

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

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

Site	Bryan Pad				
Site Position:		Northing:	14,445,110.80 usft	Latitude:	39.77562900
From:	Lat/Long	Easting:	1,703,181.57 usft	Longitude:	-80.77660992
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.143 °

Well	Bryan N-14HU (slot D)					
Well Position	+N/-S	0.00 usft	Northing:	14,445,118.17 usft	Latitude:	39.77564911
	+E/-W	0.00 usft	Easting:	1,703,203.49 usft	Longitude:	-80.77653187
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	1,191.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	6/27/2019	-8.702	66.788	51,942.18588324

Design	Surveys Original Hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	345.04	

Survey Program	Date 7/18/2019				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
197.00	928.00	MWD surf (Original Hole)	MWD	MWD - Standard	RECEIVED Office of Oil and Gas AUG 14 2020 WV Department of Environmental Protection
979.00	6,383.00	MWD (Original Hole)	MWD	MWD - Standard	
6,499.00	6,499.00	Projection (Original Hole)	MWD	MWD - Standard	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
197.00	0.35	104.17	197.00	-0.15	0.58	-0.29	0.18	0.18	0.00
MWD surveys									
244.00	0.13	81.15	244.00	-0.17	0.78	-0.37	0.50	-0.47	-48.98
291.00	0.21	94.94	291.00	-0.17	0.91	-0.40	0.19	0.17	29.34
335.00	0.26	168.68	335.00	-0.28	1.01	-0.53	0.65	0.11	167.59
382.00	0.26	162.88	382.00	-0.48	1.07	-0.74	0.06	0.00	-12.34
427.00	0.08	261.15	427.00	-0.59	1.07	-0.84	0.63	-0.40	218.38
472.00	0.30	147.50	472.00	-0.69	1.10	-0.95	0.76	0.49	-252.56



Survey Report



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

RECEIVED
Office of Oil and Gas

AUG 14 2020

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	WVD Rate (°/100usft)	Department of Environmental Protection
520.00	0.21	150.84	520.00	-0.87	1.21	-1.16	0.19	-0.19	6.96	
611.00	0.17	135.29	611.00	-1.12	1.38	-1.44	0.07	-0.04	-17.09	
701.00	0.17	261.15	701.00	-1.23	1.35	-1.54	0.34	0.00	139.84	
792.00	0.04	261.15	792.00	-1.26	1.18	-1.52	0.14	-0.14	0.00	
887.00	0.17	110.24	887.00	-1.31	1.28	-1.60	0.22	0.14	-158.85	
928.00	0.08	106.19	928.00	-1.34	1.37	-1.65	0.22	-0.22	-9.88	
979.00	0.26	42.39	979.00	-1.26	1.48	-1.60	0.46	0.35	-125.10	
1,074.00	0.17	277.67	1,073.99	-1.09	1.48	-1.43	0.40	-0.09	-131.28	
1,169.00	0.65	287.34	1,168.99	-0.91	0.83	-1.09	0.51	0.51	10.18	
1,264.00	0.13	249.37	1,263.99	-0.78	0.21	-0.81	0.58	-0.55	-39.97	
1,358.00	0.74	169.48	1,357.99	-1.42	0.22	-1.43	0.78	0.65	-84.99	
1,453.00	0.92	149.17	1,452.98	-2.68	0.73	-2.77	0.36	0.19	-21.38	
1,548.00	2.10	148.56	1,547.94	-4.82	2.03	-5.18	1.24	1.24	-0.64	
1,643.00	3.25	127.82	1,642.84	-7.95	5.06	-8.99	1.56	1.21	-21.83	
1,737.00	3.73	110.24	1,736.67	-10.64	10.04	-12.87	1.24	0.51	-18.70	
1,832.00	4.17	100.39	1,831.44	-12.34	16.33	-16.13	0.85	0.46	-10.37	
1,927.00	4.08	102.15	1,926.20	-13.67	23.03	-19.15	0.16	-0.09	1.85	
2,022.00	3.82	108.22	2,020.97	-15.37	29.34	-22.43	0.52	-0.27	6.39	
2,116.00	4.35	103.12	2,114.73	-17.16	35.79	-25.82	0.68	0.56	-5.43	
2,211.00	5.27	96.70	2,209.40	-18.49	43.63	-29.12	1.12	0.97	-6.76	
2,306.00	3.55	88.79	2,304.11	-18.93	50.91	-31.43	1.92	-1.81	-8.33	
2,401.00	3.55	91.08	2,398.93	-18.93	56.79	-32.94	0.15	0.00	2.41	
2,495.00	3.25	107.96	2,492.77	-19.80	62.23	-35.20	1.11	-0.32	17.96	
2,590.00	1.84	127.29	2,587.67	-21.56	66.01	-37.87	1.72	-1.48	20.35	
2,685.00	0.74	155.68	2,682.65	-23.04	67.47	-39.68	1.31	-1.16	29.88	
2,780.00	0.96	248.58	2,777.64	-23.89	66.98	-40.37	1.31	0.23	97.79	
2,874.00	2.15	268.09	2,871.61	-24.24	64.49	-40.06	1.37	1.27	20.76	
2,969.00	1.54	246.38	2,966.56	-24.81	61.54	-39.85	0.97	-0.64	-22.85	
3,064.00	0.44	312.92	3,061.54	-25.07	60.10	-39.74	1.50	-1.16	70.04	
3,158.00	0.09	318.19	3,155.54	-24.77	59.79	-39.36	0.37	-0.37	5.61	
3,253.00	0.70	135.91	3,250.54	-25.13	60.14	-39.81	0.83	0.64	187.07	
3,348.00	0.35	81.15	3,345.54	-25.50	60.83	-40.34	0.60	-0.37	-57.64	
3,443.00	0.92	70.87	3,440.53	-25.21	61.84	-40.32	0.61	0.60	-10.82	
3,537.00	0.92	182.22	3,534.52	-25.72	62.52	-40.98	1.62	0.00	118.46	
3,636.00	1.14	194.70	3,633.51	-27.46	62.24	-42.60	0.32	0.22	12.61	
3,730.00	0.70	315.91	3,727.50	-27.95	61.61	-42.91	1.72	-0.47	128.95	
3,825.00	1.40	337.70	3,822.49	-26.46	60.76	-41.25	0.84	0.74	22.94	
3,920.00	1.01	10.13	3,917.47	-24.57	60.47	-39.34	0.81	-0.41	34.14	
4,014.00	0.22	81.15	4,011.46	-23.72	60.79	-38.61	1.02	-0.84	75.55	
4,109.00	0.26	218.87	4,106.46	-23.86	60.84	-38.76	0.47	0.04	144.97	
4,204.00	0.62	296.66	4,201.46	-23.80	60.24	-38.54	0.65	0.38	81.88	
4,298.00	0.40	201.21	4,295.46	-23.88	59.67	-38.47	0.82	-0.23	-101.54	
4,393.00	1.10	111.91	4,390.45	-24.53	60.40	-39.29	1.23	0.74	-94.00	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,488.00	1.80	112.26	4,485.42	-25.43	62.62	-40.74	0.74	0.74	0.37	
4,583.00	1.45	93.10	4,580.38	-26.06	65.20	-42.01	0.68	-0.37	-20.17	
4,677.00	0.79	26.57	4,674.36	-25.55	66.68	-41.90	1.43	-0.70	-70.78	
4,772.00	1.67	350.36	4,769.34	-23.60	66.74	-40.03	1.19	0.93	-38.12	
4,867.00	2.20	346.84	4,864.29	-20.46	66.10	-36.83	0.57	0.56	-3.71	
4,962.00	0.75	335.42	4,959.25	-18.12	65.42	-34.39	1.55	-1.53	-12.02	
5,056.00	0.09	314.94	5,053.25	-17.50	65.11	-33.72	0.71	-0.70	-21.79	
5,151.00	0.09	22.53	5,148.25	-17.38	65.09	-33.60	0.11	0.00	71.15	
5,246.00	1.18	175.72	5,243.25	-18.29	65.19	-34.50	1.33	1.15	161.25	
5,341.00	3.21	165.70	5,338.17	-21.84	65.92	-38.12	2.17	2.14	-10.55	
5,436.00	2.64	178.18	5,433.05	-26.61	66.65	-42.91	0.90	-0.60	13.14	
5,530.00	1.27	161.39	5,526.99	-29.76	67.05	-46.06	1.56	-1.46	-17.86	
5,625.00	0.66	33.40	5,621.98	-30.30	67.69	-46.74	1.85	-0.64	-134.73	
5,720.00	1.53	23.23	5,716.97	-28.68	68.49	-45.38	0.93	0.92	-10.71	
5,815.00	2.68	39.49	5,811.90	-25.80	70.40	-43.10	1.35	1.21	17.12	
5,910.00	2.06	25.33	5,906.82	-22.54	72.54	-40.50	0.89	-0.65	-14.91	
6,004.00	1.05	333.92	6,000.79	-20.24	72.89	-38.37	1.73	-1.07	-54.69	
6,099.00	2.15	261.15	6,095.76	-19.73	70.74	-37.32	2.20	1.16	-76.60	
6,194.00	3.03	252.80	6,190.66	-20.75	66.58	-37.23	1.01	0.93	-8.79	
6,289.00	0.92	266.16	6,285.60	-21.54	63.42	-37.18	2.26	-2.22	14.06	
6,383.00	0.35	33.42	6,379.59	-21.35	62.83	-36.85	1.24	-0.61	135.38	
Survey @ 6383.00 MD 6379.59 TVD										
6,499.00	0.35	33.42	6,495.59	-20.76	63.22	-36.38	0.00	0.00	0.00	
Survey projected to 6499.00 MD 6495.59 TVD OH										

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
197.00	197.00	-0.15	0.58	MWD surveys
6,383.00	6,379.59	-21.35	62.83	Survey @ 6383.00 MD 6379.59 TVD
6,499.00	6,495.59	-20.76	63.22	Survey projected to 6499.00 MD 6495.59 TVD OH

 RECEIVED
 Office of Oil and Gas

AUG 14 2020

 WV Department of
 Environmental Protection



Survey Report - Geographic



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

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

Site	Bryan Pad				
Site Position:		Northing:	14,445,110.80 usft	Latitude:	39.77562900
From:	Lat/Long	Easting:	1,703,181.57 usft	Longitude:	-80.77660992
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.143 °

Well	Bryan N-14HU (slot D)					
Well Position	+N/-S	0.00 usft	Northing:	14,445,118.17 usft	Latitude:	39.77564911
	+E/-W	0.00 usft	Easting:	1,703,203.49 usft	Longitude:	-80.77653187
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	1,191.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	6/27/2019	-8.702	66.788	51,942.18588324

Design	Surveys Original Hole				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:		Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
		0.00	0.00	0.00	345.04

Survey Program	Date 7/18/2019				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
197.00	928.00	MWD surf (Original Hole)	MWD	MWD - Standard	
979.00	6,383.00	MWD (Original Hole)	MWD	MWD - Standard	
6,499.00	6,499.00	Projection (Original Hole)	MWD	MWD - Standard	

RECEIVED
Office of Oil and Gas
AUG 14 2020
WV Department of
Environmental Protection

Survey										
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	14,445,118.17	1,703,203.49	39.77564911	-80.77653187	
197.00	0.35	104.17	197.00	-0.15	0.58	14,445,118.03	1,703,204.07	39.77564870	-80.77652980	
MWD surveys										
244.00	0.13	81.15	244.00	-0.17	0.78	14,445,118.00	1,703,204.26	39.77564863	-80.77652911	
291.00	0.21	94.94	291.00	-0.17	0.91	14,445,118.00	1,703,204.40	39.77564863	-80.77652862	
335.00	0.26	168.68	335.00	-0.28	1.01	14,445,117.90	1,703,204.50	39.77564834	-80.77652827	
382.00	0.26	162.88	382.00	-0.48	1.07	14,445,117.69	1,703,204.55	39.77564777	-80.77652808	
427.00	0.08	261.15	427.00	-0.59	1.07	14,445,117.59	1,703,204.55	39.77564749	-80.77652809	
472.00	0.30	147.50	472.00	-0.69	1.10	14,445,117.48	1,703,204.58	39.77564721	-80.77652797	
520.00	0.21	150.84	520.00	-0.87	1.21	14,445,117.30	1,703,204.69	39.77564670	-80.77652758	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

RECEIVED
Office of Oil and Gas
AUG 14 2020

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
611.00	0.17	135.29	611.00	-1.12	1.38	14,445,117.06	1,703,204.87	39.77564604	-80.77652696
701.00	0.17	261.15	701.00	-1.23	1.35	14,445,116.94	1,703,204.83	39.77564572	-80.77652709
792.00	0.04	261.15	792.00	-1.26	1.18	14,445,116.92	1,703,204.67	39.77564565	-80.77652768
887.00	0.17	110.24	887.00	-1.31	1.28	14,445,116.86	1,703,204.77	39.77564550	-80.77652732
928.00	0.08	106.19	928.00	-1.34	1.37	14,445,116.84	1,703,204.85	39.77564542	-80.77652702
979.00	0.26	42.39	979.00	-1.26	1.48	14,445,116.91	1,703,204.96	39.77564563	-80.77652662
1,074.00	0.17	277.67	1,073.99	-1.09	1.48	14,445,117.09	1,703,204.97	39.77564612	-80.77652660
1,169.00	0.65	287.34	1,168.99	-0.91	0.83	14,445,117.27	1,703,204.31	39.77564662	-80.77652893
1,264.00	0.13	249.37	1,263.99	-0.78	0.21	14,445,117.39	1,703,203.70	39.77564696	-80.77653112
1,358.00	0.74	169.48	1,357.99	-1.42	0.22	14,445,116.76	1,703,203.71	39.77564521	-80.77653108
1,453.00	0.92	149.17	1,452.98	-2.68	0.73	14,445,115.50	1,703,204.21	39.77564176	-80.77652931
1,548.00	2.10	148.56	1,547.94	-4.82	2.03	14,445,113.36	1,703,205.51	39.77563587	-80.77652470
1,643.00	3.25	127.82	1,642.84	-7.95	5.06	14,445,110.22	1,703,208.55	39.77562724	-80.77651393
1,737.00	3.73	110.24	1,736.67	-10.64	10.04	14,445,107.53	1,703,213.52	39.77561981	-80.77649625
1,832.00	4.17	100.39	1,831.44	-12.34	16.33	14,445,105.84	1,703,219.82	39.77561512	-80.77647385
1,927.00	4.08	102.15	1,926.20	-13.67	23.03	14,445,104.50	1,703,226.52	39.77561141	-80.77645001
2,022.00	3.82	108.22	2,020.97	-15.37	29.34	14,445,102.80	1,703,232.83	39.77560670	-80.77642757
2,116.00	4.35	103.12	2,114.73	-17.16	35.79	14,445,101.01	1,703,239.28	39.77560174	-80.77640464
2,211.00	5.27	96.70	2,209.40	-18.49	43.63	14,445,099.69	1,703,247.12	39.77559804	-80.77637674
2,306.00	3.55	88.79	2,304.11	-18.93	50.91	14,445,099.24	1,703,254.39	39.77559677	-80.77635086
2,401.00	3.55	91.08	2,398.93	-18.93	56.79	14,445,099.25	1,703,260.27	39.77559674	-80.77632993
2,495.00	3.25	107.96	2,492.77	-19.80	62.23	14,445,098.37	1,703,265.72	39.77559430	-80.77631056
2,590.00	1.84	127.29	2,587.67	-21.56	66.01	14,445,096.62	1,703,269.49	39.77558945	-80.77629714
2,685.00	0.74	155.68	2,682.65	-23.04	67.47	14,445,095.13	1,703,270.96	39.77558537	-80.77629193
2,780.00	0.96	248.58	2,777.64	-23.89	66.98	14,445,094.28	1,703,270.47	39.77558304	-80.77629368
2,874.00	2.15	268.09	2,871.61	-24.24	64.49	14,445,093.94	1,703,267.98	39.77558211	-80.77630256
2,969.00	1.54	246.38	2,966.56	-24.81	61.54	14,445,093.37	1,703,265.02	39.77558056	-80.77631307
3,064.00	0.44	312.92	3,061.54	-25.07	60.10	14,445,093.10	1,703,263.59	39.77557985	-80.77631818
3,158.00	0.09	318.19	3,155.54	-24.77	59.79	14,445,093.40	1,703,263.27	39.77558068	-80.77631930
3,253.00	0.70	135.91	3,250.54	-25.13	60.14	14,445,093.04	1,703,263.63	39.77557968	-80.77631804
3,348.00	0.35	81.15	3,345.54	-25.50	60.83	14,445,092.67	1,703,264.32	39.77557865	-80.77631559
3,443.00	0.92	70.87	3,440.53	-25.21	61.84	14,445,092.97	1,703,265.33	39.77557946	-80.77631200
3,537.00	0.92	182.22	3,534.52	-25.72	62.52	14,445,092.46	1,703,266.01	39.77557806	-80.77630957
3,636.00	1.14	194.70	3,633.51	-27.46	62.24	14,445,090.71	1,703,265.73	39.77557326	-80.77631058
3,730.00	0.70	315.91	3,727.50	-27.95	61.61	14,445,090.22	1,703,265.09	39.77557192	-80.77631285
3,825.00	1.40	337.70	3,822.49	-26.46	60.76	14,445,091.71	1,703,264.25	39.77557602	-80.77631585
3,920.00	1.01	10.13	3,917.47	-24.57	60.47	14,445,093.61	1,703,263.95	39.77558123	-80.77631687
4,014.00	0.22	81.15	4,011.46	-23.72	60.79	14,445,094.45	1,703,264.28	39.77558354	-80.77631571
4,109.00	0.26	218.87	4,106.46	-23.86	60.84	14,445,094.31	1,703,264.32	39.77558316	-80.77631555
4,204.00	0.62	296.66	4,201.46	-23.80	60.24	14,445,094.37	1,703,263.73	39.77558334	-80.77631767
4,298.00	0.40	201.21	4,295.46	-23.88	59.67	14,445,094.30	1,703,263.16	39.77558313	-80.77631971
4,393.00	1.10	111.91	4,390.45	-24.53	60.40	14,445,093.65	1,703,263.88	39.77558134	-80.77631713
4,488.00	1.80	112.26	4,485.42	-25.43	62.62	14,445,092.74	1,703,266.11	39.77557884	-80.77630921
4,583.00	1.45	93.10	4,580.38	-26.06	65.20	14,445,092.11	1,703,268.69	39.77557709	-80.77630003
4,677.00	0.79	26.57	4,674.36	-25.55	66.68	14,445,092.63	1,703,270.17	39.77557849	-80.77629477
4,772.00	1.67	350.36	4,769.34	-23.60	66.74	14,445,094.58	1,703,270.23	39.77558385	-80.77629453
4,867.00	2.20	346.84	4,864.29	-20.46	66.10	14,445,097.72	1,703,269.58	39.77559248	-80.77629681
4,962.00	0.75	335.42	4,959.25	-18.12	65.42	14,445,100.06	1,703,268.91	39.77559891	-80.77629919
5,056.00	0.09	314.94	5,053.25	-17.50	65.11	14,445,100.67	1,703,268.60	39.77560059	-80.77630028
5,151.00	0.09	22.53	5,148.25	-17.38	65.09	14,445,100.79	1,703,268.58	39.77560093	-80.77630036
5,246.00	1.18	175.72	5,243.25	-18.29	65.19	14,445,099.89	1,703,268.68	39.77559844	-80.77630001
5,341.00	3.21	165.70	5,338.17	-21.84	65.92	14,445,096.33	1,703,269.41	39.77558868	-80.77629744
5,436.00	2.64	178.18	5,433.05	-26.61	66.65	14,445,091.57	1,703,270.13	39.77557559	-80.77629490
5,530.00	1.27	161.39	5,526.99	-29.76	67.05	14,445,088.42	1,703,270.53	39.77556693	-80.77629350
5,625.00	0.66	33.40	5,621.98	-30.30	67.69	14,445,087.88	1,703,271.17	39.77556544	-80.77629124

