

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Corley N-10HU (slot J)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1254+27 @ 1281.00usft (Precision 110)
Site:	Corley Pad	MD Reference:	RKB=1254+27 @ 1281.00usft (Precision 110)
Well:	Corley N-10HU (slot J)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

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

Site	Corley Pad				
Site Position:		Northing:	14,436,832.02 usft	Latitude:	39.75286638
From:	Lat/Long	Easting:	1,706,973.98 usft	Longitude:	-80.76319015
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.15 "

Well	Corley N-10HU (slot J)					
Well Position	+N/-S	0.00 usft	Northing:	14,436,859.53 usft	Latitude:	39.75294182
	+E/-W	0.00 usft	Easting:	1,706,988.48 usft	Longitude:	-80.76313833
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	1,254.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/8/2018	-8.69	66.82	52,001.65827177

Design	Surveys Original Hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	335.60	

Survey Program	Date	11/27/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	<p style="text-align: center;">RECEIVED Office of Oil and Gas</p> <p style="font-size: 2em; text-align: center;">JUL 10 2020</p> <p style="text-align: center;">WV Department of Environmental Protection</p>
311.00	2,786.00	MWD surf (Original Hole)	MWD	MWD - Standard	
2,872.00	10,583.00	MWD int (Original Hole)	MWD	MWD - Standard	
10,673.00	22,093.00	MWD (Original Hole)	MWD	MWD - Standard	
22,141.00	22,141.00	Projection (Original Hole)	MWD	MWD - Standard	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,436,859.53	1,706,988.48	39.75294182	-80.76313833
311.00	0.22	68.62	311.00	0.22	0.56	14,436,859.75	1,706,989.03	39.75294242	-80.76313635
MWD surveys									
344.00	0.14	144.14	344.00	0.21	0.64	14,436,859.74	1,706,989.11	39.75294239	-80.76313606
437.00	0.28	130.34	437.00	-0.03	0.88	14,436,859.50	1,706,989.35	39.75294173	-80.76313521
530.00	0.50	107.43	530.00	-0.30	1.44	14,436,859.23	1,706,989.91	39.75294099	-80.76313321
623.00	0.50	162.57	622.99	-0.81	1.95	14,436,858.72	1,706,990.42	39.75293959	-80.76313141
716.00	0.41	116.65	715.99	-1.34	2.37	14,436,858.18	1,706,990.84	39.75293811	-80.76312992
810.00	0.40	106.26	809.99	-1.59	2.98	14,436,857.94	1,706,991.46	39.75293744	-80.76312774

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Corley N-10HU (slot J)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1254+27 @ 1281.00usft (Precision 110)
Site:	Corley Pad	MD Reference:	RKB=1254+27 @ 1281.00usft (Precision 110)
Well:	Corley N-10HU (slot J)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

