



Well: Bryan N-02HM (slot M)
 Site: Bryan Pad
 Project: Marshall County, West Virginia
 Design: rev7
 Rig: PD 110

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1050.00	3.00	218.15	1199.93	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	1200.00	3.00	218.15	3000.00	-3.09	-2.43	2.00	218.15	-0.92	Begin 3.00° tangent section
4	3002.54	3.00	218.15	4016.50	-77.27	-60.70	0.00	0.00	-23.07	Begin 2°/100' drop
5	4053.87	24.03	218.15	4016.50	-289.38	-211.61	2.00	0.00	-80.42	Begin vertical hold section
6	5967.33	24.03	218.15	5764.17	-882.03	-692.88	0.00	0.00	-263.32	Begin 8°/100' build/turn
7	6671.61	50.00	314.20	6361.04	-800.00	-1000.00	8.00	0.00	-8.70	Begin 10°/100' build
8	7081.61	91.00	314.20	6495.00	-536.27	-1271.20	10.00	0.00	366.33	Begin 91.00° lateral section
9	8037.33	91.00	329.32	6478.23	-194.88	-1880.91	2.00	89.86	1317.99	Begin 2°/100' turn
10	8037.33	91.00	329.32	6478.23	-194.88	-1880.91	2.00	89.86	1317.99	Begin 91.00° lateral section
11	18308.47	91.00	329.32	6298.50	9026.73	-7121.37	0.00	0.00	1497.64	PBHLT/D

