



Survey Report - Geographic



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan S-10HM (slot J)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (Precision 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (Precision 110)
Well:	Bryan S-10HM (slot J)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_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 S-10HM (slot J)					
Well Position	+N-S	0.00 usft	Northing:	14,445,136.25 usft	Latitude:	39.77569893
	+E-W	0.00 usft	Easting:	1,703,176.30 usft	Longitude:	-80.77662846
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	4/1/2019	-8.694	66.808	51,989.68728599

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	133.91	

Survey Program	Date	4/16/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
223.00	922.00	MWD surf (Original Hole)	MWD	MWD - Standard	
993.00	2,608.00	MWD int (Original Hole)	MWD	MWD - Standard	
2,706.00	14,812.00	MWD (Original Hole)	MWD	MWD - Standard	
14,867.00	14,867.00	Projection (Original Hole)	MWD	MWD - Standard	

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Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,445,136.25	1,703,176.30	39.77569893	-80.77662846	
223.00	0.12	82.22	223.00	0.03	0.23	14,445,136.28	1,703,176.53	39.77569902	-80.77662764	
MWD surveys										
254.00	0.33	89.22	254.00	0.04	0.35	14,445,136.29	1,703,176.65	39.77569903	-80.77662720	
349.00	0.11	184.85	349.00	-0.05	0.62	14,445,136.20	1,703,176.92	39.77569879	-80.77662626	
443.00	0.25	203.15	443.00	-0.33	0.53	14,445,135.92	1,703,176.83	39.77569803	-80.77662658	
537.00	0.18	98.20	537.00	-0.54	0.60	14,445,135.71	1,703,176.90	39.77569745	-80.77662634	
632.00	0.21	119.00	632.00	-0.64	0.90	14,445,135.60	1,703,177.20	39.77569716	-80.77662528	
725.00	0.08	89.54	725.00	-0.73	1.11	14,445,135.52	1,703,177.41	39.77569693	-80.77662452	



