

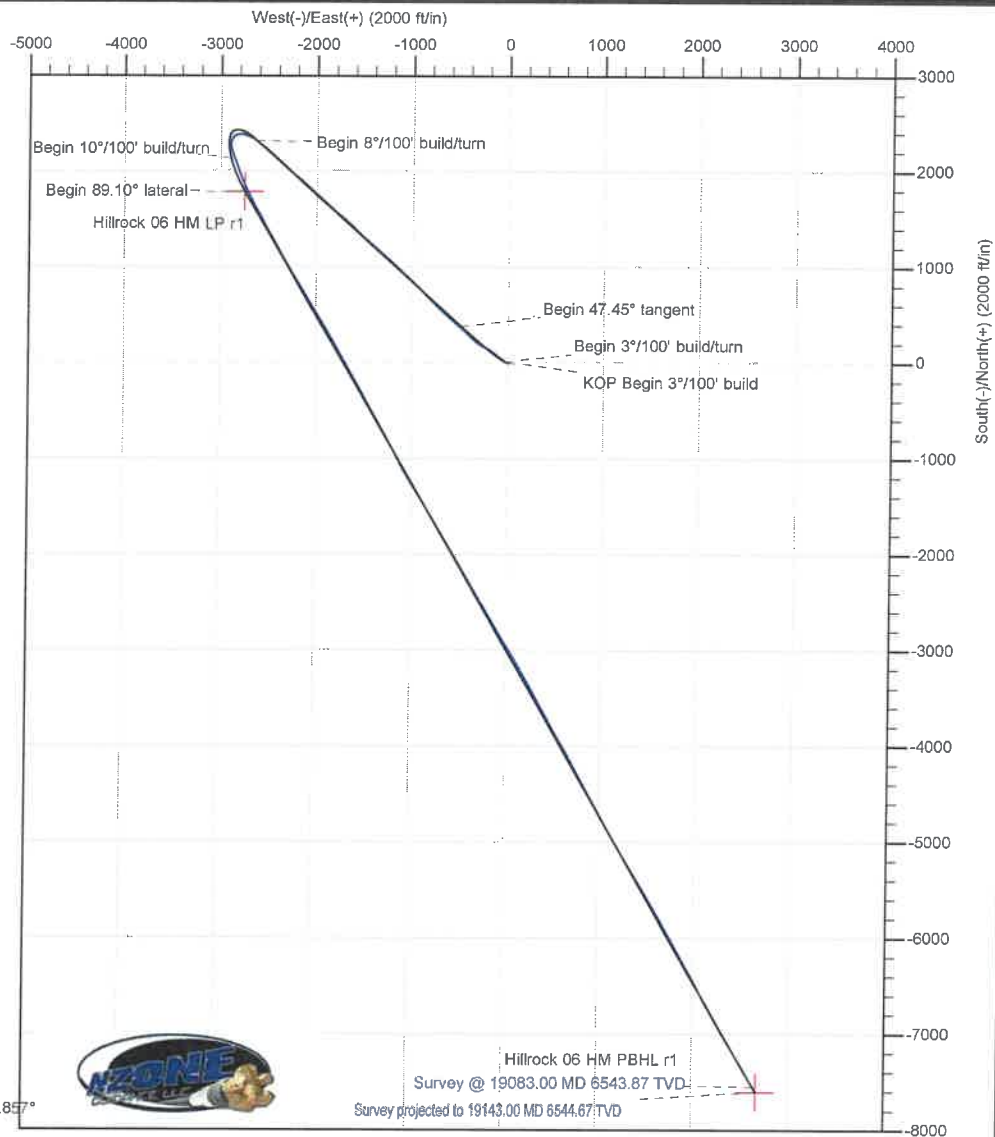
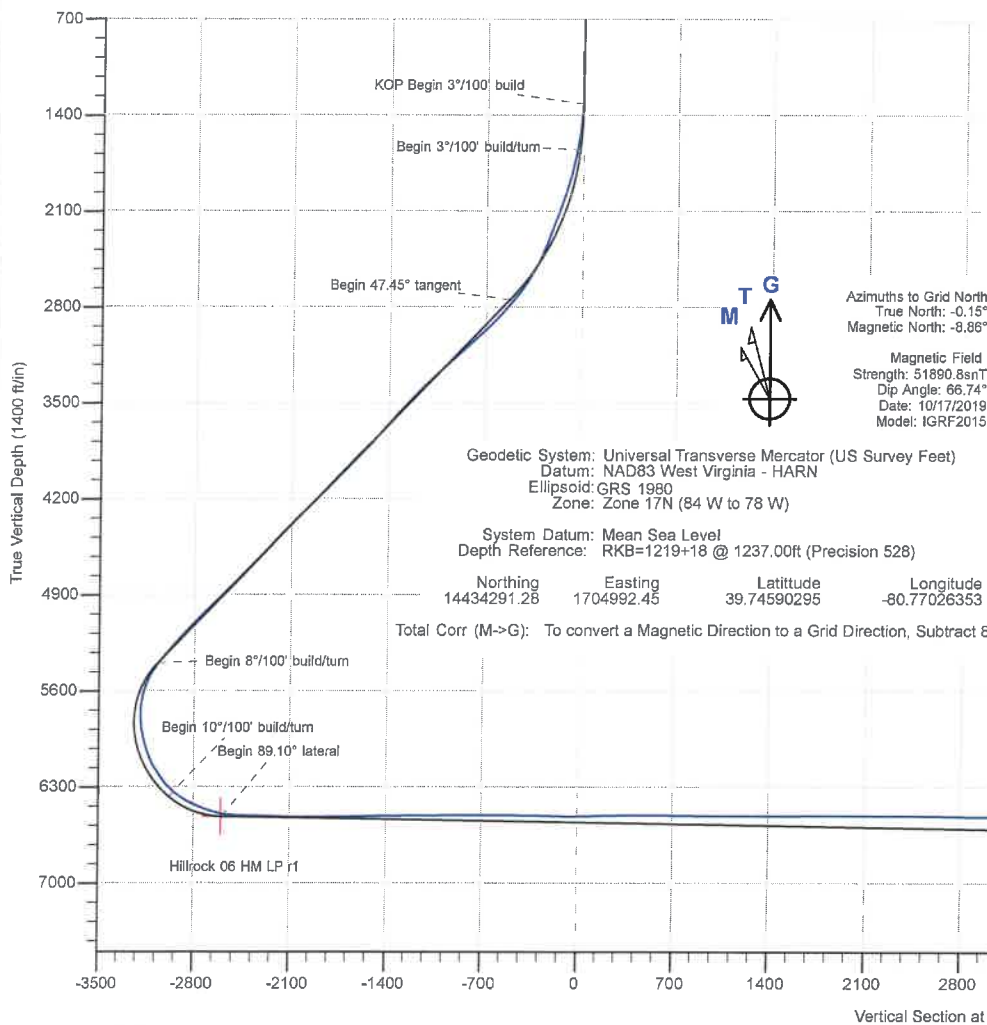


Well: Hillrock 06 HM (I)
 Site: Hillrock/Simms
 Project: Marshall County, West Virginia
 Design: rev1
 Rig: Precision 528
 SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.000	0.00	
2	1318.00	0.00	0.000	1318.00	0.00	0.00	0.00	0.000	0.00	KOP Begin 3°/100' build
3	1651.33	10.00	293.250	1649.64	11.45	-26.66	3.00	293.250	-19.64	Begin 3°/100' build/turn
4	2921.29	47.45	312.221	2745.04	383.11	-491.64	3.00	22.838	-524.43	Begin 47.45° tangent
5	6837.82	47.45	312.221	5393.59	2321.93	-2628.32	0.00	0.000	-3061.93	Begin 8°/100' build/turn
6	7987.36	50.00	166.020	6371.22	2137.88	-2895.50	8.00	-154.761	-2976.86	Begin 10°/100' build/turn
7	8404.60	89.10	150.020	6515.00	1786.45	-2745.99	10.00	-24.463	-2595.73	Begin 89.10° lateral
8	19247.30	89.10	150.020	6685.00	-7604.35	2671.39	0.00	0.000	8059.93	PBHL/TD 19247.29 MD/6685.00 TVD

ANNOTATIONS SURVEYS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Annotation
220.00	0.41	204.360	220.00	-0.72	-0.32	0.57	MWD surveys
19083.00	89.23	148.020	6543.87	-7551.88	2640.60	8000.03	Survey @ 19083.00 MD 6543.87 TVD
19143.00	89.23	148.020	6544.67	-7602.57	2672.38	8058.57	Survey projected to 19143.00 MD 6544.67 TVD



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Hillrock 06 HM (I)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Site:	Hillrock/Simms	MD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Well:	Hillrock 06 HM (I)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_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	Hillrock/Simms				
Site Position:		Northing:	14,434,279.29 usft	Latitude:	39.74587001
From:	Lat/Long	Easting:	1,704,992.60 usft	Longitude:	-80.77026312
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.147 °

Well	Hillrock 06 HM (I)					
Well Position	+N/-S	0.00 ft	Northing:	14,434,291.28 usft	Latitude:	39.74590295
	+E/-W	0.00 ft	Easting:	1,704,992.45 usft	Longitude:	-80.77026353
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft	Ground Level:	1,219.00 ft	

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2015	10/17/2019	(°)	(°)	(nT)
			-8.711	66.737	51,890.83999937

