



Actual Wellpath Report

Heaven Hill 3-08HU ST01 AWP Proj: 22395'
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 JUL 10 2020
 WV Department of
 Environmental Protection



REFERENCE WELLPATH IDENTIFICATION

Operator	TUG HILL OPERATING	Slot	Slot #08
Area	Marshall County, WV	Well	Heaven Hill 3-08HU ST01
Field	Marshall	Wellbore	Heaven Hill 3-08HU ST01 AWB
Facility	Heaven Hill 3 Pad	Sidetrack from	Heaven Hill 3-08HU AWP Proj: 7528' at 6489.00 MD

REPORT SETUP INFORMATION

Projection System	NAD83 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.1
North Reference	Grid	User	Delaset
Scale	0.999608	Report Generated	28/Nov/2018 at 09:51
Convergence at slot	0.20° East	Database/Source file	WA_MPL_EasternUS_Defn/Heaven_Hill_3-08HU_ST01_AWP_Proj_22395_.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	0.00	-0.01	1726570.78	14457200.55	39°48'31.106"N	80°41'35.583"W
Facility Reference Pt			1726570.79	14457200.55	39°48'31.106"N	80°41'35.583"W
Field Reference Pt			1920470.12	14528304.49	40°00'00.000"N	80°00'00.000"W

WELLPATH DATUM

Calculation method	Minimum curvature	Nabors B28 (RKB) to Facility Vertical Datum	26.00ft
Horizontal Reference Pt	Slot	Nabors B28 (RKB) to Mean Sea Level	1352.00ft
Vertical Reference Pt	Nabors B28 (RKB)	Nabors B28 (RKB) to Mud Line at Slot (Slot #08)	26.00ft
MD Reference Pt	Nabors B28 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	148.26°



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WELLPATH DATA (263 stations) † = Interpolated/extrapolated station																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vart Sect (ft)	North (ft)	East (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Comments
0.00†	0.000	309.450	0.00	0.00	0.00	0.00	1726570.78	14457200.55	39°48'31.106"N	80°41'35.583"W	0.00	0.000	0.00	0.00	0.00	
26.00	0.000	309.450	26.00	0.00	0.00	0.00	1726570.78	14457200.55	39°48'31.106"N	80°41'35.583"W	0.00	0.000	0.00	0.00	0.00	
155.00	0.330	309.450	155.00	-0.35	0.24	-0.29	1726570.50	14457200.79	39°48'31.108"N	80°41'35.587"W	0.37	309.450	0.26	0.26	-39.19	Benchtree MWD Surveys <12-1/4">(155'-7433')
187.00	0.350	327.820	187.00	-0.54	0.38	-0.41	1726570.37	14457200.93	39°48'31.109"N	80°41'35.589"W	0.56	312.619	0.34	0.06	57.41	
218.00	0.380	6.880	218.00	-0.71	0.56	-0.45	1726570.34	14457201.11	39°48'31.111"N	80°41'35.589"W	0.72	321.305	0.79	0.10	126.00	
248.00	0.140	330.680	248.00	-0.83	0.69	-0.45	1726570.33	14457201.24	39°48'31.112"N	80°41'35.589"W	0.83	326.653	0.93	-0.80	-120.67	
279.00	0.170	42.830	279.00	-0.88	0.76	-0.44	1726570.34	14457201.31	39°48'31.113"N	80°41'35.589"W	0.88	329.748	0.59	0.10	232.74	
309.00	0.190	85.240	309.00	-0.87	0.79	-0.36	1726570.42	14457201.34	39°48'31.113"N	80°41'35.588"W	0.87	335.504	0.44	0.07	141.37	
340.00	0.080	336.630	340.00	-0.86	0.82	-0.32	1726570.46	14457201.37	39°48'31.114"N	80°41'35.587"W	0.88	338.691	0.74	-0.35	-350.35	
378.00	0.080	45.830	378.00	-0.90	0.86	-0.31	1726570.47	14457201.41	39°48'31.114"N	80°41'35.587"W	0.92	340.162	0.24	0.00	182.11	
408.00	0.170	40.280	408.00	-0.91	0.91	-0.27	1726570.52	14457201.46	39°48'31.115"N	80°41'35.587"W	0.95	343.651	0.30	0.30	-18.50	
438.00	0.150	238.450	438.00	-0.93	0.92	-0.27	1726570.51	14457201.47	39°48'31.115"N	80°41'35.587"W	0.96	343.608	1.05	-0.07	-539.43	
469.00	0.210	230.060	469.00	-0.92	0.86	-0.35	1726570.43	14457201.41	39°48'31.114"N	80°41'35.588"W	0.93	337.995	0.21	0.19	-27.06	
499.00	0.270	94.330	499.00	-0.87	0.82	-0.32	1726570.46	14457201.37	39°48'31.114"N	80°41'35.587"W	0.88	338.710	1.48	0.20	-452.43	
530.00	0.070	136.210	530.00	-0.81	0.81	-0.24	1726570.55	14457201.36	39°48'31.114"N	80°41'35.586"W	0.84	343.710	0.72	-0.65	135.10	
560.00	0.410	85.440	560.00	-0.74	0.80	-0.12	1726570.67	14457201.35	39°48'31.114"N	80°41'35.585"W	0.81	351.782	1.23	1.13	-169.23	
590.00	0.470	46.940	590.00	-0.72	0.89	0.08	1726570.86	14457201.44	39°48'31.114"N	80°41'35.582"W	0.90	5.201	0.99	0.20	-128.33	
620.00	0.280	98.030	620.00	-0.69	0.97	0.24	1726571.03	14457201.52	39°48'31.115"N	80°41'35.580"W	1.00	14.152	1.22	-0.63	170.30	
651.00	0.500	81.660	650.99	-0.59	0.98	0.45	1726571.24	14457201.53	39°48'31.115"N	80°41'35.578"W	1.08	24.883	0.79	0.71	-52.81	
681.00	0.440	116.200	680.99	-0.44	0.94	0.69	1726571.47	14457201.49	39°48'31.115"N	80°41'35.575"W	1.17	35.987	0.95	-0.20	115.13	
712.00	0.290	89.110	711.99	-0.30	0.89	0.87	1726571.65	14457201.44	39°48'31.114"N	80°41'35.572"W	1.25	44.289	0.72	-0.48	-87.39	
742.00	0.460	86.380	741.99	-0.21	0.90	1.07	1726571.85	14457201.45	39°48'31.114"N	80°41'35.570"W	1.40	49.804	0.57	0.57	-9.10	
772.00	0.240	106.050	771.99	-0.10	0.89	1.25	1726572.03	14457201.44	39°48'31.114"N	80°41'35.567"W	1.53	54.443	0.83	-0.73	65.57	
803.00	0.450	69.260	802.99	-0.03	0.92	1.42	1726572.21	14457201.47	39°48'31.115"N	80°41'35.565"W	1.69	57.219	0.95	0.68	-118.68	
834.00	0.530	99.500	833.99	0.09	0.94	1.68	1726572.46	14457201.49	39°48'31.115"N	80°41'35.562"W	1.92	60.854	0.86	0.26	97.55	
864.00	0.420	91.070	863.99	0.24	0.91	1.93	1726572.71	14457201.46	39°48'31.115"N	80°41'35.559"W	2.13	64.675	0.43	-0.37	-28.10	
895.00	0.410	84.690	894.99	0.35	0.92	2.15	1726572.93	14457201.47	39°48'31.115"N	80°41'35.556"W	2.34	66.844	0.15	-0.03	-20.58	
926.00	0.540	79.130	925.99	0.45	0.96	2.40	1726573.19	14457201.51	39°48'31.115"N	80°41'35.553"W	2.59	68.285	0.44	0.42	-17.94	
958.00	0.440	74.940	957.99	0.54	1.02	2.67	1726573.45	14457201.57	39°48'31.116"N	80°41'35.549"W	2.86	69.139	0.33	-0.31	-13.09	
989.00	0.350	98.470	988.99	0.63	1.03	2.88	1726573.66	14457201.58	39°48'31.116"N	80°41'35.546"W	3.06	70.234	0.59	-0.29	75.90	