WV Department of Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Aug1919_v14

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,720.00	1.53	23.23	5,716.97	-28.68	68.49	14,445,089.50	1,703,271.97	39.77556989	-80.77628837
5,815.00	2.68	39.49	5,811.90	-25.80	70.40	14,445,092.38	1,703,273.89	39.77557778	-80.77628154
5,910.00	2.06	25.33	5,906.82	-22.54	72.54	14,445,095.64	1,703,276.03	39.77558672	-80.77627388
6,004.00	1.05	333.92	6,000.79	-20.24	72.89	14,445,097.94	1,703,276.37	39.77559303	-80.77627263
6,099.00	2.15	261.15	6,095.76	-19.73	70.74	14,445,098.44	1,703,274.23	39.77559444	-80.77628026
6,194.00	3.03	252.80	6,190.66	-20.75	66.58	14,445,097.43	1,703,270.07	39.77559168	-80.77629507
6,289.00	0.92	266.16	6,285.60	-21.54	63.42	14,445,096.63	1,703,266.91	39.77558952	-80.77630633
6,383.00	0.35	33.42	6,379.59	-21.35	62.83	14,445,096.82	1,703,266.32	39.77559004	-80.77630844
Survey @ 6383.00 MD 6379.59 TVD									
6,499.00	0.35	33.42	6,495.59	-20.76	63.22	14,445,097.41	1,703,266.71	39.77559166	-80.77630705
Survey projected to 6499.00 MD 6495.59 TVD OH									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
197.00	197.00	-0.15	0.58	MWD surveys	
6,383.00	6,379.59	-21.35	62.83	Survey @ 6383.00 MD 6379.59 TVD	
6,499.00	6,495.59	-20.76	63.22	Survey projected to 6499.00 MD 6495.59 TVD OH	

RECEIVED
 Office of Oil and Gas
AUG 14 2020
 WV Department of
 Environmental Protection



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 01	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 01	Database:	DB_Aug1919_v14

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

Site	Bryan Pad				
Site Position:		Northing:	14,445,110.80 usft	Latitude:	39.77562900
From:	Lat/Long	Easting:	1,703,181.57 usft	Longitude:	-80.77660992
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.143 °

Well	Bryan N-14HU (slot D)					
Well Position	+N/-S	0.00 usft	Northing:	14,445,118.17 usft	Latitude:	39.77564911
	+E/-W	0.00 usft	Easting:	1,703,203.49 usft	Longitude:	-80.77653187
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	1,191.00 usft

Wellbore	Sidetrack 01				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/8/2019	-8.703	66.785	51,938.70965229

Design	Surveys Sidetrack 01				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	6,194.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	345.04	

Survey Program	Date 7/18/2019				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
197.00	928.00	MWD surf (Original Hole)	MWD	MWD - Standard	
979.00	6,194.00	MWD (Original Hole)	MWD	MWD - Standard	
6,281.00	9,316.00	MWD ST1 (Sidetrack 01)	MWD	MWD - Standard	
9,386.00	9,386.00	Projection ST1 (Sidetrack 01)	MWD	MWD - Standard	

RECEIVED
Office of Oil and Gas
AUG 14 2020
WV Department of Environmental Protection

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
197.00	0.35	104.17	197.00	-0.15	0.58	-0.29	0.18	0.18	0.00	
244.00	0.13	81.15	244.00	-0.17	0.78	-0.37	0.50	-0.47	-48.98	
291.00	0.21	94.94	291.00	-0.17	0.91	-0.40	0.19	0.17	29.34	
335.00	0.26	168.68	335.00	-0.28	1.01	-0.53	0.65	0.11	167.59	
382.00	0.26	162.88	382.00	-0.48	1.07	-0.74	0.06	0.00	-12.34	
427.00	0.08	261.15	427.00	-0.59	1.07	-0.84	0.63	-0.40	218.38	
472.00	0.30	147.50	472.00	-0.69	1.10	-0.95	0.76	0.49	-252.56	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 01	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 01	Database:	DB_Aug1919_v14

RECEIVED
Office of Oil and Gas

AUG 14 2020

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	WV Department of Environmental Protection Rate (°/100usft)
520.00	0.21	150.84	520.00	-0.87	1.21	-1.16	0.19	-0.19	6.96
611.00	0.17	135.29	611.00	-1.12	1.38	-1.44	0.07	-0.04	-17.09
701.00	0.17	261.15	701.00	-1.23	1.35	-1.54	0.34	0.00	139.84
792.00	0.04	261.15	792.00	-1.26	1.18	-1.52	0.14	-0.14	0.00
887.00	0.17	110.24	887.00	-1.31	1.28	-1.60	0.22	0.14	-158.85
928.00	0.08	106.19	928.00	-1.34	1.37	-1.65	0.22	-0.22	-9.88
979.00	0.26	42.39	979.00	-1.26	1.48	-1.60	0.46	0.35	-125.10
1,074.00	0.17	277.67	1,073.99	-1.09	1.48	-1.43	0.40	-0.09	-131.28
1,169.00	0.65	287.34	1,168.99	-0.91	0.83	-1.09	0.51	0.51	10.18
1,264.00	0.13	249.37	1,263.99	-0.78	0.21	-0.81	0.58	-0.55	-39.97
1,358.00	0.74	169.48	1,357.99	-1.42	0.22	-1.43	0.78	0.65	-84.99
1,453.00	0.92	149.17	1,452.98	-2.68	0.73	-2.77	0.36	0.19	-21.38
1,548.00	2.10	148.56	1,547.94	-4.82	2.03	-5.18	1.24	1.24	-0.64
1,643.00	3.25	127.82	1,642.84	-7.95	5.06	-8.99	1.56	1.21	-21.83
1,737.00	3.73	110.24	1,736.67	-10.64	10.04	-12.87	1.24	0.51	-18.70
1,832.00	4.17	100.39	1,831.44	-12.34	16.33	-16.13	0.85	0.46	-10.37
1,927.00	4.08	102.15	1,926.20	-13.67	23.03	-19.15	0.16	-0.09	1.85
2,022.00	3.82	108.22	2,020.97	-15.37	29.34	-22.43	0.52	-0.27	6.39
2,116.00	4.35	103.12	2,114.73	-17.16	35.79	-25.82	0.68	0.56	-5.43
2,211.00	5.27	96.70	2,209.40	-18.49	43.63	-29.12	1.12	0.97	-6.76
2,306.00	3.55	88.79	2,304.11	-18.93	50.91	-31.43	1.92	-1.81	-8.33
2,401.00	3.55	91.08	2,398.93	-18.93	56.79	-32.94	0.15	0.00	2.41
2,495.00	3.25	107.96	2,492.77	-19.80	62.23	-35.20	1.11	-0.32	17.96
2,590.00	1.84	127.29	2,587.67	-21.56	66.01	-37.87	1.72	-1.48	20.35
2,685.00	0.74	155.68	2,682.65	-23.04	67.47	-39.68	1.31	-1.16	29.88
2,780.00	0.96	248.58	2,777.64	-23.89	66.98	-40.37	1.31	0.23	97.79
2,874.00	2.15	268.09	2,871.61	-24.24	64.49	-40.06	1.37	1.27	20.76
2,969.00	1.54	246.38	2,966.56	-24.81	61.54	-39.85	0.97	-0.64	-22.85
3,064.00	0.44	312.92	3,061.54	-25.07	60.10	-39.74	1.50	-1.16	70.04
3,158.00	0.09	318.19	3,155.54	-24.77	59.79	-39.36	0.37	-0.37	5.61
3,253.00	0.70	135.91	3,250.54	-25.13	60.14	-39.81	0.83	0.64	187.07
3,348.00	0.35	81.15	3,345.54	-25.50	60.83	-40.34	0.60	-0.37	-57.64
3,443.00	0.92	70.87	3,440.53	-25.21	61.84	-40.32	0.61	0.60	-10.82
3,537.00	0.92	182.22	3,534.52	-25.72	62.52	-40.98	1.62	0.00	118.46
3,636.00	1.14	194.70	3,633.51	-27.46	62.24	-42.60	0.32	0.22	12.61
3,730.00	0.70	315.91	3,727.50	-27.95	61.61	-42.91	1.72	-0.47	128.95
3,825.00	1.40	337.70	3,822.49	-26.46	60.76	-41.25	0.84	0.74	22.94
3,920.00	1.01	10.13	3,917.47	-24.57	60.47	-39.34	0.81	-0.41	34.14
4,014.00	0.22	81.15	4,011.46	-23.72	60.79	-38.61	1.02	-0.84	75.55
4,109.00	0.26	218.87	4,106.46	-23.86	60.84	-38.76	0.47	0.04	144.97
4,204.00	0.62	296.66	4,201.46	-23.80	60.24	-38.54	0.65	0.38	81.88
4,298.00	0.40	201.21	4,295.46	-23.88	59.67	-38.47	0.82	-0.23	-101.54
4,393.00	1.10	111.91	4,390.45	-24.53	60.40	-39.29	1.23	0.74	-94.00



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 01	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 01	Database:	DB_Aug1919_v14

 RECEIVED
 Office of Oil and Gas

AUG 14 2020

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,488.00	1.80	112.26	4,485.42	-25.43	62.62	-40.74	0.74	0.74	0.37	
4,583.00	1.45	93.10	4,580.38	-26.06	65.20	-42.01	0.68	-0.37	-20.17	
4,677.00	0.79	26.57	4,674.36	-25.55	66.68	-41.90	1.43	-0.70	-70.78	
4,772.00	1.67	350.36	4,769.34	-23.60	66.74	-40.03	1.19	0.93	-38.12	
4,867.00	2.20	346.84	4,864.29	-20.46	66.10	-36.83	0.57	0.56	-3.71	
4,962.00	0.75	335.42	4,959.25	-18.12	65.42	-34.39	1.55	-1.53	-12.02	
5,056.00	0.09	314.94	5,053.25	-17.50	65.11	-33.72	0.71	-0.70	-21.79	
5,151.00	0.09	22.53	5,148.25	-17.38	65.09	-33.60	0.11	0.00	71.15	
5,246.00	1.18	175.72	5,243.25	-18.29	65.19	-34.50	1.33	1.15	161.25	
5,341.00	3.21	165.70	5,338.17	-21.84	65.92	-38.12	2.17	2.14	-10.55	
5,436.00	2.64	178.18	5,433.05	-26.61	66.65	-42.91	0.90	-0.60	13.14	
5,530.00	1.27	161.39	5,526.99	-29.76	67.05	-46.06	1.56	-1.46	-17.86	
5,625.00	0.66	33.40	5,621.98	-30.30	67.69	-46.74	1.85	-0.64	-134.73	
5,720.00	1.53	23.23	5,716.97	-28.68	68.49	-45.38	0.93	0.92	-10.71	
5,815.00	2.68	39.49	5,811.90	-25.80	70.40	-43.10	1.35	1.21	17.12	
5,910.00	2.06	25.33	5,906.82	-22.54	72.54	-40.50	0.89	-0.65	-14.91	
6,004.00	1.05	333.92	6,000.79	-20.24	72.89	-38.37	1.73	-1.07	-54.69	
6,099.00	2.15	261.15	6,095.76	-19.73	70.74	-37.32	2.20	1.16	-76.60	
6,194.00	3.03	252.80	6,190.66	-20.75	66.58	-37.23	1.01	0.93	-8.79	
Tie into original hole @ 6194 MD										
6,281.00	3.25	284.35	6,277.54	-20.82	62.00	-36.12	1.98	0.25	36.26	
6,328.00	4.21	279.87	6,324.44	-20.19	59.01	-34.74	2.13	2.04	-9.53	
6,376.00	5.01	280.93	6,372.28	-19.49	55.21	-33.08	1.68	1.67	2.21	
6,471.00	4.26	280.84	6,466.97	-18.04	47.68	-29.74	0.79	-0.79	-0.09	
6,565.00	4.30	275.46	6,560.71	-17.05	40.74	-26.99	0.43	0.04	-5.72	
6,663.00	1.01	353.69	6,658.61	-15.84	36.98	-24.85	4.30	-3.36	79.83	
6,758.00	2.19	332.27	6,753.57	-13.40	36.05	-22.25	1.37	1.24	-22.55	
6,853.00	1.49	358.62	6,848.52	-10.56	35.17	-19.28	1.14	-0.74	27.74	
6,947.00	2.11	128.08	6,942.50	-10.41	36.51	-19.48	3.47	0.66	137.72	
7,042.00	3.82	76.49	7,037.38	-10.74	40.96	-20.95	3.16	1.80	-54.31	
7,137.00	6.24	71.57	7,132.01	-8.37	48.94	-20.72	2.59	2.55	-5.18	
7,232.00	7.16	89.68	7,226.37	-6.71	59.76	-21.91	2.41	0.97	19.06	
7,327.00	9.80	82.29	7,320.33	-5.59	73.69	-24.42	3.00	2.78	-7.78	
7,422.00	11.34	86.24	7,413.71	-3.89	91.03	-27.26	1.79	1.62	4.16	
7,516.00	14.63	88.88	7,505.30	-3.05	112.12	-31.89	3.56	3.50	2.81	
7,611.00	20.26	88.80	7,595.89	-2.47	140.58	-38.68	5.93	5.93	-0.08	
7,706.00	22.46	87.65	7,684.36	-1.39	175.17	-46.56	2.36	2.32	-1.21	
7,801.00	23.90	88.18	7,771.69	-0.03	212.53	-54.89	1.53	1.52	0.56	
7,895.00	26.19	87.21	7,856.84	1.58	252.29	-63.60	2.47	2.44	-1.03	
7,990.00	31.24	85.28	7,940.14	4.63	297.81	-72.40	5.40	5.32	-2.03	
8,085.00	33.70	83.69	8,020.28	9.56	348.57	-80.75	2.74	2.59	-1.67	
8,180.00	36.03	83.43	8,098.22	15.65	402.53	-88.79	2.46	2.45	-0.27	
8,274.00	36.61	82.82	8,173.96	22.32	457.80	-96.62	0.73	0.62	-0.65	
8,369.00	36.78	83.08	8,250.13	29.29	514.14	-104.43	0.24	0.18	0.27	