ANNOTATIONS SURVEYS

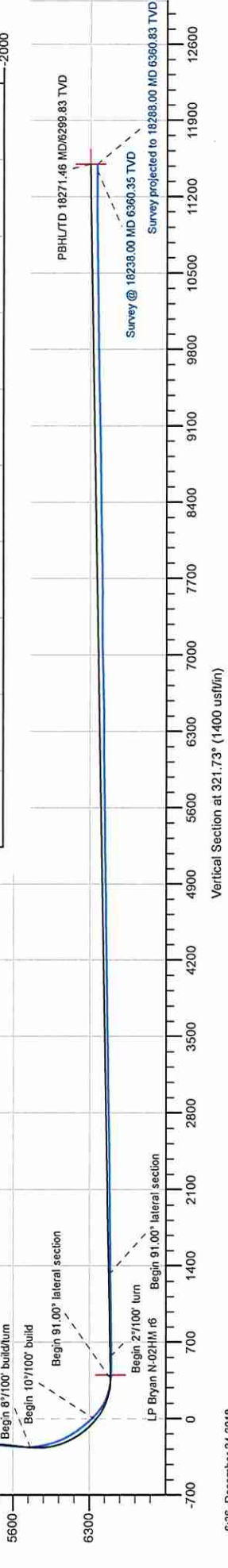
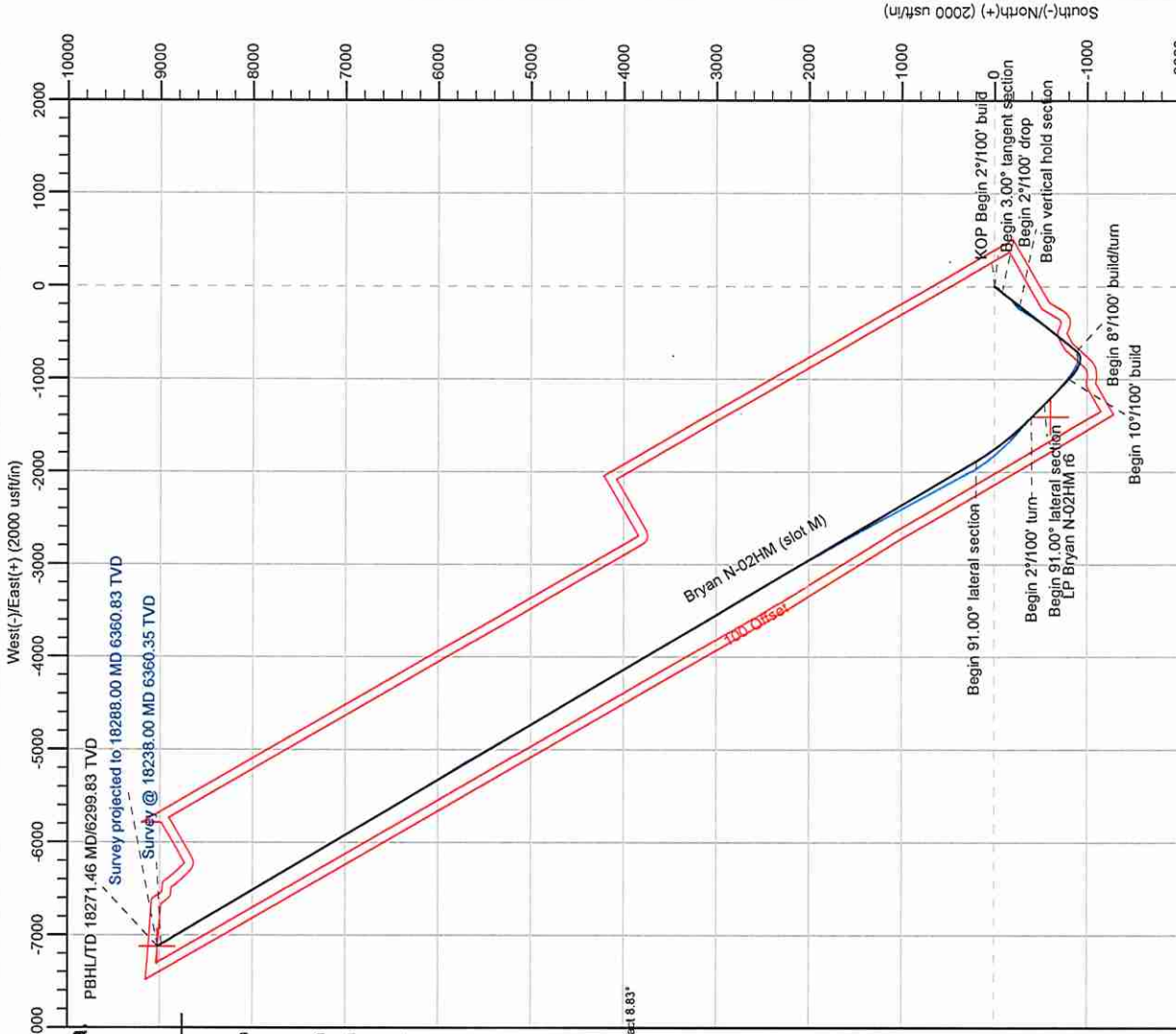
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSSect	Annotation
272.00	1.41	142.81	271.97	2.65	2.01	3.32	MWD surveys
18238.00	88.45	329.64	6360.35	8984.15	-7093.90	11447.20	Survey @ 18238.00 MD 6360.35 TVD
18288.00	88.45	329.64	6360.83	9027.29	-7119.17	11496.70	Survey projected to 18288.00 MD 6360.83 TVD

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1980
 Zone: Zone 17N (64 W to 76 W)

System Datum: Mean Sea Level
 Depth Reference: RKB=1191+28 @ 1219.00usft (PD 110)

Surface location
 Northing: 14445100.27
 Easting: 1703180.86
 Latitude: 39.77580007
 Longitude: -80.77639120

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.83°



05/07/2021

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	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:	0.14 °

Well	Bryan N-02HM (slot M)					
Well Position	+N/-S	0.00 usft	Northing:	14,445,100.28 usft	Latitude:	39.77560007
	+E/-W	0.00 usft	Easting:	1,703,186.86 usft	Longitude:	-80.77659120
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	12/6/2018	-8.68	66.83	52,006.52436865

