



Well: Michter N-03HM (C)  
 Site: Michter  
 Project: Marshall County, West Virginia  
 Design: rev4  
 Rig: H&P 611

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
1	5372.00	37.30	128.860	5026.92	-787.33	914.39	0.00	0.000-1147.34		Survey @ 5372.00 MD 5026.92 TVD
2	5500.00	37.30	128.860	5128.74	-836.00	974.79	0.00	0.000-1220.27		KOP Begin 6.45°/100' drop/turn
3	5554.49	33.80	128.275	5173.07	-855.75	999.55	6.45	-174.687-1250.00		Begin 33.80° tangent
4	5688.09	33.80	128.275	5284.09	-901.79	1057.90	0.00	0.000-1319.62		Begin 8°/100' build/turn
5	6703.92	50.00	334.494	6189.83	-688.66	1123.57	8.00	-159.976-1171.42		Begin 10°/100' build/turn
6	7122.90	91.00	325.050	6327.00	-357.24	925.57	10.00	-14.222 -785.37		Begin 91.00° lateral
7	16470.34	91.00	325.050	6164.00	7303.23	-4428.42	0.00	0.000 8540.96		PBHL/TD 16470.34 MD/6164.00 TVD

ANNOTATIONS SURVEYS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Annotation
190.00	0.35	51.430	190.00	0.36	0.45	0.07	MWD surveys
16373.00	91.16	323.190	6260.73	7253.36	-4403.47	8485.39	Survey @ 16373.00 MD 6260.73 TVD
16428.00	91.16	323.190	6259.61	7297.39	-4436.42	8540.12	Survey projected to 16428.00 MD 6259.61 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: RKB=1128+25 @ 1153.00ft (H&P 611)

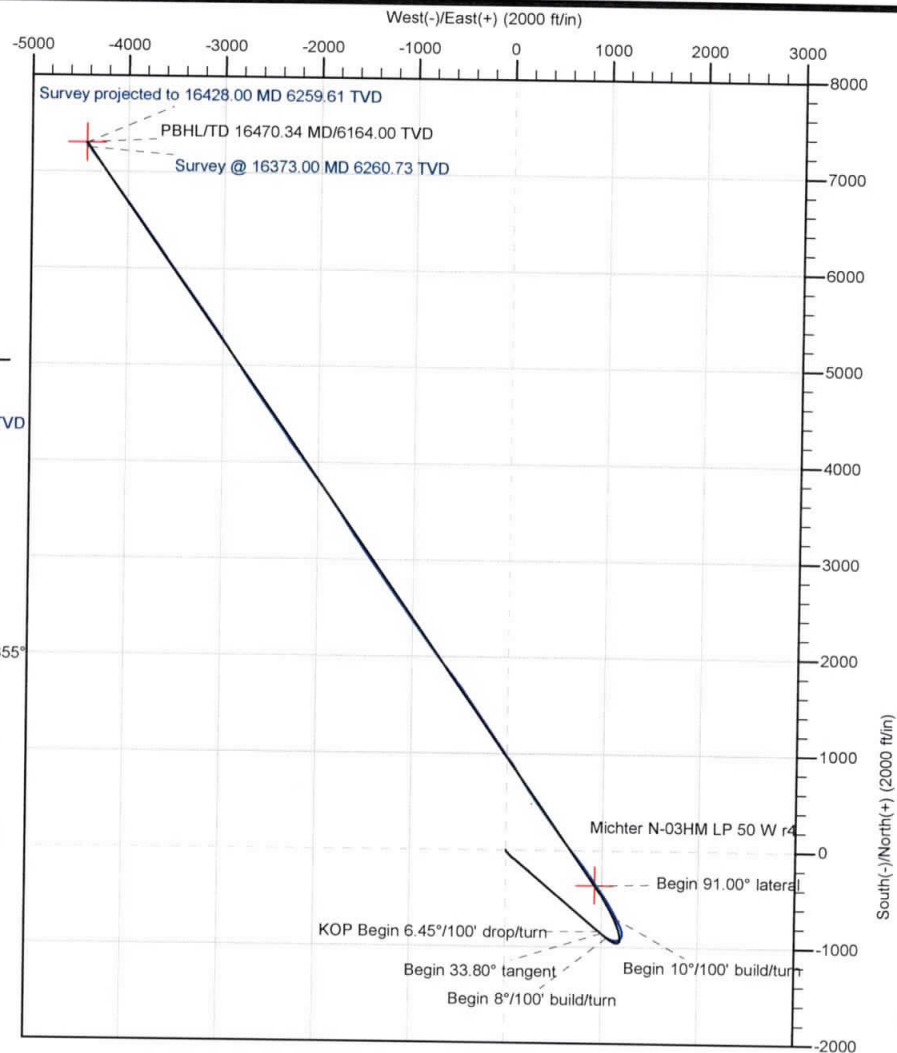
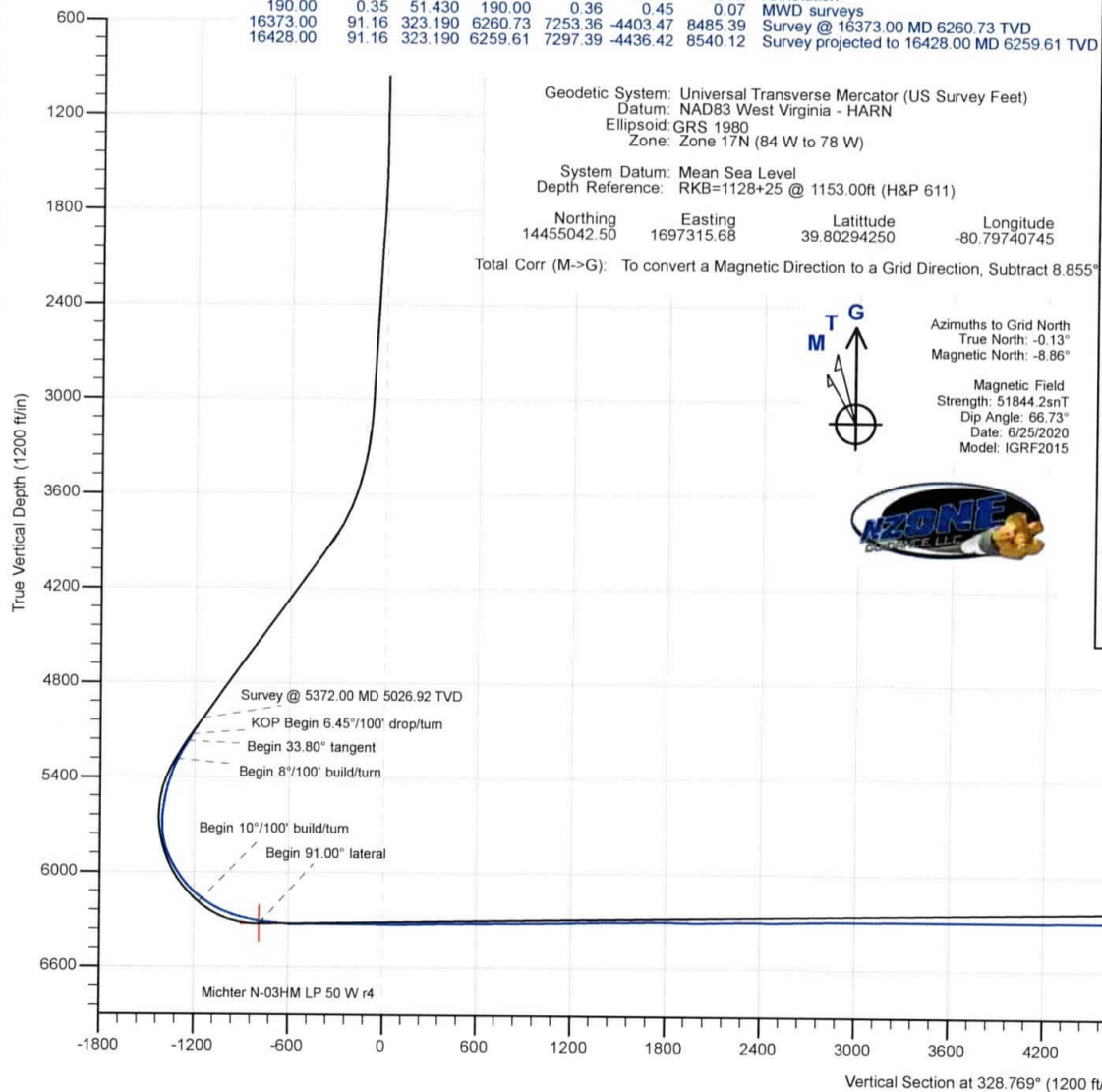
Northing: 14455042.50    Easting: 1697315.68    Latitude: 39.80294250    Longitude: -80.79740745

