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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

Harold D. Ward, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Friday, January 21, 2022  
WELL WORK PERMIT  
Horizontal 6A / New Drill

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

Re: Permit approval for BRECKENRIDGE S-9HM  
47-051-02430-00-00

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: BRECKENRIDGE S-9HM  
Farm Name: CNX LAND LLC  
U.S. WELL NUMBER: 47-051-02430-00-00  
Horizontal 6A New Drill  
Date Issued: 1/21/2022

## 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.

API Number:

## PERMIT CONDITIONS

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

01/28/2022

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      Cameron      Glen Easton 7.5'  
Operator ID      County      District      Quadrangle

2) Operator's Well Number: Breckenridge S-9HM      Well Pad Name: Breckenridge

3) Farm Name/Surface Owner: CNX Land, LLC      Public Road Access: CR 62

4) Elevation, current ground: 1,380'      Elevation, proposed post-construction: 1,370.10'

5) Well Type (a) Gas       Oil       Underground Storage

Other \_\_\_\_\_

(b) If Gas Shallow       Deep

Horizontal

6) Existing Pad: Yes or No No

*Bany Stills*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s): 10-14-21  
Marcellus is the target formation at a depth of 6,946' - 6,998', thickness of 52' and anticipated pressure of approx. 3800 psi.

8) Proposed Total Vertical Depth: 7,098'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 16,317'

11) Proposed Horizontal Leg Length: 8,417.27'

12) Approximate Fresh Water Strata Depths: 70; 1,048'

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

14) Approximate Saltwater Depths: 1,515'

15) Approximate Coal Seam Depths: Sewickley Coal - 952' and Pittsburgh Coal - 1,042'

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

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

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(a) If Yes, provide Mine Info: Name: Marshall County Mine

Depth: Pittsburgh coal - 1,042'; subsea level - 328'

Seam: Pittsburgh

Owner: Marshall County Coal Resources, Inc.

18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	30"	NEW	BW	BW	120'	120'	259ft <sup>3</sup> (CTS)
Fresh Water/Coal	13 3/8"	NEW	J55	54.5#	1,150'	1,150'	1149ft <sup>3</sup> (CTS)
Intermediate	9 5/8"	NEW	J55	36#	3,007'	3,007'	999ft <sup>3</sup> (CTS)
Production	5 1/2"	NEW	P110	20#	16,317'	16,317'	4169ft <sup>3</sup> (CTS)
Tubing	2 3/8"	NEW	N80	4.7#	7,268'		
Liners							

*Bang Stop 10-14-21*

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	30"	36"	1.0	2,333	1,866	CLASS A	1.2
Fresh Water/ Coal	13 3/8"	17 1/2"	.38	2,740	2,192	SEE #24	1.2
Intermediate	9 5/8"	12 1/4"	.352	3,520	2,816	SEE #24	1.19
Production	5 1/2"	8 7/8" _ 8 3/4"	.361	12,640	10,112	SEE #24	1.17/1.19
Tubing	2 3/8"		.19	11,200	8,960		
Liners							

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PACKERS

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

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

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

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

Well to be completed with approximately 21,100,000 lb proppant and 380,000 bbl of water. Max rate = 80 bpm; max psi = 9,000#.

B.S. 10-14-21

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 45.50 acres

22) Area to be disturbed for well pad only, less access road (acres): 8.21 acres

23) Describe centralizer placement for each casing string:

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

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

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

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25) Proposed borehole conditioning procedures:

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

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\*Note: Attach additional sheets as needed.

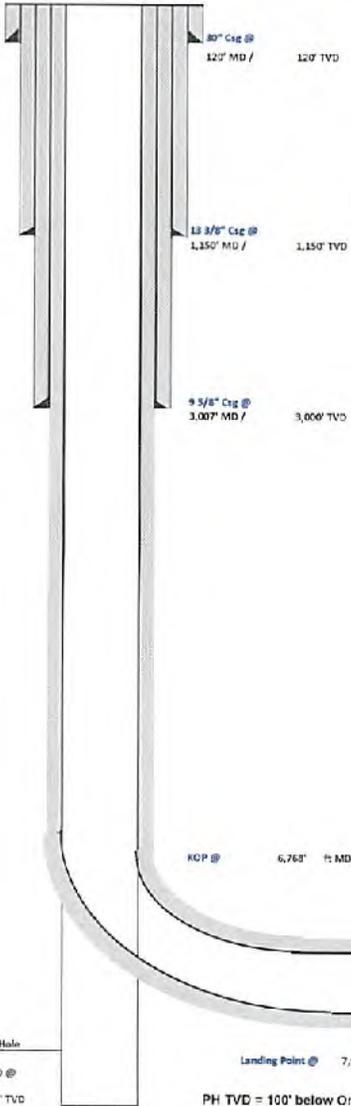


**WELL NAME:** Breckenridge 5-9HM  
**STATE:** WV **COUNTY:** Marshall  
**DISTRICT:** Cameron  
**DF Elev:** 1,370' **GL Elev:** 1,370'  
**TD:** 16,317'  
**TH Latitude:** 39.830321  
**TH Longitude:** -80.626943  
**BH Latitude:** 39.806866  
**BH Longitude:** -80.518407

FORMATION TOPS	
Formation	Depth TVD
Deepest Fresh Water	1048
Sewickley Coal	552
Pittsburgh Coal	1042
Big Lime	2205
Weia	2628
Berza	2823
Gordon	5078
Rhinestreet	6235
Genesee/Burkett	6791
Tully	6825
Hamilton	6856
Marcellus	6946
Landing Depth	6980
Onondaga	6998
Pilot Hole TD	7058

CASING SUMMARY							
Type	Hole Size (in)	Csg Size (in)	Depth (MD)	Depth (TVD)	Weight (lb/ft)	Grade	Top of Cement
Conductor	36	30	120'	120'	BW	BW	Surface
Surface	17 1/2	13 3/8	1,150'	1,150'	54.5	J55	Surface
Intermediate 1	12 1/4	9 5/8	3,007'	3,000'	36	J55	Surface
Production	8 7/8 x 8 3/4	5 1/2	16,317'	7,126'	20	CYHP110	Surface

CEMENT SUMMARY				DRILLING DETAILS	
Type	Sacks	Class	Density (ppg)	Fluid Type	Centralizer Notes
Conductor	338	A	15.6	Air	None
Surface	1,165	A	15.6	Air	3 Centralizers at equal distance
Intermediate 1	862	A	15	Air	3 Centralizer every other joint
Production	3,031	A	14.5	Air / SOBDM	1 every other joint in lateral; 1 per joint in curve; 1 every other joint to surface



B.S. 10-14-21

Pilot Hole  
 PH TD @ 7,098' TVD  
 Landing Point @ 7,901' MD / 6,880' TVD  
 PH TVD = 100' below Onondaga Top

Lateral TD @ 16,317' H MD  
 7,126' ft TVD

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**Tug Hill Operating, LLC Casing and Cement Program**

**Breckenridge S-9HM**

**Casing**

	String	Grade	Bit Size	Depth (Measured)	Cement Fill Up
Conductor	30"	BW	36"	120'	CTS
Surface	13 3/8"	J55	17 1/2"	1,150'	CTS
Intermediate	9 5/8"	J55	12 1/4"	3,007'	CTS
Production	5 1/2"	CYHP110	8 7/8 x 8 3/4"	16,317'	CTS

**Cement**

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

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

Intermediate: Premium NE-1 + 1% bwoc CaC12 + 46.5% Fresh Water – Intermediate Cement mixed at 15 ppg, Y=1.38

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

Production: 50:50 Poz: Premium NE-1 + .1% bwoc ASA-301 + 60lb/sk ASCA-1 + .35% bwoc BA-10A + .25% bwoc MPA-170, 44 lb sack + .5% bwoc R-3 + .75 gals/100sk FP-13L – Production Cement mixed at 14.5 ppg, Y = 1.3

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01/28/2022

4705102430

WW-9  
(4/16)

API Number 47 - 051 -  
Operator's Well No. Breckenridge S-9HM

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) Middle 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 Drilling

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

-If oil based, what type? Synthetic, petroleum, etc. n/a

Additives to be used in drilling medium? \_\_\_\_\_

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

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

-Landfill or offsite name/permit number? Wozel County Sanitary Landfill (SWF-1021 / WW0109185) and Westmoreland Sanitary Landfill, LLC (SAN1405 / PA DEP EC#1388426)

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

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

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

Company Official Signature Jim Pancake  
Company Official (Typed Name) Jim Pancake  
Company Official Title Vice President - Geosciences

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Subscribed and sworn before me this 2nd day of December, 2021

Susanne Deliere Notary Public

My commission expires 1/15/2025

Commonwealth of Pennsylvania - Notary Seal  
Susanne Deliere, Notary Public  
Washington County  
My commission expires January 15, 2025  
Commission # 01282932  
01/28/2022  
Member, Pennsylvania Association of Notaries

Tug Hill Operating, LLC

Proposed Revegetation Treatment: Acres Disturbed 5.44 Prevegetation pH 6.0

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

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

Attach:

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

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Doug Shilpa

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

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Title: Oil and Gas Inspector

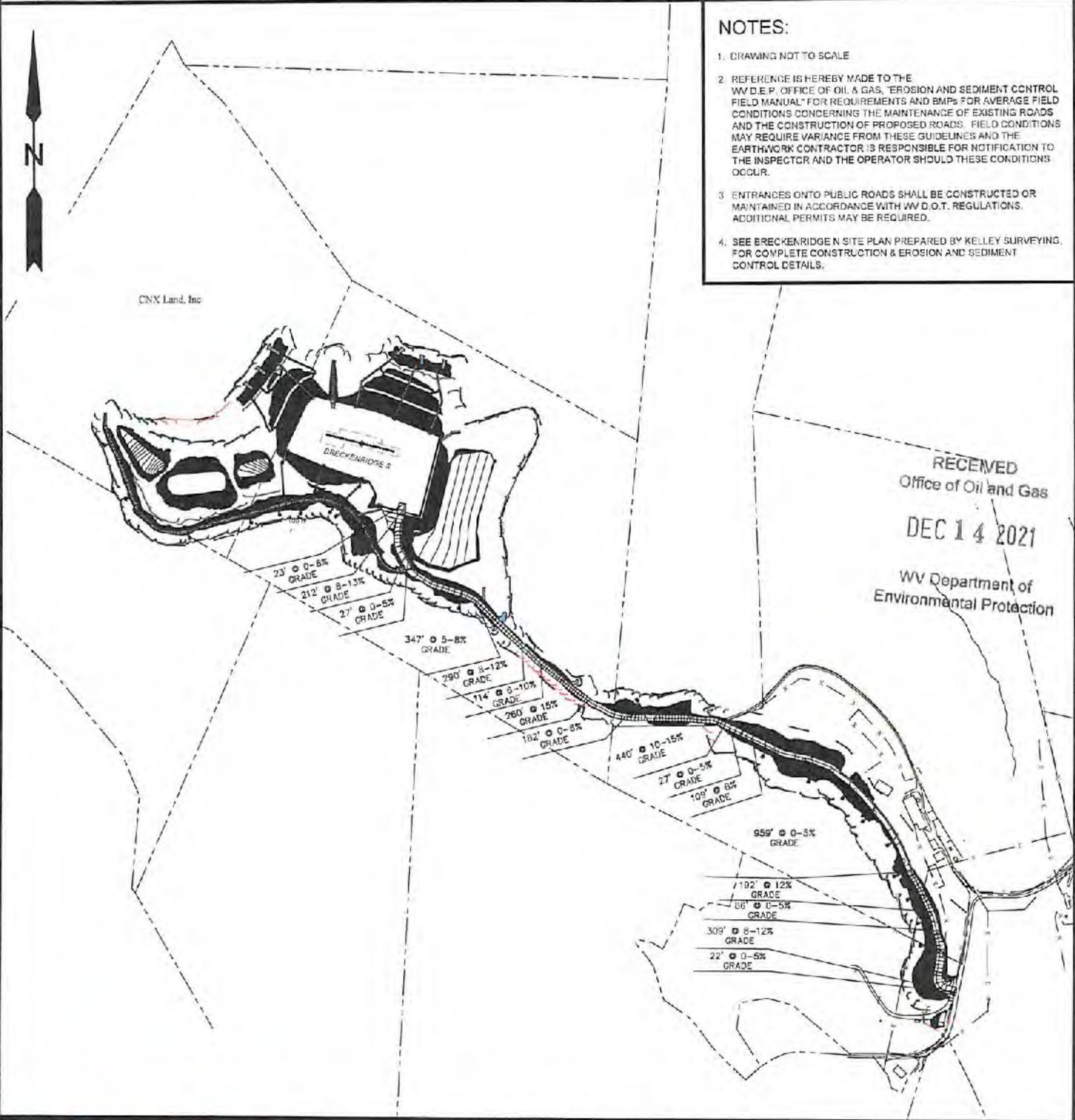
Date: 10-14-21

Field Reviewed? (  ) Yes (  ) No

# PROPOSED BRECKENRIDGE S - 9HM

**NOTES:**

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



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 1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.1992  
 254 East Beckley Drive | Beckley, WV 25201 | 304.253.2250  
 sls.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	CAMERON	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	9026	09-23-21	NONE