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	321.73	

Survey Program	Date 12/24/2018				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
272.00	898.00	MWD surf (Original Hole)	MWD	MWD - Standard	
988.00	18,238.00	MWD (Original Hole)	MWD	MWD - Standard	
18,288.00	18,288.00	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	
272.00	1.40	142.81	271.97	-2.65	2.01	-3.32	0.51	0.51	0.00	
MWD surveys										
338.00	1.23	140.53	337.96	-3.84	2.95	-4.84	0.27	-0.26	-3.45	
433.00	0.59	165.31	432.94	-5.10	3.72	-6.30	0.78	-0.67	26.08	
527.00	0.56	175.35	526.94	-6.02	3.88	-7.13	0.11	-0.03	10.68	
621.00	0.46	196.51	620.94	-6.84	3.81	-7.73	0.23	-0.11	22.51	
716.00	0.22	137.75	715.93	-7.34	3.82	-8.13	0.41	-0.25	-61.85	
809.00	0.30	184.10	808.93	-7.72	3.93	-8.49	0.23	0.09	49.84	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_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)	
898.00	0.60	170.77	897.93	-8.41	3.98	-9.07	0.35	0.34	-14.98	
988.00	0.47	160.84	987.93	-9.22	4.18	-9.83	0.18	-0.14	-11.03	
1,077.00	0.97	217.36	1,076.92	-10.17	3.84	-10.36	0.91	0.56	63.51	
1,167.00	2.50	225.60	1,166.88	-12.15	1.98	-10.76	1.72	1.70	9.16	
1,257.00	3.88	224.07	1,256.73	-15.71	-1.54	-11.38	1.54	1.53	-1.70	
1,346.00	5.12	222.27	1,345.46	-20.81	-6.31	-12.43	1.40	1.39	-2.02	
1,436.00	3.61	220.18	1,435.19	-25.95	-10.84	-13.66	1.69	-1.68	-2.32	
1,526.00	1.36	197.87	1,525.11	-29.13	-12.99	-14.82	2.68	-2.50	-24.79	
1,615.00	1.04	134.10	1,614.09	-30.70	-12.74	-16.21	1.46	-0.36	-71.65	
1,705.00	1.26	165.49	1,704.07	-32.22	-11.90	-17.93	0.73	0.24	34.88	
1,795.00	2.59	215.06	1,794.02	-34.85	-12.82	-19.41	2.24	1.48	55.08	
1,884.00	4.34	225.96	1,882.86	-38.83	-16.40	-20.33	2.09	1.97	12.25	
1,974.00	5.90	228.37	1,972.50	-44.27	-22.31	-20.94	1.75	1.73	2.68	
2,064.00	6.94	230.53	2,061.93	-50.80	-29.96	-21.33	1.19	1.16	2.40	
2,153.00	5.37	236.61	2,150.42	-56.51	-37.59	-21.09	1.91	-1.76	6.83	
2,243.00	3.79	239.36	2,240.13	-60.35	-43.67	-20.33	1.77	-1.76	3.06	
2,332.00	1.51	211.47	2,329.03	-62.85	-46.81	-20.35	2.87	-2.56	-31.34	
2,422.00	1.59	207.77	2,419.00	-64.96	-48.01	-21.27	0.14	0.09	-4.11	
2,512.00	1.93	222.89	2,508.95	-67.18	-49.62	-22.01	0.64	0.38	16.80	
2,588.00	1.76	229.42	2,584.91	-68.87	-51.38	-22.25	0.36	-0.22	8.59	
2,689.00	2.16	227.83	2,685.86	-71.16	-53.97	-22.44	0.40	0.40	-1.57	
2,779.00	2.19	228.51	2,775.79	-73.44	-56.51	-22.65	0.04	0.03	0.76	
2,868.00	2.41	236.94	2,864.72	-75.59	-59.36	-22.58	0.45	0.25	9.47	
2,958.00	4.21	238.34	2,954.57	-78.35	-63.75	-22.03	2.00	2.00	1.56	
3,051.00	6.54	236.65	3,047.15	-83.06	-71.09	-21.18	2.51	2.51	-1.82	