RECEIVED
 Office of Oil and Gas
JUL 10 2020

Survey									WV Department of Environmental Protection	
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
903.00	0.42	109.89	902.99	-1.79	3.61	14,436,857.73	1,706,992.09	39.75293687	-80.76312549	
982.00	0.53	149.54	981.98	-2.21	4.07	14,436,857.32	1,706,992.55	39.75293573	-80.76312386	
1,083.00	0.98	152.91	1,082.97	-3.38	4.70	14,436,856.15	1,706,993.18	39.75293251	-80.76312163	
1,173.00	1.21	163.64	1,172.96	-4.98	5.32	14,436,854.55	1,706,993.80	39.75292812	-80.76311945	
1,262.00	1.69	137.46	1,261.93	-6.85	6.47	14,436,852.68	1,706,994.95	39.75292298	-80.76311537	
1,352.00	1.67	128.54	1,351.89	-8.64	8.39	14,436,850.89	1,706,996.87	39.75291803	-80.76310854	
1,442.00	1.92	130.13	1,441.85	-10.43	10.57	14,436,849.10	1,706,999.05	39.75291310	-80.76310081	
1,531.00	1.27	122.94	1,530.81	-11.93	12.54	14,436,847.60	1,707,001.02	39.75290898	-80.76309382	
1,621.00	0.83	103.82	1,620.80	-12.62	14.01	14,436,846.90	1,707,002.49	39.75290705	-80.76308860	
1,711.00	2.20	50.59	1,710.77	-11.68	15.98	14,436,847.85	1,707,004.45	39.75290962	-80.76308159	
1,800.00	3.55	45.78	1,799.65	-8.68	19.27	14,436,850.85	1,707,007.75	39.75291785	-80.76306984	
1,890.00	2.62	43.26	1,889.52	-5.24	22.68	14,436,854.29	1,707,011.16	39.75292728	-80.76305768	
1,979.00	2.32	39.29	1,978.44	-2.36	25.22	14,436,857.17	1,707,013.69	39.75293516	-80.76304864	
2,069.00	3.37	44.17	2,068.33	0.95	28.21	14,436,860.48	1,707,016.69	39.75294422	-80.76303794	
2,159.00	4.71	44.80	2,158.10	5.47	32.66	14,436,865.00	1,707,021.13	39.75295660	-80.76302208	
2,249.00	4.56	62.50	2,247.81	9.74	38.44	14,436,869.27	1,707,026.91	39.75296829	-80.76300148	
2,338.00	3.86	72.99	2,336.57	12.25	44.44	14,436,871.78	1,707,032.91	39.75297514	-80.76298010	
2,428.00	3.72	86.23	2,426.38	13.33	50.25	14,436,872.86	1,707,038.72	39.75297806	-80.76295942	
2,517.00	5.30	91.60	2,515.10	13.40	57.24	14,436,872.93	1,707,045.72	39.75297822	-80.76293455	
2,607.00	4.82	89.25	2,604.75	13.34	65.18	14,436,872.87	1,707,053.65	39.75297798	-80.76290631	
2,697.00	4.47	79.56	2,694.45	14.02	72.41	14,436,873.55	1,707,060.88	39.75297981	-80.76288058	
2,786.00	5.18	75.86	2,783.14	15.63	79.71	14,436,875.16	1,707,068.19	39.75298417	-80.76285457	
2,872.00	6.18	76.97	2,868.71	17.62	87.99	14,436,877.15	1,707,076.46	39.75298959	-80.76282511	
2,962.00	7.19	72.94	2,958.10	20.37	98.09	14,436,879.90	1,707,086.57	39.75299705	-80.76278913	
3,051.00	6.25	72.48	3,046.49	23.46	108.04	14,436,882.99	1,707,096.51	39.75300547	-80.76275372	
3,141.00	4.40	73.91	3,136.10	25.89	116.03	14,436,885.42	1,707,104.50	39.75301209	-80.76272527	
3,231.00	3.37	92.85	3,225.89	26.72	121.99	14,436,886.25	1,707,110.46	39.75301431	-80.76270406	
3,320.00	3.79	104.05	3,314.72	25.87	127.45	14,436,885.40	1,707,115.93	39.75301196	-80.76268462	
3,410.00	4.32	102.33	3,404.49	24.43	133.65	14,436,883.96	1,707,122.12	39.75300794	-80.76266258	
3,500.00	5.07	103.55	3,494.19	22.77	140.83	14,436,882.30	1,707,129.30	39.75300334	-80.76263706	
3,590.00	5.35	109.02	3,583.82	20.47	148.66	14,436,880.00	1,707,137.13	39.75299697	-80.76260921	
3,679.00	5.05	114.66	3,672.46	17.49	156.14	14,436,877.02	1,707,144.62	39.75298871	-80.76258262	
3,769.00	5.11	123.25	3,762.10	13.64	163.09	14,436,873.17	1,707,151.57	39.75297809	-80.76255792	
3,859.00	4.64	126.09	3,851.78	9.30	169.39	14,436,868.82	1,707,157.86	39.75296612	-80.76253557	
3,948.00	4.11	120.93	3,940.52	5.54	175.03	14,436,865.06	1,707,163.51	39.75295575	-80.76251552	
4,038.00	4.04	111.51	4,030.29	2.72	180.75	14,436,862.24	1,707,169.22	39.75294796	-80.76249521	
4,128.00	4.21	111.81	4,120.06	0.33	186.77	14,436,859.85	1,707,175.24	39.75294136	-80.76247382	
4,218.00	4.26	109.86	4,209.81	-2.04	192.98	14,436,857.49	1,707,181.45	39.75293482	-80.76245175	
4,307.00	4.76	111.61	4,298.54	-4.52	199.52	14,436,855.01	1,707,187.99	39.75292796	-80.76242850	
4,397.00	5.12	111.09	4,388.20	-7.34	206.74	14,436,852.19	1,707,195.21	39.75292016	-80.76240284	
4,487.00	5.58	109.51	4,477.81	-10.25	214.61	14,436,849.28	1,707,203.08	39.75291212	-80.76237486	
4,576.00	5.32	111.59	4,566.41	-13.21	222.52	14,436,846.32	1,707,211.00	39.75290392	-80.76234673	
4,666.00	5.50	110.04	4,656.01	-16.22	230.45	14,436,843.30	1,707,218.93	39.75289559	-80.76231854	
4,756.00	5.37	109.73	4,745.60	-19.12	238.47	14,436,840.40	1,707,226.95	39.75288757	-80.76229004	
4,845.00	4.48	106.29	4,834.27	-21.50	245.73	14,436,838.02	1,707,234.20	39.75288098	-80.76226424	
4,935.00	4.84	102.10	4,923.98	-23.29	252.81	14,436,836.24	1,707,241.29	39.75287603	-80.76223905	
5,025.00	5.86	99.26	5,013.58	-24.82	261.06	14,436,834.71	1,707,249.54	39.75287176	-80.76220972	
5,115.00	5.85	99.21	5,103.11	-26.29	270.12	14,436,833.23	1,707,258.60	39.75286764	-80.76217749	
5,204.00	6.20	101.92	5,191.62	-28.01	279.30	14,436,831.51	1,707,267.78	39.75286286	-80.76214485	
5,294.00	7.69	104.58	5,280.96	-30.53	289.89	14,436,829.00	1,707,278.36	39.75285586	-80.76210722	
5,384.00	8.69	108.13	5,370.04	-34.16	302.18	14,436,825.36	1,707,290.65	39.75284580	-80.76206352	
5,474.00	10.45	119.98	5,458.79	-40.36	315.71	14,436,819.17	1,707,304.18	39.75282868	-80.76201543	
5,563.00	11.93	134.27	5,546.12	-50.82	329.29	14,436,808.71	1,707,317.77	39.75279987	-80.76196721	
5,653.00	13.65	138.31	5,633.88	-65.24	343.02	14,436,794.29	1,707,331.49	39.75276015	-80.76191851	
5,743.00	17.64	139.96	5,720.53	-83.62	358.86	14,436,775.91	1,707,347.33	39.75270956	-80.76186232	



