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west virginia department of environmental protection

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

Jim Justice , Governor  
Austin Caperton , Cabinet Secretary  
www.dep.wv.gov

Tuesday, May 09, 2017  
WELL WORK PERMIT  
Horizontal 6A / New Drill

TUG HILL OPERATING, LLC (A)  
1320 SOUTH UNIVERSITY DRIVE, SUITE 500

FORT WORTH , TX 76107

Re: Permit approval for HEAVEN HILL UNIT 2-8HU  
47-051-01912-00-00

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 UNIT 2-8HU  
Farm Name: CHARLES R. HAGEDORN, JR., ET UX  
U.S. WELL NUMBER: 47-051-01912-00-00  
Horizontal 6A / New Drill  
Date Issued: 5/9/2017

Promoting a healthy environment.

05/12/2017

# 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

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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](mailto:DEPOOGNotify@wv.gov).



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west virginia department of environmental protection

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

Jim Justice, Governor  
Barry K. Lay, Chairman  
ogcc.wv.gov

March 27, 2017

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

RE: Application for Deep Well Permit – API #47-051-01912

COMPANY: Tug Hill Operating, LLC

FARM: Charles R. Hagedorn, Jr., et ux - Heaven Hill Unit 2 – 8HU

COUNTY: Marshall DISTRICT: Meade QUAD: Glen Easton

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, well name, and the name and address of the operator; \*yes  
*Docket 244-233 Exception location hearing*
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,

Cindy Raines  
Administrator

Heaven Hill Pad  
2,500' spacing between lateral of 47-051-01910 6HU  
1,250' spacing between lateral of 47-051-01911 7HU

**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](mailto: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

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Permit well - Heaven Hill Unit 2-8HU

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

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Comments
4705100740	McElroy Coal Co	2780	Unknown	Unknown	Unknown but unlikely, Appears to be an old, shallow well. Old well, records are incomplete. Plugged in 1993



[Table Descriptions](#)  
[County Code Translations](#)  
[Permit-Numbering Series](#)  
[Usage Notes](#)  
[Contact Information](#)  
[Disclaimer](#)  
[WVGES Map](#)  
["Pipeline-Plus" View](#)

Select County: (051) Marshall

Enter Permit #: 00740

Select datatypes:  (Check All)

Location  Production  Plugging  
 Owner/Completion  Stratigraphy  Sample  
 Pay/ShowWater  Logs  Btm Hole Loc

WV Geological & Economic Survey. **Well: County = 51 Permit = 00740**

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_75	LAT_DD	LONG_DD	UTME	UTMN
4705100740	Marshall	740	Meese	Glen Easton	Cameron	39.766409	-80.70007	425612.3	4494316

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_TRG
4705100740	11/15/1904	Original Loc	Completed	W C Gamble (J N Neely)	1	L-1230	2595			Manufacturers Light & Heat Co			
4705100740	1/4/1993	Plugging	Completed	Roy A. Whetzel			M25			McElroy Coal Company			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	G
4705100740	11/15/1904	10/13/1904	1113	Spirit Level				unclassified	unclassified	Dry	unknown	unknown	2780			
4705100740	1/4/1993	12/26/1992	1112	Ground Level						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 Stratigraphy data for this well

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100740	1/4/1993	0

There is no Sample data for this well

5.11. Area of Review-- The permittee shall review the area surrounding the proposed well pad so as to identify and evaluate potential conduits for unintended fracture propagation, a report of which the permittee shall provide to the Office with the application for well work. All existing active, plugged, abandoned, and undocumented wells within a five hundred feet (500') radius of the surface location of the well that is the subject of the new application and within a five hundred feet (500') radius of the lateral section of the wellbore shall be considered for the potential of unintended fracture propagation. The report shall detail those wells that are known or reasonably expected to penetrate a depth that could be within the range of the fracture propagation. The detail shall include at a minimum the API number, operator name, total depth, perforated formation(s) and producing zones not perforated.

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 WV Department of Environmental Protection 05/12/2017



51-01912



Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2-8 HU (slot H)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Site:</b>	Heaven Hill	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2-8 HU (slot H)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev8		

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

<b>Site</b>	Heaven Hill				
<b>Site Position:</b>		<b>Northing:</b>	14,457,660.30 usft	<b>Latitude:</b>	39.80995400
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,720,974.97 usft	<b>Longitude:</b>	-80.71313800
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.18 °

<b>Well</b>	Heaven Hill 2-8 HU (slot H)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,457,661.70 usft	<b>Latitude:</b>	39.80995750
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,721,012.96 usft	<b>Longitude:</b>	-80.71300270
<b>Position Uncertainty</b>	0.00 usft		<b>Wellhead Elevation:</b>		<b>Ground Level:</b>	1,331.00 usft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	1/19/2016	-8.70	67.06	52,355

<b>Design</b>	rev8				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00	
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	150.00	

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	
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,486.99	9.74	216.47	3,484.65	-33.21	-24.54	2.00	2.00	0.00	216.47	
11,122.55	9.74	216.47	11,010.15	-1,072.02	-792.32	0.00	0.00	0.00	0.00	
11,973.94	89.00	150.00	11,538.05	-1,599.34	-582.13	10.00	9.31	-7.81	-66.93	
19,018.94	89.00	150.00	11,661.00	-7,699.56	2,939.83	0.00	0.00	0.00	0.00	Heaven Hill 2-8 PBHL

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Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2-8 HU (slot H)
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<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Site:</b>	Heaven Hill	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2-8 HU (slot H)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev8		

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	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
100.00	0.00	0.00	100.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
200.00	0.00	0.00	200.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
300.00	0.00	0.00	300.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
400.00	0.00	0.00	400.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
500.00	0.00	0.00	500.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
600.00	0.00	0.00	600.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
700.00	0.00	0.00	700.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
800.00	0.00	0.00	800.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
900.00	0.00	0.00	900.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
1,700.00	0.00	0.00	1,700.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
1,900.00	0.00	0.00	1,900.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
2,100.00	0.00	0.00	2,100.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
2,300.00	0.00	0.00	2,300.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
2,600.00	0.00	0.00	2,600.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
2,700.00	0.00	0.00	2,700.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
2,800.00	0.00	0.00	2,800.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
2,900.00	0.00	0.00	2,900.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
3,000.00	0.00	0.00	3,000.00	0.00	0.00	14,457,661.70	1,721,012.96	39.80995750	-80.71300270	
<b>KOP Begin 2°/100' build</b>										
3,100.00	2.00	216.47	3,099.98	-1.40	-1.04	14,457,660.30	1,721,011.92	39.80995366	-80.71300641	
3,200.00	4.00	216.47	3,199.84	-5.61	-4.15	14,457,656.09	1,721,008.81	39.80994213	-80.71301753	
3,300.00	6.00	216.47	3,299.45	-12.62	-9.33	14,457,649.08	1,721,003.63	39.80992292	-80.71303606	
3,400.00	8.00	216.47	3,398.70	-22.42	-16.57	14,457,639.28	1,720,996.39	39.80989607	-80.71306196	
3,486.99	9.74	216.47	3,484.65	-33.21	-24.54	14,457,628.49	1,720,988.42	39.80986652	-80.71309048	
<b>Begin 9.74° tangent section</b>										
3,500.00	9.74	216.47	3,497.47	-34.98	-25.85	14,457,626.72	1,720,987.11	39.80986167	-80.71309515	
3,600.00	9.74	216.47	3,596.03	-48.58	-35.91	14,457,613.12	1,720,977.06	39.80982440	-80.71313111	
3,700.00	9.74	216.47	3,694.59	-62.19	-45.96	14,457,599.51	1,720,967.00	39.80978713	-80.71316708	
3,800.00	9.74	216.47	3,793.15	-75.79	-56.02	14,457,585.91	1,720,956.94	39.80974985	-80.71320304	
3,900.00	9.74	216.47	3,891.70	-89.40	-66.07	14,457,572.30	1,720,946.89	39.80971258	-80.71323900	
4,000.00	9.74	216.47	3,990.26	-103.00	-76.13	14,457,558.70	1,720,936.83	39.80967530	-80.71327496	
4,100.00	9.74	216.47	4,088.82	-116.61	-86.18	14,457,545.09	1,720,926.78	39.80963803	-80.71331092	
4,200.00	9.74	216.47	4,187.38	-130.21	-96.24	14,457,531.49	1,720,916.72	39.80960076	-80.71334688	
4,300.00	9.74	216.47	4,285.94	-143.82	-106.29	14,457,517.88	1,720,906.67	39.80956348	-80.71338284	
4,400.00	9.74	216.47	4,384.50	-157.42	-116.35	14,457,504.28	1,720,896.61	39.80952621	-80.71341880	
4,500.00	9.74	216.47	4,483.06	-171.03	-126.40	14,457,490.67	1,720,886.56	39.80948893	-80.71345476	
4,600.00	9.74	216.47	4,581.62	-184.63	-136.46	14,457,477.07	1,720,876.50	39.80945166	-80.71349072	
4,700.00	9.74	216.47	4,680.17	-198.24	-146.51	14,457,463.46	1,720,866.45	39.80941438	-80.71352668	
4,800.00	9.74	216.47	4,778.73	-211.84	-156.57	14,457,449.86	1,720,856.39	39.80937711	-80.71356264	
4,900.00	9.74	216.47	4,877.29	-225.45	-166.63	14,457,436.25	1,720,846.34	39.80933984	-80.71359860	
5,000.00	9.74	216.47	4,975.85	-239.05	-176.68	14,457,422.65	1,720,836.28	39.80930258	-80.71363456	

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Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2-8 HU (slot H)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Site:</b>	Heaven Hill	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2-8 HU (slot H)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev8		

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	9.74	216.47	5,074.41	-252.66	-186.74	14,457,409.04	1,720,826.23	39.80926529	-80.71367052
5,200.00	9.74	216.47	5,172.97	-266.26	-196.79	14,457,395.44	1,720,816.17	39.80922801	-80.71370648
5,300.00	9.74	216.47	5,271.53	-279.87	-206.85	14,457,381.83	1,720,806.12	39.80919074	-80.71374244
5,400.00	9.74	216.47	5,370.08	-293.47	-216.90	14,457,368.23	1,720,796.06	39.80915347	-80.71377840
5,500.00	9.74	216.47	5,468.64	-307.08	-226.96	14,457,354.62	1,720,786.00	39.80911619	-80.71381436
5,600.00	9.74	216.47	5,567.20	-320.68	-237.01	14,457,341.02	1,720,775.95	39.80907892	-80.71385033
5,700.00	9.74	216.47	5,665.76	-334.29	-247.07	14,457,327.41	1,720,765.89	39.80904164	-80.71388629
5,800.00	9.74	216.47	5,764.32	-347.89	-257.12	14,457,313.81	1,720,755.84	39.80900437	-80.71392225
5,900.00	9.74	216.47	5,862.88	-361.50	-267.18	14,457,300.20	1,720,745.78	39.80896709	-80.71395821
6,000.00	9.74	216.47	5,961.44	-375.10	-277.23	14,457,286.60	1,720,735.73	39.80892982	-80.71399417
6,100.00	9.74	216.47	6,059.99	-388.71	-287.29	14,457,272.99	1,720,725.67	39.80889255	-80.71403013
6,200.00	9.74	216.47	6,158.55	-402.31	-297.34	14,457,259.39	1,720,715.62	39.80885527	-80.71406609
6,300.00	9.74	216.47	6,257.11	-415.92	-307.40	14,457,245.78	1,720,705.56	39.80881800	-80.71410205
6,400.00	9.74	216.47	6,355.67	-429.52	-317.45	14,457,232.18	1,720,695.51	39.80878072	-80.71413801
6,500.00	9.74	216.47	6,454.23	-443.13	-327.51	14,457,218.57	1,720,685.45	39.80874345	-80.71417396
6,600.00	9.74	216.47	6,552.79	-456.73	-337.57	14,457,204.97	1,720,675.40	39.80870617	-80.71420992
6,700.00	9.74	216.47	6,651.35	-470.33	-347.62	14,457,191.36	1,720,665.34	39.80866890	-80.71424588
6,800.00	9.74	216.47	6,749.90	-483.94	-357.68	14,457,177.76	1,720,655.29	39.80863163	-80.71428184
6,900.00	9.74	216.47	6,848.46	-497.54	-367.73	14,457,164.15	1,720,645.23	39.80859435	-80.71431780
7,000.00	9.74	216.47	6,947.02	-511.15	-377.79	14,457,150.55	1,720,635.18	39.80855708	-80.71435376
7,100.00	9.74	216.47	7,045.58	-524.75	-387.84	14,457,136.94	1,720,625.12	39.80851980	-80.71438972
7,200.00	9.74	216.47	7,144.14	-538.36	-397.90	14,457,123.34	1,720,615.06	39.80848253	-80.71442568
7,300.00	9.74	216.47	7,242.70	-551.96	-407.95	14,457,109.73	1,720,605.01	39.80844525	-80.71446164
7,400.00	9.74	216.47	7,341.26	-565.57	-418.01	14,457,096.13	1,720,594.95	39.80840798	-80.71449760
7,500.00	9.74	216.47	7,439.81	-579.17	-428.06	14,457,082.52	1,720,584.90	39.80837070	-80.71453356
7,600.00	9.74	216.47	7,538.37	-592.78	-438.12	14,457,068.92	1,720,574.84	39.80833343	-80.71456952
7,700.00	9.74	216.47	7,636.93	-606.38	-448.17	14,457,055.31	1,720,564.79	39.80829616	-80.71460548
7,800.00	9.74	216.47	7,735.49	-619.99	-458.23	14,457,041.71	1,720,554.73	39.80825888	-80.71464144
7,900.00	9.74	216.47	7,834.05	-633.59	-468.28	14,457,028.10	1,720,544.68	39.80822161	-80.71467740
8,000.00	9.74	216.47	7,932.61	-647.20	-478.34	14,457,014.50	1,720,534.62	39.80818433	-80.71471336
8,100.00	9.74	216.47	8,031.17	-660.80	-488.39	14,457,000.89	1,720,524.57	39.80814706	-80.71474932
8,200.00	9.74	216.47	8,129.72	-674.41	-498.45	14,456,987.29	1,720,514.51	39.80810978	-80.71478528
8,300.00	9.74	216.47	8,228.28	-688.01	-508.51	14,456,973.69	1,720,504.46	39.80807251	-80.71482124
8,400.00	9.74	216.47	8,326.84	-701.62	-518.56	14,456,960.08	1,720,494.40	39.80803523	-80.71485719
8,500.00	9.74	216.47	8,425.40	-715.22	-528.62	14,456,946.48	1,720,484.35	39.80799796	-80.71489315
8,600.00	9.74	216.47	8,523.96	-728.83	-538.67	14,456,932.87	1,720,474.29	39.80796068	-80.71492911
8,700.00	9.74	216.47	8,622.52	-742.43	-548.73	14,456,919.27	1,720,464.24	39.80792341	-80.71496507
8,800.00	9.74	216.47	8,721.08	-756.04	-558.78	14,456,905.66	1,720,454.18	39.80788614	-80.71500103
8,900.00	9.74	216.47	8,819.63	-769.64	-568.84	14,456,892.06	1,720,444.12	39.80784886	-80.71503699
9,000.00	9.74	216.47	8,918.19	-783.25	-578.89	14,456,878.45	1,720,434.07	39.80781159	-80.71507295
9,100.00	9.74	216.47	9,016.75	-796.85	-588.95	14,456,864.85	1,720,424.01	39.80777431	-80.71510891
9,200.00	9.74	216.47	9,115.31	-810.46	-599.00	14,456,851.24	1,720,413.96	39.80773704	-80.71514487
9,300.00	9.74	216.47	9,213.87	-824.06	-609.06	14,456,837.64	1,720,403.90	39.80769976	-80.71518082
9,400.00	9.74	216.47	9,312.43	-837.67	-619.11	14,456,824.03	1,720,393.85	39.80766249	-80.71521678
9,500.00	9.74	216.47	9,410.99	-851.27	-629.17	14,456,810.43	1,720,383.79	39.80762521	-80.71525274
9,600.00	9.74	216.47	9,509.55	-864.88	-639.22	14,456,796.82	1,720,373.74	39.80758794	-80.71528870
9,700.00	9.74	216.47	9,608.10	-878.48	-649.28	14,456,783.22	1,720,363.68	39.80755066	-80.71532466
9,800.00	9.74	216.47	9,706.66	-892.09	-659.33	14,456,769.61	1,720,353.63	39.80751339	-80.71536062
9,900.00	9.74	216.47	9,805.22	-905.69	-669.39	14,456,756.01	1,720,343.57	39.80747611	-80.71539658
10,000.00	9.74	216.47	9,903.78	-919.30	-679.45	14,456,742.40	1,720,333.52	39.80743884	-80.71543253
10,100.00	9.74	216.47	10,002.34	-932.90	-689.50	14,456,728.80	1,720,323.46	39.80740156	-80.71546849
10,200.00	9.74	216.47	10,100.90	-946.51	-699.56	14,456,715.19	1,720,313.41	39.80736429	-80.71550445
10,300.00	9.74	216.47	10,199.46	-960.11	-709.61	14,456,701.59	1,720,303.35	39.80732702	-80.71554041
10,400.00	9.74	216.47	10,298.01	-973.72	-719.67	14,456,687.98	1,720,293.30	39.80728974	-80.71557637
10,500.00	9.74	216.47	10,396.57	-987.32	-729.72	14,456,674.38	1,720,283.24	39.80725247	-80.71561233