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.855°



Azimuths to Grid North  
 True North: -0.13°  
 Magnetic North: -8.86°

Magnetic Field  
 Strength: 51844.2snT  
 Dip Angle: 66.73°  
 Date: 6/25/2020  
 Model: IGRF2015





<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Michter N-03HM (C)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Site:</b>	Michter	<b>MD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Well:</b>	Michter N-03HM (C)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	DB_Aug1919_v14

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

<b>Site</b>	Michter				
<b>Site Position:</b>		<b>Northing:</b>	14,454,962.42 usft	<b>Latitude:</b>	39.80272253
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,697,325.45 usft	<b>Longitude:</b>	-80.79737330
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.130 °

<b>Well</b>	Michter N-03HM (C)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	14,455,042.50 usft	<b>Latitude:</b>	39.80294250
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	1,697,315.68 usft	<b>Longitude:</b>	-80.79740745
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	1,130.00 ft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	6/25/2020	-8.725	66.728	51,844.23100198

<b>Design</b>	Surveys Original Hole				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00		328.769

<b>Survey Program</b>	<b>Date</b>	8/2/2020			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
190.00	809.00	MWD surf (Original Hole)	MWD	MWD - Standard	
872.00	2,644.00	MWD int (Original Hole)	MWD	MWD - Standard	
2,766.00	16,373.00	MWD (Original Hole)	MWD	MWD - Standard	
16,428.00	16,428.00	Projection (Original Hole)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
190.00	0.35	51.430	190.00	0.36	0.45	0.07	0.18	0.18	0.00	
<b>MWD surveys</b>										
234.00	0.31	41.590	234.00	0.53	0.64	0.13	0.16	-0.09	-22.36	
281.00	0.26	29.370	281.00	0.72	0.77	0.22	0.17	-0.11	-26.00	
325.00	0.22	7.490	325.00	0.89	0.83	0.33	0.23	-0.09	-49.73	
372.00	0.26	359.750	372.00	1.09	0.85	0.49	0.11	0.09	-16.47	
416.00	0.22	358.430	416.00	1.27	0.84	0.65	0.09	-0.09	-3.00	



<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Michter N-03HM (C)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Site:</b>	Michter	<b>MD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Well:</b>	Michter N-03HM (C)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	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)
463.00	0.18	14.960	463.00	1.44	0.86	0.78	0.15	-0.09	35.17
506.00	0.22	2.650	506.00	1.58	0.88	0.90	0.14	0.09	-28.63
553.00	0.21	353.860	553.00	1.76	0.88	1.05	0.07	-0.02	-18.70
597.00	0.26	350.340	597.00	1.94	0.85	1.22	0.12	0.11	-8.00
623.00	0.17	355.880	622.99	2.03	0.84	1.30	0.35	-0.35	21.31
688.00	0.13	11.880	687.99	2.20	0.85	1.44	0.09	-0.06	24.62
735.00	0.08	354.120	734.99	2.29	0.85	1.51	0.13	-0.11	-37.79
777.00	0.13	336.720	776.99	2.36	0.83	1.59	0.14	0.12	-41.43
809.00	0.08	57.670	808.99	2.41	0.84	1.62	0.44	-0.16	252.97
872.00	0.18	152.600	871.99	2.34	0.92	1.53	0.32	0.16	150.68
967.00	0.31	152.600	966.99	1.98	1.11	1.12	0.14	0.14	0.00
1,061.00	0.40	169.470	1,060.99	1.43	1.28	0.56	0.15	0.10	17.95
1,156.00	0.66	157.780	1,155.99	0.60	1.55	-0.29	0.30	0.27	-12.31
1,251.00	0.40	163.670	1,250.98	-0.23	1.85	-1.15	0.28	-0.27	6.20
1,345.00	0.40	167.010	1,344.98	-0.86	2.02	-1.78	0.02	0.00	3.55
1,440.00	0.61	168.320	1,439.98	-1.68	2.19	-2.57	0.22	0.22	1.38
1,535.00	1.01	176.670	1,534.97	-3.01	2.34	-3.79	0.44	0.42	8.79
1,630.00	1.97	172.540	1,629.93	-5.46	2.61	-6.02	1.02	1.01	-4.35
1,724.00	2.76	163.230	1,723.85	-9.23	3.47	-9.69	0.93	0.84	-9.90
1,819.00	3.55	142.040	1,818.71	-13.74	5.94	-14.83	1.47	0.83	-22.31
1,914.00	3.99	131.940	1,913.51	-18.27	10.20	-20.91	0.84	0.46	-10.63
2,009.00	3.77	128.160	2,008.29	-22.41	15.12	-27.00	0.36	-0.23	-3.98
2,104.00	2.98	127.890	2,103.12	-25.86	19.52	-32.23	0.83	-0.83	-0.28
2,198.00	2.72	137.030	2,197.01	-28.99	22.97	-36.70	0.56	-0.28	9.72
2,293.00	2.90	145.650	2,291.89	-32.62	25.86	-41.30	0.48	0.19	9.07
2,388.00	3.25	143.980	2,386.76	-36.78	28.80	-46.39	0.38	0.37	-1.76
2,483.00	3.56	142.490	2,481.59	-41.30	32.18	-52.00	0.34	0.33	-1.57
2,577.00	3.08	133.700	2,575.43	-45.36	35.79	-57.34	0.74	-0.51	-9.35
2,644.00	2.90	128.070	2,642.34	-47.65	38.42	-60.67	0.51	-0.27	-8.40
2,766.00	2.90	129.210	2,764.19	-51.50	43.24	-66.46	0.05	0.00	0.93
2,861.00	2.98	148.900	2,859.06	-55.14	46.38	-71.20	1.06	0.08	20.73
2,956.00	2.72	143.270	2,953.95	-59.06	49.00	-75.91	0.40	-0.27	-5.93
3,051.00	3.77	133.610	3,048.79	-63.02	52.61	-81.17	1.24	1.11	-10.17
3,145.00	4.96	132.990	3,142.52	-67.92	57.82	-88.06	1.27	1.27	-0.66
3,240.00	8.30	127.280	3,236.87	-74.88	66.29	-98.40	3.58	3.52	-6.01
3,335.00	11.33	124.470	3,330.47	-84.31	79.44	-113.28	3.23	3.19	-2.96
3,429.00	13.89	123.330	3,422.19	-95.74	96.48	-131.89	2.74	2.72	-1.21
3,524.00	17.09	130.800	3,513.74	-111.13	116.58	-155.48	3.96	3.37	7.86
3,619.00	20.08	131.240	3,603.78	-131.01	139.42	-184.31	3.15	3.15	0.46
3,713.00	23.99	130.360	3,690.89	-154.03	166.12	-217.84	4.17	4.16	-0.94
3,808.00	29.62	129.740	3,775.65	-181.57	198.92	-258.39	5.93	5.93	-0.65
3,903.00	34.19	129.220	3,856.28	-213.47	237.67	-305.77	4.82	4.81	-0.55
3,998.00	37.27	131.060	3,933.39	-249.25	280.05	-358.34	3.43	3.24	1.94