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Facility	Heaven Hill 3 Pad	Sidetrack from	Heaven Hill 3-08HU AWP Proj: 7528' at 6489.00 MD

WELLPATH DATA (263 stations)																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Comments
1021.00	0.340	94.990	1020.98	0.75	1.01	3.07	1726573.85	14457201.56	39°48'31.115"N	80°41'35.544"W	3.23	71.758	0.07	-0.03	-10.87	
1052.00	0.470	112.450	1051.98	0.91	0.96	3.28	1726574.06	14457201.51	39°48'31.115"N	80°41'35.541"W	3.42	73.758	0.57	0.42	56.32	
1084.00	0.480	103.890	1083.98	1.11	0.87	3.53	1726574.31	14457201.42	39°48'31.114"N	80°41'35.538"W	3.64	76.111	0.22	0.03	-26.75	
1119.00	0.720	85.470	1118.98	1.32	0.86	3.89	1726574.67	14457201.41	39°48'31.114"N	80°41'35.533"W	3.99	77.607	0.87	0.69	-52.63	
1192.00	1.220	86.620	1191.97	1.90	0.94	5.13	1726575.91	14457201.49	39°48'31.115"N	80°41'35.518"W	5.21	79.637	0.69	0.68	1.58	
1287.00	1.530	86.570	1286.94	2.98	1.07	7.40	1726578.18	14457201.62	39°48'31.116"N	80°41'35.489"W	7.48	81.752	0.33	0.33	-0.05	
1382.00	0.980	106.110	1381.92	4.18	0.92	9.45	1726580.23	14457201.47	39°48'31.114"N	80°41'35.462"W	9.49	84.419	0.73	-0.58	20.57	
1476.00	2.150	72.520	1475.89	5.22	1.23	11.90	1726582.68	14457201.78	39°48'31.117"N	80°41'35.431"W	11.97	84.100	1.53	1.24	-35.73	
1569.00	4.110	65.880	1568.74	6.08	3.13	16.60	1726587.38	14457203.68	39°48'31.136"N	80°41'35.371"W	16.89	79.335	2.14	2.11	-7.35	
1664.00	3.550	83.010	1663.53	6.76	5.86	22.33	1726593.10	14457206.41	39°48'31.163"N	80°41'35.297"W	23.08	75.285	0.62	-0.59	-2.81	
1759.00	4.020	67.870	1758.32	7.56	8.45	28.03	1726598.80	14457209.00	39°48'31.188"N	80°41'35.224"W	29.28	73.220	0.60	0.49	5.12	
1852.00	3.650	71.700	1851.11	8.79	10.61	33.86	1726604.63	14457211.16	39°48'31.209"N	80°41'35.149"W	35.49	72.602	0.48	-0.40	4.12	
1947.00	3.850	68.630	1945.91	10.07	12.72	39.70	1726610.47	14457213.27	39°48'31.230"N	80°41'35.074"W	41.69	72.233	0.30	0.21	-3.23	
2041.00	3.870	66.110	2039.70	11.07	15.16	45.54	1726616.31	14457215.70	39°48'31.254"N	80°41'34.999"W	48.00	71.593	0.18	0.02	-2.68	
2136.00	4.870	74.050	2134.42	12.60	17.56	52.35	1726623.11	14457218.11	39°48'31.277"N	80°41'34.912"W	55.22	71.454	1.23	1.05	8.36	
2231.00	5.790	76.030	2229.01	15.16	19.83	60.88	1726631.64	14457220.37	39°48'31.299"N	80°41'34.802"W	64.03	71.960	0.99	0.97	2.08	
2323.00	5.590	76.390	2320.56	17.97	22.00	69.74	1726640.49	14457222.54	39°48'31.321"N	80°41'34.689"W	73.13	72.489	0.22	-0.22	0.39	
2418.00	5.360	73.400	2415.12	20.57	24.36	78.49	1726649.24	14457224.90	39°48'31.344"N	80°41'34.577"W	82.18	72.768	0.39	-0.24	-3.15	
2512.00	5.260	68.010	2508.72	22.45	27.23	86.69	1726657.44	14457227.77	39°48'31.372"N	80°41'34.471"W	90.86	72.564	0.54	-0.11	-5.73	
2607.00	5.430	60.470	2603.31	23.36	31.07	94.64	1726665.38	14457231.61	39°48'31.409"N	80°41'34.369"W	99.61	71.823	0.76	0.18	-7.94	
2702.00	5.630	51.500	2697.87	22.98	36.19	102.20	1726672.94	14457236.73	39°48'31.460"N	80°41'34.272"W	108.41	70.500	0.93	0.21	-9.44	
2797.00	5.590	43.950	2792.41	21.29	42.42	109.05	1726679.80	14457242.96	39°48'31.521"N	80°41'34.184"W	117.01	68.744	0.78	-0.04	-7.95	
2888.00	5.540	40.430	2882.99	18.85	48.96	114.98	1726685.72	14457249.49	39°48'31.586"N	80°41'34.108"W	124.97	66.937	0.38	-0.05	-3.87	
2982.00	5.440	36.270	2976.55	15.79	56.00	120.56	1726691.29	14457256.53	39°48'31.655"N	80°41'34.036"W	132.93	65.084	0.44	-0.11	-4.43	
3077.00	3.710	28.780	3071.25	12.60	62.33	124.70	1726695.44	14457262.85	39°48'31.717"N	80°41'33.983"W	139.41	63.444	1.92	-1.82	-7.88	
3171.00	2.080	16.260	3165.13	9.96	66.63	126.64	1726697.38	14457267.15	39°48'31.760"N	80°41'33.958"W	143.10	62.250	1.85	-1.73	-13.32	
3266.00	1.500	350.220	3260.08	7.65	69.51	126.92	1726697.65	14457270.03	39°48'31.788"N	80°41'33.954"W	144.70	61.291	1.04	-0.61	-27.41	
3361.00	1.520	305.970	3355.05	5.33	71.48	125.68	1726696.42	14457272.00	39°48'31.808"N	80°41'33.970"W	144.59	60.373	1.20	0.02	-46.58	
3457.00	2.440	269.670	3451.00	3.09	72.21	122.61	1726693.35	14457272.73	39°48'31.815"N	80°41'34.009"W	142.30	59.503	1.57	0.96	-37.81	
3551.00	3.630	245.520	3544.87	1.67	70.97	117.90	1726688.64	14457271.49	39°48'31.803"N	80°41'34.070"W	137.61	58.955	1.83	1.27	-25.69	