WV Department of Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 01	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 01	Database:	DB_Aug1919_v14

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,464.00	37.44	78.69	8,325.91	38.38	570.70	-110.25	2.87	0.69	-4.62	
8,559.00	37.31	75.44	8,401.41	51.28	626.89	-112.28	2.08	-0.14	-3.42	
8,653.00	41.40	79.57	8,474.09	64.08	685.06	-114.94	5.16	4.35	4.39	
8,714.00	40.31	81.69	8,520.23	70.58	724.43	-118.82	2.89	-1.79	3.47	
Top of Fish @ 8714 MD 8520 TVD										
8,748.00	39.72	82.91	8,546.27	73.51	746.09	-121.58	2.89	-1.74	3.59	
8,842.00	42.58	87.83	8,617.06	78.43	807.70	-132.74	4.59	3.04	5.23	
8,937.00	45.35	90.27	8,685.44	79.48	873.63	-148.73	3.42	2.92	2.57	
9,032.00	44.34	88.00	8,752.80	80.48	940.60	-165.06	1.99	-1.06	-2.39	
9,126.00	43.59	85.45	8,820.46	84.20	1,005.74	-178.28	2.05	-0.80	-2.71	
9,221.00	42.63	83.87	8,889.82	90.23	1,070.38	-189.14	1.52	-1.01	-1.66	
9,316.00	41.48	81.24	8,960.36	98.46	1,133.47	-197.47	2.21	-1.21	-2.77	
Survey @ 9316.00 MD 8960.36 TVD										
9,386.00	41.48	81.24	9,012.80	105.52	1,179.29	-202.48	0.00	0.00	0.00	
Survey projected to 9386.00 MD 9012.80 TVD ST1										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
6,194.00	6,190.66	-20.75	66.58	Tie into original hole @ 6194 MD	
8,714.00	8,520.23	70.58	724.43	Top of Fish @ 8714 MD 8520 TVD	
9,316.00	8,960.36	98.46	1,133.47	Survey @ 9316.00 MD 8960.36 TVD	
9,386.00	9,012.80	105.52	1,179.29	Survey projected to 9386.00 MD 9012.80 TVD ST1	

RECEIVED
 Office of Oil and Gas
 AUG 14 2020
 WV Department of
 Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 01	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 01	Database:	DB_Aug1919_v14

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

Site	Bryan Pad				
Site Position:		Northing:	14,445,110.80 usft	Latitude:	39.77562900
From:	Lat/Long	Easting:	1,703,181.57 usft	Longitude:	-80.77660992
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.143 °

Well	Bryan N-14HU (slot D)					
Well Position	+N/-S	0.00 usft	Northing:	14,445,118.17 usft	Latitude:	39.77564911
	+E/-W	0.00 usft	Easting:	1,703,203.49 usft	Longitude:	-80.77653187
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	1,191.00 usft

Wellbore	Sidetrack 01				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/8/2019	-8.703	66.785	51,938.70965229

Design	Surveys Sidetrack 01				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	6,194.00
Vertical Section:		Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
		0.00	0.00	0.00	345.04

Survey Program	Date 7/18/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
197.00	928.00	MWD surf (Original Hole)	MWD	MWD - Standard
979.00	6,194.00	MWD (Original Hole)	MWD	MWD - Standard
6,281.00	9,316.00	MWD ST1 (Sidetrack 01)	MWD	MWD - Standard
9,386.00	9,386.00	Projection ST1 (Sidetrack 01)	MWD	MWD - Standard

RECEIVED
Office of Oil and Gas
AUG 14 2020

Survey	WV Department of Environmental Protection									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,445,118.17	1,703,203.49	39.77564911	-80.77653187	
197.00	0.35	104.17	197.00	-0.15	0.58	14,445,118.03	1,703,204.07	39.77564870	-80.77652980	
244.00	0.13	81.15	244.00	-0.17	0.78	14,445,118.00	1,703,204.26	39.77564863	-80.77652911	
291.00	0.21	94.94	291.00	-0.17	0.91	14,445,118.00	1,703,204.40	39.77564863	-80.77652862	
335.00	0.26	168.68	335.00	-0.28	1.01	14,445,117.90	1,703,204.50	39.77564834	-80.77652827	
382.00	0.26	162.88	382.00	-0.48	1.07	14,445,117.69	1,703,204.55	39.77564777	-80.77652808	
427.00	0.08	261.15	427.00	-0.59	1.07	14,445,117.59	1,703,204.55	39.77564749	-80.77652809	
472.00	0.30	147.50	472.00	-0.69	1.10	14,445,117.48	1,703,204.58	39.77564721	-80.77652797	
520.00	0.21	150.84	520.00	-0.87	1.21	14,445,117.30	1,703,204.69	39.77564670	-80.77652758	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 01	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 01	Database:	DB_Aug1919_v14

RECEIVED
Office of Oil and Gas
AUG 14 2020

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
611.00	0.17	135.29	611.00	-1.12	1.38	14,445,117.06	1,703,204.87	39.77564604	-80.77652696
701.00	0.17	261.15	701.00	-1.23	1.35	14,445,116.94	1,703,204.83	39.77564572	-80.77652709
792.00	0.04	261.15	792.00	-1.26	1.18	14,445,116.92	1,703,204.67	39.77564565	-80.77652768
887.00	0.17	110.24	887.00	-1.31	1.28	14,445,116.86	1,703,204.77	39.77564550	-80.77652732
928.00	0.08	106.19	928.00	-1.34	1.37	14,445,116.84	1,703,204.85	39.77564542	-80.77652702
979.00	0.26	42.39	979.00	-1.26	1.48	14,445,116.91	1,703,204.96	39.77564563	-80.77652662
1,074.00	0.17	277.67	1,073.99	-1.09	1.48	14,445,117.09	1,703,204.97	39.77564612	-80.77652660
1,169.00	0.65	287.34	1,168.99	-0.91	0.83	14,445,117.27	1,703,204.31	39.77564662	-80.77652893
1,264.00	0.13	249.37	1,263.99	-0.78	0.21	14,445,117.39	1,703,203.70	39.77564696	-80.77653112
1,358.00	0.74	169.48	1,357.99	-1.42	0.22	14,445,116.76	1,703,203.71	39.77564521	-80.77653108
1,453.00	0.92	149.17	1,452.98	-2.68	0.73	14,445,115.50	1,703,204.21	39.77564176	-80.77652931
1,548.00	2.10	148.56	1,547.94	-4.82	2.03	14,445,113.36	1,703,205.51	39.77563587	-80.77652470
1,643.00	3.25	127.82	1,642.84	-7.95	5.06	14,445,110.22	1,703,208.55	39.77562724	-80.77651393
1,737.00	3.73	110.24	1,736.67	-10.64	10.04	14,445,107.53	1,703,213.52	39.77561981	-80.77649625
1,832.00	4.17	100.39	1,831.44	-12.34	16.33	14,445,105.84	1,703,219.82	39.77561512	-80.77647385
1,927.00	4.08	102.15	1,926.20	-13.67	23.03	14,445,104.50	1,703,226.52	39.77561141	-80.77645001
2,022.00	3.82	108.22	2,020.97	-15.37	29.34	14,445,102.80	1,703,232.83	39.77560670	-80.77642757
2,116.00	4.35	103.12	2,114.73	-17.16	35.79	14,445,101.01	1,703,239.28	39.77560174	-80.77640464
2,211.00	5.27	96.70	2,209.40	-18.49	43.63	14,445,099.69	1,703,247.12	39.77559804	-80.77637674
2,306.00	3.55	88.79	2,304.11	-18.93	50.91	14,445,099.24	1,703,254.39	39.77559677	-80.77635086
2,401.00	3.55	91.08	2,398.93	-18.93	56.79	14,445,099.25	1,703,260.27	39.77559674	-80.77632993
2,495.00	3.25	107.96	2,492.77	-19.80	62.23	14,445,098.37	1,703,265.72	39.77559430	-80.77631056
2,590.00	1.84	127.29	2,587.67	-21.56	66.01	14,445,096.62	1,703,269.49	39.77558945	-80.77629714
2,685.00	0.74	155.68	2,682.65	-23.04	67.47	14,445,095.13	1,703,270.96	39.77558537	-80.77629193
2,780.00	0.96	248.58	2,777.64	-23.89	66.98	14,445,094.28	1,703,270.47	39.77558304	-80.77629368
2,874.00	2.15	268.09	2,871.61	-24.24	64.49	14,445,093.94	1,703,267.98	39.77558211	-80.77630256
2,969.00	1.54	246.38	2,966.56	-24.81	61.54	14,445,093.37	1,703,265.02	39.77558056	-80.77631307
3,064.00	0.44	312.92	3,061.54	-25.07	60.10	14,445,093.10	1,703,263.59	39.77557985	-80.77631818
3,158.00	0.09	318.19	3,155.54	-24.77	59.79	14,445,093.40	1,703,263.27	39.77558068	-80.77631930
3,253.00	0.70	135.91	3,250.54	-25.13	60.14	14,445,093.04	1,703,263.63	39.77557968	-80.77631804
3,348.00	0.35	81.15	3,345.54	-25.50	60.83	14,445,092.67	1,703,264.32	39.77557865	-80.77631559
3,443.00	0.92	70.87	3,440.53	-25.21	61.84	14,445,092.97	1,703,265.33	39.77557946	-80.77631200
3,537.00	0.92	182.22	3,534.52	-25.72	62.52	14,445,092.46	1,703,266.01	39.77557806	-80.77630957
3,636.00	1.14	194.70	3,633.51	-27.46	62.24	14,445,090.71	1,703,265.73	39.77557326	-80.77631058
3,730.00	0.70	315.91	3,727.50	-27.95	61.61	14,445,090.22	1,703,265.09	39.77557192	-80.77631285
3,825.00	1.40	337.70	3,822.49	-26.46	60.76	14,445,091.71	1,703,264.25	39.77557602	-80.77631585
3,920.00	1.01	10.13	3,917.47	-24.57	60.47	14,445,093.61	1,703,263.95	39.77558123	-80.77631687
4,014.00	0.22	81.15	4,011.46	-23.72	60.79	14,445,094.45	1,703,264.28	39.77558354	-80.77631571
4,109.00	0.26	218.87	4,106.46	-23.86	60.84	14,445,094.31	1,703,264.32	39.77558316	-80.77631555
4,204.00	0.62	296.66	4,201.46	-23.80	60.24	14,445,094.37	1,703,263.73	39.77558334	-80.77631767
4,298.00	0.40	201.21	4,295.46	-23.88	59.67	14,445,094.30	1,703,263.16	39.77558313	-80.77631971
4,393.00	1.10	111.91	4,390.45	-24.53	60.40	14,445,093.65	1,703,263.88	39.77558134	-80.77631713
4,488.00	1.80	112.26	4,485.42	-25.43	62.62	14,445,092.74	1,703,266.11	39.77557884	-80.77630921
4,583.00	1.45	93.10	4,580.38	-26.06	65.20	14,445,092.11	1,703,268.69	39.77557709	-80.77630003
4,677.00	0.79	26.57	4,674.36	-25.55	66.68	14,445,092.63	1,703,270.17	39.77557849	-80.77629477
4,772.00	1.67	350.36	4,769.34	-23.60	66.74	14,445,094.58	1,703,270.23	39.77558385	-80.77629453
4,867.00	2.20	346.84	4,864.29	-20.46	66.10	14,445,097.72	1,703,269.58	39.77559248	-80.77629681
4,962.00	0.75	335.42	4,959.25	-18.12	65.42	14,445,100.06	1,703,268.91	39.77559891	-80.77629919
5,056.00	0.09	314.94	5,053.25	-17.50	65.11	14,445,100.67	1,703,268.60	39.77560059	-80.77630028
5,151.00	0.09	22.53	5,148.25	-17.38	65.09	14,445,100.79	1,703,268.58	39.77560093	-80.77630036
5,246.00	1.18	175.72	5,243.25	-18.29	65.19	14,445,099.89	1,703,268.68	39.77559844	-80.77630001
5,341.00	3.21	165.70	5,338.17	-21.84	65.92	14,445,096.33	1,703,269.41	39.77558868	-80.77629744
5,436.00	2.64	178.18	5,433.05	-26.61	66.65	14,445,091.57	1,703,270.13	39.77557559	-80.77629490
5,530.00	1.27	161.39	5,526.99	-29.76	67.05	14,445,088.42	1,703,270.53	39.77556693	-80.77629350
5,625.00	0.66	33.40	5,621.98	-30.30	67.69	14,445,087.88	1,703,271.17	39.77556544	-80.77629124

WV Department of Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 01	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 01	Database:	DB_Aug1919_v14

