

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2W-09HM (slot I)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Site:</b>	Heaven Hill 2	<b>MD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Well:</b>	Heaven Hill 2W-09HM (slot I)	<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_Aug0116_LT_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)		

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<b>Site</b>	Heaven Hill 2		
<b>Site Position:</b>		<b>Northing:</b>	14,457,660.30 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,720,974.97 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	39.80995400
		<b>Longitude:</b>	-80.71313800
		<b>Grid Convergence:</b>	0.18 °

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<b>Well</b>	Heaven Hill 2W-09HM (slot I)		
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b> 14,457,744.19 usft
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b> 1,721,048.83 usft
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	usft
		<b>Latitude:</b>	39.81018372
		<b>Longitude:</b>	-80.71287405
		<b>Ground Level:</b>	1,331.00 usft

<b>Wellbore</b>	Original Hole		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/30/2018	-8.72	66.88	52,056.34994672

<b>Design</b>	Surveys Original Hole		
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<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) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
		0.00	0.00	0.00	165.40

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
60.00	894.00	Gyro (Original Hole)	NS-GYRO-MS	North sensing gyrocompassing m/s
931.00	6,280.00	MWD (Original Hole)	MWD	MWD - Standard
6,350.00	16,354.00	MWD lat (Original Hole)	MWD	MWD - Standard
16,404.00	16,404.00	Projection (Original Hole)	MWD	MWD - Standard

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,457,744.19	1,721,048.83	39.81018372	-80.71287405
60.00	0.45	336.11	60.00	0.22	-0.10	14,457,744.40	1,721,048.73	39.81018431	-80.71287439
<b>Gyro</b>									
90.00	0.24	302.79	90.00	0.36	-0.20	14,457,744.55	1,721,048.63	39.81018470	-80.71287474
120.00	0.28	328.89	120.00	0.45	-0.29	14,457,744.64	1,721,048.54	39.81018497	-80.71287507
150.00	0.28	350.05	150.00	0.59	-0.34	14,457,744.78	1,721,048.49	39.81018534	-80.71287524
180.00	0.35	12.86	180.00	0.75	-0.33	14,457,744.94	1,721,048.50	39.81018579	-80.71287522
210.00	0.35	4.76	210.00	0.93	-0.30	14,457,745.12	1,721,048.52	39.81018628	-80.71287511
240.00	0.36	359.99	240.00	1.12	-0.29	14,457,745.30	1,721,048.53	39.81018679	-80.71287508

**Company:** Tug Hill Operating LLC  
**Project:** Marshall County, West Virginia  
**Site:** Heaven Hill 2  
**Well:** Heaven Hill 2W-09HM (slot I)  
**Wellbore:** Original Hole  
**Design:** Surveys Original Hole

**Local Co-ordinate Reference:** Well Heaven Hill 2W-09HM (slot I)  
**TVD Reference:** RKB=1331+33 @ 1364.00usft (Nabors X08)  
**MD Reference:** RKB=1331+33 @ 1364.00usft (Nabors X08)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** DB\_Aug0116\_LT\_v14