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3646.00	3.860	218.060	3639.67	2.39	67.20	113.19	1726683.93	14457267.73	39°48'31.766"N	80°41'34.130"W	131.64	59.302	1.88	0.24	-28.91	
3741.00	3.660	189.110	3734.48	5.79	61.69	110.74	1726681.48	14457262.22	39°48'31.712"N	80°41'34.162"W	126.76	60.878	1.99	-0.21	-30.47	
3839.00	4.750	170.190	3832.21	11.92	54.60	110.94	1726681.68	14457255.13	39°48'31.641"N	80°41'34.159"W	123.65	63.793	1.79	1.11	-19.31	
3934.00	4.190	157.970	3926.93	18.99	47.51	112.91	1726683.65	14457248.04	39°48'31.571"N	80°41'34.135"W	122.50	67.179	1.16	-0.59	-12.86	
4028.00	3.620	158.300	4020.71	25.30	41.57	115.29	1726686.03	14457242.10	39°48'31.513"N	80°41'34.104"W	122.56	70.173	0.61	-0.61	0.35	
4123.00	2.700	173.040	4115.57	30.28	36.56	116.67	1726687.41	14457237.10	39°48'31.463"N	80°41'34.087"W	122.27	72.600	1.28	-0.97	15.52	
4217.00	2.540	184.100	4209.47	33.98	32.29	116.79	1726687.53	14457232.83	39°48'31.421"N	80°41'34.085"W	121.17	74.546	0.56	-0.17	11.77	
4313.00	1.980	207.550	4305.39	36.55	28.70	115.87	1726686.61	14457229.23	39°48'31.385"N	80°41'34.097"W	119.37	76.091	1.11	-0.58	24.43	
4407.00	2.090	240.600	4399.34	37.31	26.41	113.63	1726684.37	14457226.95	39°48'31.363"N	80°41'34.126"W	116.66	76.914	1.24	0.12	35.16	
4501.00	1.840	259.150	4493.28	36.70	25.29	110.65	1726681.39	14457225.83	39°48'31.352"N	80°41'34.164"W	113.51	77.127	0.72	-0.27	19.73	
4596.00	1.260	266.320	4588.25	35.67	24.93	108.11	1726678.86	14457225.47	39°48'31.348"N	80°41'34.197"W	110.95	77.013	0.64	-0.61	7.55	
4691.00	1.550	269.490	4683.22	34.51	24.86	105.79	1726676.53	14457225.40	39°48'31.348"N	80°41'34.227"W	108.67	76.777	0.32	0.31	3.34	
4786.00	1.630	291.990	4778.18	32.76	25.35	103.25	1726673.99	14457225.89	39°48'31.353"N	80°41'34.259"W	106.32	76.205	0.66	0.08	23.68	
4881.00	0.910	318.680	4873.16	30.92	26.42	101.50	1726672.24	14457226.96	39°48'31.363"N	80°41'34.282"W	104.88	75.408	0.96	-0.76	28.09	
4976.00	1.050	348.120	4968.15	29.36	27.84	100.82	1726671.56	14457228.38	39°48'31.377"N	80°41'34.290"W	104.59	74.563	0.54	0.15	30.99	
5070.00	0.760	23.770	5062.14	28.20	29.25	100.89	1726671.64	14457229.79	39°48'31.391"N	80°41'34.289"W	105.05	73.830	0.66	-0.31	37.93	
5165.00	1.090	53.790	5157.13	27.77	30.37	101.88	1726672.62	14457230.90	39°48'31.402"N	80°41'34.277"W	106.31	73.403	0.61	0.35	31.60	
5261.00	1.850	52.500	5253.09	27.54	31.85	103.84	1726674.59	14457232.39	39°48'31.417"N	80°41'34.251"W	108.62	72.950	0.79	0.79	-1.34	
5355.00	2.910	60.040	5347.01	27.47	33.96	107.12	1726677.86	14457234.50	39°48'31.438"N	80°41'34.209"W	112.37	72.408	1.17	1.13	8.02	
5450.00	2.560	63.160	5441.90	27.72	36.13	111.10	1726681.84	14457236.66	39°48'31.459"N	80°41'34.158"W	116.82	71.987	0.40	-0.37	3.28	
5545.00	1.590	81.910	5536.84	28.43	37.27	114.30	1726685.03	14457237.80	39°48'31.470"N	80°41'34.117"W	120.22	71.940	1.23	-1.02	19.74	
5639.00	0.870	79.590	5630.82	29.21	37.58	116.29	1726687.03	14457238.12	39°48'31.473"N	80°41'34.092"W	122.21	72.091	0.77	-0.77	-2.47	
5734.00	1.150	111.070	5725.80	30.24	37.37	117.89	1726688.62	14457237.90	39°48'31.471"N	80°41'34.071"W	123.67	72.412	0.64	0.29	33.14	
5828.00	0.470	106.110	5819.79	31.27	36.92	119.14	1726689.87	14457237.46	39°48'31.466"N	80°41'34.055"W	124.73	72.781	0.73	-0.72	-5.28	
5923.00	0.310	231.910	5914.79	31.59	36.66	119.31	1726690.05	14457237.19	39°48'31.464"N	80°41'34.053"W	124.81	72.921	0.73	-0.17	132.42	
6018.00	1.020	231.660	6009.79	31.72	35.97	118.44	1726689.18	14457236.51	39°48'31.457"N	80°41'34.064"W	123.79	73.106	0.75	0.75	-0.26	
6112.00	2.080	227.530	6103.75	32.13	34.30	116.53	1726687.27	14457234.84	39°48'31.441"N	80°41'34.089"W	121.47	73.597	1.13	1.13	-4.39	
6206.00	2.150	225.480	6197.69	32.84	31.91	114.01	1726684.75	14457232.45	39°48'31.417"N	80°41'34.121"W	118.40	74.362	0.11	0.07	-2.18	
6301.00	1.790	215.630	6292.63	33.80	29.46	111.88	1726682.62	14457230.00	39°48'31.393"N	80°41'34.148"W	115.69	75.248	0.52	-0.38	-10.37	
6395.00	2.570	208.570	6386.56	35.41	26.41	110.02	1726680.76	14457226.95	39°48'31.363"N	80°41'34.173"W	113.14	76.499	0.88	0.83	-7.51	



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Operator	TUG HILL OPERATING	Slot	Slot #08
Area	Marshall County, WV	Well	Heaven Hill 3-08HU ST01
Field	Marshall	Wellbore	Heaven Hill 3-08HU ST01 AWB
Facility	Heaven Hill 3 Pad	Sidetrack from	Heaven Hill 3-08HU AWP Proj: 7528' at 6489.00 MD

