208	-80.69429743	
Begin 2°/100' build/turm										
8,600.00	4.81	242.30	8,591.55	-126.10	-296.27	14,457,077.22	1,726,262.33	39.80830465	-80.69431746	
8,700.00	6.80	240.03	8,691.03	-131.01	-305.11	14,457,072.32	1,726,253.49	39.80829126	-80.69434899	
8,800.00	8.79	238.79	8,790.10	-137.92	-316.77	14,457,065.40	1,726,241.83	39.80827238	-80.69439059	
8,899.98	10.78	238.00	8,888.62	-146.84	-331.24	14,457,056.49	1,726,227.36	39.80824803	-80.69444221	
Begin 10.78° tangent										
8,900.00	10.78	238.00	8,888.64	-146.84	-331.24	14,457,056.49	1,726,227.36	39.80824803	-80.69444223	
9,000.00	10.78	238.00	8,986.86	-156.75	-347.11	14,457,046.57	1,726,211.49	39.80822095	-80.69449885	
9,100.00	10.78	238.00	9,085.11	-166.67	-362.99	14,457,036.66	1,726,195.62	39.80819387	-80.69455547	
9,200.00	10.78	238.00	9,183.35	-176.58	-378.84	14,457,026.74	1,726,179.75	39.80816679	-80.69461210	
9,300.00	10.78	238.00	9,281.58	-186.50	-394.71	14,457,016.83	1,726,163.89	39.80813971	-80.69466872	
9,400.00	10.78	238.00	9,379.81	-196.41	-410.58	14,457,006.91	1,726,148.02	39.80811263	-80.69472534	
9,500.00	10.78	238.00	9,478.05	-206.33	-426.45	14,456,997.00	1,726,132.15	39.80808556	-80.69478197	
9,600.00	10.78	238.00	9,576.28	-216.24	-442.32	14,456,987.08	1,726,116.28	39.80805848	-80.69483859	
9,700.00	10.78	238.00	9,674.52	-226.15	-458.18	14,456,977.17	1,726,100.41	39.80803140	-80.69489521	
9,800.00	10.78	238.00	9,772.75	-236.07	-474.05	14,456,967.26	1,726,084.55	39.80800432	-80.69495184	
9,900.00	10.78	238.00	9,870.98	-245.98	-489.92	14,456,957.34	1,726,068.68	39.80797724	-80.69500846	
10,000.00	10.78	238.00	9,969.22	-255.90	-505.79	14,456,947.43	1,726,052.81	39.80795016	-80.69506508	

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Planning Report - Geographic

Database:	DB_Jul2218dt_v14	Local Co-ordinate Reference:	Wall Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,100.00	10.78	238.00	10,067.45	-265.81	-521.66	14,456,937.51	1,726,036.94	39.80792308	-80.69512171	
10,200.00	10.78	238.00	10,165.68	-275.73	-537.53	14,456,927.60	1,726,021.07	39.80789600	-80.69517833	
10,300.00	10.78	238.00	10,263.92	-285.64	-553.39	14,456,917.68	1,726,005.20	39.80786892	-80.69523495	
10,400.00	10.78	238.00	10,362.15	-295.56	-569.26	14,456,907.77	1,725,989.34	39.80784185	-80.69529158	
10,500.00	10.78	238.00	10,460.39	-305.47	-585.13	14,456,897.86	1,725,973.47	39.80781477	-80.69534820	
10,600.00	10.78	238.00	10,558.62	-315.38	-601.00	14,456,887.94	1,725,957.60	39.80778769	-80.69540482	
10,700.00	10.78	238.00	10,656.85	-325.30	-616.87	14,456,878.03	1,725,941.73	39.80776061	-80.69546145	
10,800.00	10.78	238.00	10,755.09	-335.21	-632.74	14,456,868.11	1,725,925.86	39.80773353	-80.69551807	
10,900.00	10.78	238.00	10,853.32	-345.13	-648.60	14,456,858.20	1,725,910.00	39.80770645	-80.69557469	
11,000.00	10.78	238.00	10,951.58	-355.04	-664.47	14,456,848.28	1,725,894.13	39.80767937	-80.69563132	
11,100.00	10.78	238.00	11,049.79	-364.96	-680.34	14,456,838.37	1,725,878.26	39.80765229	-80.69568794	
11,104.81	10.78	238.00	11,054.32	-365.41	-681.07	14,456,837.91	1,725,877.53	39.80765104	-80.69569055	
Begin 10°/100' build/turn										
11,200.00	14.58	196.86	11,147.55	-381.87	-692.15	14,456,821.65	1,725,866.45	39.80760650	-80.69573018	
11,300.00	22.51	177.16	11,242.37	-412.91	-694.86	14,456,790.41	1,725,863.74	39.80752073	-80.69574021	
11,400.00	31.59	167.84	11,331.38	-457.75	-688.37	14,456,745.58	1,725,870.22	39.80739754	-80.69571767	
11,500.00	41.07	162.43	11,411.86	-514.82	-672.90	14,456,688.51	1,725,885.70	39.80724067	-80.69566326	
11,600.00	50.72	158.77	11,481.39	-582.38	-648.90	14,456,620.94	1,725,909.70	39.80705489	-80.69557693	
11,700.00	60.46	156.00	11,537.83	-658.40	-617.11	14,456,544.93	1,725,941.49	39.80684584	-80.69548636	
11,800.00	70.25	153.73	11,579.49	-740.54	-578.49	14,456,482.78	1,725,980.10	39.80661988	-80.69532984	
11,900.00	80.06	151.72	11,605.08	-826.33	-534.22	14,456,376.99	1,726,024.38	39.80638388	-80.69517324	
11,991.05	89.00	150.00	11,613.76	-905.41	-490.13	14,456,297.92	1,726,068.47	39.80616630	-80.69501719	
Begin 89.00° lateral section										
12,000.00	89.00	150.00	11,613.91	-913.16	-485.65	14,456,290.17	1,726,072.95	39.80614498	-80.69500135	
12,100.00	89.00	150.00	11,615.66	-999.75	-435.66	14,456,203.58	1,726,122.94	39.80590671	-80.69482440	
12,200.00	89.00	150.00	11,617.40	-1,086.34	-385.67	14,456,116.99	1,726,172.93	39.80566845	-80.69464744	
12,300.00	89.00	150.00	11,619.15	-1,172.92	-335.67	14,456,030.40	1,726,222.92	39.80543019	-80.69447049	
12,400.00	89.00	150.00	11,620.89	-1,259.51	-285.68	14,455,943.81	1,726,272.92	39.80519192	-80.69429354	
12,500.00	89.00	150.00	11,622.64	-1,346.10	-235.69	14,455,857.22	1,726,322.91	39.80495366	-80.69411659	
12,600.00	89.00	150.00	11,624.38	-1,432.69	-185.70	14,455,770.63	1,726,372.90	39.80471539	-80.69393964	
12,700.00	89.00	150.00	11,626.13	-1,519.28	-135.71	14,455,684.04	1,726,422.89	39.80447713	-80.69376269	
12,800.00	89.00	150.00	11,627.87	-1,605.87	-85.71	14,455,597.45	1,726,472.89	39.80423886	-80.69358574	
12,900.00	89.00	150.00	11,629.62	-1,692.46	-35.72	14,455,510.86	1,726,522.88	39.80400059	-80.69340880	
13,000.00	89.00	150.00	11,631.37	-1,779.05	14.27	14,455,424.27	1,726,572.87	39.80376233	-80.69323185	
13,100.00	89.00	150.00	11,633.11	-1,865.64	64.26	14,455,337.69	1,726,622.86	39.80352406	-80.69305491	
13,200.00	89.00	150.00	11,634.86	-1,952.23	114.26	14,455,251.10	1,726,672.86	39.80328579	-80.69287797	
13,300.00	89.00	150.00	11,636.60	-2,038.82	164.25	14,455,164.51	1,726,722.85	39.80304753	-80.69270103	
13,400.00	89.00	150.00	11,638.35	-2,125.41	214.24	14,455,077.92	1,726,772.84	39.80280926	-80.69252409	
13,500.00	89.00	150.00	11,640.09	-2,212.00	264.23	14,454,991.33	1,726,822.83	39.80257099	-80.69234715	
13,600.00	89.00	150.00	11,641.84	-2,298.59	314.23	14,454,904.74	1,726,872.83	39.80233272	-80.69217021	
13,700.00	89.00	150.00	11,643.58	-2,385.18	364.22	14,454,818.15	1,726,922.82	39.80209446	-80.69199328	
13,800.00	89.00	150.00	11,645.33	-2,471.77	414.21	14,454,731.56	1,726,972.81	39.80185619	-80.69181634	
13,900.00	89.00	150.00	11,647.07	-2,558.35	464.20	14,454,644.97	1,727,022.80	39.80161792	-80.69163941	
14,000.00	89.00	150.00	11,648.82	-2,644.94	514.20	14,454,558.38	1,727,072.79	39.80137965	-80.69146248	
14,100.00	89.00	150.00	11,650.56	-2,731.53	564.19	14,454,471.79	1,727,122.79	39.80114138	-80.69128554	
14,200.00	89.00	150.00	11,652.31	-2,818.12	614.18	14,454,385.20	1,727,172.78	39.80090311	-80.69110861	
14,300.00	89.00	150.00	11,654.05	-2,904.71	664.17	14,454,298.61	1,727,222.77	39.80066484	-80.69093169	
14,400.00	89.00	150.00	11,655.80	-2,991.30	714.17	14,454,212.02	1,727,272.76	39.80042657	-80.69075476	
14,500.00	89.00	150.00	11,657.54	-3,077.89	764.16	14,454,125.43	1,727,322.76	39.80018830	-80.69057783	
14,600.00	89.00	150.00	11,659.29	-3,164.48	814.15	14,454,038.84	1,727,372.75	39.79995003	-80.69040091	
14,700.00	89.00	150.00	11,661.03	-3,251.07	864.14	14,453,952.26	1,727,422.74	39.79971176	-80.69022398	
14,800.00	89.00	150.00	11,662.78	-3,337.66	914.14	14,453,865.67	1,727,472.73	39.79947349	-80.69004708	
14,900.00	89.00	150.00	11,664.52	-3,424.25	964.13	14,453,779.08	1,727,522.73	39.79923522	-80.68987014	
15,000.00	89.00	150.00	11,666.27	-3,510.84	1,014.12	14,453,692.49	1,727,572.72	39.79899695	-80.68969322	

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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
15,100.00	89.00	150.00	11,668.02	-3,597.43	1,064.11	14,453,605.90	1,727,622.71	39.79875867	-80.68951630	
15,200.00	89.00	150.00	11,669.76	-3,684.02	1,114.10	14,453,519.31	1,727,672.70	39.79852040	-80.68933938	
15,300.00	89.00	150.00	11,671.51	-3,770.61	1,164.10	14,453,432.72	1,727,722.70	39.79828213	-80.68918247	
15,400.00	89.00	150.00	11,673.25	-3,857.19	1,214.09	14,453,346.13	1,727,772.69	39.79804386	-80.68898555	
15,500.00	89.00	150.00	11,675.00	-3,943.78	1,264.08	14,453,259.54	1,727,822.68	39.79780558	-80.68880864	
15,600.00	89.00	150.00	11,676.74	-4,030.37	1,314.07	14,453,172.95	1,727,872.67	39.79756731	-80.68863172	
15,700.00	89.00	150.00	11,678.49	-4,116.96	1,364.07	14,453,086.36	1,727,922.67	39.79732904	-80.68845481	
15,800.00	89.00	150.00	11,680.23	-4,203.55	1,414.06	14,452,999.77	1,727,972.66	39.79709076	-80.68827780	
15,900.00	89.00	150.00	11,681.98	-4,290.14	1,464.05	14,452,913.18	1,728,022.65	39.79685249	-80.68810099	
16,000.00	89.00	150.00	11,683.72	-4,376.73	1,514.04	14,452,826.59	1,728,072.64	39.79661421	-80.68792408	
16,100.00	89.00	150.00	11,685.47	-4,463.32	1,564.04	14,452,740.00	1,728,122.63	39.79637594	-80.68774718	
16,200.00	89.00	150.00	11,687.21	-4,549.91	1,614.03	14,452,653.42	1,728,172.63	39.79613766	-80.68757027	
16,300.00	89.00	150.00	11,688.96	-4,636.50	1,664.02	14,452,566.83	1,728,222.62	39.79589939	-80.68739337	
16,400.00	89.00	150.00	11,690.70	-4,723.09	1,714.01	14,452,480.24	1,728,272.61	39.79566111	-80.68721646	
16,500.00	89.00	150.00	11,692.45	-4,809.68	1,764.01	14,452,393.65	1,728,322.60	39.79542284	-80.68703956	
16,600.00	89.00	150.00	11,694.19	-4,896.27	1,814.00	14,452,307.06	1,728,372.60	39.79518456	-80.68686266	
16,700.00	89.00	150.00	11,695.94	-4,982.86	1,863.99	14,452,220.47	1,728,422.59	39.79494629	-80.68668576	
16,800.00	89.00	150.00	11,697.68	-5,069.45	1,913.98	14,452,133.86	1,728,472.58	39.79470801	-80.68650886	
16,900.00	89.00	150.00	11,699.43	-5,156.04	1,963.98	14,452,047.29	1,728,522.57	39.79446973	-80.68633197	
17,000.00	89.00	150.00	11,701.17	-5,242.62	2,013.97	14,451,960.70	1,728,572.57	39.79423145	-80.68615507	
17,100.00	89.00	150.00	11,702.92	-5,329.21	2,063.96	14,451,874.11	1,728,622.56	39.79399318	-80.68597818	
17,200.00	89.00	150.00	11,704.67	-5,415.80	2,113.95	14,451,787.52	1,728,672.55	39.79375490	-80.68580128	
17,300.00	89.00	150.00	11,706.41	-5,502.39	2,163.94	14,451,700.93	1,728,722.54	39.79351662	-80.68562439	
17,400.00	89.00	150.00	11,708.16	-5,588.98	2,213.94	14,451,614.34	1,728,772.54	39.79327834	-80.68544750	
17,500.00	89.00	150.00	11,709.90	-5,675.57	2,263.93	14,451,527.75	1,728,822.53	39.79304006	-80.68527061	
17,600.00	89.00	150.00	11,711.65	-5,762.16	2,313.92	14,451,441.16	1,728,872.52	39.79280179	-80.68509372	
17,700.00	89.00	150.00	11,713.39	-5,848.75	2,363.91	14,451,354.57	1,728,922.51	39.79256351	-80.68491683	
17,800.00	89.00	150.00	11,715.14	-5,935.34	2,413.91	14,451,267.99	1,728,972.51	39.79232523	-80.68473995	
17,900.00	89.00	150.00	11,716.88	-6,021.93	2,463.90	14,451,181.40	1,729,022.50	39.79208695	-80.68456306	
18,000.00	89.00	150.00	11,718.63	-6,108.52	2,513.89	14,451,094.81	1,729,072.49	39.79184867	-80.68438618	
18,100.00	89.00	150.00	11,720.37	-6,195.11	2,563.88	14,451,008.22	1,729,122.48	39.79161039	-80.68420930	
18,200.00	89.00	150.00	11,722.12	-6,281.70	2,613.88	14,450,921.63	1,729,172.47	39.79137211	-80.68403241	
18,300.00	89.00	150.00	11,723.86	-6,368.29	2,663.87	14,450,835.04	1,729,222.47	39.79113383	-80.68385553	
18,400.00	89.00	150.00	11,725.61	-6,454.88	2,713.86	14,450,748.45	1,729,272.46	39.79089555	-80.68367866	
18,500.00	89.00	150.00	11,727.35	-6,541.46	2,763.85	14,450,661.86	1,729,322.45	39.79065726	-80.68350178	
18,600.00	89.00	150.00	11,729.10	-6,628.05	2,813.85	14,450,575.27	1,729,372.44	39.79041898	-80.68332489	
18,700.00	89.00	150.00	11,730.84	-6,714.64	2,863.84	14,450,488.68	1,729,422.44	39.79018070	-80.68314803	
18,800.00	89.00	150.00	11,732.59	-6,801.23	2,913.83	14,450,402.09	1,729,472.43	39.78994242	-80.68297115	
18,900.00	89.00	150.00	11,734.33	-6,887.82	2,963.82	14,450,315.50	1,729,522.42	39.78970414	-80.68279428	
19,000.00	89.00	150.00	11,736.08	-6,974.41	3,013.82	14,450,228.91	1,729,572.41	39.78946585	-80.68261741	
19,100.00	89.00	150.00	11,737.82	-7,061.00	3,063.81	14,450,142.32	1,729,622.41	39.78922757	-80.68244054	
19,200.00	89.00	150.00	11,739.57	-7,147.59	3,113.80	14,450,055.73	1,729,672.40	39.78898929	-80.68226367	
19,300.00	89.00	150.00	11,741.32	-7,234.18	3,163.79	14,449,969.15	1,729,722.39	39.78875101	-80.68208680	
19,400.00	89.00	150.00	11,743.06	-7,320.77	3,213.78	14,449,882.56	1,729,772.38	39.78851272	-80.68190993	
19,500.00	89.00	150.00	11,744.81	-7,407.36	3,263.78	14,449,795.97	1,729,822.38	39.78827444	-80.68173307	
19,600.00	89.00	150.00	11,746.55	-7,493.95	3,313.77	14,449,709.38	1,729,872.37	39.78803615	-80.68155620	
19,700.00	89.00	150.00	11,748.30	-7,580.54	3,363.76	14,449,622.79	1,729,922.36	39.78779787	-80.68137934	
19,800.00	89.00	150.00	11,750.04	-7,667.13	3,413.75	14,449,536.20	1,729,972.35	39.78755958	-80.68120248	
19,900.00	89.00	150.00	11,751.79	-7,753.72	3,463.75	14,449,449.61	1,730,022.35	39.78732130	-80.68102562	
20,000.00	89.00	150.00	11,753.53	-7,840.30	3,513.74	14,449,363.02	1,730,072.34	39.78708301	-80.68084876	
20,100.00	89.00	150.00	11,755.28	-7,926.89	3,563.73	14,449,276.43	1,730,122.33	39.78684473	-80.68067190	
20,200.00	89.00	150.00	11,757.02	-8,013.48	3,613.72	14,449,189.84	1,730,172.32	39.78660644	-80.68049504	
20,300.00	89.00	150.00	11,758.77	-8,100.07	3,663.72	14,449,103.25	1,730,222.32	39.78636815	-80.68031819	
20,400.00	89.00	150.00	11,760.51	-8,186.66	3,713.71	14,449,016.66	1,730,272.31	39.78612987	-80.68014133	
20,500.00	89.00	150.00	11,762.26	-8,273.25	3,763.70	14,448,930.07	1,730,322.31	39.78589158	-80.67996448	