**TUG HILL  
OPERATING**

01/28/2022



**TUG HILL**  
OPERATING

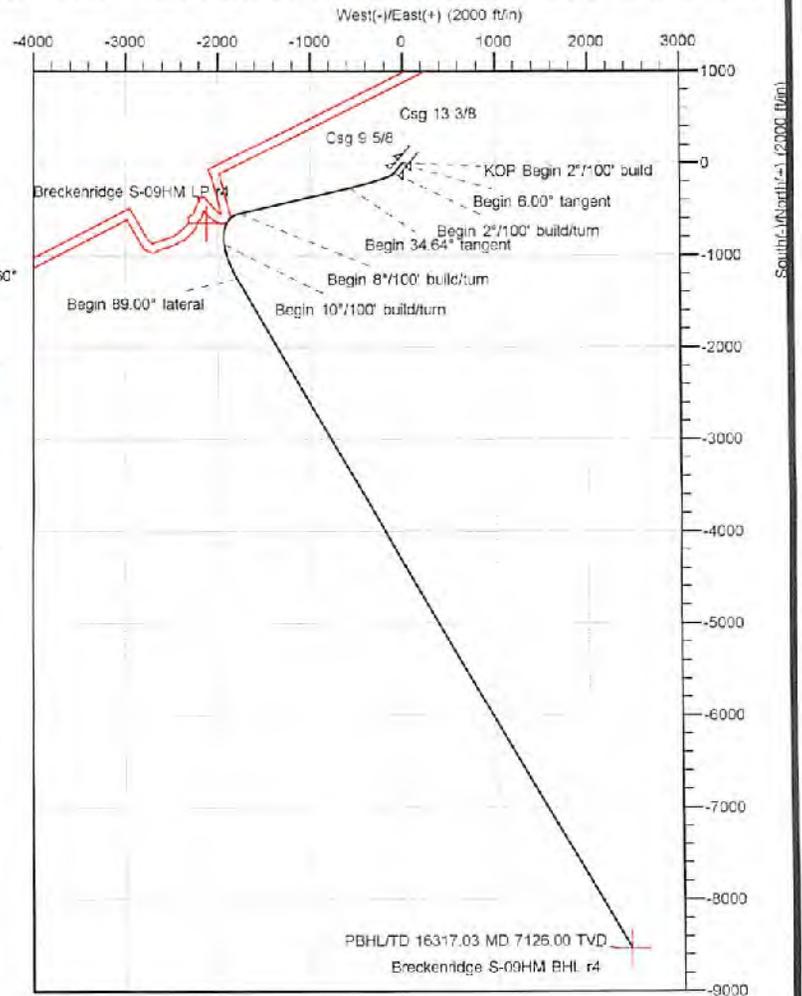
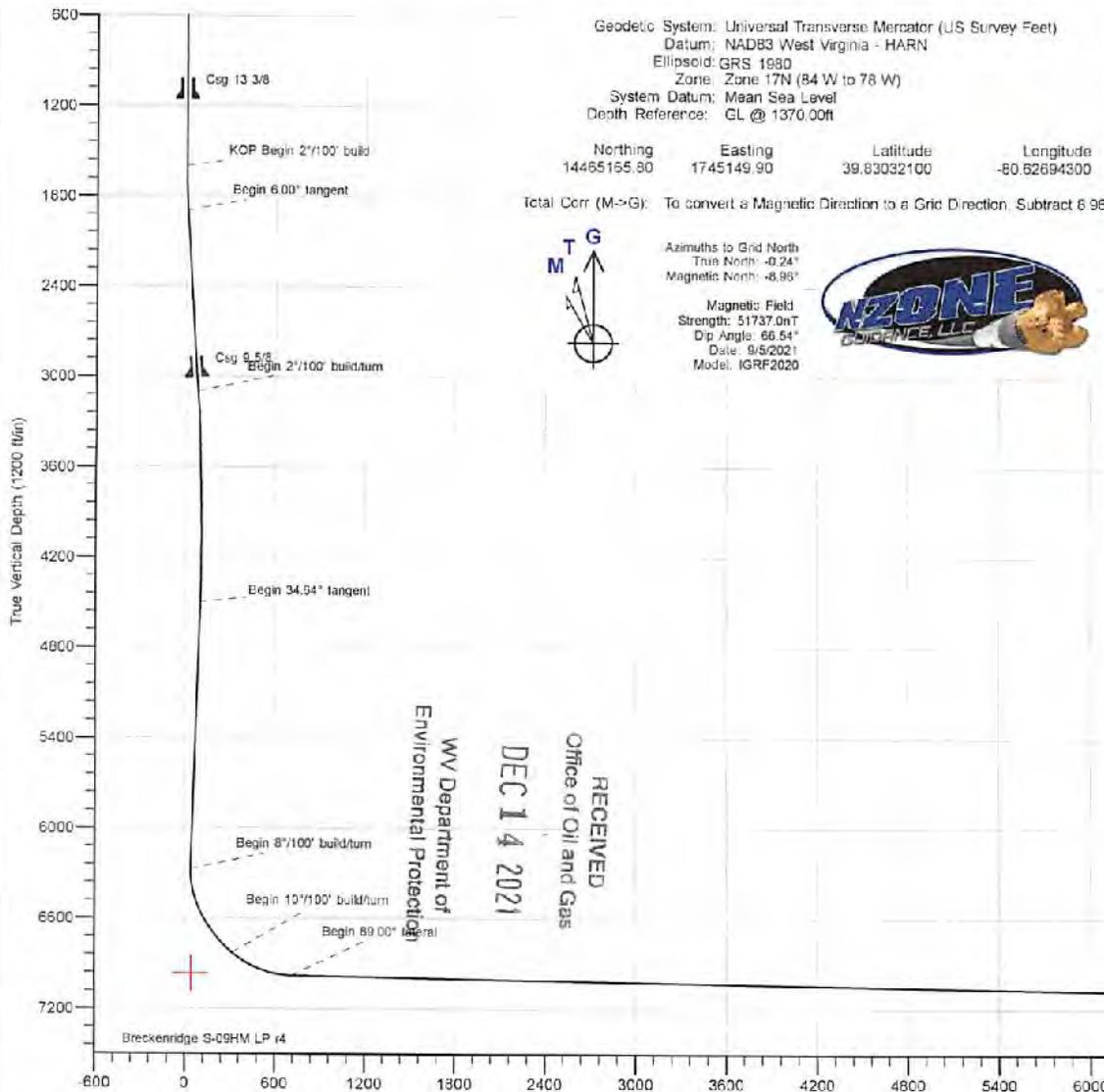
**Well: Breckenridge S-09 HM (slot K)**  
**Site: Breckenridge (1 row)**  
**Project: Marshall County, West Virginia**  
**Design: rev5**  
**Rig:**

**DESIGN TARGET DETAILS**

Name	TVD	-N/S	+E/W	Northing	Easting	Latitude	Longitude
Breckenridge S-09HM LP r4	3967.00	-648.17	-2118.13	14464517.83	1743031.77	39.82856500	-80.63449700
- plan misses target center by 316.25ft at 7395.38ft MD (6781.66 TVD, -328.68 N, -1936.25 E)							
Breckenridge S-09HM BHL r4	7126.00	-8530.59	2432.86	14456635.22	1747582.76	39.80606600	-80.61840700
- plan hits target center							

**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	0.000	0.00	
2	1600.00	0.00	0.00	1600.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 2"/100' build
3	1900.00	6.00	220.00	1899.45	-12.02	-10.09	2.00	220.000	8.80	Begin 5.00' tangent
4	3107.18	6.00	220.00	3100.00	-108.68	-91.20	0.00	0.000	79.60	Begin 2"/100' build/turn
5	4809.37	34.64	257.01	4497.07	-258.52	-568.71	2.00	43.111	102.75	Begin 34.64' tangent
6	6767.55	34.64	257.01	6272.60	-544.40	-1784.19	0.00	0.000	41.18	Begin 8"/100' build/turn
7	7464.83	50.00	171.42	6828.11	-879.99	-1930.84	8.00	-112.535	318.40	Begin 10"/100' build/turn
8	7901.28	89.00	149.88	6979.58	-1252.20	-1789.51	10.00	-32.131	715.07	Begin 89.00' lateral
9	16317.03	89.00	149.88	7126.00	-6530.59	2432.86	0.00	0.000	8870.72	PBHL/TD 15317.03 MD 7126.00 TVD





Planning Report - Geographic

<b>Database:</b>	DB_Dec2220_v16	<b>Local Co-ordinate Reference:</b>	Well Breckenridge S-09 HM (slot K)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1370.00ft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL @ 1370.00ft
<b>Site:</b>	Breckenridge (1 row)	<b>North Reference:</b>	Grid
<b>Well:</b>	Breckenridge S-09 HM (slot K)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev5		

<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>	Breckenridge (1 row)				
<b>Site Position:</b>		<b>Northing:</b>	14,465,184.76 usft	<b>Latitude:</b>	39.83037401
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,745,068.18 usft	<b>Longitude:</b>	-80.62723379
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "		

<b>Well</b>	Breckenridge S-09 HM (slot K)					
<b>Well Position</b>	+N-S	0.00 ft	<b>Northing:</b>	14,465,185.80 usft	<b>Latitude:</b>	39.83032100
	+E-W	0.00 ft	<b>Easting:</b>	1,745,149.90 usft	<b>Longitude:</b>	-80.62694300
<b>Position Uncertainty</b>	0.00 ft		<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	1,370.00 ft
<b>Grid Convergence:</b>						

<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>
	IGRF2020	9/5/2021	-8.721	66.539	51,737.04834376

<b>Design</b>	rev5			
<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) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	164.13

<b>Plan Survey Tool Program</b>	<b>Date</b>			
<b>Depth From (ft)</b>	<b>Depth To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	16,317.03 rev5 (Original Hole)		



Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Breckenridge S-09 HM (slot K)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1370.00ft
Project:	Marshall County, West Virginia	MD Reference:	GL @ 1370.00ft
Site:	Breckenridge (1 row)	North Reference:	Grid
Well:	Breckenridge S-09 HM (slot K)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev5		

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,900.00	6.00	220.00	1,899.45	-12.02	-10.09	2.00	2.00	0.00	220.000	
3,107.16	6.00	220.00	3,100.00	-108.88	-91.20	0.00	0.00	0.00	0.000	
4,609.37	34.64	257.01	4,497.07	-268.52	-568.71	2.00	1.91	2.46	43.111	
6,787.55	34.64	257.01	6,272.60	-544.40	-1,784.19	0.00	0.00	0.00	0.000	
7,464.83	50.00	171.42	6,826.11	-879.99	-1,930.84	8.00	2.20	-12.27	-112.535	
7,901.28	89.00	149.88	6,979.58	-1,252.20	-1,789.51	10.00	8.94	-4.94	-32.131	
16,317.03	89.00	149.88	7,126.00	-8,530.59	2,432.86	0.00	0.00	0.00	0.000	Breckenridge S-09HM

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Planning Report - Geographic

Database: DB\_Dec2220\_v16  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Breckenridge (1 row)  
 Well: Breckenridge S-09 HM (slot K)  
 Wellbore: Original Hole  
 Design: rev5

Local Co-ordinate Reference: Well Breckenridge S-09 HM (slot K)  
 TVD Reference: GL @ 1370.00ft  
 MD Reference: GL @ 1370.00ft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
100.00	0.00	0.00	100.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
200.00	0.00	0.00	200.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
300.00	0.00	0.00	300.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
400.00	0.00	0.00	400.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
500.00	0.00	0.00	500.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
600.00	0.00	0.00	600.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
700.00	0.00	0.00	700.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
800.00	0.00	0.00	800.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
900.00	0.00	0.00	900.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,465,165.80	1,745,149.90	39.83032100	-80.62694300	
<b>KOP Begin 2°/100' build</b>										
1,700.00	2.00	220.00	1,699.96	-1.34	-1.12	14,465,164.46	1,745,148.78	39.83031734	-80.62694702	
1,800.00	4.00	220.00	1,799.84	-5.35	-4.49	14,465,160.45	1,745,145.41	39.83030637	-80.62695908	
1,900.00	6.00	220.00	1,899.45	-12.02	-10.09	14,465,153.78	1,745,139.81	39.83028810	-80.62697911	
<b>Begin 6.00° tangent</b>										
2,000.00	6.00	220.00	1,998.90	-20.03	-16.81	14,465,145.77	1,745,133.09	39.83026619	-80.62700316	
2,100.00	8.00	220.00	2,098.36	-28.04	-23.53	14,465,137.76	1,745,126.37	39.83024428	-80.62702721	
2,200.00	5.00	220.00	2,197.81	-36.04	-30.24	14,465,129.75	1,745,119.85	39.83022236	-80.62705126	
2,300.00	8.00	220.00	2,297.26	-44.05	-35.96	14,465,121.75	1,745,112.94	39.83020045	-80.62707531	
2,400.00	6.00	220.00	2,396.71	-52.08	-43.88	14,465,113.74	1,745,106.22	39.83017854	-80.62709937	
2,500.00	8.00	220.00	2,496.17	-60.07	-50.40	14,465,105.73	1,745,099.50	39.83015663	-80.62712342	
2,600.00	6.00	220.00	2,595.62	-68.07	-57.12	14,465,097.73	1,745,092.78	39.83013471	-80.62714747	
2,700.00	6.00	220.00	2,695.07	-76.08	-63.84	14,465,089.72	1,745,086.06	39.83011280	-80.62717152	
2,800.00	6.00	220.00	2,794.52	-84.09	-70.56	14,465,081.71	1,745,079.34	39.83009089	-80.62719557	
2,900.00	6.00	220.00	2,893.97	-92.10	-77.28	14,465,073.70	1,745,072.62	39.83006897	-80.62721962	
3,000.00	6.00	220.00	2,993.43	-100.10	-84.00	14,465,065.70	1,745,065.90	39.83004706	-80.62724367	
3,107.16	6.00	220.00	3,100.00	-108.68	-81.20	14,465,057.12	1,745,058.70	39.83002358	-80.62726944	
<b>Begin 2°/100' build/turn</b>										
3,200.00	7.46	229.82	3,192.20	-116.29	-98.92	14,465,049.51	1,745,050.98	39.83000277	-80.62729708	
3,300.00	9.20	236.71	3,291.14	-124.87	-110.57	14,465,040.93	1,745,039.33	39.82997934	-80.62733668	
3,400.00	11.02	241.39	3,369.59	-133.84	-125.65	14,465,031.96	1,745,024.25	39.82995489	-80.62739252	
3,500.00	12.90	244.73	3,487.41	-143.18	-144.14	14,465,022.61	1,745,005.76	39.82992944	-80.62745853	
3,600.00	14.81	247.24	3,584.50	-152.89	-166.02	14,465,012.80	1,744,983.88	39.82990302	-80.62753662	
3,700.00	16.74	249.18	3,680.73	-162.96	-191.27	14,465,002.84	1,744,958.63	39.82987567	-80.62762670	
3,800.00	18.68	250.73	3,775.98	-173.37	-219.85	14,464,992.43	1,744,930.05	39.82984742	-80.62772866	
3,900.00	20.64	251.89	3,870.15	-184.10	-251.73	14,464,981.70	1,744,898.17	39.82981830	-80.62784238	
4,000.00	22.60	253.05	3,963.11	-195.15	-286.88	14,464,970.64	1,744,863.02	39.82978835	-80.62796772	
4,100.00	24.57	253.94	4,054.76	-206.51	-325.24	14,464,959.29	1,744,824.66	39.82975760	-80.62810452	
4,200.00	26.54	254.71	4,144.97	-218.15	-366.77	14,464,947.65	1,744,783.13	39.82972610	-80.62825262	
4,300.00	28.52	255.33	4,233.64	-230.07	-411.42	14,464,935.73	1,744,738.48	39.82969368	-80.62841184	
4,400.00	30.49	255.97	4,320.67	-242.25	-459.14	14,464,923.55	1,744,690.76	39.82966099	-80.62858198	
4,500.00	32.48	256.49	4,405.94	-254.67	-508.86	14,464,911.13	1,744,640.04	39.82962745	-80.62876265	
4,609.37	34.84	257.01	4,497.07	-268.52	-568.71	14,464,897.28	1,744,581.19	39.82959008	-80.62897266	
<b>Begin 34.64° tangent</b>										
4,700.00	34.64	257.01	4,571.64	-280.11	-618.92	14,464,865.69	1,744,530.98	39.82955884	-80.62915165	
4,800.00	34.64	257.01	4,653.91	-292.89	-674.31	14,464,872.91	1,744,475.59	39.82952436	-80.62934914	
4,900.00	34.64	257.01	4,736.18	-305.67	-729.70	14,464,860.13	1,744,420.20	39.82948989	-80.62954663	

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 Site: Breckenridge (1 row)  
 Well: Breckenridge S-09 HM (slot K)  
 Wellbore: Original Hole  
 Design: rev5