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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
270.00	0.41	2.78	270.00	1.32	-0.29	14,457,745.51	1,721,048.54	39.81018734	-80.71287506
300.00	0.43	13.54	300.00	1.53	-0.26	14,457,745.72	1,721,048.57	39.81018794	-80.71287495
330.00	0.53	2.61	329.99	1.78	-0.22	14,457,745.97	1,721,048.60	39.81018862	-80.71287483
360.00	0.38	359.57	359.99	2.02	-0.22	14,457,746.21	1,721,048.61	39.81018927	-80.71287481
390.00	0.35	353.82	389.99	2.21	-0.23	14,457,746.40	1,721,048.60	39.81018980	-80.71287484
420.00	0.34	8.99	419.99	2.39	-0.23	14,457,746.58	1,721,048.60	39.81019029	-80.71287483
450.00	0.32	358.09	449.99	2.56	-0.21	14,457,746.75	1,721,048.61	39.81019076	-80.71287478
480.00	0.33	3.96	479.99	2.73	-0.21	14,457,746.92	1,721,048.61	39.81019123	-80.71287477
510.00	0.36	8.55	509.99	2.91	-0.19	14,457,747.10	1,721,048.63	39.81019172	-80.71287470
540.00	0.34	351.82	539.99	3.09	-0.19	14,457,747.28	1,721,048.64	39.81019222	-80.71287469
570.00	0.34	2.31	569.99	3.27	-0.20	14,457,747.46	1,721,048.63	39.81019270	-80.71287472
600.00	0.34	358.91	599.99	3.45	-0.20	14,457,747.64	1,721,048.63	39.81019319	-80.71287471
630.00	0.35	359.80	629.99	3.63	-0.20	14,457,747.82	1,721,048.63	39.81019369	-80.71287472
660.00	0.18	6.80	659.99	3.77	-0.19	14,457,747.95	1,721,048.63	39.81019407	-80.71287470
690.00	0.16	17.51	689.99	3.85	-0.18	14,457,748.04	1,721,048.65	39.81019431	-80.71287463
720.00	0.10	21.28	719.99	3.92	-0.15	14,457,748.11	1,721,048.67	39.81019448	-80.71287455
750.00	0.19	6.74	749.99	3.99	-0.14	14,457,748.18	1,721,048.69	39.81019469	-80.71287450
780.00	0.14	23.28	779.99	4.07	-0.12	14,457,748.26	1,721,048.71	39.81019491	-80.71287442
810.00	0.24	13.63	809.99	4.17	-0.09	14,457,748.36	1,721,048.74	39.81019517	-80.71287432
840.00	0.28	13.07	839.99	4.30	-0.06	14,457,748.49	1,721,048.77	39.81019554	-80.71287420
870.00	0.26	351.90	869.99	4.44	-0.05	14,457,748.63	1,721,048.78	39.81019592	-80.71287418
894.00	0.22	312.95	893.99	4.53	-0.09	14,457,748.71	1,721,048.73	39.81019615	-80.71287432
931.00	0.31	2.71	930.99	4.67	-0.14	14,457,748.86	1,721,048.69	39.81019656	-80.71287449
<b>MWD surveys</b>									
962.00	0.31	354.12	961.99	4.84	-0.14	14,457,749.03	1,721,048.68	39.81019702	-80.71287451
994.00	0.22	36.51	993.99	4.98	-0.12	14,457,749.17	1,721,048.71	39.81019739	-80.71287441
1,025.00	0.22	350.49	1,024.99	5.08	-0.09	14,457,749.27	1,721,048.74	39.81019768	-80.71287431
1,057.00	0.40	319.51	1,056.98	5.23	-0.17	14,457,749.42	1,721,048.65	39.81019808	-80.71287461