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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
20,600.00	89.00	150.00	11,764.00	-8,359.84	3,813.69	14,448,843.48	1,730,372.29	39.78565329	-80.67978763	
20,700.00	89.00	150.00	11,765.75	-8,446.43	3,863.69	14,448,756.89	1,730,422.28	39.78541501	-80.67961078	
20,800.00	89.00	150.00	11,767.49	-8,533.02	3,913.68	14,448,670.30	1,730,472.28	39.78517672	-80.67943393	
20,900.00	89.00	150.00	11,769.24	-8,619.61	3,963.67	14,448,583.72	1,730,522.27	39.78493643	-80.67925708	
21,000.00	89.00	150.00	11,770.98	-8,706.20	4,013.66	14,448,497.13	1,730,572.26	39.78470014	-80.67908023	
21,100.00	89.00	150.00	11,772.73	-8,792.79	4,063.66	14,448,410.54	1,730,622.25	39.78446185	-80.67890339	
21,200.00	89.00	150.00	11,774.47	-8,879.38	4,113.65	14,448,323.95	1,730,672.25	39.78422356	-80.67872654	
21,300.00	89.00	150.00	11,776.22	-8,965.97	4,163.64	14,448,237.36	1,730,722.24	39.78398528	-80.67854970	
21,400.00	89.00	150.00	11,777.97	-9,052.56	4,213.63	14,448,150.77	1,730,772.23	39.78374699	-80.67837286	
21,500.00	89.00	150.00	11,779.71	-9,139.15	4,263.62	14,448,064.18	1,730,822.22	39.78350870	-80.67819601	
21,600.00	89.00	150.00	11,781.46	-9,225.73	4,313.62	14,447,977.59	1,730,872.22	39.78327041	-80.67801917	
21,700.00	89.00	150.00	11,783.20	-9,312.32	4,363.61	14,447,891.00	1,730,922.21	39.78303212	-80.67784234	
21,800.00	89.00	150.00	11,784.95	-9,398.91	4,413.60	14,447,804.41	1,730,972.20	39.78279383	-80.67766550	
21,900.00	89.00	150.00	11,786.69	-9,485.50	4,463.59	14,447,717.82	1,731,022.19	39.78255554	-80.67748866	
22,000.00	89.00	150.00	11,788.44	-9,572.09	4,513.59	14,447,631.23	1,731,072.19	39.78231725	-80.67731183	
22,100.00	89.00	150.00	11,790.18	-9,658.68	4,563.58	14,447,544.64	1,731,122.18	39.78207895	-80.67713499	
22,200.00	89.00	150.00	11,791.93	-9,745.27	4,613.57	14,447,458.05	1,731,172.17	39.78184066	-80.67695816	
22,300.00	89.00	150.00	11,793.67	-9,831.86	4,663.56	14,447,371.46	1,731,222.16	39.78160237	-80.67678133	
22,400.00	89.00	150.00	11,795.42	-9,918.45	4,713.56	14,447,284.88	1,731,272.16	39.78136408	-80.67660450	
22,500.00	89.00	150.00	11,797.16	-10,005.04	4,763.55	14,447,198.29	1,731,322.15	39.78112579	-80.67642767	
22,600.00	89.00	150.00	11,798.91	-10,091.63	4,813.54	14,447,111.70	1,731,372.14	39.78088749	-80.67625084	
22,700.00	89.00	150.00	11,800.65	-10,178.22	4,863.53	14,447,025.11	1,731,422.13	39.78064920	-80.67607402	
22,800.00	89.00	150.00	11,802.40	-10,264.81	4,913.53	14,446,938.52	1,731,472.12	39.78041091	-80.67589719	
22,900.00	89.00	150.00	11,804.14	-10,351.40	4,963.52	14,446,851.93	1,731,522.12	39.78017261	-80.67572037	
23,000.00	89.00	150.00	11,805.89	-10,437.99	5,013.51	14,446,765.34	1,731,572.11	39.77993432	-80.67554354	
23,100.00	89.00	150.00	11,807.63	-10,524.57	5,063.50	14,446,678.75	1,731,622.10	39.77969603	-80.67536672	
23,200.00	89.00	150.00	11,809.38	-10,611.16	5,113.50	14,446,592.16	1,731,672.09	39.77945773	-80.67518990	
23,300.00	89.00	150.00	11,811.12	-10,697.75	5,163.49	14,446,505.57	1,731,722.09	39.77921944	-80.67501308	
23,400.00	89.00	150.00	11,812.87	-10,784.34	5,213.48	14,446,418.98	1,731,772.08	39.77898114	-80.67483626	
23,500.00	89.00	150.00	11,814.62	-10,870.93	5,263.47	14,446,332.39	1,731,822.07	39.77874285	-80.67465945	
23,600.00	89.00	150.00	11,816.36	-10,957.52	5,313.46	14,446,245.80	1,731,872.06	39.77850455	-80.67448263	
23,700.00	89.00	150.00	11,818.11	-11,044.11	5,363.46	14,446,159.21	1,731,922.06	39.77826626	-80.67430582	
23,800.00	89.00	150.00	11,819.85	-11,130.70	5,413.45	14,446,072.62	1,731,972.05	39.77802796	-80.67412900	
23,808.54	89.00	150.00	11,820.00	-11,138.10	5,417.72	14,446,065.23	1,731,976.32	39.77800761	-80.67411390	
PBHL/TD										
23,808.55	89.00	150.00	11,820.00	-11,138.10	5,417.72	14,446,065.22	1,731,976.32	39.77800759	-80.67411369	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Heaven Hill 3-7 HU LP - hit/miss target - Shape - Point	0.00	0.01	11,802.00	-359.33	-805.56	14,456,844.00	1,725,753.04	39.80766891	-80.69613375	
- plan misses target center by 279.15usft at 11500.00usft MD (11411.86 TVD, -514.82 N, -672.90 E)										
Heaven Hill 3-7 HU BHL - plan hits target center - Point	0.00	0.00	11,820.00	-11,138.10	5,417.72	14,446,065.22	1,731,976.32	39.77800759	-80.67411369	

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Planning Report - Geographic

Database:	DB_Jul2216dt_v14	Local Co-ordinate Reference:	Well Heaven Hill 3-7 HU
Company:	Tug Hill Operating LLC	TVD Reference:	RKB=1326 @ 1326.00usft
Project:	Marshall County, West Virginia	MD Reference:	RKB=1326 @ 1326.00usft
Site:	Heaven Hill 3	North Reference:	Grid
Well:	Heaven Hill 3-7 HU	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev3		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
120.00	120.00	30" Casing @ 120 TVD	30	36	
1,185.00	1,185.00	20" Casing @ 1185 TVD	20	24	
2,800.41	2,800.00	13 3/8" Casing @ 2800 TVD	13-3/8	17	
10,438.53	10,400.00	9 5/8" Casing @ 10400 TVD	9-5/8	12-1/4	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N-S (usft)	+E-W (usft)		
2,400.00	2,400.00	0.00	0.00	KOP Begin 2°/100' build	
2,550.00	2,549.93	-1.53	-3.61	Begin 3.00° tangent	
8,508.23	8,500.00	-123.38	-290.65	Begin 2°/100' build/turn	
8,869.98	8,888.62	-146.84	-331.24	Begin 10.78° tangent	
11,104.61	11,054.32	-365.41	-681.07	Begin 10°/100' build/turn	
11,991.05	11,613.76	-905.41	-490.13	Begin 89.00° lateral section	
23,808.54	11,820.00	-11,138.10	5,417.72	PBHL/TD	

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WW-9
(4/16)

API Number 47 - 051 - 01969
Operator's Well No. Heaven Hill 3-7HU

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

Watershed (HUIC 10) Fish Creek Quadrangle Glen Easton 7.5'

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

Will a pit be used? Yes No

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

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

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number UIC 2459, UIC 985, UIC 359, UIC 2D0732540, UIC 2D0732523)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain _____)

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / W/0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1380426)

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

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

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

Company Official Signature _____

Company Official (Typed Name) Sean Gasser

Company Official Title Engineer

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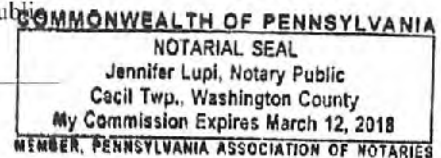
WV Department of
Environmental Protection

Subscribed and sworn before me this 8th day of June, 2017

Jennifer Lupi

Notary Public

My commission expires March 12, 2018



51-01969

Form WW-9

Operator's Well No. Heaven Hill 3-7HU

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 18.43 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

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

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by:

Jan [Signature]

Comments:

Title: Oil & Gas Inspector

Date: 8/31/17

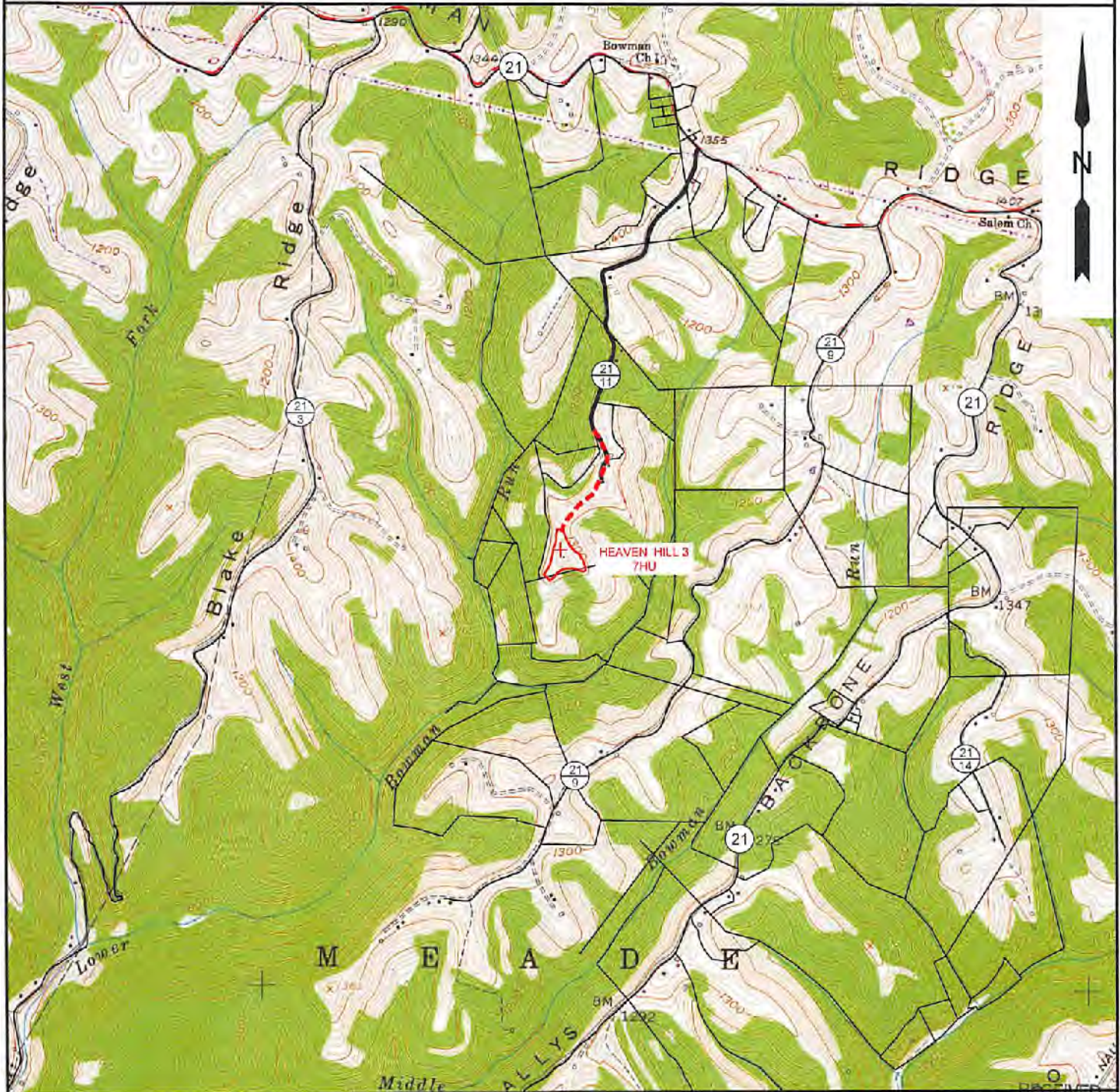
Field Reviewed? Yes No

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Environmental Protection

PROPOSED HEAVEN HILL 3 - 7HU



NOTE: CLOSEST WATER PURVEYOR
GRANDVIEW - DOOLIN PUBLIC SERVICE DISTRICT
PROCTOR, WV

LAT: 39.7137712
LON: -80.8258327
LOCATED: S 47°57'55" W AT 50.802' FROM HEAVEN HILL 3 - 7HU SURFACE LOCATION

Office of Oil and Gas

SEP - 6 2017

SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 160 • 12 Vanham Drive • Glenville, WV 26351 • (304) 462-5834
www.slsurveys.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	8654	08/25/2017	1" = 2000'