Local Co-ordinate Reference: Well Breckenridge S-09 HM (slot K)  
 TVD Reference: GL @ 1370.00ft  
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 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,000.00	34.64	257.01	4,818.45	-318.46	-785.09	14,464,847.34	1,744,364.81	39.82945541	-80.62974412
5,100.00	34.64	257.01	4,900.72	-331.24	-840.49	14,464,834.56	1,744,309.41	39.82942094	-80.62994161
5,200.00	34.64	257.01	4,982.98	-344.02	-895.88	14,464,821.78	1,744,254.02	39.82938646	-80.63013909
5,300.00	34.64	257.01	5,065.25	-356.80	-951.27	14,464,808.99	1,744,198.63	39.82935199	-80.63033558
5,400.00	34.64	257.01	5,147.52	-369.59	-1,006.66	14,464,796.21	1,744,143.24	39.82931751	-80.63053407
5,500.00	34.64	257.01	5,229.79	-382.37	-1,062.08	14,464,783.43	1,744,087.84	39.82928303	-80.63073156
5,600.00	34.64	257.01	5,312.06	-395.15	-1,117.45	14,464,770.65	1,744,032.45	39.82924856	-80.63092905
5,700.00	34.64	257.01	5,394.33	-407.94	-1,172.84	14,464,757.86	1,743,977.06	39.82921408	-80.63112654
5,800.00	34.64	257.01	5,476.60	-420.72	-1,228.24	14,464,745.08	1,743,921.67	39.82917960	-80.63132402
5,900.00	34.64	257.01	5,558.87	-433.50	-1,283.63	14,464,732.30	1,743,866.27	39.82914512	-80.63152151
6,000.00	34.64	257.01	5,641.14	-446.29	-1,339.02	14,464,719.51	1,743,810.88	39.82911064	-80.63171900
6,100.00	34.64	257.01	5,723.41	-459.07	-1,394.41	14,464,706.73	1,743,755.49	39.82907616	-80.63191649
6,200.00	34.64	257.01	5,805.68	-471.85	-1,449.81	14,464,693.95	1,743,700.10	39.82904169	-80.63211397
6,300.00	34.64	257.01	5,887.95	-484.64	-1,505.20	14,464,681.16	1,743,644.70	39.82900721	-80.63231146
6,400.00	34.64	257.01	5,970.22	-497.42	-1,560.59	14,464,668.38	1,743,589.31	39.82897273	-80.63250895
6,500.00	34.64	257.01	6,052.49	-510.20	-1,615.98	14,464,655.60	1,743,533.92	39.82893825	-80.63270643
6,600.00	34.64	257.01	6,134.76	-522.98	-1,671.38	14,464,642.81	1,743,478.53	39.82890376	-80.63290392
6,700.00	34.64	257.01	6,217.02	-535.77	-1,726.77	14,464,630.03	1,743,423.13	39.82886928	-80.63310140
6,767.55	34.64	257.01	6,272.60	-544.40	-1,764.19	14,464,621.40	1,743,385.72	39.82884599	-80.63323480
<b>Begin 8°/100° build/turn</b>									
6,800.00	33.72	252.68	6,299.44	-549.16	-1,781.78	14,464,616.64	1,743,368.12	39.82883313	-80.63329753
6,850.00	32.62	245.65	6,341.31	-558.85	-1,807.32	14,464,606.95	1,743,342.59	39.82880580	-80.63338864
6,900.00	31.93	238.27	6,383.60	-571.36	-1,830.85	14,464,594.44	1,743,319.05	39.82877270	-80.63347264
6,950.00	31.67	230.69	6,426.12	-586.64	-1,852.26	14,464,579.16	1,743,297.64	39.82873100	-80.63354912
7,000.00	31.87	223.10	6,468.54	-604.60	-1,871.45	14,464,561.20	1,743,278.46	39.82868188	-80.63361772
7,050.00	32.51	215.69	6,510.97	-625.16	-1,888.51	14,464,540.64	1,743,261.59	39.82862561	-80.63367809
7,100.00	33.57	208.61	6,552.90	-648.22	-1,902.78	14,464,517.58	1,743,247.13	39.82856244	-80.63372995
7,150.00	35.01	201.98	6,594.22	-673.67	-1,914.77	14,464,492.13	1,743,235.13	39.82849269	-80.63377304
7,200.00	36.78	195.85	6,634.73	-701.36	-1,924.23	14,464,464.42	1,743,225.67	39.82841669	-80.63380694
7,250.00	38.84	190.26	6,674.25	-731.22	-1,931.12	14,464,434.58	1,743,218.78	39.82833482	-80.63383211
7,300.00	41.14	185.17	6,712.56	-763.04	-1,935.39	14,464,402.76	1,743,214.51	39.82824748	-80.63384780
7,350.00	43.65	180.54	6,749.49	-796.69	-1,937.04	14,464,369.11	1,743,212.86	39.82815509	-80.63385415
7,400.00	46.32	176.33	6,784.86	-832.01	-1,936.05	14,464,333.79	1,743,213.86	39.82805810	-80.63385113
7,450.00	49.14	172.50	6,818.49	-868.81	-1,932.42	14,464,296.99	1,743,217.48	39.82795698	-80.63384375
7,464.83	50.00	171.42	6,828.11	-879.99	-1,930.84	14,464,285.81	1,743,219.08	39.82792526	-80.63383828
<b>Begin 10°/100° build/turn</b>									
7,500.00	53.00	169.08	6,850.00	-907.11	-1,926.17	14,464,258.89	1,743,223.74	39.82785174	-80.63381704
7,550.00	57.34	166.05	6,878.56	-947.17	-1,917.31	14,464,218.63	1,743,232.60	39.82774164	-80.63378605
7,600.00	61.75	163.31	6,903.90	-988.71	-1,905.90	14,464,177.09	1,743,244.00	39.82762741	-80.63374604
7,650.00	68.20	160.78	6,925.83	-1,031.44	-1,892.04	14,464,134.37	1,743,257.67	39.82750993	-80.63369728
7,700.00	70.70	158.43	6,944.19	-1,075.00	-1,875.82	14,464,090.80	1,743,274.08	39.82739010	-80.63364016
7,750.00	75.22	156.20	6,958.84	-1,119.09	-1,857.37	14,464,046.71	1,743,292.53	39.82726882	-80.63357511
7,800.00	79.76	154.06	6,969.67	-1,163.36	-1,836.84	14,464,002.44	1,743,313.08	39.82714703	-80.63350262
7,850.00	84.32	151.98	6,976.59	-1,207.47	-1,814.38	14,463,958.33	1,743,335.53	39.82702563	-80.63342325
7,901.28	89.00	149.88	6,979.58	-1,252.20	-1,789.51	14,463,913.60	1,743,360.39	39.82690251	-80.63333533
<b>Begin 89.00° lateral</b>									
8,000.00	89.00	149.88	6,981.29	-1,337.58	-1,739.98	14,463,823.22	1,743,409.92	39.82666750	-80.63316017
8,100.00	89.00	149.88	6,983.03	-1,424.06	-1,689.81	14,463,741.74	1,743,460.09	39.82642942	-80.63288273
8,200.00	89.00	149.88	6,984.77	-1,510.55	-1,639.64	14,463,655.25	1,743,510.27	39.82619135	-80.63260530
8,300.00	89.00	149.88	6,986.51	-1,597.03	-1,589.46	14,463,568.77	1,743,560.44	39.82595328	-80.63232787
8,400.00	89.00	149.88	6,988.25	-1,683.52	-1,539.29	14,463,482.28	1,743,610.61	39.82571520	-80.63205043
8,500.00	89.00	149.88	6,989.99	-1,770.00	-1,489.12	14,463,395.80	1,743,660.78	39.82547713	-80.63227300
8,600.00	89.00	149.88	6,991.73	-1,855.49	-1,438.95	14,463,309.31	1,743,710.96	39.82523906	-80.63209557
8,700.00	89.00	149.88	6,993.47	-1,942.97	-1,388.77	14,463,222.83	1,743,761.13	39.82500098	-80.63191815

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 North Reference: Grid  
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Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,800.00	89.00	149.88	6,995.21	-2,029.46	-1,338.60	14,463,136.34	1,743,811.30	39.82476291	-80.63174072
8,900.00	89.00	149.88	6,996.95	-2,115.94	-1,288.43	14,463,049.86	1,743,861.47	39.82452483	-80.63156329
9,000.00	89.00	149.88	6,998.69	-2,202.43	-1,238.26	14,462,963.37	1,743,911.64	39.82428676	-80.63138597
9,100.00	89.00	149.88	7,000.43	-2,288.92	-1,188.09	14,462,876.89	1,743,961.82	39.82404868	-80.63120845
9,200.00	89.00	149.88	7,002.17	-2,375.40	-1,137.91	14,462,790.40	1,744,011.99	39.82381061	-80.63103103
9,300.00	89.00	149.88	7,003.91	-2,461.89	-1,087.74	14,462,703.92	1,744,062.16	39.82357253	-80.63085361
9,400.00	89.00	149.88	7,005.65	-2,548.37	-1,037.57	14,462,617.43	1,744,112.33	39.82333446	-80.63067619
9,500.00	89.00	149.88	7,007.39	-2,634.86	-987.40	14,462,530.95	1,744,162.50	39.82309638	-80.63049877
9,600.00	89.00	149.88	7,009.13	-2,721.34	-937.22	14,462,444.46	1,744,212.68	39.82285830	-80.63032135
9,700.00	89.00	149.88	7,010.87	-2,807.83	-887.05	14,462,357.98	1,744,262.85	39.82262023	-80.63014394
9,800.00	89.00	149.88	7,012.61	-2,894.31	-836.88	14,462,271.49	1,744,313.02	39.82238215	-80.62996652
9,900.00	89.00	149.88	7,014.35	-2,980.80	-786.71	14,462,185.01	1,744,363.19	39.82214407	-80.62978911
10,000.00	89.00	149.88	7,016.09	-3,067.28	-736.54	14,462,098.52	1,744,413.37	39.82190599	-80.62961170
10,100.00	89.00	149.88	7,017.83	-3,153.77	-686.36	14,462,012.04	1,744,463.54	39.82166792	-80.62943428
10,200.00	89.00	149.88	7,019.57	-3,240.25	-636.19	14,461,925.55	1,744,513.71	39.82142984	-80.62925688
10,300.00	89.00	149.88	7,021.31	-3,326.74	-586.02	14,461,839.07	1,744,563.88	39.82119176	-80.62907947
10,400.00	89.00	149.88	7,023.05	-3,413.23	-535.85	14,461,752.58	1,744,614.05	39.82095368	-80.62890206
10,500.00	89.00	149.88	7,024.79	-3,499.71	-485.67	14,461,666.10	1,744,664.23	39.82071560	-80.62872465
10,600.00	89.00	149.88	7,026.53	-3,586.20	-435.50	14,461,579.61	1,744,714.40	39.82047752	-80.62854725
10,700.00	89.00	149.88	7,028.27	-3,672.68	-385.33	14,461,493.12	1,744,764.57	39.82023944	-80.62836985
10,800.00	89.00	149.88	7,030.01	-3,759.17	-335.16	14,461,406.64	1,744,814.74	39.82000136	-80.62819244
10,900.00	89.00	149.88	7,031.75	-3,845.65	-284.98	14,461,320.15	1,744,864.91	39.81976328	-80.62801504
11,000.00	89.00	149.88	7,033.49	-3,932.14	-234.81	14,461,233.67	1,744,915.09	39.81952520	-80.62783764
11,100.00	89.00	149.88	7,035.23	-4,018.62	-184.64	14,461,147.18	1,744,965.26	39.81928712	-80.62766024
11,200.00	89.00	149.88	7,036.97	-4,105.11	-134.47	14,461,060.70	1,745,015.43	39.81904904	-80.62748285
11,300.00	89.00	149.88	7,038.71	-4,191.59	-84.30	14,460,974.21	1,745,065.60	39.81881096	-80.62730545
11,400.00	89.00	149.88	7,040.45	-4,278.08	-34.12	14,460,887.73	1,745,115.78	39.81857288	-80.62712806
11,500.00	89.00	149.88	7,042.19	-4,364.56	16.05	14,460,801.24	1,745,165.95	39.81833480	-80.62695066
11,600.00	89.00	149.88	7,043.93	-4,451.05	66.22	14,460,714.76	1,745,216.12	39.81809671	-80.62677327
11,700.00	89.00	149.88	7,045.67	-4,537.53	116.39	14,460,628.27	1,745,266.29	39.81785863	-80.62659588
11,800.00	89.00	149.88	7,047.41	-4,624.02	166.57	14,460,541.79	1,745,316.46	39.81762055	-80.62641849
11,900.00	89.00	149.88	7,049.15	-4,710.51	216.74	14,460,455.30	1,745,366.64	39.81738247	-80.62624110
12,000.00	89.00	149.88	7,050.89	-4,796.99	266.91	14,460,368.82	1,745,416.81	39.81714439	-80.62606371
12,100.00	89.00	149.88	7,052.63	-4,883.48	317.09	14,460,282.33	1,745,466.98	39.81690630	-80.62588632
12,200.00	89.00	149.88	7,054.37	-4,969.96	367.25	14,460,195.85	1,745,517.15	39.81666822	-80.62570894
12,300.00	89.00	149.88	7,056.11	-5,056.45	417.43	14,460,109.36	1,745,567.33	39.81643013	-80.62553155
12,400.00	89.00	149.88	7,057.85	-5,142.93	467.60	14,460,022.88	1,745,617.50	39.81619205	-80.62535417
12,500.00	89.00	149.88	7,059.59	-5,229.42	517.77	14,459,936.39	1,745,667.67	39.81595396	-80.62517679
12,600.00	89.00	149.88	7,061.33	-5,315.90	567.94	14,459,849.91	1,745,717.84	39.81571588	-80.62499941
12,700.00	89.00	149.88	7,063.07	-5,402.39	618.12	14,459,763.42	1,745,768.01	39.81547779	-80.62482203
12,800.00	89.00	149.88	7,064.81	-5,488.87	668.29	14,459,676.94	1,745,818.19	39.81523971	-80.62464465
12,900.00	89.00	149.88	7,066.55	-5,575.36	718.46	14,459,590.45	1,745,868.36	39.81500162	-80.62446728
13,000.00	89.00	149.88	7,068.29	-5,661.84	768.63	14,459,503.97	1,745,918.53	39.81476354	-80.62428990
13,100.00	89.00	149.88	7,070.03	-5,748.33	818.80	14,459,417.48	1,745,968.70	39.81452545	-80.62411253
13,200.00	89.00	149.88	7,071.77	-5,834.82	868.98	14,459,330.99	1,746,018.87	39.81428736	-80.62393515
13,300.00	89.00	149.88	7,073.51	-5,921.30	919.15	14,459,244.51	1,746,069.05	39.81404928	-80.62375778
13,400.00	89.00	149.88	7,075.25	-6,007.79	969.32	14,459,158.02	1,746,119.22	39.81381119	-80.62358041
13,500.00	89.00	149.88	7,076.99	-6,094.27	1,019.49	14,459,071.54	1,746,169.39	39.81357310	-80.62340304
13,600.00	89.00	149.88	7,078.73	-6,180.76	1,069.67	14,458,985.05	1,746,219.56	39.81333501	-80.62322568
13,700.00	89.00	149.88	7,080.47	-6,267.24	1,119.84	14,458,898.57	1,746,269.74	39.81309693	-80.62304831
13,800.00	89.00	149.88	7,082.21	-6,353.73	1,170.01	14,458,812.08	1,746,319.91	39.81285884	-80.62287094
13,900.00	89.00	149.88	7,083.95	-6,440.21	1,220.18	14,458,725.60	1,746,370.08	39.81262075	-80.62269358
14,000.00	89.00	149.88	7,085.69	-6,526.70	1,270.36	14,458,639.11	1,746,420.25	39.81238266	-80.62251621
14,100.00	89.00	149.88	7,087.43	-6,613.18	1,320.53	14,458,552.63	1,746,470.42	39.81214457	-80.62233885
14,200.00	89.00	149.88	7,089.17	-6,699.67	1,370.70	14,458,466.14	1,746,520.60	39.81190648	-80.62216149

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Planning Report - Geographic

Database: DB\_Dec2220\_v16  
 Company: Tug Hill Operating LLC  
 Project: Marshall County, West Virginia  
 Site: Breckenridge (1 row)  
 Well: Breckenridge S-09 HM (slot K)  
 Wellbore: Original Hole  
 Design: rev5