Design	Surveys Original Hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	160.640	

Survey Program	Date	11/4/2019			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
220.00	930.00	MWD surf (Original Hole)	MWD	MWD - Standard	
980.00	2,782.00	MWD int (Original Hole)	MWD	MWD - Standard	
2,876.00	19,083.00	MWD (Original Hole)	MWD	MWD - Standard	
19,143.00	19,143.00	Projection (Original Hole)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
220.00	0.41	204.360	220.00	-0.72	-0.32	0.57	0.19	0.19	0.00	
MWD surveys										
248.00	0.81	186.220	248.00	-1.01	-0.39	0.82	1.57	1.43	-64.79	
278.00	0.30	182.120	278.00	-1.29	-0.41	1.08	1.70	-1.70	-13.67	
309.00	0.27	187.170	308.99	-1.45	-0.43	1.23	0.13	-0.10	16.29	
339.00	0.23	126.070	338.99	-1.55	-0.39	1.34	0.85	-0.13	-203.67	
370.00	0.62	121.930	369.99	-1.68	-0.19	1.52	1.26	1.26	-13.35	

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Well:	Hillrock 06 HM (I)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
400.00	0.18	154.370	399.99	-1.81	-0.03	1.69	1.59	-1.47	108.13
431.00	0.11	186.000	430.99	-1.88	-0.02	1.77	0.33	-0.23	102.03
521.00	0.28	164.510	520.99	-2.18	0.03	2.07	0.20	0.19	-23.88
612.00	0.12	204.540	611.99	-2.48	0.05	2.36	0.22	-0.18	43.99
703.00	0.09	189.030	702.99	-2.64	0.00	2.49	0.05	-0.03	-17.04
793.00	0.11	237.020	792.99	-2.75	-0.08	2.57	0.09	0.02	53.32
888.00	0.11	77.610	887.99	-2.78	-0.07	2.60	0.23	0.00	-167.80
930.00	0.16	280.190	929.99	-2.76	-0.09	2.58	0.63	0.12	-374.81
980.00	0.24	266.690	979.99	-2.76	-0.26	2.52	0.18	0.16	-27.00
1,074.00	0.41	276.180	1,073.99	-2.73	-0.79	2.32	0.19	0.18	10.10
1,168.00	0.34	304.500	1,167.99	-2.54	-1.36	1.95	0.21	-0.07	30.13
1,264.00	0.91	310.200	1,263.98	-1.89	-2.17	1.06	0.60	0.59	5.94
1,359.00	3.51	306.730	1,358.90	0.34	-5.08	-2.01	2.74	2.74	-3.65
1,455.00	7.95	300.600	1,454.40	5.48	-13.15	-9.53	4.66	4.63	-6.39
1,550.00	11.39	301.270	1,548.04	13.70	-26.83	-21.82	3.62	3.62	0.71
1,645.00	13.37	305.340	1,640.82	24.92	-43.81	-38.03	2.28	2.08	4.28
1,740.00	14.79	308.030	1,732.97	38.74	-62.32	-57.21	1.65	1.49	2.83
1,833.00	15.71	310.110	1,822.69	54.17	-81.30	-78.06	1.15	0.99	2.24
1,928.00	18.36	309.960	1,913.52	72.07	-102.61	-102.01	2.79	2.79	-0.16
2,023.00	23.09	307.440	2,002.35	93.01	-128.89	-130.48	5.07	4.98	-2.65
2,118.00	25.65	303.240	2,088.88	115.62	-160.88	-162.41	3.25	2.69	-4.42
2,213.00	27.06	301.180	2,174.01	138.08	-196.57	-195.43	1.77	1.48	-2.17
2,308.00	26.42	297.880	2,258.85	159.15	-233.74	-227.63	1.70	-0.67	-3.47
2,403.00	26.22	298.500	2,344.00	179.04	-270.87	-258.71	0.36	-0.21	0.65
2,497.00	27.95	305.850	2,427.71	201.86	-306.98	-292.21	4.00	1.84	7.82
2,592.00	31.24	310.340	2,510.32	230.86	-343.82	-331.78	4.17	3.46	4.73
2,687.00	35.55	313.690	2,589.62	265.90	-382.59	-377.70	4.93	4.54	3.53
2,782.00	39.33	314.460	2,665.04	306.08	-424.06	-429.35	4.01	3.98	0.81
2,876.00	43.28	311.880	2,735.64	348.47	-469.33	-484.35	4.58	4.20	-2.74
2,970.00	45.11	310.160	2,803.04	391.46	-518.78	-541.30	2.33	1.95	-1.83
3,064.00	47.14	310.320	2,868.19	435.23	-570.50	-599.75	2.16	2.16	0.17
3,159.00	48.76	312.490	2,931.82	481.90	-623.39	-661.30	2.41	1.71	2.28
3,254.00	49.95	313.770	2,993.70	531.18	-675.99	-725.23	1.62	1.25	1.35
3,349.00	50.90	314.540	3,054.22	582.19	-728.52	-790.77	1.18	1.00	0.81
3,444.00	51.44	315.440	3,113.79	634.51	-780.86	-857.49	0.93	0.57	0.95
3,537.00	50.83	314.830	3,172.14	685.83	-831.94	-922.84	0.83	-0.66	-0.66
3,632.00	50.92	314.850	3,232.09	737.80	-884.20	-989.19	0.10	0.09	0.02
3,726.00	49.14	313.990	3,292.47	788.22	-935.64	-1,053.82	2.02	-1.89	-0.91
3,821.00	48.28	313.940	3,355.16	837.78	-987.02	-1,117.60	0.91	-0.91	-0.05
3,916.00	47.45	313.850	3,418.89	886.62	-1,037.78	-1,180.52	0.88	-0.87	-0.09
4,011.00	46.62	314.260	3,483.64	934.96	-1,087.74	-1,242.68	0.93	-0.87	0.43
4,106.00	47.02	312.860	3,548.65	982.69	-1,137.94	-1,304.36	1.15	0.42	-1.47
4,200.00	45.67	313.650	3,613.54	1,029.29	-1,187.48	-1,364.74	1.56	-1.44	0.84

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Well:	Hillrock 06 HM (I)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,294.00	45.84	311.940	3,679.13	1,075.04	-1,236.89	-1,424.28	1.32	0.18	-1.82
4,390.00	45.43	311.600	3,746.25	1,120.75	-1,288.07	-1,484.38	0.50	-0.43	-0.35
4,485.00	45.15	311.070	3,813.09	1,165.34	-1,338.77	-1,543.25	0.49	-0.29	-0.56
4,580.00	47.35	311.010	3,878.78	1,210.40	-1,390.52	-1,602.92	2.32	2.32	-0.06
4,675.00	48.04	311.650	3,942.72	1,256.80	-1,443.28	-1,664.18	0.88	0.73	0.67
4,770.00	48.22	310.080	4,006.13	1,303.08	-1,496.78	-1,725.58	1.25	0.19	-1.65
4,864.00	47.98	312.600	4,068.91	1,349.29	-1,549.30	-1,786.59	2.01	-0.26	2.68
4,959.00	47.97	314.340	4,132.51	1,397.83	-1,600.51	-1,849.37	1.36	-0.01	1.83
5,053.00	48.25	314.070	4,195.27	1,446.62	-1,650.68	-1,912.02	0.37	0.30	-0.29
5,147.00	48.53	311.240	4,257.70	1,494.23	-1,702.36	-1,974.07	2.27	0.30	-3.01
5,242.00	49.44	310.400	4,320.05	1,541.08	-1,756.60	-2,036.26	1.17	0.96	-0.88
5,337.00	48.75	310.560	4,382.25	1,587.70	-1,811.22	-2,098.34	0.74	-0.73	0.17
5,431.00	47.26	311.460	4,445.14	1,633.53	-1,863.94	-2,159.06	1.74	-1.59	0.96
5,525.00	46.31	313.890	4,509.51	1,679.95	-1,914.30	-2,219.55	2.14	-1.01	2.59
5,620.00	46.48	314.610	4,575.03	1,727.95	-1,963.58	-2,281.17	0.58	0.18	0.76
5,715.00	47.09	313.930	4,640.08	1,776.28	-2,013.15	-2,343.20	0.83	0.64	-0.72
5,810.00	48.43	311.900	4,703.95	1,824.15	-2,064.66	-2,405.45	2.12	1.41	-2.14
5,905.00	48.85	310.300	4,766.73	1,871.02	-2,118.40	-2,467.48	1.34	0.44	-1.68
6,000.00	48.75	309.800	4,829.30	1,917.02	-2,173.11	-2,529.01	0.41	-0.11	-0.53
6,093.00	48.17	310.690	4,890.97	1,961.98	-2,226.24	-2,589.05	0.95	-0.62	0.96
6,188.00	48.73	311.750	4,953.99	2,008.83	-2,279.72	-2,650.98	1.02	0.59	1.12
6,284.00	47.59	314.170	5,018.03	2,057.56	-2,332.06	-2,714.29	2.22	-1.19	2.52
6,379.00	48.04	314.440	5,081.82	2,106.73	-2,382.43	-2,777.38	0.52	0.47	0.28
6,473.00	47.53	312.230	5,144.99	2,154.50	-2,433.06	-2,839.24	1.82	-0.54	-2.35
6,569.00	46.62	310.420	5,210.37	2,200.92	-2,485.84	-2,900.53	1.67	-0.95	-1.89
6,663.00	45.93	310.590	5,275.34	2,245.04	-2,537.49	-2,959.28	0.75	-0.73	0.18
6,758.00	45.26	309.760	5,341.82	2,288.83	-2,589.35	-3,017.78	0.94	-0.71	-0.87
6,799.00	43.87	310.180	5,371.03	2,307.31	-2,611.40	-3,042.52	3.47	-3.39	1.02
6,894.00	38.95	301.750	5,442.31	2,344.31	-2,662.01	-3,094.21	7.82	-5.18	-8.87
6,989.00	34.86	291.020	5,518.34	2,369.80	-2,712.82	-3,135.10	8.02	-4.31	-11.29
7,084.00	28.26	282.940	5,599.28	2,384.60	-2,760.16	-3,164.76	8.24	-6.95	-8.51
7,179.00	21.76	269.580	5,685.39	2,389.51	-2,799.76	-3,182.52	9.03	-6.84	-14.06
7,274.00	19.21	247.870	5,774.51	2,383.49	-2,831.90	-3,187.49	8.38	-2.68	-22.85
7,369.00	19.87	228.270	5,864.13	2,366.84	-2,858.45	-3,180.59	6.90	0.69	-20.63
7,464.00	20.26	213.850	5,953.42	2,342.41	-2,879.67	-3,164.58	5.21	0.41	-15.18
7,558.00	21.93	192.410	6,041.25	2,311.71	-2,892.53	-3,139.87	8.35	1.78	-22.81
7,652.00	27.25	174.920	6,126.81	2,273.05	-2,894.40	-3,104.02	9.54	5.66	-18.61
7,747.00	34.29	163.140	6,208.46	2,225.67	-2,884.70	-3,056.10	9.73	7.41	-12.40
7,840.00	41.71	159.980	6,281.70	2,171.45	-2,866.48	-2,998.91	8.25	7.98	-3.40
7,935.00	51.69	159.360	6,346.77	2,106.71	-2,842.46	-2,929.87	10.52	10.51	-0.65
8,029.00	61.63	160.240	6,398.37	2,033.09	-2,815.41	-2,851.45	10.60	10.57	0.94
8,124.00	66.55	158.920	6,439.87	1,953.05	-2,785.59	-2,766.04	5.33	5.18	-1.39
8,218.00	72.84	155.500	6,472.48	1,871.85	-2,751.41	-2,678.10	7.51	6.69	-3.64
8,312.00	79.34	153.910	6,495.07	1,789.41	-2,712.43	-2,587.40	7.11	6.91	-1.69