WV Department of Environmental Protection
TUG HILL OPERATING

51-01969



Well Site Safety Plan

Tug Hill Operating, LLC

Jac
1/26/18

Well Name: Heaven Hill 3-7HU

Pad Location: Heaven Hill Unit 3
Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

NORTHING -4,406,564.39

EASTING -526,256.11

January 2018

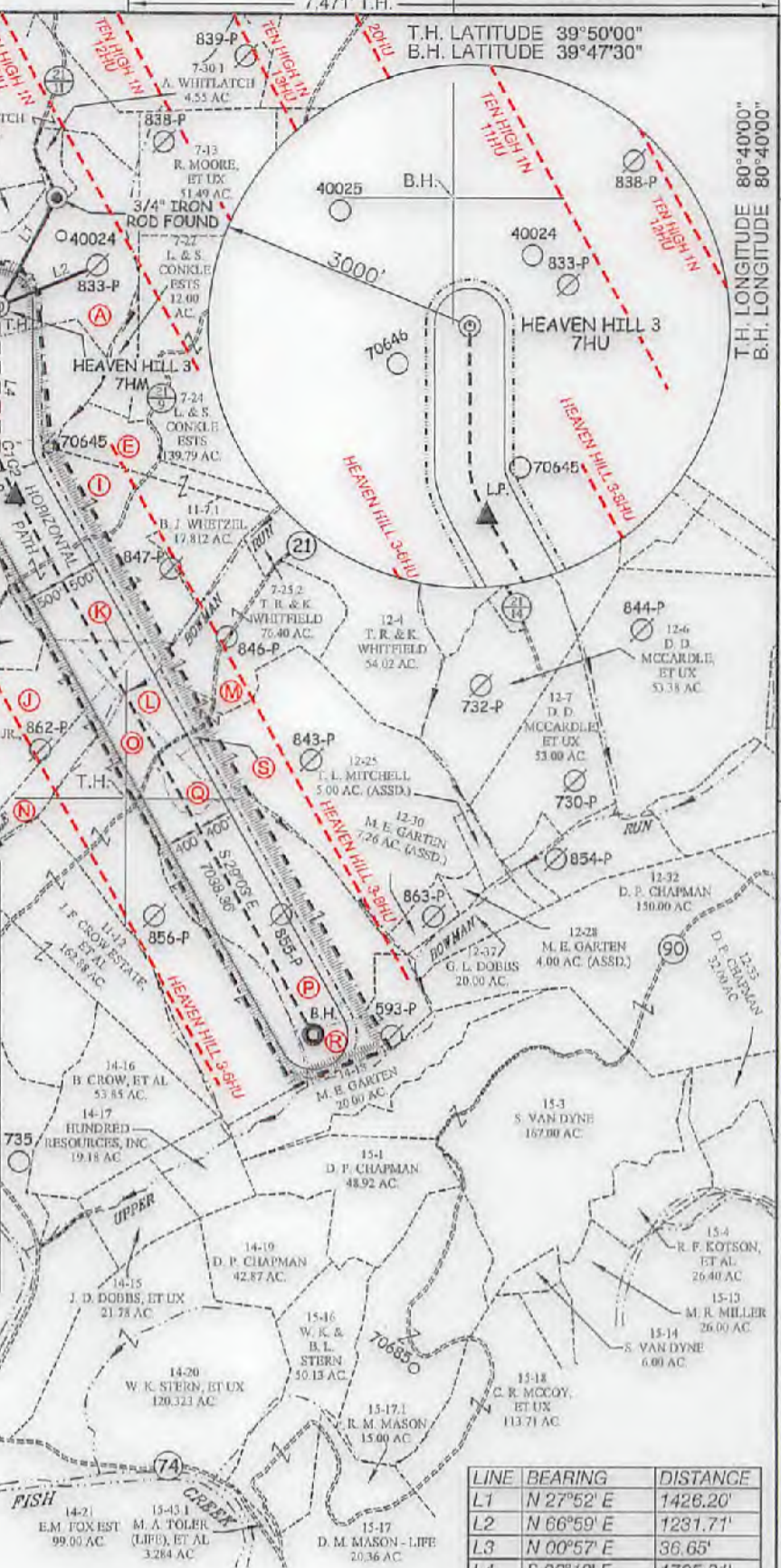
**HEAVEN HILL 3 LEASE
UTICA UNIT - 265.71 AC±
WELL 7HU
TUG HILL OPERATING**

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

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°40'00"

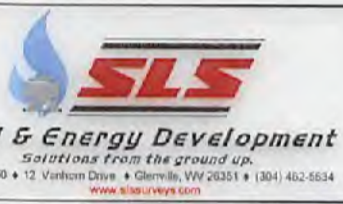
NAD'83 GRID NORTH

TAG	SURFACE OWNER	PARCEL	ACRES
A	RICKY L. WHITLATCH	9-7-30	72.82
B	RICKY L. WHITLATCH	9-7-31	16.53
C	KEVIN E. MCGILTON	9-7-18	14.00
D	RICKY L. WHITLATCH	9-7-21	42.22
E	LARRY J. WHITZEL, ET UX	9-7-23	36.00
F	KEVIN E. MCGILTON	9-7-20	13.39
G	KEVIN E. MCGILTON	9-7-19	23.00
H	BRENDA J. WHITZEL - LIFE	9-11-6-1	30.24
I	BRENDA J. WHITZEL - LIFE	9-11-7	82.858
J	MICHAEL A. WHITZEL	9-11-9	92.00
K	GERALD W. QUIGLEY, ET AL.	9-12-27	1.00 (ASSD)
L	GERALD W. QUIGLEY, ET AL.	9-12-2	139.79
M	WNEK FAMILY IRREVOCABLE TRUST	9-11-8	50.10
N	ROBERT L. CLARK	9-11-10	18.00
O	KENNETH M. & DELORES MCCARDLE LIVING TRUST	9-11-11	109.95
P	KENNETH M. & DELORES MCCARDLE LIVING TRUST	9-12-1	92.455
Q	KENNETH M. & DELORES MCCARDLE	9-12-1-1	7.54
R	HARMON & MARY CROW	9-11-51	20.00
S	LESLIE E. QUIGLEY	9-12-2-1	2.58



LINE	BEARING	DISTANCE
L1	N 27°52' E	1426.20'
L2	N 66°59' E	1231.71'
L3	N 00°57' E	36.65'
L4	S 00°12' E	1705.81'

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	236.17'	786.80'	17°11'54"	S 15°23' E	235.29'
C2	302.35'	2538.63'	6°49'26"	S 25°48' E	302.17'



P.S. 677
Gregory A. Smith

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

NAD'83 S.P.C.(FT)	N. 478,877.13	E. 1,633,269.15
NAD'83 GEO.	LAT-(N) 39.808648	LONG-(W) 80.693261
NAD'83 UTM (M)	N. 4,408,564.39	E. 526,266.11

LANDING POINT

NAD'83 S.P.C.(FT)	N. 475,799.1	E. 1,633,469.6
NAD'83 GEO.	LAT-(N) 39.802704	LONG-(W) 80.692445
NAD'83 UTM (M)	N. 4,405,904.9	E. 526,326.2

BOTTOM HOLE

NAD'83 S.P.C.(FT)	N. 470,055.7	E. 1,636,906.4
NAD'83 GEO.	LAT-(N) 39.785936	LONG-(W) 80.679967
NAD'83 UTM (M)	N. 4,404,047.6	E. 527,400.5



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

LEGEND

- UNIT BOUNDARY
- LEASED TRACTS INSIDE UNIT BOUNDARY
- SURFACE LINE
- PROPOSED UTICA
- WELL LATERAL
- 400' OFFSET LINE
- 500' OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- SURFACE OWNER (SEE TABLE)
- LEASE # (SEE PGS. 1 & 3)

SCALE 1" = 2000' FILE NO. 8664P7HUR3.dwg

DATE AUGUST 25, 20 17

REVISED 10-9-2017, 1-25-2018 & 1-29-2018

OPERATORS WELL NO. HEAVEN HILL 3-7HU

API WELL NO. 47 - 051 - 01969H6A

NO. STATE COUNTY PERMIT

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

WELL OPERATOR TUG HILL OPERATING, LLC ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 FORT WORTH, TX 76107

DESIGNATED AGENT DIANNA STAMPER CT CORPORATION SYSTEM ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313

COUNTY NAME PERMIT

**HEAVEN HILL 3 LEASE
UTICA UNIT - 265.71 AC±
WELL 7HU
TUG HILL OPERATING**

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

T.H. LONGITUDE 80°40'00"
B.H. LONGITUDE 80°40'00"

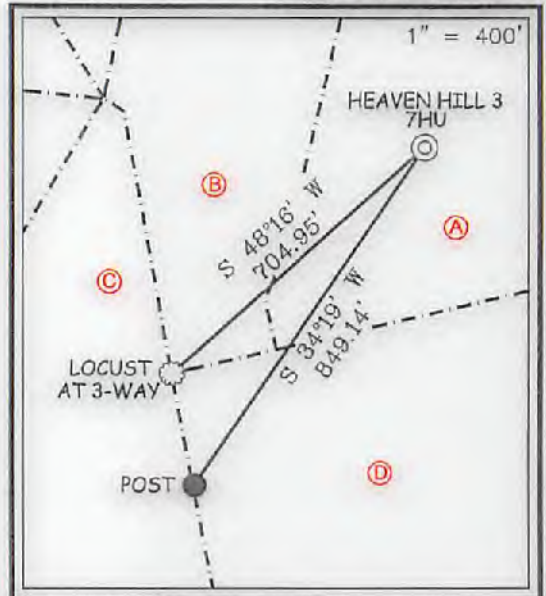
8,992' T.H.