1,088.00	0.09	319.51	1,087.98	5.33	-0.26	14,457,749.52	1,721,048.57	39.81019836	-80.71287491
1,120.00	0.22	67.01	1,119.98	5.37	-0.22	14,457,749.56	1,721,048.61	39.81019848	-80.71287477
1,138.00	0.31	31.80	1,137.98	5.43	-0.16	14,457,749.62	1,721,048.66	39.81019863	-80.71287456
1,176.00	0.22	4.08	1,175.98	5.59	-0.10	14,457,749.78	1,721,048.72	39.81019907	-80.71287435
1,271.00	0.31	26.69	1,270.98	6.00	0.03	14,457,750.19	1,721,048.85	39.81020020	-80.71287389
1,365.00	0.31	16.82	1,364.98	6.47	0.21	14,457,750.66	1,721,049.04	39.81020149	-80.71287321
1,460.00	0.40	35.81	1,459.98	6.99	0.48	14,457,751.17	1,721,049.31	39.81020290	-80.71287225
1,555.00	0.62	352.31	1,554.98	7.76	0.61	14,457,751.95	1,721,049.43	39.81020504	-80.71287180
1,649.00	1.90	285.49	1,648.95	8.68	-0.96	14,457,752.87	1,721,047.86	39.81020758	-80.71287758
1,743.00	4.02	273.29	1,742.82	9.29	-5.75	14,457,753.48	1,721,043.07	39.81020928	-80.71289443
1,838.00	5.92	262.58	1,837.47	8.85	-13.94	14,457,753.04	1,721,034.89	39.81020814	-80.71292358
1,932.00	7.38	258.30	1,930.83	7.00	-24.66	14,457,751.19	1,721,024.17	39.81020315	-80.71296177
2,027.00	6.98	249.40	2,025.09	3.73	-36.03	14,457,747.92	1,721,012.79	39.81019428	-80.71300232
2,122.00	5.79	235.92	2,119.50	-0.99	-45.41	14,457,743.20	1,721,003.42	39.81018141	-80.71303575
2,216.00	4.68	236.01	2,213.11	-5.79	-52.51	14,457,738.40	1,720,996.31	39.81016829	-80.71306112
2,311.00	4.29	255.70	2,307.82	-8.83	-59.17	14,457,735.36	1,720,989.65	39.81015999	-80.71308486
2,406.00	4.42	264.91	2,402.55	-10.04	-66.26	14,457,734.15	1,720,982.56	39.81015675	-80.71311011
2,500.00	4.60	259.32	2,496.26	-11.06	-73.57	14,457,733.13	1,720,975.25	39.81015401	-80.71313616
2,595.00	5.21	256.59	2,590.91	-12.76	-81.51	14,457,731.43	1,720,967.31	39.81014939	-80.71316445
2,690.00	4.82	262.01	2,685.55	-14.32	-89.66	14,457,729.87	1,720,959.17	39.81014519	-80.71319349
2,769.00	4.29	263.81	2,764.30	-15.10	-95.88	14,457,729.09	1,720,952.94	39.81014311	-80.71321566
2,838.00	4.60	262.58	2,833.09	-15.73	-101.19	14,457,728.46	1,720,947.63	39.81014141	-80.71323457
2,870.00	4.68	262.71	2,864.99	-16.06	-103.76	14,457,728.12	1,720,945.06	39.81014052	-80.71324372
2,964.00	10.69	271.61	2,958.10	-16.31	-116.29	14,457,727.88	1,720,932.53	39.81013997	-80.71328834
3,059.00	18.91	272.80	3,049.87	-15.30	-140.52	14,457,728.88	1,720,908.31	39.81014293	-80.71337459
3,154.00	24.08	269.10	3,138.24	-14.86	-175.30	14,457,729.33	1,720,873.53	39.81014447	-80.71349843
3,248.00	27.09	267.78	3,223.01	-15.99	-215.87	14,457,728.20	1,720,832.96	39.81014172	-80.71364291