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Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,406.00	85.98	152.860	6,507.07	1,706.11	-2,670.68	-2,494.97	7.15	7.06	-1.12
8,501.00	91.25	151.280	6,509.36	1,622.23	-2,626.22	-2,401.10	5.79	5.55	-1.66
8,596.00	88.13	152.860	6,509.88	1,538.31	-2,581.73	-2,307.17	3.68	-3.28	1.66
8,691.00	87.38	152.510	6,513.60	1,453.97	-2,538.17	-2,213.16	0.87	-0.79	-0.37
8,785.00	88.22	151.010	6,517.21	1,371.22	-2,493.72	-2,120.36	1.83	0.89	-1.60
8,880.00	90.15	151.190	6,518.56	1,288.06	-2,447.82	-2,026.69	2.04	2.03	0.19
8,975.00	90.90	151.280	6,517.69	1,204.79	-2,402.10	-1,932.97	0.80	0.79	0.09
9,069.00	90.29	151.100	6,516.71	1,122.43	-2,356.81	-1,840.25	0.68	-0.65	-0.19
9,164.00	90.07	149.080	6,516.41	1,040.09	-2,309.44	-1,746.86	2.14	-0.23	-2.13
9,259.00	91.69	148.380	6,514.96	958.90	-2,260.14	-1,653.92	1.86	1.71	-0.74
9,354.00	90.95	148.110	6,512.77	878.14	-2,210.15	-1,561.16	0.83	-0.78	-0.28
9,450.00	90.24	146.530	6,511.77	797.35	-2,158.32	-1,467.75	1.80	-0.74	-1.65
9,545.00	91.91	150.490	6,509.99	716.37	-2,108.72	-1,374.91	4.52	1.76	4.17
9,640.00	91.34	150.220	6,507.29	633.84	-2,061.75	-1,281.48	0.66	-0.60	-0.28
9,734.00	90.51	149.870	6,505.78	552.41	-2,014.82	-1,189.09	0.96	-0.88	-0.37
9,830.00	89.76	148.460	6,505.55	469.98	-1,965.61	-1,095.01	1.66	-0.78	-1.47
9,925.00	90.90	151.100	6,505.00	387.90	-1,917.80	-1,001.73	3.03	1.20	2.78
10,020.00	90.59	150.310	6,503.77	305.06	-1,871.32	-908.16	0.89	-0.33	-0.83
10,115.00	90.15	150.400	6,503.15	222.50	-1,824.34	-814.69	0.47	-0.46	0.09
10,210.00	89.93	150.570	6,503.09	139.83	-1,777.53	-721.18	0.29	-0.23	0.18
10,305.00	89.67	150.490	6,503.42	57.12	-1,730.80	-627.65	0.29	-0.27	-0.08
10,401.00	89.45	150.310	6,504.16	-26.35	-1,683.38	-533.18	0.30	-0.23	-0.19
10,496.00	89.27	150.840	6,505.22	-109.09	-1,636.71	-439.65	0.59	-0.19	0.56
10,591.00	88.92	150.400	6,506.72	-191.86	-1,590.11	-346.11	0.59	-0.37	-0.46
10,686.00	88.40	150.570	6,508.94	-274.51	-1,543.32	-252.63	0.58	-0.55	0.18
10,781.00	87.65	150.750	6,512.21	-357.27	-1,496.80	-159.12	0.81	-0.79	0.19
10,876.00	90.55	149.960	6,513.70	-439.82	-1,449.82	-65.67	3.16	3.05	-0.83
10,970.00	90.95	150.840	6,512.47	-521.54	-1,403.40	26.82	1.03	0.43	0.94
11,065.00	92.00	151.010	6,510.03	-604.54	-1,357.25	120.43	1.12	1.11	0.18
11,160.00	91.52	151.190	6,507.11	-687.67	-1,311.36	214.07	0.54	-0.51	0.19
11,255.00	90.99	151.280	6,505.03	-770.93	-1,265.65	307.77	0.57	-0.56	0.09
11,350.00	90.51	150.930	6,503.79	-854.10	-1,219.75	401.45	0.63	-0.51	-0.37
11,445.00	89.98	152.420	6,503.38	-937.72	-1,174.68	495.29	1.66	-0.56	1.57
11,539.00	89.23	153.740	6,504.03	-1,021.53	-1,132.12	588.46	1.62	-0.80	1.40
11,634.00	88.35	150.220	6,506.04	-1,105.36	-1,087.51	682.34	3.82	-0.93	-3.71
11,729.00	89.23	148.460	6,508.04	-1,187.06	-1,039.08	775.48	2.07	0.93	-1.85
11,822.00	88.57	147.940	6,509.83	-1,266.08	-990.08	866.28	0.90	-0.71	-0.56
11,917.00	90.37	148.640	6,510.71	-1,346.89	-940.15	959.07	2.03	1.89	0.74
12,013.00	89.58	148.380	6,510.75	-1,428.75	-890.01	1,052.92	0.87	-0.82	-0.27
12,107.00	90.07	148.820	6,511.04	-1,508.99	-841.03	1,144.86	0.70	0.52	0.47
12,201.00	89.71	147.150	6,511.22	-1,588.69	-791.20	1,236.57	1.82	-0.38	-1.78
12,296.00	91.21	151.100	6,510.45	-1,670.20	-742.46	1,329.63	4.45	1.58	4.16
12,390.00	90.81	151.100	6,508.80	-1,752.48	-697.04	1,422.32	0.43	-0.43	0.00