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Michter N-03HM (C)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Site:</b>	Michter	<b>MD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Well:</b>	Michter N-03HM (C)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	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)
4,093.00	37.04	130.620	4,009.11	-286.78	323.46	-412.93	0.37	-0.24	-0.46
4,187.00	37.00	130.000	4,084.16	-323.39	366.62	-466.61	0.40	-0.04	-0.66
4,282.00	37.44	129.210	4,159.81	-360.02	410.89	-520.89	0.68	0.46	-0.83
4,377.00	37.48	130.970	4,235.22	-397.23	455.09	-575.62	1.13	0.04	1.85
4,471.00	37.17	131.500	4,309.97	-434.79	497.95	-629.97	0.48	-0.33	0.56
4,566.00	37.04	131.150	4,385.74	-472.64	540.99	-684.64	0.26	-0.14	-0.37
4,661.00	37.44	130.090	4,461.37	-510.06	584.63	-739.27	0.80	0.42	-1.12
4,756.00	38.05	129.210	4,536.49	-547.17	629.40	-794.21	0.86	0.64	-0.93
4,851.00	37.79	130.180	4,611.43	-584.45	674.33	-849.39	0.68	-0.27	1.02
4,945.00	37.35	129.480	4,685.94	-621.17	718.34	-903.60	0.65	-0.47	-0.74
5,040.00	37.00	130.100	4,761.63	-657.90	762.45	-957.88	0.54	-0.37	0.65
5,135.00	36.65	130.970	4,837.68	-694.91	805.72	-1,011.96	0.66	-0.37	0.92
5,230.00	36.83	130.970	4,913.81	-732.17	848.63	-1,066.07	0.19	0.19	0.00
5,324.00	37.40	129.740	4,988.76	-768.89	891.86	-1,119.88	1.00	0.61	-1.31
5,372.00	37.30	128.860	5,026.92	-787.33	914.39	-1,147.34	1.13	-0.21	-1.83
5,452.00	33.80	129.130	5,092.00	-816.59	950.54	-1,191.10	4.38	-4.38	0.34
5,517.00	32.66	128.340	5,146.37	-838.88	978.32	-1,224.56	1.88	-1.75	-1.22
5,565.00	32.44	128.160	5,186.83	-854.87	998.60	-1,248.75	0.50	-0.46	-0.38
5,612.00	32.22	126.670	5,226.55	-870.14	1,018.56	-1,272.16	1.76	-0.47	-3.17
5,659.00	31.74	126.140	5,266.41	-884.92	1,038.60	-1,295.18	1.18	-1.02	-1.13
5,706.00	27.96	121.220	5,307.18	-897.93	1,058.01	-1,316.37	9.58	-8.04	-10.47
5,754.00	25.01	116.120	5,350.14	-908.23	1,076.75	-1,334.90	7.76	-6.15	-10.63
5,801.00	22.77	111.810	5,393.11	-915.98	1,094.12	-1,350.53	6.04	-4.77	-9.17
5,849.00	21.67	105.050	5,437.56	-921.74	1,111.31	-1,364.36	5.79	-2.29	-14.08
5,896.00	20.18	98.630	5,481.46	-925.21	1,127.70	-1,375.83	5.81	-3.17	-13.66
5,943.00	18.96	92.390	5,525.75	-926.74	1,143.35	-1,385.26	5.15	-2.60	-13.28
5,990.00	17.27	86.850	5,570.42	-926.68	1,157.95	-1,392.77	5.13	-3.60	-11.79
6,038.00	15.78	78.940	5,616.44	-925.03	1,171.47	-1,398.38	5.62	-3.10	-16.48
6,085.00	15.47	69.100	5,661.71	-921.57	1,183.60	-1,401.70	5.67	-0.66	-20.94
6,132.00	15.74	54.680	5,707.00	-915.65	1,194.66	-1,402.37	8.25	0.57	-30.68
6,179.00	17.14	38.070	5,752.10	-906.50	1,204.14	-1,399.47	10.40	2.98	-35.34
6,227.00	19.69	23.750	5,797.66	-893.53	1,211.76	-1,392.33	10.78	5.31	-29.83
6,274.00	22.46	12.230	5,841.53	-877.49	1,216.86	-1,381.26	10.58	5.89	-24.51
6,321.00	25.05	1.340	5,884.57	-858.76	1,218.99	-1,366.35	10.82	5.51	-23.17
6,368.00	28.48	350.170	5,926.55	-837.75	1,217.31	-1,347.51	12.93	7.30	-23.77
6,416.00	31.87	340.150	5,968.07	-814.53	1,211.05	-1,324.41	12.63	7.06	-20.88
6,463.00	34.95	337.170	6,007.30	-790.45	1,201.61	-1,298.92	7.42	6.55	-6.34
6,511.00	36.88	333.120	6,046.18	-764.92	1,189.76	-1,270.95	6.37	4.02	-8.44
6,558.00	41.45	332.600	6,082.61	-738.52	1,176.22	-1,241.35	9.75	9.72	-1.11
6,606.00	46.11	331.800	6,117.26	-709.15	1,160.72	-1,208.21	9.78	9.71	-1.67
6,653.00	50.73	332.330	6,148.44	-678.10	1,144.26	-1,173.12	9.87	9.83	1.13
6,700.00	55.82	330.750	6,176.54	-645.00	1,126.30	-1,135.51	11.16	10.83	-3.36
6,747.00	58.42	329.520	6,202.05	-610.78	1,106.64	-1,096.05	5.95	5.53	-2.62
6,795.00	62.99	328.380	6,225.53	-574.93	1,085.05	-1,054.20	9.74	9.52	-2.38



<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Michter N-03HM (C)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Site:</b>	Michter	<b>MD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Well:</b>	Michter N-03HM (C)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	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)	
6,842.00	66.64	327.670	6,245.53	-538.86	1,062.53	-1,011.68	7.89	7.77	-1.51	
6,890.00	70.77	327.670	6,262.96	-501.08	1,038.62	-966.98	8.60	8.60	0.00	
6,937.00	73.98	326.880	6,277.19	-463.40	1,014.40	-922.20	7.02	6.83	-1.68	
6,985.00	76.18	326.440	6,289.55	-424.66	988.91	-875.86	4.67	4.58	-0.92	
7,032.00	78.24	325.740	6,299.95	-386.62	963.34	-830.08	4.62	4.38	-1.49	
7,079.00	80.53	325.480	6,308.61	-348.50	937.25	-783.95	4.90	4.87	-0.55	
7,126.00	83.03	324.160	6,315.33	-310.49	910.45	-737.55	6.00	5.32	-2.81	
7,174.00	85.19	323.980	6,320.25	-271.83	882.43	-689.97	4.52	4.50	-0.38	
7,221.00	85.76	323.890	6,323.96	-233.95	854.85	-643.28	1.23	1.21	-0.19	
7,269.00	88.31	323.980	6,326.44	-195.21	826.63	-595.52	5.32	5.31	0.19	
7,363.00	91.21	322.930	6,326.84	-119.70	770.67	-501.94	3.28	3.09	-1.12	
7,458.00	89.89	322.310	6,325.93	-44.22	713.00	-407.49	1.54	-1.39	-0.65	
7,553.00	89.93	322.660	6,326.08	31.14	655.15	-313.06	0.37	0.04	0.37	
7,648.00	90.24	322.050	6,325.93	106.36	597.12	-218.66	0.72	0.33	-0.64	
7,743.00	89.49	324.770	6,326.16	182.63	540.50	-124.08	2.97	-0.79	2.86	
7,837.00	89.76	324.510	6,326.77	259.29	486.10	-30.33	0.40	0.29	-0.28	
7,932.00	90.07	324.770	6,326.91	336.76	431.13	64.43	0.43	0.33	0.27	
8,027.00	90.46	324.770	6,326.47	414.36	376.33	159.19	0.41	0.41	0.00	
8,122.00	90.90	324.680	6,325.35	491.91	321.47	253.95	0.47	0.46	-0.09	
8,216.00	91.30	323.890	6,323.54	568.22	266.61	347.64	0.94	0.43	-0.84	
8,311.00	90.37	327.060	6,322.16	646.47	212.78	442.46	3.48	-0.98	3.34	
8,406.00	90.59	327.850	6,321.36	726.55	161.67	537.43	0.86	0.23	0.83	
8,501.00	90.95	328.990	6,320.09	807.47	111.93	632.42	1.26	0.38	1.20	
8,595.00	90.77	325.920	6,318.67	886.69	61.37	726.38	3.27	-0.19	-3.27	
8,690.00	91.56	325.300	6,316.74	965.07	7.72	821.21	1.06	0.83	-0.65	
8,785.00	89.93	325.390	6,315.51	1,043.21	-46.29	916.03	1.72	-1.72	0.09	
8,879.00	90.20	325.120	6,315.40	1,120.45	-99.86	1,009.85	0.41	0.29	-0.29	
8,974.00	90.81	325.210	6,314.56	1,198.42	-154.13	1,104.66	0.65	0.64	0.09	
9,069.00	91.12	325.650	6,312.96	1,276.63	-208.02	1,199.49	0.57	0.33	0.46	
9,164.00	91.56	325.480	6,310.74	1,354.96	-261.73	1,294.31	0.50	0.46	-0.18	
9,258.00	92.26	324.950	6,307.61	1,432.12	-315.32	1,388.08	0.93	0.74	-0.56	
9,353.00	90.42	326.090	6,305.39	1,510.41	-369.09	1,482.89	2.28	-1.94	1.20	
9,448.00	90.77	326.350	6,304.40	1,589.36	-421.90	1,577.79	0.46	0.37	0.27	
9,543.00	90.37	324.250	6,303.46	1,667.46	-475.98	1,672.61	2.25	-0.42	-2.21	
9,637.00	91.03	323.890	6,302.31	1,743.57	-531.13	1,766.29	0.80	0.70	-0.38	
9,732.00	88.70	322.840	6,302.53	1,819.80	-587.82	1,860.86	2.69	-2.45	-1.11	
9,826.00	89.27	322.580	6,304.20	1,894.57	-644.76	1,954.31	0.67	0.61	-0.28	
9,920.00	90.29	322.840	6,304.56	1,969.35	-701.71	2,047.79	1.12	1.09	0.28	
10,015.00	91.16	324.600	6,303.36	2,045.92	-757.91	2,142.41	2.07	0.92	1.85	
10,110.00	91.65	324.860	6,301.03	2,123.46	-812.75	2,237.14	0.58	0.52	0.27	
10,204.00	89.67	324.420	6,299.94	2,200.11	-867.15	2,330.89	2.16	-2.11	-0.47	
10,298.00	89.93	324.160	6,300.27	2,276.44	-922.01	2,424.60	0.39	0.28	-0.28	
10,393.00	90.29	324.510	6,300.09	2,353.62	-977.40	2,519.31	0.53	0.38	0.37	