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,720.00	1.53	23.23	5,716.97	-28.68	68.49	14,445,089.50	1,703,271.97	39.77556989	-80.77628837	
5,815.00	2.68	39.49	5,811.90	-25.80	70.40	14,445,092.38	1,703,273.89	39.77557778	-80.77628154	
5,910.00	2.06	25.33	5,906.82	-22.54	72.54	14,445,095.64	1,703,276.03	39.77558672	-80.77627388	
6,004.00	1.05	333.92	6,000.79	-20.24	72.89	14,445,097.94	1,703,276.37	39.77559303	-80.77627263	
6,099.00	2.15	261.15	6,095.76	-19.73	70.74	14,445,098.44	1,703,274.23	39.77559444	-80.77628026	
6,194.00	3.03	252.80	6,190.66	-20.75	66.58	14,445,097.43	1,703,270.07	39.77559168	-80.77629507	
Tie into original hole @ 6194 MD										
6,281.00	3.25	284.35	6,277.54	-20.82	62.00	14,445,097.36	1,703,265.48	39.77559152	-80.77631140	
6,328.00	4.21	279.87	6,324.44	-20.19	59.01	14,445,097.98	1,703,262.49	39.77559326	-80.77632203	
6,376.00	5.01	280.93	6,372.28	-19.49	55.21	14,445,098.68	1,703,258.70	39.77559521	-80.77633553	
6,471.00	4.26	280.84	6,466.97	-18.04	47.68	14,445,100.13	1,703,251.16	39.77559924	-80.77636235	
6,565.00	4.30	275.46	6,560.71	-17.05	40.74	14,445,101.13	1,703,244.22	39.77560201	-80.77638703	
6,663.00	1.01	353.69	6,658.61	-15.84	36.98	14,445,102.33	1,703,240.47	39.77560536	-80.77640038	
6,758.00	2.19	332.27	6,753.57	-13.40	36.05	14,445,104.77	1,703,239.53	39.77561206	-80.77640369	
6,853.00	1.49	358.62	6,848.52	-10.56	35.17	14,445,107.62	1,703,238.66	39.77561987	-80.77640678	
6,947.00	2.11	128.08	6,942.50	-10.41	36.51	14,445,107.77	1,703,239.99	39.77562029	-80.77640203	
7,042.00	3.82	76.49	7,037.38	-10.74	40.96	14,445,107.43	1,703,244.45	39.77561932	-80.77638618	
7,137.00	6.24	71.57	7,132.01	-8.37	48.94	14,445,109.80	1,703,252.42	39.77562578	-80.77635777	
7,232.00	7.16	89.68	7,226.37	-6.71	59.76	14,445,111.47	1,703,263.24	39.77563028	-80.77631925	
7,327.00	9.80	82.29	7,320.33	-5.59	73.69	14,445,112.59	1,703,277.18	39.77563326	-80.77626964	
7,422.00	11.34	86.24	7,413.71	-3.89	91.03	14,445,114.28	1,703,294.51	39.77563780	-80.77620793	
7,516.00	14.63	88.88	7,505.30	-3.05	112.12	14,445,115.12	1,703,315.61	39.77563996	-80.77613284	
7,611.00	20.26	88.80	7,595.89	-2.47	140.58	14,445,115.70	1,703,344.07	39.77564135	-80.77603153	
7,706.00	22.46	87.65	7,684.36	-1.39	175.17	14,445,116.79	1,703,378.65	39.77564410	-80.77590845	
7,801.00	23.90	88.18	7,771.69	-0.03	212.53	14,445,118.14	1,703,416.02	39.77564757	-80.77577544	
7,895.00	26.19	87.21	7,856.84	1.58	252.29	14,445,119.76	1,703,455.78	39.77565173	-80.77563392	
7,990.00	31.24	85.28	7,940.14	4.63	297.81	14,445,122.81	1,703,501.30	39.77565979	-80.77547188	
8,085.00	33.70	83.69	8,020.28	9.56	348.57	14,445,127.73	1,703,552.05	39.77567297	-80.77529119	
8,180.00	36.03	83.43	8,098.22	15.65	402.53	14,445,133.83	1,703,606.01	39.77568933	-80.77509909	
8,274.00	36.61	82.82	8,173.96	22.32	457.80	14,445,140.49	1,703,661.29	39.77570726	-80.77490230	
8,369.00	36.78	83.08	8,250.13	29.29	514.14	14,445,147.46	1,703,717.62	39.77572600	-80.77470172	
8,464.00	37.44	78.69	8,325.91	38.38	570.70	14,445,156.55	1,703,774.18	39.77575058	-80.77450034	
8,559.00	37.31	75.44	8,401.41	51.28	626.89	14,445,169.46	1,703,830.37	39.77578562	-80.77430024	
8,653.00	41.40	79.57	8,474.09	64.08	685.06	14,445,182.25	1,703,888.55	39.77582036	-80.77409307	
8,714.00	40.31	81.69	8,520.23	70.58	724.43	14,445,188.76	1,703,927.91	39.77583795	-80.77395291	
Top of Fish @ 8714 MD 8520 TVD										
8,748.00	39.72	82.91	8,546.27	73.51	746.09	14,445,191.69	1,703,949.57	39.77584585	-80.77387578	
8,842.00	42.58	87.83	8,617.06	78.43	807.70	14,445,196.60	1,704,011.19	39.77585892	-80.77365645	
8,937.00	45.35	90.27	8,685.44	79.48	873.63	14,445,197.66	1,704,077.11	39.77586137	-80.77342180	
9,032.00	44.34	88.00	8,752.80	80.48	940.60	14,445,198.66	1,704,144.09	39.77586365	-80.77318342	
9,126.00	43.59	85.45	8,820.46	84.20	1,005.74	14,445,202.38	1,704,209.23	39.77587340	-80.77295154	
9,221.00	42.63	83.87	8,889.82	90.23	1,070.38	14,445,208.41	1,704,273.87	39.77588952	-80.77272144	
9,316.00	41.48	81.24	8,960.36	98.46	1,133.47	14,445,216.64	1,704,336.95	39.77591168	-80.77249682	
Survey @ 9316.00 MD 8960.36 TVD										
9,386.00	41.48	81.24	9,012.80	105.52	1,179.29	14,445,223.70	1,704,382.78	39.77593075	-80.77233366	
Survey projected to 9386.00 MD 9012.80 TVD ST1										

RECEIVED
Office of Oil and Gas

AUG 14 2020

WV Department of
Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 01	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 01	Database:	DB_Aug1919_v14

Design Annotations					
	Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
			+N/-S (usft)	+E/-W (usft)	
	6,194.00	6,190.66	-20.75	66.58	Tie into original hole @ 6194 MD
	8,714.00	8,520.23	70.58	724.43	Top of Fish @ 8714 MD 8520 TVD
	9,316.00	8,960.36	98.46	1,133.47	Survey @ 9316.00 MD 8960.36 TVD
	9,386.00	9,012.80	105.52	1,179.29	Survey projected to 9386.00 MD 9012.80 TVD ST1

 RECEIVED
 Office of Oil and Gas

AUG 14 2020

 WV Department of
 Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

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

Site	Bryan Pad				
Site Position:		Northing:	14,445,110.80 usft	Latitude:	39.77562900
From:	Lat/Long	Easting:	1,703,181.57 usft	Longitude:	-80.77660992
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.143 °

Well	Bryan N-14HU (slot D)					
Well Position	+N/-S	0.00 usft	Northing:	14,445,118.17 usft	Latitude:	39.77564911
	+E/-W	0.00 usft	Easting:	1,703,203.49 usft	Longitude:	-80.77653187
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	1,191.00 usft

Wellbore	Sidetrack 02				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/15/2019	-8.712	66.762	51,907.43817370

Design	Surveys Sidetrack 02				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	8,274.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	345.04	

Survey Program	Date	11/10/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
197.00	928.00	MWD surf (Original Hole)	MWD	MWD - Standard	<p>RECEIVED Office of Oil and Gas AUG 14 2020</p>
979.00	6,194.00	MWD (Original Hole)	MWD	MWD - Standard	
6,281.00	8,274.00	MWD ST1 (Sidetrack 01)	MWD	MWD - Standard	
8,367.00	8,651.00	MWD ST2 (Sidetrack 02)	MWD	MWD - Standard	
8,803.00	23,732.00	MWD ST2 lat (Sidetrack 02)	MWD	MWD - Standard	
23,785.00	23,785.00	Projection ST2 (Sidetrack 02)			

Survey	WV Department of Environmental Protection									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
197.00	0.35	104.17	197.00	-0.15	0.58	-0.29	0.18	0.18	0.00	0.00
244.00	0.13	81.15	244.00	-0.17	0.78	-0.37	0.50	-0.47	-48.98	
291.00	0.21	94.94	291.00	-0.17	0.91	-0.40	0.19	0.17	29.34	
335.00	0.26	168.68	335.00	-0.28	1.01	-0.53	0.65	0.11	167.59	
382.00	0.26	162.88	382.00	-0.48	1.07	-0.74	0.06	0.00	-12.34	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

RECEIVED
Office of Oil and Gas

AUG 14 2020

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn of Protection (°/100usft)
427.00	0.08	261.15	427.00	-0.59	1.07	-0.84	0.63	-0.40	218.38
472.00	0.30	147.50	472.00	-0.69	1.10	-0.95	0.76	0.49	-252.56
520.00	0.21	150.84	520.00	-0.87	1.21	-1.16	0.19	-0.19	6.96
611.00	0.17	135.29	611.00	-1.12	1.38	-1.44	0.07	-0.04	-17.09
701.00	0.17	261.15	701.00	-1.23	1.35	-1.54	0.34	0.00	139.84
792.00	0.04	261.15	792.00	-1.26	1.18	-1.52	0.14	-0.14	0.00
887.00	0.17	110.24	887.00	-1.31	1.28	-1.60	0.22	0.14	-158.85
928.00	0.08	106.19	928.00	-1.34	1.37	-1.65	0.22	-0.22	-9.88
979.00	0.26	42.39	979.00	-1.26	1.48	-1.60	0.46	0.35	-125.10
1,074.00	0.17	277.67	1,073.99	-1.09	1.48	-1.43	0.40	-0.09	-131.28
1,169.00	0.65	287.34	1,168.99	-0.91	0.83	-1.09	0.51	0.51	10.18
1,264.00	0.13	249.37	1,263.99	-0.78	0.21	-0.81	0.58	-0.55	-39.97
1,358.00	0.74	169.48	1,357.99	-1.42	0.22	-1.43	0.78	0.65	-84.99
1,453.00	0.92	149.17	1,452.98	-2.68	0.73	-2.77	0.36	0.19	-21.38
1,548.00	2.10	148.56	1,547.94	-4.82	2.03	-5.18	1.24	1.24	-0.64
1,643.00	3.25	127.82	1,642.84	-7.95	5.06	-8.99	1.56	1.21	-21.83
1,737.00	3.73	110.24	1,736.67	-10.64	10.04	-12.87	1.24	0.51	-18.70
1,832.00	4.17	100.39	1,831.44	-12.34	16.33	-16.13	0.85	0.46	-10.37
1,927.00	4.08	102.15	1,926.20	-13.67	23.03	-19.15	0.16	-0.09	1.85
2,022.00	3.82	108.22	2,020.97	-15.37	29.34	-22.43	0.52	-0.27	6.39
2,116.00	4.35	103.12	2,114.73	-17.16	35.79	-25.82	0.68	0.56	-5.43
2,211.00	5.27	96.70	2,209.40	-18.49	43.63	-29.12	1.12	0.97	-6.76
2,306.00	3.55	88.79	2,304.11	-18.93	50.91	-31.43	1.92	-1.81	-8.33
2,401.00	3.55	91.08	2,398.93	-18.93	56.79	-32.94	0.15	0.00	2.41
2,495.00	3.25	107.96	2,492.77	-19.80	62.23	-35.20	1.11	-0.32	17.96
2,590.00	1.84	127.29	2,587.67	-21.56	66.01	-37.87	1.72	-1.48	20.35
2,685.00	0.74	155.68	2,682.65	-23.04	67.47	-39.68	1.31	-1.16	29.88
2,780.00	0.96	248.58	2,777.64	-23.89	66.98	-40.37	1.31	0.23	97.79
2,874.00	2.15	268.09	2,871.61	-24.24	64.49	-40.06	1.37	1.27	20.76
2,969.00	1.54	246.38	2,966.56	-24.81	61.54	-39.85	0.97	-0.64	-22.85
3,064.00	0.44	312.92	3,061.54	-25.07	60.10	-39.74	1.50	-1.16	70.04
3,158.00	0.09	318.19	3,155.54	-24.77	59.79	-39.36	0.37	-0.37	5.61
3,253.00	0.70	135.91	3,250.54	-25.13	60.14	-39.81	0.83	0.64	187.07
3,348.00	0.35	81.15	3,345.54	-25.50	60.83	-40.34	0.60	-0.37	-57.64
3,443.00	0.92	70.87	3,440.53	-25.21	61.84	-40.32	0.61	0.60	-10.82
3,537.00	0.92	182.22	3,534.52	-25.72	62.52	-40.98	1.62	0.00	118.46
3,636.00	1.14	194.70	3,633.51	-27.46	62.24	-42.60	0.32	0.22	12.61
3,730.00	0.70	315.91	3,727.50	-27.95	61.61	-42.91	1.72	-0.47	128.95
3,825.00	1.40	337.70	3,822.49	-26.46	60.76	-41.25	0.84	0.74	22.94
3,920.00	1.01	10.13	3,917.47	-24.57	60.47	-39.34	0.81	-0.41	34.14
4,014.00	0.22	81.15	4,011.46	-23.72	60.79	-38.61	1.02	-0.84	75.55
4,109.00	0.26	218.87	4,106.46	-23.86	60.84	-38.76	0.47	0.04	144.97
4,204.00	0.62	296.66	4,201.46	-23.80	60.24	-38.54	0.65	0.38	81.88
4,298.00	0.40	201.21	4,295.46	-23.88	59.67	-38.47	0.82	-0.23	-101.54

WV Department of Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

RECEIVED
Office of Oil and Gas
AUG 14 2020

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Rate of Turn (°/100usft)
4,393.00	1.10	111.91	4,390.45	-24.53	60.40	-39.29	1.23	0.74	-94.00
4,488.00	1.80	112.26	4,485.42	-25.43	62.62	-40.74	0.74	0.74	0.37
4,583.00	1.45	93.10	4,580.38	-26.06	65.20	-42.01	0.68	-0.37	-20.17
4,677.00	0.79	26.57	4,674.36	-25.55	66.68	-41.90	1.43	-0.70	-70.78
4,772.00	1.67	350.36	4,769.34	-23.60	66.74	-40.03	1.19	0.93	-38.12
4,867.00	2.20	346.84	4,864.29	-20.46	66.10	-36.83	0.57	0.56	-3.71
4,962.00	0.75	335.42	4,959.25	-18.12	65.42	-34.39	1.55	-1.53	-12.02
5,056.00	0.09	314.94	5,053.25	-17.50	65.11	-33.72	0.71	-0.70	-21.79
5,151.00	0.09	22.53	5,148.25	-17.38	65.09	-33.60	0.11	0.00	71.15
5,246.00	1.18	175.72	5,243.25	-18.29	65.19	-34.50	1.33	1.15	161.25
5,341.00	3.21	165.70	5,338.17	-21.84	65.92	-38.12	2.17	2.14	-10.55
5,436.00	2.64	178.18	5,433.05	-26.61	66.65	-42.91	0.90	-0.60	13.14
5,530.00	1.27	161.39	5,526.99	-29.76	67.05	-46.06	1.56	-1.46	-17.86
5,625.00	0.66	33.40	5,621.98	-30.30	67.69	-46.74	1.85	-0.64	-134.73
5,720.00	1.53	23.23	5,716.97	-28.68	68.49	-45.38	0.93	0.92	-10.71
5,815.00	2.68	39.49	5,811.90	-25.80	70.40	-43.10	1.35	1.21	17.12
5,910.00	2.06	25.33	5,906.82	-22.54	72.54	-40.50	0.89	-0.65	-14.91
6,004.00	1.05	333.92	6,000.79	-20.24	72.89	-38.37	1.73	-1.07	-54.69
6,099.00	2.15	261.15	6,095.76	-19.73	70.74	-37.32	2.20	1.16	-76.60
6,194.00	3.03	252.80	6,190.66	-20.75	66.58	-37.23	1.01	0.93	-8.79
6,281.00	3.25	284.35	6,277.54	-20.82	62.00	-36.12	1.98	0.25	36.26
6,328.00	4.21	279.87	6,324.44	-20.19	59.01	-34.74	2.13	2.04	-9.53
6,376.00	5.01	280.93	6,372.28	-19.49	55.21	-33.08	1.68	1.67	2.21
6,471.00	4.26	280.84	6,466.97	-18.04	47.68	-29.74	0.79	-0.79	-0.09
6,565.00	4.30	275.46	6,560.71	-17.05	40.74	-26.99	0.43	0.04	-5.72
6,663.00	1.01	353.69	6,658.61	-15.84	36.98	-24.85	4.30	-3.36	79.83
6,758.00	2.19	332.27	6,753.57	-13.40	36.05	-22.25	1.37	1.24	-22.55
6,853.00	1.49	358.62	6,848.52	-10.56	35.17	-19.28	1.14	-0.74	27.74
6,947.00	2.11	128.08	6,942.50	-10.41	36.51	-19.48	3.47	0.66	137.72
7,042.00	3.82	76.49	7,037.38	-10.74	40.96	-20.95	3.16	1.80	-54.31
7,137.00	6.24	71.57	7,132.01	-8.37	48.94	-20.72	2.59	2.55	-5.18
7,232.00	7.16	89.68	7,226.37	-6.71	59.76	-21.91	2.41	0.97	19.06
7,327.00	9.80	82.29	7,320.33	-5.59	73.69	-24.42	3.00	2.78	-7.78
7,422.00	11.34	86.24	7,413.71	-3.89	91.03	-27.26	1.79	1.62	4.16
7,516.00	14.63	88.88	7,505.30	-3.05	112.12	-31.89	3.56	3.50	2.81
7,611.00	20.26	88.80	7,595.89	-2.47	140.58	-38.68	5.93	5.93	-0.08
7,706.00	22.46	87.65	7,684.36	-1.39	175.17	-46.56	2.36	2.32	-1.21
7,801.00	23.90	88.18	7,771.69	-0.03	212.53	-54.89	1.53	1.52	0.56
7,895.00	26.19	87.21	7,856.84	1.58	252.29	-63.60	2.47	2.44	-1.03
7,990.00	31.24	85.28	7,940.14	4.63	297.81	-72.40	5.40	5.32	-2.03
8,085.00	33.70	83.69	8,020.28	9.56	348.57	-80.75	2.74	2.59	-1.67
8,180.00	36.03	83.43	8,098.22	15.65	402.53	-88.79	2.46	2.45	-0.27
8,274.00	36.61	82.82	8,173.96	22.32	457.80	-96.62	0.73	0.62	-0.65

WV Department of Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

RECEIVED
Office of Oil and Gas
AUG 14 2020
WV Department of Environmental Protection