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Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2-8 HU (slot H)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Site:</b>	Heaven Hill	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2-8 HU (slot H)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev8		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,600.00	9.74	216.47	10,495.13	-1,000.93	-739.78	14,456,660.77	1,720,273.18	39.80721519	-80.71564828	
10,700.00	9.74	216.47	10,593.69	-1,014.53	-749.83	14,456,647.17	1,720,263.13	39.80717792	-80.71568424	
10,800.00	9.74	216.47	10,692.25	-1,028.14	-759.89	14,456,633.56	1,720,253.07	39.80714064	-80.71572020	
10,900.00	9.74	216.47	10,790.81	-1,041.74	-769.94	14,456,619.96	1,720,243.02	39.80710337	-80.71575616	
11,000.00	9.74	216.47	10,889.37	-1,055.35	-780.00	14,456,606.35	1,720,232.96	39.80706609	-80.71579212	
11,100.00	9.74	216.47	10,987.92	-1,068.95	-790.05	14,456,592.75	1,720,222.91	39.80702882	-80.71582808	
11,122.55	9.74	216.47	11,010.15	-1,072.02	-792.32	14,456,589.68	1,720,220.64	39.80702041	-80.71583618	
<b>Begin 10°/100' build/turn</b>										
11,200.00	14.61	187.03	11,085.90	-1,087.01	-797.42	14,456,574.69	1,720,215.54	39.80697930	-80.71585450	
11,300.00	23.29	171.31	11,180.45	-1,119.15	-795.97	14,456,542.55	1,720,216.99	39.80689101	-80.71584971	
11,400.00	32.71	164.04	11,268.67	-1,164.79	-785.53	14,456,496.91	1,720,227.43	39.80676557	-80.71581304	
11,500.00	42.37	159.79	11,347.88	-1,222.54	-766.41	14,456,439.16	1,720,246.55	39.80660681	-80.71574562	
11,600.00	52.15	156.88	11,415.67	-1,290.64	-739.19	14,456,371.05	1,720,273.77	39.80641955	-80.71564948	
11,700.00	61.97	154.65	11,469.99	-1,367.03	-704.71	14,456,294.67	1,720,308.25	39.80620947	-80.71552756	
11,800.00	71.83	152.81	11,509.18	-1,449.38	-664.00	14,456,212.32	1,720,348.96	39.80598296	-80.71538355	
11,900.00	81.70	151.16	11,532.06	-1,535.20	-618.31	14,456,126.50	1,720,394.65	39.80574690	-80.71522183	
11,973.94	89.00	150.00	11,538.05	-1,599.34	-582.13	14,456,062.36	1,720,430.83	39.80557041	-80.71509373	
<b>Begin 89.00° lateral section</b>										
12,000.00	89.00	150.00	11,538.50	-1,621.91	-569.10	14,456,039.79	1,720,443.86	39.80550833	-80.71504760	
12,100.00	89.00	150.00	11,540.25	-1,708.50	-519.11	14,455,953.20	1,720,493.85	39.80527010	-80.71487058	
12,200.00	89.00	150.00	11,541.99	-1,795.09	-469.12	14,455,866.61	1,720,543.84	39.80503187	-80.71469356	
12,300.00	89.00	150.00	11,543.74	-1,881.68	-419.13	14,455,780.02	1,720,593.83	39.80479363	-80.71451654	
12,400.00	89.00	150.00	11,545.48	-1,968.26	-369.13	14,455,693.43	1,720,643.83	39.80455540	-80.71433952	
12,500.00	89.00	150.00	11,547.23	-2,054.85	-319.14	14,455,606.85	1,720,693.82	39.80431716	-80.71416250	
12,600.00	89.00	150.00	11,548.97	-2,141.44	-269.15	14,455,520.26	1,720,743.81	39.80407893	-80.71398548	
12,700.00	89.00	150.00	11,550.72	-2,228.03	-219.16	14,455,433.67	1,720,793.80	39.80384069	-80.71380847	
12,800.00	89.00	150.00	11,552.46	-2,314.62	-169.17	14,455,347.08	1,720,843.80	39.80360246	-80.71363145	
12,900.00	89.00	150.00	11,554.21	-2,401.21	-119.17	14,455,260.49	1,720,893.79	39.80336422	-80.71345444	
13,000.00	89.00	150.00	11,555.96	-2,487.80	-69.18	14,455,173.90	1,720,943.78	39.80312599	-80.71327743	
13,100.00	89.00	150.00	11,557.70	-2,574.39	-19.19	14,455,087.31	1,720,993.77	39.80288775	-80.71310041	
13,200.00	89.00	150.00	11,559.45	-2,660.98	30.80	14,455,000.72	1,721,043.77	39.80264951	-80.71292340	
13,300.00	89.00	150.00	11,561.19	-2,747.57	80.80	14,454,914.13	1,721,093.76	39.80241128	-80.71274640	
13,400.00	89.00	150.00	11,562.94	-2,834.16	130.79	14,454,827.54	1,721,143.75	39.80217304	-80.71256939	
13,500.00	89.00	150.00	11,564.68	-2,920.75	180.78	14,454,740.95	1,721,193.74	39.80193480	-80.71239238	
13,600.00	89.00	150.00	11,566.43	-3,007.34	230.77	14,454,654.36	1,721,243.74	39.80169657	-80.71221538	
13,700.00	89.00	150.00	11,568.17	-3,093.93	280.77	14,454,567.77	1,721,293.73	39.80145833	-80.71203837	
13,800.00	89.00	150.00	11,569.92	-3,180.52	330.76	14,454,481.18	1,721,343.72	39.80122009	-80.71186137	
13,900.00	89.00	150.00	11,571.66	-3,267.10	380.75	14,454,394.59	1,721,393.71	39.80098185	-80.71168437	
14,000.00	89.00	150.00	11,573.41	-3,353.69	430.74	14,454,308.00	1,721,443.71	39.80074361	-80.71150737	
14,100.00	89.00	150.00	11,575.15	-3,440.28	480.74	14,454,221.42	1,721,493.70	39.80050537	-80.71133037	
14,200.00	89.00	150.00	11,576.90	-3,526.87	530.73	14,454,134.83	1,721,543.69	39.80026713	-80.71115337	
14,300.00	89.00	150.00	11,578.64	-3,613.46	580.72	14,454,048.24	1,721,593.68	39.80002890	-80.71097638	
14,400.00	89.00	150.00	11,580.39	-3,700.05	630.71	14,453,961.65	1,721,643.67	39.79979066	-80.71079938	
14,500.00	89.00	150.00	11,582.13	-3,786.64	680.71	14,453,875.06	1,721,693.67	39.79955242	-80.71062239	
14,600.00	89.00	150.00	11,583.88	-3,873.23	730.70	14,453,788.47	1,721,743.66	39.79931417	-80.71044539	
14,700.00	89.00	150.00	11,585.62	-3,959.82	780.69	14,453,701.88	1,721,793.65	39.79907593	-80.71026840	
14,800.00	89.00	150.00	11,587.37	-4,046.41	830.68	14,453,615.29	1,721,843.64	39.79883769	-80.71009141	
14,900.00	89.00	150.00	11,589.11	-4,133.00	880.67	14,453,528.70	1,721,893.64	39.79859945	-80.70991442	
15,000.00	89.00	150.00	11,590.86	-4,219.59	930.67	14,453,442.11	1,721,943.63	39.79836121	-80.70973743	
15,100.00	89.00	150.00	11,592.61	-4,306.18	980.66	14,453,355.52	1,721,993.62	39.79812297	-80.70956045	
15,200.00	89.00	150.00	11,594.35	-4,392.77	1,030.65	14,453,268.93	1,722,043.61	39.79788473	-80.70938346	
15,300.00	89.00	150.00	11,596.10	-4,479.36	1,080.64	14,453,182.34	1,722,093.61	39.79764649	-80.70920648	
15,400.00	89.00	150.00	11,597.84	-4,565.94	1,130.64	14,453,095.75	1,722,143.60	39.79740824	-80.70902949	
15,500.00	89.00	150.00	11,599.59	-4,652.53	1,180.63	14,453,009.16	1,722,193.59	39.79717000	-80.70885251	

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<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Site:</b>	Heaven Hill	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2-8 HU (slot H)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev8		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
15,600.00	89.00	150.00	11,601.33	-4,739.12	1,230.62	14,452,922.58	1,722,243.58	39.79693176	-80.70867553	
15,700.00	89.00	150.00	11,603.08	-4,825.71	1,280.61	14,452,835.99	1,722,293.58	39.79669351	-80.70849855	
15,800.00	89.00	150.00	11,604.82	-4,912.30	1,330.61	14,452,749.40	1,722,343.57	39.79645527	-80.70832157	
15,900.00	89.00	150.00	11,606.57	-4,998.89	1,380.60	14,452,662.81	1,722,393.56	39.79621703	-80.70814460	
16,000.00	89.00	150.00	11,608.31	-5,085.48	1,430.59	14,452,576.22	1,722,443.55	39.79597878	-80.70796762	
16,100.00	89.00	150.00	11,610.06	-5,172.07	1,480.58	14,452,489.63	1,722,493.55	39.79574054	-80.70779065	
16,200.00	89.00	150.00	11,611.80	-5,258.66	1,530.58	14,452,403.04	1,722,543.54	39.79550229	-80.70761367	
16,300.00	89.00	150.00	11,613.55	-5,345.25	1,580.57	14,452,316.45	1,722,593.53	39.79526405	-80.70743670	
16,400.00	89.00	150.00	11,615.29	-5,431.84	1,630.56	14,452,229.86	1,722,643.52	39.79502580	-80.70725973	
16,500.00	89.00	150.00	11,617.04	-5,518.43	1,680.55	14,452,143.27	1,722,693.51	39.79478756	-80.70708276	
16,600.00	89.00	150.00	11,618.78	-5,605.02	1,730.55	14,452,056.68	1,722,743.51	39.79454931	-80.70690579	
16,700.00	89.00	150.00	11,620.53	-5,691.61	1,780.54	14,451,970.09	1,722,793.50	39.79431106	-80.70672883	
16,800.00	89.00	150.00	11,622.27	-5,778.20	1,830.53	14,451,883.50	1,722,843.49	39.79407282	-80.70655186	
16,900.00	89.00	150.00	11,624.02	-5,864.79	1,880.52	14,451,796.91	1,722,893.48	39.79383457	-80.70637489	
17,000.00	89.00	150.00	11,625.76	-5,951.37	1,930.51	14,451,710.32	1,722,943.48	39.79359633	-80.70619793	
17,100.00	89.00	150.00	11,627.51	-6,037.96	1,980.51	14,451,623.73	1,722,993.47	39.79335808	-80.70602097	
17,200.00	89.00	150.00	11,629.26	-6,124.55	2,030.50	14,451,537.15	1,723,043.46	39.79311983	-80.70584401	
17,300.00	89.00	150.00	11,631.00	-6,211.14	2,080.49	14,451,450.56	1,723,093.45	39.79288158	-80.70566705	
17,400.00	89.00	150.00	11,632.75	-6,297.73	2,130.48	14,451,363.97	1,723,143.45	39.79264333	-80.70549009	
17,500.00	89.00	150.00	11,634.49	-6,384.32	2,180.48	14,451,277.38	1,723,193.44	39.79240509	-80.70531313	
17,600.00	89.00	150.00	11,636.24	-6,470.91	2,230.47	14,451,190.79	1,723,243.43	39.79216684	-80.70513617	
17,700.00	89.00	150.00	11,637.98	-6,557.50	2,280.46	14,451,104.20	1,723,293.42	39.79192859	-80.70495922	
17,800.00	89.00	150.00	11,639.73	-6,644.09	2,330.45	14,451,017.61	1,723,343.42	39.79169034	-80.70478227	
17,900.00	89.00	150.00	11,641.47	-6,730.68	2,380.45	14,450,931.02	1,723,393.41	39.79145209	-80.70460531	
18,000.00	89.00	150.00	11,643.22	-6,817.27	2,430.44	14,450,844.43	1,723,443.40	39.79121384	-80.70442836	
18,100.00	89.00	150.00	11,644.96	-6,903.86	2,480.43	14,450,757.84	1,723,493.39	39.79097559	-80.70425141	
18,200.00	89.00	150.00	11,646.71	-6,990.45	2,530.42	14,450,671.25	1,723,543.39	39.79073734	-80.70407446	
18,300.00	89.00	150.00	11,648.45	-7,077.04	2,580.42	14,450,584.66	1,723,593.38	39.79049909	-80.70389751	
18,400.00	89.00	150.00	11,650.20	-7,163.63	2,630.41	14,450,498.07	1,723,643.37	39.79026084	-80.70372057	
18,500.00	89.00	150.00	11,651.94	-7,250.21	2,680.40	14,450,411.48	1,723,693.36	39.79002259	-80.70354362	
18,600.00	89.00	150.00	11,653.69	-7,336.80	2,730.39	14,450,324.89	1,723,743.35	39.78978434	-80.70336668	
18,700.00	89.00	150.00	11,655.43	-7,423.39	2,780.39	14,450,238.31	1,723,793.35	39.78954609	-80.70318974	
18,800.00	89.00	150.00	11,657.18	-7,509.98	2,830.38	14,450,151.72	1,723,843.34	39.78930783	-80.70301279	
18,900.00	89.00	150.00	11,658.92	-7,596.57	2,880.37	14,450,065.13	1,723,893.33	39.78906958	-80.70283585	
19,000.00	89.00	150.00	11,660.67	-7,683.16	2,930.36	14,449,978.54	1,723,943.32	39.78883133	-80.70265891	
19,018.94	89.00	150.00	11,661.00	-7,699.56	2,939.83	14,449,962.14	1,723,952.79	39.78878620	-80.70262540	

PBHL/TD

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Heaven Hill 2-8 LP r7	0.00	0.00	11,529.00	-1,122.12	-857.66	14,456,539.58	1,720,155.30	39.80688340	-80.71606940	
- plan misses target center by 222.55usft at 11529.64usft MD (11369.26 TVD, -1241.73 N, -759.15 E)										
- Point										
Heaven Hill 2-8 PBHL r7	0.00	0.00	11,661.00	-7,699.56	2,939.83	14,449,962.14	1,723,952.79	39.78878620	-80.70262540	
- plan hits target center										
- Point										

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51-01912



Planning Report - Geographic

<b>Database:</b>	DB Jul2216dt	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2-8 HU (slot H)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	RKB=1331+28 @ 1359.00usft
<b>Site:</b>	Heaven Hill	<b>North Reference:</b>	Grid
<b>Well:</b>	Heaven Hill 2-8 HU (slot H)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev8		

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,100.00	1,100.00	20" Casing @ 1100 TVD	20	24	
2,800.00	2,800.00	13 3/8" Casing @ 2800 TVD	13-3/8	17-1/2	
10,452.75	10,350.00	9 5/8" Casing @ 10350 TVD	9-5/8	12-1/4	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
3,000.00	3,000.00	0.00	0.00	KOP Begin 2°/100' build	
3,486.99	3,484.65	-33.21	-24.54	Begin 9.74° tangent section	
11,122.55	11,010.15	-1,072.02	-792.32	Begin 10°/100' build/turn	
11,973.94	11,538.05	-1,599.34	-582.13	Begin 89.00° lateral section	
19,018.94	11,661.00	-7,699.56	2,939.83	PBHL/TD	

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

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

2) Operator's Well Number: Heaven Hill Unit 2-8HU      Well Pad Name: Heaven Hill Unit 2

3) Farm Name/Surface Owner: Charles R. Hagedorn, Jr., et ux      Public Road Access: Blake Ridge Rd (Co. Rt. 21/3)

4) Elevation, current ground: 1350'      Elevation, proposed post-construction: 1331'

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

(b) If Gas Shallow  Deep   
Horizontal

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Point Pleasant is the target formation at a depth of 11,504' - 11,634' thickness of 130' and anticipated pressure of approx. 7500 psi

8) Proposed Total Vertical Depth: 11,784'

9) Formation at Total Vertical Depth: Trenton

10) Proposed Total Measured Depth: 19,019'

11) Proposed Horizontal Leg Length: 7,045'

12) Approximate Fresh Water Strata Depths: 70', 1066'

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 - 969' and Pittsburgh Coal - 1059'

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: 1059' TVD and 291' subsea level  
Seam: Pittsburgh #8  
Owner: Murray Energy / Consolidated Coal Co.

WW-6B  
(04/15)

API NO. 47- 051 - 01912  
 OPERATOR WELL NO. Heaven Hill Unit 2-8HU  
 Well Pad Name: Heaven Hill Unit 2

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	125'	120'	259FT^3(CTS)
Fresh Water	20"	NEW	J55	106.5#	1,200'	1,190'	1,900ft^3(CTS)
Coal	13 3/8"	NEW	J55	54.5#	2,885'	2,875'	2,033ft^3(CTS)
Intermediate	9 5/8"	NEW	J55	47#	10,475'	10,465'	3,420ft^3(CTS)
Production	5 1/2"	NEW	HP110	23#	19,029'	19,019'	4,535ft^3(CTS)
Tubing	2 7/8"	NEW	P110	6.5#		11,174'	
Liners							

*Jan 4/28/17*

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 7/8"			14,530	11,624		
Liners							

**PACKERS**

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

WW-6B  
(10/14)

API NO. 47- 051 - 01912  
OPERATOR WELL NO. Heaven Hill Unit 2-8HU  
Well Pad Name: Heaven Hill Unit 2

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

*Handwritten signature and date: 4/28/17*

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 18,112,500 lb proppant and 280,032 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 32.98

22) Area to be disturbed for well pad only, less access road (acres): 4.57

23) Describe centralizer placement for each casing string:

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

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

\*See Attachment

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.



SI-01912

WW6B Attachment to #24

**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

WW6B Attachment to #24.

**Conductor and Surface Casing Cement:**

*Premium NE-1 + 2% CaCl*

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

**Intermediate Casing:**

*Premium NE-1 + 1% CaCl + .25 lb/sk Cello Flake + .25% BA-10A + .75 gals/100sk FP-13L*

- Premium NE-1 – Class A Portland API spec
- CaCl – Calcium Chloride
- Cello Flake – Fluid Loss Preventer
- BA-10A – Bonding Agent
- FP-13L – Anti-Foaming Agent

**Production Casing Cement:**

Lead: *50:50 (Poz:Premium NE-1) + .2% R-3 + .2% MPA-170 + .75 gal/100sk FP-13L*

Tail: *Premium NE-1 + .5% R-3 + .1% ASA-301 + .25% MPA-170 + .35% BA-10A + .75 gal-100sk FP-13L + 60 lb/sk ASCA-1*

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

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WV Department of  
Environmental Protection

05/12/2017



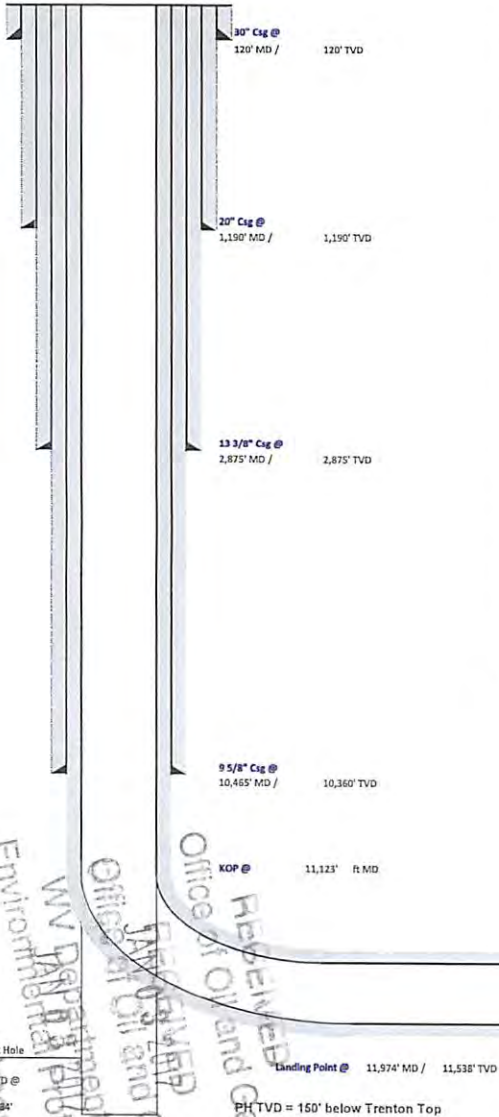
WELL NAME: **Heaven Hill 2-8HU**  
 STATE: **West Virginia** COUNTY: **Marshall**  
 DISTRICT: **Meade**  
 DF Elev: **1,359'** GL Elev: **1,331'**  
 TD: **19,019'**  
 TH Latitude: **39.80995756**  
 TH Longitude: **-80.71300276**  
 BH Latitude: **39.7887862**  
 BH Longitude: **-80.7026254**

*du*  
12/27/16

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	1,068'
Sewickley Coal	969'
Pittsburgh Coal	1,059'
Big Lime	2,063'
Berea	2,687'
Tully	6,620'
Marcellus	6,727'
Onondaga	6,779'
Salina	7,484'
Lockport	8,540'
Utica	11,337'
Point Pleasant	11,504'
Landing Depth	11,538'
Trenton	11,634'
Pilot Hole TD	11,784'

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	BW	Surface
Surface	26	20	1,190'	1,190'	106.5	J55	Surface
Intermediate 1	17 1/2	13 3/8	2,875'	2,875'	54.5	J55	Surface
Intermediate 2	12 1/4	9 5/8	10,465'	10,360'	47	HP110	Surface
Production	8 1/2	5 1/2	19,019'	11,661'	23	P110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
	Sacks	Class	Density	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	2,051	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	2,202	A	15	Air	1 Centralizer every other jt
Intermediate 2	2,786	A	14.5	Air	1 Centralizer every other jt
Production	3,897	A	15	Air / SOBM	1 every other joint in lateral; 1 per joint in curve; 1 every other jt to s/c