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2W-09HM (slot I)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Site:</b>	Heaven Hill 2	<b>MD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Well:</b>	Heaven Hill 2W-09HM (slot I)	<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_Aug0116_LT_v14

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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,343.00	28.59	265.88	3,307.02	-18.46	-260.16	14,457,725.73	1,720,788.67	39.81013532	-80.71380065
3,437.00	30.09	264.39	3,388.96	-22.38	-306.04	14,457,721.81	1,720,742.78	39.81012496	-80.71396410
3,532.00	29.70	262.80	3,471.32	-27.66	-353.09	14,457,716.53	1,720,695.73	39.81011088	-80.71413170
3,627.00	30.80	261.21	3,553.38	-34.32	-400.48	14,457,709.87	1,720,648.34	39.81009298	-80.71430051
3,721.00	31.20	258.70	3,633.96	-42.77	-448.14	14,457,701.42	1,720,600.68	39.81007020	-80.71447033
3,816.00	32.21	259.71	3,714.78	-52.12	-497.19	14,457,692.07	1,720,551.64	39.81004497	-80.71464507
3,911.00	33.98	261.52	3,794.37	-60.55	-548.36	14,457,683.63	1,720,500.47	39.81002224	-80.71482739
4,005.00	34.29	263.68	3,872.18	-67.34	-600.66	14,457,676.85	1,720,448.16	39.81000405	-80.71501370
4,100.00	34.20	263.59	3,950.71	-73.27	-653.79	14,457,670.92	1,720,395.03	39.80998824	-80.71520296
4,194.00	35.09	262.89	4,028.04	-79.56	-706.86	14,457,664.62	1,720,341.97	39.80997142	-80.71539199
4,289.00	34.51	261.52	4,106.05	-86.91	-760.57	14,457,657.28	1,720,288.26	39.80995171	-80.71558334
4,384.00	32.48	257.82	4,185.28	-96.26	-812.13	14,457,647.92	1,720,236.69	39.80992648	-80.71576705
4,478.00	32.30	259.10	4,264.65	-106.34	-861.46	14,457,637.85	1,720,187.36	39.80989924	-80.71594284
4,573.00	34.69	263.68	4,343.88	-114.12	-913.27	14,457,630.07	1,720,135.55	39.80987833	-80.71612741
4,668.00	35.40	265.80	4,421.66	-119.11	-967.59	14,457,625.08	1,720,081.24	39.80986510	-80.71632087
4,762.00	34.69	264.21	4,498.62	-123.80	-1,021.36	14,457,620.39	1,720,027.47	39.80985268	-80.71651239
4,857.00	33.72	265.71	4,577.19	-128.50	-1,074.55	14,457,615.69	1,719,974.28	39.80984023	-80.71670186
4,955.00	32.48	264.91	4,659.29	-132.87	-1,127.89	14,457,611.32	1,719,920.94	39.80982870	-80.71689183
5,049.00	33.41	265.40	4,738.17	-137.18	-1,178.82	14,457,607.00	1,719,870.00	39.80981729	-80.71707326
5,144.00	33.89	266.10	4,817.25	-141.08	-1,231.32	14,457,603.10	1,719,817.51	39.80980704	-80.71726024
5,238.00	35.31	266.19	4,894.62	-144.67	-1,284.57	14,457,599.52	1,719,764.25	39.80979765	-80.71744991
5,333.00	37.78	265.31	4,970.94	-148.88	-1,340.98	14,457,595.31	1,719,707.85	39.80978659	-80.71765081
5,428.00	37.38	264.78	5,046.23	-153.88	-1,398.70	14,457,590.31	1,719,650.12	39.80977335	-80.71785641
5,523.00	34.69	263.42	5,123.05	-159.60	-1,454.29	14,457,584.59	1,719,594.54	39.80975812	-80.71805440
5,617.00	33.50	262.31	5,200.89	-166.14	-1,506.57	14,457,578.05	1,719,542.26	39.80974062	-80.71824065
5,712.00	32.21	260.42	5,280.69	-173.86	-1,557.52	14,457,570.33	1,719,491.31	39.80971985	-80.71842216