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Michter N-03HM (C)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Site:</b>	Michter	<b>MD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Well:</b>	Michter N-03HM (C)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	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)	
10,488.00	91.16	324.160	6,298.89	2,430.79	-1,032.79	2,614.02	0.99	0.92	-0.37	
10,582.00	90.90	324.250	6,297.20	2,507.03	-1,087.76	2,707.71	0.29	-0.28	0.10	
10,677.00	91.60	323.810	6,295.12	2,583.89	-1,143.54	2,802.36	0.87	0.74	-0.46	
10,772.00	89.80	324.860	6,293.96	2,661.07	-1,198.92	2,897.06	2.19	-1.89	1.11	
10,866.00	90.24	325.120	6,293.93	2,738.06	-1,252.85	2,990.86	0.54	0.47	0.28	
10,961.00	89.85	325.480	6,293.86	2,816.16	-1,306.93	3,085.68	0.56	-0.41	0.38	
11,056.00	90.46	324.510	6,293.60	2,893.97	-1,361.43	3,180.48	1.21	0.64	-1.02	
11,150.00	89.71	324.770	6,293.46	2,970.63	-1,415.83	3,274.23	0.84	-0.80	0.28	
11,245.00	90.33	323.980	6,293.43	3,047.85	-1,471.16	3,368.95	1.06	0.65	-0.83	
11,340.00	90.02	326.000	6,293.14	3,125.66	-1,525.66	3,463.74	2.15	-0.33	2.13	
11,435.00	90.81	325.390	6,292.45	3,204.13	-1,579.20	3,558.60	1.05	0.83	-0.64	
11,529.00	89.85	326.350	6,291.91	3,281.94	-1,631.94	3,652.47	1.44	-1.02	1.02	
11,624.00	90.20	327.230	6,291.87	3,361.42	-1,683.97	3,747.42	1.00	0.37	0.93	
11,719.00	90.95	327.230	6,290.91	3,441.29	-1,735.39	3,842.38	0.79	0.79	0.00	
11,814.00	89.58	325.740	6,290.47	3,520.49	-1,787.84	3,937.30	2.13	-1.44	-1.57	
11,908.00	89.80	325.920	6,290.98	3,598.27	-1,840.64	4,031.17	0.30	0.23	0.19	
12,003.00	90.64	325.300	6,290.62	3,676.66	-1,894.29	4,126.02	1.10	0.88	-0.65	
12,098.00	89.01	324.250	6,290.91	3,754.26	-1,949.09	4,220.79	2.04	-1.72	-1.11	
12,192.00	89.36	324.160	6,292.24	3,830.50	-2,004.06	4,314.48	0.38	0.37	-0.10	
12,287.00	89.93	323.890	6,292.83	3,907.38	-2,059.86	4,409.15	0.66	0.60	-0.28	
12,382.00	90.81	323.370	6,292.22	3,983.87	-2,116.20	4,503.77	1.08	0.93	-0.55	
12,477.00	89.19	323.980	6,292.22	4,060.40	-2,172.47	4,598.39	1.82	-1.71	0.64	
12,572.00	90.15	323.980	6,292.77	4,137.24	-2,228.33	4,693.05	1.01	1.01	0.00	
12,666.00	91.38	324.770	6,291.51	4,213.64	-2,283.08	4,786.77	1.56	1.31	0.84	
12,761.00	90.15	325.560	6,290.24	4,291.61	-2,337.34	4,881.57	1.54	-1.29	0.83	
12,855.00	90.77	325.480	6,289.49	4,369.09	-2,390.55	4,975.41	0.67	0.66	-0.09	
12,950.00	91.43	325.210	6,287.66	4,447.22	-2,444.56	5,070.23	0.75	0.69	-0.28	
13,045.00	89.89	325.480	6,286.57	4,525.36	-2,498.58	5,165.05	1.65	-1.62	0.28	
13,140.00	90.29	325.040	6,286.42	4,603.42	-2,552.71	5,259.87	0.63	0.42	-0.46	
13,234.00	91.30	324.770	6,285.12	4,680.33	-2,606.75	5,353.65	1.11	1.07	-0.29	
13,329.00	90.07	326.620	6,283.98	4,758.79	-2,660.29	5,448.50	2.34	-1.29	1.95	
13,424.00	90.59	326.270	6,283.43	4,837.96	-2,712.79	5,543.42	0.66	0.55	-0.37	
13,518.00	91.43	326.090	6,281.78	4,916.04	-2,765.10	5,637.30	0.91	0.89	-0.19	
13,613.00	89.32	326.270	6,281.16	4,994.96	-2,817.98	5,732.20	2.23	-2.22	0.19	
13,708.00	89.98	325.830	6,281.74	5,073.76	-2,871.03	5,827.09	0.83	0.69	-0.46	
13,802.00	88.13	326.090	6,283.29	5,151.64	-2,923.64	5,920.96	1.99	-1.97	0.28	
13,897.00	88.57	326.180	6,286.02	5,230.49	-2,976.55	6,015.82	0.47	0.46	0.09	
13,993.00	90.64	326.180	6,286.68	5,310.24	-3,029.98	6,111.71	2.16	2.16	0.00	
14,088.00	92.22	325.740	6,284.31	5,388.93	-3,083.14	6,206.57	1.73	1.66	-0.46	
14,183.00	91.08	326.000	6,281.58	5,467.54	-3,136.42	6,301.41	1.23	-1.20	0.27	
14,278.00	90.11	325.300	6,280.59	5,545.96	-3,190.02	6,396.26	1.26	-1.02	-0.74	
14,372.00	91.16	324.250	6,279.55	5,622.75	-3,244.23	6,490.02	1.58	1.12	-1.12	
14,467.00	90.11	324.950	6,278.50	5,700.18	-3,299.26	6,584.76	1.33	-1.11	0.74	



<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Michter N-03HM (C)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Site:</b>	Michter	<b>MD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Well:</b>	Michter N-03HM (C)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	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)
14,562.00	91.30	324.330	6,277.33	5,777.64	-3,354.23	6,679.51	1.41	1.25	-0.65
14,657.00	90.68	323.810	6,275.69	5,854.56	-3,409.97	6,774.17	0.85	-0.65	-0.55
14,752.00	89.89	324.680	6,275.21	5,931.65	-3,465.48	6,868.87	1.24	-0.83	0.92
14,846.00	91.03	325.480	6,274.46	6,008.72	-3,519.28	6,962.67	1.48	1.21	0.85
14,941.00	89.36	325.480	6,274.13	6,086.99	-3,573.12	7,057.51	1.76	-1.76	0.00
15,036.00	90.51	324.860	6,274.24	6,164.97	-3,627.38	7,152.32	1.38	1.21	-0.65
15,131.00	92.31	324.600	6,271.91	6,242.51	-3,682.21	7,247.05	1.91	1.89	-0.27
15,225.00	90.95	325.040	6,269.23	6,319.30	-3,736.35	7,340.79	1.52	-1.45	0.47
15,320.00	89.32	325.920	6,269.01	6,397.57	-3,790.18	7,435.63	1.95	-1.72	0.93
15,415.00	90.55	325.560	6,269.12	6,476.09	-3,843.66	7,530.50	1.35	1.29	-0.38
15,509.00	89.98	324.600	6,268.68	6,553.16	-3,897.47	7,624.30	1.19	-0.61	-1.02
15,604.00	91.65	323.890	6,267.33	6,630.24	-3,952.97	7,718.99	1.91	1.76	-0.75
15,699.00	90.64	324.070	6,265.43	6,707.07	-4,008.82	7,813.64	1.08	-1.06	0.19
15,794.00	89.80	324.950	6,265.07	6,784.41	-4,063.97	7,908.37	1.28	-0.88	0.93
15,888.00	91.25	324.860	6,264.20	6,861.32	-4,118.01	8,002.15	1.55	1.54	-0.10
15,983.00	89.45	324.510	6,263.62	6,938.83	-4,172.93	8,096.90	1.93	-1.89	-0.37
16,078.00	90.37	323.720	6,263.77	7,015.80	-4,228.61	8,191.59	1.28	0.97	-0.83
16,173.00	91.21	323.890	6,262.46	7,092.46	-4,284.71	8,286.22	0.90	0.88	0.18
16,268.00	89.85	323.540	6,261.59	7,169.03	-4,340.92	8,380.85	1.48	-1.43	-0.37
16,362.00	90.95	323.370	6,260.93	7,244.55	-4,396.90	8,474.44	1.18	1.17	-0.18
16,373.00	91.16	323.190	6,260.73	7,253.36	-4,403.47	8,485.39	2.51	1.91	-1.64
<b>Survey @ 16373.00 MD 6260.73 TVD</b>									
16,428.00	91.16	323.190	6,259.61	7,297.39	-4,436.42	8,540.12	0.00	0.00	0.00
<b>Survey projected to 16428.00 MD 6259.61 TVD</b>									