WELLPATH DATA (263 stations)																
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate	Comments
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(US ft)	(US ft)			(ft)	(°)	(°/100ft)	(°/100ft)	(°/100ft)	
6489.00	1.990	202.770	6480.49	37.40	23.06	108.38	1726679.12	14457223.60	39°48'31.330"N	80°41'34.194"W	110.80	77.989	0.66	-0.62	-6.17	
6571.00	2.220	166.150	6562.43	39.74	20.20	108.21	1726678.95	14457220.75	39°48'31.302"N	80°41'34.196"W	110.08	79.424	1.63	0.28	-44.66	Benchmark MWD Surveys <12-1/4">(6489')(6571'-10633')
6602.00	3.660	145.970	6593.39	41.30	18.80	108.90	1726679.64	14457219.34	39°48'31.288"N	80°41'34.187"W	110.51	80.205	5.65	4.65	-65.10	
6634.00	5.220	137.760	6625.30	43.75	16.88	110.45	1726681.19	14457217.42	39°48'31.269"N	80°41'34.167"W	111.74	81.313	5.25	4.87	-25.66	
6665.00	6.450	138.370	6656.14	46.86	14.53	112.56	1726683.30	14457215.08	39°48'31.245"N	80°41'34.140"W	113.49	82.644	3.97	3.97	1.97	
6758.00	8.800	137.580	6748.31	58.99	5.37	120.83	1726691.56	14457205.92	39°48'31.155"N	80°41'34.035"W	120.95	87.454	2.53	2.53	-0.85	
6852.00	10.080	137.580	6841.03	74.14	-6.01	131.23	1726701.96	14457194.55	39°48'31.042"N	80°41'33.902"W	131.37	92.621	1.36	1.36	0.00	
6947.00	13.010	136.700	6934.10	92.79	-19.93	144.17	1726714.90	14457180.63	39°48'30.904"N	80°41'33.737"W	145.54	97.871	3.09	3.08	-0.93	
7042.00	15.930	136.310	7026.08	116.03	-37.14	160.52	1726731.24	14457163.42	39°48'30.733"N	80°41'33.528"W	164.76	103.029	3.08	3.07	-0.41	
7136.00	17.500	135.660	7116.10	142.44	-56.58	179.31	1726750.02	14457143.99	39°48'30.540"N	80°41'33.288"W	188.02	107.513	1.68	1.67	-0.69	
7231.00	18.740	137.020	7206.39	171.35	-77.96	199.69	1726770.40	14457122.62	39°48'30.328"N	80°41'33.028"W	214.37	111.326	1.38	1.31	1.43	
7326.00	17.000	135.870	7296.80	199.89	-99.10	219.77	1726790.47	14457101.49	39°48'30.119"N	80°41'32.772"W	241.08	114.271	1.87	-1.83	-1.21	
7421.00	17.000	136.390	7387.65	227.04	-119.12	239.02	1726809.71	14457081.48	39°48'29.920"N	80°41'32.526"W	267.05	116.490	0.16	0.00	0.55	
7515.00	17.710	137.270	7477.37	254.53	-139.57	258.20	1726828.88	14457061.03	39°48'29.718"N	80°41'32.281"W	293.51	118.394	0.81	0.76	0.94	
7610.00	16.200	140.110	7568.24	281.83	-160.35	276.50	1726847.18	14457040.26	39°48'29.512"N	80°41'32.047"W	319.63	120.111	1.81	-1.59	2.99	
7705.00	15.640	142.520	7659.60	307.69	-180.68	292.79	1726863.46	14457019.94	39°48'29.310"N	80°41'31.840"W	344.06	121.679	0.91	-0.59	2.54	
7799.00	14.750	137.140	7750.32	332.04	-199.51	308.64	1726879.31	14457001.12	39°48'29.123"N	80°41'31.637"W	367.51	122.879	1.77	-0.95	-5.72	
7894.00	15.670	136.930	7841.99	356.49	-217.75	325.63	1726896.29	14456982.89	39°48'28.943"N	80°41'31.420"W	391.73	123.771	0.97	0.97	-0.22	
7988.00	16.150	137.560	7932.39	381.78	-236.67	343.12	1726913.77	14456963.97	39°48'28.755"N	80°41'31.197"W	416.83	124.596	0.54	0.51	0.67	
8083.00	16.650	138.290	8023.52	408.17	-256.58	361.09	1726931.73	14456944.07	39°48'28.558"N	80°41'30.968"W	442.97	125.397	0.57	0.53	0.77	
8176.00	16.630	135.340	8112.63	434.26	-275.99	379.31	1726949.95	14456924.66	39°48'28.365"N	80°41'30.735"W	469.10	126.040	0.91	-0.02	-3.17	
8270.00	16.730	133.470	8202.67	460.45	-294.87	398.59	1726969.21	14456905.80	39°48'28.178"N	80°41'30.489"W	495.80	126.494	0.58	0.11	-1.99	
8364.00	17.070	133.380	8292.61	486.87	-313.65	418.43	1726989.05	14456887.02	39°48'27.992"N	80°41'30.236"W	522.94	126.855	0.36	0.36	-0.10	
8459.00	17.070	133.780	8383.43	513.84	-332.88	438.63	1727009.24	14456867.80	39°48'27.801"N	80°41'29.978"W	550.64	127.195	0.12	0.00	0.42	
8553.00	17.760	134.290	8473.12	541.12	-352.43	458.86	1727029.46	14456848.25	39°48'27.607"N	80°41'29.719"W	578.58	127.527	0.75	0.73	0.54	
8648.00	16.010	136.050	8564.02	567.98	-371.99	478.32	1727048.92	14456828.71	39°48'27.413"N	80°41'29.471"W	605.94	127.872	1.92	-1.84	1.85	
8742.00	15.560	139.390	8654.48	593.11	-390.89	495.53	1727066.11	14456809.81	39°48'27.226"N	80°41'29.251"W	631.14	128.268	1.08	-0.48	3.55	
8837.00	14.220	143.810	8746.29	617.33	-409.98	510.71	1727081.29	14456790.73	39°48'27.037"N	80°41'29.057"W	654.91	128.756	1.85	-1.41	4.65	
8932.00	15.390	141.800	8838.13	641.49	-429.31	525.40	1727095.97	14456771.41	39°48'26.845"N	80°41'28.870"W	678.49	129.253	1.34	1.23	-2.12	
9026.00	15.530	140.820	8928.73	666.37	-448.86	541.06	1727111.63	14456751.86	39°48'26.651"N	80°41'28.670"W	703.01	129.679	0.32	0.15	-1.04	



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Facility	Heaven Hill 3 Pad	Sidetrack from	Heaven Hill 3-08HU AWP Proj: 7528' at 6489.00 MD

WELLPATH DATA (263 stations)																
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate	Comments
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(US ft)	(US ft)			(ft)	(°)	(°/100ft)	(°/100ft)	(°/100ft)	
9121.00	16.630	140.080	9020.01	692.43	-469.15	557.82	1727128.38	14456731.59	39°48'26.450"N	80°41'28.456"W	728.88	130.065	1.18	1.16	-0.78	
9216.00	17.900	135.660	9110.74	720.14	-490.02	576.75	1727147.30	14456710.73	39°48'26.243"N	80°41'28.215"W	756.81	130.352	1.92	1.34	-4.65	
9310.00	18.100	135.150	9200.14	748.46	-510.70	597.14	1727167.89	14456690.05	39°48'26.038"N	80°41'27.954"W	785.74	130.538	0.27	0.21	-0.54	
9404.00	17.070	126.560	9289.76	775.50	-529.27	618.53	1727189.07	14456671.48	39°48'25.854"N	80°41'27.681"W	814.07	130.554	2.97	-1.10	-9.14	
9498.00	17.250	140.040	9379.61	802.13	-548.18	638.57	1727209.10	14456652.58	39°48'25.666"N	80°41'27.425"W	841.59	130.645	4.23	0.19	14.34	
9593.00	17.380	141.260	9470.30	830.15	-570.05	656.49	1727227.02	14456630.73	39°48'25.450"N	80°41'27.196"W	869.45	130.968	0.41	0.14	1.28	
9688.00	16.410	142.440	9561.20	857.58	-591.75	673.55	1727244.07	14456609.03	39°48'25.235"N	80°41'26.979"W	896.57	131.301	1.08	-1.02	1.24	
9783.00	17.270	142.370	9652.13	884.96	-613.56	690.34	1727260.85	14456587.23	39°48'25.019"N	80°41'26.765"W	923.59	131.630	0.91	0.91	-0.07	
9878.00	18.480	138.040	9742.54	913.81	-635.92	709.02	1727279.53	14456564.88	39°48'24.797"N	80°41'26.526"W	952.42	131.889	1.89	1.27	-4.56	
9973.00	16.700	135.190	9833.10	941.92	-656.81	728.71	1727299.21	14456544.00	39°48'24.590"N	80°41'26.275"W	981.02	132.029	2.08	-1.87	-3.00	
10068.00	16.780	136.290	9924.08	968.64	-676.40	747.80	1727318.29	14456524.42	39°48'24.396"N	80°41'26.031"W	1008.33	132.130	0.34	0.08	1.16	
10162.00	15.810	136.360	10014.30	994.44	-695.48	766.02	1727336.50	14456505.35	39°48'24.206"N	80°41'25.799"W	1034.64	132.237	1.03	-1.03	0.07	
10256.00	14.400	129.380	10105.06	1018.03	-712.16	783.89	1727354.37	14456488.67	39°48'24.041"N	80°41'25.570"W	1059.09	132.255	2.45	-1.50	-7.43	
10351.00	14.420	129.360	10197.07	1040.40	-727.16	802.17	1727372.64	14456473.68	39°48'23.892"N	80°41'25.337"W	1082.70	132.192	0.02	0.02	-0.02	
10445.00	15.800	136.380	10287.82	1064.00	-743.85	820.05	1727390.51	14456457.00	39°48'23.727"N	80°41'25.108"W	1107.15	132.210	2.44	1.47	7.47	
10539.00	16.900	136.980	10378.02	1089.92	-763.10	838.20	1727408.65	14456437.75	39°48'23.536"N	80°41'24.877"W	1133.54	132.315	1.18	1.17	0.64	
10633.00	16.400	137.880	10468.08	1116.38	-782.93	856.42	1727426.87	14456417.92	39°48'23.339"N	80°41'24.644"W	1160.36	132.433	0.60	-0.53	0.96	
10692.00	18.190	139.340	10524.41	1133.67	-796.10	868.01	1727438.45	14456404.76	39°48'23.209"N	80°41'24.496"W	1177.80	132.526	3.12	3.03	2.47	BH AT Curve <8-1/2"> (10633')(10692'-22370')
10786.00	15.870	148.260	10614.30	1161.02	-818.17	884.34	1727454.77	14456382.71	39°48'22.990"N	80°41'24.288"W	1204.76	132.774	3.71	-2.47	9.49	
10881.00	15.210	151.710	10705.83	1186.45	-840.19	897.08	1727467.51	14456360.69	39°48'22.772"N	80°41'24.126"W	1229.09	133.124	1.20	-0.69	3.63	
10976.00	15.660	142.230	10797.41	1211.65	-861.30	910.84	1727481.26	14456339.59	39°48'22.563"N	80°41'23.950"W	1253.58	133.399	2.69	0.47	-9.98	
11071.00	15.670	134.340	10888.90	1236.85	-880.40	927.87	1727498.29	14456320.49	39°48'22.373"N	80°41'23.733"W	1279.08	133.496	2.24	0.01	-8.31	
11166.00	16.620	132.570	10980.15	1262.39	-898.56	947.05	1727517.46	14456302.34	39°48'22.193"N	80°41'23.488"W	1305.49	133.495	1.13	1.00	-1.86	
11261.00	16.910	133.030	11071.11	1288.80	-917.18	967.15	1727537.56	14456283.73	39°48'22.009"N	80°41'23.231"W	1332.89	133.481	0.34	0.31	0.48	
11356.00	17.180	137.990	11161.94	1315.94	-937.03	986.65	1727557.04	14456263.88	39°48'21.812"N	80°41'22.982"W	1360.70	133.523	1.56	0.28	5.22	
11451.00	22.740	149.120	11251.23	1348.14	-963.25	1005.48	1727575.87	14456237.68	39°48'21.552"N	80°41'22.742"W	1392.42	133.771	7.06	5.85	11.72	
11545.00	27.110	151.330	11336.46	1387.71	-997.65	1025.09	1727595.47	14456203.29	39°48'21.211"N	80°41'22.492"W	1430.42	134.223	4.75	4.65	2.35	
11640.00	34.530	146.420	11418.00	1436.31	-1039.14	1050.41	1727620.78	14456161.82	39°48'20.800"N	80°41'22.170"W	1477.55	134.891	8.24	7.81	-5.17	
11735.00	41.480	140.720	11492.83	1494.50	-1085.99	1085.27	1727655.63	14456114.98	39°48'20.336"N	80°41'21.725"W	1535.32	135.019	8.19	7.32	-6.00	
11830.00	49.890	139.260	11559.14	1561.69	-1137.97	1128.98	1727699.32	14456063.03	39°48'19.821"N	80°41'21.167"W	1602.99	135.227	8.92	8.85	-1.54	