5,807.00	32.79	261.08	5,360.81	-182.06	-1,607.90	14,457,562.13	1,719,440.93	39.80969776	-80.71860165
5,901.00	31.82	262.31	5,440.26	-189.33	-1,657.60	14,457,554.86	1,719,391.22	39.80967824	-80.71877872
5,996.00	31.90	263.11	5,520.95	-195.69	-1,707.34	14,457,548.50	1,719,341.48	39.80966120	-80.71895591
6,091.00	35.00	266.41	5,600.21	-200.41	-1,759.47	14,457,543.78	1,719,289.35	39.80964869	-80.71914158
6,186.00	35.00	266.90	5,678.03	-203.59	-1,813.87	14,457,540.60	1,719,234.96	39.80964043	-80.71933532
6,280.00	32.61	263.81	5,756.14	-207.78	-1,865.98	14,457,536.41	1,719,182.85	39.80962937	-80.71952092
6,350.00	31.52	264.08	5,815.46	-211.70	-1,902.93	14,457,532.49	1,719,145.89	39.80961892	-80.71965256
6,412.00	33.85	265.48	5,867.64	-214.73	-1,936.27	14,457,529.46	1,719,112.55	39.80961088	-80.71977131
6,507.00	36.00	254.76	5,945.60	-224.16	-1,989.64	14,457,520.02	1,719,059.18	39.80958543	-80.71996146
6,600.00	36.79	242.55	6,020.56	-244.21	-2,040.80	14,457,499.97	1,719,008.03	39.80953081	-80.72014383
6,695.00	37.54	232.17	6,096.34	-275.11	-2,088.95	14,457,469.08	1,718,959.88	39.80944637	-80.72031564
6,790.00	39.12	223.74	6,170.91	-314.54	-2,132.56	14,457,429.65	1,718,916.26	39.80933845	-80.72047138
6,885.00	41.05	216.09	6,243.64	-361.44	-2,171.69	14,457,382.75	1,718,877.14	39.80921000	-80.72061121
6,980.00	44.53	205.63	6,313.43	-416.77	-2,204.52	14,457,327.42	1,718,844.30	39.80905834	-80.72072875
7,074.00	46.33	194.82	6,379.50	-479.45	-2,227.51	14,457,264.74	1,718,821.32	39.80888640	-80.72081131
7,169.00	48.22	184.71	6,444.04	-548.07	-2,239.22	14,457,196.12	1,718,809.60	39.80869805	-80.72085378
7,264.00	49.76	174.52	6,506.47	-619.57	-2,238.67	14,457,124.62	1,718,810.16	39.80850167	-80.72085260
7,358.00	51.16	164.50	6,566.40	-690.67	-2,225.44	14,457,053.51	1,718,823.39	39.80830630	-80.72080628
7,452.00	53.54	157.82	6,623.86	-761.01	-2,201.37	14,456,983.17	1,718,847.46	39.80811292	-80.72072134
7,547.00	57.19	153.78	6,677.86	-832.25	-2,169.29	14,456,911.94	1,718,879.54	39.80791701	-80.72060790
7,641.00	60.09	153.69	6,726.77	-904.22	-2,133.77	14,456,839.97	1,718,915.06	39.80771905	-80.72048223
7,735.00	66.24	153.16	6,769.18	-979.20	-2,096.25	14,456,764.99	1,718,952.57	39.80751283	-80.72034948
7,830.00	72.88	152.55	6,802.34	-1,058.36	-2,055.65	14,456,685.83	1,718,993.17	39.80729508	-80.72020579
7,925.00	78.95	152.37	6,825.45	-1,140.02	-2,013.07	14,456,604.16	1,719,035.76	39.80707045	-80.72005507
8,019.00	84.88	151.84	6,838.66	-1,222.24	-1,969.54	14,456,521.95	1,719,079.28	39.80684429	-80.71990100
8,114.00	87.47	151.67	6,845.00	-1,305.73	-1,924.69	14,456,438.46	1,719,124.14	39.80661461	-80.71974222
8,208.00	89.58	150.96	6,847.42	-1,388.16	-1,879.59	14,456,356.02	1,719,169.24	39.80638784	-80.71958255
8,303.00	90.20	151.40	6,847.60	-1,471.40	-1,833.79	14,456,272.79	1,719,215.04	39.80615887	-80.71942041
8,398.00	89.27	150.26	6,848.04	-1,554.34	-1,787.49	14,456,189.84	1,719,261.34	39.80593068	-80.71925647