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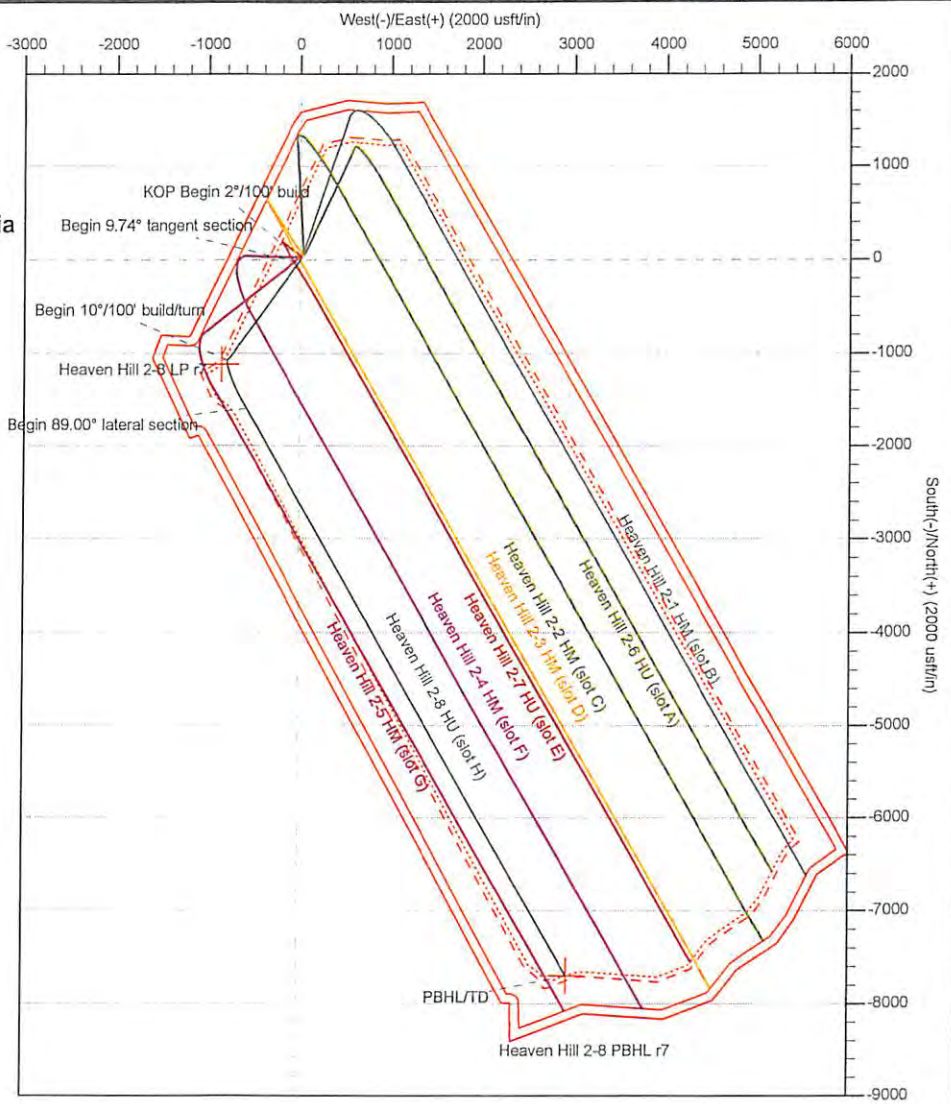
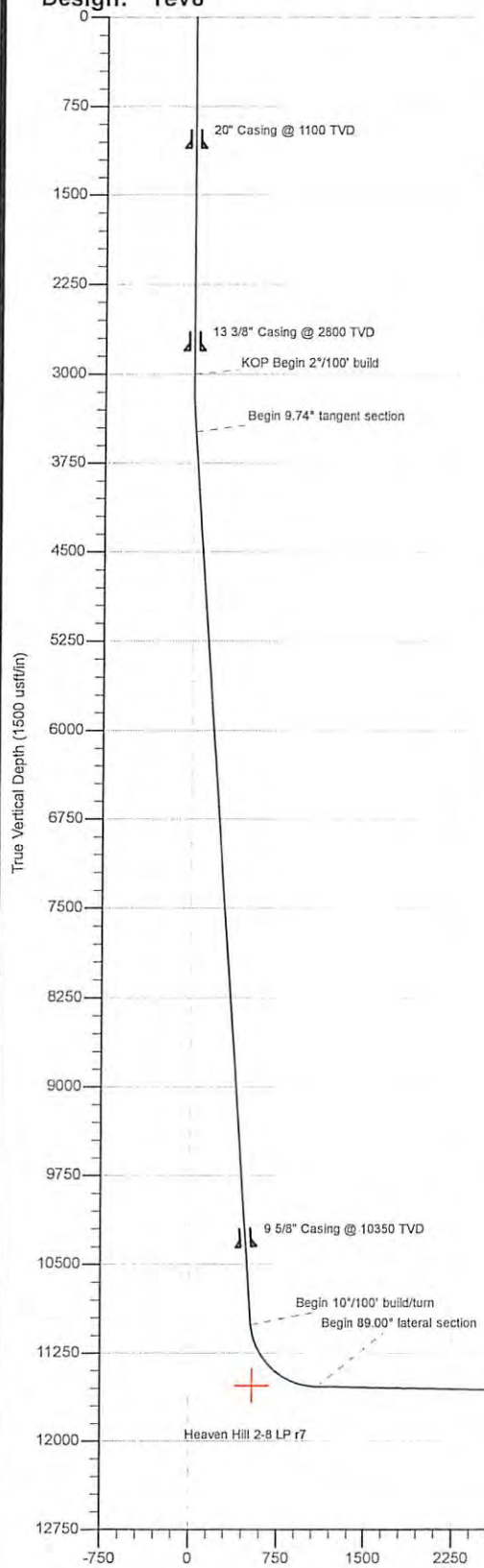
Lateral TD @ 19,019' ft MD  
 11,661' ft TVD

SI-019124

51-01912



**Tug Hill Operating LLC**  
**Well: Heaven Hill 2-8 HU (slot H)**  
**Site: Heaven Hill**  
**Project: Marshall County, West Virginia**  
**Design: rev8**



**SECTION DETAILS**

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3000.00	0.00	0.00	3000.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	3486.99	9.74	216.47	3484.65	-33.21	-24.54	2.00	216.47	16.49	Begin 9.74° tangent section
4	11122.55	9.74	216.47	11010.15	-1072.02	-792.32	0.00	0.00	532.24	Begin 10°/100' build/turn
5	11973.94	89.00	150.00	11538.05	-1599.34	-582.13	10.00	-66.93	1094.01	Begin 89.00° lateral section
6	19018.94	89.00	150.00	11661.00	-7699.56	2939.83	0.00	0.00	8137.93	PBHL/TD

Surface Location: RKB=1331+28 @ 1359.00usft  
 Universal Transverse Mercator (US Survey Feet)  
 Zone 17N (84 W to 78 W)  
 Northing: 14457661.70    Easting: 1721012.95    Latitude: 39.80995750    Longitude: -80.71300270

Total Correction (M => G)    To convert a Magnetic Direction to a Grid Direction, Subtract 8.89°



Azimuths to Grid North  
 True North: -0.18°  
 Magnetic North: -8.88°  
 Magnetic Field Strength: 52355.2snT  
 Dip Angle: 67.06°  
 Date: 1/19/2016  
 Model: IGRF2010

JAN 03 2017  
 WV Department of Environmental Protection  
 Heaven Hill 2-8 PBHL r7

WW-9  
(4/16)

API Number 47 - 051 - 01912  
Operator's Well No. Heaven Hill Unit 2-8HU

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Tug Hill Operating, LLC OP Code 494510851

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

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

Will a pit be used? Yes  No

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

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

Proposed Disposal Method For Treated Pit Wastes:

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

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

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

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

Additives to be used in drilling medium? Barite for weight

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

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

-Landfill or offsite name/permit number? Wetzel County Sanitary Landfill (SWF-1021 / WV0109185)

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 [Signature]

Company Official (Typed Name) David Patterson

Company Official Title Senior Vice President, Operations

Subscribed and sworn before me this 22ND day of December, 20 16

Cynthia Hays Notary Public

My commission expires Dec 10, 2019

RECEIVED

Office of Oil and Gas

JAN 03 2017



05/12/2017

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 32.98 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
Annual Ryegrass	40

Seed Type	lbs/acre
Orchard Grass	10
Ladino Clover	3

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: *Jim Wheeler*

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Title: Oil & Gas Inspector

Date: 12/27/10

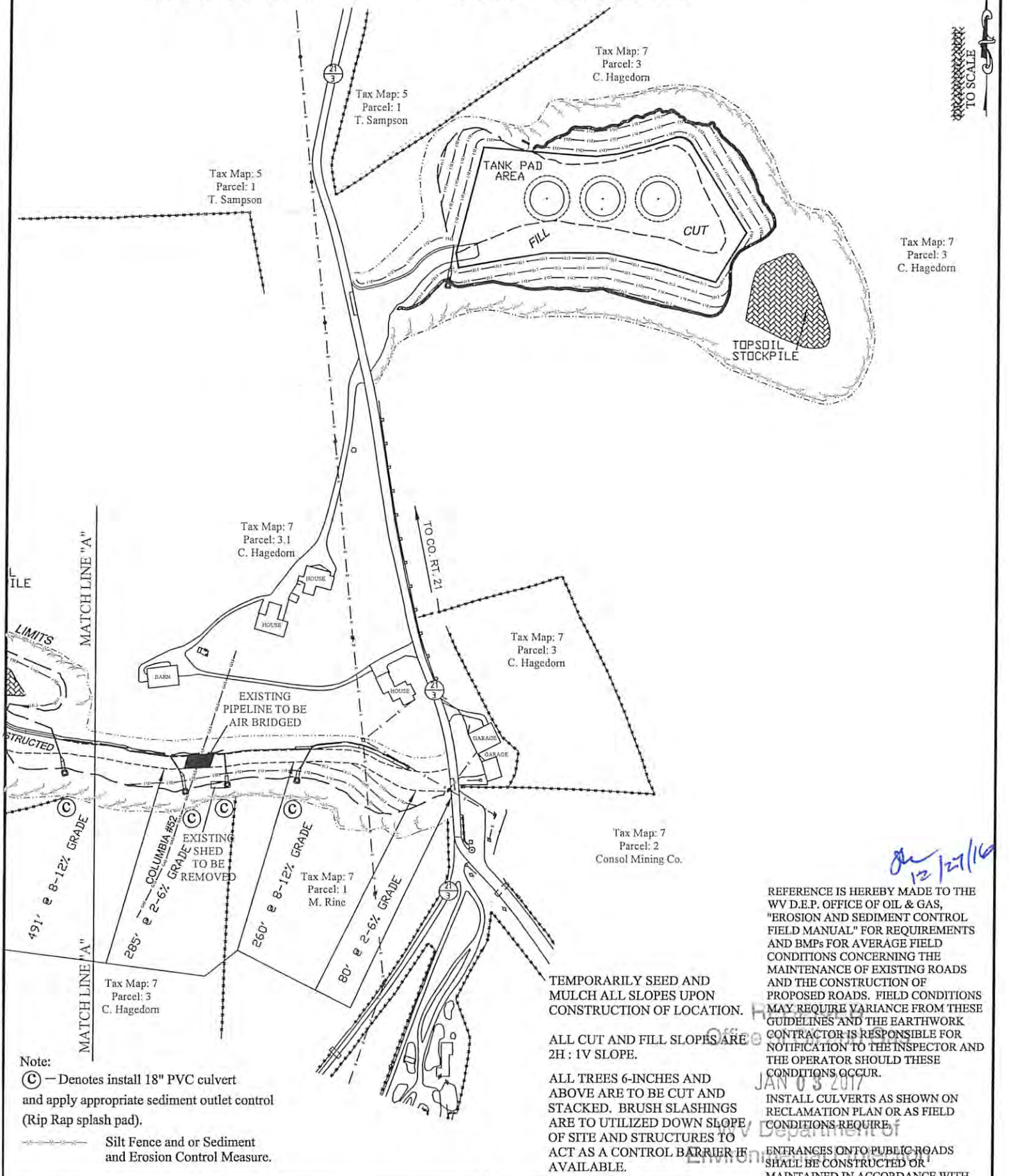
Field Reviewed?  Yes  No

RECEIVED  
Office of Oil and Gas

JAN 03 2017

WV Department of Environmental Protection  
05/12/2017

# PROPOSED HEAVEN HILL UNIT 2-8HU



Tax Map: 5  
Parcel: 1  
T. Sampson

Tax Map: 5  
Parcel: 1  
T. Sampson

Tax Map: 7  
Parcel: 3  
C. Hagedorn

Tax Map: 7  
Parcel: 3  
C. Hagedorn

Tax Map: 7  
Parcel: 3.1  
C. Hagedorn

Tax Map: 7  
Parcel: 3  
C. Hagedorn

Tax Map: 7  
Parcel: 2  
Consol Mining Co.

Tax Map: 7  
Parcel: 1  
M. Rine

Tax Map: 7  
Parcel: 3  
C. Hagedorn

Note:  
 (C) — Denotes install 18" PVC culvert and apply appropriate sediment outlet control (Rip Rap splash pad).  
 --- Silt Fence and or Sediment and Erosion Control Measure.

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.

ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.

REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.

JAN 03 2017  
 Office of Environmental Protection  
 Department of Environmental Protection

05/12/2017

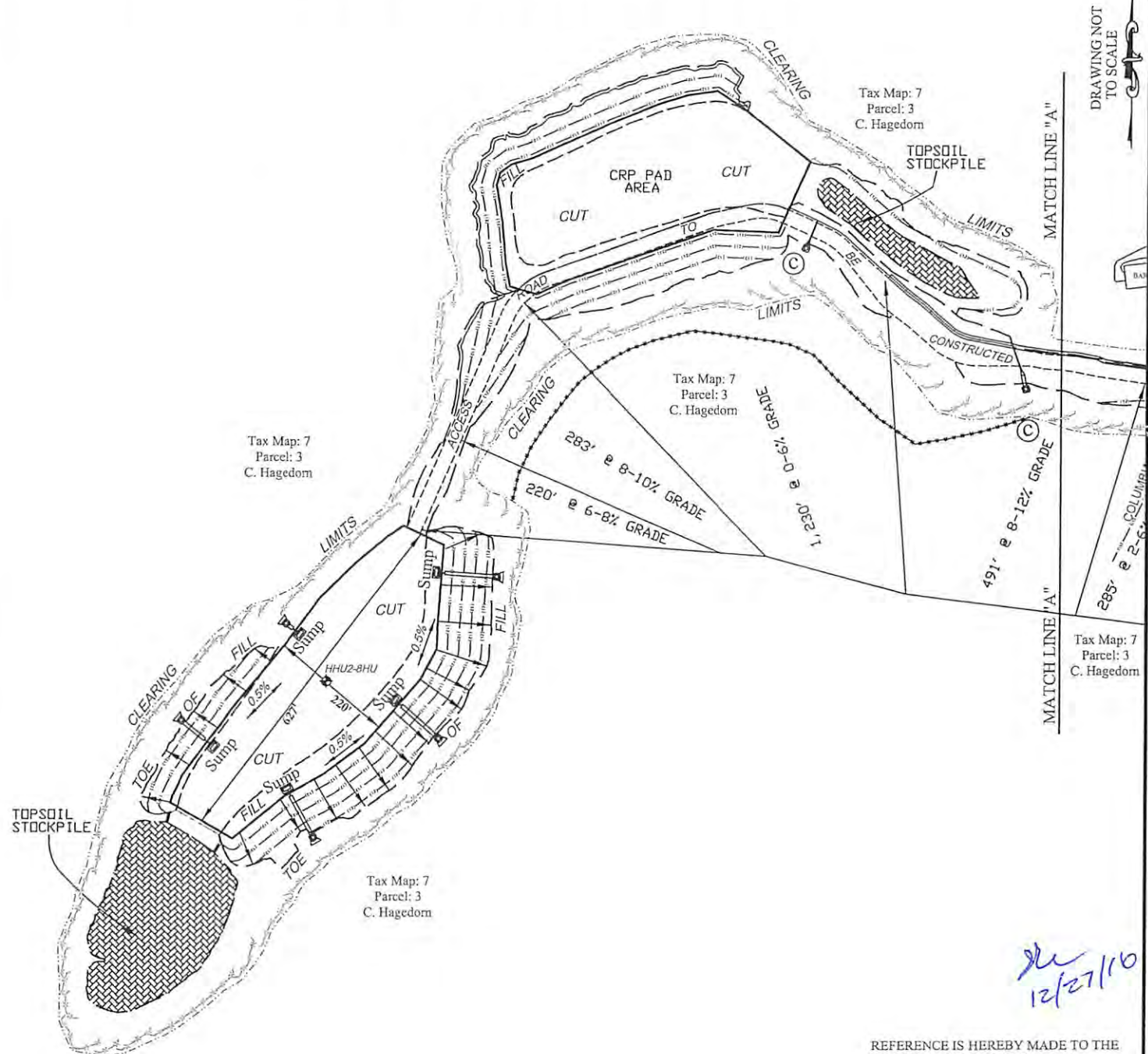
*Handwritten signature and date: 12/27/16*

51-01912

WW-9

# PROPOSED HEAVEN HILL UNIT 2-8HU

SUPPLEMENT PG 1-B



DRAWING NOT TO SCALE

*JW*  
12/27/16

Note:  
 (C) — Denotes install 18" PVC culvert and apply appropriate sediment outlet control (Rip Rap splash pad).  
 ——— Silt Fence and or Sediment and Erosion Control Measure.

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.

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Office of Oil & Gas

WV Environment

05/23/2017

DATE: 12/20/16

PROJECT NO: W0160328

DRAWN BY: J.N.W.





# Well Site Safety Plan

## Tug Hill Operating, LLC

*du*  
12/27/16

Well Name: Heaven Hill Unit 2-8HU

Pad Location: Heaven Hill Unit 2

Marshall County, West Virginia

UTM (meters), NAD83, Zone 17:

NORTHING -4,406,704.10

EASTING -524,565.80

December 2016

RECEIVED  
Office of Oil and Gas

JAN 03 2017

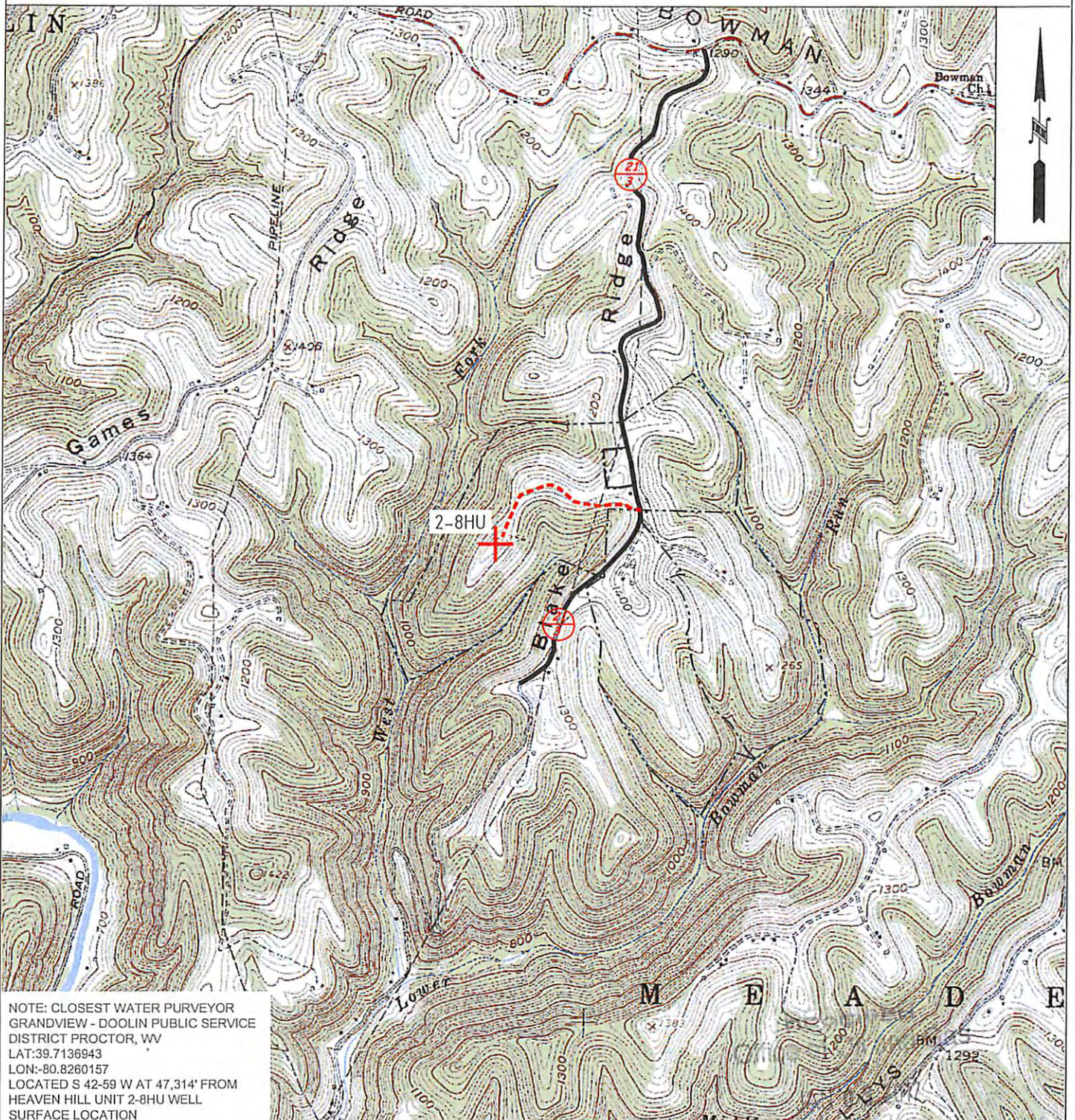
WV Department of  
Environmental Protection

SI-01912

WW-9

SUPPLEMENT PG 2

# PROPOSED HEAVEN HILL UNIT 2-8HU



NOTE: CLOSEST WATER PURVEYOR  
 GRANDVIEW - DOOLIN PUBLIC SERVICE  
 DISTRICT PROCTOR, WV  
 LAT: 39.7136943  
 LON: -80.8260157  
 LOCATED S 42-59 W AT 47,314' FROM  
 HEAVEN HILL UNIT 2-8HU WELL  
 SURFACE LOCATION



