



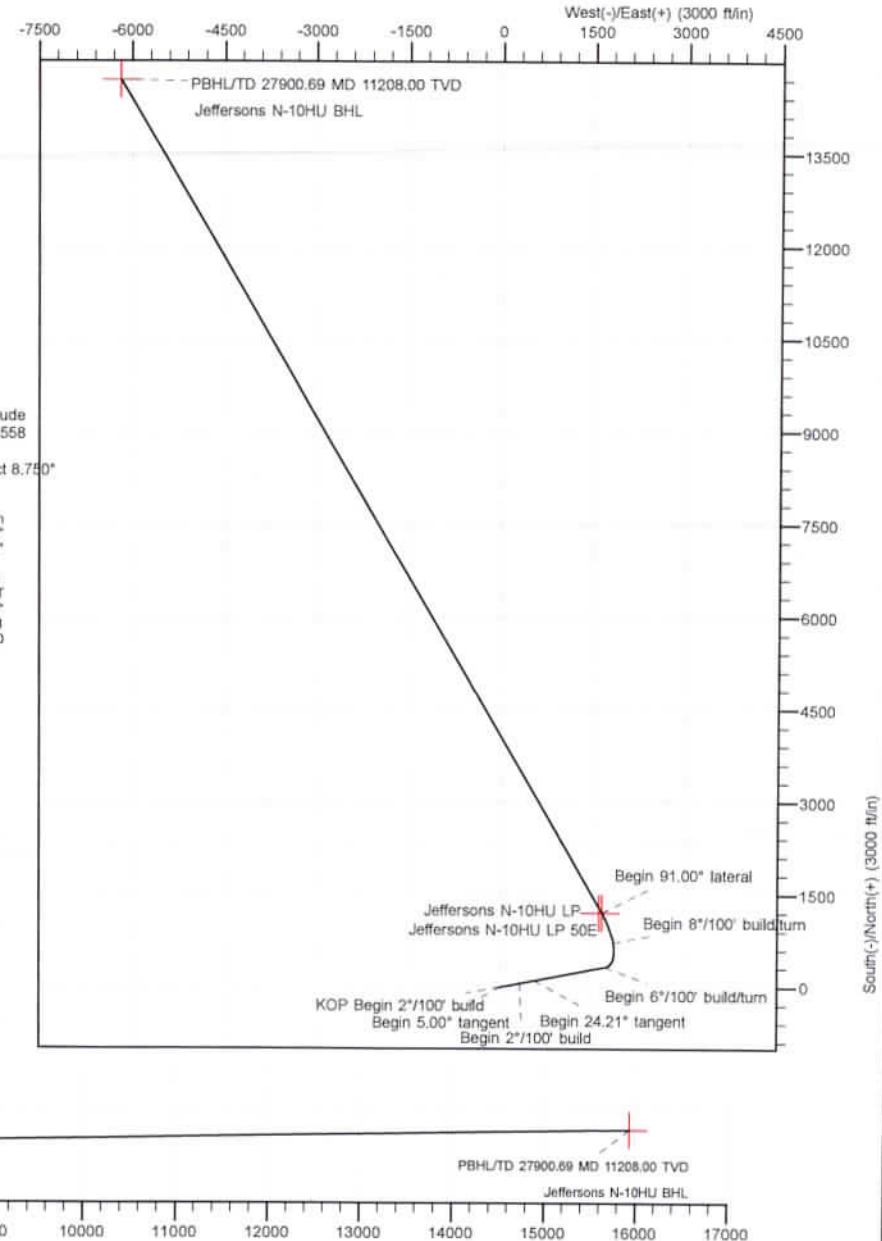
Well: Jeffersons N-10 HU (slot A)
 Site: Jeffersons
 Project: Wetzel County, West Virginia (UTM17 NAD83)
 Design: rev0
 Rig:

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Jeffersons N-10HU BHL	11208.00	14692.03	-5180.10	14427465.07	1698897.87	39.72719700	-80.79200200
- plan hits target center							
Jeffersons N-10HU LP	11480.00	1207.69	1605.07	14413980.75	1706683.02	39.69011200	-80.76443900
- plan misses target center by 43.28ft at 12328.00ft MD (11479.57 TVD, 1229.43 N, 1642.49 E)							
Jeffersons N-10HU LP 50E	1480.00	1207.69	1655.07	14413980.75	1706733.02	39.69011164	-80.76426126
- plan misses target center by 0.05ft at 12302.89ft MD (11480.00 TVD, 1207.71 N, 1655.11 E)							

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	
2	3200.00	0.00	0.00	3200.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 2"/100' build
3	3450.00	5.00	79.26	3449.68	2.03	10.71	2.00	79.260	-2.28	Begin 5.00" tangent
4	7013.88	5.00	79.26	7000.00	59.91	315.88	0.00	0.000	-67.25	Begin 2"/100' build
5	7974.22	24.21	79.26	7924.97	104.82	552.66	2.00	0.001	-117.66	Begin 24.21" tangent
6	10844.93	24.21	79.26	10543.26	324.15	1709.12	0.00	0.000	-363.90	Begin 6"/100' build/turn
7	11738.95	50.00	350.46	11293.95	725.77	1842.32	6.00	-108.006	-45.34	Begin 8"/100' build/turn
8	12302.92	91.00	329.84	11480.00	1207.74	1655.09	8.00	-29.797	471.52	Begin 91.00" lateral
9	27900.69	91.00	329.84	11208.00	14692.03	-6180.10	0.00	0.00015938.93		PBHL/TD 27900.69 MD 11208.00 TVD



Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1980
 Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level
 Depth Reference: GL @ 1217.00ft

Northing	Easting	Latitude	Longitude
14412773.06	1705077.96	39.68680674	-80.77015558

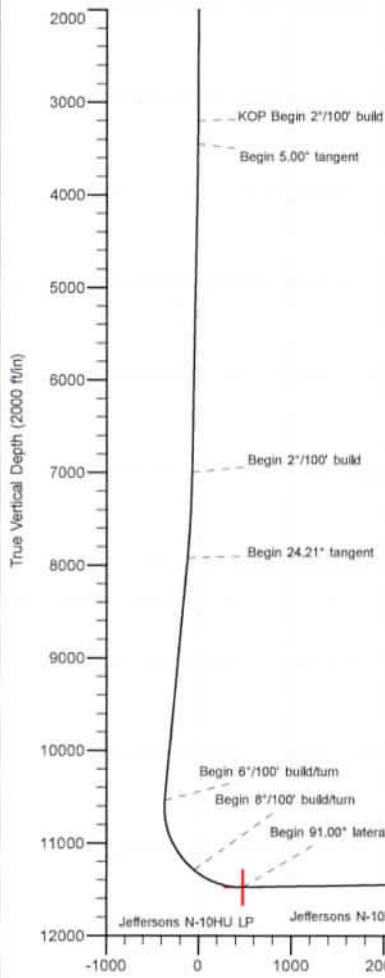
Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.750°