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Corley N-10HU (slot J)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1254+27 @ 1281.00usft (Precision 110)
Site:	Corley Pad	MD Reference:	RKB=1254+27 @ 1281.00usft (Precision 110)
Well:	Corley N-10HU (slot J)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

RECEIVED
Office of Oil and Gas

JUL 10 2020

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5.832.00	22.43	142.06	5,804.12	-107.35	377.98	14,436,752.18	1,707,366.46	39.75264426	-80.76179449
5.922.00	23.89	143.67	5,886.87	-135.57	399.34	14,436,723.95	1,707,387.81	39.75256659	-80.76171878
6.012.00	25.05	143.16	5,968.78	-165.51	421.56	14,436,694.02	1,707,410.04	39.75248423	-80.76164000
6.101.00	25.45	142.16	6,049.28	-195.69	444.59	14,436,663.84	1,707,433.06	39.75240117	-80.76155835
6.191.00	26.35	141.19	6,130.24	-226.52	468.97	14,436,633.01	1,707,457.45	39.75231631	-80.76147190
6.281.00	25.98	138.82	6,211.02	-256.92	494.47	14,436,602.60	1,707,482.94	39.75223263	-80.76138146
6.371.00	25.29	135.79	6,292.16	-285.54	520.85	14,436,573.99	1,707,509.33	39.75215385	-80.76128786
6.460.00	24.64	134.50	6,372.85	-312.17	547.34	14,436,547.36	1,707,535.82	39.75208052	-80.76119387
6.550.00	24.25	133.62	6,454.78	-338.07	574.11	14,436,521.46	1,707,562.58	39.75200919	-80.76109890
6.639.00	23.37	134.26	6,536.20	-363.00	599.98	14,436,496.53	1,707,588.45	39.75194054	-80.76100708
6.729.00	24.02	135.06	6,618.61	-388.43	625.70	14,436,471.10	1,707,614.18	39.75187053	-80.76091580
6.819.00	24.53	134.15	6,700.66	-414.40	652.05	14,436,445.12	1,707,640.52	39.75179899	-80.76082231
6.908.00	25.06	133.69	6,781.45	-440.29	678.93	14,436,419.23	1,707,667.41	39.75172769	-80.76072690
7.000.00	25.23	133.96	6,864.73	-467.36	707.13	14,436,392.17	1,707,695.61	39.75165315	-80.76062682
7.089.00	24.13	133.52	6,945.60	-493.06	733.98	14,436,366.47	1,707,722.46	39.75158238	-80.76053155
7.179.00	24.14	134.27	7,027.74	-518.57	760.50	14,436,340.96	1,707,748.97	39.75151212	-80.76043744
7.268.00	24.41	135.39	7,108.87	-544.37	786.45	14,436,315.16	1,707,774.92	39.75144109	-80.76034537
7.358.00	24.22	137.88	7,190.89	-571.30	811.89	14,436,288.23	1,707,800.36	39.75136693	-80.76025511
7.448.00	23.86	140.10	7,273.08	-598.96	835.95	14,436,260.57	1,707,824.42	39.75129080	-80.76016977
7.537.00	23.59	141.63	7,354.56	-626.73	858.55	14,436,232.80	1,707,847.02	39.75121436	-80.76008963
7.627.00	22.21	139.19	7,437.47	-653.73	880.84	14,436,205.80	1,707,869.32	39.75114006	-80.76001055
7.717.00	22.05	138.74	7,520.84	-679.30	903.10	14,436,180.23	1,707,891.58	39.75106966	-80.75993161
7.806.00	23.38	137.57	7,602.93	-704.89	926.03	14,436,154.63	1,707,914.51	39.75099921	-80.75985026
7.896.00	25.75	136.70	7,684.78	-732.31	951.49	14,436,127.22	1,707,939.97	39.75092374	-80.75975994
7.986.00	26.11	134.98	7,765.72	-760.53	978.91	14,436,098.99	1,707,967.39	39.75084602	-80.75966266
8.075.00	26.50	134.18	7,845.51	-788.22	1,007.00	14,436,071.31	1,707,995.48	39.75076979	-80.75956298
8.165.00	26.55	133.89	7,926.03	-816.15	1,035.90	14,436,043.37	1,708,024.37	39.75069285	-80.75946044
8.254.00	25.66	133.59	8,005.95	-843.23	1,064.19	14,436,016.30	1,708,052.67	39.75061828	-80.75936004