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Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude
815.00	0.16	77.14	815.00	-0.70	1.30	14,445,135.55	1,703,177.60	39.77569701
922.00	0.23	141.40	922.00	-0.83	1.57	14,445,135.42	1,703,177.88	39.77569664
993.00	0.13	97.49	993.00	-0.95	1.74	14,445,135.29	1,703,178.05	39.77569630
1,083.00	0.38	96.55	1,083.00	-1.00	2.14	14,445,135.25	1,703,178.44	39.77569617
1,173.00	0.46	117.29	1,172.99	-1.20	2.76	14,445,135.05	1,703,179.06	39.77569561
1,263.00	0.57	135.26	1,262.99	-1.68	3.40	14,445,134.56	1,703,179.70	39.77569428
1,352.00	0.50	164.66	1,351.99	-2.37	3.81	14,445,133.87	1,703,180.11	39.77569239
1,441.00	0.59	163.79	1,440.98	-3.19	4.04	14,445,133.06	1,703,180.34	39.77569015
1,531.00	0.61	169.37	1,530.98	-4.10	4.26	14,445,132.14	1,703,180.56	39.77568763
1,621.00	0.88	119.53	1,620.97	-4.92	4.95	14,445,131.33	1,703,181.25	39.77568540
1,710.00	2.14	81.12	1,709.94	-5.00	7.18	14,445,131.25	1,703,183.49	39.77568516
1,800.00	3.37	70.23	1,799.83	-3.84	11.33	14,445,132.41	1,703,187.64	39.77568830
1,890.00	4.12	51.12	1,889.64	-0.92	16.34	14,445,135.33	1,703,192.64	39.77569630
1,979.00	4.92	37.95	1,978.37	4.10	21.18	14,445,140.35	1,703,197.48	39.77571004
2,069.00	5.35	37.68	2,068.01	10.46	26.11	14,445,146.71	1,703,202.42	39.77572749
2,159.00	5.24	59.06	2,157.63	15.90	32.20	14,445,152.15	1,703,208.51	39.77574237
2,249.00	5.91	83.57	2,247.22	18.53	40.34	14,445,154.78	1,703,216.64	39.77574954
2,339.00	5.57	90.23	2,336.77	19.03	49.31	14,445,155.28	1,703,225.61	39.77575086
2,428.00	4.45	117.15	2,425.44	17.44	56.70	14,445,153.69	1,703,233.00	39.77574643
2,518.00	3.70	111.22	2,515.21	14.79	62.51	14,445,151.04	1,703,238.82	39.77573913
2,608.00	3.59	64.21	2,605.05	14.97	67.76	14,445,151.22	1,703,244.06	39.77573958
2,706.00	4.28	44.70	2,702.82	18.90	73.09	14,445,155.15	1,703,249.40	39.77575034
2,780.00	4.19	23.96	2,776.62	23.34	76.13	14,445,159.58	1,703,252.44	39.77576250
2,870.00	6.35	0.31	2,866.25	31.32	77.50	14,445,167.57	1,703,253.80	39.77578441
2,960.00	9.39	5.26	2,955.39	43.61	78.20	14,445,179.86	1,703,254.50	39.77581816
3,049.00	12.16	18.60	3,042.83	59.73	81.85	14,445,195.98	1,703,258.16	39.77586241
3,139.00	16.57	36.38	3,130.03	79.07	92.50	14,445,215.31	1,703,268.80	39.77591543
3,230.00	20.33	40.74	3,216.34	101.50	110.52	14,445,237.75	1,703,286.82	39.77597692
3,319.00	19.09	38.90	3,300.13	124.54	129.75	14,445,260.79	1,703,306.05	39.77604006
3,409.00	17.57	42.55	3,385.56	146.00	148.18	14,445,282.25	1,703,324.48	39.77609888
3,499.00	18.46	44.97	3,471.15	166.09	167.44	14,445,302.34	1,703,343.74	39.77615392
3,588.00	21.11	43.49	3,554.89	187.69	188.43	14,445,323.94	1,703,364.73	39.77621309
3,678.00	23.39	44.43	3,638.18	212.21	212.09	14,445,348.46	1,703,388.40	39.77628027
3,768.00	28.37	47.51	3,719.14	239.43	240.39	14,445,375.68	1,703,416.69	39.77635482
3,857.00	31.86	46.04	3,796.11	270.03	272.90	14,445,406.27	1,703,449.20	39.77643863
3,947.00	31.33	47.63	3,872.77	302.28	307.28	14,445,438.53	1,703,483.58	39.77652698
4,037.00	30.53	47.86	3,949.97	333.39	341.52	14,445,469.64	1,703,517.82	39.77661217
4,125.00	30.17	49.89	4,025.92	362.64	375.01	14,445,498.88	1,703,551.31	39.77669225
4,218.00	32.28	51.20	4,105.44	393.26	412.24	14,445,529.50	1,703,588.54	39.77677609
4,308.00	32.31	48.60	4,181.52	424.22	449.01	14,445,560.47	1,703,625.31	39.77686088
4,398.00	34.56	49.17	4,256.62	456.82	486.37	14,445,593.07	1,703,662.68	39.77695015
4,487.00	36.97	52.88	4,328.84	489.49	526.82	14,445,625.73	1,703,703.13	39.77703957
4,577.00	36.81	53.71	4,400.82	521.78	570.14	14,445,658.03	1,703,746.44	39.77712795
4,666.00	36.20	51.16	4,472.37	554.04	612.10	14,445,690.29	1,703,788.40	39.77721628
4,756.00	35.63	52.29	4,545.26	586.75	653.54	14,445,722.99	1,703,829.84	39.77730580
4,846.00	35.83	53.53	4,618.32	618.44	695.47	14,445,754.69	1,703,871.77	39.77739255
4,935.00	36.40	51.89	4,690.22	650.22	737.19	14,445,786.47	1,703,913.49	39.77747954
5,025.00	35.20	50.95	4,763.21	683.05	778.35	14,445,819.29	1,703,954.65	39.77756940
5,115.00	34.13	51.74	4,837.24	715.02	818.32	14,445,851.27	1,703,994.62	39.77765694
5,205.00	34.36	54.15	4,911.64	745.53	858.73	14,445,881.78	1,704,035.04	39.77774045
5,294.00	34.87	51.98	4,984.88	775.91	899.14	14,445,912.16	1,704,075.44	39.77782361
5,384.00	35.26	51.91	5,058.55	807.79	939.85	14,445,944.03	1,704,116.15	39.77791085
5,473.00	34.88	52.73	5,131.39	839.05	980.32	14,445,975.29	1,704,156.62	39.77799642
5,563.00	33.98	53.12	5,205.63	869.72	1,020.92	14,446,005.97	1,704,197.22	39.77808038
5,653.00	34.02	50.59	5,280.24	900.80	1,060.49	14,446,037.05	1,704,236.79	39.77816546