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WELLPATH DATA (263 stations)																
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]	Comments
11924.00	58.560	145.160	11614.07	1637.43	-1198.27	1175.46	1727745.78	14456002.76	39°48'19.224"N	80°41'20.575"W	1678.56	135.550	10.53	9.22	6.28	
12018.00	65.170	152.040	11658.42	1720.20	-1269.00	1218.46	1727788.76	14455932.05	39°48'18.523"N	80°41'20.027"W	1759.26	136.164	9.54	7.03	7.32	
12112.00	72.030	151.850	11692.69	1807.49	-1346.19	1259.60	1727829.89	14455854.89	39°48'17.759"N	80°41'19.503"W	1843.58	136.903	7.30	7.30	-0.20	
12206.00	78.600	152.680	11716.51	1898.14	-1426.63	1301.88	1727872.15	14455774.48	39°48'16.962"N	80°41'18.965"W	1931.36	137.618	7.04	6.99	0.88	
12300.00	86.090	154.350	11729.02	1990.84	-1509.96	1343.39	1727913.64	14455691.19	39°48'16.137"N	80°41'18.437"W	2021.05	138.341	8.16	7.97	1.78	
12394.00	86.430	153.500	11735.16	2084.18	-1594.21	1384.62	1727954.86	14455606.97	39°48'15.303"N	80°41'17.912"W	2111.55	139.025	0.97	0.36	-0.90	
12489.00	87.110	153.000	11740.51	2178.67	-1678.91	1427.31	1727997.53	14455522.31	39°48'14.465"N	80°41'17.369"W	2203.62	139.631	0.89	0.72	-0.53	
12582.00	88.920	153.200	11743.73	2271.28	-1761.79	1469.36	1728039.56	14455439.45	39°48'13.644"N	80°41'16.834"W	2294.10	140.171	1.96	1.95	0.22	
12677.00	88.950	147.580	11745.50	2366.16	-1844.33	1516.28	1728086.47	14455356.95	39°48'12.827"N	80°41'16.236"W	2387.61	140.575	5.94	0.03	-5.94	
12772.00	88.680	148.350	11747.46	2461.14	-1924.83	1566.68	1728136.85	14455276.47	39°48'12.030"N	80°41'15.594"W	2481.83	140.857	0.88	-0.28	0.83	
12867.00	88.460	147.190	11749.83	2556.10	-2005.17	1617.33	1728187.47	14455196.17	39°48'11.234"N	80°41'14.949"W	2576.13	141.111	1.24	-0.23	-1.22	
12962.00	87.910	146.880	11752.84	2651.03	-2084.83	1668.99	1728239.12	14455116.54	39°48'10.445"N	80°41'14.291"W	2670.59	141.321	0.66	-0.58	-0.33	
13056.00	88.000	147.780	11756.20	2744.96	-2163.91	1719.70	1728289.81	14455037.49	39°48'09.662"N	80°41'13.644"W	2764.03	141.525	0.96	0.10	0.96	
13151.00	87.910	147.410	11759.59	2839.89	-2244.07	1770.58	1728340.67	14454957.37	39°48'08.868"N	80°41'12.996"W	2858.46	141.726	0.40	-0.09	-0.39	
13246.00	88.950	150.040	11762.19	2934.85	-2325.22	1819.87	1728389.94	14454876.24	39°48'08.064"N	80°41'12.368"W	2952.73	141.951	2.98	1.09	2.77	
13341.00	88.890	154.970	11763.98	3029.54	-2409.45	1863.71	1728433.76	14454792.05	39°48'07.230"N	80°41'11.810"W	3046.13	142.278	5.19	-0.06	5.19	
13435.00	88.950	157.160	11765.75	3122.65	-2495.35	1901.84	1728471.87	14454706.18	39°48'06.380"N	80°41'11.326"W	3137.48	142.687	2.33	0.06	2.33	
13530.00	88.920	156.210	11767.52	3216.60	-2582.58	1939.43	1728509.45	14454618.99	39°48'05.517"N	80°41'10.848"W	3229.72	143.095	1.00	-0.03	-1.00	
13624.00	88.860	150.170	11769.34	3310.19	-2666.42	1981.80	1728551.80	14454535.18	39°48'04.687"N	80°41'10.309"W	3322.24	143.379	6.42	-0.06	-6.43	
13719.00	88.980	145.510	11771.13	3405.15	-2746.80	2032.34	1728602.33	14454454.83	39°48'03.890"N	80°41'09.665"W	3416.92	143.502	4.91	0.13	-4.91	
13814.00	88.890	146.840	11772.90	3500.07	-2825.71	2085.22	1728655.18	14454375.95	39°48'03.109"N	80°41'08.991"W	3511.80	143.575	1.40	-0.09	1.40	
13909.00	88.920	147.850	11774.71	3595.04	-2905.68	2136.47	1728706.41	14454296.02	39°48'02.317"N	80°41'08.338"W	3606.58	143.674	1.06	0.03	1.06	
14004.00	88.860	147.860	11776.55	3690.02	-2986.10	2187.00	1728756.93	14454215.63	39°48'01.520"N	80°41'07.694"W	3701.32	143.781	0.06	-0.06	0.01	
14098.00	88.830	148.080	11778.45	3784.00	-3065.77	2236.85	1728806.75	14454135.98	39°48'00.731"N	80°41'07.059"W	3795.06	143.885	0.24	-0.03	0.23	
14193.00	89.050	147.300	11780.21	3878.97	-3146.05	2287.62	1728857.50	14454055.74	39°47'59.936"N	80°41'06.412"W	3889.83	143.978	0.85	0.23	-0.82	
14288.00	89.140	149.180	11781.71	3973.96	-3226.81	2337.61	1728907.48	14453975.01	39°47'59.136"N	80°41'05.775"W	3984.56	144.079	1.98	0.09	1.98	
14382.00	89.200	151.250	11783.07	4067.89	-3308.38	2384.30	1728954.14	14453893.47	39°47'58.328"N	80°41'05.181"W	4078.02	144.220	2.20	0.06	2.20	
14477.00	89.170	152.820	11784.42	4162.67	-3392.28	2428.84	1728998.67	14453809.61	39°47'57.498"N	80°41'04.614"W	4172.15	144.398	1.65	-0.03	1.65	
14572.00	89.020	153.350	11785.92	4257.32	-3476.97	2471.84	1729041.65	14453724.94	39°47'56.659"N	80°41'04.067"W	4266.07	144.590	0.58	-0.16	0.56	
14666.00	88.740	155.340	11787.76	4350.77	-3561.69	2512.53	1729082.32	14453640.26	39°47'55.821"N	80°41'03.549"W	4358.72	144.800	2.14	-0.30	2.12	