Azimuths to Grid North
 True North: -0.15°
 Magnetic North: -8.75°

Magnetic Field
 Strength: 51670.0nT
 Dip Angle: 66.44°
 Date: 10/9/2021
 Model: IGRF2020



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Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Jeffersons N-10 HU (slot A)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1217.00ft
Project:	Wetzel County, West Virginia (UTM17 NAD83)	MD Reference:	GL @ 1217.00ft
Site:	Jeffersons	North Reference:	Grid
Well:	Jeffersons N-10 HU (slot A)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Project	Wetzel County, West Virginia (UTM17 NAD83)		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD83 West Virginia - HARN		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	Jeffersons				
Site Position:		Northing:	14,412,666.05 usft	Latitude:	39.68651309
From:	Lat/Long	Easting:	1,705,043.41 usft	Longitude:	-80.77027935
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "		

Well	Jeffersons N-10 HU (slot A)					
Well Position	+N/-S	0.00 ft	Northing:	14,412,773.07 usft	Latitude:	39.68680674
	+E/-W	0.00 ft	Easting:	1,705,077.95 usft	Longitude:	-80.77015558
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	1,217.00 ft
Grid Convergence:						

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	10/9/2021	-8.603	66.437	51,670.02890916

Design	rev0			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	337.19

Plan Survey Tool Program		Date		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	27,900.69	rev0 (Original Hole)	

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Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Jeffersons N-10 HU (slot A)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1217.00ft
Project:	Wetzel County, West Virginia (UTM17 NAD83)	MD Reference:	GL @ 1217.00ft
Site:	Jeffersons	North Reference:	Grid
Well:	Jeffersons N-10 HU (slot A)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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	
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.000	
3,450.00	5.00	79.26	3,449.68	2.03	10.71	2.00	2.00	0.00	79.260	
7,013.88	5.00	79.26	7,000.00	59.91	315.88	0.00	0.00	0.00	0.000	
7,974.22	24.21	79.26	7,924.97	104.82	552.66	2.00	2.00	0.00	0.001	
10,844.93	24.21	79.26	10,543.26	324.15	1,709.12	0.00	0.00	0.00	0.000	
11,738.95	50.00	350.46	11,293.95	725.77	1,842.32	6.00	2.89	-9.93	-108.006	
12,302.92	91.00	329.84	11,480.00	1,207.74	1,655.09	8.00	7.27	-3.66	-29.797	
27,900.69	91.00	329.84	11,208.00	14,692.03	-6,180.10	0.00	0.00	0.00	0.000	Jeffersons N-10HU BI

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Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Jeffersons N-10 HU (slot A)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1217.00ft
Project:	Wetzel County, West Virginia (UTM17 NAD83)	MD Reference:	GL @ 1217.00ft
Site:	Jeffersons	North Reference:	Grid
Well:	Jeffersons N-10 HU (slot A)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

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	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
100.00	0.00	0.00	100.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
200.00	0.00	0.00	200.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
300.00	0.00	0.00	300.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
400.00	0.00	0.00	400.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
500.00	0.00	0.00	500.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
600.00	0.00	0.00	600.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
700.00	0.00	0.00	700.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
800.00	0.00	0.00	800.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
900.00	0.00	0.00	900.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
1,700.00	0.00	0.00	1,700.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
1,900.00	0.00	0.00	1,900.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
2,100.00	0.00	0.00	2,100.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
2,300.00	0.00	0.00	2,300.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
2,600.00	0.00	0.00	2,600.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
2,700.00	0.00	0.00	2,700.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
2,800.00	0.00	0.00	2,800.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
2,900.00	0.00	0.00	2,900.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
3,000.00	0.00	0.00	3,000.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
3,100.00	0.00	0.00	3,100.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
3,200.00	0.00	0.00	3,200.00	0.00	0.00	14,412,773.07	1,705,077.95	39.68680674	-80.77015558	
KOP Begin 2°/100' build										
3,300.00	2.00	79.26	3,299.98	0.33	1.71	14,412,773.39	1,705,079.67	39.68680762	-80.77014948	
3,400.00	4.00	79.26	3,399.84	1.30	6.86	14,412,774.37	1,705,084.81	39.68681026	-80.77013120	
3,450.00	5.00	79.26	3,449.68	2.03	10.71	14,412,775.10	1,705,088.66	39.68681224	-80.77011749	
Begin 5.00° tangent										
3,500.00	5.00	79.26	3,499.49	2.84	14.99	14,412,775.91	1,705,092.95	39.68681445	-80.77010227	
3,600.00	5.00	79.26	3,599.11	4.47	23.55	14,412,777.53	1,705,101.51	39.68681885	-80.77007181	
3,700.00	5.00	79.26	3,698.73	6.09	32.12	14,412,779.16	1,705,110.07	39.68682325	-80.77004136	
3,800.00	5.00	79.26	3,798.35	7.72	40.68	14,412,780.78	1,705,118.63	39.68682765	-80.77001091	
3,900.00	5.00	79.26	3,897.97	9.34	49.24	14,412,782.41	1,705,127.20	39.68683205	-80.76998046	
4,000.00	5.00	79.26	3,997.59	10.96	57.81	14,412,784.03	1,705,135.76	39.68683645	-80.76995000	
4,100.00	5.00	79.26	4,097.21	12.59	66.37	14,412,785.66	1,705,144.32	39.68684085	-80.76991955	
4,200.00	5.00	79.26	4,196.83	14.21	74.93	14,412,787.28	1,705,152.89	39.68684525	-80.76988910	
4,300.00	5.00	79.26	4,296.45	15.84	83.50	14,412,788.90	1,705,161.45	39.68684965	-80.76985865	
4,400.00	5.00	79.26	4,396.07	17.46	92.06	14,412,790.53	1,705,170.01	39.68685405	-80.76982820	
4,500.00	5.00	79.26	4,495.69	19.09	100.62	14,412,792.15	1,705,178.57	39.68685845	-80.76979774	
4,600.00	5.00	79.26	4,595.31	20.71	109.18	14,412,793.78	1,705,187.14	39.68686285	-80.76976729	
4,700.00	5.00	79.26	4,694.93	22.33	117.75	14,412,795.40	1,705,195.70	39.68686725	-80.76973684	
4,800.00	5.00	79.26	4,794.55	23.96	126.31	14,412,797.02	1,705,204.26	39.68687165	-80.76970639	
4,900.00	5.00	79.26	4,894.17	25.58	134.87	14,412,798.65	1,705,212.83	39.68687605	-80.76967594	
5,000.00	5.00	79.26	4,993.79	27.21	143.44	14,412,800.27	1,705,221.39	39.68688045	-80.76964548	



Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Jeffersons N-10 HU (slot A)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1217.00ft
Project:	Wetzel County, West Virginia (UTM17 NAD83)	MD Reference:	GL @ 1217.00ft
Site:	Jeffersons	North Reference:	Grid
Well:	Jeffersons N-10 HU (slot A)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,100.00	5.00	79.26	5,093.40	28.83	152.00	14,412,801.90	1,705,229.95	39.68688485	-80.76961503	
5,200.00	5.00	79.26	5,193.02	30.45	160.56	14,412,803.52	1,705,238.51	39.68688925	-80.76958458	
5,300.00	5.00	79.26	5,292.64	32.08	169.12	14,412,805.15	1,705,247.08	39.68689365	-80.76955413	
5,400.00	5.00	79.26	5,392.26	33.70	177.69	14,412,806.77	1,705,255.64	39.68689805	-80.76952367	
5,500.00	5.00	79.26	5,491.88	35.33	186.25	14,412,808.39	1,705,264.20	39.68690245	-80.76949322	
5,600.00	5.00	79.26	5,591.50	36.95	194.81	14,412,810.02	1,705,272.77	39.68690685	-80.76946277	
5,700.00	5.00	79.26	5,691.12	38.58	203.38	14,412,811.64	1,705,281.33	39.68691125	-80.76943232	
5,800.00	5.00	79.26	5,790.74	40.20	211.94	14,412,813.27	1,705,289.89	39.68691565	-80.76940187	
5,900.00	5.00	79.26	5,890.36	41.82	220.50	14,412,814.89	1,705,298.45	39.68692005	-80.76937141	
6,000.00	5.00	79.26	5,989.98	43.45	229.06	14,412,816.51	1,705,307.02	39.68692445	-80.76934096	
6,100.00	5.00	79.26	6,089.60	45.07	237.63	14,412,818.14	1,705,315.58	39.68692885	-80.76931051	
6,200.00	5.00	79.26	6,189.22	46.70	246.19	14,412,819.76	1,705,324.14	39.68693325	-80.76928006	
6,300.00	5.00	79.26	6,288.84	48.32	254.75	14,412,821.39	1,705,332.71	39.68693765	-80.76924960	
6,400.00	5.00	79.26	6,388.46	49.94	263.32	14,412,823.01	1,705,341.27	39.68694205	-80.76921915	
6,500.00	5.00	79.26	6,488.08	51.57	271.88	14,412,824.64	1,705,349.83	39.68694645	-80.76918870	
6,600.00	5.00	79.26	6,587.70	53.19	280.44	14,412,826.26	1,705,358.40	39.68695085	-80.76915825	
6,700.00	5.00	79.26	6,687.32	54.82	289.00	14,412,827.88	1,705,366.96	39.68695525	-80.76912780	
6,800.00	5.00	79.26	6,786.94	56.44	297.57	14,412,829.51	1,705,375.52	39.68695965	-80.76909734	
6,900.00	5.00	79.26	6,886.55	58.07	306.13	14,412,831.13	1,705,384.08	39.68696405	-80.76906689	
7,000.00	5.00	79.26	6,986.17	59.69	314.69	14,412,832.76	1,705,392.65	39.68696845	-80.76903644	
7,013.88	5.00	79.26	7,000.00	59.91	315.88	14,412,832.98	1,705,393.84	39.68696906	-80.76903221	
Begin 2°/100' build										
7,100.00	6.72	79.26	7,085.67	61.55	324.52	14,412,834.62	1,705,402.48	39.68697350	-80.76900149	
7,200.00	8.72	79.26	7,184.76	64.06	337.72	14,412,837.12	1,705,415.68	39.68698028	-80.76895454	
7,300.00	10.72	79.26	7,283.31	67.20	354.31	14,412,840.27	1,705,432.27	39.68698881	-80.76889553	
7,400.00	12.72	79.26	7,381.22	70.99	374.27	14,412,844.06	1,705,452.23	39.68699906	-80.76882455	
7,500.00	14.72	79.26	7,478.36	75.41	397.58	14,412,848.48	1,705,475.53	39.68701104	-80.76874167	
7,600.00	16.72	79.26	7,574.62	80.46	424.20	14,412,853.53	1,705,502.15	39.68702471	-80.76864699	
7,700.00	18.72	79.26	7,669.87	86.13	454.11	14,412,859.20	1,705,532.06	39.68704008	-80.76854064	
7,800.00	20.72	79.26	7,764.00	92.42	487.26	14,412,865.49	1,705,565.21	39.68705711	-80.76842274	
7,900.00	22.72	79.26	7,856.89	99.31	523.62	14,412,872.38	1,705,601.57	39.68707579	-80.76829342	
7,974.22	24.21	79.26	7,924.97	104.82	552.66	14,412,877.89	1,705,630.61	39.68709071	-80.76819017	
Begin 24.21° tangent										
8,000.00	24.21	79.26	7,948.48	106.79	563.04	14,412,879.86	1,705,640.99	39.68709604	-80.76815323	
8,100.00	24.21	79.26	8,039.69	114.43	603.33	14,412,887.50	1,705,681.28	39.68711674	-80.76800997	
8,200.00	24.21	79.26	8,130.90	122.07	643.61	14,412,895.14	1,705,721.56	39.68713744	-80.76786670	
8,300.00	24.21	79.26	8,222.11	129.71	683.90	14,412,902.78	1,705,761.85	39.68715813	-80.76772344	
8,400.00	24.21	79.26	8,313.31	137.35	724.18	14,412,910.42	1,705,802.13	39.68717883	-80.76758017	
8,500.00	24.21	79.26	8,404.52	144.99	764.47	14,412,918.06	1,705,842.42	39.68719953	-80.76743690	
8,600.00	24.21	79.26	8,495.73	152.63	804.75	14,412,925.70	1,705,882.70	39.68722022	-80.76729364	
8,700.00	24.21	79.26	8,586.93	160.27	845.04	14,412,933.34	1,705,922.99	39.68724092	-80.76715037	
8,800.00	24.21	79.26	8,678.14	167.91	885.32	14,412,940.98	1,705,963.27	39.68726161	-80.76700710	
8,900.00	24.21	79.26	8,769.35	175.55	925.61	14,412,948.62	1,706,003.56	39.68728231	-80.76686384	
9,000.00	24.21	79.26	8,860.56	183.19	965.89	14,412,956.26	1,706,043.84	39.68730300	-80.76672057	
9,100.00	24.21	79.26	8,951.76	190.83	1,006.18	14,412,963.90	1,706,084.13	39.68732370	-80.76657730	
9,200.00	24.21	79.26	9,042.97	198.47	1,046.46	14,412,971.54	1,706,124.41	39.68734439	-80.76643404	
9,300.00	24.21	79.26	9,134.18	206.11	1,086.75	14,412,979.18	1,706,164.70	39.68736509	-80.76629077	
9,400.00	24.21	79.26	9,225.39	213.75	1,127.03	14,412,986.82	1,706,204.98	39.68738578	-80.76614750	
9,500.00	24.21	79.26	9,316.59	221.40	1,167.32	14,412,994.46	1,706,245.27	39.68740647	-80.76600424	
9,600.00	24.21	79.26	9,407.80	229.04	1,207.60	14,413,002.10	1,706,285.55	39.68742717	-80.76586097	
9,700.00	24.21	79.26	9,499.01	236.68	1,247.89	14,413,009.74	1,706,325.84	39.68744786	-80.76571770	
9,800.00	24.21	79.26	9,590.21	244.32	1,288.17	14,413,017.38	1,706,366.12	39.68746856	-80.76557443	
9,900.00	24.21	79.26	9,681.42	251.96	1,328.46	14,413,025.02	1,706,406.41	39.68748925	-80.76543117	
10,000.00	24.21	79.26	9,772.63	259.60	1,368.74	14,413,032.66	1,706,446.69	39.68750994	-80.76528790	