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5,743.00	34.45	47.67	5,354.65	933.93	1,098.76	14,446,070.18	1,704,275.07	39.77825617	-80.77270938
5,832.00	33.71	49.37	5,428.37	966.97	1,136.12	14,446,103.21	1,704,312.42	39.77834664	-80.77257613
5,922.00	34.39	54.88	5,502.96	997.86	1,175.87	14,446,134.11	1,704,352.17	39.77843120	-80.77243435
5,988.00	34.46	55.95	5,557.40	1,019.04	1,206.59	14,446,155.28	1,704,382.89	39.77848915	-80.77232483
6,077.00	34.24	54.71	5,630.88	1,047.60	1,247.89	14,446,183.85	1,704,424.19	39.77856730	-80.77217757
6,167.00	33.23	54.10	5,705.72	1,076.69	1,288.53	14,446,212.94	1,704,464.84	39.77864690	-80.77203265
6,256.00	34.46	53.48	5,779.64	1,105.97	1,328.52	14,446,242.22	1,704,504.83	39.77872705	-80.77189004
6,346.00	35.43	51.81	5,853.41	1,137.26	1,369.49	14,446,273.50	1,704,545.79	39.77881267	-80.77174394
6,436.00	34.64	54.10	5,927.11	1,168.39	1,410.72	14,446,304.63	1,704,587.02	39.77889787	-80.77159692
6,481.00	34.46	64.47	5,964.20	1,181.38	1,432.58	14,446,317.63	1,704,608.89	39.77893341	-80.77151897
6,525.00	34.20	69.74	6,000.55	1,191.03	1,455.42	14,446,327.28	1,704,631.73	39.77895975	-80.77143760
6,570.00	35.03	73.17	6,037.59	1,199.15	1,479.65	14,446,335.40	1,704,655.95	39.77898188	-80.77135128
6,615.00	35.47	75.98	6,074.34	1,206.06	1,504.68	14,446,342.30	1,704,680.99	39.77900066	-80.77126213
6,660.00	36.79	77.21	6,110.68	1,212.20	1,530.49	14,446,348.45	1,704,706.80	39.77901736	-80.77117021
6,704.00	38.37	80.38	6,145.55	1,217.40	1,556.81	14,446,353.65	1,704,733.11	39.77903146	-80.77107649
6,749.00	40.13	85.56	6,180.41	1,220.86	1,585.05	14,446,357.11	1,704,761.35	39.77904076	-80.77097595
6,794.00	41.67	89.70	6,214.43	1,222.06	1,614.47	14,446,358.31	1,704,790.77	39.77904385	-80.77087121
6,839.00	43.69	96.38	6,247.53	1,220.41	1,644.90	14,446,356.66	1,704,821.20	39.77903910	-80.77076294
6,884.00	46.29	101.91	6,279.36	1,215.32	1,676.27	14,446,351.57	1,704,852.58	39.77902491	-80.77065130
6,929.00	47.38	104.02	6,310.15	1,207.96	1,708.25	14,446,344.20	1,704,884.56	39.77900445	-80.77053754
6,973.00	50.07	109.21	6,339.18	1,198.48	1,739.91	14,446,334.73	1,704,916.21	39.77897820	-80.77042496
7,018.00	52.79	115.10	6,367.25	1,185.19	1,772.45	14,446,321.44	1,704,948.76	39.77894148	-80.77030925
7,063.00	54.41	117.73	6,393.96	1,169.07	1,804.88	14,446,305.32	1,704,981.18	39.77889699	-80.77019397
7,108.00	58.95	119.05	6,418.67	1,151.19	1,837.95	14,446,287.44	1,705,014.25	39.77884764	-80.77007644
7,153.00	63.56	122.83	6,440.31	1,130.89	1,871.75	14,446,267.14	1,705,048.06	39.77879166	-80.76995630
7,198.00	68.04	127.66	6,458.76	1,107.19	1,905.24	14,446,243.44	1,705,081.54	39.77872634	-80.76983734
7,242.00	71.38	132.41	6,474.03	1,080.65	1,936.81	14,446,216.89	1,705,113.11	39.77865321	-80.76972522