3,141.00	8.29	223.24	3,136.40	-90.60	-79.81	-21.70	2.72	1.94	-14.90	
3,231.00	8.75	208.09	3,225.42	-101.37	-87.48	-25.40	2.54	0.51	-16.83	
3,320.00	8.66	199.60	3,313.40	-113.65	-92.92	-31.68	1.45	-0.10	-9.54	
3,410.00	8.22	203.46	3,402.42	-125.94	-97.75	-38.33	0.80	-0.49	4.29	
3,500.00	8.91	211.15	3,491.42	-137.81	-103.92	-43.83	1.48	0.77	8.54	
3,589.00	11.43	220.20	3,579.02	-150.44	-113.18	-48.02	3.34	2.83	10.17	
3,679.00	13.66	225.47	3,666.87	-164.71	-126.51	-50.96	2.78	2.48	5.86	
3,769.00	16.40	231.98	3,753.79	-179.99	-144.10	-52.06	3.57	3.04	7.23	
3,858.00	19.83	233.61	3,838.37	-196.69	-166.16	-51.51	3.90	3.85	1.83	
3,948.00	23.64	231.69	3,921.95	-216.94	-192.62	-51.02	4.31	4.23	-2.13	
4,037.00	25.51	224.39	4,002.91	-241.71	-220.03	-53.48	4.00	2.10	-8.20	
4,127.00	26.83	212.85	4,083.73	-272.64	-244.62	-62.54	5.83	1.47	-12.82	
4,217.00	23.82	210.85	4,165.07	-305.31	-264.97	-75.59	3.48	-3.34	-2.22	
4,306.00	23.71	212.89	4,246.53	-335.77	-283.90	-87.78	0.93	-0.12	2.29	
4,396.00	26.02	215.04	4,328.18	-367.13	-305.06	-99.29	2.76	2.57	2.39	
4,486.00	25.70	213.86	4,409.17	-399.50	-327.27	-110.95	0.67	-0.36	-1.31	
4,575.00	24.09	215.14	4,489.90	-430.38	-348.48	-122.06	1.91	-1.81	1.44	
4,665.00	24.74	217.51	4,571.85	-460.34	-370.52	-131.93	1.31	0.72	2.63	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_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)	
4,754.00	25.16	217.12	4,652.55	-490.20	-393.28	-141.27	0.51	0.47	-0.44	
4,844.00	23.99	213.61	4,734.40	-520.69	-414.95	-151.79	2.08	-1.30	-3.90	
4,934.00	23.41	214.93	4,816.81	-550.59	-435.32	-162.65	0.87	-0.64	1.47	
5,023.00	23.52	218.15	4,898.45	-579.05	-456.41	-171.93	1.45	0.12	3.62	
5,113.00	25.21	218.50	4,980.43	-608.18	-479.44	-180.53	1.88	1.88	0.39	
5,203.00	26.07	215.71	5,061.57	-639.24	-502.91	-190.38	1.65	0.96	-3.10	
5,292.00	24.92	213.78	5,141.91	-670.70	-524.75	-201.55	1.59	-1.29	-2.17	
5,382.00	24.50	214.50	5,223.66	-701.84	-545.87	-212.92	0.57	-0.47	0.80	
5,471.00	22.32	215.98	5,305.33	-730.73	-566.25	-222.98	2.54	-2.45	1.66	
5,561.00	22.47	217.69	5,388.55	-758.17	-586.81	-231.79	0.74	0.17	1.90	
5,651.00	22.61	218.67	5,471.67	-785.29	-608.13	-239.87	0.45	0.16	1.09	
5,740.00	22.10	219.66	5,553.98	-811.53	-629.51	-247.24	0.71	-0.57	1.11	
5,830.00	23.57	221.33	5,636.93	-838.08	-652.20	-254.03	1.78	1.63	1.86	
5,857.00	24.10	221.90	5,661.63	-846.24	-659.44	-255.94	2.14	1.96	2.11	
5,902.00	23.60	222.06	5,702.78	-859.76	-671.61	-259.03	1.12	-1.11	0.36	
5,946.00	23.96	233.13	5,743.07	-871.67	-684.67	-260.29	10.16	0.82	25.16	
5,991.00	23.69	242.10	5,784.25	-881.39	-699.97	-258.44	8.07	-0.60	19.93	
6,036.00	24.13	249.04	5,825.39	-888.91	-716.55	-254.07	6.32	0.98	15.42	