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REFERENCE WELLPATH IDENTIFICATION			
Operator	TUG HILL OPERATING	Slot	Slot #08
Area	Marshall County, WV	Well	Heaven Hill 3-08HU ST01
Field	Marshall	Wellbore	Heaven Hill 3-08HU ST01 AWB
Facility	Heaven Hill 3 Pad	Sidetrack from	Heaven Hill 3-08HU AWP Proj: 7528' at 6489.00 MD

WELLPATH DATA (263 stations)																
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]	Comments
14760.00	89.020	154.360	11789.60	4444.13	-3646.78	2552.47	1729122.25	14453555.23	39°47'54.978"N	80°41'03.041"W	4451.28	145.011	1.08	0.30	-1.04	
14855.00	88.830	146.030	11791.38	4538.97	-3729.10	2599.64	1729169.40	14453472.91	39°47'54.163"N	80°41'02.441"W	4545.80	145.119	8.77	-0.20	-8.77	
14950.00	88.740	139.460	11793.40	4633.46	-3804.66	2657.10	1729226.84	14453397.39	39°47'53.414"N	80°41'01.708"W	4640.65	145.070	6.91	-0.09	-6.92	
15043.00	88.680	140.890	11795.49	4725.51	-3876.07	2716.65	1729286.36	14453326.01	39°47'52.707"N	80°41'00.948"W	4733.29	144.974	1.54	-0.06	-1.54	
15139.00	88.710	146.450	11797.88	4821.14	-3953.35	2773.48	1729343.18	14453248.75	39°47'51.941"N	80°41'00.224"W	4829.21	144.948	5.79	0.03	5.79	
15234.00	88.800	155.000	11799.75	4915.94	-4036.13	2819.88	1729389.56	14453166.01	39°47'51.121"N	80°40'59.633"W	4923.62	145.059	9.00	0.09	9.00	
15328.00	88.710	157.640	11801.79	5008.98	-4122.18	2857.63	1729427.28	14453079.99	39°47'50.269"N	80°40'59.153"W	5015.82	145.269	2.81	-0.10	2.81	
15420.00	88.770	157.720	11803.81	5099.72	-4207.27	2892.56	1729462.20	14452994.94	39°47'49.427"N	80°40'58.710"W	5105.68	145.491	0.11	0.07	0.09	
15515.00	88.770	155.430	11805.85	5193.69	-4294.41	2930.31	1729499.94	14452907.83	39°47'48.565"N	80°40'58.230"W	5198.92	145.692	2.41	0.00	-2.41	
15609.00	88.710	151.390	11807.92	5287.27	-4378.43	2972.37	1729541.98	14452823.84	39°47'47.733"N	80°40'57.695"W	5292.04	145.829	4.30	-0.06	-4.30	
15703.00	88.710	148.970	11810.04	5381.19	-4459.96	3019.10	1729588.69	14452742.34	39°47'46.928"N	80°40'57.100"W	5385.74	145.905	2.57	0.00	-2.57	
15798.00	88.740	149.090	11812.15	5476.16	-4541.40	3067.97	1729637.55	14452660.94	39°47'46.119"N	80°40'56.477"W	5480.58	145.959	0.13	0.03	0.13	
15892.00	88.710	147.470	11814.24	5570.13	-4621.33	3117.38	1729686.94	14452581.04	39°47'45.327"N	80°40'55.848"W	5574.48	145.998	1.72	-0.03	-1.72	
15987.00	88.650	148.230	11816.43	5665.10	-4701.74	3167.92	1729737.46	14452500.66	39°47'44.531"N	80°40'55.204"W	5669.40	146.029	0.80	-0.06	0.80	
16082.00	88.590	151.290	11818.72	5760.03	-4783.78	3215.74	1729785.26	14452418.65	39°47'43.718"N	80°40'54.595"W	5764.16	146.090	3.22	-0.06	3.22	
16176.00	92.370	152.660	11817.93	5853.81	-4866.74	3259.90	1729829.40	14452335.72	39°47'42.897"N	80°40'54.033"W	5857.65	146.185	4.28	4.02	1.46	
16271.00	89.570	151.710	11816.32	5948.56	-4950.74	3304.22	1729873.70	14452251.76	39°47'42.065"N	80°40'53.469"W	5952.12	146.280	3.11	-2.95	-1.00	
16366.00	88.250	153.140	11818.13	6043.29	-5034.93	3348.18	1729917.65	14452167.60	39°47'41.232"N	80°40'52.910"W	6046.56	146.376	2.05	-1.39	1.51	
16461.00	88.190	153.200	11821.08	6137.90	-5119.66	3391.04	1729960.49	14452082.90	39°47'40.393"N	80°40'52.365"W	6140.86	146.481	0.09	-0.06	0.06	
16556.00	88.250	151.310	11824.03	6232.62	-5203.70	3435.24	1730004.68	14451998.90	39°47'39.561"N	80°40'51.802"W	6235.33	146.569	1.99	0.06	-1.99	
16649.00	88.250	148.570	11826.87	6325.52	-5284.14	3481.80	1730051.21	14451918.49	39°47'38.764"N	80°40'51.210"W	6328.12	146.619	2.94	0.00	-2.95	
16744.00	88.150	146.130	11829.86	6420.46	-5364.09	3533.03	1730102.42	14451838.57	39°47'37.972"N	80°40'50.557"W	6423.06	146.629	2.57	-0.11	-2.57	
16839.00	88.310	143.950	11832.79	6515.26	-5441.90	3587.43	1730156.80	14451760.79	39°47'37.201"N	80°40'49.863"W	6517.97	146.606	2.30	0.17	-2.29	
16934.00	88.310	147.300	11835.60	6610.10	-5520.27	3641.04	1730210.39	14451682.48	39°47'36.425"N	80°40'49.180"W	6612.90	146.592	3.52	0.00	3.53	
17028.00	88.340	151.290	11838.35	6704.03	-5601.04	3689.01	1730258.34	14451601.72	39°47'35.625"N	80°40'48.569"W	6706.74	146.630	4.24	0.03	4.24	
17123.00	89.200	150.710	11840.38	6798.90	-5684.11	3735.05	1730304.37	14451518.68	39°47'34.803"N	80°40'47.983"W	6801.45	146.691	1.09	0.91	-0.61	
17217.00	89.140	150.680	11841.75	6892.80	-5766.07	3781.06	1730350.35	14451436.75	39°47'33.991"N	80°40'47.398"W	6895.21	146.745	0.07	-0.06	-0.03	
17312.00	89.020	153.760	11843.27	6987.55	-5850.10	3825.32	1730394.60	14451352.75	39°47'33.159"N	80°40'46.835"W	6989.76	146.820	3.24	-0.13	3.24	
17406.00	89.110	154.160	11844.81	7081.07	-5934.54	3866.58	1730435.84	14451268.34	39°47'32.323"N	80°40'46.310"W	7083.03	146.914	0.44	0.10	0.43	
17501.00	88.860	153.780	11846.49	7175.59	-6019.89	3908.27	1730477.51	14451183.03	39°47'31.478"N	80°40'45.780"W	7177.30	147.007	0.48	-0.26	-0.40	



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REFERENCE WELLPATH IDENTIFICATION

Operator	TUG HILL OPERATING	Slot	Slot #08
Area	Marshall County, WV	Well	Heaven Hill 3-08HU ST01
Field	Marshall	Wellbore	Heaven Hill 3-08HU ST01 AWB
Facility	Heaven Hill 3 Pad	Sidetrack from	Heaven Hill 3-08HU AWP Proj: 7528' at 6489.00 MD