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2W-09HM (slot I)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Site:</b>	Heaven Hill 2	<b>MD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Well:</b>	Heaven Hill 2W-09HM (slot I)	<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_Aug0116_LT_v14

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Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,493.00	90.20	149.91	6,848.48	-1,636.69	-1,740.11	14,456,107.50	1,719,308.71	39.80570414	-80.71908870
8,588.00	90.46	149.29	6,847.93	-1,718.62	-1,692.04	14,456,025.57	1,719,356.79	39.80547871	-80.71891845
8,683.00	88.75	148.77	6,848.59	-1,800.07	-1,643.16	14,455,944.11	1,719,405.67	39.80525460	-80.71874530
8,777.00	89.36	148.68	6,850.14	-1,880.40	-1,594.36	14,455,863.79	1,719,454.46	39.80503357	-80.71857247
8,872.00	90.68	148.68	6,850.11	-1,961.56	-1,544.98	14,455,782.63	1,719,503.84	39.80481028	-80.71839755
8,966.00	90.68	149.64	6,848.99	-2,042.26	-1,496.80	14,455,701.93	1,719,552.03	39.80458823	-80.71822689
9,061.00	86.81	147.36	6,851.07	-2,123.22	-1,447.19	14,455,620.97	1,719,601.64	39.80436546	-80.71805115
9,156.00	88.35	148.94	6,855.08	-2,203.84	-1,397.10	14,455,540.35	1,719,651.72	39.80414363	-80.71787373
9,250.00	89.41	149.12	6,856.92	-2,284.42	-1,348.74	14,455,459.77	1,719,700.08	39.80392191	-80.71770244
9,345.00	90.81	149.29	6,856.74	-2,366.03	-1,300.11	14,455,378.16	1,719,748.72	39.80369738	-80.71753019
9,439.00	91.30	150.17	6,855.01	-2,447.20	-1,252.73	14,455,296.99	1,719,796.09	39.80347406	-80.71736242
9,534.00	90.20	149.64	6,853.76	-2,529.38	-1,205.10	14,455,214.81	1,719,843.72	39.80324795	-80.71719375
9,629.00	91.30	150.35	6,852.52	-2,611.64	-1,157.60	14,455,132.55	1,719,891.23	39.80302163	-80.71702554
9,723.00	90.68	150.96	6,850.90	-2,693.56	-1,111.54	14,455,050.62	1,719,937.29	39.80279624	-80.71686247
9,818.00	87.69	149.47	6,852.25	-2,775.99	-1,064.36	14,454,968.19	1,719,984.47	39.80256946	-80.71669542
9,912.00	88.40	150.00	6,855.45	-2,857.14	-1,017.01	14,454,887.05	1,720,031.81	39.80234621	-80.71652775
10,006.00	89.10	150.88	6,857.50	-2,938.88	-970.65	14,454,805.31	1,720,078.17	39.80212132	-80.71636360
10,101.00	90.46	150.52	6,857.87	-3,021.72	-924.16	14,454,722.46	1,720,124.66	39.80189341	-80.71619901
10,196.00	90.59	151.31	6,857.00	-3,104.74	-877.98	14,454,639.45	1,720,170.84	39.80166502	-80.71603554
10,290.00	89.67	151.31	6,856.79	-3,187.20	-832.86	14,454,556.99	1,720,215.97	39.80143817	-80.71587580
10,385.00	90.07	151.31	6,857.00	-3,270.53	-787.25	14,454,473.65	1,720,261.57	39.80120891	-80.71571436
10,478.00	89.89	151.67	6,857.03	-3,352.26	-742.86	14,454,391.93	1,720,305.96	39.80098410	-80.71555724
10,573.00	89.49	151.14	6,857.55	-3,435.67	-697.39	14,454,308.52	1,720,351.43	39.80075463	-80.71539630
10,667.00	90.07	150.79	6,857.91	-3,517.85	-651.77	14,454,226.34	1,720,397.05	39.80052853	-80.71523480
10,762.00	90.37	150.79	6,857.54	-3,600.77	-605.41	14,454,143.42	1,720,443.41	39.80030041	-80.71507068