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
190.00	190.00	0.36	0.45	MWD surveys
16,373.00	6,260.73	7,253.36	-4,403.47	Survey @ 16373.00 MD 6260.73 TVD

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Michter N-03HM (C)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Site:</b>	Michter	<b>MD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Well:</b>	Michter N-03HM (C)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	DB_Aug1919_v14

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

<b>Site</b>	Michter				
<b>Site Position:</b>		<b>Northing:</b>	14,454,962.42 usft	<b>Latitude:</b>	39.80272253
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,697,325.45 usft	<b>Longitude:</b>	-80.79737330
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.130 °

<b>Well</b>	Michter N-03HM (C)					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	14,455,042.50 usft	<b>Latitude:</b>	39.80294250
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	1,697,315.68 usft	<b>Longitude:</b>	-80.79740745
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	1,130.00 ft

<b>Wellbore</b>	Original Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	6/25/2020	-8.725	66.728	51,844.23100198

<b>Design</b>	Surveys Original Hole				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00		328.769

<b>Survey Program</b>	<b>Date</b>	8/2/2020			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
190.00	809.00	MWD surf (Original Hole)	MWD	MWD - Standard	
872.00	2,644.00	MWD int (Original Hole)	MWD	MWD - Standard	
2,766.00	16,373.00	MWD (Original Hole)	MWD	MWD - Standard	
16,428.00	16,428.00	Projection (Original Hole)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>	
0.00	0.00	0.000	0.00	0.00	0.00	14,455,042.50	1,697,315.68	39.80294250	-80.79740745	
190.00	0.35	51.430	190.00	0.36	0.45	14,455,042.86	1,697,316.13	39.80294349	-80.79740583	
<b>MWD surveys</b>										
234.00	0.31	41.590	234.00	0.53	0.64	14,455,043.03	1,697,316.31	39.80294397	-80.79740518	
281.00	0.26	29.370	281.00	0.72	0.77	14,455,043.22	1,697,316.45	39.80294448	-80.79740469	
325.00	0.22	7.490	325.00	0.89	0.83	14,455,043.39	1,697,316.51	39.80294495	-80.79740447	
372.00	0.26	359.750	372.00	1.09	0.85	14,455,043.59	1,697,316.52	39.80294549	-80.79740443	
416.00	0.22	358.430	416.00	1.27	0.84	14,455,043.77	1,697,316.52	39.80294599	-80.79740444	
463.00	0.18	14.960	463.00	1.44	0.86	14,455,043.93	1,697,316.54	39.80294644	-80.79740438	



<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Michter N-03HM (C)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Site:</b>	Michter	<b>MD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Well:</b>	Michter N-03HM (C)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	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	
506.00	0.22	2.650	506.00	1.58	0.88	14,455,044.08	1,697,316.56	39.80294684	-80.79740430	
553.00	0.21	353.860	553.00	1.76	0.88	14,455,044.26	1,697,316.55	39.80294733	-80.79740432	
597.00	0.26	350.340	597.00	1.94	0.85	14,455,044.44	1,697,316.53	39.80294782	-80.79740441	
623.00	0.17	355.880	622.99	2.03	0.84	14,455,044.53	1,697,316.51	39.80294808	-80.79740445	
688.00	0.13	11.880	687.99	2.20	0.85	14,455,044.70	1,697,316.52	39.80294854	-80.79740442	
735.00	0.08	354.120	734.99	2.29	0.85	14,455,044.79	1,697,316.53	39.80294878	-80.79740439	
777.00	0.13	336.720	776.99	2.36	0.83	14,455,044.86	1,697,316.51	39.80294898	-80.79740447	
809.00	0.08	57.670	808.99	2.41	0.84	14,455,044.90	1,697,316.51	39.80294910	-80.79740445	
872.00	0.18	152.600	871.99	2.34	0.92	14,455,044.84	1,697,316.59	39.80294893	-80.79740416	
967.00	0.31	152.600	966.99	1.98	1.11	14,455,044.48	1,697,316.78	39.80294793	-80.79740350	
1,061.00	0.40	169.470	1,060.99	1.43	1.28	14,455,043.93	1,697,316.96	39.80294643	-80.79740287	
1,156.00	0.66	157.780	1,155.99	0.60	1.55	14,455,043.10	1,697,317.23	39.80294414	-80.79740193	
1,251.00	0.40	163.670	1,250.98	-0.23	1.85	14,455,042.27	1,697,317.53	39.80294187	-80.79740086	
1,345.00	0.40	167.010	1,344.98	-0.86	2.02	14,455,041.64	1,697,317.69	39.80294013	-80.79740028	
1,440.00	0.61	168.320	1,439.98	-1.68	2.19	14,455,040.82	1,697,317.87	39.80293788	-80.79739965	
1,535.00	1.01	176.670	1,534.97	-3.01	2.34	14,455,039.49	1,697,318.02	39.80293422	-80.79739913	
1,630.00	1.97	172.540	1,629.93	-5.46	2.61	14,455,037.03	1,697,318.28	39.80292748	-80.79739822	
1,724.00	2.76	163.230	1,723.85	-9.23	3.47	14,455,033.26	1,697,319.14	39.80291712	-80.79739518	
1,819.00	3.55	142.040	1,818.71	-13.74	5.94	14,455,028.76	1,697,321.61	39.80290472	-80.79738642	
1,914.00	3.99	131.940	1,913.51	-18.27	10.20	14,455,024.23	1,697,325.88	39.80289226	-80.79737126	
2,009.00	3.77	128.160	2,008.29	-22.41	15.12	14,455,020.09	1,697,330.79	39.80288087	-80.79735380	
2,104.00	2.98	127.890	2,103.12	-25.86	19.52	14,455,016.64	1,697,335.20	39.80287137	-80.79733814	
2,198.00	2.72	137.030	2,197.01	-28.99	22.97	14,455,013.51	1,697,338.65	39.80286275	-80.79732589	
2,293.00	2.90	145.650	2,291.89	-32.62	25.86	14,455,009.88	1,697,341.54	39.80285275	-80.79731562	
2,388.00	3.25	143.980	2,386.76	-36.78	28.80	14,455,005.71	1,697,344.48	39.80284131	-80.79730519	
2,483.00	3.56	142.490	2,481.59	-41.30	32.18	14,455,001.20	1,697,347.86	39.80282888	-80.79729319	
2,577.00	3.08	133.700	2,575.43	-45.36	35.79	14,454,997.14	1,697,351.46	39.80281771	-80.79728040	
2,644.00	2.90	128.070	2,642.34	-47.65	38.42	14,454,994.85	1,697,354.10	39.80281140	-80.79727103	
2,766.00	2.90	129.210	2,764.19	-51.50	43.24	14,454,990.99	1,697,358.92	39.80280079	-80.79725390	
2,861.00	2.98	148.900	2,859.06	-55.14	46.38	14,454,987.36	1,697,362.06	39.80279079	-80.79724275	
2,956.00	2.72	143.270	2,953.95	-59.06	49.00	14,454,983.44	1,697,364.68	39.80278001	-80.79723344	
3,051.00	3.77	133.610	3,048.79	-63.02	52.61	14,454,979.48	1,697,368.29	39.80276911	-80.79722062	
3,145.00	4.96	132.990	3,142.52	-67.92	57.82	14,454,974.58	1,697,373.50	39.80275561	-80.79720211	
3,240.00	8.30	127.280	3,236.87	-74.88	66.29	14,454,967.62	1,697,381.96	39.80273646	-80.79717204	
3,335.00	11.33	124.470	3,330.47	-84.31	79.44	14,454,958.18	1,697,395.11	39.80271046	-80.79712529	
3,429.00	13.89	123.330	3,422.19	-95.74	96.48	14,454,946.76	1,697,412.16	39.80267897	-80.79706470	
3,524.00	17.09	130.800	3,513.74	-111.13	116.58	14,454,931.36	1,697,432.26	39.80263657	-80.79699325	
3,619.00	20.08	131.240	3,603.78	-131.01	139.42	14,454,911.49	1,697,455.09	39.80258184	-80.79691211	
3,713.00	23.99	130.360	3,690.89	-154.03	166.12	14,454,888.47	1,697,481.80	39.80251846	-80.79681721	
3,808.00	29.62	129.740	3,775.65	-181.57	198.92	14,454,860.93	1,697,514.59	39.80244263	-80.79670066	
3,903.00	34.19	129.220	3,856.28	-213.47	237.67	14,454,829.03	1,697,553.35	39.80235477	-80.79656295	
3,998.00	37.27	131.060	3,933.39	-249.25	280.05	14,454,793.25	1,697,595.72	39.80225624	-80.79641234	
4,093.00	37.04	130.620	4,009.11	-286.78	323.46	14,454,755.72	1,697,639.13	39.80215292	-80.79625809	
4,187.00	37.00	130.000	4,084.16	-323.39	366.62	14,454,719.11	1,697,682.29	39.80205210	-80.79610473	
4,282.00	37.44	129.210	4,159.81	-360.02	410.89	14,454,682.48	1,697,726.56	39.80195123	-80.79594739	
4,377.00	37.48	130.970	4,235.22	-397.23	455.09	14,454,645.27	1,697,770.76	39.80184877	-80.79579032	
4,471.00	37.17	131.500	4,309.97	-434.79	497.95	14,454,607.71	1,697,813.62	39.80174534	-80.79563802	
4,566.00	37.04	131.150	4,385.74	-472.64	540.99	14,454,569.86	1,697,856.66	39.80164113	-80.79548509	
4,661.00	37.44	130.090	4,461.37	-510.06	584.63	14,454,532.44	1,697,900.30	39.80153808	-80.79533002	
4,756.00	38.05	129.210	4,536.49	-547.17	629.40	14,454,495.33	1,697,945.08	39.80143590	-80.79517090	
4,851.00	37.79	130.180	4,611.43	-584.45	674.33	14,454,458.04	1,697,990.00	39.80133322	-80.79501126	
4,945.00	37.35	129.480	4,685.94	-621.17	718.34	14,454,421.33	1,698,034.01	39.80123212	-80.79485485	
5,040.00	37.00	130.100	4,761.63	-657.90	762.45	14,454,384.60	1,698,078.12	39.80113096	-80.79469810	
5,135.00	36.65	130.970	4,837.68	-694.91	805.72	14,454,347.59	1,698,121.40	39.80102906	-80.79454433	
5,230.00	36.83	130.970	4,913.81	-732.17	848.63	14,454,310.33	1,698,164.30	39.80092647	-80.79439186	