6,081.00	24.62	256.16	5,866.39	-894.44	-734.25	-247.46	6.62	1.09	15.82	
6,126.00	24.48	264.60	5,907.34	-897.56	-752.64	-238.52	7.79	-0.31	18.76	
6,171.00	24.92	271.45	5,948.23	-898.20	-771.40	-227.40	6.43	0.98	15.22	
6,216.00	25.19	276.46	5,989.00	-896.88	-790.40	-214.60	4.75	0.60	11.13	
6,260.00	27.12	282.35	6,028.50	-893.68	-809.50	-200.25	7.35	4.39	13.39	
6,305.00	29.63	288.50	6,068.10	-887.96	-830.08	-183.01	8.56	5.58	13.67	
6,350.00	32.70	293.51	6,106.60	-879.58	-851.78	-162.99	8.92	6.82	11.13	
6,395.00	33.76	298.70	6,144.25	-868.72	-873.90	-140.77	6.74	2.36	11.53	
6,440.00	36.22	300.98	6,181.12	-855.87	-896.27	-116.82	6.19	5.47	5.07	
6,485.00	37.89	303.27	6,217.03	-841.44	-919.23	-91.28	4.81	3.71	5.09	
6,530.00	40.70	304.50	6,251.85	-825.55	-942.88	-64.15	6.48	6.24	2.73	
6,574.00	43.08	307.14	6,284.61	-808.35	-966.68	-35.90	6.73	5.41	6.00	
6,619.00	45.19	308.81	6,316.90	-789.06	-991.38	-5.47	5.35	4.69	3.71	
6,709.00	49.49	310.39	6,377.88	-746.86	-1,042.34	59.23	4.95	4.78	1.76	
6,754.00	54.99	311.44	6,405.42	-723.56	-1,069.20	94.16	12.36	12.22	2.33	
6,799.00	59.78	311.88	6,429.67	-698.37	-1,097.51	131.47	10.68	10.64	0.98	
6,844.00	65.36	312.41	6,450.39	-671.58	-1,127.11	170.84	12.44	12.40	1.18	
6,889.00	70.51	314.34	6,467.29	-642.94	-1,157.40	212.09	12.11	11.44	4.29	
6,933.00	76.48	315.66	6,479.79	-613.12	-1,187.21	253.96	13.87	13.57	3.00	
6,978.00	80.57	314.70	6,488.74	-581.84	-1,218.29	297.77	9.33	9.09	-2.13	
7,023.00	81.67	314.43	6,495.69	-550.65	-1,249.97	341.88	2.52	2.44	-0.60	
7,068.00	86.51	313.82	6,500.32	-519.49	-1,282.09	386.23	10.84	10.76	-1.36	
7,113.00	90.77	312.50	6,501.39	-488.73	-1,314.90	430.71	9.91	9.47	-2.93	
7,158.00	90.68	312.32	6,500.82	-458.38	-1,348.12	475.11	0.45	-0.20	-0.40	
7,248.00	90.20	312.06	6,500.13	-397.94	-1,414.80	563.86	0.61	-0.53	-0.29	
7,337.00	90.37	312.41	6,499.68	-338.12	-1,480.70	651.64	0.44	0.19	0.39	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_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)
7,427.00	89.58	311.97	6,499.72	-277.67	-1,547.38	740.39	1.00	-0.88	-0.49
7,517.00	91.21	314.61	6,499.10	-215.97	-1,612.88	829.41	3.45	1.81	2.93
7,606.00	91.03	315.13	6,497.36	-153.19	-1,675.94	917.75	0.62	-0.20	0.58
7,696.00	91.30	317.42	6,495.53	-88.17	-1,738.13	1,007.32	2.56	0.30	2.54
7,786.00	91.60	319.18	6,493.25	-21.00	-1,797.98	1,097.13	1.98	0.33	1.96
7,875.00	91.08	321.11	6,491.17	47.30	-1,855.00	1,186.06	2.25	-0.58	2.17
7,965.00	89.71	323.40	6,490.55	118.46	-1,910.09	1,276.05	2.96	-1.52	2.54
8,055.00	90.24	329.37	6,490.59	193.38	-1,959.89	1,365.71	6.66	0.59	6.63