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Office of Oil and Gas
JAN 26 2023

05/26/2023



Planning Report - Geographic

Database: DB_Dec2220_v16
 Company: Tug Hill Operating LLC
 Project: Wetzel County, West Virginia (UTM17 NAD83)
 Site: Jeffersons
 Well: Jeffersons N-10 HU (slot A)
 Wellbore: Original Hole
 Design: rev0

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well Jeffersons N-10 HU (slot A)
 GL @ 1217.00ft
 GL @ 1217.00ft
 Grid
 Minimum Curvature
 WV Department of
 Economic Development

RECEIVED
 JAN 26 2023

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,100.00	24.21	79.26	9,863.84	267.24	1,409.03	14,413,040.30	1,706,486.98	39.68753064	-80.76514463
10,200.00	24.21	79.26	9,955.04	274.88	1,449.31	14,413,047.94	1,706,527.26	39.68755133	-80.76500136
10,300.00	24.21	79.26	10,046.25	282.52	1,489.60	14,413,055.58	1,706,567.55	39.68757202	-80.76485809
10,400.00	24.21	79.26	10,137.46	290.16	1,529.88	14,413,063.22	1,706,607.83	39.68759271	-80.76471483
10,500.00	24.21	79.26	10,228.66	297.80	1,570.17	14,413,070.86	1,706,648.12	39.68761341	-80.76457156
10,600.00	24.21	79.26	10,319.87	305.44	1,610.45	14,413,078.50	1,706,688.40	39.68763410	-80.76442829
10,700.00	24.21	79.26	10,411.08	313.08	1,650.74	14,413,086.14	1,706,728.69	39.68765479	-80.76428502
10,800.00	24.21	79.26	10,502.29	320.72	1,691.02	14,413,093.78	1,706,768.97	39.68767548	-80.76414175
10,844.93	24.21	79.26	10,543.26	324.15	1,709.12	14,413,097.22	1,706,787.07	39.68768478	-80.76407739
Begin 6°/100' build/turn									
10,850.00	24.11	78.55	10,547.89	324.55	1,711.16	14,413,097.62	1,706,789.11	39.68768586	-80.76407014
10,900.00	23.38	71.32	10,593.67	329.76	1,730.57	14,413,102.82	1,706,808.52	39.68770002	-80.76400108
10,950.00	23.00	63.76	10,639.63	337.26	1,748.74	14,413,110.32	1,706,826.69	39.68772048	-80.76393643
11,000.00	22.99	56.08	10,685.67	347.03	1,765.61	14,413,120.09	1,706,843.56	39.68774719	-80.76387637
11,050.00	23.35	48.50	10,731.65	359.04	1,781.14	14,413,132.11	1,706,859.09	39.68778008	-80.76382107
11,100.00	24.05	41.24	10,777.44	373.27	1,795.28	14,413,146.34	1,706,873.23	39.68781905	-80.76377067
11,150.00	25.08	34.46	10,822.93	389.67	1,807.99	14,413,162.74	1,706,885.94	39.68786401	-80.76372532
11,200.00	26.39	28.24	10,867.97	408.20	1,819.25	14,413,181.27	1,706,897.20	39.68791482	-80.76368514
11,250.00	27.94	22.62	10,912.46	428.81	1,829.01	14,413,201.88	1,706,906.96	39.68797134	-80.76365024
11,300.00	29.70	17.57	10,956.27	451.44	1,837.26	14,413,224.51	1,706,915.21	39.68803343	-80.76362071
11,350.00	31.64	13.07	10,999.28	476.03	1,843.97	14,413,249.10	1,706,921.92	39.68810091	-80.76359664
11,400.00	33.71	9.05	11,041.38	502.51	1,849.12	14,413,275.58	1,706,927.07	39.68817360	-80.76357809
11,450.00	35.90	5.45	11,082.43	530.81	1,852.69	14,413,303.88	1,706,930.64	39.68825129	-80.76356511
11,500.00	38.18	2.23	11,122.35	560.85	1,854.69	14,413,333.92	1,706,932.64	39.68833378	-80.76355775
11,550.00	40.55	359.31	11,161.00	592.55	1,855.09	14,413,365.62	1,706,933.04	39.68842084	-80.76355601
11,600.00	42.98	356.68	11,198.30	625.83	1,853.91	14,413,398.89	1,706,931.86	39.68851223	-80.76355990
11,650.00	45.47	354.27	11,234.13	660.58	1,851.14	14,413,433.65	1,706,929.09	39.68860769	-80.76356942
11,700.00	48.00	352.06	11,268.40	696.72	1,846.79	14,413,469.79	1,706,924.74	39.68870698	-80.76358453
11,738.95	50.00	350.46	11,293.95	725.77	1,842.32	14,413,498.84	1,706,920.27	39.68878679	-80.76360015
Begin 8°/100' build/turn									
11,750.00	50.77	349.89	11,301.00	734.16	1,840.87	14,413,507.22	1,706,918.82	39.68880984	-80.76360524
11,800.00	54.28	347.47	11,331.42	773.05	1,833.06	14,413,546.12	1,706,911.01	39.68891671	-80.76363262
11,850.00	57.83	345.26	11,359.34	813.35	1,823.27	14,413,586.41	1,706,901.22	39.68902744	-80.76366704
11,900.00	61.42	343.21	11,384.62	854.85	1,811.54	14,413,627.91	1,706,889.49	39.68914150	-80.76370836
11,950.00	65.04	341.30	11,407.13	897.35	1,797.93	14,413,670.42	1,706,875.88	39.68925832	-80.76375635
12,000.00	68.68	339.50	11,426.78	940.65	1,782.50	14,413,713.72	1,706,860.45	39.68937735	-80.76381079
12,050.00	72.34	337.78	11,443.46	984.54	1,765.33	14,413,757.60	1,706,843.28	39.68949800	-80.76387142
12,100.00	76.01	336.14	11,457.10	1,028.79	1,746.50	14,413,801.86	1,706,824.45	39.68961967	-80.76393793
12,150.00	79.70	334.54	11,467.61	1,073.20	1,726.10	14,413,846.27	1,706,804.05	39.68974179	-80.76401001
12,200.00	83.39	332.99	11,474.97	1,117.56	1,704.24	14,413,890.62	1,706,782.19	39.68986375	-80.76408730
12,250.00	87.08	331.45	11,479.12	1,161.63	1,681.02	14,413,934.70	1,706,758.97	39.68998496	-80.76416943
12,302.92	91.00	329.84	11,480.00	1,207.74	1,655.09	14,413,980.80	1,706,733.04	39.69011177	-80.76426118
Begin 91.00° lateral									
12,400.00	91.00	329.84	11,478.31	1,291.67	1,606.33	14,414,064.73	1,706,684.28	39.69034262	-80.76443375
12,500.00	91.00	329.84	11,476.57	1,378.12	1,556.09	14,414,151.18	1,706,634.04	39.69058040	-80.76461151
12,600.00	91.00	329.84	11,474.82	1,464.57	1,505.86	14,414,237.63	1,706,583.81	39.69081818	-80.76478926
12,700.00	91.00	329.84	11,473.08	1,551.02	1,455.63	14,414,324.08	1,706,533.58	39.69105596	-80.76496703
12,800.00	91.00	329.84	11,471.34	1,637.47	1,405.40	14,414,410.53	1,706,483.35	39.69129374	-80.76514479
12,900.00	91.00	329.84	11,469.59	1,723.92	1,355.16	14,414,496.98	1,706,433.11	39.69153152	-80.76532255
13,000.00	91.00	329.84	11,467.85	1,810.37	1,304.93	14,414,583.43	1,706,382.88	39.69176930	-80.76550031
13,100.00	91.00	329.84	11,466.10	1,896.82	1,254.70	14,414,669.88	1,706,332.65	39.69200708	-80.76567808
13,200.00	91.00	329.84	11,464.36	1,983.27	1,204.46	14,414,756.33	1,706,282.42	39.69224486	-80.76585585
13,300.00	91.00	329.84	11,462.62	2,069.72	1,154.23	14,414,842.78	1,706,232.18	39.69248264	-80.76603361
13,400.00	91.00	329.84	11,460.87	2,156.17	1,104.00	14,414,929.23	1,706,181.95	39.69272042	-80.76621138