No.	Lease Name or No.	Ty	Parcel	Oil & Gas Royalty Owners	Deed Book/Page
1	10*1557	A	5-7-18	RICKY WHITLATCH ET AL	780 226
2	10*1557	B	5-7-18	RICKY WHITLATCH ET AL	780 226
3	10*1557	C	5-7-18	RICKY WHITLATCH ET AL	780 226
4	10*1557	D	5-7-18	RICKY WHITLATCH ET AL	780 226
5	10*1557	E	5-7-18	RICKY WHITLATCH ET AL	780 226
6	10*1557	F	5-7-18	RICKY WHITLATCH ET AL	780 226
7	10*1557	G	5-7-18	RICKY WHITLATCH ET AL	780 226
8	10*1557	H	5-7-18	RICKY WHITLATCH ET AL	780 226
9	10*1557	I	5-7-18	RICKY WHITLATCH ET AL	780 226
10	10*1557	J	5-7-18	RICKY WHITLATCH ET AL	780 226
11	10*1557	K	5-7-18	RICKY WHITLATCH ET AL	780 226
12	10*1557	L	5-7-18	RICKY WHITLATCH ET AL	780 226
13	10*1557	M	5-7-18	RICKY WHITLATCH ET AL	780 226
14	10*1557	N	5-7-18	RICKY WHITLATCH ET AL	780 226
15	10*1557	O	5-7-18	RICKY WHITLATCH ET AL	780 226
16	10*1557	P	5-7-18	RICKY WHITLATCH ET AL	780 226
17	10*1557	Q	5-7-18	RICKY WHITLATCH ET AL	780 226
18	10*1557	R	5-7-18	RICKY WHITLATCH ET AL	780 226
19	10*1557	S	5-7-18	RICKY WHITLATCH ET AL	780 226
20	10*1557	T	5-7-18	RICKY WHITLATCH ET AL	780 226
21	10*1557	U	5-7-18	RICKY WHITLATCH ET AL	780 226
22	10*1557	V	5-7-18	RICKY WHITLATCH ET AL	780 226
23	10*1557	W	5-7-18	RICKY WHITLATCH ET AL	780 226
24	10*1557	X	5-7-18	RICKY WHITLATCH ET AL	780 226
25	10*1557	Y	5-7-18	RICKY WHITLATCH ET AL	780 226
26	10*1557	Z	5-7-18	RICKY WHITLATCH ET AL	780 226
27	10*1557	AA	5-7-18	RICKY WHITLATCH ET AL	780 226
28	10*1557	AB	5-7-18	RICKY WHITLATCH ET AL	780 226
29	10*1557	AC	5-7-18	RICKY WHITLATCH ET AL	780 226
30	10*1557	AD	5-7-18	RICKY WHITLATCH ET AL	780 226
31	10*1557	AE	5-7-18	RICKY WHITLATCH ET AL	780 226
32	10*1557	AF	5-7-18	RICKY WHITLATCH ET AL	780 226
33	10*1557	AG	5-7-18	RICKY WHITLATCH ET AL	780 226
34	10*1557	AH	5-7-18	RICKY WHITLATCH ET AL	780 226
35	10*1557	AI	5-7-18	RICKY WHITLATCH ET AL	780 226
36	10*1557	AJ	5-7-18	RICKY WHITLATCH ET AL	780 226
37	10*1557	AK	5-7-18	RICKY WHITLATCH ET AL	780 226
38	10*1557	AL	5-7-18	RICKY WHITLATCH ET AL	780 226
39	10*1557	AM	5-7-18	RICKY WHITLATCH ET AL	780 226
40	10*1557	AN	5-7-18	RICKY WHITLATCH ET AL	780 226
41	10*1557	AO	5-7-18	RICKY WHITLATCH ET AL	780 226
42	10*1557	AP	5-7-18	RICKY WHITLATCH ET AL	780 226
43	10*1557	AQ	5-7-18	RICKY WHITLATCH ET AL	780 226
44	10*1557	AR	5-7-18	RICKY WHITLATCH ET AL	780 226
45	10*1557	AS	5-7-18	RICKY WHITLATCH ET AL	780 226
46	10*1557	AT	5-7-18	RICKY WHITLATCH ET AL	780 226
47	10*1557	AU	5-7-18	RICKY WHITLATCH ET AL	780 226
48	10*1557	AV	5-7-18	RICKY WHITLATCH ET AL	780 226
49	10*1557	AW	5-7-18	RICKY WHITLATCH ET AL	780 226
50	10*1557	AX	5-7-18	RICKY WHITLATCH ET AL	780 226
51	10*1557	AY	5-7-18	RICKY WHITLATCH ET AL	780 226
52	10*1557	AZ	5-7-18	RICKY WHITLATCH ET AL	780 226
53	10*1557	BA	5-7-18	RICKY WHITLATCH ET AL	780 226
54	10*1557	BB	5-7-18	RICKY WHITLATCH ET AL	780 226
55	10*1557	BC	5-7-18	RICKY WHITLATCH ET AL	780 226
56	10*1557	BD	5-7-18	RICKY WHITLATCH ET AL	780 226
57	10*1557	BE	5-7-18	RICKY WHITLATCH ET AL	780 226
58	10*1557	BF	5-7-18	RICKY WHITLATCH ET AL	780 226
59	10*1557	BG	5-7-18	RICKY WHITLATCH ET AL	780 226
60	10*1557	BH	5-7-18	RICKY WHITLATCH ET AL	780 226
61	10*1557	BI	5-7-18	RICKY WHITLATCH ET AL	780 226
62	10*1557	BJ	5-7-18	RICKY WHITLATCH ET AL	780 226
63	10*1557	BK	5-7-18	RICKY WHITLATCH ET AL	780 226
64	10*1557	BL	5-7-18	RICKY WHITLATCH ET AL	780 226
65	10*1557	BM	5-7-18	RICKY WHITLATCH ET AL	780 226
66	10*1557	BN	5-7-18	RICKY WHITLATCH ET AL	780 226
67	10*1557	BO	5-7-18	RICKY WHITLATCH ET AL	780 226
68	10*1557	BP	5-7-18	RICKY WHITLATCH ET AL	780 226
69	10*1557	BQ	5-7-18	RICKY WHITLATCH ET AL	780 226
70	10*1557	BR	5-7-18	RICKY WHITLATCH ET AL	780 226
71	10*1557	BS	5-7-18	RICKY WHITLATCH ET AL	780 226
72	10*1557	BT	5-7-18	RICKY WHITLATCH ET AL	780 226
73	10*1557	BU	5-7-18	RICKY WHITLATCH ET AL	780 226
74	10*1557	BV	5-7-18	RICKY WHITLATCH ET AL	780 226
75	10*1557	BW	5-7-18	RICKY WHITLATCH ET AL	780 226
76	10*1557	BX	5-7-18	RICKY WHITLATCH ET AL	780 226
77	10*1557	BY	5-7-18	RICKY WHITLATCH ET AL	780 226
78	10*1557	BZ	5-7-18	RICKY WHITLATCH ET AL	780 226
79	10*1557	CA	5-7-18	RICKY WHITLATCH ET AL	780 226
80	10*1557	CB	5-7-18	RICKY WHITLATCH ET AL	780 226

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
 NAD'83 S.P.C.(FT) N. 478,877.13 E. 1,633,289.15
 NAD'83 GEO. LAT-(N) 39.806648 LONG-(W) 80.693261
 NAD'83 UTM (M) N. 4,406,584.39 E. 526,256.11
LANDING POINT
 NAD'83 S.P.C.(FT) N. 476,700.1 E. 1,633,489.6
 NAD'83 GEO. LAT-(N) 39.802704 LONG-(W) 80.692445
 NAD'83 UTM (M) N. 4,405,904.9 E. 526,328.2
BOTTOM HOLE
 NAD'83 S.P.C.(FT) N. 470,055.7 E. 1,636,906.4
 NAD'83 GEO. LAT-(N) 39.785936 LONG-(W) 80.679997
 NAD'83 UTM (M) N. 4,404,047.6 E. 527,400.5

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 AUGUST 25, OCTOBER 9, 20 17
 REVISED 10-9-2017, 1-25-2018 & 1-29-2018
 OPERATORS WELL NO. HEAVEN HILL 3-7HU
 API WELL NO. 47-051-01969H6A
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8654P7HUR3.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: GROUND = 1,340.10' 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 PAGES 1 & 3 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 POINT PLEASANT
 ESTIMATED DEPTH TVD: 11,829' / TMD: 19,282'

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

COUNTY NAME PERMIT

**HEAVEN HILL 3 LEASE
UTICA UNIT - 265.71 AC ±
WELL 7HU
TUG HILL OPERATING**



No.	Lease Name or Map	Tag	Parcel	Oil & Gas Royalty Owner - Continued	Deed Book/Page
81	10*42051.256.8	I	9-11-7	MICHAEL DAVID PILES AND CYNTHIA A PILES	809 209
82	10*42051.256.8	I	9-11-7	PAMLA ANN MASON	805 31
83	10*42051.256.23	I	9-11-7	ROBERT L BONAR	513 555
84	10*42051.256.32	I	9-11-7	STEVEN A BOHRER	505 39
85	10*42051.256.9	I	9-11-7	JOHNNY BONAR AND TAMIA S BONAR	575 575
86	10*42051.256.9	I	9-11-7	WARDIA MASON SUNSHINE	505 33
87	10*42051.256.15	I	9-11-7	WILLIAM W CRAIG AND GLENDA I CRAIG	505 41
88	10*42051.256.15	J	9-11-9	MICHAEL A WITZEL	885 51
89	10*42051.256.15	K	9-11-7	SUSAN MARIE JOHNSON AKA SUSAN MARIE HUBER	874 614
90	10*42051.256.23	K	9-11-7	LESLIE E CHURLEY	505 8
91	10*42051.256.23	K	9-11-7	LEWIS M CHURLEY AND MAXINE V CHURLEY	507 217
92	10*42051.256.23	L	9-11-7	LESLIE E CHURLEY	505 12
93	10*42051.256.23	L	9-11-7	LEWIS M CHURLEY AND MAXINE V CHURLEY	507 217
94	10*42051.256.23	L	9-11-7	SUSAN MARIE JOHNSON AKA SUSAN MARIE HUBER	874 614
95	10*42051.256.23	M	9-11-8	ALEX RUSSELL AND JOYCE A CAMPBELL	808 248
96	10*42051.256.23	M	9-11-8	ALICE GORBY MARTIN	808 52
97	10*42051.256.23	M	9-11-8	ANDREW W ORTE	808 28
98	10*42051.256.23	M	9-11-8	ANITA MARIE JACKSON	808 251
99	10*42051.256.23	M	9-11-8	SARAH A BIZZARD	808 28
100	10*42051.256.23	M	9-11-8	BETHA EMBLEY	808 64
101	10*42051.256.23	M	9-11-8	PETTY HOUSTEN AND WILLIAM KEITH STERN	808 64
102	10*42051.256.23	M	9-11-8	BRYEN AUST STORTS	821 808
103	10*42051.256.23	M	9-11-8	BRITNEY RICHARDSON	821 376
104	10*42051.256.23	M	9-11-8	BRITNEY RICHARDSON	808 57
105	10*42051.256.23	M	9-11-8	CHARLES A RINE	908 274
106	10*42051.256.23	M	9-11-8	CHARLES F AND DAIN PYLE	908 266
107	10*42051.256.23	M	9-11-8	CHRISTOPHER TRACY	927 425
108	10*42051.256.23	M	9-11-8	CHRIS COOPER AND TAMMY RICHARDSON	921 465
109	10*42051.256.23	M	9-11-8	CINDY LAMBERG	921 577
110	10*42051.256.23	M	9-11-8	CYNTHIA HICSON	908 219
111	10*42051.256.23	M	9-11-8	DAVID H WILSON	921 474
112	10*42051.256.23	M	9-11-8	DAVID W WILSON	907 649
113	10*42051.256.23	M	9-11-8	DAVID BULLER AND SUSAN STORTS BULLER	931 513
114	10*42051.256.23	M	9-11-8	DEAN P RIGBY AND SUSAN RIGBY	908 197
115	10*42051.256.23	M	9-11-8	DEBRA L CAFFAGNONE	908 197
116	10*42051.256.23	M	9-11-8	DENNIS M WILSON	921 526
117	10*42051.256.23	M	9-11-8	DENNIS R AND BARBARA DELL FLOWY	921 70
118	10*42051.256.23	M	9-11-8	DONNA E ANNE BRASKETT	921 152
119	10*42051.256.23	M	9-11-8	ELIZABETH REP	908 39
120	10*42051.256.23	M	9-11-8	GARY WARD AND EMERSON D WARD	908 228
121	10*42051.256.23	M	9-11-8	GEORGE A SHEFFER AND STEPHANIE L SCHNEER	921 89
122	10*42051.256.23	M	9-11-8	GEORGE MGDANTA JR	907 541
123	10*42051.256.23	M	9-11-8	HAROLD S BROWN AND MARIA A BROWN	921 357
124	10*42051.256.23	M	9-11-8	HAROLD W PYLE	921 129
125	10*42051.256.23	M	9-11-8	HENRIE L JACKSON KENT BARNES	908 257
126	10*42051.256.23	M	9-11-8	JACK LAND AND BRILEY PYLE	908 4
127	10*42051.256.23	M	9-11-8	JACK R WILSON JR AND JANE A WILSON	908 42
128	10*42051.256.23	M	9-11-8	JAMES A GORBY	921 73
129	10*42051.256.23	M	9-11-8	JAMES E KELNICE AND LYNN MANDREY	921 67
130	10*42051.256.23	M	9-11-8	JAMES KENNETH JACKSON AND JULIE JACKSON	921 325
131	10*42051.256.23	M	9-11-8	JAMES M JACKSON	921 111
132	10*42051.256.23	M	9-11-8	JAMES MICHAEL ZELL AND LUCILLE D ZELL	921 367
133	10*42051.256.23	M	9-11-8	JAMES N REEVES JR AND RITA M REEVES	921 340
134	10*42051.256.23	M	9-11-8	JAMES R & TRACY E NICKOLSON	908 180
135	10*42051.256.23	M	9-11-8	JANICE MGDANTA GAVAIK	907 679
136	10*42051.256.23	M	9-11-8	JASON RINE AND LEATHER RINE	877 216
137	10*42051.256.23	M	9-11-8	JEAN ANNE GORBY STORCH	921 370
138	10*42051.256.23	M	9-11-8	JEFFREY REEVES AND JOEY REEVES	921 370
139	10*42051.256.23	M	9-11-8	JEFFREY COCHRAN	921 389
140	10*42051.256.23	M	9-11-8	BECKY KATH JACKSON AND LITA BETH D JACKSON	921 377
141	10*42051.256.23	M	9-11-8	JOSE LEONAR AND TERESA GINA EZELLE	921 115
142	10*42051.256.23	M	9-11-8	JO BECK DAVID	908 136
143	10*42051.256.23	M	9-11-8	JOANNE WELCH	908 143
144	10*42051.256.23	M	9-11-8	JOHN KUVACUJA AND PATRICIA A BEVAFZEM	931 144
145	10*42051.256.23	M	9-11-8	JOHN K FOUNDS	927 478
146	10*42051.256.23	M	9-11-8	JOHN K FOUNDS	908 170
147	10*42051.256.23	M	9-11-8	JOHN OMER BOLTZ	908 160
148	10*42051.256.23	M	9-11-8	JOHN R REEVES AND MONA B REEVES	931 579
149	10*42051.256.23	M	9-11-8	JOHN F AND PATRICIA S DADD	908 205
150	10*42051.256.23	M	9-11-8	JOSEPH GORBY GARRAN	908 175
151	10*42051.256.23	M	9-11-8	JOSEPH W FOUNDS	921 28
152	10*42051.256.23	M	9-11-8	JOSHUA RINE AND REBECCA RINE	907 634
153	10*42051.256.23	M	9-11-8	JOSTIN RINE AND BECKY RINE	907 630
154	10*42051.256.23	M	9-11-8	KAREN S GAST	908 150
155	10*42051.256.23	M	9-11-8	KATHRYN L & ROSELYN TYRELL	921 519
156	10*42051.256.23	M	9-11-8	KELLY FOUNDS CAMPBELL	921 59
157	10*42051.256.23	M	9-11-8	KENDRA WALLIS	927 484
158	10*42051.256.23	M	9-11-8	LARRY D TAINT AND NANCY L TAINT	908 34
159	10*42051.256.23	M	9-11-8	LARBE DRIGGERS MANDERSON	908 105
160	10*42051.256.23	M	9-11-8	LARBE ELLI WERRY	921 245
161	10*42051.256.23	M	9-11-8	LESTER G AND CONSTANCE B HICKOLSON	921 343
162	10*42051.256.23	M	9-11-8	LINDA FOUNT	908 57
163	10*42051.256.23	M	9-11-8	MARGIE ANN JACKSON BOBINS GRAMAM	921 51
164	10*42051.256.23	M	9-11-8	MARION L AND EMILY CAMPBELL	908 245
165	10*42051.256.23	M	9-11-8	MARK E AND LESLEY A STOKS	921 501
166	10*42051.256.23	M	9-11-8	MARY BARCAW DUKE	921 105
167	10*42051.256.23	M	9-11-8	MARY CHRISTINE MCKENNA	921 332
168	10*42051.256.23	M	9-11-8	MARY ELIZABETH DRIGGERS	908 208
169	10*42051.256.23	M	9-11-8	MARLENE FOUNDS AND LAUREN FOUNDS	921 79
170	10*42051.256.23	M	9-11-8	MARTIN RIBB JACKSON RAYSCOTT	908 211
171	10*42051.256.23	M	9-11-8	MICHAEL EZELLE	921 121
172	10*42051.256.23	M	9-11-8	MICHAEL LORTIZ	921 249
173	10*42051.256.23	M	9-11-8	MICHAEL P PYLE	908 255
174	10*42051.256.23	M	9-11-8	MICHAEL TRANEIN	921 381
175	10*42051.256.23	M	9-11-8	MICHAEL W STOKS AND JESSICA M STOKS	921 504
176	10*42051.256.23	M	9-11-8	MICHELLE MCKINROW BARK	921 317
177	10*42051.256.23	M	9-11-8	MILTON HOWARD EZELLE JR AND DIANETRA EZELLE	921 123
178	10*42051.256.23	M	9-11-8	NANCY CAFFAGNONE HOSLEY	908 185
179	10*42051.256.23	M	9-11-8	NATHAN P & BARBARA TERBOSSY	921 188
180	10*42051.256.23	M	9-11-8	NORMA S PARKSON	921 320
181	10*42051.256.23	M	9-11-8	PATRICIA A BARKER AND ROBIN A BARKER	921 264
182	10*42051.256.23	M	9-11-8	PATRICK S GALLAGHER AND JOYCE ANN FOUNDS	921 86
183	10*42051.256.23	M	9-11-8	PATSY JO BARR	908 155
184	10*42051.256.23	M	9-11-8	PAUL C WALSON	927 830
185	10*42051.256.23	M	9-11-8	PHILLIS J BAKE	921 250
186	10*42051.256.23	M	9-11-8	RALPH E HUNTER JR AND CHARLOTTE HUNTER	908 9
187	10*42051.256.23	M	9-11-8	RALPH J WALSON	921 522
188	10*42051.256.23	M	9-11-8	RALPH J AND IBANITA L CRIM	908 584
189	10*42051.256.23	M	9-11-8	RICARDO DITZ	921 252
190	10*42051.256.23	M	9-11-8	RICHARD P PYLE	921 259
191	10*42051.256.23	M	9-11-8	RICHARD THOMAS AND VICKI J THOMAS	908 864
192	10*42051.256.23	M	9-11-8	RICK A AND LINDSEY A STOKS	921 502
193	10*42051.256.23	M	9-11-8	ROBERT A LEADRETER AND M REBECCA LEADRETER	908 225
194	10*42051.256.23	M	9-11-8	ROBERT E GORBY	908 47
195	10*42051.256.23	M	9-11-8	ROBERT G & ELLEN FOUNDS	908 280
196	10*42051.256.23	M	9-11-8	ROBERT G FUNARI	921 82
197	10*42051.256.23	M	9-11-8	ROBERT J RIGBY	908 241
198	10*42051.256.23	M	9-11-8	ROBERT STEPHEN DRIGGERS	908 224
199	10*42051.256.23	M	9-11-8	RONALD S CRIM	908 81
200	10*42051.256.23	M	9-11-8	ROBBY NICOLE JACKSON	908 235
201	10*42051.256.23	M	9-11-8	ROSELYN E	908 24
202	10*42051.256.23	M	9-11-8	SAMUEL ELLI EZELL	921 116
203	10*42051.256.23	M	9-11-8	SANDRA JEAN WALSON	921 524
204	10*42051.256.23	M	9-11-8	SANDRA K THIEL	908 229
205	10*42051.256.23	M	9-11-8	SHANE ALLEN AND MENDY BEAN ALLEN	921 134
206	10*42051.256.23	M	9-11-8	SHERA BRASSETT WERCHLEY	921 516
207	10*42051.256.23	M	9-11-8	SHERYL PREEBAR	927 481