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Hillrock 06 HM (I)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Site:	Hillrock/Simms	MD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Well:	Hillrock 06 HM (I)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
12,486.00	90.11	150.570	6,508.02	-1,836.31	-650.26	1,516.91	0.91	-0.73	-0.55
12,580.00	89.49	149.690	6,508.35	-1,917.82	-603.45	1,609.33	1.15	-0.66	-0.94
12,674.00	90.59	150.400	6,508.29	-1,999.26	-556.51	1,701.73	1.39	1.17	0.76
12,769.00	89.85	149.870	6,507.92	-2,081.65	-509.21	1,795.13	0.96	-0.78	-0.56
12,865.00	90.64	149.340	6,507.51	-2,164.45	-460.63	1,889.36	0.99	0.82	-0.55
12,960.00	90.81	148.900	6,506.31	-2,245.98	-411.88	1,982.44	0.50	0.18	-0.46
13,055.00	89.93	149.260	6,505.70	-2,327.47	-363.07	2,075.51	1.00	-0.93	0.38
13,148.00	89.85	149.520	6,505.88	-2,407.51	-315.71	2,166.72	0.29	-0.09	0.28
13,244.00	90.42	150.130	6,505.65	-2,490.50	-267.46	2,261.01	0.87	0.59	0.64
13,338.00	89.36	149.080	6,505.83	-2,571.58	-219.90	2,353.27	1.59	-1.13	-1.12
13,433.00	88.31	149.170	6,507.76	-2,653.10	-171.16	2,446.34	1.11	-1.11	0.09
13,527.00	90.86	148.820	6,508.44	-2,733.66	-122.75	2,538.39	2.74	2.71	-0.37
13,622.00	89.93	149.080	6,507.79	-2,815.05	-73.75	2,631.42	1.02	-0.98	0.27
13,717.00	89.01	148.820	6,508.67	-2,896.43	-24.75	2,724.44	1.01	-0.97	-0.27
13,812.00	87.78	147.940	6,511.33	-2,977.29	25.03	2,817.24	1.59	-1.29	-0.93
13,906.00	88.62	148.110	6,514.28	-3,056.99	74.79	2,908.92	0.91	0.89	0.18
14,000.00	90.68	150.050	6,514.85	-3,137.62	123.08	3,001.01	3.01	2.19	2.06
14,095.00	90.20	150.130	6,514.12	-3,219.97	170.45	3,094.40	0.51	-0.51	0.08
14,190.00	91.30	151.450	6,512.88	-3,302.88	216.81	3,187.98	1.81	1.16	1.39
14,284.00	90.68	151.720	6,511.26	-3,385.54	261.53	3,280.80	0.72	-0.66	0.29
14,378.00	89.98	151.450	6,510.71	-3,468.21	306.26	3,373.63	0.80	-0.74	-0.29
14,473.00	90.86	150.570	6,510.02	-3,551.31	352.30	3,467.28	1.31	0.93	-0.93
14,568.00	90.15	150.310	6,509.18	-3,633.94	399.16	3,560.78	0.80	-0.75	-0.27
14,664.00	89.19	150.570	6,509.73	-3,717.44	446.52	3,655.26	1.04	-1.00	0.27
14,759.00	91.91	150.310	6,508.82	-3,800.06	493.38	3,748.74	2.88	2.86	-0.27
14,854.00	91.12	149.690	6,506.31	-3,882.30	540.87	3,842.07	1.06	-0.83	-0.65
14,949.00	90.55	149.080	6,504.93	-3,964.05	589.24	3,935.24	0.88	-0.60	-0.64
15,044.00	90.42	148.640	6,504.12	-4,045.36	638.37	4,028.23	0.48	-0.14	-0.46
15,139.00	90.37	150.930	6,503.47	-4,127.45	686.17	4,121.52	2.41	-0.05	2.41
15,234.00	89.23	151.540	6,503.80	-4,210.72	731.89	4,215.24	1.36	-1.20	0.64
15,328.00	88.88	151.720	6,505.35	-4,293.42	776.54	4,308.07	0.42	-0.37	0.19
15,423.00	88.22	151.630	6,507.75	-4,377.02	821.60	4,401.88	0.70	-0.69	-0.09
15,518.00	87.91	151.980	6,510.96	-4,460.70	866.46	4,495.70	0.49	-0.33	0.37
15,613.00	89.80	150.570	6,512.86	-4,543.98	912.11	4,589.41	2.48	1.99	-1.48
15,676.00	89.14	150.310	6,513.44	-4,598.78	943.19	4,651.41	1.13	-1.05	-0.41
15,739.00	89.58	150.660	6,514.15	-4,653.60	974.22	4,713.42	0.89	0.70	0.56
15,802.00	90.37	150.400	6,514.17	-4,708.45	1,005.22	4,775.44	1.32	1.25	-0.41
15,865.00	89.54	150.840	6,514.22	-4,763.35	1,036.12	4,837.48	1.49	-1.32	0.70
15,928.00	88.70	150.840	6,515.19	-4,818.36	1,066.82	4,899.55	1.33	-1.33	0.00
15,991.00	88.97	150.660	6,516.47	-4,873.31	1,097.59	4,961.60	0.52	0.43	-0.29
16,054.00	89.67	150.750	6,517.22	-4,928.25	1,128.42	5,023.65	1.12	1.11	0.14
16,117.00	88.97	150.490	6,517.97	-4,983.14	1,159.32	5,085.69	1.19	-1.11	-0.41
16,180.00	88.40	150.310	6,519.41	-5,037.91	1,190.43	5,147.67	0.95	-0.90	-0.29

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Hillrock 06 HM (I)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Site:	Hillrock/Simms	MD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Well:	Hillrock 06 HM (I)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,274.00	87.25	149.170	6,522.98	-5,119.04	1,237.77	5,239.90	1.72	-1.22	-1.21
16,369.00	88.40	148.110	6,526.58	-5,200.10	1,287.17	5,332.76	1.65	1.21	-1.12
16,464.00	89.85	147.670	6,528.04	-5,280.55	1,337.66	5,425.40	1.60	1.53	-0.46
16,559.00	90.51	149.080	6,527.74	-5,361.44	1,387.47	5,518.23	1.64	0.69	1.48
16,654.00	89.45	148.990	6,527.77	-5,442.90	1,436.35	5,611.28	1.12	-1.12	-0.09
16,749.00	90.90	149.340	6,527.48	-5,524.47	1,485.04	5,704.38	1.57	1.53	0.37
16,811.00	90.51	149.430	6,526.72	-5,577.83	1,516.61	5,765.19	0.65	-0.63	0.15
16,874.00	90.11	149.520	6,526.38	-5,632.09	1,548.61	5,826.99	0.65	-0.63	0.14
16,937.00	89.58	149.260	6,526.55	-5,686.31	1,580.69	5,888.78	0.94	-0.84	-0.41
16,999.00	89.05	149.520	6,527.29	-5,739.67	1,612.26	5,949.59	0.95	-0.85	0.42
17,062.00	89.05	149.780	6,528.33	-5,794.03	1,644.09	6,011.42	0.41	0.00	0.41
17,125.00	90.24	149.960	6,528.72	-5,848.52	1,675.71	6,073.31	1.91	1.89	0.29
17,188.00	89.71	149.870	6,528.75	-5,903.03	1,707.29	6,135.21	0.85	-0.84	-0.14
17,251.00	89.76	150.750	6,529.04	-5,957.76	1,738.49	6,197.19	1.40	0.08	1.40
17,314.00	89.71	151.720	6,529.33	-6,012.98	1,768.81	6,259.34	1.54	-0.08	1.54
17,377.00	89.85	150.930	6,529.57	-6,068.25	1,799.04	6,321.51	1.27	0.22	-1.25
17,440.00	89.80	150.660	6,529.77	-6,123.24	1,829.78	6,383.58	0.44	-0.08	-0.43
17,503.00	90.29	150.750	6,529.72	-6,178.19	1,860.60	6,445.63	0.79	0.78	0.14
17,565.00	91.65	150.310	6,528.67	-6,232.16	1,891.10	6,506.66	2.31	2.19	-0.71
17,629.00	91.30	150.220	6,527.02	-6,287.71	1,922.83	6,569.59	0.56	-0.55	-0.14
17,692.00	89.76	150.400	6,526.44	-6,342.44	1,954.04	6,631.57	2.46	-2.44	0.29
17,755.00	90.15	153.210	6,526.49	-6,397.96	1,983.80	6,693.81	4.50	0.62	4.46
17,819.00	89.54	151.980	6,526.66	-6,454.77	2,013.26	6,757.18	2.15	-0.95	-1.92
17,882.00	89.10	152.770	6,527.41	-6,510.59	2,042.47	6,819.52	1.44	-0.70	1.25
17,943.00	88.48	151.450	6,528.70	-6,564.49	2,070.99	6,879.83	2.39	-1.02	-2.16
18,006.00	88.04	151.540	6,530.61	-6,619.82	2,101.04	6,942.00	0.71	-0.70	0.14
18,068.00	88.40	151.190	6,532.54	-6,674.21	2,130.74	7,003.16	0.81	0.58	-0.56
18,131.00	89.67	150.130	6,533.60	-6,729.12	2,161.61	7,065.20	2.63	2.02	-1.68
18,195.00	89.19	150.840	6,534.23	-6,784.81	2,193.13	7,128.19	1.34	-0.75	1.11
18,256.00	88.75	150.840	6,535.33	-6,838.07	2,222.85	7,188.29	0.72	-0.72	0.00
18,319.00	89.14	150.570	6,536.49	-6,893.01	2,253.67	7,250.34	0.75	0.62	-0.43
18,382.00	90.37	149.610	6,536.76	-6,947.61	2,285.09	7,312.27	2.48	1.95	-1.52
18,445.00	89.63	149.430	6,536.76	-7,001.91	2,317.04	7,374.09	1.21	-1.17	-0.29
18,508.00	89.14	149.610	6,537.44	-7,056.20	2,349.00	7,435.90	0.83	-0.78	0.29
18,571.00	88.53	149.340	6,538.72	-7,110.46	2,380.99	7,497.69	1.06	-0.97	-0.43
18,635.00	88.92	149.780	6,540.14	-7,165.62	2,413.40	7,560.48	0.92	0.61	0.69
18,698.00	89.93	148.730	6,540.77	-7,219.76	2,445.61	7,622.24	2.31	1.60	-1.67
18,762.00	89.41	149.430	6,541.14	-7,274.66	2,478.49	7,684.94	1.36	-0.81	1.09
18,825.00	88.70	149.780	6,542.18	-7,329.00	2,510.36	7,746.77	1.26	-1.13	0.56
18,888.00	89.36	150.490	6,543.25	-7,383.62	2,541.73	7,808.70	1.54	1.05	1.13
18,952.00	90.29	149.960	6,543.44	-7,439.17	2,573.51	7,871.65	1.67	1.45	-0.83
19,015.00	89.89	149.430	6,543.34	-7,493.56	2,605.30	7,933.50	1.05	-0.63	-0.84
19,083.00	89.23	148.020	6,543.87	-7,551.68	2,640.60	8,000.03	2.29	-0.97	-2.07