7,287.00	73.63	135.75	6,487.56	1,050.79	1,967.63	14,446,187.04	1,705,143.93	39.77857100	-80.76961580
7,332.00	76.75	139.97	6,499.06	1,018.54	1,996.80	14,446,154.78	1,705,173.10	39.77848222	-80.76951227
7,377.00	78.42	144.19	6,508.74	983.87	2,023.79	14,446,120.12	1,705,200.10	39.77838683	-80.76941650
7,422.00	79.56	147.79	6,517.34	947.26	2,048.49	14,446,083.51	1,705,224.80	39.77828612	-80.76932892
7,467.00	82.20	149.81	6,524.47	909.26	2,071.50	14,446,045.51	1,705,247.81	39.77818159	-80.76924737
7,511.00	87.12	150.08	6,528.56	871.36	2,093.44	14,446,007.60	1,705,269.74	39.77807734	-80.76916965
7,556.00	91.74	149.02	6,529.01	832.57	2,116.24	14,445,968.82	1,705,292.54	39.77797067	-80.76908886
7,601.00	91.91	148.76	6,527.58	794.07	2,139.47	14,445,930.31	1,705,315.78	39.77786475	-80.76900650
7,691.00	88.40	149.55	6,527.33	716.81	2,185.61	14,445,853.06	1,705,361.91	39.77765226	-80.76884300
7,780.00	88.04	149.55	6,530.10	640.12	2,230.69	14,445,776.37	1,705,407.00	39.77744133	-80.76868324
7,870.00	89.01	150.43	6,532.42	562.22	2,275.69	14,445,698.46	1,705,451.99	39.77722706	-80.76852380
7,960.00	92.44	150.52	6,531.28	483.92	2,320.03	14,445,620.17	1,705,496.34	39.77701173	-80.76836670
8,050.00	92.26	150.08	6,527.59	405.81	2,364.59	14,445,542.06	1,705,540.89	39.77679690	-80.76820885
8,140.00	91.96	149.29	6,524.27	328.17	2,409.98	14,445,464.42	1,705,586.29	39.77658335	-80.76804799
8,229.00	90.46	151.13	6,522.39	250.95	2,454.19	14,445,387.20	1,705,630.49	39.77637098	-80.76789137
8,319.00	90.51	150.69	6,521.63	172.31	2,497.94	14,445,308.56	1,705,674.24	39.77615469	-80.76773636
8,409.00	87.74	152.45	6,523.01	93.18	2,540.78	14,445,229.43	1,705,717.08	39.77593708	-80.76758463
8,498.00	89.93	152.01	6,524.82	14.46	2,582.24	14,445,150.70	1,705,758.54	39.77572058	-80.76743781
8,588.00	90.59	151.83	6,524.41	-64.95	2,624.60	14,445,071.30	1,705,800.90	39.77550221	-80.76728777
8,678.00	89.32	151.92	6,524.48	-144.32	2,667.02	14,444,991.93	1,705,843.32	39.77528393	-80.76713751
8,768.00	88.57	152.27	6,526.14	-223.84	2,709.14	14,444,912.41	1,705,885.44	39.77506524	-80.76698836
8,857.00	89.67	150.08	6,527.50	-301.80	2,752.04	14,444,834.45	1,705,928.34	39.77485084	-80.76683639
8,947.00	89.85	149.02	6,527.88	-379.38	2,797.65	14,444,756.86	1,705,973.95	39.77463745	-80.76667478
9,037.00	91.38	150.52	6,526.91	-457.14	2,842.96	14,444,679.11	1,706,019.26	39.77442359	-80.76651425
9,127.00	90.99	149.90	6,525.05	-535.23	2,887.66	14,444,601.02	1,706,063.96	39.77420882	-80.76635587
9,216.00	90.24	150.08	6,524.10	-612.29	2,932.17	14,444,523.96	1,706,108.47	39.77399686	-80.76619817
9,306.00	89.49	150.16	6,524.31	-690.32	2,977.01	14,444,445.92	1,706,153.31	39.77378223	-80.76603932
9,396.00	89.27	149.81	6,525.28	-768.25	3,022.02	14,444,368.00	1,706,198.33	39.77356790	-80.76587983