WELLPATH DATA (263 stations)

MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Comments
17596.00	88.950	151.460	11848.30	7270.29	-6104.23	3951.94	1730521.17	14451098.72	39°47'30.643"N	80°40'45.224"W	7271.83	147.081	2.44	0.09	-2.44	
17690.00	88.770	150.860	11850.17	7364.15	-6186.56	3997.28	1730566.49	14451016.43	39°47'29.828"N	80°40'44.647"W	7365.57	147.133	0.67	-0.19	-0.64	
17785.00	88.590	150.230	11852.36	7459.05	-6269.25	4043.98	1730613.17	14450933.76	39°47'29.009"N	80°40'44.053"W	7460.38	147.176	0.69	-0.19	-0.66	
17880.00	88.620	147.300	11854.68	7554.01	-6350.45	4093.22	1730662.40	14450852.60	39°47'28.205"N	80°40'43.426"W	7555.31	147.196	3.08	0.03	-3.08	
17974.00	89.110	150.080	11856.54	7647.97	-6430.74	4142.06	1730711.21	14450772.34	39°47'27.410"N	80°40'42.804"W	7649.25	147.214	3.00	0.52	2.96	
18069.00	89.200	150.990	11857.94	7742.89	-6513.44	4188.78	1730757.92	14450689.67	39°47'26.591"N	80°40'42.209"W	7744.08	147.255	0.96	0.09	0.96	
18164.00	89.880	152.780	11858.70	7837.69	-6597.22	4233.55	1730802.66	14450605.92	39°47'25.761"N	80°40'41.639"W	7838.77	147.311	2.02	0.72	1.88	
18258.00	89.880	153.420	11858.90	7931.36	-6681.05	4276.07	1730845.17	14450522.13	39°47'24.931"N	80°40'41.098"W	7932.29	147.380	0.68	0.00	0.68	
18353.00	89.660	147.620	11859.28	8026.24	-6763.72	4322.90	1730891.89	14450439.50	39°47'24.112"N	80°40'40.503"W	8027.11	147.417	6.11	-0.23	-6.11	
18448.00	89.600	144.370	11859.89	8121.15	-6842.46	4375.93	1730944.99	14450360.79	39°47'23.332"N	80°40'39.827"W	8122.07	147.400	3.42	-0.06	-3.42	
18543.00	89.750	141.960	11860.43	8215.77	-6918.48	4432.88	1731001.91	14450284.79	39°47'22.579"N	80°40'39.101"W	8216.80	147.351	2.54	0.16	-2.54	
18637.00	89.850	144.050	11860.76	8309.37	-6993.56	4489.44	1731058.45	14450209.75	39°47'21.835"N	80°40'38.379"W	8310.53	147.302	2.23	0.11	2.22	
18732.00	89.720	146.430	11861.12	8404.23	-7071.60	4543.59	1731112.59	14450131.74	39°47'21.062"N	80°40'37.689"W	8405.46	147.279	2.51	-0.14	2.51	
18826.00	89.350	149.030	11861.88	8498.21	-7151.07	4593.78	1731162.75	14450052.30	39°47'20.275"N	80°40'37.050"W	8499.45	147.284	2.79	-0.39	2.77	
18920.00	89.690	150.700	11862.67	8592.17	-7232.36	4640.96	1731209.92	14449971.04	39°47'19.470"N	80°40'36.449"W	8593.34	147.312	1.81	0.36	1.78	
19015.00	89.570	153.450	11863.28	8686.95	-7316.29	4685.45	1731254.39	14449887.14	39°47'18.639"N	80°40'35.883"W	8688.01	147.364	2.90	-0.13	2.89	
19109.00	89.720	153.500	11863.86	8780.56	-7400.39	4727.43	1731296.35	14449803.07	39°47'17.806"N	80°40'35.350"W	8781.48	147.429	0.17	0.16	0.05	
19204.00	89.820	155.010	11864.25	8875.03	-7485.96	4768.69	1731337.60	14449717.54	39°47'16.959"N	80°40'34.825"W	8875.81	147.502	1.59	0.11	1.59	
19299.00	89.850	154.190	11864.52	8969.45	-7571.77	4809.44	1731378.33	14449631.76	39°47'16.109"N	80°40'34.307"W	8970.09	147.577	0.86	0.03	-0.86	
19394.00	89.320	154.330	11865.21	9063.93	-7657.34	4850.70	1731419.57	14449546.22	39°47'15.262"N	80°40'33.782"W	9064.45	147.647	0.58	-0.56	0.15	
19488.00	89.260	151.230	11866.37	9157.62	-7740.92	4893.68	1731462.54	14449462.68	39°47'14.435"N	80°40'33.236"W	9158.05	147.700	3.30	-0.06	-3.30	
19583.00	89.320	146.940	11867.55	9252.58	-7822.40	4942.48	1731511.31	14449381.23	39°47'13.628"N	80°40'32.614"W	9253.00	147.714	4.52	0.06	-4.52	
19678.00	89.290	144.680	11868.70	9347.48	-7900.97	4995.85	1731564.67	14449302.69	39°47'12.849"N	80°40'31.934"W	9347.93	147.694	2.38	-0.03	-2.38	
19772.00	89.200	145.370	11869.94	9441.32	-7977.98	5049.73	1731618.53	14449225.71	39°47'12.086"N	80°40'31.248"W	9441.82	147.668	0.74	-0.10	0.73	
19867.00	89.290	147.700	11871.19	9536.26	-8057.22	5102.11	1731670.88	14449146.50	39°47'11.301"N	80°40'30.580"W	9536.79	147.657	2.45	0.09	2.45	
19962.00	89.320	149.080	11872.35	9631.25	-8138.12	5151.90	1731720.65	14449065.83	39°47'10.500"N	80°40'29.946"W	9631.77	147.664	1.45	0.03	1.45	
20057.00	89.390	149.380	11873.42	9726.23	-8219.74	5200.49	1731769.23	14448984.04	39°47'09.692"N	80°40'29.328"W	9726.73	147.679	0.32	0.07	0.32	
20151.00	89.320	152.270	11874.47	9820.12	-8301.80	5246.31	1731815.03	14448902.01	39°47'08.879"N	80°40'28.745"W	9820.57	147.709	3.08	-0.07	3.07	
20246.00	89.230	152.370	11875.68	9914.87	-8385.92	5290.44	1731859.14	14448817.93	39°47'08.046"N	80°40'28.183"W	9915.26	147.753	0.14	-0.09	0.11	
20341.00	89.450	152.070	11876.77	10009.64	-8469.97	5334.71	1731903.40	14448733.92	39°47'07.214"N	80°40'27.620"W	10009.97	147.796	0.39	0.23	-0.32	



Actual Wellpath Report

Heaven Hill 3-08HU ST01 AWP Proj: 22395'
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REFERENCE WELLPATH IDENTIFICATION			
Operator	TUG HILL OPERATING	Slot	Slot #08
Area	Marshall County, WV	Well	Heaven Hill 3-08HU ST01
Field	Marshall	Wellbore	Heaven Hill 3-08HU ST01 AWB
Facility	Heaven Hill 3 Pad	Sidetrack from	Heaven Hill 3-08HU AWP Proj: 7528' at 6489.00 MD