Survey @ 19083.00 MD 6543.87 TVD

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Hillrock 06 HM (I)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Site:	Hillrock/Simms	MD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Well:	Hillrock 06 HM (I)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
19,143.00	89.23	148.020	6,544.67	-7,602.57	2,672.38	8,058.58	0.00	0.00	0.00
Survey projected to 19143.00 MD 6544.67 TVD									

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
220.00	220.00	-0.72	-0.32	MWD surveys
19,083.00	6,543.87	-7,551.68	2,640.60	Survey @ 19083.00 MD 6543.87 TVD
19,143.00	6,544.67	-7,602.57	2,672.38	Survey projected to 19143.00 MD 6544.67 TVD

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Hillrock 06 HM (I)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Site:	Hillrock/Simms	MD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Well:	Hillrock 06 HM (I)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_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	Hillrock/Simms				
Site Position:		Northing:	14,434,279.29 usft	Latitude:	39.74587001
From:	Lat/Long	Easting:	1,704,992.60 usft	Longitude:	-80.77026312
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.147 °

Well	Hillrock 06 HM (I)					
Well Position	+N-S	0.00 ft	Northing:	14,434,291.28 usft	Latitude:	39.74590295
	+E-W	0.00 ft	Easting:	1,704,992.45 usft	Longitude:	-80.77026353
Position Uncertainty	0.00 ft		Wellhead Elevation:	ft	Ground Level:	1,219.00 ft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/17/2019	-8.711	66.737	51,890.83999937

Design	Surveys Original Hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N-S (ft)	+E-W (ft)	Direction (°)	
	0.00	0.00	0.00	160.640	

Survey Program	Date	11/4/2019			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
220.00	930.00	MWD surf (Original Hole)	MWD	MWD - Standard	
980.00	2,782.00	MWD int (Original Hole)	MWD	MWD - Standard	
2,876.00	19,083.00	MWD (Original Hole)	MWD	MWD - Standard	
19,143.00	19,143.00	Projection (Original Hole)	MWD	MWD - Standard	

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	0.000	0.00	0.00	0.00	14,434,291.28	1,704,992.45	39.74590295	-80.77026353	
220.00	0.41	204.360	220.00	-0.72	-0.32	14,434,290.57	1,704,992.13	39.74590098	-80.77026469	
MWD surveys										
248.00	0.81	186.220	248.00	-1.01	-0.39	14,434,290.28	1,704,992.06	39.74590019	-80.77026492	
278.00	0.30	182.120	278.00	-1.29	-0.41	14,434,289.99	1,704,992.04	39.74589940	-80.77026501	
309.00	0.27	187.170	308.99	-1.45	-0.43	14,434,289.84	1,704,992.03	39.74589898	-80.77026506	
339.00	0.23	126.070	338.99	-1.55	-0.39	14,434,289.73	1,704,992.07	39.74589869	-80.77026492	
370.00	0.62	121.930	369.99	-1.68	-0.19	14,434,289.61	1,704,992.26	39.74589834	-80.77026423	
400.00	0.18	154.370	399.99	-1.81	-0.03	14,434,289.48	1,704,992.42	39.74589799	-80.77026367	

Company: Tug Hill Operating LLC
Project: Marshall County, West Virginia
Site: Hillrock/Simms
Well: Hillrock 06 HM (I)
Wellbore: Original Hole
Design: Surveys Original Hole

Local Co-ordinate Reference: Well Hillrock 06 HM (I)
TVD Reference: RKB=1219+18 @ 1237.00ft (Precision 528)
MD Reference: RKB=1219+18 @ 1237.00ft (Precision 528)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Aug1919_v14

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
431.00	0.11	186.000	430.99	-1.88	-0.02	14,434,289.40	1,704,992.43	39.74589779	-80.77026361
521.00	0.28	164.510	520.99	-2.18	0.03	14,434,289.11	1,704,992.48	39.74589697	-80.77026343
612.00	0.12	204.540	611.99	-2.48	0.05	14,434,288.80	1,704,992.50	39.74589614	-80.77026337
703.00	0.09	189.030	702.99	-2.64	0.00	14,434,288.65	1,704,992.45	39.74589571	-80.77026355
793.00	0.11	237.020	792.99	-2.75	-0.08	14,434,288.53	1,704,992.37	39.74589539	-80.77026385
888.00	0.11	77.610	887.99	-2.78	-0.07	14,434,288.50	1,704,992.38	39.74589536	-80.77026380
930.00	0.16	280.190	929.99	-2.76	-0.09	14,434,288.52	1,704,992.36	39.74589536	-80.77026387
980.00	0.24	266.690	979.99	-2.76	-0.26	14,434,288.53	1,704,992.19	39.74589538	-80.77026448
1,074.00	0.41	276.180	1,073.99	-2.73	-0.79	14,434,288.55	1,704,991.66	39.74589545	-80.77026637
1,168.00	0.34	304.500	1,167.99	-2.54	-1.36	14,434,288.74	1,704,991.10	39.74589599	-80.77026838
1,264.00	0.91	310.200	1,263.98	-1.89	-2.17	14,434,289.40	1,704,990.28	39.74589779	-80.77027128
1,359.00	3.51	306.730	1,358.90	0.34	-5.08	14,434,291.62	1,704,987.37	39.74590392	-80.77028160
1,455.00	7.95	300.600	1,454.40	5.48	-13.15	14,434,296.76	1,704,979.30	39.74591809	-80.77031028
1,550.00	11.39	301.270	1,548.04	13.70	-26.83	14,434,304.98	1,704,965.62	39.74594075	-80.77035886
1,645.00	13.37	305.340	1,640.82	24.92	-43.81	14,434,316.20	1,704,948.64	39.74597170	-80.77041916
1,740.00	14.79	308.030	1,732.97	38.74	-62.32	14,434,330.03	1,704,930.13	39.74600979	-80.77048490
1,833.00	15.71	310.110	1,822.69	54.17	-81.30	14,434,345.45	1,704,911.15	39.74605229	-80.77055228
1,928.00	18.36	309.960	1,913.52	72.07	-102.61	14,434,363.35	1,704,889.84	39.74610159	-80.77062792
2,023.00	23.09	307.440	2,002.35	93.01	-128.89	14,434,384.30	1,704,863.57	39.74615930	-80.77072121
2,118.00	25.65	303.240	2,088.88	115.62	-160.88	14,434,406.90	1,704,831.57	39.74622160	-80.77083483
2,213.00	27.06	301.180	2,174.01	138.08	-196.57	14,434,429.36	1,704,795.88	39.74628353	-80.77096159
2,308.00	26.42	297.880	2,258.85	159.15	-233.74	14,434,450.43	1,704,758.71	39.74634166	-80.77109364
2,403.00	26.22	298.500	2,344.00	179.04	-270.87	14,434,470.33	1,704,721.59	39.74639656	-80.77122553
2,497.00	27.95	305.850	2,427.71	201.86	-306.98	14,434,493.15	1,704,685.47	39.74645948	-80.77135382
2,592.00	31.24	310.340	2,510.32	230.86	-343.82	14,434,522.14	1,704,648.63	39.74653937	-80.77148461
2,687.00	35.55	313.690	2,589.62	265.90	-382.59	14,434,557.19	1,704,609.86	39.74663588	-80.77162221
2,782.00	39.33	314.460	2,665.04	306.08	-424.06	14,434,597.36	1,704,568.39	39.74674651	-80.77176939
2,876.00	43.28	311.880	2,735.64	348.47	-469.33	14,434,639.76	1,704,523.12	39.74686325	-80.77193007
2,970.00	45.11	310.160	2,803.04	391.46	-518.78	14,434,682.75	1,704,473.68	39.74698166	-80.77210559
3,064.00	47.14	310.320	2,868.19	435.23	-570.50	14,434,726.52	1,704,421.96	39.74710223	-80.77228919
3,159.00	48.76	312.490	2,931.82	481.90	-623.39	14,434,773.18	1,704,369.06	39.74723075	-80.77247695
3,254.00	49.95	313.770	2,993.70	531.18	-675.99	14,434,822.46	1,704,316.47	39.74736645	-80.77266363
3,349.00	50.90	314.540	3,054.22	582.19	-728.52	14,434,873.47	1,704,263.93	39.74750691	-80.77285006
3,444.00	51.44	315.440	3,113.79	634.51	-780.86	14,434,925.79	1,704,211.60	39.74765096	-80.77303578
3,537.00	50.83	314.830	3,172.14	685.83	-831.94	14,434,977.12	1,704,160.52	39.74779227	-80.77321705
3,632.00	50.92	314.850	3,232.09	737.80	-884.20	14,435,029.08	1,704,108.26	39.74793535	-80.77340250
3,726.00	49.14	313.990	3,292.47	788.22	-935.64	14,435,079.51	1,704,056.81	39.74807418	-80.77358507
3,821.00	48.28	313.940	3,355.16	837.78	-987.02	14,435,129.06	1,704,005.44	39.74821063	-80.77376741
3,916.00	47.45	313.850	3,418.89	886.62	-1,037.78	14,435,177.91	1,703,954.67	39.74834512	-80.77394758
4,011.00	46.62	314.260	3,483.64	934.96	-1,087.74	14,435,226.24	1,703,904.71	39.74847821	-80.77412490
4,106.00	47.02	312.860	3,548.65	982.69	-1,137.94	14,435,273.98	1,703,854.51	39.74860965	-80.77430306
4,200.00	45.67	313.650	3,613.54	1,029.29	-1,187.48	14,435,320.57	1,703,804.98	39.74873797	-80.77447888
4,294.00	45.84	311.940	3,679.13	1,075.04	-1,236.89	14,435,366.32	1,703,755.57	39.74886393	-80.77465425
4,390.00	45.43	311.600	3,746.25	1,120.75	-1,288.07	14,435,412.04	1,703,704.38	39.74898984	-80.77483595
4,485.00	45.15	311.070	3,813.09	1,165.34	-1,338.77	14,435,456.63	1,703,653.69	39.74911265	-80.77501590
4,580.00	47.35	311.010	3,878.78	1,210.40	-1,390.52	14,435,501.68	1,703,601.93	39.74923674	-80.77519964
4,675.00	48.04	311.650	3,942.72	1,256.80	-1,443.28	14,435,548.08	1,703,549.18	39.74936453	-80.77538692
4,770.00	48.22	310.080	4,006.13	1,303.08	-1,496.78	14,435,594.36	1,703,495.68	39.74949200	-80.77557684
4,864.00	47.98	312.600	4,068.91	1,349.29	-1,549.30	14,435,640.57	1,703,443.15	39.74961925	-80.77576330
4,959.00	47.97	314.340	4,132.51	1,397.83	-1,600.51	14,435,689.11	1,703,391.94	39.74975293	-80.77594507
5,053.00	48.25	314.070	4,195.27	1,446.62	-1,650.68	14,435,737.90	1,703,341.78	39.74988726	-80.77612310
5,147.00	48.53	311.240	4,257.70	1,494.23	-1,702.36	14,435,785.51	1,703,290.10	39.75001837	-80.77630655
5,242.00	49.44	310.400	4,320.05	1,541.08	-1,756.60	14,435,832.37	1,703,235.85	39.75014741	-80.77649914
5,337.00	48.75	310.560	4,382.25	1,587.70	-1,811.22	14,435,878.98	1,703,181.24	39.75027579	-80.77669303
5,431.00	47.26	311.460	4,445.14	1,633.53	-1,863.94	14,435,924.81	1,703,128.52	39.75040203	-80.77688019