No.	Lease Name or Map	Tag	Parcel	Oil & Gas Royalty Owner - Continued	Deed Book/Page
208	10*42051.256.23	M	9-11-8	SUSAN NELSON	908 209
209	10*42051.256.23	M	9-11-8	TERENCE E BRANCY JANDERSON	908 213
210	10*42051.256.23	M	9-11-8	TERESA EVELL BARRIA AND DEWIDE RANZA	927 487
211	10*42051.256.23	M	9-11-8	TERESA ONIZ BIGGS	921 347
212	10*42051.256.23	M	9-11-8	TERRY LAMM THELMA A POFF	927 472
213	10*42051.256.23	M	9-11-8	THOMAS G AND DIANE W BAYLESS	921 341
214	10*42051.256.23	M	9-11-8	THOMAS BARKIN	917 25
215	10*42051.256.23	M	9-11-8	TIM F HODAS	908 277
216	10*42051.256.23	M	9-11-8	TINA MOORE	921 534
217	10*42051.256.23	M	9-11-8	VERGINIA J WHEIMAN	921 578
218	10*42051.256.23	M	9-11-8	WENDY L SARKKEL	908 22
219	10*42051.256.23	M	9-11-8	WILLIAM DALE BRASKETT	921 96
220	10*42051.256.23	M	9-11-8	WILLIAM R AND SHIRLEY D TAYLOR	921 510
221	10*42051.256.23	M	9-11-8	WILSON ANDREW JACKSON	907 229
222	10*42051.256.23	M	9-11-8	ROBERT L CLARK	905 279
223	10*42051.256.23	M	9-11-8	KENNETH MACCANNIE ET UCE REV LI	916 899
224	10*42051.256.23	M	9-11-8	EMMY ANN NICHOLS	924 617
225	10*42051.256.23	M	9-11-8	THOMAS MICHAEL WALLACE	924 610
226	10*42051.256.23	M	9-11-8	THOMAS S BIGGS III	904 556
227	10*42051.256.23	M	9-11-8	WILLIAM MARTIN BIGGS ANGELA BAE MOORE	907 420
228	10*42051.256.23	M	9-11-8	EMMY ANN NICHOLS	924 617
229	10*42051.256.23	M	9-11-8	THOMAS MICHAEL WALLACE	924 610
230	10*42051.256.23	M	9-11-8	THOMAS S BIGGS III	904 556
231	10*42051.256.23	M	9-11-8	WILLIAM MARTIN BIGGS ANGELA BAE MOORE	907 229
232	10*42051.256.23	M	9-11-8	EMMY ANN NICHOLS	924 617
233	10*42051.256.23	M	9-11-8	THOMAS MICHAEL WALLACE	924 610
234	10*42051.256.23	M	9-11-8	THOMAS S BIGGS III	904 556
235	10*42051.256.23	M	9-11-8	WILLIAM MARTIN BIGGS ANGELA BAE MOORE	907 229
236	10*42051.256.23	M	9-11-8	EMMY ANN NICHOLS	924 617
237	10*42051.256.23	M	9-11-8	EMMY ANN NICHOLS	924 617
238	10*42051.256.23	M	9-11-8	THOMAS MICHAEL WALLACE	924 610
239	10*42051.256.23	M	9-11-8	THOMAS S BIGGS III	904 556
240	10*42051.256.23	M	9-11-8	WILLIAM MARTIN BIGGS ANGELA BAE MOORE	907 229
241	10*420				

**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 sheets

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

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

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

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

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

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Operator's Well No. Heaven Hill 3 - 7HU

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment
10*15557	A	9-7-30	RICKY L WHITLATCH ET AL	CHEVRON USA INC	1/8+	780	N/A	N/A	Chevron to Tug Hill: 36/148
10*15557	B	9-7-31	RICKY L WHITLATCH ET AL	CHEVRON USA INC	1/8+	226	N/A	N/A	Chevron to Tug Hill: 36/148
10*16289	C	9-7-18	BRENDA HINERMAN WILLIAMSON AND BRIAN K WILLIAMSON	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*16051	C	9-7-18	DONNA JEAN SNIDER AND DAVID SNIDER	TH EXPLORATION LLC	1/8+	905	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	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	N/A	N/A	N/A
10*15720	C	9-7-18	KAREN L GREATHOUSE AND FLOYD GREATHOUSE	TH EXPLORATION LLC	1/8+	905	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	N/A	N/A	N/A
10*16413	C	9-7-18	RONALD H EDGE JR	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*16028	C	9-7-18	ROSEMARY PARKINS AND STEPHEN PARKINS	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*16020	C	9-7-18	SHARON HINERMAN MAY & DANIEL G MAY	TH EXPLORATION LLC	1/8+	905	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	N/A	N/A	N/A
10*15667	C	9-7-18	KEVIN E MCGILTON ET UX	CHEVRON USA INC	1/8+	850	N/A	N/A	Chevron to Tug Hill: 36/148
10*15557	D	9-7-21	RICKY L WHITLATCH ET AL	CHEVRON USA INC	1/8+	780	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.256.22	E	9-7-23	BEVERLY J HOPSON	TH EXPLORATION LLC	1/8+	913	N/A	N/A	N/A
10*47051.256.1	E	9-7-23	BRENDA J WHEITZEL	TH EXPLORATION LLC	1/8+	881	N/A	N/A	N/A
10*15746	E	9-7-23	BRUCE D SCHURR	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16247	E	9-7-23	CAROL RIGGLE PARSLEY AND JAMES DENNIS PARSLEY	TH EXPLORATION LLC	1/8+	925	N/A	N/A	N/A
10*47051.256.24	E	9-7-23	CATHERINE BONAR PETTIT BILLIE	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A
10*47051.256.16	E	9-7-23	CHARLOTTE B HUMMELL	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*47051.256.15	E	9-7-23	CHARLOTTE J BONAR YOHO	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A
10*17506	E	9-7-23	CHASKIA F HARRIS AND JAMES M HARRIS	TH EXPLORATION LLC	1/8+	919	N/A	N/A	N/A
10*17507	E	9-7-23	DEZRAY METCALF	TH EXPLORATION LLC	1/8+	919	N/A	N/A	N/A
10*17415	E	9-7-23	DILLON PITSEBARGER	TH EXPLORATION LLC	1/8+	919	N/A	N/A	N/A
10*16115	E	9-7-23	EARL W HARRIS	TH EXPLORATION LLC	1/8+	925	N/A	N/A	N/A
10*47051.256.10	E	9-7-23	GRACE LAURA BONAR	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*47051.256.14	E	9-7-23	HUGH R BUZZARD	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*47051.256.14	E	9-7-23	JACK L MASON AND JEAN M MASON	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A
10*47051.256.21	E	9-7-23	JEFFREY THOMAS PYLES AND TERESA A PYLES	TH EXPLORATION LLC	1/8+	907	N/A	N/A	N/A
10*47051.256.20	E	9-7-23	JOHN L MASON	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*47051.256.11	E	9-7-23	JOHN WILLIAM BONAR AND SHIRLEY BONAR	TH EXPLORATION LLC	1/8+	913	N/A	N/A	N/A
10*47051.256.18	E	9-7-23	MARILYN SUE BUMER	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*47051.256.17	E	9-7-23	MAXINE G JOHNSON	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A
10*47051.256.19	E	9-7-23	MICHAEL DAVID PYLES AND CYNTHIA A PYLES	TH EXPLORATION LLC	1/8+	907	N/A	N/A	N/A
10*47051.256.8	E	9-7-23	PAMELA ANN MASON	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*47051.256.23	E	9-7-23	ROBERT L BONAR	TH EXPLORATION LLC	1/8+	913	N/A	N/A	N/A
10*47051.256.12	E	9-7-23	STEVEN A BOHRER	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*16021	E	9-7-23	TOMMY BONAR AND TANYA S BONAR	TH EXPLORATION LLC	1/8+	925	N/A	N/A	N/A
10*47051.256.9	E	9-7-23	WANDA MASON SUNSHINE	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*47051.256.13	E	9-7-23	WILLIAM W CRAIG AND GLENDA L CRAIG	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*16289	F	9-7-20	BRENDA HINERMAN WILLIAMSON AND BRIAN K WILLIAMSON	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*16051	F	9-7-20	DONNA JEAN SNIDER AND DAVID SNIDER	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*16412	F	9-7-20	ELIZABETH ANN BLAZER AND PAUL R BLAZER	TH EXPLORATION LLC	1/8+	905	N/A	N/A	N/A
10*16053	F	9-7-20	GARY D HINERMAN AND JUDY ANN HINERMAN	TH EXPLORATION LLC	1/8+	905	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
10*15720	F	9-7-20	KAREN I. GREATHOUSE AND FLOYD GREATHOUSE	TH EXPLORATION LLC	1/8+	905 458	N/A	N/A	N/A
10*15698	F	9-7-20	ROBERT A EDGE AND SHERRIE N EDGE	TH EXPLORATION LLC	1/8+	900 363	N/A	N/A	N/A
10*16413	F	9-7-20	RONALD H EDGE JR	TH EXPLORATION LLC	1/8+	905 454	N/A	N/A	N/A
10*16028	F	9-7-20	ROSEMARY PARKINS AND STEPHEN PARKINS	TH EXPLORATION LLC	1/8+	905 460	N/A	N/A	N/A
10*16020	F	9-7-20	SHARON HINERMAN MAY & DANIEL G MAY	TH EXPLORATION LLC	1/8+	905 464	N/A	N/A	N/A
10*15721	F	9-7-20	TINA L EDGE MONTI AND THOMAS MONTI	TH EXPLORATION LLC	1/8+	905 456	N/A	N/A	N/A
10*15667	F	9-7-20	KEVIN E MCGILTON ET UX	CHEVRON USA INC	1/8+	850 351	N/A	N/A	Chevron to Tug Hill: 36/148
10*15667	G	9-7-19	KEVIN E MCGILTON ET UX	CHEVRON USA INC	1/8+	850 351	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.256.1	H	9-11-6.1	BRENDA J WHEITZEL	TH EXPLORATION LLC	1/8+	881 145	N/A	N/A	N/A
10*47051.256.3	H	9-11-6.1	BRENDA S DYKHOUSE	TH EXPLORATION LLC	1/8+	881 148	N/A	N/A	N/A
10*47051.256.2	H	9-11-6.1	CAROL JEAN ANDERSON	TH EXPLORATION LLC	1/8+	879 299	N/A	N/A	N/A
10*47051.256.4	H	9-11-6.1	GLEN A BONAR	TH EXPLORATION LLC	1/8+	881 151	N/A	N/A	N/A
10*47051.256.5	H	9-11-6.1	JERRY W ZIEN AND KATHLEEN E ZIEN	TH EXPLORATION LLC	1/8+	882 530	N/A	N/A	N/A
10*15669	H	9-11-6.1	EMMA ANDERSON	CHEVRON USA INC	1/8+	861 586	N/A	N/A	Chevron to Tug Hill: 36/148
10*15670	H	9-11-6.1	GARY M BONAR AND ELLEN L BONAR	CHEVRON USA INC	1/8+	861 577	N/A	N/A	Chevron to Tug Hill: 36/148
10*15671	H	9-11-6.1	JUDALENE K COLLUMS	CHEVRON USA INC	1/8+	861 571	N/A	N/A	Chevron to Tug Hill: 36/148
10*15672	H	9-11-6.1	NAOMI HUPP	CHEVRON USA INC	1/8+	861 604	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.256.22	I	9-11-7	BEVERLY J HOPSON	TH EXPLORATION LLC	1/8+	913 581	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.256.1	I	9-11-7	BRENDA J WHEITZEL	TH EXPLORATION LLC	1/8+	881 145	N/A	N/A	N/A
10*15746	I	9-11-7	BRUCE D SCHURR	TH EXPLORATION LLC	1/8+	921 478	N/A	N/A	N/A
10*16247	I	9-11-7	CAROL RIGGLE PARSLEY AND JAMES DENNIS PARSLEY	TH EXPLORATION LLC	1/8+	925 327	N/A	N/A	N/A
10*47051.256.24	I	9-11-7	CATHERINE BONAR PETTIT BILLIE	TH EXPLORATION LLC	1/8+	904 628	N/A	N/A	N/A
10*47051.256.16	I	9-11-7	CHARLOTTE B HUMMELL	TH EXPLORATION LLC	1/8+	905 45	N/A	N/A	N/A
10*47051.256.15	I	9-11-7	CHASKIA F HARRIS AND JAMES M HARRIS	TH EXPLORATION LLC	1/8+	904 455	N/A	N/A	N/A
10*17506	I	9-11-7	DEZRAY METCALF	TH EXPLORATION LLC	1/8+	919 239	N/A	N/A	N/A
10*17507	I	9-11-7	DILLON PITSENBARGER	TH EXPLORATION LLC	1/8+	919 235	N/A	N/A	N/A
10*17415	I	9-11-7	EARL W HARRIS	TH EXPLORATION LLC	1/8+	919 241	N/A	N/A	N/A
10*16115	I	9-11-7	GRACE LAURA BONAR	TH EXPLORATION LLC	1/8+	905 35	N/A	N/A	N/A
10*47051.256.10	I	9-11-7	HUGH R BUZZARD	TH EXPLORATION LLC	1/8+	905 43	N/A	N/A	N/A
10*47051.256.14	I	9-11-7	JACK L MASON AND JEAN M MASON	TH EXPLORATION LLC	1/8+	904 626	N/A	N/A	N/A
10*47051.256.21	I	9-11-7	JEFFREY THOMAS PYLES AND TERESA A PYLES	TH EXPLORATION LLC	1/8+	907 209	N/A	N/A	N/A
10*47051.256.20	I	9-11-7	JOHN L MASON	TH EXPLORATION LLC	1/8+	905 37	N/A	N/A	N/A
10*47051.256.11	I	9-11-7	JOHN WILLIAM BONAR AND SHIRLEY BONAR	TH EXPLORATION LLC	1/8+	913 522	N/A	N/A	N/A
10*47051.256.18	I	9-11-7	MARILYN SUE BUMER	TH EXPLORATION LLC	1/8+	905 29	N/A	N/A	N/A
10*47051.256.7	I	9-11-7	MAXINE G JOHNSON	TH EXPLORATION LLC	1/8+	904 457	N/A	N/A	N/A
10*47051.256.17	I	9-11-7	MICHAEL DAVID PYLES AND CYNTHIA A PYLES	TH EXPLORATION LLC	1/8+	907 207	N/A	N/A	N/A
10*47051.256.19	I	9-11-7	PAMELA ANN MASON	TH EXPLORATION LLC	1/8+	905 31	N/A	N/A	N/A
10*47051.256.23	I	9-11-7	ROBERT L BONAR	TH EXPLORATION LLC	1/8+	913 556	N/A	N/A	N/A
10*47051.256.12	I	9-11-7	STEVEN A BOHRER	TH EXPLORATION LLC	1/8+	905 39	N/A	N/A	N/A
10*16021	I	9-11-7	TOMMY BONAR AND TANYA S BONAR	TH EXPLORATION LLC	1/8+	925 325	N/A	N/A	N/A
10*47051.256.9	I	9-11-7	WANDA MASON SUNSHINE	TH EXPLORATION LLC	1/8+	905 33	N/A	N/A	N/A
10*47051.256.13	I	9-11-7	WILLIAM W CRAIG AND GLENDA L CRAIG	TH EXPLORATION LLC	1/8+	905 41	N/A	N/A	N/A
10*47051.108.1	J	9-11-9	MICHAEL A WHEITZEL	TH EXPLORATION LLC	1/8+	885 51	N/A	N/A	N/A