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Tie into sidetrack 01 @ 8274 MD									
8,367.00	33.44	80.18	8,250.11	30.16	510.58	-102.87	3.78	-3.41	-2.84
8,398.00	32.08	76.58	8,276.18	33.53	527.00	-103.65	7.66	-4.39	-11.61
8,462.00	30.23	69.28	8,330.97	43.17	558.62	-102.49	6.57	-2.89	-11.41
8,556.00	33.13	69.02	8,410.96	60.75	604.75	-97.42	3.09	3.09	-0.28
8,651.00	33.70	71.56	8,490.26	78.38	653.99	-93.10	1.59	0.60	2.67
Survey @ 8651.00 MD 8490.26 TVD									
8,844.00	39.77	78.78	8,644.93	107.37	765.49	-93.88	3.86	3.15	3.74
8,939.00	39.68	83.35	8,718.01	116.80	825.44	-100.24	3.08	-0.09	4.81
9,033.00	40.64	87.39	8,789.86	121.67	885.83	-111.13	2.95	1.02	4.30
9,128.00	42.18	90.46	8,861.12	122.82	948.64	-126.23	2.68	1.62	3.23
9,223.00	43.19	90.37	8,930.95	122.35	1,013.05	-143.31	1.07	1.06	-0.09
9,318.00	44.25	85.98	8,999.62	124.47	1,078.64	-158.20	3.38	1.12	-4.62
9,412.00	43.81	84.23	9,067.21	130.04	1,143.73	-169.62	1.38	-0.47	-1.86
9,507.00	42.58	83.08	9,136.47	137.22	1,208.35	-179.36	1.54	-1.29	-1.21
9,602.00	43.42	83.70	9,205.95	144.67	1,272.71	-188.78	0.99	0.88	0.65
9,696.00	44.08	86.07	9,273.85	150.46	1,337.45	-199.90	1.88	0.70	2.52
9,791.00	44.38	85.02	9,341.93	155.61	1,403.51	-211.98	0.83	0.32	-1.11
9,886.00	44.51	84.48	9,409.75	161.69	1,469.75	-223.20	0.42	0.14	-0.57
9,981.00	45.52	83.78	9,476.91	168.57	1,536.59	-233.81	1.18	1.06	-0.74
10,076.00	44.29	86.77	9,544.20	174.11	1,603.41	-245.70	2.57	-1.29	3.15
10,170.00	44.34	87.30	9,611.46	177.51	1,668.99	-259.35	0.40	0.05	0.56
10,265.00	44.60	87.13	9,679.25	180.74	1,735.46	-273.38	0.30	0.27	-0.18
10,360.00	45.52	84.14	9,746.36	185.87	1,802.49	-285.73	2.43	0.97	-3.15
10,455.00	45.62	86.60	9,812.87	191.35	1,870.10	-297.90	1.85	0.11	2.59
10,549.00	45.62	84.67	9,878.62	196.46	1,937.08	-310.25	1.47	0.00	-2.05
10,644.00	44.03	83.96	9,946.00	203.09	2,003.72	-321.05	1.75	-1.67	-0.75
10,730.00	44.20	83.69	10,007.74	209.53	2,063.24	-330.19	0.29	0.20	-0.31
10,779.00	43.87	86.85	10,042.97	212.34	2,097.17	-336.23	4.53	-0.67	6.45
10,874.00	43.91	88.08	10,111.44	215.25	2,162.97	-350.40	0.90	0.04	1.29
10,968.00	44.00	83.07	10,179.13	220.28	2,227.98	-362.32	3.70	0.10	-5.33
11,062.00	43.47	82.72	10,247.04	228.32	2,292.46	-371.21	0.62	-0.56	-0.37
11,109.00	42.99	81.84	10,281.29	232.64	2,324.36	-375.26	1.64	-1.02	-1.87
11,157.00	42.59	81.40	10,316.51	237.39	2,356.62	-379.00	1.04	-0.83	-0.92
11,204.00	42.29	78.15	10,351.20	243.02	2,387.82	-381.62	4.71	-0.64	-6.91
11,252.00	42.11	74.46	10,386.77	250.65	2,419.14	-382.33	5.18	-0.38	-7.69
11,299.00	41.05	70.07	10,421.93	260.13	2,448.84	-380.84	6.60	-2.26	-9.34
11,346.00	40.66	67.60	10,457.48	271.23	2,477.50	-377.52	3.54	-0.83	-5.26
11,393.00	40.53	65.76	10,493.17	283.33	2,505.59	-373.07	2.56	-0.28	-3.91
11,441.00	40.09	62.68	10,529.78	296.83	2,533.54	-367.25	4.25	-0.92	-6.42
11,488.00	39.25	57.85	10,565.97	311.69	2,559.58	-359.61	6.80	-1.79	-10.28
11,535.00	38.95	53.89	10,602.45	328.32	2,584.11	-349.89	5.35	-0.64	-8.43
11,582.00	38.64	49.94	10,639.08	346.47	2,607.28	-338.33	5.31	-0.66	-8.40
11,630.00	38.77	45.28	10,676.55	366.69	2,629.43	-324.51	6.08	0.27	-9.71

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

 RECEIVED
 Office of Oil and Gas

AUG 14 2020

WV Department of Environmental Protection

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,677.00	38.99	40.36	10,713.15	388.32	2,649.47	-308.79	6.59	0.47	-10.47
11,724.00	38.90	36.32	10,749.71	411.48	2,667.79	-291.14	5.41	-0.19	-8.60
11,771.00	38.90	31.75	10,786.29	435.92	2,684.30	-271.79	6.10	0.00	-9.72
11,819.00	38.51	29.72	10,823.75	461.72	2,699.64	-250.83	2.77	-0.81	-4.23
11,866.00	40.53	25.24	10,860.01	488.25	2,713.41	-228.75	7.43	4.30	-9.53
11,913.00	43.87	19.44	10,894.84	517.44	2,725.35	-203.63	10.91	7.11	-12.34
11,960.00	45.93	15.49	10,928.14	549.08	2,735.28	-175.63	7.37	4.38	-8.40
12,008.00	47.30	11.44	10,961.11	582.99	2,743.39	-144.96	6.76	2.85	-8.44
12,055.00	49.76	7.66	10,992.24	617.71	2,749.20	-112.92	7.98	5.23	-8.04
12,103.00	51.21	5.29	11,022.78	654.50	2,753.37	-78.45	4.86	3.02	-4.94
12,149.00	53.23	3.53	11,050.97	690.74	2,756.16	-44.16	5.33	4.39	-3.83
12,197.00	55.91	1.16	11,078.79	729.82	2,757.75	-6.82	6.88	5.58	-4.94
12,244.00	58.29	359.40	11,104.32	769.27	2,757.93	31.25	5.96	5.06	-3.74
12,291.00	60.35	357.64	11,128.30	809.67	2,756.88	70.56	5.44	4.38	-3.74
12,338.00	63.69	355.80	11,150.35	851.10	2,754.50	111.20	7.90	7.11	-3.91
12,386.00	67.47	353.78	11,170.19	894.62	2,750.52	154.26	8.76	7.88	-4.21
12,433.00	71.08	351.05	11,186.83	938.18	2,744.70	197.85	9.41	7.68	-5.81
12,480.00	73.98	347.62	11,200.94	982.22	2,736.40	242.54	9.30	6.17	-7.30
12,527.00	75.82	344.02	11,213.18	1,026.20	2,725.28	287.91	8.37	3.91	-7.66
12,575.00	76.44	340.24	11,224.70	1,070.55	2,710.98	334.44	7.75	1.29	-7.88
12,622.00	78.37	337.08	11,234.95	1,113.26	2,694.29	380.01	7.74	4.11	-6.72
12,669.00	79.91	333.65	11,243.80	1,155.21	2,675.05	425.50	7.88	3.28	-7.30
12,716.00	83.25	332.07	11,250.69	1,196.57	2,653.84	470.94	7.85	7.11	-3.36
12,764.00	87.47	331.28	11,254.57	1,238.68	2,631.14	517.48	8.94	8.79	-1.65
12,859.00	90.73	331.36	11,256.06	1,322.00	2,585.56	609.74	3.43	3.43	0.08
12,953.00	90.51	331.54	11,255.04	1,404.57	2,540.64	701.11	0.30	-0.23	0.19
13,048.00	91.16	330.66	11,253.66	1,487.73	2,494.74	793.30	1.15	0.68	-0.93
13,142.00	92.22	331.28	11,250.89	1,569.88	2,449.14	884.44	1.31	1.13	0.66
13,236.00	89.71	329.34	11,249.30	1,651.52	2,402.59	975.32	3.37	-2.67	-2.06
13,330.00	89.41	328.99	11,250.02	1,732.23	2,354.41	1,065.73	0.49	-0.32	-0.37
13,424.00	89.05	329.34	11,251.29	1,812.93	2,306.24	1,156.14	0.53	-0.38	0.37
13,519.00	91.16	328.11	11,251.11	1,894.12	2,256.92	1,247.31	2.57	2.22	-1.29
13,613.00	89.76	327.41	11,250.36	1,973.62	2,206.78	1,337.06	1.67	-1.49	-0.74
13,708.00	89.05	327.67	11,251.35	2,053.77	2,155.80	1,427.66	0.80	-0.75	0.27
13,802.00	89.36	330.31	11,252.65	2,134.32	2,107.38	1,517.98	2.83	0.33	2.81
13,897.00	89.05	331.54	11,253.97	2,217.34	2,061.22	1,610.10	1.34	-0.33	1.29
13,992.00	90.90	331.45	11,254.01	2,300.82	2,015.88	1,702.45	1.95	1.95	-0.09
14,086.00	92.00	331.19	11,251.63	2,383.26	1,970.78	1,793.74	1.20	1.17	-0.28
14,180.00	91.56	331.28	11,248.71	2,465.62	1,925.57	1,884.98	0.48	-0.47	0.10
14,275.00	91.21	331.45	11,246.41	2,548.98	1,880.06	1,977.26	0.41	-0.37	0.18
14,369.00	90.33	332.07	11,245.15	2,631.78	1,835.59	2,068.74	1.15	-0.94	0.66
14,464.00	91.08	331.10	11,243.98	2,715.33	1,790.38	2,161.12	1.29	0.79	-1.02
14,558.00	91.34	329.17	11,242.00	2,796.82	1,743.59	2,251.93	2.07	0.28	-2.05

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

RECEIVED
Office of Oil and Gas

AUG 14 2020

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Built-in Environmental Protection Rate (°/100usft)	Turn of Direction (°)
14,653.00	90.68	329.61	11,240.32	2,878.57	1,695.22	2,343.40	0.83	-0.69	0.46
14,749.00	91.30	328.38	11,238.66	2,960.84	1,645.78	2,435.64	1.43	0.65	-1.28
14,843.00	90.59	328.38	11,237.11	3,040.88	1,596.50	2,525.68	0.76	-0.76	0.00
14,938.00	90.20	328.90	11,236.46	3,122.00	1,547.07	2,616.81	0.68	-0.41	0.55
15,032.00	90.77	328.64	11,235.66	3,202.37	1,498.33	2,707.04	0.67	0.61	-0.28
15,127.00	90.55	328.73	11,234.57	3,283.53	1,448.96	2,798.19	0.25	-0.23	0.09
15,221.00	91.74	329.43	11,232.69	3,364.15	1,400.67	2,888.55	1.47	1.27	0.74
15,315.00	91.43	329.96	11,230.09	3,445.27	1,353.26	2,979.16	0.65	-0.33	0.56
15,409.00	90.95	330.66	11,228.14	3,526.91	1,306.71	3,070.06	0.90	-0.51	0.74
15,504.00	90.59	330.75	11,226.86	3,609.76	1,260.23	3,162.09	0.39	-0.38	0.09
15,598.00	90.51	331.10	11,225.96	3,691.91	1,214.55	3,253.25	0.38	-0.09	0.37
15,693.00	91.21	328.99	11,224.53	3,774.20	1,167.12	3,345.00	2.34	0.74	-2.22
15,787.00	90.90	325.83	11,222.80	3,853.38	1,116.51	3,434.55	3.38	-0.33	-3.36
15,882.00	91.03	320.64	11,221.20	3,929.45	1,059.67	3,522.71	5.46	0.14	-5.46
15,976.00	91.52	320.47	11,219.11	4,002.02	999.97	3,608.24	0.55	0.52	-0.18
16,071.00	92.13	322.66	11,216.08	4,076.39	940.95	3,695.33	2.39	0.64	2.31
16,165.00	96.09	327.15	11,209.34	4,153.06	887.06	3,783.31	6.36	4.21	4.78
16,260.00	92.18	330.31	11,202.49	4,234.03	837.90	3,874.22	5.29	-4.12	3.33
16,355.00	91.47	331.28	11,199.47	4,316.91	791.57	3,966.25	1.26	-0.75	1.02
16,449.00	90.86	329.52	11,197.56	4,398.62	745.15	4,057.18	1.98	-0.65	-1.87
16,544.00	91.34	332.77	11,195.73	4,481.80	699.32	4,149.37	3.46	0.51	3.42
16,638.00	91.34	334.62	11,193.53	4,566.04	657.67	4,241.50	1.97	0.00	1.97
16,733.00	92.44	332.42	11,190.40	4,651.02	615.34	4,334.53	2.59	1.16	-2.32
16,828.00	92.18	330.84	11,186.57	4,734.54	570.24	4,426.86	1.68	-0.27	-1.66
16,922.00	90.68	331.89	11,184.23	4,817.01	525.21	4,518.17	1.95	-1.60	1.12
17,016.00	90.55	332.16	11,183.22	4,900.02	481.12	4,609.75	0.32	-0.14	0.29
17,111.00	90.07	331.80	11,182.70	4,983.89	436.49	4,702.29	0.63	-0.51	-0.38
17,205.00	89.80	331.98	11,182.81	5,066.80	392.20	4,793.82	0.35	-0.29	0.19
17,300.00	89.19	332.07	11,183.65	5,150.69	347.64	4,886.38	0.65	-0.64	0.09
17,394.00	90.24	332.42	11,184.11	5,233.88	303.86	4,978.04	1.18	1.12	0.37
17,489.00	91.78	332.51	11,182.44	5,318.10	259.95	5,070.75	1.62	1.62	0.09
17,584.00	91.43	332.77	11,179.78	5,402.44	216.31	5,163.49	0.46	-0.37	0.27
17,677.00	91.91	332.51	11,177.07	5,485.00	173.59	5,254.28	0.59	0.52	-0.28
17,772.00	91.34	331.72	11,174.37	5,568.94	129.18	5,346.84	1.03	-0.60	-0.83
17,866.00	91.47	330.13	11,172.07	5,651.06	83.51	5,437.97	1.70	0.14	-1.69
17,961.00	92.26	329.08	11,168.98	5,732.96	35.47	5,529.49	1.38	0.83	-1.11
18,055.00	91.47	328.82	11,165.92	5,813.45	-12.99	5,619.76	0.88	-0.84	-0.28
18,149.00	90.77	329.34	11,164.08	5,894.08	-61.28	5,710.12	0.93	-0.74	0.55
18,244.00	91.03	329.52	11,162.59	5,975.86	-109.59	5,801.61	0.33	0.27	0.19
18,338.00	92.22	330.13	11,159.92	6,057.09	-156.82	5,892.27	1.42	1.27	0.65
18,433.00	91.56	330.40	11,156.79	6,139.53	-203.91	5,984.08	0.75	-0.69	0.28
18,527.00	90.99	330.84	11,154.70	6,221.42	-250.01	6,075.10	0.77	-0.61	0.47
18,621.00	91.21	331.63	11,152.89	6,303.81	-295.24	6,166.36	0.87	0.23	0.84