10,856.00	89.01	150.08	6,858.05	-3,682.53	-559.03	14,454,061.66	1,720,489.79	39.80007548	-80.71490648
10,951.00	89.98	150.52	6,858.89	-3,765.04	-511.97	14,453,979.14	1,720,536.86	39.79984846	-80.71473984
11,045.00	90.51	150.17	6,858.49	-3,846.73	-465.46	14,453,897.46	1,720,583.37	39.79962372	-80.71457518
11,140.00	91.52	149.73	6,856.80	-3,928.95	-417.89	14,453,815.24	1,720,630.93	39.79939751	-80.71440677
11,235.00	90.24	148.85	6,855.35	-4,010.61	-369.39	14,453,733.58	1,720,679.44	39.79917282	-80.71423499
11,329.00	91.30	149.12	6,854.08	-4,091.17	-320.96	14,453,653.02	1,720,727.87	39.79895117	-80.71406349
11,424.00	89.49	149.12	6,853.43	-4,172.69	-272.20	14,453,571.49	1,720,776.62	39.79872685	-80.71389083
11,518.00	90.51	149.03	6,853.43	-4,253.33	-223.89	14,453,490.86	1,720,824.93	39.79850498	-80.71371976
11,613.00	89.67	149.91	6,853.28	-4,335.16	-175.64	14,453,409.03	1,720,873.19	39.79827983	-80.71354888
11,708.00	90.68	150.17	6,852.99	-4,417.46	-128.19	14,453,326.73	1,720,920.63	39.79805339	-80.71338091
11,802.00	89.58	150.79	6,852.77	-4,499.26	-81.88	14,453,244.93	1,720,966.95	39.79782835	-80.71321695
11,897.00	90.59	151.49	6,852.63	-4,582.46	-36.03	14,453,161.73	1,721,012.80	39.79759946	-80.71305465
11,992.00	89.71	151.49	6,852.39	-4,665.93	9.32	14,453,078.25	1,721,058.14	39.79736981	-80.71289417
12,087.00	89.10	150.70	6,853.37	-4,749.09	55.23	14,452,995.09	1,721,104.06	39.79714102	-80.71273165
12,181.00	88.40	150.44	6,855.42	-4,830.94	101.41	14,452,913.24	1,721,150.24	39.79691584	-80.71256818
12,276.00	89.67	151.75	6,857.02	-4,914.09	147.32	14,452,830.09	1,721,196.15	39.79668708	-80.71240569
12,371.00	87.56	152.63	6,859.32	-4,998.09	191.63	14,452,746.10	1,721,240.45	39.79645601	-80.71224891
12,465.00	87.87	151.40	6,863.07	-5,081.03	235.70	14,452,663.16	1,721,284.52	39.79622785	-80.71209295
12,560.00	88.62	151.40	6,865.98	-5,164.40	281.15	14,452,579.79	1,721,329.98	39.79599849	-80.71193208
12,655.00	89.80	150.70	6,867.29	-5,247.52	327.13	14,452,496.67	1,721,375.96	39.79576982	-80.71176934
12,749.00	89.93	148.77	6,867.51	-5,328.70	374.51	14,452,415.48	1,721,423.33	39.79554645	-80.71160162
12,844.00	90.59	148.68	6,867.08	-5,409.90	423.82	14,452,334.29	1,721,472.65	39.79532303	-80.71142697
12,938.00	92.31	149.12	6,864.70	-5,490.36	472.36	14,452,253.83	1,721,521.19	39.79510164	-80.71125510
13,033.00	89.98	149.12	6,862.80	-5,571.87	521.11	14,452,172.32	1,721,569.93	39.79487736	-80.71108250
13,127.00	90.20	149.12	6,862.65	-5,652.54	569.35	14,452,091.64	1,721,618.18	39.79465538	-80.71091167
13,222.00	90.81	149.73	6,861.81	-5,734.33	617.67	14,452,009.86	1,721,666.50	39.79443034	-80.71074058
13,317.00	89.80	149.29	6,861.31	-5,816.19	665.87	14,451,928.00	1,721,714.70	39.79420510	-80.71056993
13,411.00	90.77	149.47	6,860.84	-5,897.08	713.75	14,451,847.10	1,721,762.57	39.79398253	-80.71040041
13,506.00	89.36	148.50	6,860.73	-5,978.50	762.70	14,451,765.69	1,721,811.52	39.79375851	-80.71022709
13,601.00	90.42	149.29	6,860.92	-6,059.84	811.77	14,451,684.35	1,721,860.60	39.79353469	-80.71005332