WELLPATH DATA (263 stations)																
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate	Comments
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(US ft)	(US ft)			(ft)	(°)	(°/100ft)	(°/100ft)	(°/100ft)	
20435.00	89.540	154.540	11877.60	10103.27	-8553.94	5376.93	1731945.60	14448649.98	39°47'06.383"N	80°40'27.083"W	10103.53	147.847	2.63	0.10	2.63	
20529.00	89.140	153.750	11878.68	10196.76	-8638.52	5417.92	1731986.58	14448565.43	39°47'05.545"N	80°40'26.562"W	10196.96	147.905	0.94	-0.43	-0.84	
20624.00	89.200	153.300	11880.06	10291.35	-8723.55	5460.27	1732028.91	14448480.43	39°47'04.703"N	80°40'26.024"W	10291.50	147.957	0.48	0.06	-0.47	
20718.00	89.200	151.550	11881.37	10385.09	-8806.86	5503.78	1732072.40	14448397.15	39°47'03.879"N	80°40'25.470"W	10385.20	147.997	1.86	0.00	-1.86	
20812.00	89.110	151.510	11882.76	10478.93	-8889.49	5548.58	1732117.18	14448314.56	39°47'03.060"N	80°40'24.900"W	10479.01	148.029	0.10	-0.10	-0.04	
20906.00	89.290	151.680	11884.07	10572.76	-8972.16	5593.30	1732161.88	14448231.92	39°47'02.242"N	80°40'24.331"W	10572.82	148.060	0.26	0.19	0.18	
21001.00	89.140	150.080	11885.37	10667.65	-9055.14	5639.52	1732208.08	14448148.97	39°47'01.420"N	80°40'23.743"W	10667.70	148.085	1.69	-0.16	-1.68	
21096.00	89.170	149.870	11886.77	10762.60	-9137.38	5687.05	1732255.60	14448066.76	39°47'00.606"N	80°40'23.138"W	10762.64	148.102	0.22	0.03	-0.22	
21191.00	89.200	149.500	11888.12	10857.56	-9219.39	5735.00	1732303.52	14447984.79	39°46'59.793"N	80°40'22.528"W	10857.59	148.116	0.39	0.03	-0.39	
21286.00	89.290	150.330	11889.37	10952.51	-9301.58	5782.62	1732351.12	14447902.63	39°46'58.979"N	80°40'21.922"W	10952.54	148.132	0.88	0.09	0.87	
21381.00	89.170	150.240	11890.65	11047.44	-9384.08	5829.70	1732398.19	14447820.16	39°46'58.162"N	80°40'21.322"W	11047.46	148.150	0.16	-0.13	-0.09	
21475.00	89.200	149.260	11891.99	11141.40	-9465.27	5877.05	1732445.52	14447739.00	39°46'57.358"N	80°40'20.720"W	11141.41	148.164	1.04	0.03	-1.04	
21570.00	89.200	149.590	11893.31	11236.37	-9547.06	5925.37	1732493.82	14447657.25	39°46'56.548"N	80°40'20.105"W	11236.38	148.174	0.35	0.00	0.35	
21664.00	89.260	150.610	11894.58	11330.31	-9628.54	5972.22	1732540.66	14447575.80	39°46'55.741"N	80°40'19.508"W	11330.32	148.190	1.09	0.06	1.09	
21758.00	88.430	152.300	11896.47	11424.14	-9711.09	6017.13	1732585.54	14447493.28	39°46'54.924"N	80°40'18.937"W	11424.14	148.217	2.00	-0.88	1.80	
21853.00	87.910	152.450	11899.51	11518.85	-9795.22	6061.16	1732629.55	14447409.19	39°46'54.091"N	80°40'18.377"W	11518.85	148.251	0.57	-0.55	0.16	
21948.00	87.140	149.840	11903.61	11613.63	-9878.34	6106.95	1732675.34	14447326.10	39°46'53.268"N	80°40'17.794"W	11613.63	148.275	2.86	-0.81	-2.75	
22043.00	87.940	154.530	11907.69	11708.29	-9962.26	6151.23	1732719.59	14447242.21	39°46'52.437"N	80°40'17.231"W	11708.30	148.307	5.00	0.84	4.94	
22137.00	88.060	146.670	11910.98	11802.08	-10044.04	6197.31	1732765.65	14447160.47	39°46'51.627"N	80°40'16.645"W	11802.09	148.325	8.36	0.13	-8.36	
22231.00	87.910	146.180	11914.28	11895.98	-10122.31	6249.26	1732817.59	14447082.23	39°46'50.852"N	80°40'15.983"W	11895.98	148.310	0.54	-0.16	-0.52	
22326.00	87.970	147.400	11917.70	11990.88	-10201.74	6301.26	1732869.56	14447002.83	39°46'50.065"N	80°40'15.321"W	11990.88	148.298	1.28	0.06	1.28	
22370.00	87.850	147.860	11919.30	12034.85	-10238.87	6324.80	1732893.10	14446965.70	39°46'49.697"N	80°40'15.021"W	12034.85	148.295	1.08	-0.27	1.05	
22395.00	87.850	147.860	11920.24	12059.83	-10260.03	6338.09	1732906.38	14446944.56	39°46'49.487"N	80°40'14.852"W	12059.83	148.294	0.00	0.00	0.00	Projected MD at TD [ST01]: 22395'



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Heaven Hill 3-08HU ST01 AWP Proj: 22395'
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REFERENCE WELLPATH IDENTIFICATION			
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Area	Marshall County, WV	Well	Heaven Hill 3-08HU ST01
Field	Marshall	Wellbore	Heaven Hill 3-08HU ST01 AWB
Facility	Heaven Hill 3 Pad	Sidetrack from	Heaven Hill 3-08HU AWP Proj: 7528' at 6489.00 MD

HOLE & CASING SECTIONS - Ref Wellbore: Heaven Hill 3-08HU ST01 AWB Ref Wellpath: Heaven Hill 3-08HU ST01 AWP Proj: 22395'									
String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
20in Conductor	26.00	1142.00	1116.00	26.00	1141.98	0.00	0.00	0.88	4.21
17.5in Open Hole	1142.00	2905.00	1763.00	1141.98	2899.91	0.88	4.21	50.21	116.03
13.375in Casing Surface	26.00	2905.00	2879.00	26.00	2899.91	0.00	0.00	50.21	116.03
12.25in Open Hole	2905.00	10708.00	7803.00	2899.91	10539.63	50.21	116.03	-799.88	871.18
9.625in Casing Intermediate	26.00	10669.00	10643.00	26.00	10502.52	0.00	0.00	-790.77	863.39
8.5in Open Hole	10708.00	22395.00	11687.00	10539.63	11920.24	-799.88	871.18	-10260.03	6338.09
5.5in Casing Production	26.00	22395.00	22369.00	26.00	11920.24	0.00	0.00	-10260.03	6338.09

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Heaven Hill 3-08HU LP - Rev-1	11734.00	-1536.52	1357.41	1727927.66	14455664.63	39°48'15.874"N	80°41'18.258"W	point
Heaven Hill 3-08HU BHL - Rev-1	11909.35	-10256.81	6344.42	1732912.71	14446947.78	39°46'49.519"N	80°40'14.770"W	point

WELLPATH COMPOSITION - Ref Wellbore: Heaven Hill 3-08HU ST01 AWB Ref Wellpath: Heaven Hill 3-08HU ST01 AWP Proj: 22395'				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
26.00	6489.00	ISCWSA MWD, Rev. 4 (Standard)	01_Benchtree MWD Surveys <12-1/4">(155'-7433')	Heaven Hill 3-08HU AWB
6489.00	10633.00	ISCWSA MWD, Rev. 4 (Standard)	02_Benchtree MWD Surveys <12-1/4">(6489')(6571'-10633')	Heaven Hill 3-08HU ST01 AWB
10633.00	22370.00	BHI AutoTrak Curve (Short)	03_BH AT Curve <8-1/2"> (10633')(10692'-22370')	Heaven Hill 3-08HU ST01 AWB
22370.00	22395.00	Blind Drilling (std)	Projection to bit	Heaven Hill 3-08HU ST01 AWB



Actual Wellpath Report

Heaven Hill 3-08HU ST01 AWP Proj: 22395'
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REFERENCE WELLPATH IDENTIFICATION			
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Area	Marshall County, WV	Well	Heaven Hill 3-08HU ST01
Field	Marshall	Wellbore	Heaven Hill 3-08HU ST01 AWB
Facility	Heaven Hill 3 Pad	Sidetrack from	Heaven Hill 3-08HU AWP Proj: 7528' at 6489.00 MD

COMMENTS
Wellpath general comments API: 47051019670000 BHI Job #: 109520484 Rig: Nabors B28 Duration: 11.17.2018 - 11.27.2018 Benchtree MWD Surveys <12-1/4">(155'-7433') Benchtree MWD Surveys <12-1/4">(6489')(6571'-10633') BH AT Curve <8-1/2"> (10633')(10692'-22370') Projected MD at TD [ST01]: 22395'

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