OPERATOR **163-697(CEC)**  
 TUG HILL OPERATING, LLC  
 380 SOUTHPOINTE BLVD  
 SUITE 200  
 CANONSBURG, PA 15317

TOPO SECTION **WV Department of Environmental Protection**  
 GLEN EASTON 7.5'  
 SCALE: 1" = 2000'

LEASE NAME **Heaven Hill Unit 2**  
 DATE: 12/20/16

05/12/2017

HEAVEN HILL LATITUDE 39° 50' 00"  
UNIT 2-8HU  
501.42±  
ACRES UNIT

LEGEND	
---	LEASED TRACTS
---	SURFACE TRACTS
---	UNIT BOUNDARY
(A)	LEASE # (SEE PG 2)

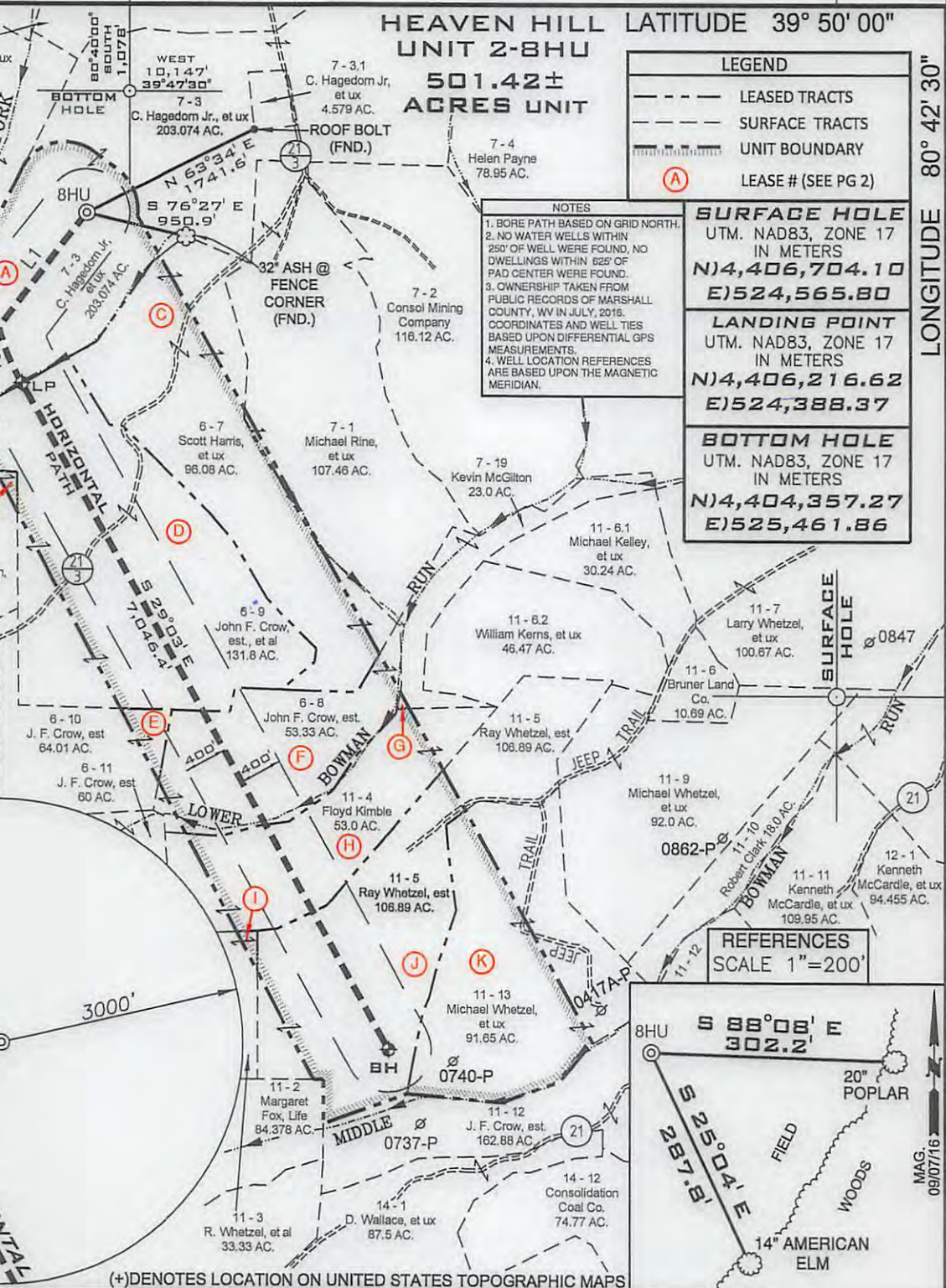
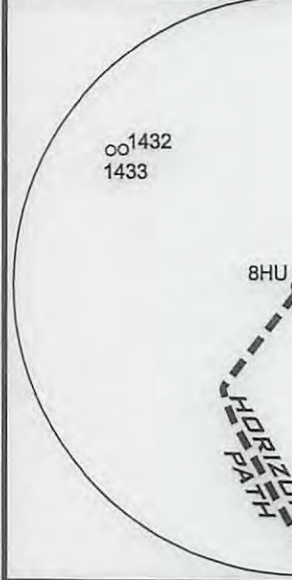
**NOTES**  
 1. BORE PATH BASED ON GRID NORTH.  
 2. NO WATER WELLS WITHIN 250' OF WELL WERE FOUND, NO DWELLINGS WITHIN 625' OF PAD CENTER WERE FOUND.  
 3. OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN JULY, 2016. COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS.  
 4. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

**SURFACE HOLE**  
 UTM. NAD83, ZONE 17  
 IN METERS  
**N)4,406,704.10**  
**E)524,565.80**

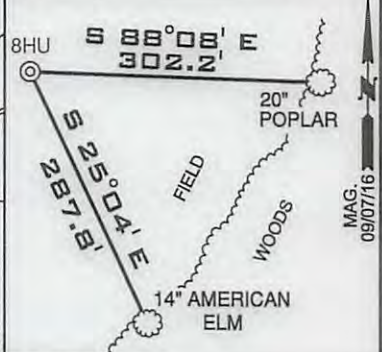
**LANDING POINT**  
 UTM. NAD83, ZONE 17  
 IN METERS  
**N)4,406,216.62**  
**E)524,388.37**

**BOTTOM HOLE**  
 UTM. NAD83, ZONE 17  
 IN METERS  
**N)4,404,357.27**  
**E)525,461.86**

LINE	BEARING	DISTANCE
L1	S 37°25' W	1333.46'
CURVE	ARC LENGTH	RADIUS
C1	48.41'	64.94'
C2	527.84'	1748.81'
CHORD BEARING	CHORD LENGTH	
C1	S 05°23' W	47.30'
C2	S 23°03' E	525.83'



**REFERENCES**  
 SCALE 1"=200'



(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

FILE NUMBER 163-697  
 DRAWING NUMBER HHU2\_WP\_8HU  
 SCALE 1" = 1500'  
 MINIMUM DEGREE OF ACCURACY 1/2500  
 PROVEN SOURCE OF ELEVATION SUBMETER MAPPING  
GRADE GPS

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

P.S. 2122  
*Jonathan N. White*  
 12/27/16



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



DATE: DECEMBER 20, 2016  
 OPERATORS WELL NO. Heaven Hill Unit 2-8HU

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW   
 LOCATION ELEVATION 1331' WATERSHED (HUC 10) FISH CREEK  
 DISTRICT MEADE COUNTY MARSHALL  
 QUADRANGLE GLEN EASTON 7.5' LEASE NUMBER SEE ATTACHED PG 2 AND 3

SURFACE OWNER CHARLES R. HAGEDORN, JR., ET UX ACREAGE 203.074  
 OIL & GAS ROYALTY OWNER CHARLES R. HAGEDORN, JR., ET AL LEASE ACREAGE 501.42 UNIT  
 PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION   
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE (SPECIFY) \_\_\_\_\_

TARGET FORMATION POINT PLEASANT ESTIMATED DEPTH TVD 11,784' TMD 19,019'  
 WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DIANNA STAMPER  
 ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5400 D BIG TYLER ROAD  
FORT WORTH, TX 76107 CHARLESTON, WV 25313

05/12/2017

COUNTY NAME  
 PERMIT

**HEAVEN HILL UNIT 2-8HU  
WELL PLAT LEASE INFORMATION**

Lease No.	Tag	Parcel	Oil & Gas Royalty Owner	Deed Book	Deed Page
10*15505	A	9-7-3	RALPH E. WELLMAN	686	412
10*15521	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	722	281
10*15608	A	9-7-3	CHARLES R HAGEDORN JR	816	423
10*47051.073.1	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	888	618
10*47051.073.2	A	9-7-3	PATRIOT RESTORATIONS LLC	908	541
10*47051.073.3	A	9-7-3	TRIENERGY HOLDINGS, LLC	878	330
10*15505	A	9-7-3	RALPH E. WELLMAN	686	412
10*15521	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	722	281
10*15608	A	9-7-3	CHARLES R HAGEDORN JR	816	423
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10*47051.073.2	A	9-7-3	PATRIOT RESTORATIONS LLC	908	541
10*47051.073.3	A	9-7-3	TRIENERGY HOLDINGS, LLC	878	330
10*15525	B	9-6-12	RONALD KEITH MASON ET UX	772	445
10*15541	B	9-6-12	MARY RUTH FROHNAPFEL	781	312
10*15542	B	9-6-12	KENNETH D SIBURT	781	218
10*15543	B	9-6-12	SANDRA FROWEN	781	307
10*15544	B	9-6-12	VICKI J CHERRY A/K/A VICKIE L CHERRY	793	318
10*15545	B	9-6-12	JAMES B SIBURT ET UX	793	332
10*15546	B	9-6-12	ALAN K SIBURT ET UX	793	325
10*15547	B	9-6-12	RODNEY L SIBURT	793	346
10*47051.255.0	C	9-6-7	SCOTT C & CAROLYN R HARRIS	879	296
10*15510	D	9-6-9	ELAINE PHELPS ET VIR	718	326
10*15511	D	9-6-9	DAVID E CROW	718	376
10*15512	D	9-6-9	FRANCES COFFEY	718	378
10*15513	D	9-6-9	KAY KEYES	718	330
10*15514	D	9-6-9	L PAUL CROW	718	336
10*15515	D	9-6-9	DESIRE L CROW	718	334
10*15516	D	9-6-9	ROSE MARIE KIELGCZEWSKI	718	354
10*15517	D	9-6-9	DIANNE GELLNER & GARY GELLNER	718	345
10*15518	D	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718	347
10*15519	D	9-6-9	JOHN CROW	726	580
10*15520	D	9-6-9	TIMOTHY CROW	726	582
10*47051.123.1	D	9-6-9	LLOYD G BAKER	865	389
10*47051.123.2	D	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143
10*15510	E	9-6-10	ELAINE PHELPS ET VIR	718	326
10*15511	E	9-6-10	DAVID E CROW	718	376
10*15512	E	9-6-10	FRANCES COFFEY	718	378
10*15513	E	9-6-10	KAY KEYES	718	330
10*15514	E	9-6-10	L PAUL CROW	718	336
10*15515	E	9-6-10	DESIRE L CROW	718	334
10*15516	E	9-6-10	ROSE MARIE KIELGCZEWSKI	718	354
10*15517	E	9-6-10	DIANNE GELLNER & GARY GELLNER	718	345
10*15518	E	9-6-10	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	718	347
10*15519	E	9-6-10	JOHN CROW	726	580
10*15520	E	9-6-10	TIMOTHY CROW	726	582
10*47051.123.1	E	9-6-10	LLOYD G BAKER	865	389
10*47051.123.2	E	9-6-10	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143
10*15510	F	9-6-8	ELAINE PHELPS ET VIR	718	326
10*15511	F	9-6-8	DAVID E CROW	718	376
10*15512	F	9-6-8	FRANCES COFFEY	718	378
10*15513	F	9-6-8	KAY KEYES	718	330
10*15514	F	9-6-8	L PAUL CROW	718	336
10*15515	F	9-6-8	DESIRE L CROW	718	334
10*15516	F	9-6-8	ROSE MARIE KIELGCZEWSKI	718	354
10*15517	F	9-6-8	DIANNE GELLNER & GARY GELLNER	718	345
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10*15519	F	9-6-8	JOHN CROW	726	580
10*15520	F	9-6-8	TIMOTHY CROW	726	582
10*47051.123.1	F	9-6-8	LLOYD G BAKER	865	389
10*47051.123.2	F	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	873	143

05/12/2017

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

**HEAVEN HILL UNIT 2-BHU  
WELL PLAT LEASE INFORMATION**

Lease No.	Tag	Parcel	Oil & Gas Royalty Owner	Deed Book	Deed Page
10*15667	G	9-7-19	KEVIN E MCGILTON ET UX	850	351
10*16517	H	9-11-4	RHDK INVESTMENTS	907	550
10*15561	I	9-11-3	VICKIE MASON	680	413
10*15562	I	9-11-3	MARY A SOUTH	682	231
10*15563	I	9-11-3	MARK L WHETZAL	682	544
10*15564	I	9-11-3	RAY A WHETZAL JR	682	548
10*15565	I	9-11-3	ROBERT L WHETZAL	682	552
10*15566	I	9-11-3	SHARON L WHETZAL	682	556
10*47051.108.1	I	9-11-3	MICHAEL A WHETZEL	885	51
10*47051.108.5	I	9-11-3	BRENDA J WHETZEL	885	55
10*47051.108.6	I	9-11-3	TERRI MCCARDLE	985	23
10*47051.108.7	I	9-11-3	GARY FRANCIS WHETZAL	895	26
10*15584	J	9-11-5	VICKIE MASON	686	239
10*15585	J	9-11-5	SHARON L WHETZAL	687	147
10*15586	J	9-11-5	MARY A SOUTH	690	615
10*15587	J	9-11-5	ROBERT L WHETZAL	690	559
10*15588	J	9-11-5	RAY A WHETZAL JR	693	571
10*15589	J	9-11-5	MARK L WHETZAL	693	576
10*47051.108.1	J	9-11-5	MICHAEL A WHETZEL	885	51
10*47051.108.5	J	9-11-5	BRENDA J WHETZEL	885	55
10*16258	K	9-11-13	CHESTNUT HOLDINGS INC	848	220

05/12/2017

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

51-01912

WW-6A1  
(5/13)

Operator's Well No. Heaven Hill Unit 2-8HU

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

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

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

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

See Attached

**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 RECEIVED  
 By: Jonathan White Office of Oil and Gas  
 Its: Regulatory Analyst JAN 03 2017

WV Department of  
Environmental Protection

05/12/2017

10-19-15

Lease Name or No.	Tag	Parcel	Grantor, Lessor, ect.	Grantee, Lessee, ect.	Royalty	Deed Book/Pg	Assignment	Assignment	Assignment
10*15505	A	9-7-3	RALPH E. WELLMAN	TH EXPLORATION LLC	1/8+	686 412	N/A	N/A	N/A
10*15521	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	TRIENERGY HOLDINGS, LLC	1/8+	722 281	Tri Energy to NPAR: 24/196	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15608	A	9-7-3	CHARLES R HAGEDORN JR	CHEVRON USA INC	1/8+	816 423	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.073.1	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	TH EXPLORATION LLC	1/8+	888 618	N/A	N/A	N/A
10*47051.073.2	A	9-7-3	PATRIOT RESTORATIONS LLC	TH EXPLORATION LLC	1/8+	908 541	N/A	N/A	N/A
10*47051.073.3	A	9-7-3	TRIENERGY HOLDINGS, LLC	TH EXPLORATION LLC	1/8+	878 330	N/A	N/A	N/A
10*15505	A	9-7-3	RALPH E. WELLMAN	TH EXPLORATION LLC	1/8+	686 412	N/A	N/A	N/A
10*15521	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	TRIENERGY HOLDINGS, LLC	1/8+	722 281	Tri Energy to NPAR: 24/196	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15608	A	9-7-3	CHARLES R HAGEDORN JR	CHEVRON USA INC	1/8+	816 423	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.073.1	A	9-7-3	VENANGO 21ST CENTURY ENERGY INC	TH EXPLORATION LLC	1/8+	888 618	N/A	N/A	N/A
10*47051.073.2	A	9-7-3	PATRIOT RESTORATIONS LLC	TH EXPLORATION LLC	1/8+	908 541	N/A	N/A	N/A
10*47051.073.3	A	9-7-3	TRIENERGY HOLDINGS, LLC	TH EXPLORATION LLC	1/8+	878 330	N/A	N/A	N/A
10*15525	B	9-6-12	RONALD KEITH MASON ET UX	CHEVRON USA INC	1/8+	772 445	N/A	N/A	Chevron to Tug Hill: 36/148
10*15541	B	9-6-12	MARY RUTH FROHNAPFEL	CHEVRON USA INC	1/8+	781 312	N/A	N/A	Chevron to Tug Hill: 36/148
10*15542	B	9-6-12	KENNETH D SIBURT	CHEVRON USA INC	1/8+	781 218	N/A	N/A	Chevron to Tug Hill: 36/148
10*15543	B	9-6-12	SANDRA FROWEN	CHEVRON USA INC	1/8+	781 307	N/A	N/A	Chevron to Tug Hill: 36/148
10*15544	B	9-6-12	VICKI J CHERRY A/K/A VICKIE L CHERRY	CHEVRON USA INC	1/8+	793 318	N/A	N/A	Chevron to Tug Hill: 36/148
10*15545	B	9-6-12	JAMES B SIBURT ET UX	CHEVRON USA INC	1/8+	793 332	N/A	N/A	Chevron to Tug Hill: 36/148
10*15546	B	9-6-12	ALAN K SIBURT ET UX	CHEVRON USA INC	1/8+	793 325	N/A	N/A	Chevron to Tug Hill: 36/148
10*15547	B	9-6-12	RODNEY L SIBURT	CHEVRON USA INC	1/8+	793 346	N/A	N/A	Chevron to Tug Hill: 36/148
10*47051.255.0	C	9-6-7	SCOTT C & CAROLYN R HARRIS	TH EXPLORATION LLC	1/8+	879 296	N/A	N/A	N/A
10*15510	D	9-6-9	ELAINE PHELPS ET VIR	TRIENERGY HOLDINGS, LLC	1/8+	718 326	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15511	D	9-6-9	DAVID E CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 376	Tri Energy to NPAR: 25/463	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15512	D	9-6-9	FRANCES COFFEY	TRIENERGY HOLDINGS, LLC	1/8+	718 378	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15513	D	9-6-9	KAY KEYES	TRIENERGY HOLDINGS, LLC	1/8+	718 330	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15514	D	9-6-9	L PAUL CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 336	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15515	D	9-6-9	DESIRE L CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 334	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15516	D	9-6-9	ROSE MARIE KIELGCZEWSKI	TRIENERGY HOLDINGS, LLC	1/8+	718 354	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15517	D	9-6-9	DIANNE GELLNER & GARY GELLNER	TRIENERGY HOLDINGS, LLC	1/8+	718 345	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15518	D	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TRIENERGY HOLDINGS, LLC	1/8+	718 347	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15519	D	9-6-9	JOHN CROW	TRIENERGY HOLDINGS, LLC	1/8+	726 580	Tri Energy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15520	D	9-6-9	TIMOTHY CROW	TRIENERGY HOLDINGS, LLC	1/8+	726 582	Tri Energy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*47051.123.1	D	9-6-9	LLOYD G BAKER	TH EXPLORATION LLC	1/8+	865 389	N/A	N/A	N/A
10*47051.123.2	D	9-6-9	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TH EXPLORATION LLC	1/8+	873 143	N/A	N/A	N/A
10*15510	E	9-6-10	ELAINE PHELPS ET VIR	TRIENERGY HOLDINGS, LLC	1/8+	718 326	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15511	E	9-6-10	DAVID E CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 376	Tri Energy to NPAR: 25/463	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15512	E	9-6-10	FRANCES COFFEY	TRIENERGY HOLDINGS, LLC	1/8+	718 378	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148