Survey Report - Geographic



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan S-10HM (slot J)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (Precision 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (Precision 110)
Well:	Bryan S-10HM (slot J)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

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Latitude Longitude

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,485.00	91.21	149.37	6,524.91	-845.00	3,067.07	14,444,291.25	1,706,243.37	39.77335680	-80.76572022
9,575.00	90.99	149.37	6,523.18	-922.43	3,112.92	14,444,213.82	1,706,289.22	39.77314383	-80.76555777
9,665.00	90.20	149.29	6,522.25	-999.84	3,158.82	14,444,136.41	1,706,335.12	39.77293092	-80.76539512
9,754.00	89.27	149.55	6,522.66	-1,076.46	3,204.10	14,444,059.79	1,706,380.40	39.77272018	-80.76523469
9,844.00	88.48	149.46	6,524.43	-1,153.99	3,249.76	14,443,982.26	1,706,426.06	39.77250691	-80.76507290
9,934.00	90.73	149.20	6,525.05	-1,231.40	3,295.67	14,443,904.85	1,706,471.97	39.77229401	-80.76491025
10,023.00	90.55	148.76	6,524.05	-1,307.66	3,341.53	14,443,828.59	1,706,517.83	39.77208423	-80.76474775
10,113.00	90.20	148.49	6,523.46	-1,384.50	3,388.38	14,443,751.75	1,706,564.69	39.77187287	-80.76458171
10,203.00	90.46	148.05	6,522.94	-1,461.05	3,435.72	14,443,675.20	1,706,612.02	39.77166231	-80.76441397
10,292.00	90.90	151.31	6,521.89	-1,537.86	3,480.64	14,443,598.39	1,706,656.94	39.77145105	-80.76425482
10,382.00	90.59	151.92	6,520.72	-1,617.03	3,523.42	14,443,519.22	1,706,699.72	39.77123331	-80.76410331
10,472.00	90.33	152.19	6,520.00	-1,696.53	3,565.59	14,443,439.72	1,706,741.90	39.77101466	-80.76395396
10,561.00	89.41	152.10	6,520.20	-1,775.22	3,607.18	14,443,361.03	1,706,783.48	39.77079827	-80.76380671
10,651.00	88.92	152.01	6,521.51	-1,854.72	3,649.35	14,443,281.53	1,706,825.65	39.77057964	-80.76365737
10,740.00	91.60	151.22	6,521.11	-1,933.01	3,691.65	14,443,203.24	1,706,867.96	39.77036432	-80.76350755
10,830.00	91.25	150.87	6,518.87	-2,011.73	3,735.21	14,443,124.51	1,706,911.51	39.77014781	-80.76335327
10,920.00	90.46	151.04	6,517.52	-2,090.41	3,778.90	14,443,045.84	1,706,955.20	39.76993143	-80.76319853
11,010.00	89.63	151.39	6,517.45	-2,169.28	3,822.24	14,442,966.96	1,706,998.54	39.76971450	-80.76304505
11,099.00	90.99	150.34	6,516.97	-2,247.02	3,865.57	14,442,889.23	1,707,041.87	39.76950070	-80.76289158
11,189.00	90.81	149.72	6,515.56	-2,324.97	3,910.52	14,442,811.27	1,707,086.82	39.76928628	-80.76273233
11,279.00	88.31	151.31	6,516.25	-2,403.31	3,954.81	14,442,732.94	1,707,131.11	39.76907084	-80.76257545
11,368.00	88.00	150.87	6,519.11	-2,481.18	3,997.81	14,442,655.07	1,707,174.12	39.76885668	-80.76242314
11,458.00	90.37	150.69	6,520.39	-2,559.71	4,041.74	14,442,576.54	1,707,218.04	39.76864068	-80.76226756
11,547.00	90.68	150.25	6,519.58	-2,637.14	4,085.61	14,442,499.10	1,707,261.91	39.76842770	-80.76211218
11,637.00	90.02	150.08	6,519.03	-2,715.21	4,130.38	14,442,421.03	1,707,306.68	39.76821298	-80.76195358