8.344.00	25.52	132.85	8,087.12	-869.85	1,092.52	14,435,989.68	1,708,080.99	39.75054496	-80.75925951
8.434.00	24.76	133.35	8,168.60	-895.97	1,120.44	14,435,963.55	1,708,108.91	39.75047302	-80.75916043
8.523.00	25.23	135.50	8,249.26	-922.30	1,147.29	14,435,937.23	1,708,135.76	39.75040053	-80.75906516
8.613.00	24.99	134.88	8,330.76	-949.39	1,174.20	14,435,910.14	1,708,162.68	39.75032592	-80.75896966
8.702.00	23.96	137.87	8,411.76	-976.06	1,199.65	14,435,883.47	1,708,188.12	39.75025249	-80.75887938
8.792.00	23.05	141.86	8,494.30	-1,003.47	1,222.79	14,435,856.05	1,708,211.26	39.75017703	-80.75879731
8.881.00	23.80	142.67	8,575.96	-1,031.46	1,244.44	14,435,828.07	1,708,232.91	39.75010002	-80.75872055
8.971.00	25.18	142.80	8,657.87	-1,061.15	1,267.03	14,435,798.38	1,708,255.50	39.75001831	-80.75864047
9.061.00	25.25	141.97	8,739.29	-1,091.52	1,290.43	14,435,768.01	1,708,278.90	39.74993474	-80.75855750
9.150.00	26.04	141.49	8,819.52	-1,121.76	1,314.29	14,435,737.77	1,708,302.76	39.74985151	-80.75847291
9.239.00	27.62	140.61	8,898.94	-1,152.99	1,339.55	14,435,706.54	1,708,328.02	39.74976555	-80.75838335
9.329.00	27.57	137.94	8,978.70	-1,184.58	1,366.74	14,435,674.95	1,708,355.21	39.74967860	-80.75828690
9.419.00	27.37	136.90	9,058.56	-1,215.15	1,394.83	14,435,644.38	1,708,383.30	39.74959444	-80.75818727
9.508.00	27.91	135.32	9,137.40	-1,244.90	1,423.45	14,435,614.63	1,708,411.93	39.74951253	-80.75808571
9.598.00	26.81	133.87	9,217.33	-1,273.94	1,452.90	14,435,585.59	1,708,441.37	39.74943255	-80.75798123
9.688.00	25.87	132.73	9,297.99	-1,301.33	1,481.95	14,435,558.20	1,708,470.43	39.74935711	-80.75787812
9.777.00	25.37	132.94	9,378.24	-1,327.50	1,510.17	14,435,532.03	1,708,498.65	39.74928505	-80.75777797
9.867.00	25.61	132.73	9,459.48	-1,353.83	1,538.58	14,435,505.70	1,708,527.05	39.74921252	-80.75767717
9.956.00	26.01	132.73	9,539.60	-1,380.12	1,567.04	14,435,479.41	1,708,555.51	39.74914010	-80.75757616
10.046.00	24.67	134.20	9,620.94	-1,406.61	1,595.00	14,435,452.92	1,708,583.48	39.74906715	-80.75747693
10.135.00	23.68	134.66	9,702.13	-1,432.12	1,621.03	14,435,427.41	1,708,609.51	39.74899689	-80.75738457
10.225.00	23.76	134.80	9,784.53	-1,457.60	1,646.75	14,435,401.93	1,708,635.23	39.74892673	-80.75729331
10.314.00	23.31	134.31	9,866.13	-1,482.53	1,672.07	14,435,376.99	1,708,660.55	39.74885806	-80.75720346
10.404.00	23.94	135.07	9,948.58	-1,507.90	1,697.71	14,435,351.63	1,708,686.19	39.74878821	-80.75711249
10.494.00	23.56	135.61	10,030.96	-1,533.68	1,723.19	14,435,325.85	1,708,711.67	39.74871722	-80.75702209
10.583.00	23.74	136.28	10,112.49	-1,559.34	1,748.02	14,435,300.19	1,708,736.49	39.74864657	-80.75693402
10.673.00	23.21	137.27	10,195.04	-1,585.46	1,772.57	14,435,274.07	1,708,761.05	39.74857465	-80.75684691

WV Department of Environmental Protection



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Corley N-10HU (slot J)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1254+27 @ 1281.00usft (Precision 110)
Site:	Corley Pad	MD Reference:	RKB=1254+27 @ 1281.00usft (Precision 110)
Well:	Corley N-10HU (slot J)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