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WW-6A1 Supplement

Operator's Well No. Heaven Hill 3 - 7HU

Lease Name or No.	Tag	Parcel	Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment
10*16238	K	9-12-27	SUSAN MARIE JOHNSON AKA SUSAN MARIE HUBER	TH EXPLORATION LLC	1/8+	924	614	N/A	N/A
10*47051.309.1	K	9-12-27	LESLIE E QUIGLEY	TH EXPLORATION LLC	1/8+	905	8	N/A	N/A
10*47051.309.2	K	9-12-27	LEWIS M QUIGLEY AND MAXINE V QUIGLEY	TH EXPLORATION LLC	1/8+	907	217	N/A	N/A
10*47051.309.3	K	9-12-27	GERALD W QUIGLEY AND VICKI L QUIGLEY	TH EXPLORATION LLC	1/8+	905	12	N/A	N/A
10*15606	L	9-12-2	CHK-MAC LLC	CHESAPEAKE APPALACHIA LLC	1/8+	798	150	N/A	Chesapeake to Chevron: 30/461
10*47051.309.3	L	9-12-2	GERALD W QUIGLEY AND VICKI L QUIGLEY	TH EXPLORATION LLC	1/8+	905	12	N/A	Chevron to Tug Hill: 36/148
10*47051.309.1	L	9-12-2	LESLIE E QUIGLEY	TH EXPLORATION LLC	1/8+	905	8	N/A	N/A
10*47051.309.2	L	9-12-2	LEWIS M QUIGLEY AND MAXINE V QUIGLEY	TH EXPLORATION LLC	1/8+	907	217	N/A	N/A
10*16238	L	9-12-2	SUSAN MARIE JOHNSON AKA SUSAN MARIE HUBER	TH EXPLORATION LLC	1/8+	924	614	N/A	N/A
10*16514	M	9-11-8	ALEX RUSSELL AND JOYCE A CAMPBELL	TH EXPLORATION LLC	1/8+	908	248	N/A	N/A
10*47051.223.12	M	9-11-8	ALICE GORBY MARTIN	TH EXPLORATION LLC	1/8+	908	52	N/A	N/A
10*17416	M	9-11-8	ANDREW M. ORTIZ	TH EXPLORATION, LLC	1/8+	921	346	N/A	N/A
10*16515	M	9-11-8	ANNA MARIE JACKSON	TH EXPLORATION LLC	1/8+	908	251	N/A	N/A
10*47051.223.20	M	9-11-8	BARBARA A BUZZARD	TH EXPLORATION LLC	1/8+	908	24	N/A	N/A
10*17276	M	9-11-8	BERTHA EZELL WVAIT	TH EXPLORATION LLC	1/8+	921	526	N/A	N/A
10*47051.223.16	M	9-11-8	BETTY LOU STERN AND WILLIAM KEITH STERN	TH EXPLORATION LLC	1/8+	908	64	N/A	N/A
10*16880	M	9-11-8	BEVERLY ANN STORTS	TH EXPLORATION LLC	1/8+	921	498	N/A	N/A
10*16989	M	9-11-8	BRITTANY RICHARDSON	TH EXPLORATION LLC	1/8+	921	376	N/A	N/A
10*47051.223.18	M	9-11-8	BRITNEY MENEAR	TH EXPLORATION LLC	1/8+	908	57	N/A	N/A
10*15463	M	9-11-8	CHARLES A RINE	TH EXPLORATION LLC	1/8+	908	274	N/A	N/A
10*16667	M	9-11-8	CHARLES F AND GAIL ANN PYLE	TH EXPLORATION LLC	1/8+	908	266	N/A	N/A
10*16686	M	9-11-8	CHERYLE M TRACEY	TH EXPLORATION LLC	1/8+	927	475	N/A	N/A
10*16802	M	9-11-8	CHRISTOPHER AND TAMMY RICHARDSON	TH EXPLORATION LLC	1/8+	921	495	N/A	N/A
10*17130	M	9-11-8	CINDY L BARGER	TH EXPLORATION LLC	1/8+	921	137	N/A	N/A
10*16416	M	9-11-8	CYNTHIA HUDSON	TH EXPLORATION, LLC	1/8+	908	219	N/A	N/A
10*17274	M	9-11-8	DAVID H WILSON	TH EXPLORATION LLC	1/8+	921	474	N/A	N/A
10*47051.223.8	M	9-11-8	DAVID M WILSON	TH EXPLORATION LLC	1/8+	907	649	N/A	N/A
10*16807	M	9-11-8	DAVID TULLER AND SUSAN STORTS TULLER	TH EXPLORATION LLC	1/8+	921	513	N/A	N/A
10*15481	M	9-11-8	DEAN P RIGBY AND SUSAN RIGBY	TH EXPLORATION LLC	1/8+	908	197	N/A	N/A
10*47051.223.35	M	9-11-8	DEBRA L CIAFFAGNONE	TH EXPLORATION LLC	1/8+	908	192	N/A	N/A
10*17438	M	9-11-8	DENNIS M WILSON	TH EXPLORATION LLC	1/8+	921	476	N/A	N/A
10*16962	M	9-11-8	DENNIS P AND BARBARA EZELL FLORY	TH EXPLORATION LLC	1/8+	921	70	N/A	N/A
10*16720	M	9-11-8	DONNA ELAINE BRASKETT	TH EXPLORATION LLC	1/8+	921	152	N/A	N/A
10*47051.223.11	M	9-11-8	EUIZABETH ESTER	TH EXPLORATION LLC	1/8+	908	39	N/A	N/A
10*47051.223.21	M	9-11-8	GARY T WARD AND SHARON D WARD	TH EXPLORATION LLC	1/8+	908	19	N/A	N/A
10*16298	M	9-11-8	GEOFFREY A SHIEFFER AND STEPHANIE L SCHIEFFER	TH EXPLORATION LLC	1/8+	908	238	N/A	N/A
10*17677	M	9-11-8	GEORGE M GONTA JR	TH EXPLORATION, LLC	1/8+	921	89	N/A	N/A
10*47051.223.5	M	9-11-8	HAROLD S BROWN II AND MARIA A BROWN	TH EXPLORATION LLC	1/8+	907	641	N/A	N/A
10*16815	M	9-11-8	HAROLD W PYLE	TH EXPLORATION LLC	1/8+	921	357	N/A	N/A
10*17156	M	9-11-8	HENRI NELL JACKSON KENT BARNES	TH EXPLORATION LLC	1/8+	921	139	N/A	N/A
10*16668	M	9-11-8	JACK I AND MERRILEE PYLE	TH EXPLORATION LLC	1/8+	908	257	N/A	N/A
10*47051.223.7	M	9-11-8	JACK R WILSON JR AND JANE A WILSON	TH EXPLORATION LLC	1/8+	908	4	N/A	N/A
10*47051.223.13	M	9-11-8	JAMES A GORBY	TH EXPLORATION LLC	1/8+	908	42	N/A	N/A
10*16839	M	9-11-8	JAMES B FOUNDS AND LYNN M MOWERY	TH EXPLORATION LLC	1/8+	921	73	N/A	N/A

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10*16800	M	9-11-8	JAMES KENNETH JACKSON AND JULIE JACKSON	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17588	M	9-11-8	JAMES M JACKSON	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17527	M	9-11-8	JAMES MICHAEL EZELL AND LUCILLE D EZELL	TH EXPLORATION LLC	1/8+	111	N/A	N/A	N/A
10*17157	M	9-11-8	JAMES N REEVES JR AND RITA M REEVES	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17564	M	9-11-8	JAMES R & TRACEY E NICKOLSON	TH EXPLORATION, LLC	1/8+	921	N/A	N/A	N/A
10*47051.223.31	M	9-11-8	JANICE M GONTA GAVALIK	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*47051.223.19	M	9-11-8	JASON RINE AND HEATHER RINE	TH EXPLORATION LLC	1/8+	907	N/A	N/A	N/A
10*47051.223.1	M	9-11-8	JEAN ANNIE GORBY STORCH	TH EXPLORATION LLC	1/8+	877	N/A	N/A	N/A
10*17526	M	9-11-8	JEFFREY L REEVES AND JODY L REEVES	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16977	M	9-11-8	JEREMY COCHENOUR	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17565	M	9-11-8	JESSE ALLEN JACKSON AND ELIZABETH D JACKSON	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17155	M	9-11-8	JESSE LEON JR AND TERESA GAIL EZELLE	TH EXPLORATION LLC	1/8+	327	N/A	N/A	N/A
10*47051.223.24	M	9-11-8	JO DEE K DAVIS	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*47051.223.25	M	9-11-8	JOANNE WELCH	TH EXPLORATION LLC	1/8+	136	N/A	N/A	N/A
10*17552	M	9-11-8	JOHN BEVACQUA AND PATRICIA A BEVACQUA	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*16689	M	9-11-8	JOHN C FOUNDS	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*47051.223.34	M	9-11-8	JOHN CIARFAGNONE	TH EXPLORATION LLC	1/8+	478	N/A	N/A	N/A
10*15686	M	9-11-8	JOHN OMER BOLITZ	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*17275	M	9-11-8	JOHN R REEVES AND MONA G REEVES	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*16669	M	9-11-8	JOHN S AND PATRICIA S DADO	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*47051.223.32	M	9-11-8	JOSEPH GORBY DAKAN	TH EXPLORATION LLC	1/8+	175	N/A	N/A	N/A
10*17339	M	9-11-8	JOSEPH W FOUNDS	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*47051.223.6	M	9-11-8	JOSHUA RINE AND REBECCA RINE	TH EXPLORATION LLC	1/8+	907	N/A	N/A	N/A
10*47051.223.14	M	9-11-8	JUSTIN RINE AND BECKY RINE	TH EXPLORATION LLC	1/8+	639	N/A	N/A	N/A
10*47051.223.28	M	9-11-8	KAREN S GAST	TH EXPLORATION LLC	1/8+	150	N/A	N/A	N/A
10*17561	M	9-11-8	KATHRYN L & ROGER L TYRELL	TH EXPLORATION, LLC	1/8+	921	N/A	N/A	N/A
10*17444	M	9-11-8	KELLY FOUNDS CAMPBELL	TH EXPLORATION LLC	1/8+	519	N/A	N/A	N/A
10*17440	M	9-11-8	KENDRA WALISA	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*47051.223.15	M	9-11-8	LARRY D TAUNT AND NANCY L TAUNT	TH EXPLORATION LLC	1/8+	927	N/A	N/A	N/A
10*47051.223.30	M	9-11-8	LAURIE DRIGGERS MANDERSON	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*16987	M	9-11-8	LAURIE EZELL PERRY	TH EXPLORATION LLC	1/8+	165	N/A	N/A	N/A
10*16976	M	9-11-8	LESTER G AND CONSTANCE B NICKOLSON	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*47051.223.9	M	9-11-8	LINDA DELBERT	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*17485	M	9-11-8	MARGIE ANN JACKSON ROBBINS GRAHAM	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16478	M	9-11-8	MARION L AND EMILY CAMPBELL	TH EXPLORATION LLC	1/8+	91	N/A	N/A	N/A
10*16879	M	9-11-8	MARK E AND LESLEY A STORTS	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*16902	M	9-11-8	MARY BARCAW DUKE	TH EXPLORATION LLC	1/8+	245	N/A	N/A	N/A
10*17589	M	9-11-8	MARY CHRISTINE MCKENNA	TH EXPLORATION, LLC	1/8+	921	N/A	N/A	N/A
10*16414	M	9-11-8	MARY ELIZABETH DRIGGERS	TH EXPLORATION, LCC	1/8+	332	N/A	N/A	N/A
10*16991	M	9-11-8	MARYELLEN FOUNDS AND LAUREN FOUNDS	TH EXPLORATION LLC	1/8+	208	N/A	N/A	N/A
10*16058	M	9-11-8	MATTIE RUTH JACKSON PRESCOTT	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17278	M	9-11-8	MICHAEL L EZELE	TH EXPLORATION LLC	1/8+	79	N/A	N/A	N/A
10*16808	M	9-11-8	MICHAEL L ORTIZ	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16666	M	9-11-8	MICHAEL P PYLE	TH EXPLORATION LLC	1/8+	349	N/A	N/A	N/A
						255	N/A	N/A	N/A