11,727.00	89.45	149.64	6,519.45	-2,793.04	4,175.57	14,442,343.20	1,707,351.87	39.76799890	-80.76179350
11,817.00	89.63	149.20	6,520.17	-2,870.53	4,221.35	14,442,265.72	1,707,397.66	39.76778578	-80.76163130
11,906.00	89.32	148.93	6,520.98	-2,946.86	4,267.10	14,442,189.39	1,707,443.41	39.76757581	-80.76146921
11,996.00	91.74	151.66	6,520.15	-3,025.02	4,311.69	14,442,111.23	1,707,488.00	39.76736084	-80.76131127
12,086.00	92.53	151.92	6,516.80	-3,104.27	4,354.21	14,442,031.98	1,707,530.51	39.76714288	-80.76116073
12,175.00	92.62	152.27	6,512.80	-3,182.84	4,395.82	14,441,953.40	1,707,572.12	39.76692679	-80.76101340
12,265.00	89.54	151.31	6,511.10	-3,262.13	4,438.35	14,441,874.12	1,707,614.65	39.76670874	-80.76086280
12,355.00	89.27	152.10	6,512.04	-3,341.37	4,481.01	14,441,794.88	1,707,657.31	39.76649081	-80.76071175
12,444.00	88.79	152.27	6,513.55	-3,420.08	4,522.53	14,441,716.17	1,707,698.83	39.76627436	-80.76056473
12,534.00	89.14	152.36	6,515.17	-3,499.76	4,564.34	14,441,636.49	1,707,740.64	39.76605522	-80.76041671
12,624.00	88.79	152.10	6,516.80	-3,579.38	4,606.26	14,441,556.87	1,707,782.57	39.76583625	-80.76026827
12,713.00	87.87	149.37	6,519.39	-3,656.98	4,649.75	14,441,479.27	1,707,826.05	39.76562282	-80.76011426
12,803.00	87.34	148.93	6,523.15	-3,734.18	4,695.86	14,441,402.07	1,707,872.16	39.76541047	-80.75995091
12,892.00	89.05	148.58	6,525.95	-3,810.23	4,742.00	14,441,326.02	1,707,918.30	39.76520127	-80.75978744
12,982.00	90.20	145.90	6,526.54	-3,885.90	4,790.69	14,441,250.34	1,707,966.99	39.76499309	-80.75961488
13,072.00	91.08	145.77	6,525.54	-3,960.37	4,841.23	14,441,175.88	1,708,017.53	39.76478822	-80.75943575
13,162.00	91.91	148.93	6,523.19	-4,036.11	4,889.76	14,441,100.14	1,708,066.07	39.76457986	-80.75926376
13,251.00	91.65	148.93	6,520.43	-4,112.30	4,935.67	14,441,023.94	1,708,111.98	39.76437026	-80.75910112
13,341.00	91.03	148.49	6,518.32	-4,189.19	4,982.40	14,440,947.06	1,708,158.71	39.76415876	-80.75893557
13,430.00	90.46	148.49	6,517.16	-4,265.06	5,028.91	14,440,871.19	1,708,205.22	39.76395006	-80.75877078
13,520.00	89.80	147.62	6,516.96	-4,341.43	5,076.53	14,440,794.82	1,708,252.84	39.76373998	-80.75860206
13,610.00	89.23	148.05	6,517.72	-4,417.61	5,124.44	14,440,718.63	1,708,300.75	39.76353040	-80.75843230
13,699.00	89.85	151.04	6,518.44	-4,494.32	5,169.55	14,440,641.93	1,708,345.85	39.76331940	-80.75827254
13,789.00	89.45	150.52	6,518.99	-4,572.87	5,213.48	14,440,563.38	1,708,389.78	39.76310337	-80.75811695
13,878.00	90.81	152.27	6,518.78	-4,651.00	5,256.09	14,440,485.25	1,708,432.39	39.76288848	-80.75796609
13,968.00	90.55	151.92	6,517.72	-4,730.53	5,298.21	14,440,405.72	1,708,474.51	39.76266976	-80.75781698
14,058.00	90.99	151.48	6,516.51	-4,809.77	5,340.87	14,440,326.48	1,708,517.17	39.76245184	-80.75766592
14,148.00	90.99	151.31	6,514.95	-4,888.77	5,383.95	14,440,247.48	1,708,560.26	39.76223455	-80.75751338
14,237.00	90.37	151.57	6,513.89	-4,966.93	5,426.50	14,440,169.32	1,708,602.80	39.76201957	-80.75736273
14,327.00	89.71	151.75	6,513.83	-5,046.14	5,469.22	14,440,090.10	1,708,645.52	39.76180172	-80.75721147