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Lease Name or No.	Tag	Parcel	Grantor, Lessor, ect.	Grantee, Lessee, ect.	Royalty	Deed Book/Pg	Assignment	Assignment	Assignment
10*15513	E	9-6-10	KAY KEYES	TRIENERGY HOLDINGS, LLC	1/8+	718 330	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15514	E	9-6-10	L PAUL CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 336	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15515	E	9-6-10	DESIRE L CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 334	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15516	E	9-6-10	ROSE MARIE KIELGCZEWSKI	TRIENERGY HOLDINGS, LLC	1/8+	718 354	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15517	E	9-6-10	DIANNE GELLNER & GARY GELLNER	TRIENERGY HOLDINGS, LLC	1/8+	718 345	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15518	E	9-6-10	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TRIENERGY HOLDINGS, LLC	1/8+	718 347	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15519	E	9-6-10	JOHN CROW	TRIENERGY HOLDINGS, LLC	1/8+	726 580	Tri Energy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15520	E	9-6-10	TIMOTHY CROW	TRIENERGY HOLDINGS, LLC	1/8+	726 582	Tri Energy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*47051.123.1	E	9-6-10	LLOYD G BAKER	TH EXPLORATION LLC	1/8+	865 389	N/A	N/A	N/A
10*47051.123.2	E	9-6-10	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TH EXPLORATION LLC	1/8+	873 143	N/A	N/A	N/A
10*15510	F	9-6-8	ELAINE PHELPS ET VIR	TRIENERGY HOLDINGS, LLC	1/8+	718 326	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15511	F	9-6-8	DAVID E CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 376	Tri Energy to NPAR: 25/463	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15512	F	9-6-8	FRANCES COFFEY	TRIENERGY HOLDINGS, LLC	1/8+	718 378	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15513	F	9-6-8	KAY KEYES	TRIENERGY HOLDINGS, LLC	1/8+	718 330	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15514	F	9-6-8	L PAUL CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 336	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15515	F	9-6-8	DESIRE L CROW	TRIENERGY HOLDINGS, LLC	1/8+	718 334	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15516	F	9-6-8	ROSE MARIE KIELGCZEWSKI	TRIENERGY HOLDINGS, LLC	1/8+	718 354	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15517	F	9-6-8	DIANNE GELLNER & GARY GELLNER	TRIENERGY HOLDINGS, LLC	1/8+	718 345	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15518	F	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TRIENERGY HOLDINGS, LLC	1/8+	718 347	Tri Energy to NPAR: 24/430	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15519	F	9-6-8	JOHN CROW	TRIENERGY HOLDINGS, LLC	1/8+	726 580	Tri Energy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*15520	F	9-6-8	TIMOTHY CROW	TRIENERGY HOLDINGS, LLC	1/8+	726 582	Tri Energy to NPAR: 25/449	NPAR to Chevron: 756/332	Chevron to Tug Hill: 36/148
10*47051.123.1	F	9-6-8	LLOYD G BAKER	TH EXPLORATION LLC	1/8+	865 389	N/A	N/A	N/A
10*47051.123.2	F	9-6-8	JAMES P HOLLIDAY AND JACQUELINE HOLLIDAY	TH EXPLORATION LLC	1/8+	873 143	N/A	N/A	N/A
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*16517	H	9-11-4	RHDK INVESTMENTS	TH EXPLORATION LLC	1/8+	907 550	N/A	N/A	N/A
10*15561	I	9-11-3	VICKIE MASON	CHESAPEAKE APPALACHIA LLC	1/8+	680 413	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15562	I	9-11-3	MARY A SOUTH	CHESAPEAKE APPALACHIA LLC	1/8+	682 231	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15563	I	9-11-3	MARK L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	682 544	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15564	I	9-11-3	RAY A WHETZAL JR	CHESAPEAKE APPALACHIA LLC	1/8+	682 548	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15565	I	9-11-3	ROBERT L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	682 552	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15566	I	9-11-3	SHARON L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	682 556	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*47051.108.1	I	9-11-3	MICHAEL A WHETZEL	TH EXPLORATION LLC	1/8+	885 51	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*47051.108.5	I	9-11-3	BRENDA J WHETZEL	TH EXPLORATION LLC	1/8+	885 55	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*47051.108.6	I	9-11-3	TERRI MCCARDLE	TH EXPLORATION LLC	1/8+	985 23	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*47051.108.7	I	9-11-3	GARY FRANCIS WHETZAL	TH EXPLORATION LLC	1/8+	895 26	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15584	J	9-11-5	VICKIE MASON	CHESAPEAKE APPALACHIA LLC	1/8+	686 239	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15585	J	9-11-5	SHARON L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	687 147	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148

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 WV Department of Environmental Protection

21610-15



Lease Name or No.	Tag	Parcel	Grantor, Lessor, ect.	Grantee, Lessee, ect.	Royalty	Deed Book/Pg		Assignment	Assignment	Assignment
10*15586	J	9-11-5	MARY A SOUTH	CHESAPEAKE APPALACHIA LLC	1/8+	690	615	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15587	J	9-11-5	ROBERT L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	690	559	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15588	J	9-11-5	RAY A WHETZAL JR	CHESAPEAKE APPALACHIA LLC	1/8+	693	571	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*15589	J	9-11-5	MARK L WHETZAL	CHESAPEAKE APPALACHIA LLC	1/8+	693	576	N/A	Chesapeake to Chevron: 30/461	Chevron to Tug Hill: 36/148
10*47051.108.1	J	9-11-5	MICHAEL A WHETZEL	TH EXPLORATION LLC	1/8+	885	51	N/A	N/A	N/A
10*47051.108.5	J	9-11-5	BRENDA J WHETZEL	TH EXPLORATION LLC	1/8+	885	55	N/A	N/A	N/A
10*16258	K	9-11-13	CHESTNUT HOLDINGS INC	Fossil Creek Ohio, LLC	1/8+	848	220	N/A	N/A	Fossil Creek to Tug Hill: 36/535

51-01912

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 Office of Oil and Gas  
 JAN 0 2017  
 WV Department of  
 Environmental Protection

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

Date of Notice Certification: 12/29/2016

API No. 47- 051 - 01912  
Operator's Well No. Heaven Hill Unit 2-8HU  
Well Pad Name: Heaven Hill Unit 2

**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>524,565.80</u>
County: <u>Marshall</u>	UTM NAD 83 Northing: <u>4,406,704.10</u>
District: <u>Meade</u>	Public Road Access: <u>Blake Ridge Road (Co. Rt. 21/3)</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Charles R. Hagedorn, Jr., et ux</u>
Watershed: <u>(HUC 10) Fish Creek</u>	

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

<p>Pursuant to West Virginia Code § 22-6A, the Operator has attached proof to this Notice Certification that the Operator has properly served the required parties with the following:</p> <p>*PLEASE CHECK ALL THAT APPLY</p> <p><input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED</p> <p><input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED</p> <p><input type="checkbox"/> 3. NOTICE OF INTENT TO DRILL or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NOTICE OF ENTRY FOR PLAT SURVEY WAS CONDUCTED or</p> <p style="padding-left: 100px;"><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><b>OOG OFFICE USE ONLY</b></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.

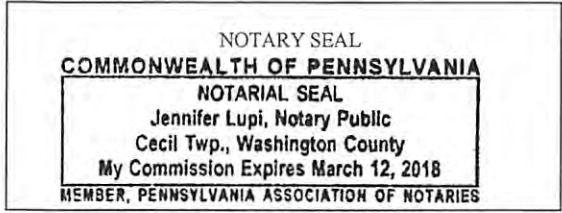
WV Department of  
Environmental Protection

05/12/2017

**Certification of Notice is hereby given:**

THEREFORE, I Jonathan White, 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 Blvd, Southepointe Plaza II, Suite 200</u>
By:	<u>Jonathan White <i>Jonathan White</i></u>		<u>Canonsburg, PA 15317</u>
Its:	<u>Regulatory Analyst - Appalachia</u>	Facsimile:	<u>724-338-2030</u>
Telephone:	<u>724-338-2026</u>	Email:	<u>jwhite@tug-hillop.com</u>



Subscribed and sworn before me this 29th day of December 2016  
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](mailto:depprivacyofficer@wv.gov).

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WV Department of  
Environmental Protection

AFFIDAVIT

STATE OF TEXAS §
COUNTY OF TARRANT § SS

On this 18th day of October, 2016, before me, the undersigned authority, personally appeared David D. Kalish ("Affiant") who being first duly sworn under oath, deposes and saith:

- 1. TH Exploration, LLC, TH Exploration II, LLC and TH Exploration III, LLC are wholly owned subsidiaries of THQ Appalachia I, LLC.
2. Tug Hill Operating, LLC provides oil and gas operations services to THQ Appalachia I, LLC under an Operating Services Agreement dated July 23, 2014.
3. David D. Kalish, the Affiant, is the Vice President of Tug Hill Operating, LLC, THQ Appalachia I, LLC, TH Exploration, LLC, TH Exploration II, LLC and TH Exploration III, LLC, and;
3. Tug Hill Operating, LLC is authorized to operate and maintain the assets owned by THQ Appalachia I, LLC, including, as referenced above, TH Exploration, LLC, TH Exploration II, LLC, and TH Exploration III, LLC, including oil and gas leases, wells, pipelines, surface facilities, and other all other assets that support the business of THQ Appalachia I, LLC, and;
4. Specifically, Tug Hill Operating, LLC is authorized to submit and obtain well work permits and carry out all activities pursuant to such work permits for assets owned by TH Exploration, LLC, TH Exploration II, LLC, TH Exploration III, LLC.

FURTHER, AFFIANT SAITH NOT.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this 18th day of October, 2016.

David D. Kalish
Affiant: David D. Kalish

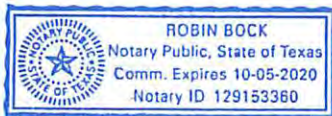
JURAT

Carroll S. Haugnt
WETZEL County: 10-29-27 AM
Instrument No: 212093
Date Recorded: 10/20/2016
Document Type: AFDI
Pages Recorded: 1
Book-Page: 119-291
Recording Fee: \$5.00
Additional: \$6.00

STATE OF TEXAS §
COUNTY OF TARRANT § SS

Sworn and subscribed to (or affirmed) before me on this, the 18th day of October, 2016, by David D. Kalish.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.



My Commission Expires: 10-05-2020
Signature/Notary Public: Robin Boock
Name/Notary Public (Print): Robin Boock 2017

AB 24/196

Image Print

REC0024 REC0196

STATE OF WEST VIRGINIA :  
COUNTY OF MARSHALL :

ASSIGNMENT OF  
OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS THAT

TRIENERGY HOLDINGS, LLC  
412 Beaver Street, 2<sup>nd</sup> floor  
Sowickley, PA 15143  
("Assignor")

for and in consideration of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby sell, assign, convey, transfer and set over unto:

NPAR, LLC  
6802 W. Snowville Rd., Suite B  
Brecksville, OH 44141  
("Assignee")

A 100% WORKING INTEREST IN AND TO THOSE CERTAIN OIL AND GAS LEASES IN MARSHALL COUNTY, WEST VIRGINIA SET FORTH ON EXHIBIT "A", ATTACHED HERETO AND MADE A PART HEREOF (EACH INDIVIDUALLY A "LEASE" AND COLLECTIVELY THE "LEASES"); BUT EXCEPTING AND RESERVING UNTO ASSIGNOR IN AND TO EACH LEASE AN OVERRIDING ROYALTY EQUAL TO THE DIFFERENCE BETWEEN 20% AND THE LESSOR'S ROYALTY PROVIDED IN EACH LEASE, ON A LEASE BY LEASE BASIS IN ALL OIL, GAS, COALEDED METHANE GAS AND ASSOCIATED HYDROCARBONS PRODUCED, SAVED AND SOLD FROM THE LEASES, SUBJECT TO A PROPORTIONATE REDUCTION BASED ON PARTIAL LEASEHOLD INTEREST, AS DESCRIBED BELOW.

Assignor's overriding royalty interest reserved hereunder shall be calculated and paid in the same manner as the Lessor's royalty provided for in the subject LEASE. Furthermore, if any LEASE covers less than a full mineral interest in the lands described therein or if Assignor owns less than a full interest in a given LEASE, then Assignor's overriding royalty related thereto shall be proportionately reduced accordingly.

Assignor covenants with and warrants to Assignee, its successors and assigns, that Assignor is the lawful owner of the interests in each LEASE, that Assignor has good and right authority to sell and convey the same, and that the LEASES are free and clear of all encumbrances by, through or under Assignor.

Assignee, by the acceptance of this Assignment, hereby agrees to be bound by and fulfill all of the terms, conditions, limitations and covenants of the each LEASE. Assignor's overriding royalty reserved interest hereunder shall extend to any and all extensions or renewals of each LEASE that may be acquired by Assignee, its successors and assigns.

This Assignment shall extend and inure to the benefit of Assignor's and Assignee's respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED AND MADE DULY EFFECTIVE THIS INSTRUMENT THIS 24<sup>th</sup> DAY OF MARCH, 2011.

Witness:

ASSIGNOR  
TRIENERGY HOLDINGS, LLC

Joseph H. Bojalek  
President and Managing Partner

ASSIGNEE

Witness:

NPAR, LLC  
Gordon O. Youel  
Chief Executive Officer

AB  
LEGAL  
CJG

Pages Omitted

BOOK 0024 PAGE 0430

ASN 24/430

AP 24/430

BOOK 0024 PAGE 0430  
STATE OF WEST VIRGINIA :  
COUNTY OF MARSHALL :

ASSIGNMENT OF  
OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS THAT

**TRIENERGY HOLDINGS, LLC**  
412 Beaver Street, 2<sup>nd</sup> floor  
Sewickley, PA 15143  
("Assignor")

for and in consideration of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby sell, assign, convey, transfer and set over unto:

**NPAR, LLC**  
6802 W. Snowville Rd., Suite E  
Brecksville, OH 44141  
("Assignee")

Planned

A 100% WORKING INTEREST IN AND TO THOSE CERTAIN OIL AND GAS LEASES IN MARSHALL COUNTY, WEST VIRGINIA SET FORTH ON EXHIBIT "A2, ATTACHED HERETO AND MADE A PART HEREOF (EACH INDIVIDUALLY A "LEASE" AND COLLECTIVELY THE "LEASES"); BUT EXCEPTING AND RESERVING UNTO ASSIGNOR IN AND TO EACH LEASE AN OVERRIDING ROYALTY EQUAL TO THE DIFFERENCE BETWEEN 20% AND THE LESSOR'S ROYALTY PROVIDED IN EACH LEASE, ON A LEASE BY LEASE BASIS, BUT IN NO EVENT SHALL ASSIGNOR'S OVERRIDING ROYALTY BE GREATER THAN FOUR PERCENT OF 8/8THS (4% OF 8/8<sup>THS</sup>) OR LESS THAN TWO PERCENT OF 8/8THS (2% OF 8/8<sup>THS</sup>) IN ALL OIL, GAS, COALBED METHANE GAS AND ASSOCIATED HYDROCARBONS PRODUCED, SAVED AND SOLD FROM THE LEASES, SUBJECT TO A PROPORTIONATE REDUCTION BASED ON PARTIAL LEASEHOLD INTEREST, AS DESCRIBED BELOW.


Assignor's overriding royalty interest reserved hereunder shall be calculated and paid in the same manner as the Lessor's royalty provided for in the subject LEASE. Furthermore, if any LEASE covers less than a full mineral interest in the lands described therein or if Assignor owns less than a full interest in a given LEASE, then Assignor's overriding royalty related thereto shall be proportionately reduced accordingly.

Assignor covenants with and warrants to Assignee, its successors and assigns, that Assignor is the lawful owner of the interests in each LEASE, that Assignor has good and right authority to sell and convey the same, and that the LEASES are free and clear of all encumbrances by, through or under Assignor.

Assignee, by the acceptance of this Assignment, hereby agrees to be bound by and fulfill all of the terms, conditions, limitations and covenants of the each LEASE. Assignor's overriding royalty reserved interest hereunder shall extend to any and all extensions or renewals of each LEASE that may be acquired by Assignee, its successors and assigns.

This Assignment shall extend and inure to the benefit of Assignor's and Assignee's respective heirs, executors, administrators, successors and assigns.

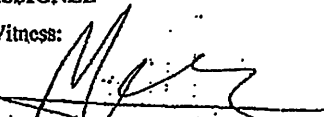
IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED AND MADE DULY EFFECTIVE THIS INSTRUMENT THIS 28<sup>TH</sup> DAY OF MAY, 2011.

Witness: 

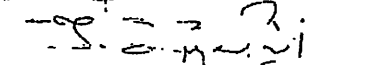
ASSIGNOR  
**TRIENERGY HOLDINGS, LLC**

Joseph E. Bojalad  
President and Managing Partner

Jan Pest  
MARSHALL County 11:45:09 AM  
Instrument No. 1506153  
Date Recorded 06/13/2011  
Document Type Oil and Gas  
Pages Recorded 13  
Book Page 24-430  
Recording Fee \$27.00  
Additional \$7.00 2017

ASSIGNEE  
Witness: 

ASSIGNEE  
**NPAR, LLC**



WV Department of  
Environmental Protection

BOOK 0025 PAGE 0463  
ASN 25/463

STATE OF WEST VIRGINIA :  
COUNTY OF MARSHALL :

ASSIGNMENT OF  
OIL & GAS LEASES

KNOW ALL MEN BY THESE PRESENTS THAT

TRIENERGY HOLDINGS, LLC  
412 Beaver Street, 2<sup>nd</sup> floor  
Sewickley, PA 15143  
("Assignor")

for and in consideration of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby sell, assign, convey, transfer and set over unto:

NPAR, LLC  
6802 W. Snowville Rd., Suite E  
Brecksville, OH 44141  
("Assignee")

A 100% WORKING INTEREST IN AND TO THOSE CERTAIN OIL AND GAS LEASES IN MARSHALL COUNTY, WEST VIRGINIA SET FORTH ON EXHIBIT "A", ATTACHED HERETO AND MADE A PART HEREOF (EACH INDIVIDUALLY A "LEASE" AND COLLECTIVELY THE "LEASES"); BUT EXCEPTING AND RESERVING UNTO ASSIGNOR IN AND TO EACH LEASE AN OVERRIDING ROYALTY EQUAL TO THE DIFFERENCE BETWEEN 20% AND THE LESSOR'S ROYALTY PROVIDED IN EACH LEASE, ON A LEASE BY LEASE BASIS; BUT IN NO EVENT SHALL ASSIGNOR'S OVERRIDING ROYALTY BE GREATER THAN FOUR PERCENT OF 8/8ths (4% of 8/8ths) OR LESS THAN TWO PERCENT OF 8/8ths (2% of 8/8ths) IN ALL OIL, GAS, COALBED METHANE GAS AND ASSOCIATED HYDROCARBONS PRODUCED, SAVED AND SOLD FROM THE LEASES, SUBJECT TO A PROPORTIONATE REDUCTION BASED ON PARTIAL LEASEHOLD INTEREST, AS DESCRIBED BELOW.

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Assignee, by the acceptance of this Assignment, hereby agrees to be bound by and fulfill all of the terms, conditions, limitations and covenants of the each LEASE; Assignor's overriding royalty interest reserved hereunder shall extend to any and all extensions or renewals of each LEASE that may be acquired by Assignee, its successors and assigns.

This Assignment shall extend and inure to the benefit of Assignor's and Assignee's respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED AND MADE DULY EFFECTIVE THIS INSTRUMENT THIS 3rd DAY OF August 2011.

Witness:

Debra Reed

ASSIGNOR  
TRIENERGY HOLDINGS, LLC

Joseph E. Bojalad  
President and Managing Partner

ASSIGNEE

Witness:

Patricia A. Bell

Jan Post  
MARSHALL County 12:50:36 PM  
Instrument No 1308986  
Date Recorded 08/04/2011  
Document Type ASH  
Pages Recorded 10  
Book Page 25-663  
Recording Fee \$10.00  
Additional \$7.00

NPAR, LLC

Gordon O. Yonel  
Chief Executive Officer

RECEIVED  
Office of Oil and Gas

JAN 09 2017

WV Department of  
Environmental Protection  
8/5/2011

TRIENERGY HOLDINGS, LLC  
PO BOX 69  
SEWICKLEY, PA 15143-0069

Pages Omitted

BOOK

ASN 25/449

BOOK 0025 PAGE 0449

STATE OF WEST VIRGINIA :  
COUNTY OF MARSHALL :

**ASSIGNMENT OF  
OIL & GAS LEASES**

KNOW ALL MEN BY THESE PRESENTS THAT

**TRIENERGY HOLDINGS, LLC**  
412 Beaver Street, 2<sup>nd</sup> floor  
Sewickley, PA 15143  
("Assignor")

for and in consideration of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby sell, assign, convey, transfer and set over unto:

**NPAR, LLC**  
6802 W. Snowville Rd., Suite E  
Brecksville, OH 44141  
("Assignee")

**A 100% WORKING INTEREST IN AND TO THOSE CERTAIN OIL AND GAS LEASES IN MARSHALL COUNTY, WEST VIRGINIA SET FORTH ON EXHIBIT "A", ATTACHED HERETO AND MADE A PART HEREOF (EACH INDIVIDUALLY A "LEASE" AND COLLECTIVELY THE "LEASES"), BUT EXCEPTING AND RESERVING INTO ASSIGNOR IN AND TO EACH LEASE AN OVERRIDING ROYALTY EQUAL TO THE DIFFERENCE BETWEEN 20% AND THE LESSOR'S ROYALTY PROVIDED IN EACH LEASE ON A LEASE BY LEASE BASIS; BUT IN NO EVENT SHALL ASSIGNOR'S OVERRIDING ROYALTY BE GREATER THAN FOUR PERCENT OF 8/8THS (4% OF 8/8<sup>TH</sup>) OR LESS THAN TWO PERCENT OF 8/8THS (2% OF 8/8<sup>TH</sup>) IN ALL OIL, GAS, COALBED METHANE GAS AND ASSOCIATED HYDROCARBONS PRODUCED, SAVED AND SOLD FROM THE LEASES, SUBJECT TO A PROPORTIONATE REDUCTION BASED ON PARTIAL LEASEHOLD INTEREST, AS DESCRIBED BELOW.**

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Assignor covenants with and warrants to Assignee, its successors and assigns, that Assignor is the lawful owner of the interests in each LEASE, that Assignor has good and right authority to sell and convey the same, and that the LEASES are free and clear of all encumbrances by, through or under Assignor.