<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Michter N-03HM (C)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Site:</b>	Michter	<b>MD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Well:</b>	Michter N-03HM (C)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	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	
5,324.00	37.40	129.740	4,988.76	-768.89	891.86	14,454,273.61	1,698,207.53	39.80082534	-80.79423826	
5,372.00	37.30	128.860	5,026.92	-787.33	914.39	14,454,255.17	1,698,230.06	39.80077455	-80.79415818	
5,452.00	33.80	129.130	5,092.00	-816.59	950.54	14,454,225.91	1,698,266.21	39.80069396	-80.79402972	
5,517.00	32.66	128.340	5,146.37	-838.88	978.32	14,454,203.62	1,698,293.99	39.80063257	-80.79393099	
5,565.00	32.44	128.160	5,186.83	-854.87	998.60	14,454,187.63	1,698,314.27	39.80058853	-80.79385891	
5,612.00	32.22	126.670	5,226.55	-870.14	1,018.56	14,454,172.36	1,698,334.24	39.80054647	-80.79378796	
5,659.00	31.74	126.140	5,266.41	-884.92	1,038.60	14,454,157.58	1,698,354.27	39.80050577	-80.79371676	
5,706.00	27.96	121.220	5,307.18	-897.93	1,058.01	14,454,144.57	1,698,373.69	39.80046992	-80.79364773	
5,754.00	25.01	116.120	5,350.14	-908.23	1,076.75	14,454,134.27	1,698,392.43	39.80044151	-80.79358110	
5,801.00	22.77	111.810	5,393.11	-915.98	1,094.12	14,454,126.52	1,698,409.79	39.80042010	-80.79351932	
5,849.00	21.67	105.050	5,437.56	-921.74	1,111.31	14,454,120.76	1,698,426.98	39.80040419	-80.79345818	
5,896.00	20.18	98.630	5,481.46	-925.21	1,127.70	14,454,117.29	1,698,443.38	39.80039456	-80.79339982	
5,943.00	18.96	92.390	5,525.75	-926.74	1,143.35	14,454,115.76	1,698,459.02	39.80039024	-80.79334413	
5,990.00	17.27	86.850	5,570.42	-926.68	1,157.95	14,454,115.82	1,698,473.62	39.80039033	-80.79329216	
6,038.00	15.78	78.940	5,616.44	-925.03	1,171.47	14,454,117.47	1,698,487.14	39.80039476	-80.79324400	
6,085.00	15.47	69.100	5,661.71	-921.57	1,183.60	14,454,120.93	1,698,499.27	39.80040419	-80.79320079	
6,132.00	15.74	54.680	5,707.00	-915.65	1,194.66	14,454,126.85	1,698,510.33	39.80042039	-80.79316135	
6,179.00	17.14	38.070	5,752.10	-906.50	1,204.14	14,454,136.00	1,698,519.81	39.80044544	-80.79312753	
6,227.00	19.69	23.750	5,797.66	-893.53	1,211.76	14,454,148.97	1,698,527.43	39.80048103	-80.79310028	
6,274.00	22.46	12.230	5,841.53	-877.49	1,216.86	14,454,165.01	1,698,532.53	39.80052503	-80.79308202	
6,321.00	25.05	1.340	5,884.57	-858.76	1,218.99	14,454,183.74	1,698,534.66	39.80057646	-80.79307426	
6,368.00	28.48	350.170	5,926.55	-837.75	1,217.31	14,454,204.75	1,698,532.98	39.80063417	-80.79308007	
6,416.00	31.87	340.150	5,968.07	-814.53	1,211.05	14,454,227.97	1,698,526.72	39.80069797	-80.79310218	
6,463.00	34.95	337.170	6,007.30	-790.45	1,201.61	14,454,252.05	1,698,517.28	39.80076417	-80.79313559	
6,511.00	36.88	333.120	6,046.18	-764.92	1,189.76	14,454,277.58	1,698,505.43	39.80083435	-80.79317757	
6,558.00	41.45	332.600	6,082.61	-738.52	1,176.22	14,454,303.98	1,698,491.89	39.80090695	-80.79322557	
6,606.00	46.11	331.800	6,117.26	-709.15	1,160.72	14,454,333.34	1,698,476.40	39.80098769	-80.79328049	
6,653.00	50.73	332.330	6,148.44	-678.10	1,144.26	14,454,364.40	1,698,459.94	39.80107308	-80.79333884	
6,700.00	55.82	330.750	6,176.54	-645.00	1,126.30	14,454,397.50	1,698,441.97	39.80116409	-80.79340252	
6,747.00	58.42	329.520	6,202.05	-610.78	1,106.64	14,454,431.72	1,698,422.32	39.80125819	-80.79347223	
6,795.00	62.99	328.380	6,225.53	-574.93	1,085.05	14,454,467.57	1,698,400.72	39.80135678	-80.79354881	
6,842.00	66.64	327.670	6,245.53	-538.86	1,062.53	14,454,503.64	1,698,378.20	39.80145598	-80.79362871	
6,890.00	70.77	327.670	6,262.96	-501.08	1,038.62	14,454,541.42	1,698,354.29	39.80155989	-80.79371353	
6,937.00	73.98	326.880	6,277.19	-463.40	1,014.40	14,454,579.10	1,698,330.07	39.80166351	-80.79379944	
6,985.00	76.18	326.440	6,289.55	-424.66	988.91	14,454,617.84	1,698,304.58	39.80177008	-80.79388988	
7,032.00	78.24	325.740	6,299.95	-386.62	963.34	14,454,655.88	1,698,279.01	39.80187470	-80.79398061	
7,079.00	80.53	325.480	6,308.61	-348.50	937.25	14,454,694.00	1,698,252.92	39.80197955	-80.79407320	
7,126.00	83.03	324.160	6,315.33	-310.49	910.45	14,454,732.01	1,698,226.12	39.80208412	-80.79416830	
7,174.00	85.19	323.980	6,320.25	-271.83	882.43	14,454,770.67	1,698,198.11	39.80219046	-80.79426774	
7,221.00	85.76	323.890	6,323.96	-233.95	854.85	14,454,808.54	1,698,170.53	39.80229465	-80.79436564	
7,269.00	88.31	323.980	6,326.44	-195.21	826.63	14,454,847.29	1,698,142.31	39.80240123	-80.79446579	
7,363.00	91.21	322.930	6,326.84	-119.70	770.67	14,454,922.80	1,698,086.34	39.80260895	-80.79466444	
7,458.00	89.89	322.310	6,325.93	-44.22	713.00	14,454,998.28	1,698,028.67	39.80281661	-80.79486916	
7,553.00	89.93	322.660	6,326.08	31.14	655.15	14,455,073.64	1,697,970.82	39.80302392	-80.79507452	
7,648.00	90.24	322.050	6,325.93	106.36	597.12	14,455,148.86	1,697,912.80	39.80323086	-80.79528050	
7,743.00	89.49	324.770	6,326.16	182.63	540.50	14,455,225.13	1,697,856.18	39.80344067	-80.79548149	
7,837.00	89.76	324.510	6,326.77	259.29	486.10	14,455,301.78	1,697,801.78	39.80365154	-80.79567455	
7,932.00	90.07	324.770	6,326.91	336.76	431.13	14,455,379.26	1,697,746.80	39.80386465	-80.79586967	
8,027.00	90.46	324.770	6,326.47	414.36	376.33	14,455,456.86	1,697,692.00	39.80407810	-80.79606417	
8,122.00	90.90	324.680	6,325.35	491.91	321.47	14,455,534.41	1,697,637.14	39.80429142	-80.79625887	
8,216.00	91.30	323.890	6,323.54	568.22	266.61	14,455,610.72	1,697,582.28	39.80450132	-80.79645359	
8,311.00	90.37	327.060	6,322.16	646.47	212.78	14,455,688.97	1,697,528.45	39.80471655	-80.79664463	
8,406.00	90.59	327.850	6,321.36	726.55	161.67	14,455,769.04	1,697,477.35	39.80493679	-80.79682594	
8,501.00	90.95	328.990	6,320.09	807.47	111.93	14,455,849.97	1,697,427.60	39.80515933	-80.79700241	
8,595.00	90.77	325.920	6,318.67	886.69	61.37	14,455,929.19	1,697,377.05	39.80537721	-80.79718179	