Survey Report - Geographic



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan S-10HM (slot J)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (Precision 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (Precision 110)
Well:	Bryan S-10HM (slot J)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,417.00	88.97	151.92	6,514.87	-5,125.48	5,511.70	14,440,010.77	1,708,688.00	39.76158352	-80.75706108
14,507.00	89.58	150.52	6,516.01	-5,204.36	5,555.03	14,439,931.89	1,708,731.33	39.76136658	-80.75690767
14,596.00	89.67	149.90	6,516.59	-5,281.59	5,599.24	14,439,854.65	1,708,775.54	39.76115414	-80.75675108
14,686.00	89.14	149.29	6,517.52	-5,359.21	5,644.79	14,439,777.04	1,708,821.09	39.76094064	-80.75658976
14,776.00	88.75	149.02	6,519.18	-5,436.47	5,690.92	14,439,699.78	1,708,867.23	39.76072813	-80.75642634
14,812.00	88.48	148.85	6,520.05	-5,467.30	5,709.50	14,439,668.95	1,708,885.80	39.76064333	-80.75636055
Survey @ 14812.00 MD 6520.05 TVD									
14,867.00	88.48	148.85	6,521.51	-5,514.35	5,737.94	14,439,621.90	1,708,914.24	39.76051389	-80.75625981
Survey projected to 14867.00 MD 6521.51 TVD									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
223.00	223.00	0.03	0.23	MWD surveys
14,812.00	6,520.05	-5,467.30	5,709.50	Survey @ 14812.00 MD 6520.05 TVD
14,867.00	6,521.51	-5,514.35	5,737.94	Survey projected to 14867.00 MD 6521.51 TVD