Assignee, by the acceptance of this Assignment, hereby agrees to be bound by and fulfill all of the terms, conditions, limitations and covenants of the each LEASE. Assignor's overriding royalty interest reserved hereunder shall extend to any and all extensions or renewals of each LEASE that may be acquired by Assignee, its successors and assigns.

This Assignment shall extend and inure to the benefit of Assignor's and Assignee's respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, THE UNDERSIGNED HAVE SIGNED AND MADE DULY EFFECTIVE THIS INSTRUMENT THIS 3rd DAY OF August, 2011.

Witness:

Debra Reid

**ASSIGNOR**  
**TRIENERGY HOLDINGS, LLC**

Joseph E. Bojalad  
President and Managing Partner

TRIENERGY HOLDINGS, LLC  
PO BOX 89  
SEWICKLEY, PA 15143-0089

Jan Pest  
MARSHALL County 12:48:53 PM  
Instrument No 1308985  
Date Recorded 08/04/2011  
Document Type BSA  
Pages Recorded 14  
Book-Page 25-449  
Recording Fee \$14.00  
Additional \$7.00

ASSIGNEE

Witness:

Patricia A. Dier

**NPAR, LLC**

Gordon O. Yoncl  
Chief Executive Officer

RECEIVED  
Office of Oil and Gas

JAN 03 2017

8/3/2011 Department of  
Environmental Protection



\* Pages Omitted

DB 756/332

BOOK 0756 PAGE 0332

JIM BOURBEAU LAND SERVICE INC  
11106 BT HWY 18  
CORNEAULT LAKE, PA 16316-3620

Jan. Post  
MARSHALL County 10:52:20 AM  
Instrument No 1317416  
Date Recorded 01/26/2012  
Document Type O&G  
Pages Recorded 65  
Book-Page 756-332  
Recording Fee \$65.00  
Additional \$12.00

MARSHALL COUNTY, WEST VIRGINIA

## CONVEYANCE

This Conveyance (this "Conveyance") is dated as of August 5, 2011 (the "Execution Date"), by and between NPAR, LLC, a Delaware limited liability company ("Grantor"), on the one part, and Chevron U.S.A. Inc., a Pennsylvania corporation ("Grantee"), on the other part. Each of Grantor and Grantee are sometimes referred to herein individually as a "Party" and collectively as the "Parties."

Capitalized terms used but not defined herein shall have the respective meanings set forth in that certain Purchase and Sale Agreement (the "PSA"), dated as of July 6, 2011, by and between Grantor and Grantee.

ARTICLE I  
CONVEYANCE

Section 1.1 Conveyance. Subject to the terms and conditions hereof, with effect as of 7:00 a.m., Eastern Time, on April 1, 2011 (the "Effective Date"), Grantor, for and in consideration of the sum of Ten Dollars (\$10.00) cash and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, hereby sells, transfers and conveys unto Grantee, and Grantee hereby accepts from Grantor, all of Grantor's right, title and interest in and to the following (collectively the "Assets"); but excepting and excluding, in all such instances, the Excluded Assets:

(a) All oil and gas leases, oil, gas and mineral leases, subleases and other leaseholds, royalties, overriding royalties, net profits interests, mineral fee interests, carried interests and other rights to Hydrocarbons in place owned by Grantor in the Asset Areas, including those that are identified on Exhibit A-1 (collectively, the "Leases"), subject to the depth limitations and other restrictions that may be set forth in the Leases;

(b) All pooled, communitized or unitized acreage which includes all or a part of any Lease (the "Units"), and all tenements, hereditaments and appurtenances belonging to the Leases and Units;

(c) All oil, gas, water, carbon dioxide or injection wells located on the Leases or Units, whether producing, shut-in or temporarily abandoned, including the interests in the wells shown on Exhibit A-2 (the "Wells");

(d) All flowlines, pipelines, gathering systems and appurtenances thereto located on the Leases or Units or used, or held for use, in connection with the operation of the

1100865779.1



December 21, 2016

WV Department of Environmental Protection  
Office of Oil & Gas  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304  
Attention: Laura Cooper

RE: Heaven Hill Unit 2-8HU

Subject: County Route 21/3 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 21/3 in the area reflected on the Heaven Hill Unit 2-8HU well plat. THO has conducted a full title search in the relevant Court House to confirm its ownership under said County Route 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 304-689-7676, or by email at [Jwhite@tug-hilop.com](mailto:Jwhite@tug-hilop.com).

Sincerely,

A handwritten signature in blue ink that reads "Jonathan White". The signature is written in a cursive, flowing style.

Jonathan White  
Regulatory Analyst – Appalachia Region  
Cell 304-689-7676  
Email: [jwhite@tug-hilop.com](mailto:jwhite@tug-hilop.com)

RECEIVED  
Office of Oil and Gas  
JAN 03 2017  
WV Department of  
Environmental Protection

**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:** 12/29/2016 **Date Permit Application Filed:** 12/29/16

**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: Charles R. Hagedorn, Jr., ex ux  
 Address: 78 Hagedorn Drive  
Glen Easton, WV 26039

Name: None  
 Address: \_\_\_\_\_

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

Name: Michael J. Rlne, et ux  
 Address: 1466 Blake Ridge Road  
Glen Easton, WV 26039

Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

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: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 \*See supplement page 1A attached

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

Name: None  
 Address: \_\_\_\_\_

\*Please attach additional forms if necessary

**RECEIVED**  
 Office of Oil and Gas  
 JAN 03 2017  
 WV Department of  
 Environmental Protection  
 05/12/2017

**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 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://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 57<sup>th</sup> St. SE  
Charleston, WV 25304  
(304) 926-0450

RECEIVED  
Office of Oil and Gas

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.**

JAN 09 2017  
WV Department of  
Environmental Protection  
05/12/2017

**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.

WW-6A  
(8-13)

API NO. 47- 051 - 01912  
OPERATOR WELL NO. Heaven Hill Unit 2-8HU  
Well Pad Name: Heaven Hill Unit 2

**Notice is hereby given by:**

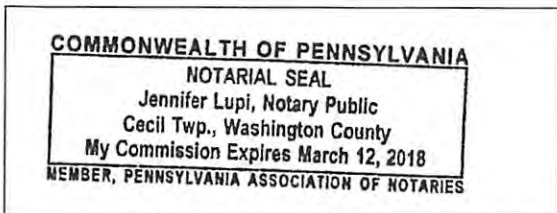
Well Operator: Tug Hill Operating, LLC  
Telephone: 724-338-2026  
Email: jwhite@tug-hilltop.com

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

**Oil and Gas Privacy Notice:**

*Jonathan White*

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 [deprivacyofficer@wv.gov](mailto:deprivacyofficer@wv.gov).



Subscribed and sworn before me this 29<sup>th</sup> day of Dec., 2016.  
Jennifer Lupi Notary Public  
My Commission Expires March 12, 2018

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JAN 03 2017  
WV Department of  
Environmental Protection  
**05/12/2017**

WW-6A

Supplement Pg. 1A

December 29, 2016  
 Tug Hill Operating, LLC  
 380 Southpointe BLVD  
 Suite 200  
 Canonsburg, PA 15317

## WATER WELL REPORT

Well: Heaven Hill Unit 2-8HU  
 District: Meade  
 County: Marshall  
 State: WV

There appears to be No ( 6 ) possible water sources within 2,000 feet of the above referenced well location.

House 1 TM 07 Par. 3.1 Charles R. Hagedorn Jr., et ux Phone 304-845-7332 78 Hagedorn Rd. Glen Easton, WV 26039	House 2 TM 07 Par. 3.1 Charles R. Hagedorn Jr., et ux Phone 304-845-7332 78 Hagedorn Rd. Glen Easton, WV 26039	House 3 TM 07 Par. 3 Charles R. Hagedorn Jr., et ux Phone 304-845-7332 78 Hagedorn Rd. Glen Easton, WV 26039
House 4 TM 07 Par. 1 Michael Rine, et ux Phone 304-845-4437 1466 Blake Ridge Road Glen Easton, WV 26039	Spring with House 4 TM 07 Par. 1 Michael Rine, et ux Phone 304-845-4437 1466 Blake Ridge Road Glen Easton, WV 26039	House 5 TM 06 Par. 07 Scott & Carolyn Harris Phone 304-845-0747 1944 Blake Ridge Road Glen Easton, WV 26039

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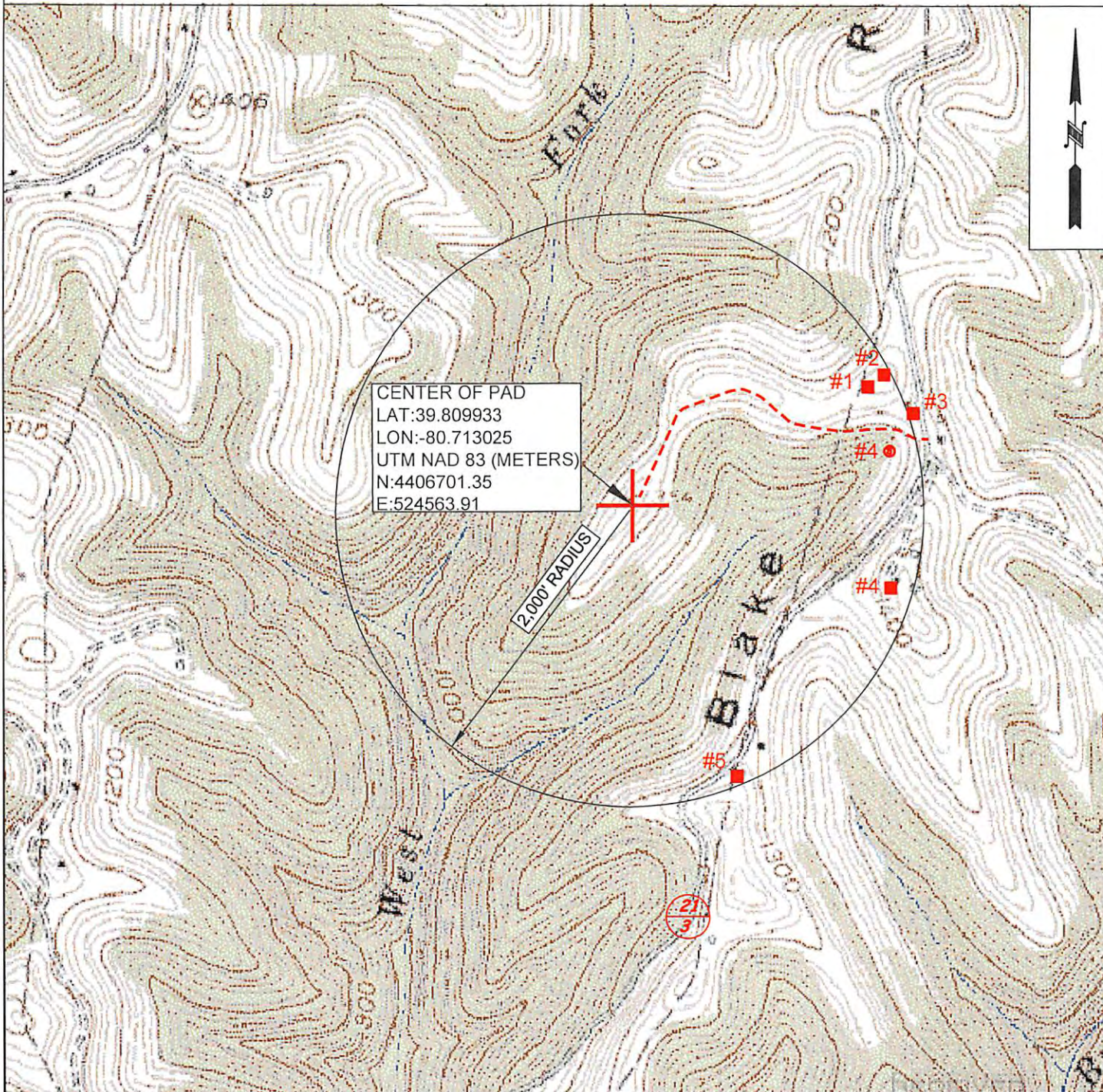


WW-6A

# PROPOSED HEAVEN HILL UNIT 2-8HU

SUPPLEMENT PG 1B

There appear to be ( 6 ) possible water sources within 2,000'.



	<b>OPERATOR</b>	<b>TOPO SECTION</b>	<b>UNIT NAME</b>
	TUG HILL OPERATING, LLC 380 SOUTHPOINTE BLVD SUITE 200 CANONSBURG, PA 15317	GLEN EASTON 7.5'	HEAVEN HILL UNIT 2
		<b>SCALE:</b>	<b>DATE:</b>
		1" = 1000'	12/20/16 of

**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:** April 14, 2016      **Date of Planned Entry:** April 25, 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: Charles R. Hagedorn ✓  
Address: 78 Hagedorn Drive  
Glen Easton, WV 26039

Name: Michael J. Rine ✓  
Address: 1466 Blake Ridge Road  
Glen Easton, WV 26039

Name: \_\_\_\_\_  
Address: \_\_\_\_\_

COAL OWNER OR LESSEE

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

MINERAL OWNER(s)

Name: JMK Irrevocable Trust ✓  
Address: 600 Texas Street, Suite 101  
Fort Worth, TX 76102

\*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: 39.8097546, Long: -80.7132884</u>
County: <u>Marshall</u>	Public Road Access: <u>Blake Ridge Road (Co. Rt. 21/3)</u>
District: <u>Meade</u>	Watershed: <u>West Fork / HUC-10 Fish Creek</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Charles R. Hagedorn</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 57<sup>th</sup> 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](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Notice is hereby given by:**

Well Operator: <u>Tug Hill Operating, LLC</u>	Address: <u>380 Southpointe Blvd, Suite 200</u>
Telephone: <u>724-338-2026</u>	<u>Canonsburg, PA 15317</u>
Email: <u>jwhite@tug-hillop.com</u>	Facsimile: <u>724-338-2030</u>

**Oil and Gas Privacy Notice:**

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

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**05/12/2017**

**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:** April 25, 2016      **Date of Planned Entry:** May 4, 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: Charles R. Hagedorn

Address: 78 Hagedorn Drive  
Glen Easton, WV 26039

Name: Michael J. Rine

Address: 1466 Blake Ridge Road  
Glen Easton, WV 26039

Name: \_\_\_\_\_

Address: \_\_\_\_\_

COAL OWNER OR LESSEE

Name: Murray Energy Corporation

Address: 46226 National Road  
St. Clairsville, OH 43950

MINERAL OWNER(s)

Name: JMK Irrevocable Trust

Address: 600 Texas Street, Suite 101  
Fort Worth, TX 76102

\*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: 39.8097546, Long: -80.7132884</u>
County: <u>Marshall</u>	Public Road Access: <u>Blake Ridge Road (Co. Rt. 21/3)</u>
District: <u>Meade</u>	Watershed: <u>West Fork / HUC-10 Fish Creek</u>
Quadrangle: <u>Glen Easton 7.5'</u>	Generally used farm name: <u>Charles R. Hagedorn</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 57<sup>th</sup> 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](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

**Notice is hereby given by:**

Well Operator: <u>Tug Hill Operating, LLC</u>	Address: <u>380 Southpointe Blvd, Suite 200</u>
Telephone: <u>724-338-2026</u>	<u>Canonsburg, PA 15317</u>
Email: <u>jwhite@tug-hill.com</u>	Facsimile: <u>724-338-2030</u>

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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](mailto:depprivacyofficer@wv.gov).

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**WW-6A3 Notice of Entry for Plat Survey**

**Attachment 1 of 1**

**Mineral Owner(s):**

**Name:** Marcellus TX Minerals Partners, LTD  
**Address:** 307 W 7<sup>th</sup> St.  
Fort Worth, TX 76102

**Name:** Purpleburgh Ventures, LLC  
**Address:** 306 W 7<sup>th</sup> St.  
Fort Worth, TX 76102

**Name:** Charles R. Hagedorn  
**Address:** 78 Hagedorn Drive  
Glen Easton, WV 26039

**Name:** Venango 21st Century  
**Address:** 301 Moon Clinton Road  
Moon Township, PA 15108

**Name:** TriEnergy Holdings, LLC  
**Address:** 412 Beaver Street, 2nd Floor  
Sewickley, PA 15143

**Name:** Patriot Restoration  
**Address:** 713 Sycamore Road Extension  
Sewickley, PA 15143

**Name:** Ralph E. Wellman  
**Address:** 2209 Bowman Ridge Rd.  
Glen Easton, WV 26039



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Operator Well No. Heaven Hill Unit 2-8HU**WW-6A3 Notice of Entry for Plat Survey****Attachment 1 of 1****Mineral Owner(s):**

**Name:** Marcellus TX Minerals Partners, LTD  
**Address:** 5111 Broadway Street  
San Antonio, TX 78209

**Name:** Purpleburgh Ventures, LLC  
**Address:** 600 Texas Street, Suite 101  
Fort Worth, TX 76102

**Name:** Charles R. Hagedorn  
**Address:** 78 Hagedorn Drive  
Glen Easton, WV 26039

**Name:** Venango 21st Century  
**Address:** 301 Moon Clinton Road  
Moon Township, PA 15108

**Name:** TriEnergy Holdings, LLC  
**Address:** 412 Beaver Street, 2nd Floor  
Sewickley, PA 15143

**Name:** Patriot Restoration  
**Address:** 713 Sycamore Road Extension  
Sewickley, PA 15143

**Name:** Ralph E. Wellman  
**Address:** 1824 4th Street  
Moundsville, WV 26041

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**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:** 12/29/2016      **Date Permit Application Filed:** 12/30/2016

**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: Charles R. Hagedorn, Jr., et ux  
Address: 78 Hagedorn Drive  
Glen Easton, WV 26039

Name: Michael J. Rine, et ux  
Address: 1466 Blake Ridge Road  
Glen Easton, WV 26039

**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>524,565.8</u>
County:	<u>Marshall</u>		Northing:	<u>4,406,704.1</u>
District:	<u>Meade</u>	Public Road Access:	<u>Blake Ridge Road (Co. Rt. 21/3)</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>Charles R. Hagedorn, Jr., et ux</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 57<sup>th</sup> Street, SE, Charleston, WV 25304 (304-926-0450) or by visiting [www.dep.wv.gov/oil-and-gas/pages/default.aspx](http://www.dep.wv.gov/oil-and-gas/pages/default.aspx).