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10*16991	M	9-11-8	MARTELLEN FOUNDS AND LAUREN FOUNDS	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16958	M	9-11-8	MATTIE RUTH JACKSON PRESCOTT	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*17278	M	9-11-8	MICHAEL L EZZELLE	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16808	M	9-11-8	MICHAEL L ORTIZ	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16666	M	9-11-8	MICHAEL P PYLE	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*17554	M	9-11-8	MICHAEL T RANKIN	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16888	M	9-11-8	MICHAEL W STORTS AND JESSICA M STORTS	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17443	M	9-11-8	MICHELLE MORROW-BACK	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17327	M	9-11-8	MILTON HOWARD EZZELLE JR AND ELIZABETH A EZZELLE	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*47051.223.93	M	9-11-8	NANCY CARFAGNONE HOUSLEY	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17565	M	9-11-8	NATHAN P & BARBARA T ERDOOSY	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16798	M	9-11-8	PATRICK A RANKIN AND ROBIN A RANKIN	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17208	M	9-11-8	PATRICK S GALLAGHER AND JOYCE ANN FOUNDS	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*47051.223.29	M	9-11-8	PAISY JD BAUI	TH EXPLORATION LLC	1/8+	927	N/A	N/A	N/A
10*16742	M	9-11-8	PAUL C WILSON	TH EXPLORATION LLC	1/8+	927	N/A	N/A	N/A
10*17449	M	9-11-8	PHYLLIS J BLAKE	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*47051.223.17	M	9-11-8	RALPH E HUNTER JR AND CHARLOTTE HUNTER	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*17441	M	9-11-8	RALPH J WILSON	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16448	M	9-11-8	RALPH L AND JUANITA L CRINA	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*16890	M	9-11-8	RICARDO ORTIZ	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17483	M	9-11-8	RICHARD I PYLE	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16662	M	9-11-8	RICHARD THOMAS AND VICKI J MIMS	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*16936	M	9-11-8	RICK A AND LENOIRE A STORTS	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16297	M	9-11-8	ROBERT A LEADBETTER AND M REBECCA LEADBETTER	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*47051.223.10	M	9-11-8	ROBERT E GORBY	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*16545	M	9-11-8	ROBERT G & ELLEN FOUNDS	TH EXPLORATION LLC	1/8+	508	N/A	N/A	N/A
10*16838	M	9-11-8	ROBERT G FURNARI	TH EXPLORATION LLC	1/8+	508	N/A	N/A	N/A
10*16424	M	9-11-8	ROBERT J RIGBY	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16383	M	9-11-8	ROBERT STEPHEN DRIGGERS	TH EXPLORATION LLC	1/8+	508	N/A	N/A	N/A
10*47051.223.23	M	9-11-8	RONALD S CRIM	TH EXPLORATION LLC	1/8+	508	N/A	N/A	N/A
10*16118	M	9-11-8	RUBY RIDDLER JACKSON	TH EXPLORATION LLC	1/8+	508	N/A	N/A	N/A
10*47051.223.22	M	9-11-8	SALLY COLE	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17205	M	9-11-8	SAM PRESLEY EZZELL	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*17744	M	9-11-8	SANDRA JEAN WILSON	TH EXPLORATION LLC	1/8+	116	N/A	N/A	N/A
10*15750	M	9-11-8	SANDRA K TRULL	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*17442	M	9-11-8	SHANE ALLEN AND MENDY JEAN ALLEN	TH EXPLORATION LLC	1/8+	229	N/A	N/A	N/A
10*16821	M	9-11-8	SHEILA BRASKETT WERCHEY	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16688	M	9-11-8	SHERYL PYLE BAIR	TH EXPLORATION LLC	1/8+	927	N/A	N/A	N/A
10*15482	M	9-11-8	SUSAN NELSON	TH EXPLORATION LLC	1/8+	481	N/A	N/A	N/A
10*16415	M	9-11-8	TERENCE J & NANCY J ANDERSON	TH EXPLORATION LLC	1/8+	508	N/A	N/A	N/A
10*17482	M	9-11-8	TERESA EZZELLE RALYVA AND DAVID L RALYVA	TH EXPLORATION LLC	1/8+	203	N/A	N/A	N/A
10*16819	M	9-11-8	TERESA ORTIZ BRIGGS	TH EXPLORATION LLC	1/8+	213	N/A	N/A	N/A
10*16837	M	9-11-8	TERRY L AND THELMA A POFF	TH EXPLORATION LLC	1/8+	487	N/A	N/A	N/A
10*17198	M	9-11-8	THOMAS G AND DIANE W BATTLESS	TH EXPLORATION LLC	1/8+	927	N/A	N/A	N/A
10*16696	M	9-11-8	THOMAS RANKIN	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*47051.223.27	M	9-11-8	TIM J HOBBS	TH EXPLORATION LLC	1/8+	141	N/A	N/A	N/A
10*16969	M	9-11-8	TINA MOORE	TH EXPLORATION LLC	1/8+	927	N/A	N/A	N/A
10*16806	M	9-11-8	VIRGINIA L WHITMAN	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*47051.223.26	M	9-11-8	VERNOY L SWARKEL	TH EXPLORATION LLC	1/8+	277	N/A	N/A	N/A
10*16747	M	9-11-8	WILLIAM DALE BRASKETT	TH EXPLORATION LLC	1/8+	354	N/A	N/A	N/A
10*16604	M	9-11-8	WILLIAM N AND SHERRY D TAYLOR	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*16516	M	9-11-8	WILSON ANDREW JACKSON	TH EXPLORATION LLC	1/8+	921	N/A	N/A	N/A
10*15582	N	9-11-10	ROBERT L CLARK	TH EXPLORATION LLC	1/8+	908	N/A	N/A	N/A
10*15559	O	9-11-11	KENNETH M MCCARDLE ET UX REV LT	CHESSAPEAKE APPALACHIA LLC	1/8+	685	N/A	N/A	N/A
10*16244	P	9-12-1	EMILY ANN NICIFORGOS	CHEVON USA INC	1/8+	816	N/A	N/A	N/A
10*16149	P	9-12-1	THOMAS MICHAEL WALLACE	TH EXPLORATION LLC	1/8+	924	N/A	N/A	N/A

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10*47051.393.1	P	9-12-1	THOMAS S RIGGS III	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A
10*47051.393.2	Q	9-12-1	WILLIAM MARTIN RIGGS ANGELA RAE MOORE	TH EXPLORATION LLC	1/8+	907	N/A	N/A	N/A
10*16244	Q	9-12-1.1	EMILY ANN NICIFOROS	TH EXPLORATION LLC	1/8+	924	N/A	N/A	N/A
10*47051.393.1	Q	9-12-1.1	THOMAS MICHAEL WALLACE	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A
10*47051.393.2	Q	9-12-1.1	THOMAS S RIGGS III	TH EXPLORATION LLC	1/8+	907	N/A	N/A	N/A
10*16244	R	9-12-1.1	WILLIAM MARTIN RIGGS ANGELA RAE MOORE	TH EXPLORATION LLC	1/8+	924	N/A	N/A	N/A
10*15609	R	9-12-91	EMILY ANN NICIFOROS	TH EXPLORATION LLC	1/8+	924	N/A	N/A	N/A
10*16149	R	9-12-91	FANHURST COMPANY A FLORIDA PARTNERSHIP	CHESAPEAKE APPALACHIA LLC	1/8+	727	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 35/148
10*47051.393.1	R	9-12-91	THOMAS MICHAEL WALLACE	TH EXPLORATION LLC	1/8+	924	N/A	N/A	N/A
10*47051.393.2	R	9-12-91	THOMAS S RIGGS III	TH EXPLORATION LLC	1/8+	904	N/A	N/A	N/A
10*16932	R	9-12-91	WILLIAM MARTIN RIGGS ANGELA RAE MOORE	TH EXPLORATION LLC	1/8+	907	N/A	N/A	N/A
47051.393.1	S	9-12-2.1	HAYMAKER PROPERTIES, LP	TH EXPLORATION LLC	1/8+	902	N/A	N/A	Chevron to Tug Hill: 37/437
10*16238	S	9-12-2.1	LESLIE E. CUNLEY	CHEVRON USA INC	1/8+	905	N/A	N/A	N/A
10*16245	S	9-12-2.1	SUSAN MARIE JOHNSON AKA SUSAN MARIE RUBER	TH EXPLORATION LLC	1/8+	924	N/A	N/A	N/A
	S	9-12-2.1	CHARLES STEPHEN JOHNSON AKA CHARLES STEVEN JOHNSON AND SHIRLEY LOUISE JOHNSON	TH EXPLORATION LLC	1/8+	924	N/A	N/A	N/A

51-01969



June 28, 2017

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

RE: Heaven Hill 3-7HU

Subject: Marshall County Route 21/9 and 21 Road Crossing Letter

Dear Laura:

Tug Hill Operating, LLC (THO) hereby submits this letter as confirmation that THO has obtained the right to drill, extract and produce the minerals under Marshall County Route 21/9 and 21 in the area reflected on the Heaven Hill 3-7HU well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Routes and is not currently aware of any recorded document that would suggest an ownership other than THO.

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

Sincerely,

A handwritten signature in blue ink that reads "Amy Miller".

Amy Miller
Permit Specialist – Appalachia Region
Cell 304-376-0111
Email: amiller@tug-hilop.com

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

Date of Notice Certification: 09/01/2017

API No. 47- 051-01969
Operator's Well No. Heaven Hill 3-7HU
Well Pad Name: _____

Notice has been given:

Pursuant to the provisions in West Virginia Code § 22-6A, the Operator has provided the required parties with the Notice Forms listed below for the tract of land as follows:

State: <u>West Virginia</u>	UTM NAD 83	Easting: <u>526,256.11</u>
County: <u>Marshall</u>		Northing: <u>4,406,564.393</u>
District: <u>Meade</u>	Public Road Access: <u>Yeater Lane CR 21/11</u>	
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Ricky L. Whitlatch</u>	
Watershed: <u>Lower Bowman Run of Fish Creek (HUC 10)</u>		

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

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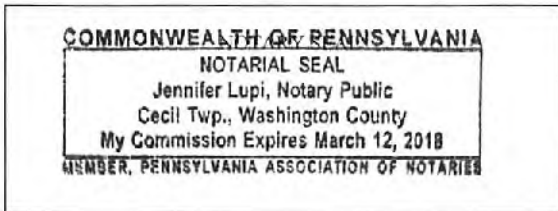
Required Attachments:

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

Certification of Notice is hereby given:

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

Well Operator:	<u>Tug Hill Operating, LLC</u>	Address:	<u>380 Southpointe Boulevard, Plaza II, Suite 200</u>
By:	<u>Amy L. Miller</u>		<u>Canonsburg, PA 15317</u>
Its:	<u>Permitting Specialist - Appalachia</u>	Facsimile:	<u>724-338-2030</u>
Telephone:	<u>304-376-01111</u>	Email:	<u>amiller@tug-hillop.com</u>



Subscribed and sworn before me this 1st day of Sept 2017.
Jennifer Lupi Notary Public
 My Commission Expires March 12, 2018

Oil and Gas Privacy Notice:

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

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

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

Date of Notice: 8/31/2017 **Date Permit Application Filed:** 9/1/2017

Notice of:

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

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

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

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

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

SURFACE OWNER(s)

Name: Ricky L. Whittlatch
Address: 1044 Yeater Lane
Glen Easton, WV 26039

Name: None
Address: _____

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

Name: Andrew Whittlatch
Address: 942 Yeater Lane
Glen Easton, WV 26039

Name: Arnie Goodnight, et ux
Address: 102 Goodnight Lane
Moundsville, WV 26041

SURFACE OWNER(s) (Impoundments or Pits)

Name: None
Address: _____

COAL OWNER OR LESSEE

Name: Murray Energy Corporation
Address: 46226 National Road
St. Clairsville, OH 43950

COAL OPERATOR

Name: Same as above coal owner
Address: _____

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

Name: *See supplement page 1A attached
Address: _____

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: None
Address: _____

*Please attach additional forms if necessary

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API NO. 47- 051

- 01969

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OPERATOR WELL NO. Heaven Hill 3-7HU

Well Pad Name: Heaven Hill 3

WV Department of
Environmental Protection

Notice is hereby given:

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

This Notice Shall Include:

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

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

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

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

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

Well Location Restrictions

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

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

Water Well Testing:

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

Water Testing Laboratories:

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

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

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

Written Comment:

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

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

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Such persons may request, at the time of submitting written comments, notice of the permit decision and a list of persons qualified to test water. **NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.**

Time Limits and Methods for Filing Comments.