Local Co-ordinate Reference: Well Breckenridge S-09 HM (slot K)  
 TVD Reference: GL @ 1370.00ft  
 MD Reference: GL @ 1370.00ft  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,300.00	89.00	149.88	7,090.91	-6,786.15	1,420.87	14,458,379.66	1,746,570.77	39.81166839	-80.62198413
14,400.00	89.00	149.88	7,092.65	-6,872.64	1,471.04	14,458,293.17	1,746,620.94	39.81143030	-80.62180677
14,500.00	89.00	149.88	7,094.39	-6,959.12	1,521.22	14,458,206.69	1,746,671.11	39.81119221	-80.62162942
14,600.00	89.00	149.88	7,096.13	-7,045.61	1,571.39	14,458,120.20	1,746,721.28	39.81095412	-80.62145206
14,700.00	89.00	149.88	7,097.87	-7,132.10	1,621.56	14,458,033.72	1,746,771.46	39.81071603	-80.62127471
14,800.00	89.00	149.88	7,099.61	-7,218.58	1,671.73	14,457,947.23	1,746,821.63	39.81047794	-80.62109735
14,900.00	89.00	149.88	7,101.35	-7,305.07	1,721.91	14,457,860.75	1,746,871.80	39.81023985	-80.62092000
15,000.00	89.00	149.88	7,103.09	-7,391.55	1,772.08	14,457,774.26	1,746,921.97	39.81000176	-80.62074265
15,100.00	89.00	149.88	7,104.83	-7,478.04	1,822.25	14,457,687.78	1,746,972.15	39.80976367	-80.62056530
15,200.00	89.00	149.88	7,106.57	-7,564.52	1,872.42	14,457,601.29	1,747,022.32	39.80952558	-80.62038795
15,300.00	89.00	149.88	7,108.31	-7,651.01	1,922.59	14,457,514.81	1,747,072.49	39.80928748	-80.62021060
15,400.00	89.00	149.88	7,110.05	-7,737.49	1,972.77	14,457,428.32	1,747,122.66	39.80904939	-80.62003326
15,500.00	89.00	149.88	7,111.78	-7,823.98	2,022.94	14,457,341.84	1,747,172.83	39.80881130	-80.61985591
15,600.00	89.00	149.88	7,113.52	-7,910.46	2,073.11	14,457,255.35	1,747,223.01	39.80857320	-80.61967857
15,700.00	89.00	149.88	7,115.25	-7,996.95	2,123.28	14,457,168.87	1,747,273.18	39.80833511	-80.61950123
15,800.00	89.00	149.88	7,117.00	-8,083.43	2,173.46	14,457,082.38	1,747,323.35	39.80809702	-80.61932389
15,900.00	89.00	149.88	7,118.74	-8,169.92	2,223.63	14,456,995.89	1,747,373.52	39.80785892	-80.61914655
16,000.00	89.00	149.88	7,120.48	-8,256.41	2,273.80	14,456,909.41	1,747,423.69	39.80762083	-80.61896921
16,100.00	89.00	149.88	7,122.22	-8,342.89	2,323.97	14,456,822.92	1,747,473.87	39.80738274	-80.61879187
16,200.00	89.00	149.88	7,123.96	-8,429.38	2,374.14	14,456,736.44	1,747,524.04	39.80714464	-80.61861453
16,300.00	89.00	149.88	7,125.70	-8,515.86	2,424.32	14,456,649.95	1,747,574.21	39.80690655	-80.61843720
16,317.03	89.00	149.88	7,126.00	-8,530.59	2,432.86	14,456,635.23	1,747,582.75	39.80686600	-80.61840700

PBHL/TD 16317.03 MD 7126.00 TVD

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Breckenridge S-09HM L - plan misses target center by 316.25ft at 7395.38ft MD (6781.66 TVD, -828.68 N, -1936.25 E) - Point	0.00	0.00	6,967.00	-648.17	-2,118.13	14,464,517.83	1,743,031.77	39.82856500	-80.63449700
Breckenridge S-09HM B - plan hits target center - Point	0.00	0.00	7,126.00	-8,530.59	2,432.86	14,456,635.23	1,747,582.75	39.80686600	-80.61840700

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
1,150.00	1,150.00	Csg 13 3/8	13-3/8	17-1/2
3,006.61	3,000.00	Csg 9 5/8	9-5/8	12-1/4

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Planning Report - Geographic

<b>Database:</b>	DB_Dec2220_v16	<b>Local Co-ordinate Reference:</b>	Well Breckenridge S-09 HM (slot K)
<b>Company:</b>	Tug Hill Operating LLC	<b>TVD Reference:</b>	GL @ 1370.00ft
<b>Project:</b>	Marshall County, West Virginia	<b>MD Reference:</b>	GL @ 1370.00ft
<b>Site:</b>	Breckenridge (1 row)	<b>North Reference:</b>	Grid
<b>Well:</b>	Breckenridge S-09 HM (slot K)	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Hole		
<b>Design:</b>	rev5		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,600.00	1,600.00	0.00	0.00	KOP Begin 2°/100' build
1,900.00	1,889.45	-12.02	-10.09	Begin 6.00° tangent
3,107.16	3,100.00	-108.68	-91.20	Begin 2°/100' build/turn
4,609.37	4,487.07	-268.52	-568.71	Begin 34.64° tangent
6,767.55	6,272.60	-544.40	-1,764.19	Begin 8°/100' build/turn
7,464.83	6,828.11	-879.99	-1,930.84	Begin 10°/100' build/turn
7,901.28	6,979.58	-1,252.20	-1,789.51	Begin 89.00° lateral
16,317.03	7,126.00	-8,530.59	2,432.86	PBHL/TD 16317.03 MD 7126.00 TVD

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Operator's Well No. Breckenridge S-9HM**Area of Review****Sources of information to Support 35CSR8 - 5.11: 9.3 et seq.**

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

## Data Sources Reviewed:

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

Contacted Adam Picard 724-485-9331, [apicard@dpslandservices.com](mailto:apicard@dpslandservices.com), DPS GIS (09/27/2021) to have him make maps of the wellbores with his information. DPS utilizes WVGES maps for their mapping seems it is the best publicly available. See attached map he provided.

## Request maps for:

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

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

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

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**Wells within 500' Buffer**

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

API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705101082	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 7/3/2008.
4705170164	Hope Natural Gas Company	2374' TVD	Big Injun	unknown	No, the well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation.	
4705102346	Tug Hill Operating, LLC	7115' TVD (proposed)	none	none	Yes, this is a proposed well in the Marcellus. Once completed the well will be within the expected fracture propagation from a Marcellus stimulation. Proper casing and cement should prevent migration of fluids between wellbores.	A Tug Hill Operating, LLC permitted well on the pad that is not drilled or perforated.
4705100754	Leatherwood, Inc.	3045' TVD	Gordon	unknown	No, the well is not deep enough to be within the expected fracture propagation from a Marcellus stimulation. Well is plugged.	Well was plugged 8/8/2008.

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API Number	Operator Name	Total Depth	Perforated Fms	Producing zones not perforated	Is this well "known or reasonably expected to penetrate a depth that could be within the range of Fracture propagation"? 1000' is max limit I would assign to wells that might be within in range of fracture propagation	Comments
4705100974	Consolidation Coal Co.	unknown	unknown	unknown	Unknown but unlikely. The well likely represents an old shallow well that is too shallow to be affected by fracturing in the planned Marcellus well. Well is plugged.	Well was plugged 2/3/2005.

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WV Geological & Economic Survey:

Well: County = 51 Permit = 01082

Report Time: Friday, August 27, 2021 4:10:01 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_16	LAT_DD	LON_DD	UTME	UTMN
4705101082	Marshall	1082	Cameron	Glen Easton	Cameron	39.829496	-80.627436	531880.9	4408899.7

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705101082	7/3/2008	Plugging	Completed	J Richard Wayt			M-1334			Consolidation Coal Co			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AF
4705101082	7/3/2008	6/18/2008	1262	Ground Level				unclassified	unclassified	not available	unknown	unknown						

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

Stratigraphy Information:

API	SUFFIX	FM	FM_QUALITY	DEPTH_TOP	DEPTH_QUALITY	THICKNESS	THICKNESS_QUALITY	ELEV	DATUM
4705101082	Plugging	Pittsburgh coal	Well Record	946	Reasonable	5	Reasonable	1262	Ground Level

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705101082	7/3/2008	0

There is no Sample data for this well

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WV Geological & Economic Survey

**Well: County = 51 Permit = 70164**

Report Time: Friday, August 27, 2021 4:11:58 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705170164	Marshall	70164	Liberty	Glen Easton	Cameron	39.829496	-80.625303	531977.5	4408900.1

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705170164	--		Original Loc	Completed	Elijah Williams	1	547			Hope Natural Gas Company			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT
4705170164	--	--	1420	Barometer	Big Injun (undiff)	Big Injun (undiff)		unclassified	unclassified	not available	unknown	unknown	2374					2374

WV Geological & Economic Survey

**Well: County = 51 Permit = 02346**

Report Time: Friday, August 27, 2021 4:12:17 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705102346	Marshall	2346	Cameron	Glen Easton	Cameron	39.830284	-80.626735	531940.6	4408987.3

Bottom Hole Location Information:

API	EP_FLAG	UTME	UTMN	LON_DD	LAT_DD
4705102346	1	As Proposed	532233.1	4408596.4	-80.623336 39.826751

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705102346	--		Dvtd Wrkd Ovr	Permitted	CNX Land LLC		S-10HM	Breckenridge	Hasans Ventures et al	Tug Hill Operating, LLC		7115	Marcellus Fm

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF
4705102346	--	--	1360	Ground Level															

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 Environmental Protection

WV Geological & Economic Survey

Well: County = 51 Permit = 00764

Report Time: Wednesday, September 29, 2021 3:56:57 PM

Well Reassignment Information: Reassigned From

OLD_COUNTY	OLD_PERMIT	NEW_COUNTY	NEW_PERMIT
51	70183	51	754

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100754	Marshall	754	Liberty	Glen Easton	Cameron	39.828771	-80.627248	531897.4	4409819.3

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_P
4705100754	-/-/1928		Original Loc	Completed	J O Williams	2				Cameron Heat & Light			
4705100754	8/8/2008		Plugging	Completed	J Richard Wayt		M-108			Leatherwood, Inc.			
4705100754	-/-/		Worked Over	Permitted	J Richard Wayt	2		J O Williams		Leatherwood, Inc.			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD
4705100754	-/-/1928	-/-/	1330	Ground Level	Cameron-Garner	Gordon Stray	Gordon Stray	Development Well	Development Well	Gas w/ Oil Show	Cable Tool	Shot	2999		2999	
4705100754	8/8/2008	7/8/2008	1289	Ground Level	Cameron-Garner					not available	unknown	unknown				
4705100754	-/-/	-/-/	1330	Ground Level	Cameron-Garner		Gordon Stray			Gas			3045			

Pay/Show/Water Information:

API	CMP_DT	ACTIVITY	PRODUCT	SECTION	DEPTH_TOP	FM_TOP	DEPTH_BOT	FM_BOT	G_BEF	G_AFT	O_BEF	O_AFT	WATER_QNTY
4705100754	-/-/1928	Show	Oil & Gas	Vertical			2200	Big Injun (PriceSeq)	0	0			
4705100754	-/-/1928	Pay	Gas	Vertical			2954	Gordon Stray	0	0			

Production Gas Information: (Volumes in Mcf)

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_GAS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705100754	Cameron Oil and Gas Co.	1993	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Cameron Gas Co.	1994													
4705100754	Cameron Gas Co.	1995													
4705100754	Coleman, C. R.	1996													
4705100754	Mountaineer Gas Services, Inc.	1997	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Mountaineer Gas Services, Inc.	2001	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Mountaineer Gas Services, Inc.	2002	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Mountaineer Gas Services, Inc.	2003	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Mountaineer Gas Services, Inc.	2004	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Mountaineer Gas Services, Inc.	2006	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Leatherwood, Inc.	2006	0	0	0	0	0	0	0	0	0	0	0	0	0

Production Oil Information: (Volumes in Bbl) \*\* some operators may have reported NGL under Oil

API	PRODUCING_OPERATOR	PRD_YEAR	ANN_OIL	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DCM
4705100754	Cameron Oil and Gas Co.	1993	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Cameron Gas Co.	1994													
4705100754	Cameron Gas Co.	1995													
4705100754	Coleman, C. R.	1996													
4705100754	Mountaineer Gas Services, Inc.	1997	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Mountaineer Gas Services, Inc.	2001	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Mountaineer Gas Services, Inc.	2002	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Mountaineer Gas Services, Inc.	2003	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Mountaineer Gas Services, Inc.	2004	0	0	0	0	0	0	0	0	0	0	0	0	0
4705100754	Mountaineer Gas Services, Inc.	2006	0	0	0	0	0	0	0	0	0	0	0	0	0

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

There is no Production Water data for this well

There is no Stratigraphy data for this well

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

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100754	8/8/2008	0

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WV Geological & Economic Survey:

Well: County = 51 Permit = 00974

Report Time: Wednesday, September 29, 2021 3:58:00 PM

Location Information: [View Map](#)

API	COUNTY	PERMIT	TAX_DISTRICT	QUAD_75	QUAD_15	LAT_DD	LON_DD	UTME	UTMN
4705100974	Marshall	974	Liberty	Cameron	Cameron	39.812821	-80.624689	532123.8	4407049.9

There is no Bottom Hole Location data for this well

Owner Information:

API	CMP_DT	SUFFIX	STATUS	SURFACE_OWNER	WELL_NUM	CO_NUM	LEASE	LEASE_NUM	MINERAL_OWN	OPERATOR_AT_COMPLETION	PROP_VD	PROP_TRGT_FM	TFM_EST_PR
4705100974	2/3/2005	Plugging	Completed	Samantha G Morris		M-328A			Consolidation Coal Co	Consolidation Coal Co.			

Completion Information:

API	CMP_DT	SPUD_DT	ELEV	DATUM	FIELD	DEEPEST_FM	DEEPEST_FMT	INITIAL_CLASS	FINAL_CLASS	TYPE	RIG	CMP_MTHD	TVD	TMD	NEW_FTG	KOD	G_BEF	G_AFT	O_BEF
4705100974	2/3/2005	1/21/2005	1182	Ground Level				unclassified	unclassified	not available	unknown	unknown							

There is no Pay data for this well

There is no Production Gas data for this well

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

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

There is no Production Water data for this well

There is no Stratigraphy data for this well

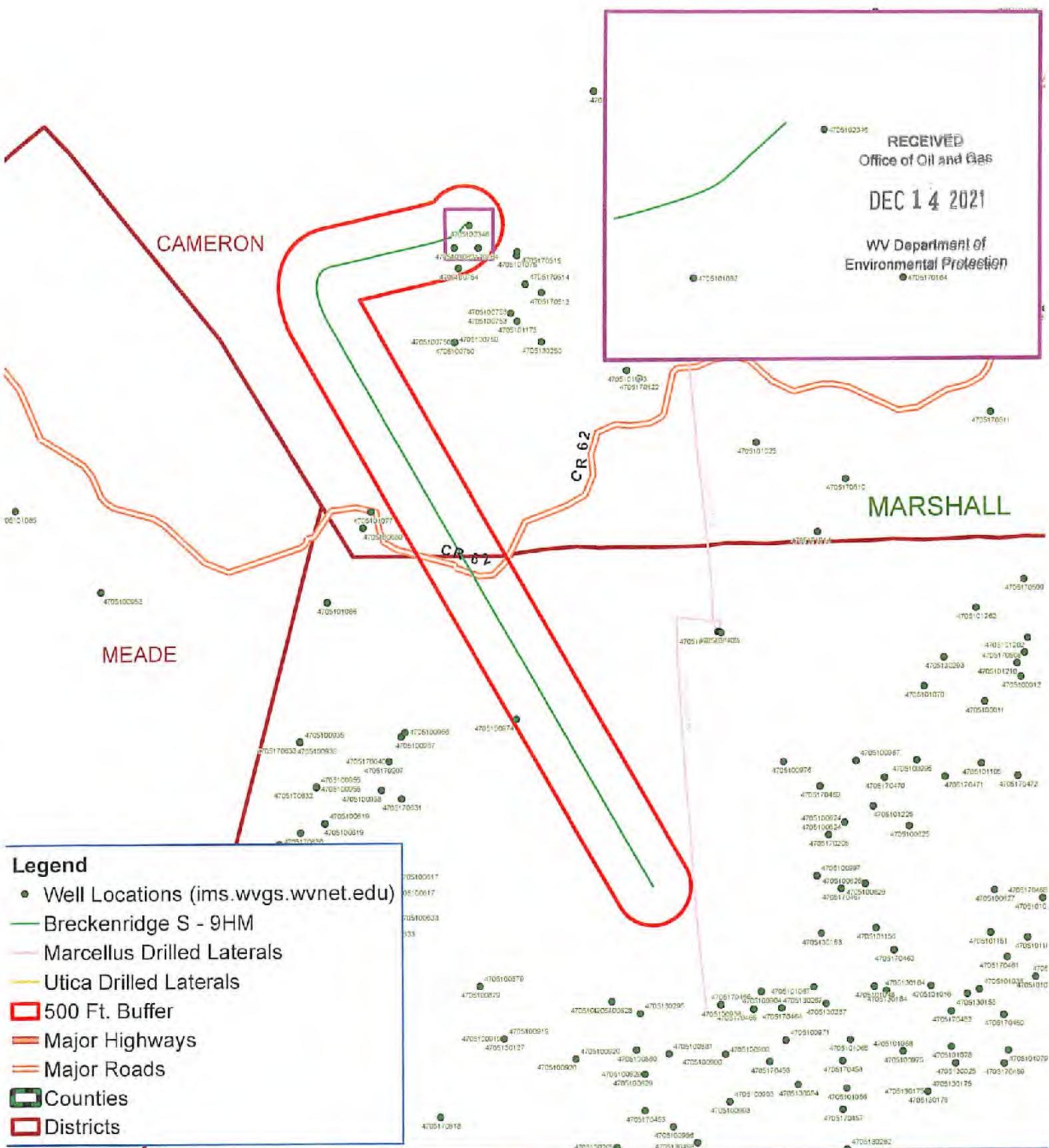
There is no Wireline (E-Log) data for this well