Well Operator: Tug Hill Operating, LLC  
Telephone: 724-338-2026  
Email: jwhite@tug-hillop.com

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

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WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

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

Earl Ray Tomblin  
Governor

Paul A. Mattox, Jr., P. E.  
Secretary of Transportation/  
Commissioner of Highways

November 2, 2016

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

Subject: DOH Permit for the Heaven Hills Unit 2 Pad, Marshall County  
Heaven Hills Unit 2-8HU 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,

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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WV Department of  
Environmental Protection

05/12/2017



TUG HILL

51-01912

PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION

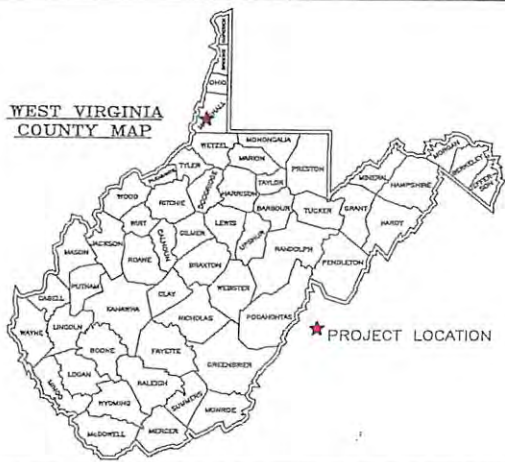
Well No. Heaven Hill Unit 2-8HU

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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WV Department of  
Environmental Protection



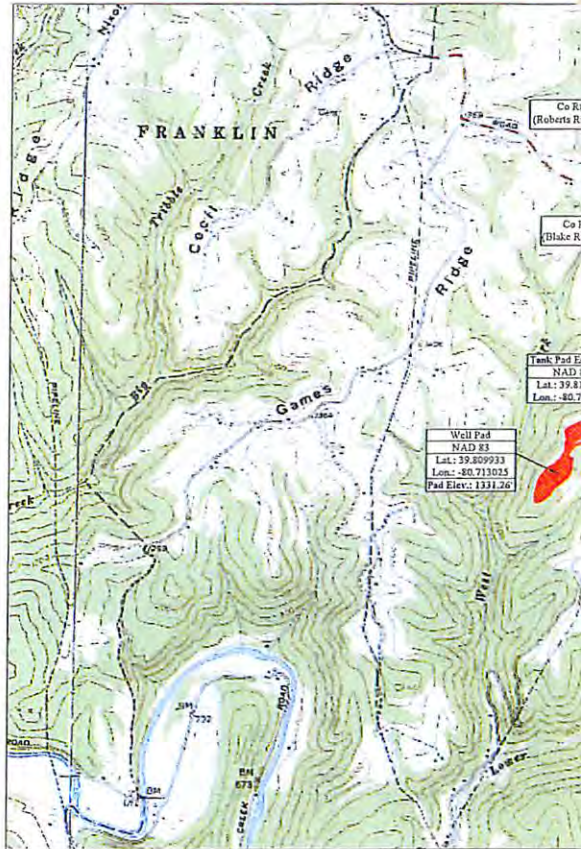
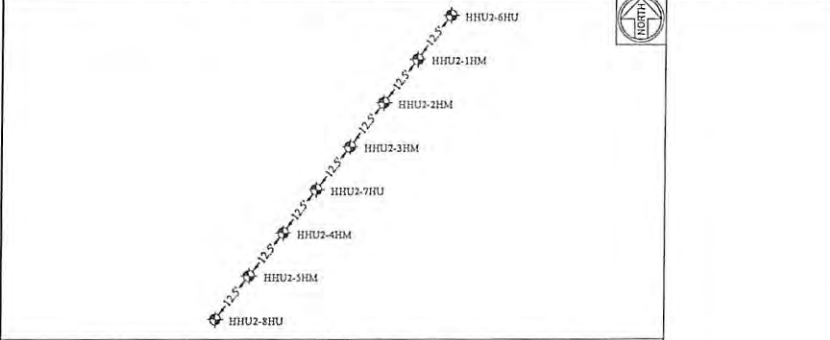
WEST VIRGINIA  
COUNTY MAP



**APPROVED**  
**WVDEP OOG**  
WJS 11/2/2016

**Exhibit A: Final D**

<b>Well Pad Site Entrance</b> WV-N NAD 83 N: 479953.89 WV-N NAD 83 E: 1629793.37 WV-N NAD 27 N: 479869.23 WV-N NAD 27 E: 1661227.19 Lat. NAD 83: 39.811344 Lon. NAD 83: -80.705763 Lat. NAD 27: 39.811267 Lon. NAD 27: -80.705955 UTM 17 NAD 83 N: 4406592.99 UTM 17 NAD 83 E: 5258184.95	<b>Center of CRP Pad</b> WV-N NAD 83 N: 480282.56 WV-N NAD 83 E: 1628301.63 WV-N NAD 27 N: 480245.93 WV-N NAD 27 E: 1659738.49 Lat. NAD 83: 39.812124 Lon. NAD 83: -80.711080 Lat. NAD 27: 39.812246 Lon. NAD 27: -80.711272 UTM 17 NAD 83 N: 4406597.16 UTM 17 NAD 83 E: 524729.49 Pad Elev.: 1348.32'	<b>Center of Well Pad</b> WV-N NAD 83 N: 479473.37 WV-N NAD 83 E: 1627743.73 WV-N NAD 27 N: 479382.76 WV-N NAD 27 E: 1659186.61 Lat. NAD 83: 39.809933 Lon. NAD 83: -80.713025 Lat. NAD 27: 39.809855 Lon. NAD 27: -80.713217 UTM 17 NAD 83 N: 4406501.55 UTM 17 NAD 83 E: 524563.91 Pad Elev.: 1331.26'	<b>Tank Pad Site Entrance</b> WV-N NAD 83 N: 480905.64 WV-N NAD 83 E: 1629565.88 WV-N NAD 27 N: 480872.99 WV-N NAD 27 E: 1661002.69 Lat. NAD 83: 39.814091 Lon. NAD 83: -80.706610 Lat. NAD 27: 39.814014 Lon. NAD 27: -80.706802 UTM 17 NAD 83 N: 4407164.64 UTM 17 NAD 83 E: 525111.45	<b>Center of Tank Pad</b> WV-N NAD 83 N: 481104.59 WV-N NAD 83 E: 1630088.18 WV-N NAD 27 N: 481067.92 WV-N NAD 27 E: 1661524.98 Lat. NAD 83: 39.814645 Lon. NAD 83: -80.704761 Lat. NAD 27: 39.814568 Lon. NAD 27: -80.704953 UTM 17 NAD 83 N: 4407266.69 UTM 17 NAD 83 E: 525249.58 Pad Elev.: 1326.53'
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Well Table			
<b>HHU2-6HU</b> WV-N NAD 83 N: 479497.28 WV-N NAD 83 E: 1627803.89 WV-N NAD 27 N: 479460.67 WV-N NAD 27 E: 1659246.76 Lat. NAD 83: 39.810149 Lon. NAD 83: -80.712814 Lat. NAD 27: 39.810072 Lon. NAD 27: -80.713005 UTM 17 NAD 83 (m) N: 4406725.39 UTM 17 NAD 83 (m) E: 524581.84	<b>HHU2-7HM</b> WV-N NAD 83 N: 479447.43 WV-N NAD 83 E: 1627796.20 WV-N NAD 27 N: 479430.81 WV-N NAD 27 E: 1659233.88 Lat. NAD 83: 39.810122 Lon. NAD 83: -80.712841 Lat. NAD 27: 39.810044 Lon. NAD 27: -80.713033 UTM 17 NAD 83 (m) N: 4406723.15 UTM 17 NAD 83 (m) E: 524579.55	<b>HHU2-2HM</b> WV-N NAD 83 N: 479477.57 WV-N NAD 83 E: 1627788.51 WV-N NAD 27 N: 479440.96 WV-N NAD 27 E: 1659225.39 Lat. NAD 83: 39.810094 Lon. NAD 83: -80.712868 Lat. NAD 27: 39.810017 Lon. NAD 27: -80.713060 UTM 17 NAD 83 (m) N: 4406719.31 UTM 17 NAD 83 (m) E: 524577.26	<b>HHU2-3HM</b> WV-N NAD 83 N: 479467.71 WV-N NAD 83 E: 1627780.82 WV-N NAD 27 N: 479431.10 WV-N NAD 27 E: 1659217.70 Lat. NAD 83: 39.810057 Lon. NAD 83: -80.712895 Lat. NAD 27: 39.809970 Lon. NAD 27: -80.713087 UTM 17 NAD 83 (m) N: 4406716.27 UTM 17 NAD 83 (m) E: 524574.97
<b>HHU2-7HU</b> WV-N NAD 83 N: 479457.86 WV-N NAD 83 E: 1627773.13 WV-N NAD 27 N: 479421.25 WV-N NAD 27 E: 1659210.01 Lat. NAD 83: 39.810040 Lon. NAD 83: -80.712922 Lat. NAD 27: 39.809962 Lon. NAD 27: -80.713114 UTM 17 NAD 83 (m) N: 4406713.22 UTM 17 NAD 83 (m) E: 524572.67	<b>HHU2-4HM</b> WV-N NAD 83 N: 479448.00 WV-N NAD 83 E: 1627765.45 WV-N NAD 27 N: 479411.39 WV-N NAD 27 E: 1659202.33 Lat. NAD 83: 39.810012 Lon. NAD 83: -80.712949 Lat. NAD 27: 39.809935 Lon. NAD 27: -80.713141 UTM 17 NAD 83 (m) N: 4406710.18 UTM 17 NAD 83 (m) E: 524570.38	<b>HHU2-5HM</b> WV-N NAD 83 N: 479438.15 WV-N NAD 83 E: 1627757.76 WV-N NAD 27 N: 479401.53 WV-N NAD 27 E: 1659194.64 Lat. NAD 83: 39.809985 Lon. NAD 83: -80.712976 Lat. NAD 27: 39.809968 Lon. NAD 27: -80.713167 UTM 17 NAD 83 (m) N: 4406707.14 UTM 17 NAD 83 (m) E: 524568.09	<b>HHU2-8HU</b> WV-N NAD 83 N: 479428.29 WV-N NAD 83 E: 1627750.07 WV-N NAD 27 N: 479391.68 WV-N NAD 27 E: 1659186.55 Lat. NAD 83: 39.809957 Lon. NAD 83: -80.713003 Lat. NAD 27: 39.809930 Lon. NAD 27: -80.713194 UTM 17 NAD 83 (m) N: 4406704.10 UTM 17 NAD 83 (m) E: 524565.80

**Project Contacts**

**Tug Hill Operating**  
Jonathan White - Regulatory Analyst  
724-485-2000 Off. 304-689-7676 Cell

**Survey and Engineer**  
Kenneth Kelly  
304-338-6983 Off.

**Geoff Radler - V.P. Production**  
817-632-5200 Off.

**John P. See**  
304-442-0220 Off.

**Zachary Summerfield**  
304-338-6987 Off.

**Geotechnical Engineer**  
American Geotech, Inc.  
Kanti Patel  
304-340-4277 Off.

**Tug Hill Operating, LLC**  
380 Southpointe Blvd  
Southpointe Plaza II, Suite 200  
Cannonsburg, PA 15317

**Environmental:**  
Wetland Delineations as provided by Allstate Ecology dated June 21, 2016

**Topographic Information:**  
The topographic information shown herein is based on aerial photography by Blue Mountain Aerial Mapping, Burton, WV

MISS UTILITY OF WEST VIRGINIA  
1-800-245-4848  
West Virginia State Law  
Section XIV, Chapter 24-C requires that you call two business days before you dig in the state of West Virginia.  
**IT'S THE LAW**

**811**  
Know what's below. Call before you dig.

Tug Hill Operating will obtain an Encroachment Permit (Form MM-109) from the WV Department of Transportation, Division of Highways, prior to the commencement of any construction activities

The WV Mines Website was consulted. Previous (Current) mining activities are within the AOI (McElroy Mine, U-0033-83, McElroy Coal Co.)

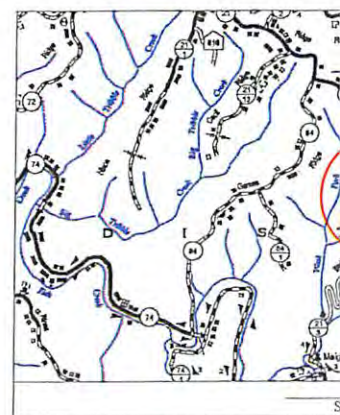
WVDEP Website files show that there are no active and/or abandoned gas wells within the AOI

**Approach Routes:**

From Moundsville, WV Head South on State Rt 2. Turn Left onto State Rt 2 Alt (Round Bottom Hill Road) approximately 4 miles south of Moundsville, WV. Follow State Rt 2 Alt for 1.5 mi. Turn Right onto Co Rt 1 (Lindsay Lane). Follow Co Rt 1 for 1.8 mi. Turn Right onto Co Rt 21 (Roberts Ridge Rd). Follow Co Rt 21 for 1.4 mi. Co Rt 21 (Roberts Ridge Rd) becomes Co Rt 21 (Roberts Ridge St Joseph Rd). Follow Co Rt 21 for 4.4 mi. Turn Left onto Co Rt 21 (Roberts Ridge Rd). Follow Co Rt 21 for 1.1 mi. Turn Right onto Co Rt 21 (Blake Ridge Rd). Follow Co Rt 21 for 1.4 mi. The site entrance will be on the Right (West) side of the road.

**Site Locations (NAD 27)**

Structure	Latitude (DD)	Longitude (DD)
Well Pad Site Entrance	39.811267	-80.705955
Center of Well Pad	39.809855	-80.713217
Tank Pad Site Entrance	39.814014	-80.706802
Center of Tank Pad	39.814568	-80.704953



**Floodplain Conditions**

Do site construction activities take place in a floodplain:	NO
Permit needed from county floodplain coordinator:	NO
Flood Hazard Zone:	X
HEC-RAS Study completed:	N/A
Floodplain shown on drawings:	N/A
FIRM Map Number(s) for site:	54051C 0173E
Averages of construction in floodplain:	N/A

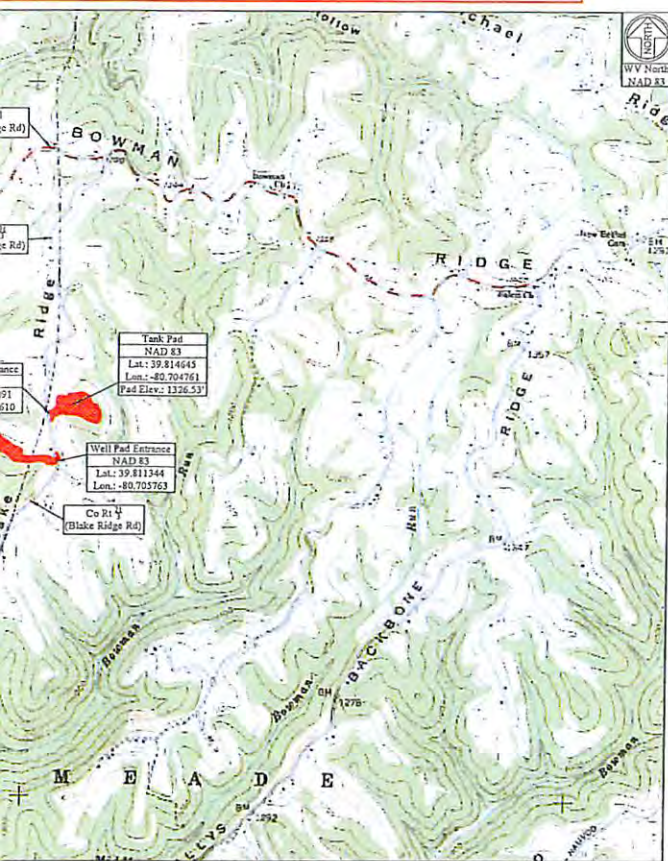
05/12/2017

# Heaven Hill 2 Site

Construction Plan, &  
 Sediment Control Plans  
 Hill Operating  
 Marshall County  
 Meade District  
 E 39.809933°  
 W -80.713025°  
 Middle Fish Creek Watershed

**Pertinent Site Information**  
 Heaven Hill 2 Site  
 Emergency Number: 304-845-1920  
 Marshall County Emergency 911 (Moundsville, WV)  
 Meade District, Marshall County, WV  
 Watershed: Middle Fish Creek

**Design: Issue for Permitting**



WV State Plane Coordinate System  
 North Zone, NAD 83  
 Elevations Based on NAV88  
 Established By Survey Grade GPS  
 and OPUS Post-Processing

**Property Owner Information - Heaven Hill 2 Site**

Owner	TM - Parcel	Well Pad	CRP Pad	Tank Pad	Access Road	Topsoil/Excess	Add. Clearing	Total Disturbed
M. Rine	7-1	0.00	0.00	0.00	0.31	0.00	0.47	0.48
C. Hagedorn	7-3	4.59	4.15	5.01	3.25	3.19	12.13	32.30
<b>Site Totals (Ac)</b>	<b>4.57</b>	<b>4.15</b>	<b>5.01</b>	<b>3.46</b>	<b>3.19</b>	<b>12.60</b>	<b>32.98</b>	

**Access Road**

Surface Owner	TM - Parcel	Road Length	Type
M. Rine	7-1	106.88'	Well Pad Access Road
C. Hagedorn	7-3	2,105.19'	Well Pad Access Road
C. Hagedorn	7-3	294.63'	Tank Pad Access Road

**Disturbed Area**

Well Pad Construction	4.57 Ac
CRP Pad Construction	4.15 Ac
Tank Pad Construction	5.01 Ac
Access Road Construction	3.46 Ac
Topsoil / Excess Material	3.19 Ac
Additional Clearing	12.60 Ac
<b>Total Disturbed Area</b>	<b>32.98 Ac</b>
<b>Additional Information</b>	
Total Wooded Acres Disturbed	4.75 Ac
Total Linear Feet of Access Road	2,606.70'

**Heaven Hill 2 Site Quantities**

Description	Cut (CY)	Fill (CY)	Spoil (CY)	Hollow (CY)	Max. Slope	Length of Slope
Well Pad	36,542.98	21,043.07	15,499.91		N/A	N/A
CRP Pad	29,711.44	15,711.44	14,000.00		N/A	N/A
Tank Pad	36,755.05	26,758.30	9,996.75		N/A	N/A
Well Pad Access Road	2,967.46	17,045.22		14,082.76	10.00%	579.30'
Tank Pad Access Road	1,198.90	810.39	368.51		8.00%	48.29'
Topsoil/Excess Material Stockpile	0.00	30,327.37		30,537.37	N/A	N/A
<b>Totals</b>	<b>107,170.83</b>	<b>111,915.79</b>	<b>39,865.17</b>	<b>44,610.13</b>		
<b>Total Spoil (CY) =</b>			<b>-4,744.96</b>		(Excess Spoil Capacity)	

**Site Locations (NAD 83)**

Structure	Latitude (DD)	Longitude (DD)
Well Pad Site Entrance	39.811344	-80.705763
Center of Well Pad	39.829933	-80.713025
Tank Pad Site Entrance	39.814091	-80.705610
Center of Tank Pad	39.814645	-80.704761

**Well Location Restrictions**

All Pad construction complies with the following restrictions.

- \*250' from an existing well or developed spring used for human or domestic animals.
- \*625' from an occupied dwelling or barn greater than 2,500 SF used for poultry or dairy measured from the center of the pad.
- \*100' from the edge of disturbance to wetlands, perennial streams, natural or artificial lake, pond or reservoir.
- \*300' from the edge of disturbance to a naturally reproducing trout stream.
- \*1,000' of a surface or ground water intake to a public water supply.

(Well Location Restrictions of WV Code 22-6A-13)

**Design Certification**

The drawings, consultation notes and reference diagrams attached hereto have been prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection, Office of Oil and Gas Services.

All Plans, Sheets, and/or Reference Diagrams included in this design constitute a complete set of plans. A complete set of plans is necessary to construct the site in accordance with the design.

John P. See RFE 6051;  
 Kelly Surveying PLLC  
 COA: CD-1323-00

Date: 06/28/2016

**As-Built Certification**

This as-built certification certifies that the gas well drilling pad was constructed in reasonable close conformance with the design drawings. It is recommended that the gas well drilling pad be included in the existing comprehensive maintenance and inspection program for gas well drilling pads or that a comprehensive maintenance and inspection program be developed to monitor the pads condition to insure the intended safe operation.