Built-in Environmental Protection Rate
Turn of Direction

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

RECEIVED
Office of Oil and Gas

AUG 14 2020

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
18,715.00	90.59	332.51	11,151.42	6,386.85	-339.26	6,257.95	1.15	-0.66	0.94
18,810.00	90.24	330.40	11,150.73	6,470.29	-384.65	6,350.29	2.25	-0.37	-2.22
18,904.00	91.30	330.22	11,149.47	6,551.94	-431.21	6,441.19	1.14	1.13	-0.19
18,999.00	91.25	329.78	11,147.35	6,634.20	-478.70	6,532.91	0.47	-0.05	-0.46
19,093.00	90.99	328.99	11,145.51	6,715.08	-526.56	6,623.41	0.88	-0.28	-0.84
19,188.00	92.66	329.17	11,142.49	6,796.53	-575.35	6,714.69	1.77	1.76	0.19
19,283.00	92.31	329.26	11,138.37	6,878.07	-623.92	6,806.01	0.38	-0.37	0.09
19,377.00	91.91	329.26	11,134.91	6,958.81	-671.94	6,896.40	0.43	-0.43	0.00
19,472.00	91.34	329.43	11,132.22	7,040.50	-720.36	6,987.82	0.63	-0.60	0.18
19,566.00	91.03	328.82	11,130.27	7,121.16	-768.58	7,078.20	0.73	-0.33	-0.65
19,661.00	91.21	329.52	11,128.41	7,202.72	-817.26	7,169.56	0.76	0.19	0.74
19,756.00	90.51	329.43	11,126.99	7,284.54	-865.51	7,261.07	0.74	-0.74	-0.09
19,850.00	90.07	329.61	11,126.51	7,365.55	-913.19	7,351.64	0.51	-0.47	0.19
19,946.00	90.07	327.94	11,126.40	7,447.64	-962.95	7,443.79	1.74	0.00	-1.74
20,040.00	91.12	328.90	11,125.42	7,527.71	-1,012.17	7,533.86	1.51	1.12	1.02
20,135.00	91.91	329.26	11,122.91	7,609.18	-1,060.97	7,625.16	0.91	0.83	0.38
20,230.00	92.00	329.61	11,119.67	7,690.94	-1,109.25	7,716.61	0.38	0.09	0.37
20,325.00	92.40	330.31	11,116.02	7,773.11	-1,156.77	7,808.27	0.85	0.42	0.74
20,420.00	91.60	330.93	11,112.70	7,855.84	-1,203.35	7,900.22	1.07	-0.84	0.65
20,515.00	90.51	331.28	11,110.96	7,939.00	-1,249.25	7,992.41	1.21	-1.15	0.37
20,609.00	91.03	333.12	11,109.69	8,022.14	-1,293.08	8,084.04	2.03	0.55	1.96
20,704.00	90.42	333.91	11,108.49	8,107.16	-1,335.44	8,177.12	1.05	-0.64	0.83
20,799.00	89.45	333.30	11,108.60	8,192.26	-1,377.68	8,270.23	1.21	-1.02	-0.64
20,894.00	89.71	330.66	11,109.29	8,276.11	-1,422.30	8,362.76	2.79	0.27	-2.78
20,989.00	90.15	329.08	11,109.41	8,358.27	-1,469.99	8,454.45	1.73	0.46	-1.66
21,084.00	90.55	328.99	11,108.83	8,439.73	-1,518.86	8,545.77	0.43	0.42	-0.09
21,179.00	91.16	329.87	11,107.41	8,521.52	-1,567.17	8,637.25	1.13	0.64	0.93
21,274.00	91.65	330.75	11,105.08	8,604.02	-1,614.21	8,729.10	1.06	0.52	0.93
21,369.00	91.08	328.38	11,102.82	8,685.90	-1,662.32	8,820.62	2.57	-0.60	-2.49
21,464.00	91.47	327.67	11,100.71	8,766.47	-1,712.61	8,911.44	0.85	0.41	-0.75
21,559.00	92.04	328.38	11,097.80	8,847.01	-1,762.90	9,002.24	0.96	0.60	0.75
21,679.00	90.95	329.08	11,094.67	8,949.55	-1,825.16	9,117.37	1.08	-0.91	0.58
21,774.00	90.99	328.55	11,093.06	9,030.81	-1,874.35	9,208.57	0.56	0.04	-0.56
21,869.00	91.30	328.46	11,091.16	9,111.79	-1,923.97	9,299.62	0.34	0.33	-0.09
21,963.00	91.91	328.38	11,088.53	9,191.84	-1,973.17	9,389.66	0.65	0.65	-0.09
22,058.00	90.29	328.55	11,086.70	9,272.80	-2,022.85	9,480.69	1.71	-1.71	0.18
22,153.00	90.46	328.29	11,086.08	9,353.72	-2,072.60	9,571.72	0.33	0.18	-0.27
22,248.00	90.99	328.82	11,084.88	9,434.77	-2,122.15	9,662.81	0.79	0.56	0.56
22,342.00	91.08	328.99	11,083.18	9,515.25	-2,170.69	9,753.09	0.20	0.10	0.18
22,437.00	91.03	328.55	11,081.43	9,596.47	-2,219.94	9,844.27	0.47	-0.05	-0.46
22,532.00	91.16	330.49	11,079.62	9,678.32	-2,268.12	9,935.79	2.05	0.14	2.04
22,627.00	92.18	330.66	11,076.85	9,761.03	-2,314.77	10,027.73	1.09	1.07	0.18
22,722.00	91.25	330.93	11,074.00	9,843.91	-2,361.10	10,119.77	1.02	-0.98	0.28
22,817.00	91.56	330.75	11,071.68	9,926.85	-2,407.38	10,211.84	0.38	0.33	-0.19

WV Department of Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
22,912.00	91.82	330.31	11,068.87	10,009.52	-2,454.09	10,303.77	0.54	0.27	-0.46	
23,007.00	91.34	329.69	11,066.25	10,091.76	-2,501.57	10,395.48	0.83	-0.51	-0.65	
23,102.00	90.90	329.43	11,064.40	10,173.65	-2,549.69	10,487.02	0.54	-0.46	-0.27	
23,196.00	91.43	330.22	11,062.49	10,254.89	-2,596.93	10,577.70	1.01	0.56	0.84	
23,291.00	91.34	329.08	11,060.19	10,336.85	-2,644.92	10,669.27	1.20	-0.09	-1.20	
23,386.00	90.90	326.35	11,058.33	10,417.14	-2,695.65	10,759.93	2.91	-0.46	-2.87	
23,481.00	91.25	324.60	11,056.55	10,495.39	-2,749.48	10,849.43	1.88	0.37	-1.84	
23,576.00	91.38	324.16	11,054.37	10,572.60	-2,804.79	10,938.29	0.48	0.14	-0.46	
23,671.00	91.43	322.40	11,052.04	10,648.72	-2,861.57	11,026.49	1.85	0.05	-1.85	
23,732.00	91.65	322.49	11,050.40	10,697.06	-2,898.74	11,082.79	0.39	0.36	0.15	
Survey @ 23732.00 MD 11051.62 TVD ST2										
23,785.00	91.65	322.49	11,048.87	10,739.08	-2,931.00	11,131.72	0.00	0.00	0.00	
Survey projected to 23785.00 MD 11050.10 TVD ST2										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
8,274.00	8,173.96	22.32	457.80	Tie into sidetrack 01 @ 8274 MD	
8,651.00	8,490.26	78.38	653.99	Survey @ 8651.00 MD 8490.26 TVD	
23,732.00	11,050.40	10,697.06	-2,898.74	Survey @ 23732.00 MD 11051.62 TVD ST2	
23,785.00	11,048.87	10,739.08	-2,931.00	Survey projected to 23785.00 MD 11050.10 TVD ST2	

RECEIVED
 Office of Oil and Gas
 AUG 14 2020
 WV Department of
 Environmental Protection



Survey Report - Geographic



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

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

Site	Bryan Pad				
Site Position:		Northing:	14,445,110.80 usft	Latitude:	39.77562900
From:	Lat/Long	Easting:	1,703,181.57 usft	Longitude:	-80.77660992
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.143 °

Well	Bryan N-14HU (slot D)					
Well Position	+N-S	0.00 usft	Northing:	14,445,118.17 usft	Latitude:	39.77564911
	+E-W	0.00 usft	Easting:	1,703,203.49 usft	Longitude:	-80.77653187
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	1,191.00 usft

Wellbore	Sidetrack 02				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/15/2019	-8.712	66.762	51,907.43817370

Design	Surveys Sidetrack 02				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	8,274.00
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)	
	0.00	0.00	0.00	345.04	

Survey Program	Date	11/10/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
197.00	928.00	MWD surf (Original Hole)	MWD	MWD - Standard	
979.00	6,194.00	MWD (Original Hole)	MWD	MWD - Standard	
6,281.00	8,274.00	MWD ST1 (Sidetrack 01)	MWD	MWD - Standard	
8,367.00	8,651.00	MWD ST2 (Sidetrack 02)	MWD	MWD - Standard	
8,803.00	23,732.00	MWD ST2 lat (Sidetrack 02)	MWD	MWD - Standard	
23,785.00	23,785.00	Projection ST2 (Sidetrack 02)			

RECEIVED
Office of Oil and Gas

AUG 14 2020

Survey										
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	14,445,118.17	1,703,203.49	39.77564911	-80.77653187	
197.00	0.35	104.17	197.00	-0.15	0.58	14,445,118.03	1,703,204.07	39.77564870	-80.77652980	
244.00	0.13	81.15	244.00	-0.17	0.78	14,445,118.00	1,703,204.26	39.77564863	-80.77652911	
291.00	0.21	94.94	291.00	-0.17	0.91	14,445,118.00	1,703,204.40	39.77564863	-80.77652862	
335.00	0.26	168.68	335.00	-0.28	1.01	14,445,117.90	1,703,204.50	39.77564834	-80.77652827	
382.00	0.26	162.88	382.00	-0.48	1.07	14,445,117.69	1,703,204.55	39.77564777	-80.77652808	
427.00	0.08	261.15	427.00	-0.59	1.07	14,445,117.59	1,703,204.55	39.77564749	-80.77652809	

WV Department of
Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

RECEIVED
Office of Oil and Gas

AUG 14 2020

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
472.00	0.30	147.50	472.00	-0.69	1.10	14,445,117.48	1,703,204.58	39.77564721	-80.77652797
520.00	0.21	150.84	520.00	-0.87	1.21	14,445,117.30	1,703,204.69	39.77564670	-80.77652758
611.00	0.17	135.29	611.00	-1.12	1.38	14,445,117.06	1,703,204.87	39.77564604	-80.77652696
701.00	0.17	261.15	701.00	-1.23	1.35	14,445,116.94	1,703,204.83	39.77564572	-80.77652709
792.00	0.04	261.15	792.00	-1.26	1.18	14,445,116.92	1,703,204.67	39.77564565	-80.77652768
887.00	0.17	110.24	887.00	-1.31	1.28	14,445,116.86	1,703,204.77	39.77564550	-80.77652732
928.00	0.08	106.19	928.00	-1.34	1.37	14,445,116.84	1,703,204.85	39.77564542	-80.77652702
979.00	0.26	42.39	979.00	-1.26	1.48	14,445,116.91	1,703,204.96	39.77564563	-80.77652662
1,074.00	0.17	277.67	1,073.99	-1.09	1.48	14,445,117.09	1,703,204.97	39.77564612	-80.77652660
1,169.00	0.65	287.34	1,168.99	-0.91	0.83	14,445,117.27	1,703,204.31	39.77564662	-80.77652893
1,264.00	0.13	249.37	1,263.99	-0.78	0.21	14,445,117.39	1,703,203.70	39.77564696	-80.77653112
1,358.00	0.74	169.48	1,357.99	-1.42	0.22	14,445,116.76	1,703,203.71	39.77564521	-80.77653108
1,453.00	0.92	149.17	1,452.98	-2.68	0.73	14,445,115.50	1,703,204.21	39.77564176	-80.77652931
1,548.00	2.10	148.56	1,547.94	-4.82	2.03	14,445,113.36	1,703,205.51	39.77563587	-80.77652470
1,643.00	3.25	127.82	1,642.84	-7.95	5.06	14,445,110.22	1,703,208.55	39.77562724	-80.77651393
1,737.00	3.73	110.24	1,736.67	-10.64	10.04	14,445,107.53	1,703,213.52	39.77561981	-80.77649625
1,832.00	4.17	100.39	1,831.44	-12.34	16.33	14,445,105.84	1,703,219.82	39.77561512	-80.77647385
1,927.00	4.08	102.15	1,926.20	-13.67	23.03	14,445,104.50	1,703,226.52	39.77561141	-80.77645001
2,022.00	3.82	108.22	2,020.97	-15.37	29.34	14,445,102.80	1,703,232.83	39.77560670	-80.77642757
2,116.00	4.35	103.12	2,114.73	-17.16	35.79	14,445,101.01	1,703,239.28	39.77560174	-80.77640464
2,211.00	5.27	96.70	2,209.40	-18.49	43.63	14,445,099.69	1,703,247.12	39.77559804	-80.77637674
2,306.00	3.55	88.79	2,304.11	-18.93	50.91	14,445,099.24	1,703,254.39	39.77559677	-80.77635086
2,401.00	3.55	91.08	2,398.93	-18.93	56.79	14,445,099.25	1,703,260.27	39.77559674	-80.77632993
2,495.00	3.25	107.96	2,492.77	-19.80	62.23	14,445,098.37	1,703,265.72	39.77559430	-80.77631056
2,590.00	1.84	127.29	2,587.67	-21.56	66.01	14,445,096.62	1,703,269.49	39.77558945	-80.77629714
2,685.00	0.74	155.68	2,682.65	-23.04	67.47	14,445,095.13	1,703,270.96	39.77558537	-80.77629193
2,780.00	0.96	248.58	2,777.64	-23.89	66.98	14,445,094.28	1,703,270.47	39.77558304	-80.77629368
2,874.00	2.15	268.09	2,871.61	-24.24	64.49	14,445,093.94	1,703,267.98	39.77558211	-80.77630256
2,969.00	1.54	246.38	2,966.56	-24.81	61.54	14,445,093.37	1,703,265.02	39.77558056	-80.77631307
3,064.00	0.44	312.92	3,061.54	-25.07	60.10	14,445,093.10	1,703,263.59	39.77557985	-80.77631818
3,158.00	0.09	318.19	3,155.54	-24.77	59.79	14,445,093.40	1,703,263.27	39.77558068	-80.77631930
3,253.00	0.70	135.91	3,250.54	-25.13	60.14	14,445,093.04	1,703,263.63	39.77557968	-80.77631804
3,348.00	0.35	81.15	3,345.54	-25.50	60.83	14,445,092.67	1,703,264.32	39.77557865	-80.77631559
3,443.00	0.92	70.87	3,440.53	-25.21	61.84	14,445,092.97	1,703,265.33	39.77557946	-80.77631200
3,537.00	0.92	182.22	3,534.52	-25.72	62.52	14,445,092.46	1,703,266.01	39.77557806	-80.77630957
3,636.00	1.14	194.70	3,633.51	-27.46	62.24	14,445,090.71	1,703,265.73	39.77557326	-80.77631058
3,730.00	0.70	315.91	3,727.50	-27.95	61.61	14,445,090.22	1,703,265.09	39.77557192	-80.77631285
3,825.00	1.40	337.70	3,822.49	-26.46	60.76	14,445,091.71	1,703,264.25	39.77557602	-80.77631585
3,920.00	1.01	10.13	3,917.47	-24.57	60.47	14,445,093.61	1,703,263.95	39.77558123	-80.77631687
4,014.00	0.22	81.15	4,011.46	-23.72	60.79	14,445,094.45	1,703,264.28	39.77558354	-80.77631571
4,109.00	0.26	218.87	4,106.46	-23.86	60.84	14,445,094.31	1,703,264.32	39.77558316	-80.77631555
4,204.00	0.62	296.66	4,201.46	-23.80	60.24	14,445,094.37	1,703,263.73	39.77558334	-80.77631767
4,298.00	0.40	201.21	4,295.46	-23.88	59.67	14,445,094.30	1,703,263.16	39.77558313	-80.77631971
4,393.00	1.10	111.91	4,390.45	-24.53	60.40	14,445,093.65	1,703,263.88	39.77558134	-80.77631713
4,488.00	1.80	112.26	4,485.42	-25.43	62.62	14,445,092.74	1,703,266.11	39.77557884	-80.77630921
4,583.00	1.45	93.10	4,580.38	-26.06	65.20	14,445,092.11	1,703,268.69	39.77557709	-80.77630003
4,677.00	0.79	26.57	4,674.36	-25.55	66.68	14,445,092.63	1,703,270.17	39.77557849	-80.77629477
4,772.00	1.67	350.36	4,769.34	-23.60	66.74	14,445,094.58	1,703,270.23	39.77558385	-80.77629453
4,867.00	2.20	346.84	4,864.29	-20.46	66.10	14,445,097.72	1,703,269.58	39.77559248	-80.77629681
4,962.00	0.75	335.42	4,959.25	-18.12	65.42	14,445,100.06	1,703,268.91	39.77559891	-80.77629919
5,056.00	0.09	314.94	5,053.25	-17.50	65.11	14,445,100.67	1,703,268.60	39.77560059	-80.77630028
5,151.00	0.09	22.53	5,148.25	-17.38	65.09	14,445,100.79	1,703,268.58	39.77560093	-80.77630036
5,246.00	1.18	175.72	5,243.25	-18.29	65.19	14,445,099.89	1,703,268.68	39.77559844	-80.77630001
5,341.00	3.21	165.70	5,338.17	-21.84	65.92	14,445,096.33	1,703,269.41	39.77558868	-80.77629744
5,436.00	2.64	178.18	5,433.05	-26.61	66.65	14,445,091.57	1,703,270.13	39.77557559	-80.77629490