Plugging Information:

API	PLG_DT	DEPTH_PBT
4705100974	2/3/2005	2

There is no Sample data for this well

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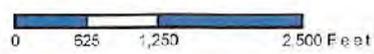


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- Legend**
- Well Locations (ims.wvgs.wvnet.edu)
  - Breckenridge S - 9HM
  - Marcellus Drilled Laterals
  - Utica Drilled Laterals
  - 500 Ft. Buffer
  - Major Highways
  - Major Roads
  - ▭ Counties
  - ▭ Districts



## Breckenridge S - 9HM Cameron District Marshall County, WV



Map Prepared by:  
**EPS**  
LAND SERVICES

01/28/2022



**TUG HILL**  
**OPERATING**

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

**Well Name: Breckenridge S-9HM**

**Pad Name: Breckenridge**

**County: Marshall**

UTM (meters), NAD83, Zone 17

Northing: 4,408,991.39

Easting: 531,922.79

*B.S. 10-14-21*

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

**Jerry V. DeRosa, Director EH&S Affairs**

**(724) 338-2029 (office)**

**(412) 736-5767 (cellular)**

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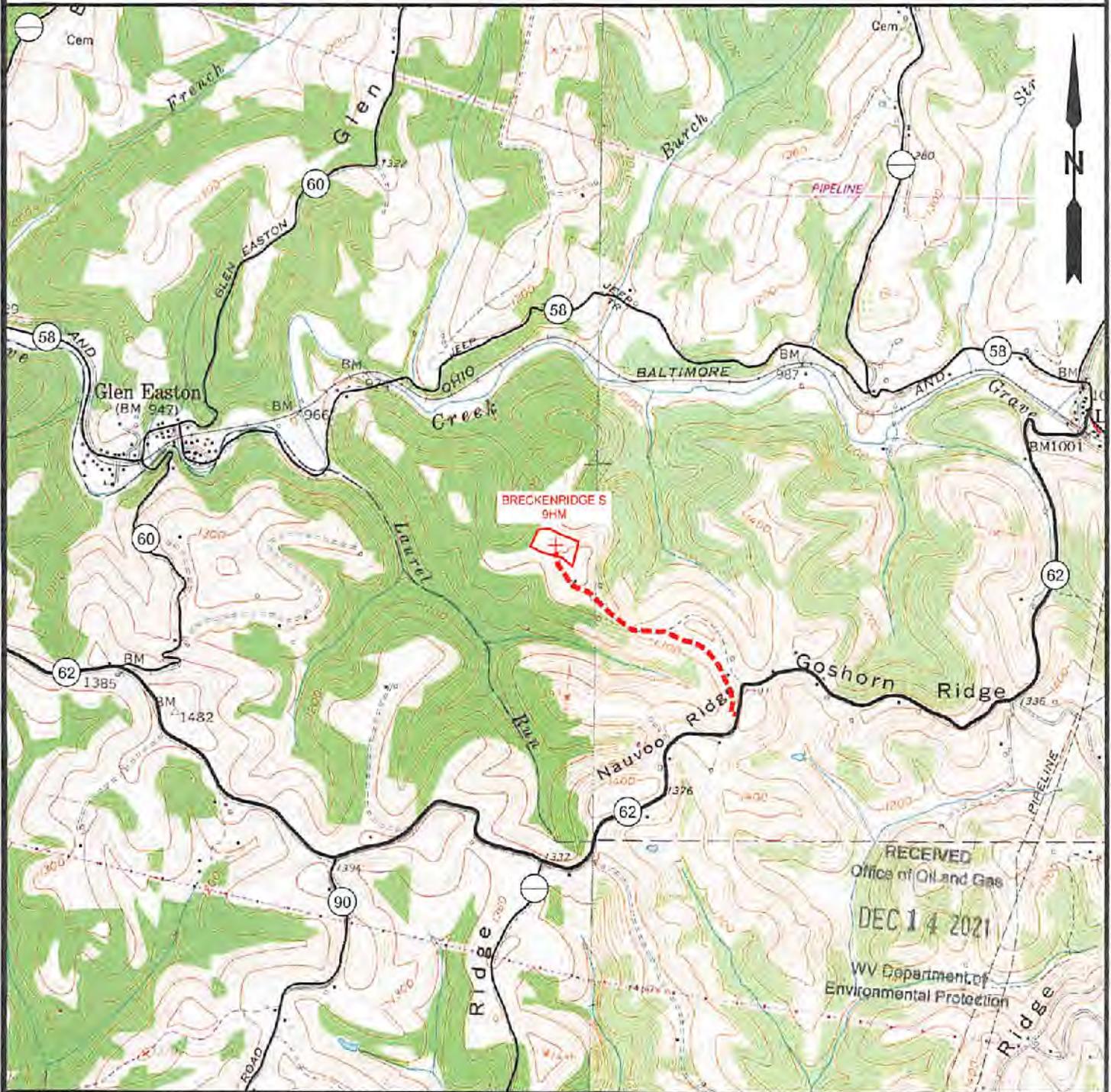
WV Department of  
Environmental Protection

**24-HOUR EMERGENCY PHONE NUMBER**

**(800) 921-9745**

01/28/2022

# PROPOSED BRECKENRIDGE S - 9HM



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

LAT: 39.829865  
LON: -80.573724  
LOCATED: S 88°42'19" E AT 14,928.72' FROM THE CENTER OF BRECKENRIDGE N WELL PAD LOCATION.



17 Vanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5334  
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952  
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.5296  
slsvv.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	CAMERON	380 SOUTHPOINTE BLVD	
DRAWN BY		DATE	SCALE
K.G.M.		09/23/2021	1" = 2000'



TUG HILL  
OPERATING

01/28/2022

**BRECKENRIDGE S LEASE  
WELL 9HM  
TUG HILL OPERATING**

LINE TABLE		
LINE	BEARING	DISTANCE
L1	S 40°57' W	141.93'
L2	N 50°25' E	2706.39'
L3	S 23°01' E	1577.99'

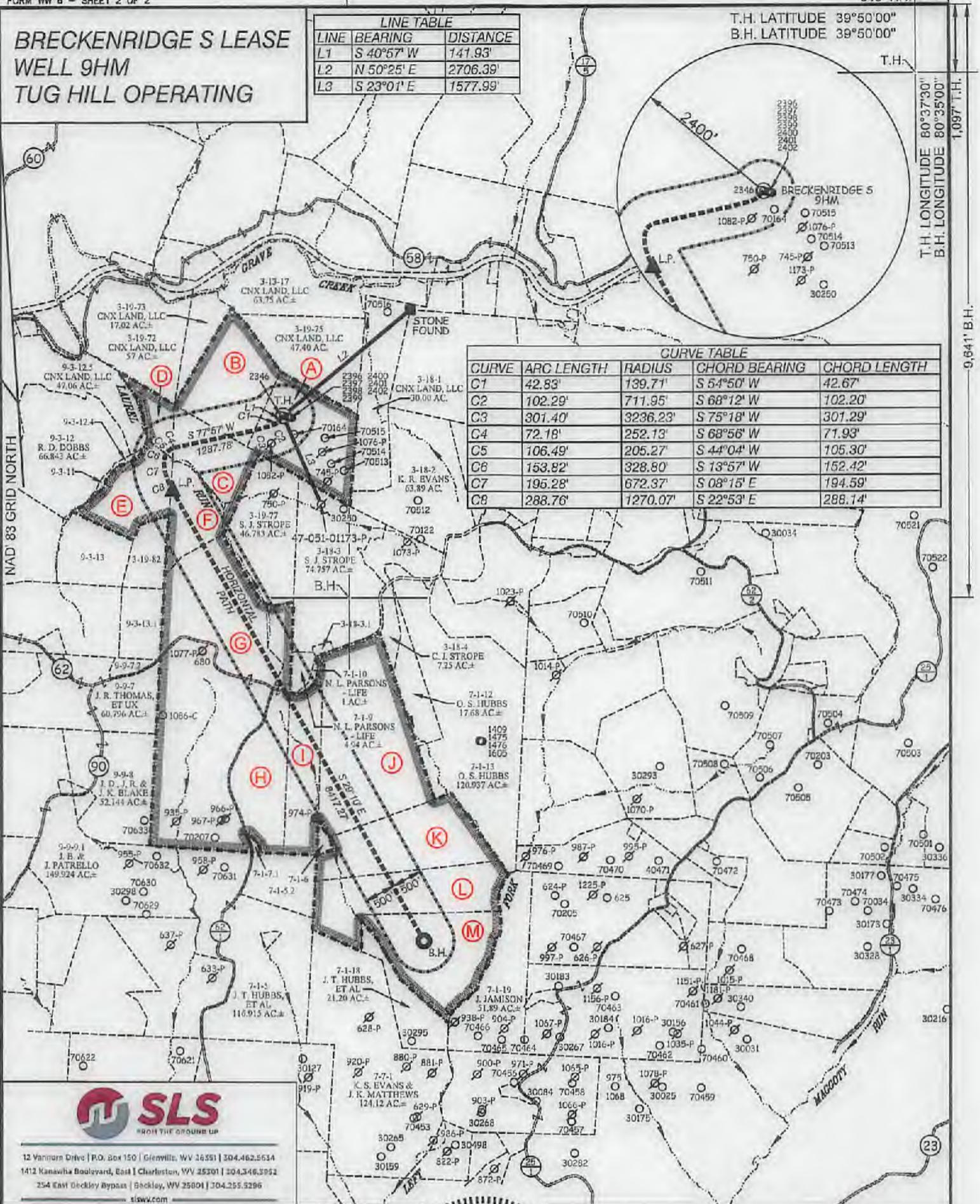
T.H. LATITUDE 39°50'00"  
B.H. LATITUDE 39°50'00"

NAD 83 GRID NORTH

T.H. LONGITUDE 80°37'30"  
B.H. LONGITUDE 80°35'00"

1,097' T.H.

9,841' B.H.



CURVE TABLE				
CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	42.83'	139.71'	S 54°50' W	42.67'
C2	102.29'	711.95'	S 68°12' W	102.20'
C3	301.40'	3236.23'	S 75°18' W	301.29'
C4	72.18'	252.13'	S 68°56' W	71.93'
C5	106.49'	205.27'	S 44°04' W	105.30'
C6	153.82'	328.80'	S 13°57' W	152.42'
C7	195.28'	672.37'	S 08°15' E	194.59'
C8	288.76'	1270.07'	S 22°53' E	288.14'



12 Yamnus Drive | P.O. Box 150 | Glenville, WV 26031 | 304.462.5634  
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 204.346.3952  
254 East Dickley Bypass | Beckley, WV 25801 | 304.255.5296  
slsw.com

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)  
NAD83 S.P.C.(FT) N. 488,530.38 E. 1,852,017.22  
NAD83 GEO. LAT:(N) 39.830321 LONG:(W) 80.828943  
NAD83 UTM (M) N. 4,408,991.35 E. 531,822.75

**LANDING POINT**  
NAD83 S.P.C.(FT) N. 485,307.9 E. 1,850,206.4  
NAD83 GEO. LAT:(N) 39.828803 LONG:(W) 80.833335  
NAD83 UTM (M) N. 4,408,609.7 E. 531,377.3

**BOTTOM HOLE**  
NAD83 S.P.C.(FT) N. 477,957.5 E. 1,854,307.9  
NAD83 GEO. LAT:(N) 39.808888 LONG:(W) 80.818407  
NAD83 UTM (M) N. 4,408,391.2 E. 532,864.3



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

P.S. 677 *Gregory A. Smith*

LEGEND	
LEASE LINE	
SURFACE LINE	
WELL LATERAL	
OFFSET LINE	
TIE LINE	
CREEK	
ROAD	
COUNTY ROUTE	
PROPOSED WELL	
EXISTING WELL	
PERMITTED WELL	
TAX MAP-PARCEL	00-00
SURFACE OWNER (SEE TABLE)	
LEASE # (SEE WW-6A1)	

SCALE 1" = 2000' FILE NO. 9026P9HM.dwg  
BRECKENRIDGE S-9HM REV5  
DATE OCTOBER 13, 20 21  
REVISED \_\_\_\_\_, 20 \_\_\_\_  
OPERATORS WELL NO. BRECKENRIDGE S-9HM  
API WELL NO. 47-051-02430  
NO. STATE COUNTY PERMIT

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

WELL OPERATOR TUG HILL OPERATING, LLC DESIGNATED AGENT DARREN BROWN - CT CORPORATION  
ADDRESS 1320 SOUTH UNIVERSITY DRIVE, SUITE 500 ADDRESS 5098 WASHINGTON ST. W. STE 407  
FORT WORTH, TX 76107 CHARLESTON, WV 25313-1551

COUNTY NAME PERMIT

01/28/2022

**BRECKENRIDGE S LEASE  
WELL 9HM  
TUG HILL OPERATING**

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

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

NAD'83 S.P.C. (FT) N. 466,530.36 E. 1,652,017.22  
NAD'83 GEO. LAT-(N) 39.830321 LONG-(W) 80.626943  
NAD'83 UTM (M) N. 4,408,991.35 E. 531,922.75

LANDING POINT

NAD'83 S.P.C. (FT) N. 465,307.9 E. 1,650,206.4  
NAD'83 GEO. LAT-(N) 39.826903 LONG-(W) 80.633335  
NAD'83 UTM (M) N. 4,408,609.7 E. 531,377.3

BOTTOM HOLE

NAD'83 S.P.C. (FT) N. 477,957.5 E. 1,654,307.9  
NAD'83 GEO. LAT-(N) 39.806866 LONG-(W) 80.616407  
NAD'83 UTM (M) N. 4,406,391.2 E. 532,864.3

T.H.

T.H. LONGITUDE 80°37'30"  
B.H. LONGITUDE 80°35'00"  
1,097' T.H.

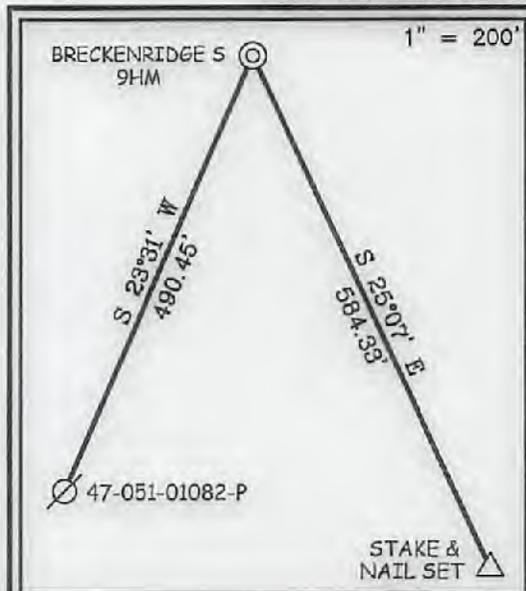
9,841' B.H.