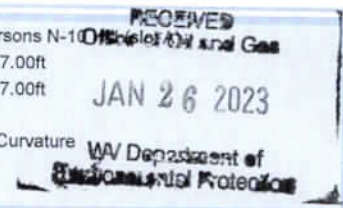


Planning Report - Geographic

Database: DB_Dec2220_v16
 Company: Tug Hill Operating LLC
 Project: Wetzel County, West Virginia (UTM17 NAD83)
 Site: Jeffersons
 Well: Jeffersons N-10 HU (slot A)
 Wellbore: Original Hole
 Design: rev0

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well Jeffersons N-10
 GL @ 1217.00ft
 GL @ 1217.00ft
 Grid
 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
13,500.00	91.00	329.84	11,459.13	2,242.62	1,053.77	14,415,015.68	1,706,131.72	39.69295819	-80.76638915
13,600.00	91.00	329.84	11,457.38	2,329.07	1,003.53	14,415,102.13	1,706,081.49	39.69319597	-80.76656692
13,700.00	91.00	329.84	11,455.64	2,415.52	953.30	14,415,188.58	1,706,031.25	39.69343375	-80.76674470
13,800.00	91.00	329.84	11,453.90	2,501.97	903.07	14,415,275.03	1,705,981.02	39.69367153	-80.76692247
13,900.00	91.00	329.84	11,452.15	2,588.42	852.84	14,415,361.48	1,705,930.79	39.69390930	-80.76710025
14,000.00	91.00	329.84	11,450.41	2,674.87	802.60	14,415,447.93	1,705,880.55	39.69414708	-80.76727802
14,100.00	91.00	329.84	11,448.67	2,761.32	752.37	14,415,534.38	1,705,830.32	39.69438486	-80.76745580
14,200.00	91.00	329.84	11,446.92	2,847.77	702.14	14,415,620.83	1,705,780.09	39.69462263	-80.76763358
14,300.00	91.00	329.84	11,445.18	2,934.22	651.90	14,415,707.28	1,705,729.86	39.69486041	-80.76781136
14,400.00	91.00	329.84	11,443.43	3,020.67	601.67	14,415,793.73	1,705,679.62	39.69509819	-80.76798914
14,500.00	91.00	329.84	11,441.69	3,107.12	551.44	14,415,880.18	1,705,629.39	39.69533596	-80.76816692
14,600.00	91.00	329.84	11,439.95	3,193.57	501.21	14,415,966.63	1,705,579.16	39.69557374	-80.76834471
14,700.00	91.00	329.84	11,438.20	3,280.02	450.97	14,416,053.08	1,705,528.93	39.69581151	-80.76852249
14,800.00	91.00	329.84	11,436.46	3,366.47	400.74	14,416,139.53	1,705,478.69	39.69604929	-80.76870028
14,900.00	91.00	329.84	11,434.71	3,452.92	350.51	14,416,225.98	1,705,428.46	39.69628706	-80.76887806
15,000.00	91.00	329.84	11,432.97	3,539.37	300.27	14,416,312.43	1,705,378.23	39.69652484	-80.76905585
15,100.00	91.00	329.84	11,431.23	3,625.82	250.04	14,416,398.88	1,705,327.99	39.69676261	-80.76923364
15,200.00	91.00	329.84	11,429.48	3,712.27	199.81	14,416,485.33	1,705,277.76	39.69700038	-80.76941143
15,300.00	91.00	329.84	11,427.74	3,798.72	149.58	14,416,571.78	1,705,227.53	39.69723816	-80.76958922
15,400.00	91.00	329.84	11,426.00	3,885.17	99.34	14,416,658.23	1,705,177.30	39.69747593	-80.76976702
15,500.00	91.00	329.84	11,424.25	3,971.62	49.11	14,416,744.68	1,705,127.06	39.69771370	-80.76994481
15,600.00	91.00	329.84	11,422.51	4,058.07	-1.12	14,416,831.13	1,705,076.83	39.69795147	-80.77012261
15,700.00	91.00	329.84	11,420.76	4,144.52	-51.35	14,416,917.58	1,705,026.60	39.69818925	-80.77030040
15,800.00	91.00	329.84	11,419.02	4,230.97	-101.59	14,417,004.03	1,704,976.37	39.69842702	-80.77047820
15,900.00	91.00	329.84	11,417.28	4,317.42	-151.82	14,417,090.48	1,704,926.13	39.69866479	-80.77065600
16,000.00	91.00	329.84	11,415.53	4,403.87	-202.05	14,417,176.93	1,704,875.90	39.69890256	-80.77083380
16,100.00	91.00	329.84	11,413.79	4,490.32	-252.29	14,417,263.38	1,704,825.67	39.69914033	-80.77101160
16,200.00	91.00	329.84	11,412.04	4,576.77	-302.52	14,417,349.83	1,704,775.44	39.69937810	-80.77118941
16,300.00	91.00	329.84	11,410.30	4,663.22	-352.75	14,417,436.28	1,704,725.20	39.69961587	-80.77136721
16,400.00	91.00	329.84	11,408.56	4,749.67	-402.98	14,417,522.73	1,704,674.97	39.69985364	-80.77154502
16,500.00	91.00	329.84	11,406.81	4,836.12	-453.22	14,417,609.18	1,704,624.74	39.70009141	-80.77172282
16,600.00	91.00	329.84	11,405.07	4,922.57	-503.45	14,417,695.63	1,704,574.50	39.70032918	-80.77190063
16,700.00	91.00	329.84	11,403.32	5,009.02	-553.68	14,417,782.08	1,704,524.27	39.70056695	-80.77207844
16,800.00	91.00	329.84	11,401.58	5,095.47	-603.92	14,417,868.53	1,704,474.04	39.70080472	-80.77225625
16,900.00	91.00	329.84	11,399.84	5,181.92	-654.15	14,417,954.98	1,704,423.81	39.70104249	-80.77243406
17,000.00	91.00	329.84	11,398.09	5,268.37	-704.38	14,418,041.43	1,704,373.57	39.70128026	-80.77261188
17,100.00	91.00	329.84	11,396.35	5,354.82	-754.61	14,418,127.88	1,704,323.34	39.70151803	-80.77278969
17,200.00	91.00	329.84	11,394.61	5,441.27	-804.85	14,418,214.33	1,704,273.11	39.70175580	-80.77296751
17,300.00	91.00	329.84	11,392.86	5,527.72	-855.08	14,418,300.78	1,704,222.88	39.70199356	-80.77314532
17,400.00	91.00	329.84	11,391.12	5,614.17	-905.31	14,418,387.23	1,704,172.64	39.70223133	-80.77332314
17,500.00	91.00	329.84	11,389.37	5,700.62	-955.55	14,418,473.68	1,704,122.41	39.70246910	-80.77350096
17,600.00	91.00	329.84	11,387.63	5,787.07	-1,005.78	14,418,560.13	1,704,072.18	39.70270687	-80.77367878
17,700.00	91.00	329.84	11,385.89	5,873.52	-1,056.01	14,418,646.58	1,704,021.95	39.70294463	-80.77385660
17,800.00	91.00	329.84	11,384.14	5,959.97	-1,106.24	14,418,733.03	1,703,971.71	39.70318240	-80.77403442
17,900.00	91.00	329.84	11,382.40	6,046.42	-1,156.48	14,418,819.48	1,703,921.48	39.70342017	-80.77421225
18,000.00	91.00	329.84	11,380.65	6,132.87	-1,206.71	14,418,905.93	1,703,871.25	39.70365793	-80.77439007
18,100.00	91.00	329.84	11,378.91	6,219.32	-1,256.94	14,418,992.38	1,703,821.01	39.70389570	-80.77456790
18,200.00	91.00	329.84	11,377.17	6,305.77	-1,307.17	14,419,078.83	1,703,770.78	39.70413346	-80.77474572
18,300.00	91.00	329.84	11,375.42	6,392.22	-1,357.41	14,419,165.28	1,703,720.55	39.70437123	-80.77492355
18,400.00	91.00	329.84	11,373.68	6,478.67	-1,407.64	14,419,251.73	1,703,670.32	39.70460899	-80.77510138
18,500.00	91.00	329.84	11,371.94	6,565.12	-1,457.87	14,419,338.18	1,703,620.08	39.70484676	-80.77527921
18,600.00	91.00	329.84	11,370.19	6,651.57	-1,508.11	14,419,424.63	1,703,569.85	39.70508452	-80.77545705
18,700.00	91.00	329.84	11,368.45	6,738.02	-1,558.34	14,419,511.08	1,703,519.62	39.70532228	-80.77563488
18,800.00	91.00	329.84	11,366.70	6,824.47	-1,608.57	14,419,597.53	1,703,469.39	39.70556005	-80.77581271
18,900.00	91.00	329.84	11,364.96	6,910.92	-1,658.80	14,419,683.98	1,703,419.15	39.70579781	-80.77599055