<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Michter N-03HM (C)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Site:</b>	Michter	<b>MD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Well:</b>	Michter N-03HM (C)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	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	
8,690.00	91.56	325.300	6,316.74	965.07	7.72	14,456,007.57	1,697,323.40	39.80559279	-80.79737217	
8,785.00	89.93	325.390	6,315.51	1,043.21	-46.29	14,456,085.70	1,697,269.39	39.80580771	-80.79756387	
8,879.00	90.20	325.120	6,315.40	1,120.45	-99.86	14,456,162.94	1,697,215.81	39.80602016	-80.79775400	
8,974.00	90.81	325.210	6,314.56	1,198.42	-154.13	14,456,240.91	1,697,161.55	39.80623463	-80.79794659	
9,069.00	91.12	325.650	6,312.96	1,276.63	-208.02	14,456,319.13	1,697,107.65	39.80644976	-80.79813787	
9,164.00	91.56	325.480	6,310.74	1,354.96	-261.73	14,456,397.46	1,697,053.95	39.80666521	-80.79832847	
9,258.00	92.26	324.950	6,307.61	1,432.12	-315.32	14,456,474.62	1,697,000.35	39.80687744	-80.79851869	
9,353.00	90.42	326.090	6,305.39	1,510.41	-369.09	14,456,552.90	1,696,946.59	39.80709276	-80.79870950	
9,448.00	90.77	326.350	6,304.40	1,589.36	-421.90	14,456,631.86	1,696,893.77	39.80730993	-80.79889694	
9,543.00	90.37	324.250	6,303.46	1,667.46	-475.98	14,456,709.95	1,696,839.70	39.80752473	-80.79908887	
9,637.00	91.03	323.890	6,302.31	1,743.57	-531.13	14,456,786.06	1,696,784.54	39.80773409	-80.79928465	
9,732.00	88.70	322.840	6,302.53	1,819.80	-587.82	14,456,862.29	1,696,727.86	39.80794377	-80.79948588	
9,826.00	89.27	322.580	6,304.20	1,894.57	-644.76	14,456,937.06	1,696,670.92	39.80814947	-80.79968804	
9,920.00	90.29	322.840	6,304.56	1,969.35	-701.71	14,457,011.84	1,696,613.97	39.80835519	-80.79989023	
10,015.00	91.16	324.600	6,303.36	2,045.92	-757.91	14,457,088.42	1,696,557.76	39.80856583	-80.80008976	
10,110.00	91.65	324.860	6,301.03	2,123.46	-812.75	14,457,165.96	1,696,502.92	39.80877910	-80.80028442	
10,204.00	89.67	324.420	6,299.94	2,200.11	-867.15	14,457,242.61	1,696,448.53	39.80898994	-80.80047749	
10,298.00	89.93	324.160	6,300.27	2,276.44	-922.01	14,457,318.93	1,696,393.67	39.80919989	-80.80067226	
10,393.00	90.29	324.510	6,300.09	2,353.62	-977.40	14,457,396.11	1,696,338.28	39.80941218	-80.80086888	
10,488.00	91.16	324.160	6,298.89	2,430.79	-1,032.79	14,457,473.29	1,696,282.89	39.80962446	-80.80106548	
10,582.00	90.90	324.250	6,297.20	2,507.03	-1,087.76	14,457,549.52	1,696,227.92	39.80983415	-80.80126062	
10,677.00	91.60	323.810	6,295.12	2,583.89	-1,143.54	14,457,626.39	1,696,172.14	39.81004559	-80.80145866	
10,772.00	89.80	324.860	6,293.96	2,661.07	-1,198.92	14,457,703.56	1,696,116.75	39.81025786	-80.80165526	
10,866.00	90.24	325.120	6,293.93	2,738.06	-1,252.85	14,457,780.55	1,696,062.83	39.81046963	-80.80184669	
10,961.00	89.85	325.480	6,293.86	2,816.16	-1,306.93	14,457,858.65	1,696,008.74	39.81068445	-80.80203866	
11,056.00	90.46	324.510	6,293.60	2,893.97	-1,361.43	14,457,936.46	1,695,954.25	39.81089847	-80.80223210	
11,150.00	89.71	324.770	6,293.46	2,970.63	-1,415.83	14,458,013.12	1,695,899.85	39.81110933	-80.80242521	
11,245.00	90.33	323.980	6,293.43	3,047.85	-1,471.16	14,458,090.34	1,695,844.52	39.81132173	-80.80262164	
11,340.00	90.02	326.000	6,293.14	3,125.66	-1,525.66	14,458,168.15	1,695,790.02	39.81153573	-80.80281511	
11,435.00	90.81	325.390	6,292.45	3,204.13	-1,579.20	14,458,246.62	1,695,736.48	39.81175156	-80.80300515	
11,529.00	89.85	326.350	6,291.91	3,281.94	-1,631.94	14,458,324.43	1,695,683.74	39.81196556	-80.80319234	
11,624.00	90.20	327.230	6,291.87	3,361.42	-1,683.97	14,458,403.91	1,695,631.71	39.81218415	-80.80337700	
11,719.00	90.95	327.230	6,290.91	3,441.29	-1,735.39	14,458,483.79	1,695,580.29	39.81240382	-80.80355948	
11,814.00	89.58	325.740	6,290.47	3,520.49	-1,787.84	14,458,562.99	1,695,527.84	39.81262165	-80.80374564	
11,908.00	89.80	325.920	6,290.98	3,598.27	-1,840.64	14,458,640.76	1,695,475.04	39.81283555	-80.80393303	
12,003.00	90.64	325.300	6,290.62	3,676.66	-1,894.29	14,458,719.15	1,695,421.39	39.81305116	-80.80412350	
12,098.00	89.01	324.250	6,290.91	3,754.26	-1,949.09	14,458,796.75	1,695,366.59	39.81326460	-80.80431801	
12,192.00	89.36	324.160	6,292.24	3,830.50	-2,004.06	14,458,872.99	1,695,311.62	39.81347429	-80.80451318	
12,287.00	89.93	323.890	6,292.83	3,907.38	-2,059.86	14,458,949.87	1,695,255.82	39.81368576	-80.80471131	
12,382.00	90.81	323.370	6,292.22	3,983.87	-2,116.20	14,459,026.36	1,695,199.48	39.81389616	-80.80491132	
12,477.00	89.19	323.980	6,292.22	4,060.40	-2,172.47	14,459,102.89	1,695,143.21	39.81410669	-80.80511112	
12,572.00	90.15	323.980	6,292.77	4,137.24	-2,228.33	14,459,179.73	1,695,087.35	39.81431803	-80.80530947	
12,666.00	91.38	324.770	6,291.51	4,213.64	-2,283.08	14,459,256.13	1,695,032.60	39.81452817	-80.80550384	
12,761.00	90.15	325.560	6,290.24	4,291.61	-2,337.34	14,459,334.09	1,694,978.34	39.81474261	-80.80569646	
12,855.00	90.77	325.480	6,289.49	4,369.09	-2,390.55	14,459,411.58	1,694,925.13	39.81495572	-80.80588536	
12,950.00	91.43	325.210	6,287.66	4,447.22	-2,444.56	14,459,489.71	1,694,871.12	39.81517061	-80.80607709	
13,045.00	89.89	325.480	6,286.57	4,525.36	-2,498.58	14,459,567.85	1,694,817.10	39.81538552	-80.80626885	
13,140.00	90.29	325.040	6,286.42	4,603.42	-2,552.71	14,459,645.91	1,694,762.97	39.81560023	-80.80646103	
13,234.00	91.30	324.770	6,285.12	4,680.33	-2,606.75	14,459,722.82	1,694,708.93	39.81581174	-80.80665288	
13,329.00	90.07	326.620	6,283.98	4,758.79	-2,660.29	14,459,801.28	1,694,655.40	39.81602754	-80.80684292	
13,424.00	90.59	326.270	6,283.43	4,837.96	-2,712.79	14,459,880.45	1,694,602.89	39.81624527	-80.80702931	
13,518.00	91.43	326.090	6,281.78	4,916.04	-2,765.10	14,459,958.53	1,694,550.58	39.81646001	-80.80721500	
13,613.00	89.32	326.270	6,281.16	4,994.96	-2,817.98	14,460,037.45	1,694,497.70	39.81667705	-80.80740268	
13,708.00	89.98	325.830	6,281.74	5,073.76	-2,871.03	14,460,116.25	1,694,444.65	39.81689378	-80.80759102	
13,802.00	88.13	326.090	6,283.29	5,151.64	-2,923.64	14,460,194.13	1,694,392.04	39.81710796	-80.80777777	