RECEIVED
Office of Oil and Gas

JUL 10 2020

Survey										WV Department of Environmental Protection	
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude		
10,740.00	22.90	136.97	10,256.69	-1,604.69	1,790.42	14,435,254.84	1,708,778.90	39.74852171	-80.75678357		
10,830.00	19.96	136.97	10,340.45	-1,628.72	1,812.86	14,435,230.81	1,708,801.34	39.74845554	-80.75670399		
10,920.00	15.08	130.82	10,426.26	-1,647.62	1,832.22	14,435,211.91	1,708,820.69	39.74840350	-80.75663531		
11,009.00	9.63	125.98	10,513.17	-1,659.57	1,847.01	14,435,199.96	1,708,835.49	39.74837057	-80.75658278		
11,098.00	4.53	99.53	10,601.48	-1,664.53	1,856.51	14,435,195.00	1,708,844.99	39.74835688	-80.75654903		
11,188.00	6.20	49.26	10,691.13	-1,661.94	1,863.70	14,435,197.58	1,708,852.18	39.74836393	-80.75652342		
11,278.00	9.45	6.19	10,780.35	-1,651.42	1,868.19	14,435,208.11	1,708,856.66	39.74839281	-80.75650737		
11,367.00	13.36	341.49	10,867.63	-1,634.38	1,865.71	14,435,225.14	1,708,854.18	39.74843960	-80.75651602		
11,457.00	19.82	333.85	10,953.85	-1,610.80	1,855.67	14,435,248.73	1,708,844.15	39.74850444	-80.75655151		
11,547.00	25.89	328.04	11,036.75	-1,580.40	1,838.53	14,435,279.13	1,708,827.00	39.74858805	-80.75661220		
11,636.00	33.05	329.10	11,114.19	-1,543.04	1,815.75	14,435,316.49	1,708,804.22	39.74869082	-80.75669288		
11,725.00	39.47	330.24	11,185.91	-1,497.61	1,789.22	14,435,361.91	1,708,777.69	39.74881578	-80.75678684		
11,815.00	45.41	329.80	11,252.30	-1,445.04	1,758.87	14,435,414.49	1,708,747.35	39.74896040	-80.75689429		
11,905.00	48.88	325.67	11,313.52	-1,389.31	1,723.61	14,435,470.21	1,708,712.09	39.74911369	-80.75701919		
11,994.00	53.80	319.87	11,369.13	-1,334.11	1,681.52	14,435,525.42	1,708,669.99	39.74926560	-80.75716844		
12,084.00	61.63	319.43	11,417.17	-1,276.18	1,632.28	14,435,583.35	1,708,620.76	39.74942507	-80.75734304		
12,173.00	72.57	320.49	11,451.75	-1,213.49	1,579.64	14,435,646.04	1,708,568.12	39.74959763	-80.75752971		
12,263.00	84.53	322.51	11,469.58	-1,144.57	1,524.86	14,435,714.96	1,708,513.34	39.74978732	-80.75772395		
12,352.00	90.24	330.33	11,473.65	-1,070.58	1,475.76	14,435,788.95	1,708,464.23	39.74999088	-80.75789795		
12,442.00	92.57	333.32	11,471.44	-991.28	1,433.28	14,435,868.25	1,708,421.76	39.75020897	-80.75804830		
12,531.00	92.57	333.23	11,467.45	-911.87	1,393.30	14,435,947.66	1,708,381.77	39.75042735	-80.75818980		
12,621.00	92.57	333.14	11,463.41	-831.62	1,352.74	14,436,027.90	1,708,341.21	39.75064802	-80.75833333		
12,711.00	92.48	333.32	11,459.45	-751.35	1,312.24	14,436,108.18	1,708,300.71	39.75086878	-80.75847664		
12,800.00	91.03	332.79	11,456.72	-672.05	1,271.93	14,436,187.48	1,708,260.41	39.75108686	-80.75861930		
12,890.00	90.59	332.09	11,455.45	-592.27	1,230.29	14,436,267.26	1,708,218.77	39.75130626	-80.75876667		
12,979.00	90.42	331.03	11,454.67	-514.02	1,187.91	14,436,345.51	1,708,176.39	39.75152148	-80.75891671		
13,069.00	92.00	333.67	11,452.76	-434.32	1,146.16	14,436,425.21	1,708,134.63	39.75174066	-80.75906450		
13,158.00	91.21	332.35	11,450.27	-355.05	1,105.78	14,436,504.48	1,708,094.26	39.75195866	-80.75920739		
13,248.00	91.30	331.38	11,448.30	-275.70	1,063.36	14,436,583.82	1,708,051.83	39.75217688	-80.75935759		
13,338.00	91.56	331.03	11,446.05	-196.86	1,020.02	14,436,662.67	1,708,008.49	39.75239373	-80.75951103		
13,427.00	91.25	330.86	11,443.87	-119.08	976.81	14,436,740.45	1,707,965.28	39.75260765	-80.75966402		
13,517.00	91.47	331.03	11,441.74	-40.43	933.11	14,436,819.10	1,707,921.59	39.75282397	-80.75981874		
13,606.00	91.47	331.03	11,439.45	37.41	890.02	14,436,896.94	1,707,878.49	39.75303805	-80.75997132		
13,696.00	91.52	330.77	11,437.11	116.02	846.26	14,436,975.55	1,707,834.74	39.75325427	-80.76012625		
13,786.00	91.43	330.24	11,434.79	194.33	801.97	14,437,053.86	1,707,790.44	39.75346965	-80.76028311		
13,875.00	91.65	329.89	11,432.40	271.43	757.57	14,437,130.96	1,707,746.05	39.75368171	-80.76044034		
13,965.00	91.82	329.89	11,429.67	349.25	712.44	14,437,208.78	1,707,700.92	39.75389576	-80.76060017		
14,054.00	90.29	330.07	11,428.03	426.30	667.92	14,437,285.82	1,707,656.40	39.75410768	-80.76075783		
14,144.00	90.37	329.98	11,427.51	504.26	622.96	14,437,363.78	1,707,611.43	39.75432211	-80.76091708		
14,234.00	90.33	329.71	11,426.97	582.07	577.75	14,437,441.60	1,707,566.22	39.75453615	-80.76107720		
14,323.00	90.37	329.45	11,426.42	658.82	532.69	14,437,518.35	1,707,521.16	39.75474725	-80.76123681		
14,413.00	90.68	329.36	11,425.60	736.29	486.88	14,437,595.82	1,707,475.36	39.75496033	-80.76139905		
14,503.00	90.77	328.48	11,424.46	813.36	440.42	14,437,672.89	1,707,428.90	39.75517234	-80.76156362		
14,592.00	90.37	329.36	11,423.57	889.58	394.48	14,437,749.11	1,707,382.96	39.75538199	-80.76172636		
14,682.00	90.95	330.95	11,422.54	967.64	349.70	14,437,827.17	1,707,338.17	39.75559668	-80.76188497		
14,772.00	91.16	334.81	11,420.88	1,047.71	308.69	14,437,907.24	1,707,297.16	39.75581689	-80.76203014		
14,861.00	92.04	336.04	11,418.39	1,128.62	271.69	14,437,988.15	1,707,260.16	39.75603935	-80.76216102		
14,951.00	92.00	332.35	11,415.22	1,209.58	232.54	14,438,069.11	1,707,221.02	39.75626198	-80.76229954		
15,041.00	92.13	332.44	11,411.98	1,289.28	190.86	14,438,148.81	1,707,179.34	39.75648117	-80.76244708		
15,130.00	91.91	329.89	11,408.84	1,367.19	147.97	14,438,226.72	1,707,136.45	39.75669544	-80.76259897		
15,220.00	91.65	329.71	11,406.04	1,444.94	102.72	14,438,304.47	1,707,091.20	39.75690929	-80.76275924		
15,310.00	91.65	329.01	11,403.45	1,522.34	56.87	14,438,381.87	1,707,045.35	39.75712219	-80.76292165		
15,399.00	91.82	328.84	11,400.76	1,598.53	10.95	14,438,458.06	1,706,999.43	39.75733177	-80.76308431		
15,489.00	92.09	328.66	11,397.69	1,675.43	-35.71	14,438,534.96	1,706,952.77	39.75754329	-80.76324962		
15,579.00	90.33	328.31	11,395.79	1,752.13	-82.74	14,438,611.66	1,706,905.74	39.75775429	-80.76341625		