05/26/2023



Planning Report - Geographic

Database: DB_Dec2220_v16
 Company: Tug Hill Operating LLC
 Project: Wetzel County, West Virginia (UTM17 NAD83)
 Site: Jeffersons
 Well: Jeffersons N-10 HU (slot A)
 Wellbore: Original Hole
 Design: rev0

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well Jeffersons N-10 HU (slot A) RECEIVED
 GL @ 1217.00ft
 GL @ 1217.00ft
 Grid
 Minimum Curvature

JAN 26 2023
 WV Department of Environmental Protection

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
19,000.00	91.00	329.84	11,363.22	6,997.37	-1,709.04	14,419,770.43	1,703,368.92	39.70603557	-80.77616839
19,100.00	91.00	329.84	11,361.47	7,083.82	-1,759.27	14,419,856.88	1,703,318.69	39.70627334	-80.77634623
19,200.00	91.00	329.84	11,359.73	7,170.28	-1,809.50	14,419,943.33	1,703,268.45	39.70651110	-80.77652407
19,300.00	91.00	329.84	11,357.98	7,256.73	-1,859.74	14,420,029.78	1,703,218.22	39.70674886	-80.77670191
19,400.00	91.00	329.84	11,356.24	7,343.18	-1,909.97	14,420,116.23	1,703,167.99	39.70698662	-80.77687975
19,500.00	91.00	329.84	11,354.50	7,429.63	-1,960.20	14,420,202.68	1,703,117.76	39.70722438	-80.77705759
19,600.00	91.00	329.84	11,352.75	7,516.08	-2,010.43	14,420,289.13	1,703,067.52	39.70746215	-80.77723544
19,700.00	91.00	329.84	11,351.01	7,602.53	-2,060.67	14,420,375.58	1,703,017.29	39.70769991	-80.77741328
19,800.00	91.00	329.84	11,349.27	7,688.98	-2,110.90	14,420,462.03	1,702,967.06	39.70793767	-80.77759113
19,900.00	91.00	329.84	11,347.52	7,775.43	-2,161.13	14,420,548.48	1,702,916.83	39.70817543	-80.77776898
20,000.00	91.00	329.84	11,345.78	7,861.88	-2,211.36	14,420,634.93	1,702,866.59	39.70841319	-80.77794683
20,100.00	91.00	329.84	11,344.03	7,948.33	-2,261.60	14,420,721.38	1,702,816.36	39.70865095	-80.77812468
20,200.00	91.00	329.84	11,342.29	8,034.78	-2,311.83	14,420,807.83	1,702,766.13	39.70888871	-80.77830253
20,300.00	91.00	329.84	11,340.55	8,121.23	-2,362.06	14,420,894.28	1,702,715.90	39.70912647	-80.77848038
20,400.00	91.00	329.84	11,338.80	8,207.68	-2,412.30	14,420,980.73	1,702,665.66	39.70936423	-80.77865824
20,500.00	91.00	329.84	11,337.06	8,294.13	-2,462.53	14,421,067.18	1,702,615.43	39.70960199	-80.77883609
20,600.00	91.00	329.84	11,335.31	8,380.58	-2,512.76	14,421,153.63	1,702,565.20	39.70983974	-80.77901395
20,700.00	91.00	329.84	11,333.57	8,467.03	-2,562.99	14,421,240.08	1,702,514.96	39.71007750	-80.77919181
20,800.00	91.00	329.84	11,331.83	8,553.48	-2,613.23	14,421,326.53	1,702,464.73	39.71031526	-80.77936967
20,900.00	91.00	329.84	11,330.08	8,639.93	-2,663.46	14,421,412.98	1,702,414.50	39.71055302	-80.77954753
21,000.00	91.00	329.84	11,328.34	8,726.38	-2,713.69	14,421,499.43	1,702,364.27	39.71079078	-80.77972539
21,100.00	91.00	329.84	11,326.59	8,812.83	-2,763.93	14,421,585.88	1,702,314.03	39.71102853	-80.77990325
21,200.00	91.00	329.84	11,324.85	8,899.28	-2,814.16	14,421,672.33	1,702,263.80	39.71126629	-80.78008111
21,300.00	91.00	329.84	11,323.11	8,985.73	-2,864.39	14,421,758.78	1,702,213.57	39.71150405	-80.78025898
21,400.00	91.00	329.84	11,321.36	9,072.18	-2,914.62	14,421,845.23	1,702,163.34	39.71174180	-80.78043685
21,500.00	91.00	329.84	11,319.62	9,158.63	-2,964.86	14,421,931.68	1,702,113.10	39.71197956	-80.78061471
21,600.00	91.00	329.84	11,317.88	9,245.08	-3,015.09	14,422,018.13	1,702,062.87	39.71221731	-80.78079258