8,144.00	90.73	332.54	6,489.84	271.17	-2,003.09	1,453.55	3.60	0.55	3.56
8,234.00	90.37	331.22	6,488.97	350.54	-2,045.51	1,542.13	1.52	-0.40	-1.47
8,324.00	89.85	330.52	6,488.80	429.16	-2,089.32	1,630.99	0.97	-0.58	-0.78
8,414.00	90.37	332.01	6,488.63	508.07	-2,132.58	1,719.74	1.75	0.58	1.66
8,503.00	90.55	331.83	6,487.91	586.59	-2,174.48	1,807.33	0.29	0.20	-0.20
8,593.00	90.15	332.01	6,487.36	666.00	-2,216.84	1,895.91	0.49	-0.44	0.20
8,682.00	89.89	331.66	6,487.33	744.46	-2,258.85	1,983.53	0.49	-0.29	-0.39
8,772.00	90.59	332.27	6,486.96	823.90	-2,301.15	2,072.10	1.03	0.78	0.68
8,861.00	90.24	331.75	6,486.31	902.48	-2,342.92	2,159.67	0.70	-0.39	-0.58
8,951.00	91.43	331.31	6,485.00	981.59	-2,385.81	2,248.34	1.41	1.32	-0.49
9,041.00	90.95	331.13	6,483.13	1,060.46	-2,429.13	2,337.09	0.57	-0.53	-0.20
9,131.00	90.42	331.04	6,482.06	1,139.23	-2,472.65	2,425.89	0.60	-0.59	-0.10
9,220.00	91.12	331.13	6,480.86	1,217.13	-2,515.67	2,513.70	0.79	0.79	0.10
9,310.00	90.81	330.34	6,479.34	1,295.63	-2,559.66	2,602.57	0.94	-0.34	-0.88
9,400.00	90.55	329.99	6,478.28	1,373.69	-2,604.44	2,691.59	0.48	-0.29	-0.39
9,489.00	91.12	331.31	6,476.98	1,451.26	-2,648.05	2,779.51	1.62	0.64	1.48
9,579.00	91.03	330.96	6,475.29	1,530.06	-2,691.49	2,868.28	0.40	-0.10	-0.39
9,669.00	90.90	330.34	6,473.77	1,608.50	-2,735.60	2,957.18	0.70	-0.14	-0.69
9,758.00	91.43	330.60	6,471.96	1,685.92	-2,779.46	3,045.13	0.66	0.60	0.29
9,848.00	90.90	329.90	6,470.13	1,764.04	-2,824.11	3,134.11	0.98	-0.59	-0.78
9,938.00	90.64	329.81	6,468.93	1,841.87	-2,869.30	3,223.20	0.31	-0.29	-0.10
10,027.00	90.33	330.16	6,468.17	1,918.93	-2,913.82	3,311.28	0.53	-0.35	0.39
10,117.00	90.99	330.08	6,467.14	1,996.96	-2,958.65	3,400.31	0.74	0.73	-0.09
10,207.00	90.99	330.25	6,465.58	2,075.02	-3,003.42	3,489.32	0.19	0.00	0.19
10,296.00	90.64	330.43	6,464.31	2,152.35	-3,047.46	3,577.31	0.44	-0.39	0.20
10,386.00	91.52	330.43	6,462.62	2,230.61	-3,091.86	3,666.26	0.98	0.98	0.00
10,476.00	90.90	329.81	6,460.72	2,308.63	-3,136.69	3,755.27	0.97	-0.69	-0.69
10,565.00	90.42	329.29	6,459.69	2,385.35	-3,181.79	3,843.44	0.80	-0.54	-0.58
10,655.00	89.93	328.67	6,459.42	2,462.48	-3,228.17	3,932.72	0.88	-0.54	-0.69
10,745.00	90.90	328.49	6,458.77	2,539.28	-3,275.09	4,022.07	1.10	1.08	-0.20
10,834.00	90.42	327.26	6,457.74	2,614.64	-3,322.41	4,110.55	1.48	-0.54	-1.38
10,924.00	90.81	329.11	6,456.77	2,691.11	-3,369.85	4,199.97	2.10	0.43	2.06
11,014.00	91.21	329.64	6,455.19	2,768.55	-3,415.69	4,289.16	0.74	0.44	0.59
11,103.00	90.95	329.46	6,453.51	2,845.26	-3,460.79	4,377.31	0.36	-0.29	-0.20
11,193.00	90.42	328.67	6,452.43	2,922.45	-3,507.05	4,466.57	1.06	-0.59	-0.88