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Corley N-10HU (slot J)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1254+27 @ 1281.00usft (Precision 110)
Site:	Corley Pad	MD Reference:	RKB=1254+27 @ 1281.00usft (Precision 110)
Well:	Corley N-10HU (slot J)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

RECEIVED
Office of Oil and Gas

JUL 1 0 2020

Survey										WV Department of Environmental Protection
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
15,668.00	90.33	328.48	11,395.27	1,827.93	-129.38	14,438,687.46	1,706,859.09	39.75796279	-80.76358150	
15,758.00	90.37	328.04	11,394.72	1,904.47	-176.73	14,438,764.00	1,706,811.75	39.75817333	-80.76374924	
15,848.00	90.29	327.52	11,394.21	1,980.61	-224.71	14,438,840.14	1,706,763.77	39.75838277	-80.76391927	
15,937.00	89.89	327.78	11,394.07	2,055.80	-272.33	14,438,915.33	1,706,716.14	39.75858960	-80.76408802	
16,027.00	91.08	329.19	11,393.30	2,132.52	-319.37	14,438,992.04	1,706,669.10	39.75880063	-80.76425469	
16,117.00	91.21	327.96	11,391.51	2,209.30	-366.29	14,439,068.83	1,706,622.19	39.75901184	-80.76442090	
16,206.00	91.30	328.48	11,389.56	2,284.94	-413.15	14,439,144.47	1,706,575.33	39.75921990	-80.76458694	
16,296.00	92.53	330.86	11,386.55	2,362.57	-458.57	14,439,222.10	1,706,529.91	39.75943343	-80.76474783	
16,385.00	92.53	330.51	11,382.62	2,440.10	-502.10	14,439,299.62	1,706,486.37	39.75964665	-80.76490201	
16,475.00	92.31	330.24	11,378.82	2,518.26	-546.55	14,439,377.79	1,706,441.92	39.75986164	-80.76505944	
16,564.00	91.47	331.03	11,375.88	2,595.78	-590.17	14,439,455.31	1,706,398.31	39.76007485	-80.76521392	
16,654.00	91.25	330.51	11,373.75	2,674.30	-634.11	14,439,533.83	1,706,354.37	39.76029079	-80.76536953	
16,744.00	91.34	329.98	11,371.71	2,752.41	-678.76	14,439,611.94	1,706,309.72	39.76050564	-80.76552770	
16,833.00	91.30	329.19	11,369.66	2,829.14	-723.80	14,439,688.67	1,706,264.67	39.76071669	-80.76568727	
16,923.00	91.43	329.80	11,367.52	2,906.66	-769.48	14,439,766.19	1,706,219.00	39.76092991	-80.76584907	
17,013.00	91.38	329.54	11,365.31	2,984.32	-814.91	14,439,843.85	1,706,173.56	39.76114350	-80.76601002	
17,102.00	91.82	329.54	11,362.83	3,061.01	-860.01	14,439,920.54	1,706,128.46	39.76135443	-80.76616979	
17,192.00	90.15	330.07	11,361.28	3,138.78	-905.27	14,439,998.31	1,706,083.21	39.76156834	-80.76633011	
17,281.00	89.58	329.71	11,361.49	3,215.77	-949.91	14,440,075.30	1,706,038.56	39.76178010	-80.76648827	
17,371.00	89.63	329.63	11,362.11	3,293.45	-995.36	14,440,152.98	1,705,993.11	39.76199376	-80.76664927	
17,460.00	90.11	331.30	11,362.31	3,370.88	-1,039.23	14,440,230.41	1,705,949.24	39.76220672	-80.76680466	
17,550.00	89.85	330.77	11,362.34	3,449.63	-1,082.82	14,440,309.16	1,705,905.66	39.76242328	-80.76695903	
17,639.00	90.33	332.00	11,362.20	3,527.75	-1,125.44	14,440,387.28	1,705,863.03	39.76263814	-80.76710997	
17,729.00	90.29	331.82	11,361.72	3,607.15	-1,167.82	14,440,466.68	1,705,820.66	39.76285650	-80.76726004	
17,818.00	90.90	331.82	11,360.79	3,685.60	-1,209.84	14,440,545.13	1,705,778.63	39.76307223	-80.76740886	