John P. See RFE 6051; Date: \_\_\_\_\_

Sheet	Description
1	Cover Sheet
V1	Schedule of Quantities
N1-N3	Site Notes
2	Pre-Construction Site Conditions
3	Site Soil Map
4	Clearing Exhibit
5	Overall Plan View
6-9	E&S Plan View
10	Toe Key Exhibit
11-14	Plan View
15-16	Cross Sections - Well Pad
17	Cross Sections - Central Reclaiming Pad
18-19	Cross Sections - Tank Pad
20-21	Cross Sections - Well Pad Access Road
22	Cross Sections - Tank Pad Access Road
G1-G2	Geotechnical Details
L1	Landowner Disturbed Area Exhibit
S1-S2	Site Reclamation
M1-M2	Production Details
D1-D2	Erosion and Sediment Control Details
R1	Access Road Details
P1	Pad Details

Revision  
 Design: WYDEP Revisions

Date  
 06-28-2016  
 10-31-2016

**TUG HILL OPERATING**



THIS DOCUMENT PREPARED FOR TUG HILL OPERATING

**Kelly Surveying**  
 1000 10th St  
 Parkersburg, WV 26101  
 304-538-0925

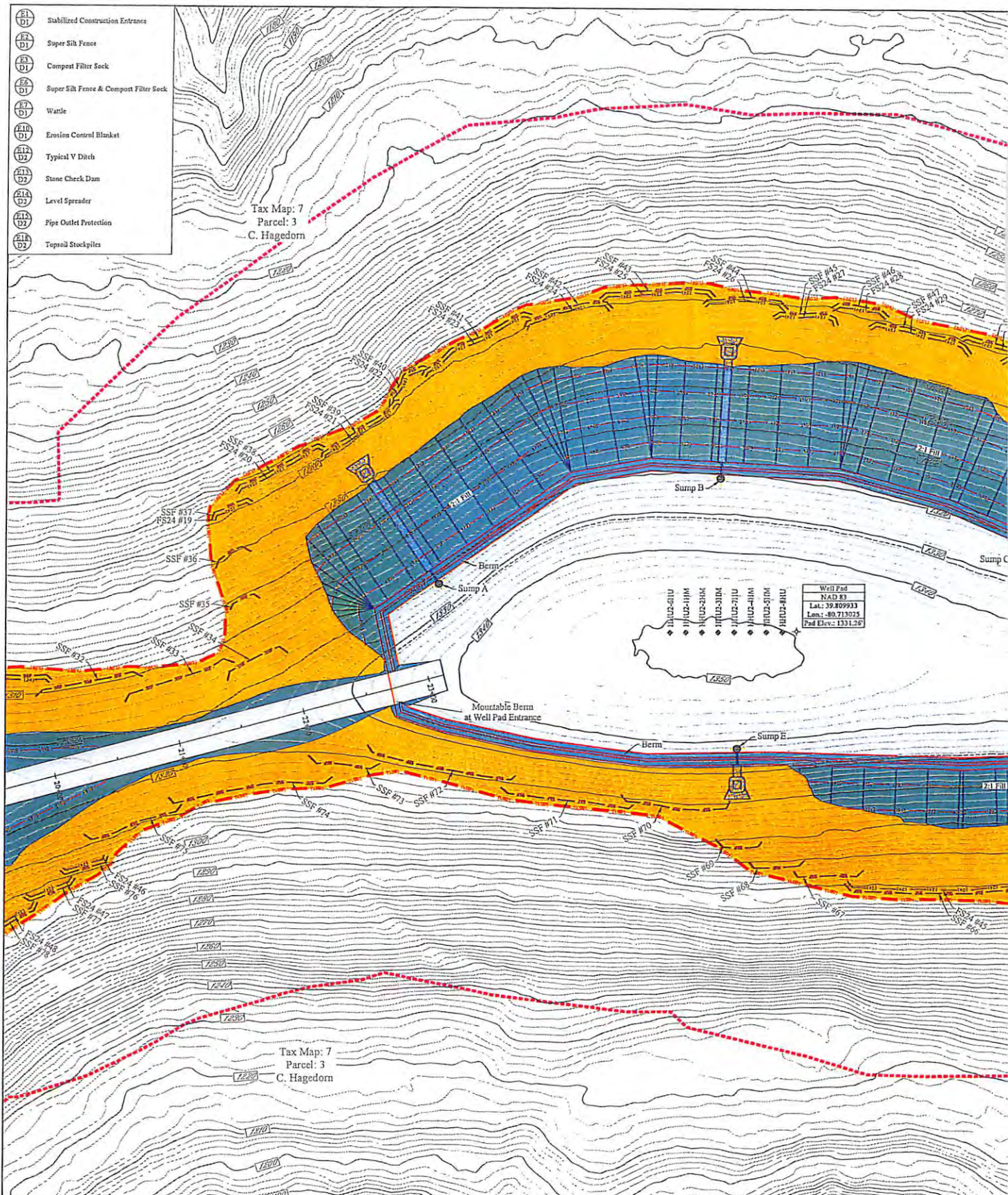
Cover Sheet  
 Heaven Hill 2 Site  
 Meade District  
 Marshall County, WV

RECEIVED  
 Office of Oil and Gas  
 JAN 0 9 2017  
 WV Department of Environmental Protection  
 05/12/2017

Date: 06/28/2016  
 Scale: As Shown  
 Designed By: ZS  
 File No.  
 Sheet 1 of 22

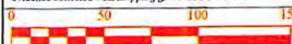
- (E1) Stabilized Construction Entrance
- (E2) Super Silt Fence
- (E3) Compost Filter Sock
- (E4) Super Silt Fence & Compost Filter Sock
- (E5) Wattle
- (E10) Erosion Control Blanket
- (E11) Typical V Ditch
- (E12) Stone Check Dam
- (E13) Level Spreader
- (E14) Pipe Outlet Protection
- (E15) Topsoil Stockpiles

Tax Map: 7  
Parcel: 3  
C. Hagedorn



Tax Map: 7  
Parcel: 3  
C. Hagedorn

NOTE:  
All surface boundary lines shown hereon are based on boundary evidence collected with mapping grade GPS receivers.



- Legend**
- Original Ground 2' Contour
  - Original Ground 10' Contour
  - Center of Structure
  - 12" Wattle
  - 24" Compost Filter Sock
  - Super Silt Fence
  - Limits of Disturbance
  - Area of Interest
  - Existing Gas Line
  - Existing Utility Pole/Line
  - Rock Lined Ditch
  - Erosion Control Blanket Lined Ditch
  - FEM Wetland
  - POW Wetland
  - P50 Wetland
  - Perennial Stream
  - Intermittent Stream
  - Ephemeral Stream
  - Seed and Mulch Area
  - Erosion Control Blanket Slope Area
  - Stone Check Dam

Disturbed Area	
Well Pad Construction	4.57 Ac
CRP Pad Construction	4.15 Ac
Tank Pad Construction	5.01 Ac
Access Road Construction	3.46 Ac
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Additional Clearing	12.69 Ac
<b>Total Disturbed Area</b>	<b>32.98 Ac</b>
Additional Information	
Total Wooded Areas Disturbed	4.73 Ac
Total Linear Feet of Access Road	2,606.70'

Access Road			
TM - Parcel	Road Length	Type	
7-1	106.88'	Well Pad Access Road	
7-3	2,305.19'	Well Pad Access Road	
7-3	294.63'	Tank Pad Access Road	

05/12/2017

Heaven Hill 2 Site  
Tug Hill Operating

Exhibit A: Final Design: Issue for Permitting

**APPROVED  
WVDEP OOG**

WJS 11/2/2016



Revision  
Design  
Design: WYDEP Elevation

Date  
06-28-2016  
10-11-2016

**TUG HILL  
OPERATING**



THIS DOCUMENT  
PREPARED FOR  
TUG HILL  
OPERATING

**Kelly Surveying**  
P.O. Box 334  
Fisher, WV 26039  
(304) 78-4444

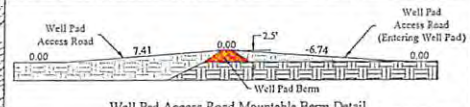
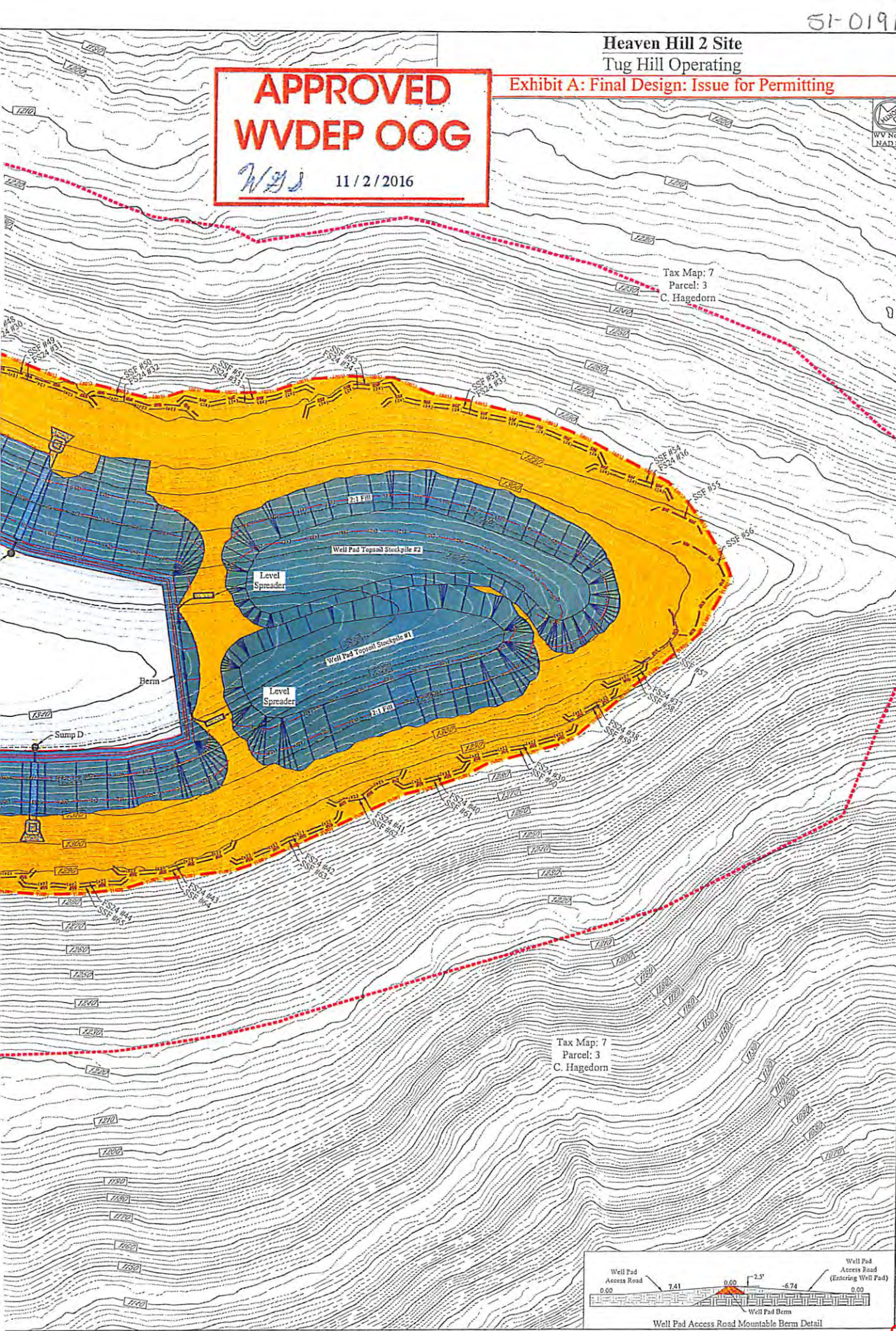
Erosion and Sediment Control Plan

Heaven Hill 2 Site

Meade District  
Marshall County, WV

Date: 06/28/2016  
Scale: As Shown  
Designed By: ZS  
File No.  
Sheet 8 of 22

05/12/2017

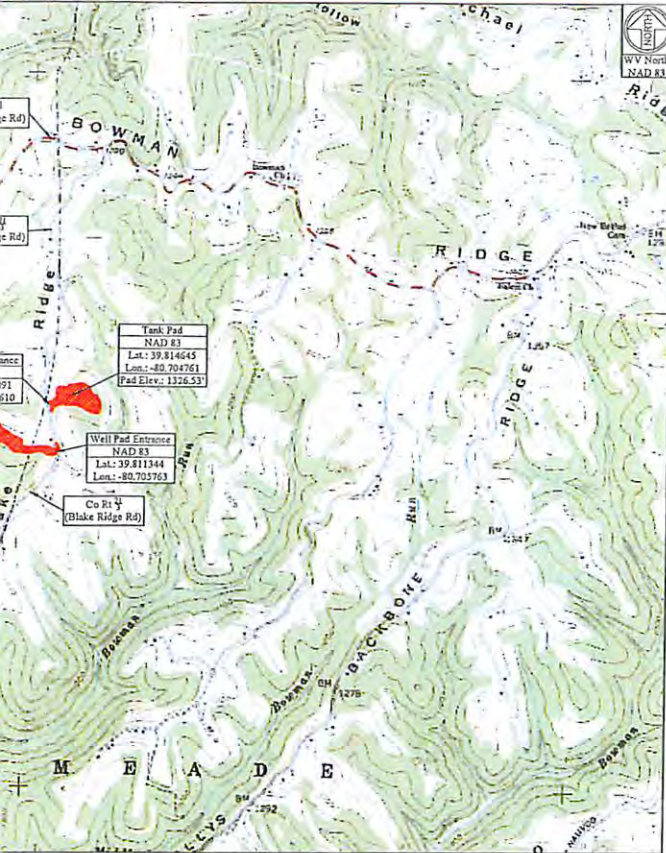


# Heaven Hill 2 Site

Construction Plan, &  
 Sediment Control Plans  
 Well Operating  
 Marshall County  
 Meade District  
 Phone: 39.809933°  
 Latitude: -80.713025°  
 Middle Fish Creek Watershed

**Pertinent Site Information**  
 Heaven Hill 2 Site  
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 Marshall County Emergency 911 (Moundsville, WV)  
 Meade District, Marshall County, WV  
 Watershed: Middle Fish Creek

Design: Issue for Permitting



WV State Plane Coordinate System  
 North Zone, NAD 83  
 Elevations Based on NAVD83  
 Established by Survey Grade GPS  
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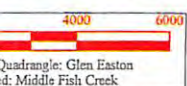
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Total Spoil (CY) =			-4,744.96	(Excess Spoil Capacity)		



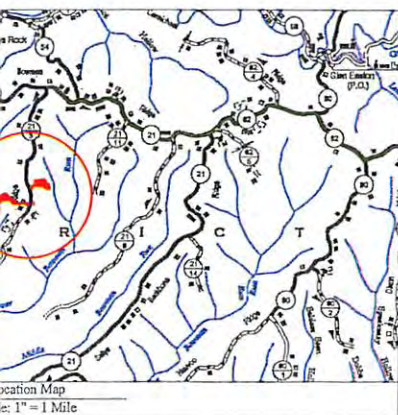
Quadrangle: Glen Easton  
 District: Middle Fish Creek

Structure	Latitude (DD)	Longitude (DD)
Well Pad Site Entrance	39.811344	-80.725763
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- \*300' from the edge of disturbance to a naturally reproducing trout stream.
- \*1,000' of a surface or ground water intake to a public water supply.

(Well Location Restrictions of WV Code 22-6A-12)



Seal

Seal

Design Certification

The drawings, construction notes and reference diagrams attached hereto have been prepared in accordance with the West Virginia Code of State Rules, Division of Environmental Protection, Office of Oil and Gas District.

All Plans, Sheets, and/or Reference Diagrams produced in this design constitute a complete set of plans. A complete set of plans is necessary to construct the site in accordance with the design.

John P. See RPE 6051  
 Kelly Surveying PLLC  
 COA: 03432.00

Date: 06/28/2016

As-Built Certification

This as-built certification certifies that the gas well drilling pad was constructed in reasonable close conformance with the design drawings. It is recommended that gas well drilling pads or that a comprehensive maintenance and inspection program for gas well drilling pads or that a comprehensive maintenance and inspection program be developed to monitor the pads condition to insure the continued safe operation.

John P. See RPE 6051  
 Date:

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1	Cover Sheet
V1	Schedule of Quantities
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2	Pre-Construction Site Conditions
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R1	Access Road Details
P1	Pad Details

Revision  
 Design  
 Design: WYDEP Revisions

Date  
 10-28-2016  
 10-31-2016



THIS DOCUMENT PREPARED FOR  
 TUG HILL OPERATING

**Kelly Surveying**  
 2000 10th Street, WV 26039  
 304-333-0945

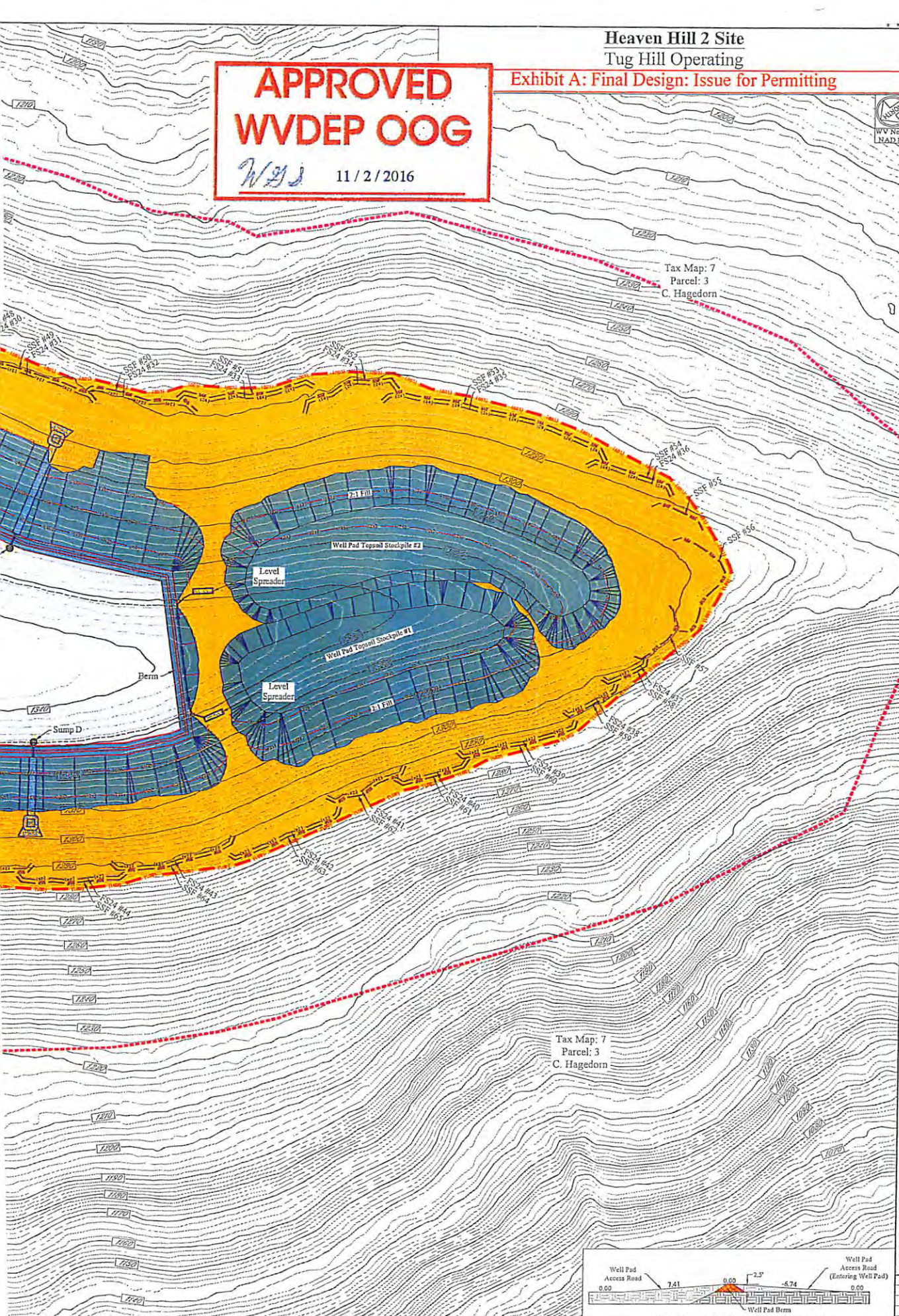
Cover Sheet  
 Heaven Hill 2 Site  
 Meade District  
 Marshall County, WV

Date: 06/28/2016  
 Scale: As Shown  
 Designed By: ZS  
 File No.  
 Sheet 1 of 22

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 WV Department of Environmental Protection  
 05/12/2017

**APPROVED  
WVDEP OOG**

*WJS* 11/2/2016



Tax Map: 7  
Parcel: 3  
C. Hagedorn

Tax Map: 7  
Parcel: 3  
C. Hagedorn

Revision  
Design  
Design: WVDEP Revisions  
Date  
06-28-2016  
10-11-2016

**TUG HILL  
OPERATING**



THIS DOCUMENT  
PREPARED FOR  
TUG HILL  
OPERATING

**Kelly Surveying**  
P.O. Box 254  
Buckley, WV 26039  
(304) 318-6985

**Erosion and Sediment Control Plan**  
Heaven Hill 2 Site  
Meade District  
Marshall County, WV



Date: 06/28/2016  
Scale: As Shown  
Designed By: ZS  
File No.  
Sheet 8 of 22

05/12/2017