WV Department of Environmental Protection

<b>Company:</b>	Tug Hill Operating LLC	<b>Local Co-ordinate Reference:</b>	Well Heaven Hill 2W-09HM (slot I)
<b>Project:</b>	Marshall County, West Virginia	<b>TVD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Site:</b>	Heaven Hill 2	<b>MD Reference:</b>	RKB=1331+33 @ 1364.00usft (Nabors X08)
<b>Well:</b>	Heaven Hill 2W-09HM (slot I)	<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_Aug0116_LT_v14

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Survey

WV Department of Environmental Protection

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,695.00	88.66	148.68	6,861.67	-6,140.39	860.20	14,451,603.80	1,721,909.03	39.79331304	-80.70988183
13,790.00	89.41	148.85	6,863.27	-6,221.61	909.46	14,451,522.58	1,721,958.28	39.79308955	-80.70970742
13,884.00	90.29	149.12	6,863.52	-6,302.17	957.89	14,451,442.02	1,722,006.72	39.79286788	-80.70953592
13,979.00	91.43	149.03	6,862.09	-6,383.65	1,006.71	14,451,360.53	1,722,055.53	39.79264367	-80.70936308
14,074.00	88.18	146.22	6,862.41	-6,463.87	1,057.56	14,451,280.32	1,722,106.39	39.79242293	-80.70918296
14,169.00	88.84	147.97	6,864.88	-6,543.60	1,109.15	14,451,200.59	1,722,157.98	39.79220351	-80.70900023
14,263.00	88.92	148.59	6,866.72	-6,623.54	1,158.57	14,451,120.65	1,722,207.39	39.79198353	-80.70882525
14,358.00	89.14	149.38	6,868.33	-6,704.95	1,207.51	14,451,039.24	1,722,256.33	39.79175953	-80.70865196
14,451.00	90.24	149.73	6,868.83	-6,785.12	1,254.63	14,450,959.07	1,722,303.46	39.79153893	-80.70848513
14,547.00	91.16	150.17	6,867.66	-6,868.21	1,302.70	14,450,875.98	1,722,351.53	39.79131031	-80.70831498
14,641.00	89.98	150.61	6,866.72	-6,949.93	1,349.14	14,450,794.26	1,722,397.97	39.79108548	-80.70815060
14,736.00	90.64	151.67	6,866.21	-7,033.13	1,394.99	14,450,711.06	1,722,443.82	39.79085658	-80.70798833
14,831.00	91.08	151.67	6,864.79	-7,116.74	1,440.07	14,450,627.45	1,722,488.90	39.79062656	-80.70782884
14,925.00	89.89	152.19	6,863.99	-7,199.68	1,484.30	14,450,544.51	1,722,533.12	39.79039839	-80.70767235
15,020.00	90.15	152.11	6,863.96	-7,283.67	1,528.68	14,450,460.51	1,722,577.50	39.79016732	-80.70751534
15,114.00	88.75	150.70	6,864.86	-7,366.20	1,573.66	14,450,377.99	1,722,622.49	39.78994027	-80.70735616
15,207.00	88.97	150.35	6,866.71	-7,447.15	1,619.42	14,450,297.04	1,722,668.24	39.78971756	-80.70719423
15,301.00	89.36	150.35	6,868.08	-7,528.83	1,665.91	14,450,215.36	1,722,714.74	39.78949282	-80.70702967
15,396.00	90.24	150.44	6,868.41	-7,611.43	1,712.84	14,450,132.76	1,722,761.67	39.78926557	-80.70686356
15,490.00	91.38	151.14	6,867.08	-7,693.46	1,758.71	14,450,050.72	1,722,807.54	39.78903986	-80.70670124
15,585.00	90.11	150.52	6,865.85	-7,776.41	1,805.01	14,449,967.78	1,722,853.83	39.78881166	-80.70653739
15,679.00	91.16	150.52	6,864.80	-7,858.23	1,851.26	14,449,885.96	1,722,900.09	39.78858654	-80.70637369
15,774.00	89.89	150.00	6,863.93	-7,940.71	1,898.39	14,449,803.48	1,722,947.21	39.78835960	-80.70620690
15,868.00	89.14	149.64	6,864.73	-8,021.97	1,945.64	14,449,722.22	1,722,994.47	39.78813603	-80.70603964
15,962.00	88.79	149.38	6,866.43	-8,102.95	1,993.33	14,449,641.23	1,723,042.15	39.78791318	-80.70587084
16,057.00	89.98	148.85	6,867.45	-8,184.48	2,042.09	14,449,559.71	1,723,090.91	39.78768886	-80.70569821
16,152.00	88.53	148.68	6,868.68	-8,265.70	2,091.35	14,449,478.49	1,723,140.17	39.78746536	-80.70552382
16,246.00	89.58	148.77	6,870.23	-8,346.03	2,140.14	14,449,398.16	1,723,188.96	39.78724432	-80.70535108
16,341.00	90.90	149.38	6,869.83	-8,427.52	2,188.96	14,449,316.67	1,723,237.78	39.78702008	-80.70517825
16,354.00	90.99	149.38	6,869.62	-8,438.70	2,195.58	14,449,305.48	1,723,244.40	39.78698930	-80.70515481
<b>Survey @ 16354.00 MD 6869.62 TVD</b>									
16,404.00	90.99	149.38	6,868.76	-8,481.72	2,221.04	14,449,262.46	1,723,269.87	39.78687092	-80.70506467
<b>Survey Projected to 16404.00 MD 6868.76 TVD</b>									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
60.00	60.00	0.22	-0.10	Gyro
931.00	930.99	4.67	-0.14	MWD surveys
16,354.00	6,869.62	-8,438.70	2,195.58	Survey @ 16354.00 MD 6869.62 TVD
16,404.00	6,868.76	-8,481.72	2,221.04	Survey Projected to 16404.00 MD 6868.76 TVD