17,908.00	90.86	331.30	11,359.41	3,764.73	-1,252.70	14,440,624.26	1,705,735.77	39.76328985	-80.76756064	
17,997.00	90.55	330.68	11,358.32	3,842.55	-1,295.86	14,440,702.08	1,705,692.62	39.76350389	-80.76771350	
18,087.00	91.08	331.30	11,357.04	3,921.25	-1,339.50	14,440,780.78	1,705,648.97	39.76372033	-80.76786807	
18,176.00	90.46	331.47	11,355.84	3,999.38	-1,382.12	14,440,858.90	1,705,606.35	39.76393518	-80.76801901	
18,266.00	91.34	331.65	11,354.43	4,078.50	-1,424.98	14,440,938.03	1,705,563.50	39.76415279	-80.76817079	
18,356.00	91.38	331.21	11,352.29	4,157.52	-1,468.00	14,441,017.05	1,705,520.47	39.76437010	-80.76832318	
18,445.00	91.03	330.95	11,350.42	4,235.41	-1,511.03	14,441,094.93	1,705,477.44	39.76458430	-80.76847559	
18,535.00	90.68	331.21	11,349.08	4,314.17	-1,554.55	14,441,173.70	1,705,433.92	39.76480093	-80.76862972	
18,624.00	90.24	331.56	11,348.36	4,392.30	-1,597.18	14,441,251.83	1,705,391.30	39.76501579	-80.76878068	
18,714.00	90.20	331.03	11,348.02	4,471.24	-1,640.40	14,441,330.77	1,705,348.07	39.76523288	-80.76893378	
18,803.00	90.33	331.82	11,347.60	4,549.40	-1,682.97	14,441,408.92	1,705,305.50	39.76544783	-80.76908455	
18,893.00	90.55	331.82	11,346.91	4,628.73	-1,725.47	14,441,488.25	1,705,263.00	39.76566599	-80.76923506	
18,983.00	90.51	330.68	11,346.08	4,707.63	-1,768.76	14,441,567.16	1,705,219.72	39.76588298	-80.76938838	
19,072.00	90.81	330.51	11,345.05	4,785.16	-1,812.45	14,441,644.68	1,705,176.02	39.76609620	-80.76954316	
19,161.00	91.25	329.28	11,343.45	4,862.14	-1,857.08	14,441,721.66	1,705,131.39	39.76630793	-80.76970129	
19,251.00	90.68	328.31	11,341.94	4,939.10	-1,903.71	14,441,798.63	1,705,084.77	39.76651963	-80.76986650	
19,341.00	90.68	328.57	11,340.87	5,015.79	-1,950.81	14,441,875.31	1,705,037.67	39.76673056	-80.77003342	
19,430.00	90.64	328.13	11,339.85	5,091.54	-1,997.51	14,441,951.07	1,704,990.97	39.76693894	-80.77019891	
19,520.00	92.18	327.25	11,337.63	5,167.58	-2,045.59	14,442,027.11	1,704,942.88	39.76714810	-80.77036934	
19,610.00	92.40	327.17	11,334.04	5,243.18	-2,094.30	14,442,102.71	1,704,894.18	39.76735606	-80.77054197	
19,699.00	92.53	327.25	11,330.21	5,317.93	-2,142.45	14,442,177.46	1,704,846.03	39.76756168	-80.77071266	
19,788.00	91.16	328.22	11,327.34	5,393.15	-2,189.93	14,442,252.68	1,704,798.54	39.76776858	-80.77088096	
19,878.00	91.08	328.84	11,325.58	5,469.89	-2,236.91	14,442,329.42	1,704,751.56	39.76797968	-80.77104743	
19,968.00	90.95	330.86	11,323.99	5,547.70	-2,282.10	14,442,407.23	1,704,706.37	39.76819368	-80.77120756	
20,058.00	90.68	332.24	11,322.71	5,626.82	-2,324.97	14,442,486.35	1,704,663.50	39.76841127	-80.77135940	
20,151.00	92.09	331.18	11,320.46	5,708.69	-2,369.04	14,442,568.22	1,704,619.44	39.76863640	-80.77151546	
20,241.00	92.04	331.10	11,317.22	5,787.46	-2,412.45	14,442,646.99	1,704,576.03	39.76885303	-80.77166924	
20,331.00	91.03	328.99	11,314.81	5,865.40	-2,457.37	14,442,724.93	1,704,531.11	39.76906740	-80.77182839	
20,420.00	90.24	329.95	11,313.82	5,942.06	-2,502.58	14,442,801.59	1,704,485.90	39.76927823	-80.77198858	
20,510.00	90.42	329.60	11,313.30	6,019.82	-2,547.88	14,442,879.35	1,704,440.60	39.76949211	-80.77214911	