TAG	SURFACE OWNER	PARCEL	ACRES
A	CNX LAND, LLC	3-19-76	53.25
B	CNX LAND, LLC	3-19-74	44.59
C	CNX LAND, LLC	3-19-78	30.927
D	CNX LAND, LLC	3-19-79	10.75
E	XCL PROCESSING OPERATING LLC	3-19-80	30.54
F	XCL PROCESSING OPERATING LLC	3-19-81	26.52
G	ANNA D. MORRIS	7-1-1	179.00
H	NANCY L. PARSONS - LIFE	7-1-7	40.86
I	NANCY L. PARSONS - LIFE	7-1-8	33.00
J	MOLLY KAY HUBBS COLLINS, ET AL	7-1-11	98.44
K	MOLLY KAY HUBBS COLLINS, ET AL	7-1-15	57.32
L	MOLLY KAY HUBBS COLLINS, ET AL	7-1-16	54.44
M	JEFFREY L. ALBRIGHT	7-1-17	57.17

MAP/PARCEL	ADJOINING SURFACE OWNER LIST	ACRES
3-18-3.1	CAROL J. EVANS - LIFE	1.173
3-19-82	XCL PROCESSING OPERATING LLC	14.89
7-1-5.2	NICHOLAS J. EVANS	22.42
7-1-6	NANCY L. PARSONS	1.00
7-1-7.1	NANCY L. PARSONS	0.50
9-3-11	CNX LAND, LLC	1.00
9-3-12.4	CNX LAND, LLC	0.149
9-3-13	XCL PROCESSING OPERATING LLC	28.00
9-3-13.1	XCL PROCESSING OPERATING LLC	10.00
9-9-7.2	XCL MIDSTREAM OPERATING LLC	3.907

B.H.

**REFERENCES**



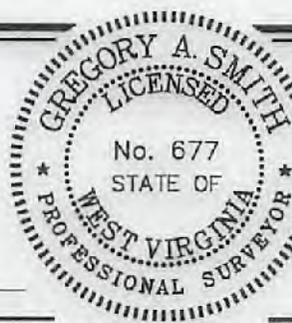
**NOTES ON SURVEY**

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



12 Vanhorn Drive | P.O. Box 130 | Glenville, WV 26031 | 304.462.5514  
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3952  
254 East Beckley Bypass | Beckley, WV 26001 | 304.255.5296  
sllw.com

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



P.S. Gregory A. Smith  
677

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS  
DATE OCTOBER 13, 20 21  
REVISED \_\_\_\_\_, 20 \_\_\_\_  
OPERATORS WELL NO. BRECKENRIDGE S-9HM  
API WELL NO. 47 - 051 - 02430  
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/2500 FILE NO. 9026P9HM.dwg  
BRECKENRIDGE S-9HM REV5  
HORIZONTAL & VERTICAL CONTROL DETERMINED BY: DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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

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

LOCATION: ELEVATION GROUND = 1,382.00' PROPOSED = 1,370.10' WATERSHED GRAVE CREEK (HUC 10) & LAUREL RUN  
DISTRICT CAMERON COUNTY MARSHALL QUADRANGLE GLEN EASTON 7.5'

SURFACE OWNER CNX LAND LLC ACREAGE 53.25±  
ROYALTY OWNER HASAN'S VENTURES, ET AL ACREAGE 0.128/2022

PROPOSED WORK: LEASE NO. SEE WW-6A1  
DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  PLUG AND ABANDON  CLEAN OUT AND REPLUG  OTHER   
PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ TARGET FORMATION MARCELLUS  
ESTIMATED DEPTH TVD: 7,098' / TMD: 16,317'

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

COUNTY NAME PERMIT

WW-6A1  
(5/13)

Operator's Well No. Breckenridge S-9HM

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

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

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

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

\*See attached pages

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DEC 14 2021  
WV Department of  
Environmental Protection

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

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

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

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

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

WW - 6A1 Supplement

Lease Id	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment			
10*31241	3-19-76	A	JAMES R WAYT	TRANS ENERGY INC AND REPUBLIC PARTNERS VI LP	1/8+	729 40						Trans Energy Inc to American Shale Development Inc: 27/172	American Shale Development Inc to Republic Partners VIII: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to TH Exploration LLC: 48/21	
10*31242	3-19-76	A	EVELYN L BUTLER	TRANS ENERGY INC AND REPUBLIC PARTNERS VI LP	1/8+	729 49						Trans Energy Inc to American Shale Development Inc: 27/172	American Shale Development Inc to Republic Partners VIII: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to TH Exploration LLC: 48/21	
10*38613	3-19-74	B	KATHERINE ZOGG OLIVER	GREAT LAKES ENERGY PARTNERS LLC	1/8+	663 449	Name Change - Great Lakes Energy Partners LLC changed name to Range Resources - Appalachia LLC: CB 19/443	Range Resources-Appalachia LLC to Chesapeake Appalachia LLC & Statoil USA Onshore Properties Inc: 23/368	Chesapeake Appalachia LLC to Statoil USA Onshore Properties Inc: 24/363	Chesapeake Appalachia LLC to SWN Production Company LLC: 33/110	Statoil USA Onshore Properties Inc to SWN Exchange Titleholder LLC: 33/424	SWN Exchange Titleholder LLC merged with and into SWN Production Company LLC: CB 19/624	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/604	SWN Production Company LLC to TH Exploration LLC: 49/635		
10*25525	3-19-78	C	IAN MARIE CREGO	AMERICAN PETROLEUM PARTNERS LLC	1/8+	939 601									American Petroleum Partners Operating LLC to TH Exploration LLC: 43/503	
10*29085	3-19-78	C	LUJEAN EGAN	TH EXPLORATION LLC	1/8+	1084 192									N/A	
10*30579	3-19-78	C	GREENFIELD RESOURCES LLC	TH EXPLORATION LLC	1/8+	1105 272									N/A	
10*38500	3-19-78	C	NINA FLETCHER AND RICHARD FLETCHER	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 525						American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38501	3-19-78	C	DOUGLAS BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 526						American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38502	3-19-78	C	THOMAS BRIGGS AND BRENDA M BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 527						American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38504	3-19-78	C	REGINA D FIGUEROA	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 529						American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38505	3-19-78	C	DANNY S KERNS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 530						American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38506	3-19-78	C	ROGER BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 540						American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120

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10*38527	3-19-78	C	DEENA J PALOMO	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 531	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38529	3-19-78	C	GERRI A BANNISTER	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 532	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38530	3-19-78	C	JULIE BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 533	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38531	3-19-78	C	JOHN BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 534	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38532	3-19-78	C	JEFF BRIGGS AND CONNIE BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 537	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38533	3-19-78	C	GARY BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 538	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38534	3-19-78	C	JERRILYN LITTS AND IVAN LITTS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 539	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*22872	3-19-79	D	OKEY RAY GILBERT SR	TH EXPLORATION LLC	1/8+	974 210	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22873	3-19-79	D	WALTER E GILBERT JR	TH EXPLORATION LLC	1/8+	974 214	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*22874	3-19-79	D	WANDA JEAN GILBERT	TH EXPLORATION LLC	1/8+	974 212	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23027	3-19-79	D	ROBERT W WAYT JR	TH EXPLORATION LLC	1/8+	977 326	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23028	3-19-79	D	SHEILA R CROW	TH EXPLORATION LLC	1/8+	977 328	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23031	3-19-79	D	TIMOTHY J LEASURE AND JOANNA C LEASURE	TH EXPLORATION LLC	1/8+	977 330	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23078	3-19-79	D	GARLAND E LOWE AND CAROL A LOWE	TH EXPLORATION LLC	1/8+	977 305	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23079	3-19-79	D	RAYMOND E HOWARD AND PATRICIA A HOWARD	TH EXPLORATION LLC	1/8+	977 308	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23080	3-19-79	D	JERRY A WELLS AND TAMMY SUE WELLS	TH EXPLORATION LLC	1/8+	977 311	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23081	3-19-79	D	KENNETH R HUGGINS AND OSIE J HUGGINS	TH EXPLORATION LLC	1/8+	977 314	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23082	3-19-79	D	GREGORY L WELLS AND MARY E WELLS	TH EXPLORATION LLC	1/8+	977 317	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23083	3-19-79	D	JAN L POE AND TAMMY M POE	TH EXPLORATION LLC	1/8+	977 323	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23084	3-19-79	D	DENNY R WELLS SR AND TAMMY WELLS	TH EXPLORATION LLC	1/8+	977 320	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23101	3-19-79	D	RICKEY LEE EDDY AND HELEN LOUISE EDDY	TH EXPLORATION LLC	1/8+	983 597	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23102	3-19-79	D	THOMAS E DOTY	TH EXPLORATION LLC	1/8+	983 550	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23103	3-19-79	D	GWENDOLYN BAKER AND JOHN BAKER	TH EXPLORATION LLC	1/8+	983 600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23355	3-19-79	D	CECIL R LIGHTNER AND SANDRA L LIGHTNER	TH EXPLORATION LLC	1/8+	988 503	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23359	3-19-79	D	GOLDIE M WAYT	TH EXPLORATION LLC	1/8+	988 506	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23415	3-19-79	D	DEBRA E DILLOW	TH EXPLORATION LLC	1/8+	1008 54	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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10*23805	3-19-79	D	EDWARD NORRIS JR	TH EXPLORATION LLC	1/8+	1041	558	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*24580	3-19-79	D	ROBERT LEE GLOVER AND LINDA LEE GLOVER	TH EXPLORATION LLC	1/8+	1026	231	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*25515	3-19-79	D	GOLDEN EAGLE RESOURCES II LLC	AMERICAN PETROLEUM PARTNERS LLC	1/8+	987	329	N/A	N/A	N/A	N/A	N/A	N/A	N/A	American Petroleum Partners Operating LLC to TH Exploration LLC: 43/503
10*29064	3-19-79	D	JAMES F WHITE AIF DEBRA ROYCE	TH EXPLORATION LLC	1/8+	1083	363	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29081	3-19-79	D	TERRY WELLS	TH EXPLORATION LLC	1/8+	1084	188	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29082	3-19-79	D	HAZEL MARIE KING AND BOBBIE L KING	TH EXPLORATION LLC	1/8+	1084	190	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29083	3-19-79	D	DONALD WELLS II	TH EXPLORATION LLC	1/8+	1084	186	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29084	3-19-79	D	DANNY WELLS	TH EXPLORATION LLC	1/8+	1084	184	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29113	3-19-79	D	LOUIS BRENT WELLS AND EDNA WELLS	TH EXPLORATION LLC	1/8+	1084	398	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29192	3-19-79	D	LOUIS KEVIN WHITE	TH EXPLORATION LLC	1/8+	1085	178	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29207	3-19-79	D	DEBRA ROYCE AND WAYNE ROYCE	TH EXPLORATION LLC	1/8+	1086	503	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29264	3-19-79	D	RICHARD L STANLEY	TH EXPLORATION LLC	1/8+	1089	631	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29376	3-19-79	D	ROGER DALE WELLS	TH EXPLORATION LLC	1/8+	1096	294	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29414	3-19-79	D	DONNA DARLENE WELLS HOOKER	TH EXPLORATION LLC	1/8+	1096	296	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29446	3-19-79	D	GRACE J WELLS HOCHSTETLER	TH EXPLORATION LLC	1/8+	1096	298	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29640	3-19-79	D	FRANCES KNEPP	TH EXPLORATION LLC	1/8+	1098	359	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*29764	3-19-79	D	LOUIS ALLEN WHITE	TH EXPLORATION LLC	1/8+	1101	21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*30004	3-19-79	D	CHICO E GILBERT AND SAMANTHA GILBERT	TH EXPLORATION LLC	1/8+	1103	545	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*30555	3-19-79	D	TELA S MORELAND	TH EXPLORATION LLC	1/8+	1106	271	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*39238	3-19-79	D	CHANDRA E BAKER	TH EXPLORATION LLC	1/8+	1119	401	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*39240	3-19-79	D	AMICA M GILBERT	TH EXPLORATION LLC	1/8+	1119	395	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*39267	3-19-79	D	FALON L MCWHORTER AND MICHAEL MCWHORTER	TH EXPLORATION LLC	1/8+	1119	389	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*39277	3-19-79	D	UNKNOWN HEIRS AND ASSIGNS OF ROCKY WELLS, JR.	TH EXPLORATION LLC	1/8+	1107	111	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*39302	3-19-79	D	HEATHER BLANKENSHIP	TH EXPLORATION LLC	1/8+	1119	407	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*25182	3-19-80	E	CHARLES ISAAH PARK ALBRIGHT AND EUN JI LEE	TH EXPLORATION LLC	1/8+	1029	503	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*25525	3-19-81	F	JAN MARIE CREGO	AMERICAN PETROLEUM PARTNERS LLC	1/8+	939	601	N/A	N/A	N/A	N/A	N/A	N/A	N/A	American Petroleum Partners Operating LLC to TH Exploration LLC: 43/503
10*29085	3-19-81	F	LUJEAN EGAN	TH EXPLORATION LLC	1/8+	1084	192	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*30579	3-19-81	F	GREENFIELD RESOURCES LLC	TH EXPLORATION LLC	1/8+	1105	272	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*38500	3-19-81	F	NINA FLETCHER AND RICHARD FLETCHER	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779	525	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38501	3-19-81	F	DOUGLAS BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779	526	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38502	3-19-81	F	THOMAS BRIGGS AND BRENDA M BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779	527	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38504	3-19-81	F	REGINA D FIGUEROA	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779	529	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120

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10*38505	3-19-81	F	DANNY S KERNS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 530	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38506	3-19-81	F	ROGER BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 540	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38527	3-19-81	F	DEENA J PALOMO	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 531	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38529	3-19-81	F	GERRI A BANNISTER	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 532	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38530	3-19-81	F	JULIE BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 533	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38531	3-19-81	F	JOHN BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 534	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38532	3-19-81	F	JEFF BRIGGS AND CONNIE BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 537	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38533	3-19-81	F	GARY BRIGGS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 538	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*38534	3-19-81	F	JERRILYN LITTS AND IVAN LITTS	AMERICAN SHALE DEVELOPMENT INC AND REPUBLIC ENERGY VENTURES LLC	1/8+	779 539	N/A	N/A	N/A	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Partners VI LP, Republic Partners VII LLC, Republic Partners VIII LLC, Republic Operating LLC to EQT Production Company: 37/25	EQT Production Company to SWN Production Company LLC & Equinor USA Onshore Properties Inc: 44/489	Equinor USA Onshore Properties Inc to TH Exploration LLC: 49/104	SWN Production Company LLC to TH Exploration LLC: 49/120
10*39627	7-1-1	G	ANNA D MORRIS	TH EXPLORATION LLC	1/8+	1125 543	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*23798	7-1-7	H	WILLIAM E PARSONS AND NANCY L PARSONS	TH EXPLORATION LLC	1/8+	1011 489	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10*17925	7-1-8	I	BOUNTY MINERALS LLC	TH EXPLORATION LLC	1/8+	928 393	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Lease Id	TMP	Tag	Grantor, Lessor, Etc.	Grantee, Lessee, Etc.	Royalty	Deed Book/Page	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	Assignment	
10*31251	7-1-8	I	GOSHORN RIDGE LLC	TRANS ENERGY INC AND REPUBLIC PARTNERS VI LP	1/8+	723 192	N/A	N/A	Trans Energy Inc to Republic Energy Ventures LLC: 24/425	Trans Energy Inc to American Shale Development Inc: 27/172	Republic Energy Ventures LLC to Republic Partners VIII LLC: 27/638 & 28/184	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Energy Ventures LLC, Republic Partners VI LP, Republic Partners VII LP, Republic Partners VIII LP and Republic Partners Operating LLC to EQT Production Company: 37/25	EQT Production Company to TH Exploration II LLC: 48/42
10*17925	7-1-11	J	BOUNTY MINERALS LLC	TH EXPLORATION LLC	1/8+	928 393	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*31251	7-1-11	J	GOSHORN RIDGE LLC	TRANS ENERGY INC AND REPUBLIC PARTNERS VI LP	1/8+	723 192	N/A	N/A	Trans Energy Inc to Republic Energy Ventures LLC: 24/425	Trans Energy Inc to American Shale Development Inc: 27/172	Republic Energy Ventures LLC to Republic Partners VIII LLC: 27/638 & 28/184	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Energy Ventures LLC, Republic Partners VI LP, Republic Partners VII LP, Republic Partners VIII LP and Republic Partners Operating LLC to EQT Production Company: 37/25	EQT Production Company to TH Exploration II LLC: 48/42
10*17925	7-1-15	K	BOUNTY MINERALS LLC	TH EXPLORATION LLC	1/8+	928 393	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*31251	7-1-15	K	GOSHORN RIDGE LLC	TRANS ENERGY INC AND REPUBLIC PARTNERS VI LP	1/8+	723 192	N/A	N/A	Trans Energy Inc to Republic Energy Ventures LLC: 24/425	Trans Energy Inc to American Shale Development Inc: 27/172	Republic Energy Ventures LLC to Republic Partners VIII LLC: 27/638 & 28/184	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Energy Ventures LLC, Republic Partners VI LP, Republic Partners VII LP, Republic Partners VIII LP and Republic Partners Operating LLC to EQT Production Company: 37/25	EQT Production Company to TH Exploration II LLC: 48/42
10*17925	7-1-16	L	BOUNTY MINERALS LLC	TH EXPLORATION LLC	1/8+	928 393	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*31251	7-1-16	L	GOSHORN RIDGE LLC	TRANS ENERGY INC AND REPUBLIC PARTNERS VI LP	1/8+	723 192	N/A	N/A	Trans Energy Inc to Republic Energy Ventures LLC: 24/425	Trans Energy Inc to American Shale Development Inc: 27/172	Republic Energy Ventures LLC to Republic Partners VIII LLC: 27/638 & 28/184	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Energy Ventures LLC, Republic Partners VI LP, Republic Partners VII LP, Republic Partners VIII LP and Republic Partners Operating LLC to EQT Production Company: 37/25	EQT Production Company to TH Exploration II LLC: 48/42
10*17925	7-1-17	M	BOUNTY MINERALS LLC	TH EXPLORATION LLC	1/8+	928 393	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
10*31251	7-1-17	M	GOSHORN RIDGE LLC	TRANS ENERGY INC AND REPUBLIC PARTNERS VI LP	1/8+	723 192	N/A	N/A	Trans Energy Inc to Republic Energy Ventures LLC: 24/425	Trans Energy Inc to American Shale Development Inc: 27/172	Republic Energy Ventures LLC to Republic Partners VIII LLC: 27/638 & 28/184	American Shale Development Inc to Republic Partners VIII LLC: 31/482	Republic Energy Ventures LLC, Republic Partners VI LP, Republic Partners VII LP, Republic Partners VIII LP and Republic Partners Operating LLC to EQT Production Company: 37/25	EQT Production Company to TH Exploration II LLC: 48/42