WV Department of Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

 RECEIVED
 Office of Oil and Gas

Survey

AUG 14 2020

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	WV Department of Environmental Protection Longitude
5,530.00	1.27	161.39	5,526.99	-29.76	67.05	14,445,088.42	1,703,270.53	39.77556693	-80.77629350
5,625.00	0.66	33.40	5,621.98	-30.30	67.69	14,445,087.88	1,703,271.17	39.77556544	-80.77629124
5,720.00	1.53	23.23	5,716.97	-28.68	68.49	14,445,089.50	1,703,271.97	39.77556989	-80.77628837
5,815.00	2.68	39.49	5,811.90	-25.80	70.40	14,445,092.38	1,703,273.89	39.77557778	-80.77628154
5,910.00	2.06	25.33	5,906.82	-22.54	72.54	14,445,095.64	1,703,276.03	39.77558672	-80.77627388
6,004.00	1.05	333.92	6,000.79	-20.24	72.89	14,445,097.94	1,703,276.37	39.77559303	-80.77627263
6,099.00	2.15	261.15	6,095.76	-19.73	70.74	14,445,098.44	1,703,274.23	39.77559444	-80.77628026
6,194.00	3.03	252.80	6,190.66	-20.75	66.58	14,445,097.43	1,703,270.07	39.77559168	-80.77629507
6,281.00	3.25	284.35	6,277.54	-20.82	62.00	14,445,097.36	1,703,265.48	39.77559152	-80.77631140
6,328.00	4.21	279.87	6,324.44	-20.19	59.01	14,445,097.98	1,703,262.49	39.77559326	-80.77632203
6,376.00	5.01	280.93	6,372.28	-19.49	55.21	14,445,098.68	1,703,258.70	39.77559521	-80.77633553
6,471.00	4.26	280.84	6,466.97	-18.04	47.68	14,445,100.13	1,703,251.16	39.77559924	-80.77636235
6,565.00	4.30	275.46	6,560.71	-17.05	40.74	14,445,101.13	1,703,244.22	39.77560201	-80.77638703
6,663.00	1.01	353.69	6,658.61	-15.84	36.98	14,445,102.33	1,703,240.47	39.77560536	-80.77640038
6,758.00	2.19	332.27	6,753.57	-13.40	36.05	14,445,104.77	1,703,239.53	39.77561206	-80.77640369
6,853.00	1.49	358.62	6,848.52	-10.56	35.17	14,445,107.62	1,703,238.66	39.77561987	-80.77640678
6,947.00	2.11	128.08	6,942.50	-10.41	36.51	14,445,107.77	1,703,239.99	39.77562029	-80.77640203
7,042.00	3.82	76.49	7,037.38	-10.74	40.96	14,445,107.43	1,703,244.45	39.77561932	-80.77638618
7,137.00	6.24	71.57	7,132.01	-8.37	48.94	14,445,109.80	1,703,252.42	39.77562578	-80.77635777
7,232.00	7.16	89.68	7,226.37	-6.71	59.76	14,445,111.47	1,703,263.24	39.77563028	-80.77631925
7,327.00	9.80	82.29	7,320.33	-5.59	73.69	14,445,112.59	1,703,277.18	39.77563326	-80.77626964
7,422.00	11.34	86.24	7,413.71	-3.89	91.03	14,445,114.28	1,703,294.51	39.77563780	-80.77620793
7,516.00	14.63	88.88	7,505.30	-3.05	112.12	14,445,115.12	1,703,315.61	39.77563996	-80.77613284
7,611.00	20.26	88.80	7,595.89	-2.47	140.58	14,445,115.70	1,703,344.07	39.77564135	-80.77603153
7,706.00	22.46	87.65	7,684.36	-1.39	175.17	14,445,116.79	1,703,378.65	39.77564410	-80.77590845
7,801.00	23.90	88.18	7,771.69	-0.03	212.53	14,445,118.14	1,703,416.02	39.77564757	-80.77577544
7,895.00	26.19	87.21	7,856.84	1.58	252.29	14,445,119.76	1,703,455.78	39.77565173	-80.77563392
7,990.00	31.24	85.28	7,940.14	4.63	297.81	14,445,122.81	1,703,501.30	39.77565979	-80.77547188
8,085.00	33.70	83.69	8,020.28	9.56	348.57	14,445,127.73	1,703,552.05	39.77567297	-80.77529119
8,180.00	36.03	83.43	8,098.22	15.65	402.53	14,445,133.83	1,703,606.01	39.77568933	-80.77509909
8,274.00	36.61	82.82	8,173.96	22.32	457.80	14,445,140.49	1,703,661.29	39.77570726	-80.77490230
Tie into sidetrack 01 @ 8274 MD									
8,367.00	33.44	80.18	8,250.11	30.16	510.58	14,445,148.33	1,703,714.06	39.77572842	-80.77471438
8,398.00	32.08	76.58	8,276.18	33.53	527.00	14,445,151.70	1,703,730.49	39.77573756	-80.77465589
8,462.00	30.23	69.28	8,330.97	43.17	558.62	14,445,161.35	1,703,762.11	39.77576384	-80.77454329
8,556.00	33.13	69.02	8,410.96	60.75	604.75	14,445,178.92	1,703,808.23	39.77581178	-80.77437896
8,651.00	33.70	71.56	8,490.26	78.38	653.99	14,445,196.56	1,703,857.48	39.77585986	-80.77420353
Survey @ 8651.00 MD 8490.26 TVD									
8,844.00	39.77	78.78	8,644.93	107.37	765.49	14,445,225.54	1,703,968.98	39.77593870	-80.77380642
8,939.00	39.68	83.35	8,718.01	116.80	825.44	14,445,234.97	1,704,028.92	39.77596417	-80.77359299
9,033.00	40.64	87.39	8,789.86	121.67	885.83	14,445,239.84	1,704,089.32	39.77597713	-80.77337797
9,128.00	42.18	90.46	8,861.12	122.82	948.64	14,445,240.99	1,704,152.13	39.77597986	-80.77315442
9,223.00	43.19	90.37	8,930.95	122.35	1,013.05	14,445,240.53	1,704,216.53	39.77597813	-80.77292520
9,318.00	44.25	85.98	8,999.62	124.47	1,078.64	14,445,242.64	1,704,282.12	39.77598348	-80.77269173
9,412.00	43.81	84.23	9,067.21	130.04	1,143.73	14,445,248.21	1,704,347.21	39.77599832	-80.77246002
9,507.00	42.58	83.08	9,136.47	137.22	1,208.35	14,445,255.39	1,704,411.84	39.77601758	-80.77222994
9,602.00	43.42	83.70	9,205.95	144.67	1,272.71	14,445,262.85	1,704,476.20	39.77603761	-80.77200082
9,696.00	44.08	86.07	9,273.85	150.46	1,337.45	14,445,268.63	1,704,540.93	39.77605305	-80.77177036
9,791.00	44.38	85.02	9,341.93	155.61	1,403.51	14,445,273.78	1,704,606.99	39.77606672	-80.77153519
9,886.00	44.51	84.48	9,409.75	161.69	1,469.75	14,445,279.87	1,704,673.24	39.77608298	-80.77129937
9,981.00	45.52	83.78	9,476.91	168.57	1,536.59	14,445,286.74	1,704,740.08	39.77610139	-80.77106142
10,076.00	44.29	86.77	9,544.20	174.11	1,603.41	14,445,292.28	1,704,806.89	39.77611614	-80.77082355
10,170.00	44.34	87.30	9,611.46	177.51	1,668.99	14,445,295.68	1,704,872.47	39.77612501	-80.77059011
10,265.00	44.60	87.13	9,679.25	180.74	1,735.46	14,445,298.92	1,704,938.95	39.77613342	-80.77035350
10,360.00	45.52	84.14	9,746.36	185.87	1,802.49	14,445,304.05	1,705,005.98	39.77614704	-80.77011487

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

RECEIVED
Office of Oil and Gas

AUG 14 2020

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,455.00	45.62	86.60	9,812.87	191.35	1,870.10	14,445,309.52	1,705,073.59	39.77619159	-80.76987419
10,549.00	45.62	84.67	9,878.62	196.46	1,937.08	14,445,314.63	1,705,140.57	39.77617516	-80.76963574
10,644.00	44.03	83.96	9,946.00	203.09	2,003.72	14,445,321.26	1,705,207.21	39.77619289	-80.76939851
10,730.00	44.20	83.69	10,007.74	209.53	2,063.24	14,445,327.70	1,705,266.72	39.77621016	-80.76918661
10,779.00	43.87	86.85	10,042.97	212.34	2,097.17	14,445,330.51	1,705,300.66	39.77621763	-80.76906581
10,874.00	43.91	88.08	10,111.44	215.25	2,162.97	14,445,333.42	1,705,366.45	39.77622517	-80.76883161
10,968.00	44.00	83.07	10,179.13	220.28	2,227.98	14,445,338.46	1,705,431.46	39.77623853	-80.76860019
11,062.00	43.47	82.72	10,247.04	228.32	2,292.46	14,445,346.49	1,705,495.95	39.77626014	-80.76837060
11,109.00	42.99	81.84	10,281.29	232.64	2,324.36	14,445,350.82	1,705,527.85	39.77627179	-80.76825703
11,157.00	42.59	81.40	10,316.51	237.39	2,356.62	14,445,355.57	1,705,560.10	39.77628461	-80.76814217
11,204.00	42.29	78.15	10,351.20	243.02	2,387.82	14,445,361.19	1,705,591.31	39.77629984	-80.76803106
11,252.00	42.11	74.46	10,386.77	250.65	2,419.14	14,445,368.82	1,705,622.62	39.77632056	-80.76791953
11,299.00	41.05	70.07	10,421.93	260.13	2,448.84	14,445,378.31	1,705,652.32	39.77634640	-80.76781375
11,346.00	40.66	67.60	10,457.48	271.23	2,477.50	14,445,389.40	1,705,680.99	39.77637667	-80.76771161
11,393.00	40.53	65.76	10,493.17	283.33	2,505.59	14,445,401.51	1,705,709.07	39.77640971	-80.76761155
11,441.00	40.09	62.68	10,529.78	296.83	2,533.54	14,445,415.01	1,705,737.03	39.77644659	-80.76751193
11,488.00	39.25	57.85	10,565.97	311.69	2,559.58	14,445,429.87	1,705,763.07	39.77648721	-80.76741910
11,535.00	38.95	53.89	10,602.45	328.32	2,584.11	14,445,446.49	1,705,787.60	39.77653269	-80.76733165
11,582.00	38.64	49.94	10,639.08	346.47	2,607.28	14,445,464.64	1,705,810.77	39.77658237	-80.76724902
11,630.00	38.77	45.28	10,676.55	366.69	2,629.43	14,445,484.87	1,705,832.92	39.77663776	-80.76716998
11,677.00	38.99	40.36	10,713.15	388.32	2,649.47	14,445,506.49	1,705,852.96	39.77669701	-80.76709847
11,724.00	38.90	36.32	10,749.71	411.48	2,667.79	14,445,529.66	1,705,871.27	39.77676048	-80.76703306
11,771.00	38.90	31.75	10,786.29	435.92	2,684.30	14,445,554.10	1,705,887.78	39.77682749	-80.76697407
11,819.00	38.51	29.72	10,823.75	461.72	2,699.64	14,445,579.89	1,705,903.12	39.77689822	-80.76691924
11,866.00	40.53	25.24	10,860.01	488.25	2,713.41	14,445,606.42	1,705,916.89	39.77697098	-80.76686998
11,913.00	43.87	19.44	10,894.84	517.44	2,725.35	14,445,635.61	1,705,928.83	39.77705106	-80.76682721
11,960.00	45.93	15.49	10,928.14	549.08	2,735.28	14,445,667.25	1,705,938.77	39.77713788	-80.76679156
12,008.00	47.30	11.44	10,961.11	582.99	2,743.39	14,445,701.17	1,705,946.87	39.77723096	-80.76676240
12,055.00	49.76	7.66	10,992.24	617.71	2,749.20	14,445,735.88	1,705,952.69	39.77732626	-80.76674137
12,103.00	51.21	5.29	11,022.78	654.50	2,753.37	14,445,772.67	1,705,956.86	39.77742726	-80.76672619
12,149.00	53.23	3.53	11,050.97	690.74	2,756.16	14,445,808.92	1,705,959.65	39.77752678	-80.76671594
12,197.00	55.91	1.16	11,078.79	729.82	2,757.75	14,445,847.99	1,705,961.23	39.77763407	-80.76670993
12,244.00	58.29	359.40	11,104.32	769.27	2,757.93	14,445,887.45	1,705,961.42	39.77774243	-80.76670890
12,291.00	60.35	357.64	11,128.30	809.67	2,756.88	14,445,927.85	1,705,960.37	39.77785340	-80.76671227
12,338.00	63.69	355.80	11,150.35	851.10	2,754.50	14,445,969.28	1,705,957.98	39.77796719	-80.76672037
12,386.00	67.47	353.78	11,170.19	894.62	2,750.52	14,446,012.79	1,705,954.00	39.77808672	-80.76673413
12,433.00	71.08	351.05	11,186.83	938.18	2,744.70	14,446,056.35	1,705,948.19	39.77820639	-80.76675442
12,480.00	73.98	347.62	11,200.94	982.22	2,736.40	14,446,100.40	1,705,939.88	39.77832740	-80.76678357
12,527.00	75.82	344.02	11,213.18	1,026.20	2,725.28	14,446,144.38	1,705,928.76	39.77844827	-80.76682274
12,575.00	76.44	340.24	11,224.70	1,070.55	2,710.98	14,446,188.72	1,705,914.47	39.77857015	-80.76687322
12,622.00	78.37	337.08	11,234.95	1,113.26	2,694.29	14,446,231.44	1,705,897.77	39.77868757	-80.76693224
12,669.00	79.91	333.65	11,243.80	1,155.21	2,675.05	14,446,273.38	1,705,878.53	39.77880291	-80.76700033
12,716.00	83.25	332.07	11,250.69	1,196.57	2,653.84	14,446,314.75	1,705,857.33	39.77891666	-80.76707543
12,764.00	87.47	331.28	11,254.57	1,238.68	2,631.14	14,446,356.85	1,705,834.63	39.77903246	-80.76715583
12,859.00	90.73	331.36	11,256.06	1,322.00	2,585.56	14,446,440.18	1,705,789.05	39.77926161	-80.76731729
12,953.00	90.51	331.54	11,255.04	1,404.57	2,540.64	14,446,522.74	1,705,744.13	39.77948868	-80.76747642
13,048.00	91.16	330.66	11,253.66	1,487.73	2,494.74	14,446,605.90	1,705,698.22	39.77971738	-80.76763905
13,142.00	92.22	331.28	11,250.89	1,569.88	2,449.14	14,446,688.05	1,705,652.63	39.77994332	-80.76780057
13,236.00	89.71	329.34	11,249.30	1,651.52	2,402.59	14,446,769.69	1,705,606.08	39.78016785	-80.76796550
13,330.00	89.41	328.99	11,250.02	1,732.23	2,354.41	14,446,850.40	1,705,557.90	39.78038984	-80.76813624
13,424.00	89.05	329.34	11,251.29	1,812.93	2,306.24	14,446,931.11	1,705,509.72	39.78061183	-80.76830698
13,519.00	91.16	328.11	11,251.11	1,894.12	2,256.92	14,447,012.29	1,705,460.41	39.78083514	-80.76848176
13,613.00	89.76	327.41	11,250.36	1,973.62	2,206.78	14,447,091.80	1,705,410.27	39.78105383	-80.76864591
13,708.00	89.05	327.67	11,251.35	2,053.77	2,155.80	14,447,171.95	1,705,359.28	39.78127432	-80.76884025
13,802.00	89.36	330.31	11,252.65	2,134.32	2,107.38	14,447,252.50	1,705,310.86	39.78149587	-80.76901185

WV Department of Environmental Protection



Survey Report - Geographic



Company: Tug Hill Operating LLC
Project: Marshall County, West Virginia.
Site: Bryan Pad
Well: Bryan N-14HU (slot D)
Wellbore: Sidetrack 02
Design: Surveys Sidetrack 02

Local Co-ordinate Reference: Well Bryan N-14HU (slot D)
TVD Reference: RKB=1191+25 @ 1216.00usft (H&P 611)
MD Reference: RKB=1191+25 @ 1216.00usft (H&P 611)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Aug1919_v14