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

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

Comment Requirements

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

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

Permit Denial or Condition

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

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

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

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

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API NO. 47-051 - 01969
OPERATOR WELL NO. Heaven Hill 3-7HU
Well Pad Name: Heaven Hill 3

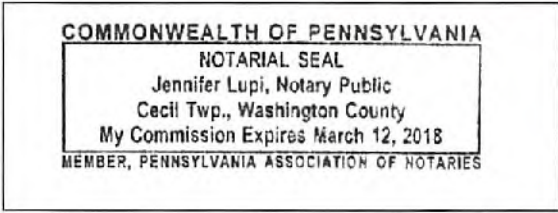
Notice is hereby given by:

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

Address: 380 Southpointe Blvd, Southpointe Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-336-2030

Oil and Gas Privacy Notice:

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



Subscribed and sworn before me this 31st day of Aug, 2017.
Jennifer Lupi Notary Public
My Commission Expires March 12, 2018

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Exhibit WW-6A**Supplement Pg. 1A**

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

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

Well: Heaven Hill 3 - 7HU
 District: Meade (House #'s 1 & 2)
 State: WV

There are two (2) residences, no businesses, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

House 1 TM 7 Pcl. 30 Ricky L. Whitlatch Phone: 304-843-1168 Physical Address: 1044 Yeater Ln. Glen Easton, WV 26039 Tax Address: Same	House 2 TM 7 Pcl. 30.1 Andrew Corey Whitlatch Phone: 304-845-9605 Physical Address: 942 Yeater Ln. Glen Easton, WV 26039 Tax Address: Same
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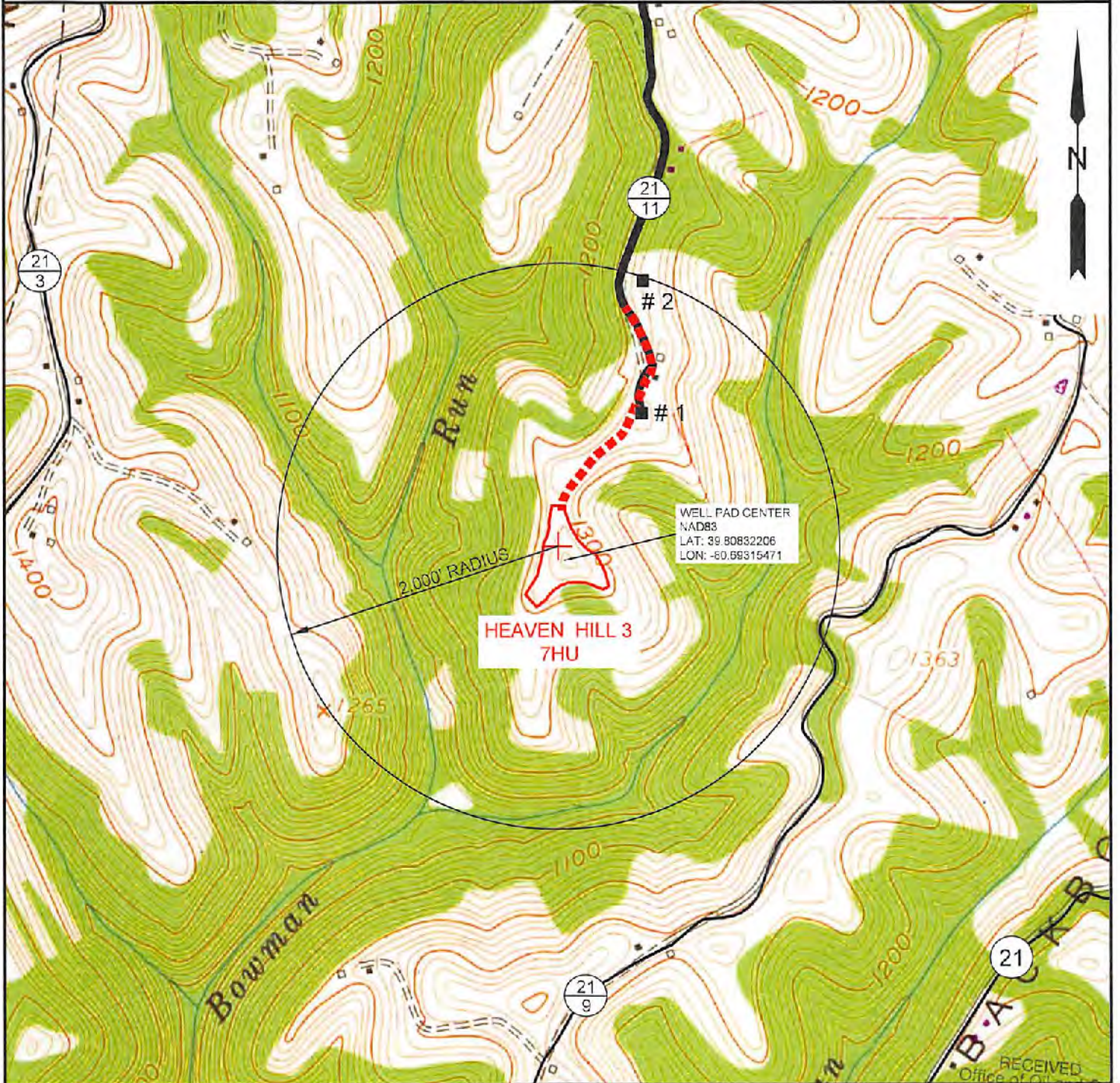
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PROPOSED HEAVEN HILL 3 - 7HU

SUPPLEMENT PG. 1B



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

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www.slsurveys.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	MEADE	380 SOUTHPOINTE BLVD	
DRAWN BY		DATE	SCALE
K.G.M.		08/25/2017	1" = 1000'

WV Department of
Environmental Protection
TUG HILL
OPERATING

**STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF ENTRY FOR PLAT SURVEY**

Notice Time Requirement: Notice shall be provided at least **SEVEN (7)** days but no more than **FORTY-FIVE (45)** days prior to entry

Date of Notice: December 5, 2016 **Date of Planned Entry:** December 18, 2016

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

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

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

Notice is hereby provided to:

SURFACE OWNER(S)

Name: Ricky L. Whittlatch
Address: 1044 Yeater Lane
Glen Easton, WV 26039

Name: Andrew Whittlatch
Address: 942 Yeater Lane
Glen Easton, WV 26039

Name: Amie Goodnight FT UX
Address: 102 Goodnight Lane
Moundsville, WV 26041

COAL OWNER OR LESSEE

Name: Murray Energy Corp.
Address: 46225 National Road
St. Clairsville, OH 43950

MINERAL OWNER(S)

Name: Ricky L. Whittlatch
Address: 1044 Yeater Lane
Glen Easton, WV 26039 ****SEE SUPPLEMENT PAGE****

**please attach additional forms if necessary*

Notice is hereby given:

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

State: <u>West Virginia</u>	Approx. Latitude & Longitude: <u>Lat: 39.8083194, Long: -80.6931660</u>
County: <u>Marshall</u>	Public Road Access: <u>Yeater Lane (CO. RL 21/11)</u>
District: <u>Meade</u>	Watershed: <u>HUC-10 Fish Creek</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Ricky L. Whittlatch</u>

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

Notice is hereby given by:

Well Operator: Tug Hill Operating, LLC
Telephone: 724-0749-8388
Email: jwhite@tug-hilltop.com

Address: 380 Southpointe Blvd., Southpointe Plaza II, Suite 200
Cancansburg, PA 15317
Facsimile: 724-338-2030

RECEIVED
Office of Oil and Gas

SEP - 6 2017

WV Department of
Environmental Protection

Oil and Gas Privacy Notice:

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

51-01969

Operator Well No. Heaven Hill Unit 3-7HU

WW-6A3 Notice of Entry for Plat Survey Attachment 1 of 1

Mineral Owner(s):

Name: Arnie Goodnight ET UX
Address: 102 Goodnight Lane
Moundsville, WV 26041

Bounty Minerals III Acquisitions, LLC
777 Main Street – Suite 850
Ft. Worth, TX 76102

Andrew Whitlatch
942 Yeater Lane
Glen Easton, WV 26039

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WV Department of
Environmental Protection

51-01969

WW-6A5
(1/12)

Operator Well No. Heaven Hill 3-7HU

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

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

Date of Notice: 09/29/2017 **Date Permit Application Filed:** 07/07/2017

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

CERTIFIED MAIL **HAND**
RETURN RECEIPT REQUESTED **DELIVERY**

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

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

Name: Ricky L. Whittatch
Address: 1044 Yeater Lane
Glen Easton, WV 26039

Name: Andrew Whittatch
Address: 942 Yeater Lane
Glen Easton, WV 26039 ****See Attached****

Notice is hereby given:

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

State: <u>West Virginia</u>	UTM NAD 83	Easting: <u>526,256.11</u>
County: <u>Marshall</u>		Northing: <u>4,406,564.39</u>
District: <u>Meade</u>	Public Road Access: <u>Yeater Lane (Co. Rt. 21/11)</u>	
Quadrangle: <u>Glen Easton 7 5'</u>	Generally used farm name: <u>Ricky L. Whittatch</u>	
Watershed: <u>(HUC 10) Fish Creek</u>		

This Notice Shall Include:

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

Well Operator: Tug Hill Operating, LLC
Telephone: 724-749-0368
Email: amiller@tug-hill-op.com

Address: 360 Southpointe Blvd, Southpointe Plaza II, Suite 200
Canonsburg, PA 15317
Facsimile: 724-338-2030

Oil and Gas Privacy Notice:

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

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Environmental Protection

SI-01969

Operator Well No. Heaven Hill Unit 3-7HU

WW-6A5 Notice of Entry for Plat Survey Attachment 1 of 1

Notice is hereby provided to the SURFACE OWNER(s):

Name: Arnie Goodnight, et ux
Address: 102 Goodnight Lane
Moundsville, WV 26041

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51-01969



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Jim Justice
Governor

Thomas J. Smith, P. E.
Secretary of Transportation/
Commissioner of Highways

May 16, 2017

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

Subject: DOH Permit for the Heaven Hills Unit 3 Pad, Marshall County
Heaven Hills Unit 3-7HU Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permits #06-2016-0284 & 0287 which have been issued to Tug Hill Operating, LLC for access to the State Road for a well site located off of Marshall County Route 21/3 SLS.

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

Very Truly Yours,

A handwritten signature in blue ink that reads "Gary K. Clayton".

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

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

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Environmental Protection



51-01969

PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

Well No. Heaven Hill 3-7HU

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

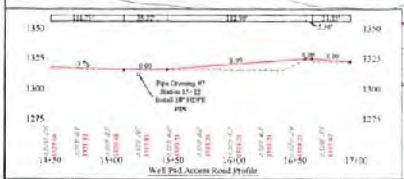
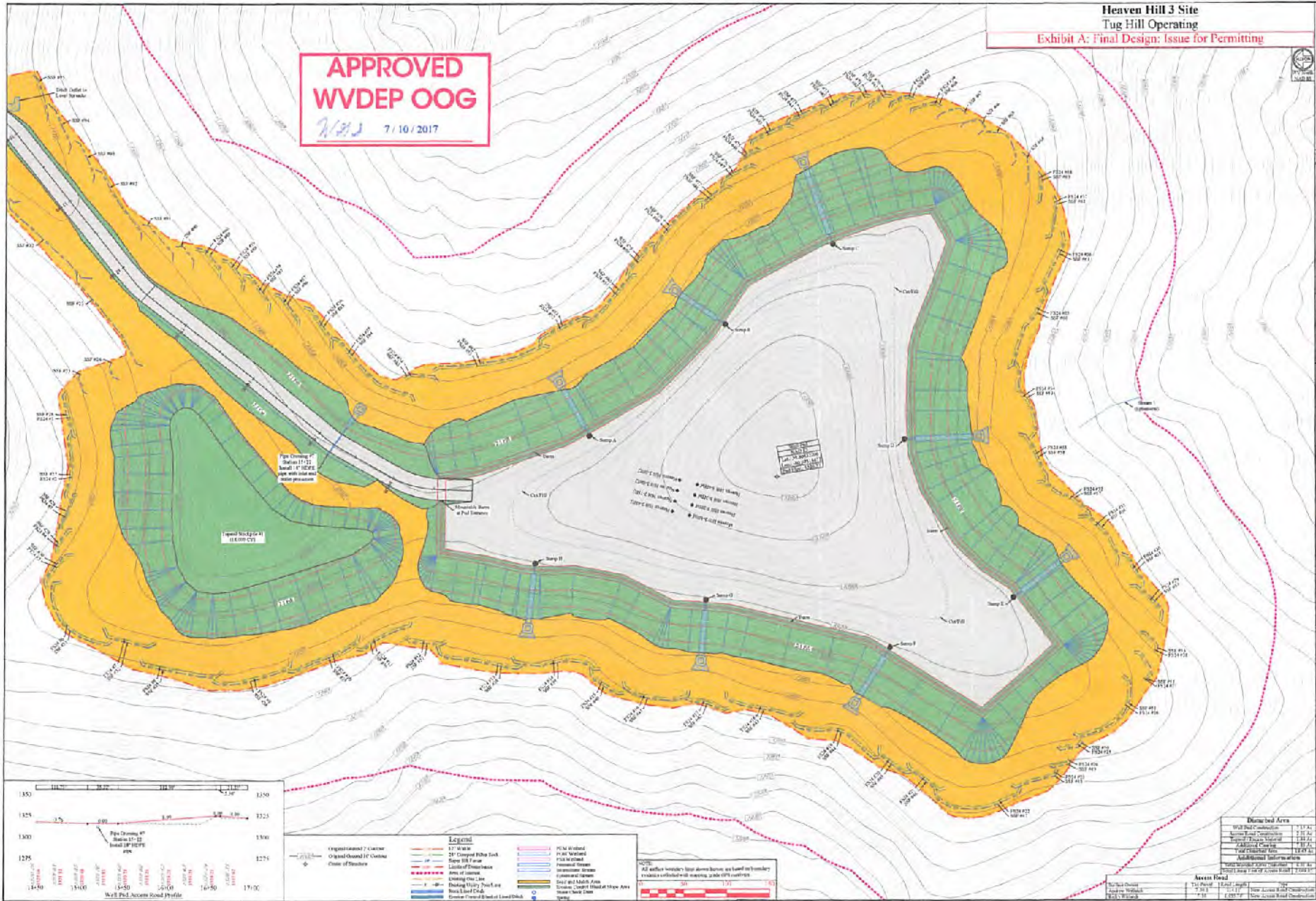
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Office of Oil and Gas

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Heaven Hill 3 Site
Tug Hill Operating
Exhibit A: Final Design: Issue for Permitting

APPROVED
WVDEP OOG
7/10/2017



Legend

Proposed 7' center	17' wide	24" Compacted Pipe Arch	30" Compacted Pipe Arch	PCW Wetland	PCW Wetland
Original Ground 10' Center	30' Wetland	36" Compacted Pipe Arch	48" Compacted Pipe Arch	30' Wetland	30' Wetland
Line of Demarcation	Line of Demarcation	Line of Demarcation	Line of Demarcation	Line of Demarcation	Line of Demarcation
Area of Concern	Area of Concern	Area of Concern	Area of Concern	Area of Concern	Area of Concern
Showing the Line	Showing the Line	Showing the Line	Showing the Line	Showing the Line	Showing the Line
Back to 10' CL	Back to 10' CL	Back to 10' CL	Back to 10' CL	Back to 10' CL	Back to 10' CL
Greater Front of Back of Level (GFB)	Greater Front of Back of Level (GFB)	Greater Front of Back of Level (GFB)	Greater Front of Back of Level (GFB)	Greater Front of Back of Level (GFB)	Greater Front of Back of Level (GFB)

NOTE: All surface boundary lines shown herein are based on boundary evidence collected in the vicinity, under the direction of the Surveyor General of West Virginia.

Revised Area

WVDEP Submittal	11/14/17
WVDEP Approval	11/14/17
WVDEP Approval	11/14/17
WVDEP Approval	11/14/17
WVDEP Approval	11/14/17
WVDEP Approval	11/14/17
WVDEP Approval	11/14/17
WVDEP Approval	11/14/17
WVDEP Approval	11/14/17
WVDEP Approval	11/14/17

HEAVEN HILL OPERATING

THIS DOCUMENT PREPARED FOR TUG HILL OPERATING

K&S CONSULTING

Environmental and Sediment Control Plan
Heaven Hill 3 Site
Mingo District
Mingo County, WV

Scale: 1" = 100'

North Arrow