21,700.00	91.00	329.84	11,316.13	9,331.53	-3,065.32	14,422,104.58	1,702,012.64	39.71245507	-80.78097045
21,800.00	91.00	329.84	11,314.39	9,417.98	-3,115.55	14,422,191.03	1,701,962.41	39.71269283	-80.78114832
21,900.00	91.00	329.84	11,312.64	9,504.43	-3,165.79	14,422,277.48	1,701,912.17	39.71293058	-80.78132620
22,000.00	91.00	329.84	11,310.90	9,590.88	-3,216.02	14,422,363.93	1,701,861.94	39.71316833	-80.78150407
22,100.00	91.00	329.84	11,309.16	9,677.33	-3,266.25	14,422,450.38	1,701,811.71	39.71340609	-80.78168194
22,200.00	91.00	329.84	11,307.41	9,763.78	-3,316.49	14,422,536.83	1,701,761.47	39.71364384	-80.78185982
22,300.00	91.00	329.84	11,305.67	9,850.23	-3,366.72	14,422,623.28	1,701,711.24	39.71388160	-80.78203770
22,400.00	91.00	329.84	11,303.92	9,936.68	-3,416.95	14,422,709.73	1,701,661.01	39.71411935	-80.78221558
22,500.00	91.00	329.84	11,302.18	10,023.13	-3,467.18	14,422,796.18	1,701,610.78	39.71435710	-80.78239346
22,600.00	91.00	329.84	11,300.44	10,109.58	-3,517.42	14,422,882.63	1,701,560.54	39.71459486	-80.78257134
22,700.00	91.00	329.84	11,298.69	10,196.03	-3,567.65	14,422,969.08	1,701,510.31	39.71483261	-80.78274922
22,800.00	91.00	329.84	11,296.95	10,282.48	-3,617.88	14,423,055.53	1,701,460.08	39.71507036	-80.78292710
22,900.00	91.00	329.84	11,295.21	10,368.93	-3,668.12	14,423,141.98	1,701,409.85	39.71530811	-80.78310499
23,000.00	91.00	329.84	11,293.46	10,455.38	-3,718.35	14,423,228.43	1,701,359.61	39.71554587	-80.78328287
23,100.00	91.00	329.84	11,291.72	10,541.83	-3,768.58	14,423,314.88	1,701,309.38	39.71578362	-80.78346076
23,200.00	91.00	329.84	11,289.97	10,628.28	-3,818.81	14,423,401.33	1,701,259.15	39.71602137	-80.78363865
23,300.00	91.00	329.84	11,288.23	10,714.73	-3,869.05	14,423,487.78	1,701,208.91	39.71625912	-80.78381654
23,400.00	91.00	329.84	11,286.49	10,801.18	-3,919.28	14,423,574.23	1,701,158.68	39.71649687	-80.78399443
23,500.00	91.00	329.84	11,284.74	10,887.63	-3,969.51	14,423,660.68	1,701,108.45	39.71673462	-80.78417232
23,600.00	91.00	329.84	11,283.00	10,974.08	-4,019.74	14,423,747.13	1,701,058.22	39.71697237	-80.78435021
23,700.00	91.00	329.84	11,281.25	11,060.53	-4,069.98	14,423,833.58	1,701,007.98	39.71721012	-80.78452811
23,800.00	91.00	329.84	11,279.51	11,146.98	-4,120.21	14,423,920.03	1,700,957.75	39.71744787	-80.78470600
23,900.00	91.00	329.84	11,277.77	11,233.43	-4,170.44	14,424,006.48	1,700,907.52	39.71768562	-80.78488390
24,000.00	91.00	329.84	11,276.02	11,319.88	-4,220.68	14,424,092.93	1,700,857.29	39.71792337	-80.78506180
24,100.00	91.00	329.84	11,274.28	11,406.33	-4,270.91	14,424,179.38	1,700,807.05	39.71816112	-80.78523970
24,200.00	91.00	329.84	11,272.54	11,492.78	-4,321.14	14,424,265.83	1,700,756.82	39.71839887	-80.78541760
24,300.00	91.00	329.84	11,270.79	11,579.23	-4,371.37	14,424,352.28	1,700,706.59	39.71863661	-80.78559550
24,400.00	91.00	329.84	11,269.05	11,665.68	-4,421.61	14,424,438.73	1,700,656.36	39.71887436	-80.78577340



Planning Report - Geographic

Database: DB_Dec2220_v16
 Company: Tug Hill Operating LLC
 Project: Wetzel County, West Virginia (UTM17 NAD83)
 Site: Jeffersons
 Well: Jeffersons N-10 HU (slot A)
 Wellbore: Original Hole
 Design: rev0

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well Jeffersons
 GL @ 1217.00ft
 GL @ 1217.00ft
 Grid
 Minimum Curvature
 WV Department of Environmental Protection
 PROHIBITED
 SALE OF OIL AND GAS
 JAN 26 2023