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Hillrock 06 HM (I)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Site:	Hillrock/Simms	MD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Well:	Hillrock 06 HM (I)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,525.00	46.31	313.890	4,509.51	1,679.95	-1,914.30	14,435,971.23	1,703,078.15	39.75052986	-80.77705897	
5,620.00	46.48	314.610	4,575.03	1,727.95	-1,963.58	14,436,019.23	1,703,028.88	39.75066202	-80.77723385	
5,715.00	47.09	313.930	4,640.08	1,776.28	-2,013.15	14,436,067.56	1,702,979.30	39.75079508	-80.77740981	
5,810.00	48.43	311.900	4,703.95	1,824.15	-2,064.66	14,436,115.43	1,702,927.79	39.75092690	-80.77759266	
5,905.00	48.85	310.300	4,766.73	1,871.02	-2,118.40	14,436,162.30	1,702,874.06	39.75105598	-80.77778341	
6,000.00	48.75	309.800	4,829.30	1,917.02	-2,173.11	14,436,208.30	1,702,819.34	39.75118267	-80.77797768	
6,093.00	48.17	310.690	4,890.97	1,961.98	-2,226.24	14,436,253.26	1,702,766.21	39.75130653	-80.77816632	
6,188.00	48.73	311.750	4,953.99	2,008.83	-2,279.72	14,436,300.11	1,702,712.74	39.75143555	-80.77835616	
6,284.00	47.59	314.170	5,018.03	2,057.56	-2,332.06	14,436,348.84	1,702,660.40	39.75156972	-80.77854196	
6,379.00	48.04	314.440	5,081.82	2,106.73	-2,382.43	14,436,398.01	1,702,610.02	39.75170509	-80.77872076	
6,473.00	47.53	312.230	5,144.99	2,154.50	-2,433.06	14,436,445.78	1,702,559.39	39.75183664	-80.77890046	
6,569.00	46.62	310.420	5,210.37	2,200.92	-2,485.84	14,436,492.20	1,702,506.61	39.75196448	-80.77908784	
6,663.00	45.93	310.590	5,275.34	2,245.04	-2,537.49	14,436,536.32	1,702,454.96	39.75208599	-80.77927123	
6,758.00	45.26	309.760	5,341.82	2,288.83	-2,589.35	14,436,580.11	1,702,403.11	39.75220659	-80.77945534	
6,799.00	43.87	310.180	5,371.03	2,307.31	-2,611.40	14,436,598.59	1,702,381.06	39.75225749	-80.77953362	
6,894.00	38.95	301.750	5,442.31	2,344.31	-2,662.01	14,436,635.59	1,702,330.45	39.75235946	-80.77971338	
6,989.00	34.86	291.020	5,518.34	2,369.80	-2,712.82	14,436,661.08	1,702,279.64	39.75242980	-80.77989393	
7,084.00	28.26	282.940	5,599.28	2,384.60	-2,760.16	14,436,675.88	1,702,232.30	39.75247076	-80.78006222	
7,179.00	21.76	269.580	5,685.39	2,389.51	-2,799.76	14,436,680.79	1,702,192.70	39.75248453	-80.78020308	
7,274.00	19.21	247.870	5,774.51	2,383.49	-2,831.90	14,436,674.77	1,702,160.56	39.75246819	-80.78031747	
7,369.00	19.87	228.270	5,864.13	2,366.84	-2,858.45	14,436,658.11	1,702,134.01	39.75242264	-80.78041210	
7,464.00	20.26	213.850	5,953.42	2,342.41	-2,879.67	14,436,633.69	1,702,112.78	39.75235571	-80.78048783	
7,558.00	21.93	192.410	6,041.25	2,311.71	-2,892.53	14,436,602.99	1,702,099.92	39.75227147	-80.78053384	
7,652.00	27.25	174.920	6,126.81	2,273.05	-2,894.40	14,436,564.33	1,702,098.05	39.75216532	-80.78054084	
7,747.00	34.29	163.140	6,208.46	2,225.67	-2,884.70	14,436,516.95	1,702,107.76	39.75203514	-80.78050671	
7,840.00	41.71	159.980	6,281.70	2,171.45	-2,866.48	14,436,462.73	1,702,125.98	39.75188611	-80.78044236	
7,935.00	51.69	159.360	6,346.77	2,106.71	-2,842.46	14,436,397.99	1,702,150.00	39.75170816	-80.78035747	
8,029.00	61.63	160.240	6,398.37	2,033.09	-2,815.41	14,436,324.37	1,702,177.05	39.75150580	-80.78026188	
8,124.00	66.55	158.920	6,439.87	1,953.05	-2,785.59	14,436,244.33	1,702,206.87	39.75128577	-80.78015647	
8,218.00	72.84	155.500	6,472.48	1,871.85	-2,751.41	14,436,163.13	1,702,241.05	39.75106254	-80.78003559	
8,312.00	79.34	153.910	6,495.07	1,789.41	-2,712.43	14,436,080.69	1,702,280.03	39.75083587	-80.77989762	
8,406.00	85.98	152.860	6,507.07	1,706.11	-2,670.68	14,435,997.39	1,702,321.77	39.75060683	-80.77974982	
8,501.00	91.25	151.280	6,509.36	1,622.23	-2,626.22	14,435,913.51	1,702,366.24	39.75037617	-80.77959234	
8,596.00	88.13	152.860	6,509.88	1,538.31	-2,581.73	14,435,829.59	1,702,410.73	39.75014541	-80.77943479	
8,691.00	87.38	152.510	6,513.60	1,453.97	-2,538.17	14,435,745.25	1,702,454.29	39.74991348	-80.77928055	
8,785.00	88.22	151.010	6,517.21	1,371.22	-2,493.72	14,435,662.50	1,702,498.73	39.74968594	-80.77912316	
8,880.00	90.15	151.190	6,518.56	1,288.06	-2,447.82	14,435,579.35	1,702,544.64	39.74945725	-80.77896056	
8,975.00	90.90	151.280	6,517.69	1,204.79	-2,402.10	14,435,496.07	1,702,590.35	39.74922825	-80.77879866	
9,069.00	90.29	151.100	6,516.71	1,122.43	-2,356.81	14,435,413.71	1,702,635.65	39.74900176	-80.77863823	
9,164.00	90.07	149.080	6,516.41	1,040.09	-2,309.44	14,435,331.37	1,702,683.02	39.74877530	-80.77847043	
9,259.00	91.69	148.380	6,514.96	958.90	-2,260.14	14,435,250.18	1,702,732.32	39.74855201	-80.77829573	
9,354.00	90.95	148.110	6,512.77	878.14	-2,210.15	14,435,169.43	1,702,782.30	39.74832988	-80.77811861	
9,450.00	90.24	146.530	6,511.77	797.35	-2,158.32	14,435,088.63	1,702,834.13	39.74810764	-80.77793493	
9,545.00	91.91	150.490	6,509.99	716.37	-2,108.72	14,435,007.66	1,702,883.74	39.74788492	-80.77775917	
9,640.00	91.34	150.220	6,507.29	633.84	-2,061.75	14,434,925.12	1,702,930.71	39.74765795	-80.77759279	
9,734.00	90.51	149.870	6,505.78	552.41	-2,014.82	14,434,843.69	1,702,977.64	39.74743399	-80.77742655	
9,830.00	89.76	148.460	6,505.55	469.98	-1,965.61	14,434,761.27	1,703,026.84	39.74720729	-80.77725223	
9,925.00	90.90	151.100	6,505.00	387.90	-1,917.80	14,434,679.19	1,703,074.65	39.74698155	-80.77708286	
10,020.00	90.59	150.310	6,503.77	305.06	-1,871.32	14,434,596.34	1,703,121.13	39.74675372	-80.77691824	
10,115.00	90.15	150.400	6,503.15	222.50	-1,824.34	14,434,513.78	1,703,168.12	39.74652666	-80.77675180	
10,210.00	89.93	150.570	6,503.09	139.83	-1,777.53	14,434,431.11	1,703,214.92	39.74629930	-80.77658603	
10,305.00	89.67	150.490	6,503.42	57.12	-1,730.80	14,434,348.40	1,703,261.66	39.74607184	-80.77642049	
10,401.00	89.45	150.310	6,504.16	-26.35	-1,683.38	14,434,264.93	1,703,309.08	39.74584228	-80.77625255	
10,496.00	89.27	150.840	6,505.22	-109.09	-1,636.71	14,434,182.19	1,703,355.74	39.74561474	-80.77608725	