<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Michter N-03HM (C)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Site:</b>	Michter	<b>MD Reference:</b>	RKB=1128+25 @ 1153.00ft (H&P 611)
<b>Well:</b>	Michter N-03HM (C)	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Original Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys Original Hole	<b>Database:</b>	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
13,897.00	88.57	326.180	6,286.02	5,230.49	-2,976.55	14,460,272.98	1,694,339.13	39.81732482	-80.80796562
13,993.00	90.64	326.180	6,286.68	5,310.24	-3,029.98	14,460,352.73	1,694,285.70	39.81754415	-80.80815528
14,088.00	92.22	325.740	6,284.31	5,388.93	-3,083.14	14,460,431.42	1,694,232.54	39.81776058	-80.80834400
14,183.00	91.08	326.000	6,281.58	5,467.54	-3,136.42	14,460,510.03	1,694,179.26	39.81797676	-80.80853314
14,278.00	90.11	325.300	6,280.59	5,545.96	-3,190.02	14,460,588.45	1,694,125.66	39.81819245	-80.80872343
14,372.00	91.16	324.250	6,279.55	5,622.75	-3,244.23	14,460,665.23	1,694,071.45	39.81840363	-80.80891592
14,467.00	90.11	324.950	6,278.50	5,700.18	-3,299.26	14,460,742.66	1,694,016.42	39.81861660	-80.80911130
14,562.00	91.30	324.330	6,277.33	5,777.64	-3,354.23	14,460,820.13	1,693,961.45	39.81882967	-80.80930649
14,657.00	90.68	323.810	6,275.69	5,854.56	-3,409.97	14,460,897.04	1,693,905.71	39.81904122	-80.80950440
14,752.00	89.89	324.680	6,275.21	5,931.65	-3,465.48	14,460,974.14	1,693,850.20	39.81925326	-80.80970150
14,846.00	91.03	325.480	6,274.46	6,008.72	-3,519.28	14,461,051.21	1,693,796.40	39.81946523	-80.80989254
14,941.00	89.36	325.480	6,274.13	6,086.99	-3,573.12	14,461,129.48	1,693,742.56	39.81968049	-80.81008368
15,036.00	90.51	324.860	6,274.24	6,164.97	-3,627.38	14,461,207.46	1,693,688.31	39.81989496	-80.81027632
15,131.00	92.31	324.600	6,271.91	6,242.51	-3,682.21	14,461,284.99	1,693,633.47	39.82010821	-80.81047103
15,225.00	90.95	325.040	6,269.23	6,319.30	-3,736.35	14,461,361.79	1,693,579.34	39.82031943	-80.81066325
15,320.00	89.32	325.920	6,269.01	6,397.57	-3,790.18	14,461,440.06	1,693,525.50	39.82053469	-80.81085438
15,415.00	90.55	325.560	6,269.12	6,476.09	-3,843.66	14,461,518.57	1,693,472.02	39.82075062	-80.81104425
15,509.00	89.98	324.600	6,268.68	6,553.16	-3,897.47	14,461,595.65	1,693,418.22	39.82096260	-80.81123531
15,604.00	91.65	323.890	6,267.33	6,630.24	-3,952.97	14,461,672.73	1,693,362.71	39.82117461	-80.81143240
15,699.00	90.64	324.070	6,265.43	6,707.07	-4,008.82	14,461,749.55	1,693,306.86	39.82138590	-80.81163075
15,794.00	89.80	324.950	6,265.07	6,784.41	-4,063.97	14,461,826.90	1,693,251.71	39.82159864	-80.81182659
15,888.00	91.25	324.860	6,264.20	6,861.32	-4,118.01	14,461,903.80	1,693,197.67	39.82181016	-80.81201848
15,983.00	89.45	324.510	6,263.62	6,938.83	-4,172.93	14,461,981.32	1,693,142.76	39.82202335	-80.81221347
16,078.00	90.37	323.720	6,263.77	7,015.80	-4,228.61	14,462,058.28	1,693,087.07	39.82223504	-80.81241122
16,173.00	91.21	323.890	6,262.46	7,092.46	-4,284.71	14,462,134.94	1,693,030.98	39.82244588	-80.81261043
16,268.00	89.85	323.540	6,261.59	7,169.03	-4,340.92	14,462,211.51	1,692,974.76	39.82265650	-80.81281008
16,362.00	90.95	323.370	6,260.93	7,244.55	-4,396.90	14,462,287.03	1,692,918.79	39.82286420	-80.81300886
16,373.00	91.16	323.190	6,260.73	7,253.36	-4,403.47	14,462,295.85	1,692,912.21	39.82288845	-80.81303222
<b>Survey @ 16373.00 MD 6260.73 TVD</b>									
16,428.00	91.16	323.190	6,259.61	7,297.39	-4,436.42	14,462,339.87	1,692,879.27	39.82300954	-80.81314923
<b>Survey projected to 16428.00 MD 6259.61 TVD</b>									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
190.00	190.00	0.36	0.45	MWD surveys
16,373.00	6,260.73	7,253.36	-4,403.47	Survey @ 16373.00 MD 6260.73 TVD
16,428.00	6,259.61	7,297.39	-4,436.42	Survey projected to 16428.00 MD 6259.61 TVD