RECEIVED
Office of Oil and Gas

Survey

AUG 14 2020

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	WV Department of Environmental Protection Longitude
13,897.00	89.05	331.54	11,253.97	2,217.34	2,061.22	14,447,335.52	1,705,264.70	39.78172419	-80.76917539
13,992.00	90.90	331.45	11,254.01	2,300.82	2,015.88	14,447,419.00	1,705,219.37	39.78195377	-80.76933600
14,086.00	92.00	331.19	11,251.63	2,383.26	1,970.78	14,447,501.44	1,705,174.27	39.78218049	-80.76949576
14,180.00	91.56	331.28	11,248.71	2,465.62	1,925.57	14,447,583.80	1,705,129.06	39.78240700	-80.76965594
14,275.00	91.21	331.45	11,246.41	2,548.98	1,880.06	14,447,667.15	1,705,083.54	39.78263624	-80.76981718
14,369.00	90.33	332.07	11,245.15	2,631.78	1,835.59	14,447,749.96	1,705,039.07	39.78286395	-80.76997472
14,464.00	91.08	331.10	11,243.98	2,715.33	1,790.38	14,447,833.50	1,704,993.87	39.78309371	-80.77013486
14,558.00	91.34	329.17	11,242.00	2,796.82	1,743.59	14,447,915.00	1,704,947.07	39.78331785	-80.77030068
14,653.00	90.68	329.61	11,240.32	2,878.57	1,695.22	14,447,996.75	1,704,898.71	39.78354269	-80.77047209
14,749.00	91.30	328.38	11,238.66	2,960.84	1,645.78	14,448,079.02	1,704,849.27	39.78376898	-80.77064733
14,843.00	90.59	328.38	11,237.11	3,040.88	1,596.50	14,448,159.05	1,704,799.99	39.78398912	-80.77082200
14,938.00	90.20	328.90	11,236.46	3,122.00	1,547.07	14,448,240.17	1,704,750.55	39.78421224	-80.77099724
15,032.00	90.77	328.64	11,235.66	3,202.37	1,498.33	14,448,320.55	1,704,701.82	39.78443332	-80.77116998
15,127.00	90.55	328.73	11,234.57	3,283.53	1,448.96	14,448,401.70	1,704,652.45	39.78465654	-80.77134499
15,221.00	91.74	329.43	11,232.69	3,364.15	1,400.67	14,448,482.32	1,704,604.16	39.78487829	-80.77151615
15,315.00	91.43	329.96	11,230.09	3,445.27	1,353.26	14,448,563.45	1,704,556.74	39.78510141	-80.77168419
15,409.00	90.95	330.66	11,228.14	3,526.91	1,306.71	14,448,645.09	1,704,510.19	39.78532594	-80.77184915
15,504.00	90.59	330.75	11,226.86	3,609.76	1,260.23	14,448,727.93	1,704,463.71	39.78555378	-80.77201385
15,598.00	90.51	331.10	11,225.96	3,691.91	1,214.55	14,448,810.08	1,704,418.04	39.78577971	-80.77217570
15,693.00	91.21	328.99	11,224.53	3,774.20	1,167.12	14,448,892.38	1,704,370.61	39.78600604	-80.77234378
15,787.00	90.90	325.83	11,222.80	3,853.38	1,116.51	14,448,971.55	1,704,319.99	39.78622383	-80.77252324
15,882.00	91.03	320.64	11,221.20	3,929.45	1,059.67	14,449,047.62	1,704,263.16	39.78643313	-80.77272486
15,976.00	91.52	320.47	11,219.11	4,002.02	999.97	14,449,120.19	1,704,203.45	39.78663285	-80.77293674
16,071.00	92.13	322.66	11,216.08	4,076.39	940.95	14,449,194.57	1,704,144.43	39.78683751	-80.77314616
16,165.00	96.09	327.15	11,209.34	4,153.06	887.06	14,449,271.24	1,704,090.54	39.78704845	-80.77333730
16,260.00	92.18	330.31	11,202.49	4,234.03	837.90	14,449,352.20	1,704,041.38	39.78727114	-80.77351157
16,355.00	91.47	331.28	11,199.47	4,316.91	791.57	14,449,435.08	1,703,995.05	39.78749907	-80.77367575
16,449.00	90.86	329.52	11,197.56	4,398.62	745.15	14,449,516.80	1,703,948.63	39.78772380	-80.77384025
16,544.00	91.34	332.77	11,195.73	4,481.80	699.32	14,449,599.97	1,703,902.80	39.78795255	-80.77400265
16,638.00	91.34	334.62	11,193.53	4,566.04	657.67	14,449,684.21	1,703,861.16	39.78818418	-80.77415014
16,733.00	92.44	332.42	11,190.40	4,651.02	615.34	14,449,769.19	1,703,818.83	39.78841786	-80.77430007
16,828.00	92.18	330.84	11,186.57	4,734.54	570.24	14,449,852.71	1,703,773.72	39.78864753	-80.77445987
16,922.00	90.68	331.89	11,184.23	4,817.01	525.21	14,449,935.19	1,703,728.69	39.78887434	-80.77461944
17,016.00	90.55	332.16	11,183.22	4,900.02	481.12	14,450,018.20	1,703,684.60	39.78910262	-80.77477565
17,111.00	90.07	331.80	11,182.70	4,983.89	436.49	14,450,102.06	1,703,639.97	39.78933324	-80.77493377
17,205.00	89.80	331.98	11,182.81	5,066.80	392.20	14,450,184.97	1,703,595.68	39.78956124	-80.77509069
17,300.00	89.19	332.07	11,183.65	5,150.69	347.64	14,450,268.87	1,703,551.12	39.78979195	-80.77524857
17,394.00	90.24	332.42	11,184.11	5,233.88	303.86	14,450,352.05	1,703,507.35	39.79002069	-80.77540366
17,489.00	91.78	332.51	11,182.44	5,318.10	259.95	14,450,436.28	1,703,463.44	39.79025230	-80.77555922
17,584.00	91.43	332.77	11,179.78	5,402.44	216.31	14,450,520.62	1,703,419.80	39.79048422	-80.77571383
17,677.00	91.91	332.51	11,177.07	5,485.00	173.59	14,450,603.18	1,703,377.07	39.79071125	-80.77586518
17,772.00	91.34	331.72	11,174.37	5,568.94	129.18	14,450,687.11	1,703,332.66	39.79094206	-80.77602254
17,866.00	91.47	330.13	11,172.07	5,651.06	83.51	14,450,769.24	1,703,287.00	39.79116792	-80.77618437
17,961.00	92.26	329.08	11,168.98	5,732.96	35.47	14,450,851.14	1,703,238.96	39.79139316	-80.77635466
18,055.00	91.47	328.82	11,165.92	5,813.45	-12.99	14,450,931.62	1,703,190.50	39.79161453	-80.77652645
18,149.00	90.77	329.34	11,164.08	5,894.08	-61.28	14,451,012.25	1,703,142.21	39.79183628	-80.77669765
18,244.00	91.03	329.52	11,162.59	5,975.86	-109.59	14,451,094.04	1,703,093.90	39.79206122	-80.77686891
18,338.00	92.22	330.13	11,159.92	6,057.09	-156.82	14,451,175.26	1,703,046.67	39.79228462	-80.77703632
18,433.00	91.56	330.40	11,156.79	6,139.53	-203.91	14,451,257.71	1,702,999.58	39.79251136	-80.77720324
18,527.00	90.99	330.84	11,154.70	6,221.42	-250.01	14,451,339.60	1,702,953.47	39.79273656	-80.77736655
18,621.00	91.21	331.63	11,152.89	6,303.81	-295.24	14,451,421.98	1,702,908.25	39.79296312	-80.77752692
18,715.00	90.59	332.51	11,151.42	6,386.85	-339.26	14,451,505.02	1,702,864.22	39.79319147	-80.77768291
18,810.00	90.24	330.40	11,150.73	6,470.29	-384.65	14,451,588.47	1,702,818.83	39.79342094	-80.77784377
18,904.00	91.30	330.22	11,149.47	6,551.94	-431.21	14,451,670.12	1,702,772.28	39.79364550	-80.77800878
18,999.00	91.25	329.78	11,147.35	6,634.20	-478.70	14,451,752.37	1,702,724.79	39.79387170	-80.77817712



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

RECEIVED
Office of Mineral Resources

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
19,093.00	90.99	328.99	11,145.51	6,715.08	-526.56	14,451,833.25	1,702,676.93	39.79409415	-80.77834679
19,188.00	92.66	329.17	11,142.49	6,796.53	-575.35	14,451,914.71	1,702,628.14	39.79431818	-80.77851977
19,283.00	92.31	329.26	11,138.37	6,878.07	-623.92	14,451,996.24	1,702,579.56	39.79454243	-80.77869199
19,377.00	91.91	329.26	11,134.91	6,958.81	-671.94	14,452,076.98	1,702,531.55	39.79476449	-80.77886222
19,472.00	91.34	329.43	11,132.22	7,040.50	-720.36	14,452,158.67	1,702,483.13	39.79498916	-80.77903387
19,566.00	91.03	328.82	11,130.27	7,121.16	-768.58	14,452,239.33	1,702,434.90	39.79521100	-80.77920486
19,661.00	91.21	329.52	11,128.41	7,202.72	-817.26	14,452,320.89	1,702,386.23	39.79543532	-80.77937744
19,756.00	90.51	329.43	11,126.99	7,284.54	-865.51	14,452,402.72	1,702,337.98	39.79566036	-80.77954849
19,850.00	90.07	329.61	11,126.51	7,365.55	-913.19	14,452,483.73	1,702,290.30	39.79588315	-80.77971752
19,946.00	90.07	327.94	11,126.40	7,447.64	-962.95	14,452,565.82	1,702,240.54	39.79610893	-80.77989397
20,040.00	91.12	328.90	11,125.42	7,527.71	-1,012.17	14,452,645.89	1,702,191.31	39.79632916	-80.78006852
20,135.00	91.91	329.26	11,122.91	7,609.18	-1,060.97	14,452,727.36	1,702,142.52	39.79655323	-80.78024153
20,230.00	92.00	329.61	11,119.67	7,690.94	-1,109.25	14,452,809.11	1,702,094.23	39.79677807	-80.78041271
20,325.00	92.40	330.31	11,116.02	7,773.11	-1,156.77	14,452,891.29	1,702,046.71	39.79700407	-80.78058118
20,420.00	91.60	330.93	11,112.70	7,855.84	-1,203.35	14,452,974.02	1,702,000.13	39.79723158	-80.78074629
20,515.00	90.51	331.28	11,110.96	7,939.00	-1,249.25	14,453,057.18	1,701,954.24	39.79746027	-80.78090896
20,609.00	91.03	333.12	11,109.69	8,022.14	-1,293.08	14,453,140.32	1,701,910.40	39.79768888	-80.78106430
20,704.00	90.42	333.91	11,108.49	8,107.16	-1,335.44	14,453,225.34	1,701,868.04	39.79792266	-80.78121438
20,799.00	89.45	333.30	11,108.60	8,192.26	-1,377.68	14,453,310.43	1,701,825.81	39.79815664	-80.78136400
20,894.00	89.71	330.66	11,109.29	8,276.11	-1,422.30	14,453,394.29	1,701,781.19	39.79838722	-80.78152215
20,989.00	90.15	329.08	11,109.41	8,358.27	-1,469.99	14,453,476.45	1,701,733.50	39.79861318	-80.78169121
21,084.00	90.55	328.99	11,108.83	8,439.73	-1,518.86	14,453,557.91	1,701,684.62	39.79883722	-80.78186452
21,179.00	91.16	329.87	11,107.41	8,521.52	-1,567.17	14,453,639.69	1,701,636.31	39.79906215	-80.78203581
21,274.00	91.65	330.75	11,105.08	8,604.02	-1,614.21	14,453,722.20	1,701,589.27	39.79928903	-80.78220257
21,369.00	91.08	328.38	11,102.82	8,685.90	-1,662.32	14,453,804.08	1,701,541.17	39.79951422	-80.78237314
21,464.00	91.47	327.67	11,100.71	8,766.47	-1,712.61	14,453,884.64	1,701,490.87	39.79973581	-80.78255151
21,559.00	92.04	328.38	11,097.80	8,847.01	-1,762.90	14,453,965.19	1,701,440.59	39.79995735	-80.78272984
21,679.00	90.95	329.08	11,094.67	8,949.55	-1,825.16	14,454,067.72	1,701,378.32	39.80023934	-80.78295064
21,774.00	90.99	328.55	11,093.06	9,030.81	-1,874.35	14,454,148.98	1,701,329.14	39.80046283	-80.78312506
21,869.00	91.30	328.46	11,091.16	9,111.79	-1,923.97	14,454,229.97	1,701,279.52	39.80068558	-80.78330103
21,963.00	91.91	328.38	11,088.53	9,191.84	-1,973.17	14,454,310.02	1,701,230.31	39.80090574	-80.78347554
22,058.00	90.29	328.55	11,086.70	9,272.80	-2,022.85	14,454,390.97	1,701,180.64	39.80112839	-80.78365171
22,153.00	90.46	328.29	11,086.08	9,353.72	-2,072.60	14,454,471.90	1,701,130.89	39.80135097	-80.78382814
22,248.00	90.99	328.82	11,084.88	9,434.77	-2,122.15	14,454,552.94	1,701,081.33	39.80157386	-80.78400389
22,342.00	91.08	328.99	11,083.18	9,515.25	-2,170.69	14,454,633.42	1,701,032.79	39.80179521	-80.78417602
22,437.00	91.03	328.55	11,081.43	9,596.47	-2,219.94	14,454,714.64	1,700,983.55	39.80201858	-80.78435066
22,532.00	91.16	330.49	11,079.62	9,678.32	-2,268.12	14,454,796.49	1,700,935.37	39.80224369	-80.78452149
22,627.00	92.18	330.66	11,076.85	9,761.03	-2,314.77	14,454,879.20	1,700,888.72	39.80247114	-80.78469689
22,722.00	91.25	330.93	11,074.00	9,843.91	-2,361.10	14,454,962.09	1,700,842.39	39.80269907	-80.78485115
22,817.00	91.56	330.75	11,071.68	9,926.85	-2,407.38	14,455,045.02	1,700,796.11	39.80292714	-80.78501520
22,912.00	91.82	330.31	11,068.87	10,009.52	-2,454.09	14,455,127.69	1,700,749.39	39.80315449	-80.78518083
23,007.00	91.34	329.69	11,066.25	10,091.76	-2,501.57	14,455,209.94	1,700,701.91	39.80338065	-80.78534919
23,102.00	90.90	329.43	11,064.40	10,173.65	-2,549.69	14,455,291.82	1,700,653.79	39.80360586	-80.78551983
23,196.00	91.43	330.22	11,062.49	10,254.89	-2,596.93	14,455,373.07	1,700,606.55	39.80382929	-80.78568733
23,291.00	91.34	329.08	11,060.19	10,336.85	-2,644.92	14,455,455.02	1,700,558.57	39.80405468	-80.78585749
23,386.00	90.90	326.35	11,058.33	10,417.14	-2,695.85	14,455,535.31	1,700,507.84	39.80427551	-80.78603743
23,481.00	91.25	324.60	11,056.55	10,495.39	-2,749.48	14,455,613.57	1,700,454.01	39.80449076	-80.78622844
23,576.00	91.38	324.16	11,054.37	10,572.60	-2,804.79	14,455,690.77	1,700,398.69	39.80470315	-80.78642473
23,671.00	91.43	322.40	11,052.04	10,648.72	-2,861.57	14,455,766.89	1,700,341.91	39.80491257	-80.78662626
23,732.00	91.65	322.49	11,050.40	10,697.06	-2,898.74	14,455,815.24	1,700,304.74	39.80504558	-80.78675819
Survey @ 23732.00 MD 11051.62 TVD ST2									
23,785.00	91.65	322.49	11,048.87	10,739.08	-2,931.00	14,455,857.26	1,700,272.49	39.80516120	-80.78687270
Survey projected to 23785.00 MD 11050.10 TVD ST2									

AUG 14 2020

WV Department of Environmental Protection



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-14HU (slot D)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Site:	Bryan Pad	MD Reference:	RKB=1191+25 @ 1216.00usft (H&P 611)
Well:	Bryan N-14HU (slot D)	North Reference:	Grid
Wellbore:	Sidetrack 02	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Sidetrack 02	Database:	DB_Aug1919_v14

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,274.00	8,173.96	22.32	457.80	Tie into sidetrack 01 @ 8274 MD
8,651.00	8,490.26	78.38	653.99	Survey @ 8651.00 MD 8490.26 TVD
23,732.00	11,050.40	10,697.06	-2,898.74	Survey @ 23732.00 MD 11051.62 TVD ST2
23,785.00	11,048.87	10,739.08	-2,931.00	Survey projected to 23785.00 MD 11050.10 TVD ST2

RECEIVED
Office of Oil and Gas

AUG 14 2020

WV Department of
Environmental Protection

RECEIVED
Office of Oil and Gas

AUG 14 2020

WV Department of
Environmental Protection