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Corley N-10HU (slot J)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1254+27 @ 1281.00usft (Precision 110)
Site:	Corley Pad	MD Reference:	RKB=1254+27 @ 1281.00usft (Precision 110)
Well:	Corley N-10HU (slot J)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

RECEIVED
Office of Oil and Gas

JUL 10 2020

Survey								WV Department of Environmental Protection	
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
20,599.00	90.51	330.30	11,312.58	6,096.86	-2,592.45	14,442,956.38	1,704,396.03	39.76970398	-80.77230701
20,689.00	90.15	329.51	11,312.06	6,174.72	-2,637.57	14,443,034.25	1,704,350.90	39.76991814	-80.77246691
20,779.00	90.24	329.34	11,311.75	6,252.21	-2,683.35	14,443,111.74	1,704,305.12	39.77013126	-80.77262913
20,868.00	90.29	329.78	11,311.34	6,328.94	-2,728.44	14,443,188.47	1,704,260.03	39.77034230	-80.77278891
20,958.00	90.64	329.78	11,310.61	6,406.71	-2,773.74	14,443,266.23	1,704,214.73	39.77055618	-80.77294941
21,047.00	90.55	329.51	11,309.69	6,483.50	-2,818.71	14,443,343.03	1,704,169.76	39.77076739	-80.77310878
21,137.00	90.64	329.25	11,308.75	6,560.95	-2,864.55	14,443,420.48	1,704,123.92	39.77098040	-80.77327121
21,227.00	90.33	329.34	11,307.99	6,638.33	-2,910.51	14,443,497.86	1,704,077.97	39.77119323	-80.77343406
21,316.00	89.67	329.51	11,307.99	6,714.95	-2,955.78	14,443,574.48	1,704,032.70	39.77140398	-80.77359449
21,406.00	89.67	329.78	11,308.51	6,792.61	-3,001.26	14,443,652.14	1,703,987.22	39.77161757	-80.77375565
21,496.00	90.33	329.69	11,308.51	6,870.35	-3,046.62	14,443,729.87	1,703,941.86	39.77183136	-80.77391639
21,585.00	90.24	329.16	11,308.07	6,946.97	-3,091.89	14,443,806.50	1,703,896.59	39.77204211	-80.77407681
21,675.00	91.08	330.39	11,307.03	7,024.73	-3,137.19	14,443,884.26	1,703,851.28	39.77225596	-80.77423734
21,765.00	91.43	332.41	11,305.06	7,103.72	-3,180.26	14,443,963.25	1,703,808.21	39.77247321	-80.77438992
21,854.00	91.38	331.71	11,302.88	7,182.32	-3,221.95	14,444,041.85	1,703,766.53	39.77268936	-80.77453758
21,944.00	91.30	330.92	11,300.77	7,261.26	-3,265.14	14,444,120.79	1,703,723.34	39.77290642	-80.77469058
22,034.00	90.99	330.74	11,298.97	7,339.83	-3,308.99	14,444,199.36	1,703,679.48	39.77312250	-80.77484596
22,093.00	90.77	330.66	11,298.07	7,391.27	-3,337.86	14,444,250.80	1,703,650.61	39.77326399	-80.77494825
Survey @ 22093.00 MD 11298.17 TVD									
22,141.00	90.77	330.66	11,297.42	7,433.11	-3,361.38	14,444,292.64	1,703,627.09	39.77337905	-80.77503157
Survey projected to 22141.00 MD 11297.42 TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
311.00	311.00	0.22	0.56	MWD surveys
22,093.00	11,298.07	7,391.27	-3,337.86	Survey @ 22093.00 MD 11298.17 TVD
22,141.00	11,297.42	7,433.11	-3,361.38	Survey projected to 22141.00 MD 11297.42 TVD