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
24,500.00	91.00	329.84	11,267.30	11,752.13	-4,471.84	14,424,525.18	1,700,606.12	39.71911211	-80.78595131
24,600.00	91.00	329.84	11,265.56	11,838.58	-4,522.07	14,424,611.63	1,700,555.89	39.71934986	-80.78612921
24,700.00	91.00	329.84	11,263.82	11,925.03	-4,572.31	14,424,698.08	1,700,505.66	39.71958761	-80.78630712
24,800.00	91.00	329.84	11,262.07	12,011.48	-4,622.54	14,424,784.53	1,700,455.42	39.71982535	-80.78648503
24,900.00	91.00	329.84	11,260.33	12,097.93	-4,672.77	14,424,870.98	1,700,405.19	39.72006310	-80.78666294
25,000.00	91.00	329.84	11,258.58	12,184.38	-4,723.00	14,424,957.43	1,700,354.96	39.72030084	-80.78684085
25,100.00	91.00	329.84	11,256.84	12,270.83	-4,773.24	14,425,043.88	1,700,304.73	39.72053859	-80.78701876
25,200.00	91.00	329.84	11,255.10	12,357.28	-4,823.47	14,425,130.33	1,700,254.49	39.72077634	-80.78719667
25,300.00	91.00	329.84	11,253.35	12,443.73	-4,873.70	14,425,216.78	1,700,204.26	39.72101408	-80.78737459
25,400.00	91.00	329.84	11,251.61	12,530.18	-4,923.93	14,425,303.23	1,700,154.03	39.72125183	-80.78755250
25,500.00	91.00	329.84	11,249.86	12,616.63	-4,974.17	14,425,389.68	1,700,103.80	39.72148957	-80.78773042
25,600.00	91.00	329.84	11,248.12	12,703.08	-5,024.40	14,425,476.13	1,700,053.56	39.72172732	-80.78790834
25,700.00	91.00	329.84	11,246.38	12,789.53	-5,074.63	14,425,562.58	1,700,003.33	39.72196506	-80.78808625
25,800.00	91.00	329.84	11,244.63	12,875.98	-5,124.87	14,425,649.03	1,699,953.10	39.72220280	-80.78826417
25,900.00	91.00	329.84	11,242.89	12,962.43	-5,175.10	14,425,735.48	1,699,902.87	39.72244055	-80.78844210
26,000.00	91.00	329.84	11,241.15	13,048.88	-5,225.33	14,425,821.93	1,699,852.63	39.72267829	-80.78862002
26,100.00	91.00	329.84	11,239.40	13,135.33	-5,275.56	14,425,908.38	1,699,802.40	39.72291604	-80.78879794
26,200.00	91.00	329.84	11,237.66	13,221.78	-5,325.80	14,425,994.83	1,699,752.17	39.72315378	-80.78897587
26,300.00	91.00	329.84	11,235.91	13,308.24	-5,376.03	14,426,081.28	1,699,701.93	39.72339152	-80.78915379
26,400.00	91.00	329.84	11,234.17	13,394.69	-5,426.26	14,426,167.73	1,699,651.70	39.72362926	-80.78933172
26,500.00	91.00	329.84	11,232.43	13,481.14	-5,476.50	14,426,254.18	1,699,601.47	39.72386701	-80.78950965
26,600.00	91.00	329.84	11,230.68	13,567.59	-5,526.73	14,426,340.63	1,699,551.24	39.72410475	-80.78968758
26,700.00	91.00	329.84	11,228.94	13,654.04	-5,576.96	14,426,427.08	1,699,501.00	39.72434249	-80.78986551
26,800.00	91.00	329.84	11,227.19	13,740.49	-5,627.19	14,426,513.53	1,699,450.77	39.72458023	-80.79004344
26,900.00	91.00	329.84	11,225.45	13,826.94	-5,677.43	14,426,599.97	1,699,400.54	39.72481797	-80.79022137
27,000.00	91.00	329.84	11,223.71	13,913.39	-5,727.66	14,426,686.42	1,699,350.31	39.72505571	-80.79039931
27,100.00	91.00	329.84	11,221.96	13,999.84	-5,777.89	14,426,772.87	1,699,300.07	39.72529345	-80.79057725
27,200.00	91.00	329.84	11,220.22	14,086.29	-5,828.13	14,426,859.32	1,699,249.84	39.72553119	-80.79075518
27,300.00	91.00	329.84	11,218.48	14,172.74	-5,878.36	14,426,945.77	1,699,199.61	39.72576893	-80.79093312
27,400.00	91.00	329.84	11,216.73	14,259.19	-5,928.59	14,427,032.22	1,699,149.37	39.72600667	-80.79111106
27,500.00	91.00	329.84	11,214.99	14,345.64	-5,978.82	14,427,118.67	1,699,099.14	39.72624441	-80.79128900
27,600.00	91.00	329.84	11,213.24	14,432.09	-6,029.06	14,427,205.12	1,699,048.91	39.72648215	-80.79146694
27,700.00	91.00	329.84	11,211.50	14,518.54	-6,079.29	14,427,291.57	1,698,998.68	39.72671989	-80.79164489
27,800.00	91.00	329.84	11,209.76	14,604.99	-6,129.52	14,427,378.02	1,698,948.44	39.72695763	-80.79182283
27,900.69	91.00	329.84	11,208.00	14,692.03	-6,180.10	14,427,465.07	1,698,897.87	39.72719700	-80.79200200

PBHL/TD 27900.69 MD 11208.00 TVD - 20" Casing

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
Jeffersons N-10HU BHL - plan hits target center - Point	0.00	0.00	11,208.00	14,692.03	-6,180.10	14,427,465.07	1,698,897.87	39.72719700	-80.79200200
Jeffersons N-10HU LP - plan misses target center by 43.28ft at 12328.00ft MD (11479.57 TVD, 1229.43 N, 1642.49 E) - Point	0.00	0.00	11,480.00	1,207.69	1,605.07	14,413,980.75	1,706,683.02	39.69011200	-80.76443900
Jeffersons N-10HU LP 5 - plan misses target center by 0.05ft at 12302.89ft MD (11480.00 TVD, 1207.71 N, 1655.11 E) - Point	0.00	0.00	11,480.00	1,207.69	1,655.07	14,413,980.75	1,706,733.02	39.69011164	-80.76426126



Planning Report - Geographic

Database:	DB_Dec2220_v16	Local Co-ordinate Reference:	Well Jeffersons N-10 HU (slot A)
Company:	Tug Hill Operating LLC	TVD Reference:	GL @ 1217.00ft
Project:	Wetzel County, West Virginia (UTM17 NAD83)	MD Reference:	GL @ 1217.00ft
Site:	Jeffersons	North Reference:	Grid
Well:	Jeffersons N-10 HU (slot A)	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	rev0		

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
27,900.69	11,208.00	20" Casing	20	24

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,200.00	3,200.00	0.00	0.00	KOP Begin 2"/100' build
3,450.00	3,449.68	2.03	10.71	Begin 5.00° tangent
7,013.88	7,000.00	59.91	315.88	Begin 2"/100' build
7,974.22	7,924.97	104.82	552.66	Begin 24.21° tangent
10,844.93	10,543.26	324.15	1,709.12	Begin 6"/100' build/turn
11,738.95	11,293.95	725.77	1,842.32	Begin 8"/100' build/turn
12,302.92	11,480.00	1,207.74	1,655.09	Begin 91.00° lateral
27,900.69	11,208.00	14,692.03	-6,180.10	PBHL/TD 27900.69 MD 11208.00 TVD

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 Office of Oil and Gas
JAN 26 2023
 WV Department of
 Environmental Protection