10,591.00	88.92	150.400	6,506.72	-191.86	-1,590.11	14,434,099.42	1,703,402.34	39.74538710	-80.77592220	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Hillrock 06 HM (I)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Site:	Hillrock/Simms	MD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Well:	Hillrock 06 HM (I)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,686.00	88.40	150.570	6,508.94	-274.51	-1,543.32	14,434,016.78	1,703,449.13	39.74515981	-80.77575648
10,781.00	87.65	150.750	6,512.21	-357.27	-1,496.80	14,433,934.01	1,703,495.65	39.74493219	-80.77559172
10,876.00	90.55	149.960	6,513.70	-439.82	-1,449.82	14,433,851.47	1,703,542.63	39.74470517	-80.77542533
10,970.00	90.95	150.840	6,512.47	-521.54	-1,403.40	14,433,769.74	1,703,589.06	39.74448042	-80.77526089
11,065.00	92.00	151.010	6,510.03	-604.54	-1,357.25	14,433,686.74	1,703,635.21	39.74425216	-80.77509746
11,160.00	91.52	151.190	6,507.11	-687.67	-1,311.36	14,433,603.61	1,703,681.10	39.74402354	-80.77493495
11,255.00	90.99	151.280	6,505.03	-770.93	-1,265.65	14,433,520.36	1,703,726.80	39.74379458	-80.77477310
11,350.00	90.51	150.930	6,503.79	-854.10	-1,219.75	14,433,437.19	1,703,772.70	39.74356587	-80.77461055
11,445.00	89.98	152.420	6,503.38	-937.72	-1,174.68	14,433,353.57	1,703,817.78	39.74333590	-80.77445095
11,539.00	89.23	153.740	6,504.03	-1,021.53	-1,132.12	14,433,269.76	1,703,860.33	39.74310544	-80.77430031
11,634.00	88.35	150.220	6,506.04	-1,105.36	-1,087.51	14,433,185.93	1,703,904.94	39.74287491	-80.77414236
11,729.00	89.23	148.460	6,508.04	-1,187.06	-1,039.08	14,433,104.23	1,703,953.37	39.74265021	-80.77397080
11,822.00	88.57	147.940	6,509.83	-1,266.08	-990.08	14,433,025.20	1,704,002.37	39.74243284	-80.77379721
11,917.00	90.37	148.640	6,510.71	-1,346.89	-940.15	14,432,944.39	1,704,052.30	39.74221057	-80.77362031
12,013.00	89.58	148.380	6,510.75	-1,428.75	-890.01	14,432,862.53	1,704,102.45	39.74198540	-80.77344266
12,107.00	90.07	148.820	6,511.04	-1,508.99	-841.03	14,432,782.30	1,704,151.42	39.74176472	-80.77326917
12,201.00	89.71	147.150	6,511.22	-1,588.69	-791.20	14,432,702.60	1,704,201.25	39.74154549	-80.77309261
12,296.00	91.21	151.100	6,510.45	-1,670.20	-742.46	14,432,621.08	1,704,249.99	39.74132129	-80.77291997
12,390.00	90.81	151.100	6,508.80	-1,752.48	-697.04	14,432,538.80	1,704,295.41	39.74109501	-80.77275913
12,486.00	90.11	150.570	6,508.02	-1,836.31	-650.26	14,432,454.98	1,704,342.19	39.74086447	-80.77259347
12,580.00	89.49	149.690	6,508.35	-1,917.82	-603.45	14,432,373.47	1,704,389.01	39.74064029	-80.77242767
12,674.00	90.59	150.400	6,508.29	-1,999.26	-556.51	14,432,292.03	1,704,435.94	39.74041630	-80.77226145
12,769.00	89.85	149.870	6,507.92	-2,081.65	-509.21	14,432,209.64	1,704,483.25	39.74018972	-80.77209391
12,865.00	90.64	149.340	6,507.51	-2,164.45	-460.63	14,432,126.84	1,704,531.82	39.73996198	-80.77192188
12,960.00	90.81	148.900	6,506.31	-2,245.98	-411.88	14,432,045.31	1,704,580.57	39.73973775	-80.77174919
13,055.00	89.93	149.260	6,505.70	-2,327.47	-363.07	14,431,963.82	1,704,629.38	39.73951359	-80.77157628
13,148.00	89.85	149.520	6,505.88	-2,407.51	-315.71	14,431,883.78	1,704,676.74	39.73929345	-80.77140856
13,244.00	90.42	150.130	6,505.65	-2,490.50	-267.46	14,431,800.79	1,704,724.99	39.73906519	-80.77123766
13,338.00	89.36	149.080	6,505.83	-2,571.58	-219.90	14,431,719.71	1,704,772.55	39.73884219	-80.77106922
13,433.00	88.31	149.170	6,507.76	-2,653.10	-171.16	14,431,638.19	1,704,821.29	39.73861798	-80.77089658
13,527.00	90.86	148.820	6,508.44	-2,733.66	-122.75	14,431,557.63	1,704,869.71	39.73839639	-80.77072509
13,622.00	89.93	149.080	6,507.79	-2,815.05	-73.75	14,431,476.24	1,704,918.70	39.73817254	-80.77055154
13,717.00	89.01	148.820	6,508.67	-2,896.43	-24.75	14,431,394.86	1,704,967.70	39.73794869	-80.77037799
13,812.00	87.78	147.940	6,511.33	-2,977.29	25.03	14,431,314.00	1,705,017.49	39.73772627	-80.77020163
13,906.00	88.62	148.110	6,514.28	-3,056.99	74.79	14,431,234.30	1,705,067.24	39.73750705	-80.77002538
14,000.00	90.68	150.050	6,514.85	-3,137.62	123.08	14,431,153.67	1,705,115.53	39.73728527	-80.76985432
14,095.00	90.20	150.130	6,514.12	-3,219.97	170.45	14,431,071.32	1,705,162.90	39.73705879	-80.76968657
14,190.00	91.30	151.450	6,512.88	-3,302.88	216.81	14,430,988.41	1,705,209.26	39.73683077	-80.76952244
14,284.00	90.68	151.720	6,511.26	-3,385.54	261.53	14,430,905.75	1,705,253.98	39.73660344	-80.76936411
14,378.00	89.98	151.450	6,510.71	-3,468.21	306.26	14,430,823.08	1,705,298.71	39.73637608	-80.76920576
14,473.00	90.86	150.570	6,510.02	-3,551.31	352.30	14,430,739.99	1,705,344.75	39.73614756	-80.76904275
14,568.00	90.15	150.310	6,509.18	-3,633.94	399.16	14,430,657.36	1,705,391.62	39.73592030	-80.76887681
14,664.00	89.19	150.570	6,509.73	-3,717.44	446.52	14,430,573.85	1,705,438.97	39.73569064	-80.76870911
14,759.00	91.91	150.310	6,508.82	-3,800.06	493.38	14,430,491.23	1,705,485.83	39.73546340	-80.76854319
14,854.00	91.12	149.690	6,506.31	-3,882.30	540.87	14,430,408.99	1,705,533.32	39.73523720	-80.76837505
14,949.00	90.55	149.080	6,504.93	-3,964.05	589.24	14,430,327.24	1,705,581.69	39.73501235	-80.76820373
15,044.00	90.42	148.640	6,504.12	-4,045.36	638.37	14,430,245.93	1,705,630.82	39.73478871	-80.76802973
15,139.00	90.37	150.930	6,503.47	-4,127.45	686.17	14,430,163.85	1,705,678.62	39.73456294	-80.76786045
15,234.00	89.23	151.540	6,503.80	-4,210.72	731.89	14,430,080.57	1,705,724.34	39.73433391	-80.76769861
15,328.00	88.88	151.720	6,505.35	-4,293.42	776.54	14,429,997.87	1,705,768.99	39.73410648	-80.76754052
15,423.00	88.22	151.630	6,507.75	-4,377.02	821.60	14,429,914.27	1,705,814.05	39.73387657	-80.76738101
15,518.00	87.91	151.980	6,510.96	-4,460.70	866.46	14,429,830.59	1,705,858.91	39.73364644	-80.76722222
15,613.00	89.80	150.570	6,512.86	-4,543.98	912.11	14,429,747.31	1,705,904.56	39.73341739	-80.76706063
15,676.00	89.14	150.310	6,513.44	-4,598.78	943.19	14,429,692.51	1,705,935.64	39.73326668	-80.76695060
15,739.00	89.58	150.660	6,514.15	-4,653.60	974.22	14,429,637.69	1,705,966.67	39.73311590	-80.76684071