ASSIGNMENT AND BILL OF SALE

This ASSIGNMENT AND BILL OF SALE (this "Assignment") dated as of December 1, 2020 (the "Execution Date"), is made by and between EQT PRODUCTION COMPANY, a Pennsylvania corporation, with an address at 625 Liberty Avenue, Suite 1700, Pittsburgh, Pennsylvania 15222 ("EQT"), and TH EXPLORATION, LLC, a Texas limited liability company, with an address at 1320 S. University Drive, Suite 500, Fort Worth, Texas 76107 ("TH") pursuant to the terms of that certain Acreage Trade Agreement by and among EQT, TH and TH Exploration II, LLC ("TH II"), dated July 8, 2020 (the "Agreement"). EQT and TH may be referred to herein together as the "Parties", and each individually as a "Party".

RECITALS

WHEREAS, EQT desires to transfer, convey and assign to TH certain of EQT's oil and gas leasehold interests located in Marshall County, West Virginia set forth on Exhibit A attached hereto and incorporated herein ("EQT Leases") in accordance with this Assignment and the Agreement; and

WHEREAS, TH desires to receive from EQT, all of EQT's right, title and interest in and to the EQT Leases in accordance with this Assignment and the Agreement.

NOW, THEREFORE, for and in consideration of the mutual promises contained herein and in the Agreement, the benefits to be derived by each Party hereunder and under the Agreement, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

ARTICLE I  
DEFINED TERMS

1.1 *Definitions.* Capitalized terms used herein and not otherwise defined throughout this Assignment shall have the meanings given such terms in the Agreement.

ARTICLE II  
ASSIGNMENT OF ASSETS

2.1 *Assignment.* Subject to the terms and conditions of this Assignment and the Agreement, EQT does hereby assign, convey and transfer to TH all of the right, title and interest of EQT in and to the following (collectively for purposes of this Assignment, the "EQT Assets"):

(a) Subject to the conveyance of the Wells Assets from EQT to TH II as described in the Agreement, the EQT Leases and appurtenances thereto (including rights of access and to install facilities), all Hydrocarbons within, produced from, derived from, or sold from the EQT Leases (and all proceeds related thereto), on and after the Valuation Date, and all Surface Contracts including but not limited to those set forth on Exhibit B attached hereto and incorporated herein (the "EQT Surface Contracts") related to the EQT Leases and such Hydrocarbons; and

(b) Copies of deeds, files and all other ownership information directly related to the acquisition, operations and maintenance of the EQT Leases, lease files for the EQT Leases

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STOCKYARDS ENERGY LAND SERVICES LLC  
4000 TOWN CENTER BLVD STE 270  
CAMONSBURG PA 15317-5837

BOOK 0-049 PAGE 0635

ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "Assignment") is from SWN PRODUCTION COMPANY, LLC, a Texas limited liability company ("Assignor"), to TH Exploration, LLC, a Texas limited liability company ("Assignee"), and is executed on October 18, 2021 (the "Effective Date"). Assignor and Assignee may be referred to herein collectively as the "Parties," or individually as a "Party." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignor and the Assignee dated June 15, 2021 (the "Acreage Trade Agreement").

ARTICLE 1  
ASSIGNMENT OF ASSETS

Section 1.1 Assignment. For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor hereby GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS unto Assignee all of Assignor's right, title and interest in and to (i) the oil and gas leases described in more detail on Exhibit A attached hereto (the "Leases") IN SO FAR AND ONLY IN SO FAR as they cover those lands described on Exhibit A and Exhibit A-1 (the "Leasehold Rights") and (ii) any surface use agreements that relate to such Leasehold Rights (collectively with the Leasehold Rights, the "Conveyed Assets").

TO HAVE AND TO HOLD the Conveyed Assets, together with all and singular the rights, privileges, contracts and appurtenances, in any way appertaining or belonging thereto, unto Assignee, its successors and assigns, forever, subject, to the terms and conditions of this Assignment.

Section 1.2 Assignment Subject to Acreage Trade Agreement. This Assignment is made in accordance with and is subject to the terms, covenants and conditions contained in that certain Acreage Trade Agreement. In the event of a conflict between the provisions of the Acreage Trade Agreement and this Assignment, the provisions of the Acreage Trade Agreement shall control. The execution and delivery of this Assignment by Assignor, and the execution and acceptance of this Assignment by Assignee, shall not operate to release or impair any surviving rights or obligations of either Party with respect to the other under the Acreage Trade Agreement.

ARTICLE 2  
SPECIAL WARRANTY OF TITLE AND DISCLAIMERS

Section 2.1 Special Warranty of Title. Assignor hereby agrees to warrant and defend Defensible Title to the Leases unto Assignee, its successors and assigns, against every Person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Assignor or any of its Affiliates, but not otherwise.

Section 2.2 Disclaimers of Warranties and Representations.

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COPY

STATE OF WEST VIRGINIA §  
COUNTY OF MARSHALL §

Marshall County  
Jan Pest, Clerk  
Instrument 1453305  
04/24/2019 @ 11:51:22 AM  
ASSIGNMENTS  
Book 43 @ Page 505  
Pages Recorded 10  
Recording Cost \$ 17.00

ASSIGNMENT AND CONVEYANCE

THIS ASSIGNMENT AND CONVEYANCE (the "Assignment") is made and entered into this 23<sup>rd</sup> day of April, 2019 (the "Effective Date"), by and between AMERICAN PETROLEUM PARTNERS OPERATING, LLC, (hereinafter "Assignor") and TH EXPLORATION, LLC (hereinafter "Assignee") pursuant to the terms of that certain Acreage Trade Agreement between the Assignor and the Assignee dated November 15, 2018 (the "Acreage Trade Agreement"). Capitalized terms used but not defined herein and defined in the Acreage Trade Agreement shall have the meanings given to such terms in the Acreage Trade Agreement.

WITNESSETH:

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to those certain Oil and Gas Leases situated in Marshall County, West Virginia, as described in Exhibit A-2, attached hereto and made a part hereof (hereinafter the "Leases"); and

WHEREAS, Assignor desires to assign, set over, and transfer to Assignee all of Assignor's right, title, and interest in and to the Leases as described below.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and subject to the limited warranties, restrictions and conditions hereinafter mentioned, the parties hereto, intending to be legally bound, do covenant and agree as follows:

1. Assignment. Assignor does hereby grant, bargain, sell, convey, deliver, assign, set over and transfer, as of the Effective Date, to Assignee, its respective successors and assigns, forever, all of Assignor's right, title and interest in and to the Leases, and the lands covered thereby, together with all rights incident thereto and appurtenances thereon.

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

2. Special Warranty. Assignor represents and warrants that Assignor has not conveyed or otherwise encumbered (other than Permitted Encumbrances) its interest in the Leases since the time that Assignor obtained its interests in the Leases. Assignor does covenant, promise and agree, to and with the Assignee, its respective successors and assigns, to forever specially warrant and defend the title to the Leases or portions thereof included under this Assignment, unto the Assignee and its respective successors and assigns, against the lawful claims of Assignor, and all persons claiming, or to claim, the same or any part thereof, by, through or under Assignor.

Assignor represents and warrants that Assignor has paid any and all bonuses, rentals, royalties, overriding royalties, and other payments required by the Leases which were due for the period in which Assignor held its interests in the Leases, and that Assignor has fully performed all conditions necessary to maintain the Leases in full force and effect during such period, free and clear of all Encumbrances, except for and subject only to Permitted Encumbrances.

3. Successors and Assigns. The terms of this Assignment shall be binding upon and inure to the benefit of the parties hereto and each of their respective successors

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ASSIGNMENT AND CONVEYANCE

This Assignment and Conveyance (this "*Assignment*") is from SWN PRODUCTION COMPANY, LLC, a Texas limited liability company ("*Assignor*"), to TH Exploration, LLC, a Texas limited liability company ("*Assignee*"), and is executed on June 30, 2021 (the "*Effective Date*"). Assignor and Assignee may be referred to herein collectively as the "*Parties*," or individually as a "*Party*." Capitalized terms used herein but not otherwise defined herein (including in Section 3.7) shall have the meanings given such terms in that certain Acreage Trade Agreement between the Assignor and the Assignee dated June 22, 2021 (the "*Acreage Trade Agreement*").

**ARTICLE 1**  
**ASSIGNMENT OF ASSETS**

**Section 1.1 Assignment.** For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor hereby GRANTS, BARGAINS, ASSIGNS, CONVEYS AND TRANSFERS unto Assignee all of Assignor's right, title and interest in and to (i) the oil and gas leases described in more detail on Exhibit A attached hereto (the "*Leases*") INsofar AND ONLY INsofar as they cover those lands described on Exhibit A (the "*Leasehold Rights*") and (ii) any surface use agreements that relate to such Leasehold Rights (collectively with the Leasehold Rights, the "*Conveyed Assets*").

**TO HAVE AND TO HOLD** the Conveyed Assets, together with all and singular the rights, privileges, contracts and appurtenances, in any way appertaining or belonging thereto, unto Assignee, its successors and assigns, forever, subject, to the terms and conditions of this Assignment.

**Section 1.2 Assignment Subject to Acreage Trade Agreement.** This Assignment is made in accordance with and is subject to the terms, covenants and conditions contained in that certain Acreage Trade Agreement. In the event of a conflict between the provisions of the Acreage Trade Agreement and this Assignment, the provisions of the Acreage Trade Agreement shall control. The execution and delivery of this Assignment by Assignor, and the execution and acceptance of this Assignment by Assignee, shall not operate to release or impair any surviving rights or obligations of either Party with respect to the other under the Acreage Trade Agreement.

**ARTICLE 2**  
**SPECIAL WARRANTY OF TITLE AND DISCLAIMERS**

**Section 2.1 Special Warranty of Title.** Assignor hereby agrees to warrant and defend Defensible Title to the Leases unto Assignee, its successors and assigns, against every Person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Assignor or any of its Affiliates, but not otherwise.

**Section 2.2 Disclaimers of Warranties and Representations.**

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01/28/2022



December 13, 2021

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

RE: Breckenridge S-9HM

Subject: Road Crossing Letter

Dear Taylor:

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 62 in the area reflected on the Breckenridge S-9HM 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 304-376-0111, or by email at [amorris@tug-hillop.com](mailto:amorris@tug-hillop.com).

Sincerely,

A handwritten signature in blue ink that reads "Amy L. Morris".

Amy L. Morris  
Permitting Specialist – Appalachia Region

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

Date of Notice Certification: 12/03/2021

API No. 47- 051 -  
Operator's Well No. Breckenridge S-9HM  
Well Pad Name: Breckenridge

**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>531,922.79</u>
County:	<u>Marshall</u>		Northing:	<u>4,408,991.39</u>
District:	<u>Cameron</u>	Public Road Access:	<u>County Route 62</u>	
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>CNX Land, LLC</u>	
Watershed:	<u>Grave Creek (HUC 10) &amp; Laurel Run</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.

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:  *PLEASE CHECK ALL THAT APPLY  <input type="checkbox"/> 1. NOTICE OF SEISMIC ACTIVITY or <input checked="" type="checkbox"/> NOTICE NOT REQUIRED BECAUSE NO SEISMIC ACTIVITY WAS CONDUCTED  <input checked="" type="checkbox"/> 2. NOTICE OF ENTRY FOR PLAT SURVEY or <input type="checkbox"/> NO PLAT SURVEY WAS CONDUCTED  <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  <input type="checkbox"/> WRITTEN WAIVER BY SURFACE OWNER (PLEASE ATTACH)  <input checked="" type="checkbox"/> 4. NOTICE OF PLANNED OPERATION  <input checked="" type="checkbox"/> 5. PUBLIC NOTICE  <input checked="" type="checkbox"/> 6. NOTICE OF APPLICATION		<p><b>OOG OFFICE USE ONLY</b></p> <input type="checkbox"/> RECEIVED/ NOT REQUIRED  <input type="checkbox"/> RECEIVED  <input type="checkbox"/> RECEIVED/ NOT REQUIRED  <input type="checkbox"/> RECEIVED  <input type="checkbox"/> RECEIVED  <input type="checkbox"/> RECEIVED
<p>RECEIVED Office of Oil and Gas  DEC 14 2021  WV Department of Environmental Protection</p>		

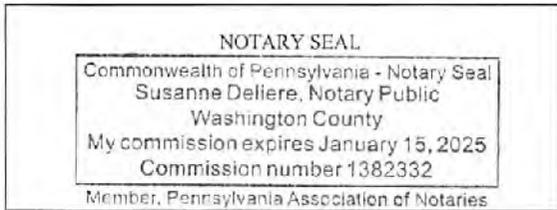
**Required Attachments:**

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

**Certification of Notice is hereby given:**

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

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



Subscribed and sworn before me this 2nd day of December, 2021  
*Susanne Deliere* Notary Public  
 My Commission Expires 1/15/2025

**Oil and Gas Privacy Notice:**

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

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

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

**Date of Notice:** 12/3/2021 **Date Permit Application Filed:** 12/6/2021

**Notice of:**

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

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

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

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

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

SURFACE OWNER(s)

Name: CNX Land, LLC (Well Pad and Access Road)  
 Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317

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

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

Name: Kevin R. & Shelly Jo Evans  
 Address: 3820 New Bethel Road  
Cameron, WV 26033

Name: David L. & Arianne R. Robinson  
 Address: 3518 New Bethel Road  
Cameron, WV 26033

SURFACE OWNER(s) (Impoundments or Pits)

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

COAL OWNER OR LESSEE

Name: CNX Land, LLC  
 Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317

COAL OPERATOR

Name: Marshall County Coal Resources, Inc. Attn: Steve Blair  
 Address: 46226 National Road  
St. Clairsville, OH 43950

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

Name: \*see attached  
 Address: \_\_\_\_\_

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

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

\*Please attach additional forms if necessary

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 Environmental Protection

**Notice is hereby given:**

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

**This Notice Shall Include:**

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

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

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

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

Additional information related to horizontal drilling may be obtained from the Secretary, at the WV Department of Environmental Protection headquarters, located at 601 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).