Survey Report - Geographic



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Hillrock 06 HM (I)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Site:	Hillrock/Simms	MD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Well:	Hillrock 06 HM (I)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,802.00	90.37	150.400	6,514.17	-4,708.45	1,005.22	14,429,582.84	1,705,997.67	39.73296505	-80.76673098
15,865.00	89.54	150.840	6,514.22	-4,763.35	1,036.12	14,429,527.95	1,706,028.57	39.73281407	-80.76662155
15,928.00	88.70	150.840	6,515.19	-4,818.36	1,066.82	14,429,472.94	1,706,059.27	39.73266278	-80.76651289
15,991.00	88.97	150.660	6,516.47	-4,873.31	1,097.59	14,429,417.98	1,706,090.04	39.73251164	-80.76640393
16,054.00	89.67	150.750	6,517.22	-4,928.25	1,128.42	14,429,363.04	1,706,120.87	39.73236054	-80.76629480
16,117.00	88.97	150.490	6,517.97	-4,983.14	1,159.32	14,429,308.15	1,706,151.77	39.73220956	-80.76618538
16,180.00	88.40	150.310	6,519.41	-5,037.91	1,190.43	14,429,253.39	1,706,182.88	39.73205894	-80.76607524
16,274.00	87.25	149.170	6,522.98	-5,119.04	1,237.77	14,429,172.26	1,706,230.22	39.73183580	-80.76590763
16,369.00	88.40	148.110	6,526.58	-5,200.10	1,287.17	14,429,091.20	1,706,279.62	39.73161282	-80.76573267
16,464.00	89.85	147.670	6,528.04	-5,280.55	1,337.66	14,429,010.74	1,706,330.11	39.73139151	-80.76555383
16,559.00	90.51	149.080	6,527.74	-5,361.44	1,387.47	14,428,929.85	1,706,379.92	39.73116900	-80.76537741
16,654.00	89.45	148.990	6,527.77	-5,442.90	1,436.35	14,428,848.39	1,706,428.80	39.73094494	-80.76520432
16,749.00	90.90	149.340	6,527.48	-5,524.47	1,485.04	14,428,766.82	1,706,477.49	39.73072058	-80.76503189
16,811.00	90.51	149.430	6,526.72	-5,577.83	1,516.61	14,428,713.47	1,706,509.06	39.73057382	-80.76492009
16,874.00	90.11	149.520	6,526.38	-5,632.09	1,548.61	14,428,659.20	1,706,541.06	39.73042456	-80.76480679
16,937.00	89.58	149.260	6,526.55	-5,686.31	1,580.69	14,428,604.98	1,706,573.14	39.73027542	-80.76469320
16,999.00	89.05	149.520	6,527.29	-5,739.67	1,612.26	14,428,551.62	1,706,604.71	39.73012866	-80.76458142
17,062.00	89.05	149.780	6,528.33	-5,794.03	1,644.09	14,428,497.27	1,706,636.53	39.72997915	-80.76446872
17,125.00	90.24	149.960	6,528.72	-5,848.52	1,675.71	14,428,442.78	1,706,668.16	39.72982928	-80.76435675
17,188.00	89.71	149.870	6,528.75	-5,903.03	1,707.29	14,428,388.27	1,706,699.74	39.72967935	-80.76424494
17,251.00	89.76	150.750	6,529.04	-5,957.76	1,738.49	14,428,333.54	1,706,730.94	39.72952882	-80.76413447
17,314.00	89.71	151.720	6,529.33	-6,012.98	1,768.81	14,428,278.31	1,706,761.26	39.72937694	-80.76402716
17,377.00	89.85	150.930	6,529.57	-6,068.25	1,799.04	14,428,223.04	1,706,791.49	39.72922493	-80.76392015
17,440.00	89.80	150.660	6,529.77	-6,123.24	1,829.78	14,428,168.05	1,706,822.23	39.72907369	-80.76381134
17,503.00	90.29	150.750	6,529.72	-6,178.19	1,860.60	14,428,113.11	1,706,853.05	39.72892257	-80.76370221
17,565.00	91.65	150.310	6,528.67	-6,232.16	1,891.10	14,428,059.14	1,706,883.55	39.72877414	-80.76359425
17,629.00	91.30	150.220	6,527.02	-6,287.71	1,922.83	14,428,003.59	1,706,915.28	39.72862134	-80.76348191
17,692.00	89.76	150.400	6,526.44	-6,342.44	1,954.04	14,427,948.86	1,706,946.48	39.72847082	-80.76337144
17,755.00	90.15	153.210	6,526.49	-6,397.96	1,983.80	14,427,893.34	1,706,976.25	39.72831813	-80.76326611
17,819.00	89.54	151.980	6,526.66	-6,454.77	2,013.26	14,427,836.53	1,707,005.70	39.72816189	-80.76316187
17,882.00	89.10	152.770	6,527.41	-6,510.59	2,042.47	14,427,780.71	1,707,034.91	39.72800839	-80.76305851
17,943.00	88.48	151.450	6,528.70	-6,564.49	2,070.99	14,427,726.81	1,707,063.44	39.72786016	-80.76295755
18,006.00	88.04	151.540	6,530.61	-6,619.82	2,101.04	14,427,671.47	1,707,093.49	39.72770797	-80.76285119
18,068.00	88.40	151.190	6,532.54	-6,674.21	2,130.74	14,427,617.08	1,707,123.19	39.72755838	-80.76274608
18,131.00	89.67	150.130	6,533.60	-6,729.12	2,161.61	14,427,562.17	1,707,154.05	39.72740736	-80.76263682
18,195.00	89.19	150.840	6,534.23	-6,784.81	2,193.13	14,427,506.48	1,707,185.58	39.72725419	-80.76252521
18,256.00	88.75	150.840	6,535.33	-6,838.07	2,222.85	14,427,453.22	1,707,215.30	39.72710770	-80.76242002
18,319.00	89.14	150.570	6,536.49	-6,893.01	2,253.67	14,427,398.29	1,707,246.12	39.72695661	-80.76231092
18,382.00	90.37	149.610	6,536.76	-6,947.61	2,285.09	14,427,343.68	1,707,277.53	39.72680642	-80.76219971
18,445.00	89.63	149.430	6,536.76	-7,001.91	2,317.04	14,427,289.39	1,707,309.49	39.72665708	-80.76208657
18,508.00	89.14	149.610	6,537.44	-7,056.20	2,349.00	14,427,235.10	1,707,341.44	39.72650775	-80.76197344
18,571.00	88.53	149.340	6,538.72	-7,110.46	2,380.99	14,427,180.84	1,707,373.43	39.72635851	-80.76186017
18,635.00	88.92	149.780	6,540.14	-7,165.62	2,413.40	14,427,125.68	1,707,405.85	39.72620677	-80.76174540
18,698.00	89.93	148.730	6,540.77	-7,219.76	2,445.61	14,427,071.54	1,707,438.05	39.72605785	-80.76163137
18,762.00	89.41	149.430	6,541.14	-7,274.66	2,478.49	14,427,016.63	1,707,470.94	39.72590683	-80.76151493
18,825.00	88.70	149.780	6,542.18	-7,329.00	2,510.36	14,426,962.30	1,707,502.81	39.72575738	-80.76140210
18,888.00	89.36	150.490	6,543.25	-7,383.62	2,541.73	14,426,907.68	1,707,534.18	39.72560714	-80.76129106
18,952.00	90.29	149.960	6,543.44	-7,439.17	2,573.51	14,426,852.13	1,707,565.96	39.72545435	-80.76117855
19,015.00	89.89	149.430	6,543.34	-7,493.56	2,605.30	14,426,797.74	1,707,597.75	39.72530474	-80.76106601
19,083.00	89.23	148.020	6,543.87	-7,551.68	2,640.60	14,426,739.62	1,707,633.05	39.72514488	-80.76094101
Survey @ 19083.00 MD 6543.87 TVD									
19,143.00	89.23	148.020	6,544.67	-7,602.57	2,672.38	14,426,688.73	1,707,664.82	39.72500489	-80.76082849
Survey projected to 19143.00 MD 6544.67 TVD									

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Hillrock 06 HM (I)
Project:	Marshall County, West Virginia	TVD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Site:	Hillrock/Simms	MD Reference:	RKB=1219+18 @ 1237.00ft (Precision 528)
Well:	Hillrock 06 HM (I)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
220.00	220.00	-0.72	-0.32	MWD surveys
19,083.00	6,543.87	-7,551.68	2,640.60	Survey @ 19083.00 MD 6543.87 TVD
19,143.00	6,544.67	-7,602.57	2,672.38	Survey projected to 19143.00 MD 6544.67 TVD