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**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

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

01/28/2022

**Time Limits and Methods for Filing Comments.**

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

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

**Comment Requirements**

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

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

**Permit Denial or Condition**

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

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

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

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

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WW-6A  
(8-13)

API NO. 47-051 - 02430  
OPERATOR WELL NO. Breckenridge S-9HM  
Well Pad Name: Breckenridge

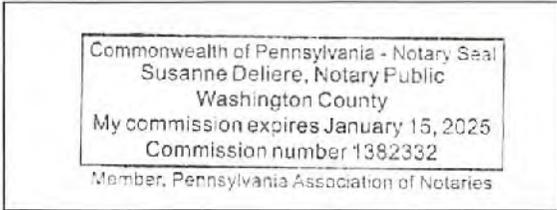
**Notice is hereby given by:**

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

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

**Oil and Gas Privacy Notice:**

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



Subscribed and sworn before me this 2nd day of December, 2021  
Susanne Deliere Notary Public  
My Commission Expires 1/15/2025

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

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

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

Well: Breckenridge S – 9HM  
District: Cameron  
State: WV

There is one (1) residence, no business or commercial sites, no churches, no schools or no emergency facilities within two-thousand feet (2,000') of the above referenced well location.

<p><b>Residence (#1)</b> TM 3-19-78 CNX Land, LLC <b>Phone:</b> 724-485-4000 <b>Physical Address:</b> Unknown – Possible Unoccupied Home or Hunting Cabin <b>Tax Address:</b> 1000 Consol Energy DR Canonsburg, PA 15317-6506</p>
---

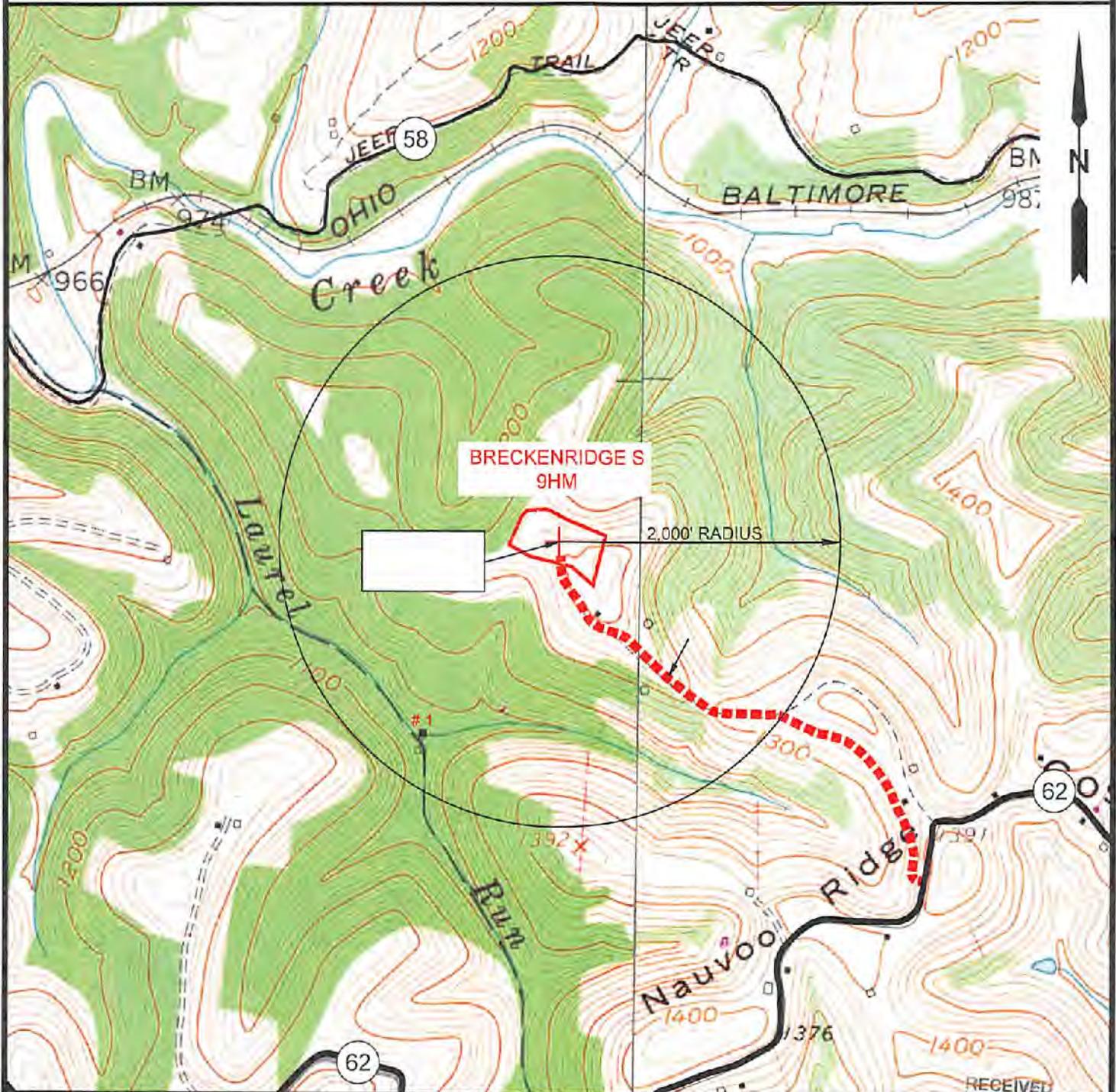
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# PROPOSED BRECKENRIDGE S - 9HM



NOTE: THERE APPEARS TO BE ONE (1) POSSIBLE WATER SOURCE WITHIN 2,000'.

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12 Yanhorn Drive | P.O. Box 150 | Glenville, WV 26351 | 304.462.5514  
1412 Kanawha Boulevard, East | Charleston, WV 25301 | 304.346.3052  
254 East Beckley Bypass | Beckley, WV 25801 | 304.255.8298  
slsw.com

TOPO SECTION:		OPERATOR:	
GLEN EASTON 7.5'		PREPARED FOR:	
COUNTY	DISTRICT	TUG HILL OPERATING, LLC	
MARSHALL	CAMERON	380 SOUTHPOINTE BLVD	
		SUITE 200	
		CANONSBURG, PA 15317	
DRAWN BY	JOB NO.	DATE	SCALE
K.G.M.	9026	09/23/2021	1" = 100'



WV Department of  
Environmental Protection  
**TUG HILL**  
OPERATING

01/28/2022

**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:** 12/1/2020      **Date of Planned Entry:** 12/7/2020

**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: CNX Land, LLC (Well Pad and Access Road)

Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317

Name: Kevin R & Shelly Jo Evans (Access Road)      /

Address: 3820 New Bethel Road  
Cameron, WV 26033

Name: David L. & Arianne R. Robinson      /

Address: 3518 New Bethel Road  
Cameron, WV 26033

COAL OWNER OR LESSEE

Name: CNX Land, LLC      /

Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317

MINERAL OWNER(s)

Name: Onward E. Burge      /

Address: RD 3 Box 33  
Cameron, WV 26033      \*\*See attached list

\*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>39.83027651; -80.62685646</u>
County:	<u>Marshall</u>	Public Road Access:	<u>County Route 62</u>
District:	<u>Cameron</u>	Watershed:	<u>Grave Creek (HUC 10) and Laurel Run</u>
Quadrangle:	<u>Glen Easton 7.5'</u>	Generally used farm name:	<u>CNX Land, LLC</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).

Office of Oil and Gas

**Notice is hereby given by:**

Well Operator: Tug Hill Operating, LLC

Telephone: 724-749-8386

Email: amorris@tug-hillop.com

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

Facsimile: 724-338-2020

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**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 of your personal information, please contact DEP's Chief Privacy Officer at [depprivacyofficer@wv.gov](mailto:depprivacyofficer@wv.gov).

01/28/2022

**WW-6A3 Attachment  
Breckenridge Well Pad**

Jan Marie Crego 2110 Plum Street Parkersburg, WV 26101 /	Nina K. Fletcher 45 Briarwood Drive Wheeling, WV 26003 /
Leon McCard 25 Honour Cir NW Atlanta, GA 30305 /	Gary Briggs 1508 26th Street Cody, WY 82414 /
Jeff and Connie Briggs 803 Meadow Lane Ave Apt 5 Cody, WY 42414 /	Roger L. Briggs 908 Amble Court Harrington, DE 19952 /
Thomas A. Briggs 996 Tunnel Hill Road Cameron, WV 26033 /	Julia A. Briggs 8154 W. Ohio State Lane NW Lancaster, OH 43130 /
Deena J. Palomo 20 Maxwell Street, Apartment 4 Hebron, IN 46341 /	Jerrilyn Litts 5582 Fairview Street Stevensville, MI 49127 /
Douglas Briggs PO Box 1416 Gillette, WY 82717 /	Gerri A Bannister 508 Richards Ave Gillette, WY 82717 /
John Briggs PO Box 2008 Richland, WA 99352 /	Noble Marcellus LP 15601 North Dallas Parkway, Suite 900 Addison, TX 75001 /
Meridius Ventures LLC PO Box 1099 Ripley, WV 25271 /	Hasan's Ventures LLC PO Box 1099 Ripley, WV 25271 /
Bounty Minerals LLC 777 Main Street, Suite 3400 Fort Worth, TX 76102 /	Goshorn Ridge, LLC 112 Algonquin Trace Wheeling, WV 26003 /

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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:** 12/03/2021      **Date Permit Application Filed:** 12/06/2021

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

**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: CNX Land, LLC  
Address: 1000 Consol Energy Drive  
Canonsburg, PA 15317

Name: Kevin R. and Shelly Jo Evans \*See Attached  
Address: 3820 New Bathal Road  
Cameron, WV 26033

**Notice is hereby given:**

Pursuant to West Virginia Code § 22-6A-16(e), 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>531,922.79</u>
County:	<u>Marshall</u>		Northing:	<u>4,408,991.39</u>
District:	<u>Cameron</u>	Public Road Access:		<u>CR 62</u>
Quadrangle:	<u>Glen Easton 7 5'</u>	Generally used farm name:		<u>CNX Land, LLC</u>
Watershed:	<u>Grass Creek (Huc 10) &amp; Laurel Run</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: 724-749-3388  
Email: amorris@tug-hillop.com

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

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**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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4705102430

**Additional Notice for WW-6A5**

David L. & Arianne R. Robinson  
3518 New Bethel Road  
Cameron, WV 26033

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4705102430

## WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

**Division of Highways**1900 Kanawha Boulevard East • Building Five • Room 110  
Charleston, West Virginia 25305-0430 • (304) 558-3505Byrd E. White, III  
Secretary of Transportation

January 7, 2021

Jimmy Wriston, P. E.  
Deputy Secretary/  
Acting CommissionerJames A. Martin, Chief  
Office of Oil and Gas  
Department of Environmental Protection  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304Subject: DOH Permit for the Breckenridge Pad, Marshall County  
Breckenridge S-9HM Well site

Dear Mr. Martin,

This well site will be accessed from a DOH permit #06-2020-0398 issued to Tug Hill Operating for access to the State Road for a well site located off Marshall County Route 62 SLS MP 3.81.

This operator is in compliance with §22-6A-20 of the WV Code. Operator has signed a DISTRICT WIDE OIL AND GAS ROAD MAINTENANCE BONDING AGREEMENT and provided the required Bond. This operator is currently in compliance with the DOH OIL AND GAS POLICY dated October 1, 2018.

Very Truly Yours,

Gary K. Clayton, P.E.  
Regional Maintenance Engineer  
Central Office O&G CoordinatorRECEIVED  
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WV Department of  
Environmental ProtectionCc: Amy Morris  
Tug Hill Operating  
CH, OM, D-6  
File

01/28/2022



**PLANNED ADDITIVES TO BE USED IN FRACTURING OR STIMULATION**

**Breckenridge Wells**

<b>PRODUCT NAME:</b>	<b>CHEMICAL DESCRIPTION:</b>	<b>PRODUCT USE:</b>	<b>HAZARDOUS COMPONENT:</b>
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

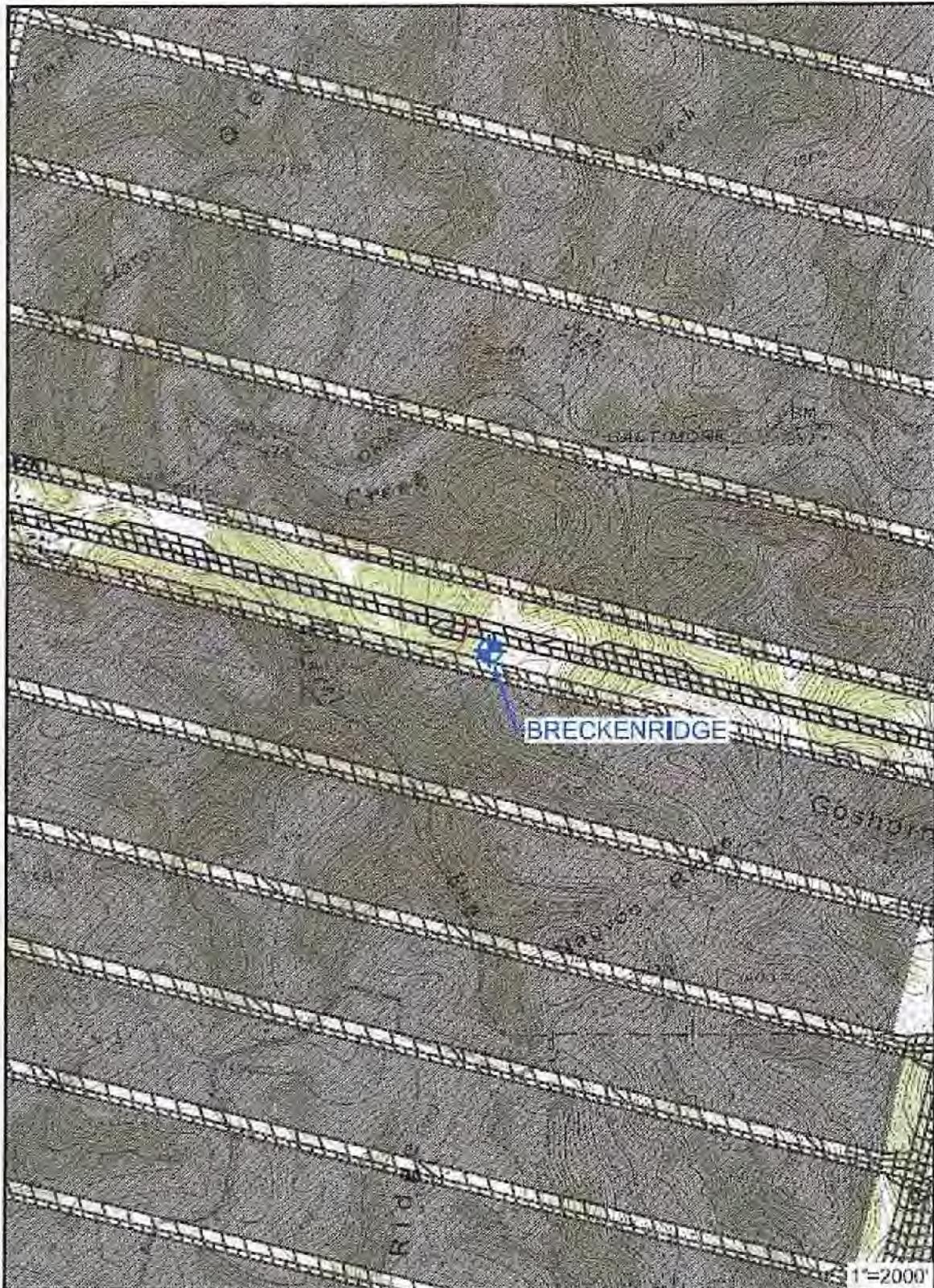
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# Breckenridge Coal Exhibit



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