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_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)	
11,283.00	91.21	329.99	6,451.15	2,999.85	-3,552.95	4,555.77	1.71	0.88	1.47	
11,372.00	90.95	329.55	6,449.48	3,076.73	-3,597.75	4,643.88	0.57	-0.29	-0.49	
11,462.00	90.68	329.37	6,448.20	3,154.24	-3,643.48	4,733.05	0.36	-0.30	-0.20	
11,552.00	90.20	328.93	6,447.51	3,231.50	-3,689.63	4,822.29	0.72	-0.53	-0.49	
11,641.00	90.77	330.43	6,446.75	3,308.32	-3,734.56	4,910.43	1.80	0.64	1.69	
11,731.00	91.34	330.16	6,445.09	3,386.48	-3,779.15	4,999.41	0.70	0.63	-0.30	
11,821.00	91.12	329.55	6,443.16	3,464.29	-3,824.33	5,088.49	0.72	-0.24	-0.68	
11,910.00	90.51	328.41	6,441.90	3,540.56	-3,870.19	5,176.77	1.45	-0.69	-1.28	
12,000.00	90.51	330.08	6,441.10	3,617.89	-3,916.21	5,265.99	1.86	0.00	1.86	
12,090.00	90.11	329.37	6,440.61	3,695.62	-3,961.58	5,355.11	0.91	-0.44	-0.79	
12,179.00	89.58	329.37	6,440.85	3,772.20	-4,006.93	5,443.32	0.60	-0.60	0.00	
12,269.00	90.68	329.72	6,440.65	3,849.78	-4,052.54	5,532.48	1.28	1.22	0.39	
12,359.00	91.38	329.55	6,439.03	3,927.42	-4,098.03	5,621.61	0.80	0.78	-0.19	
12,448.00	90.42	329.11	6,437.63	4,003.96	-4,143.42	5,709.82	1.19	-1.08	-0.49	
12,538.00	92.26	329.29	6,435.53	4,081.24	-4,189.49	5,799.03	2.05	2.04	0.20	
12,628.00	91.34	329.11	6,432.70	4,158.51	-4,235.55	5,888.22	1.04	-1.02	-0.20	
12,717.00	90.90	328.85	6,430.96	4,234.77	-4,281.41	5,976.49	0.57	-0.49	-0.29	
12,807.00	90.15	327.79	6,430.13	4,311.35	-4,328.67	6,065.89	1.44	-0.83	-1.18	
12,897.00	90.15	329.55	6,429.90	4,388.22	-4,375.47	6,155.22	1.96	0.00	1.96	
12,986.00	90.24	329.55	6,429.60	4,464.95	-4,420.57	6,243.40	0.10	0.10	0.00	
13,076.00	90.64	329.64	6,428.90	4,542.57	-4,466.12	6,332.55	0.46	0.44	0.10	
13,166.00	90.46	328.93	6,428.04	4,619.94	-4,512.09	6,421.76	0.81	-0.20	-0.79	
13,255.00	89.98	329.64	6,427.70	4,696.45	-4,557.55	6,509.99	0.96	-0.54	0.80	
13,345.00	90.95	331.31	6,426.97	4,774.76	-4,601.89	6,598.93	2.15	1.08	1.86	
13,434.00	91.25	331.92	6,425.26	4,853.04	-4,644.20	6,686.60	0.76	0.34	0.69	
13,524.00	90.51	330.69	6,423.88	4,931.98	-4,687.40	6,775.33	1.59	-0.82	-1.37	
13,614.00	92.26	329.99	6,421.70	5,010.16	-4,731.92	6,864.28	2.09	1.94	-0.78	
13,703.00	91.91	329.99	6,418.46	5,087.18	-4,776.41	6,952.30	0.39	-0.39	0.00	
13,793.00	91.47	329.90	6,415.81	5,165.04	-4,821.46	7,041.34	0.50	-0.49	-0.10	
13,883.00	90.81	329.72	6,414.02	5,242.82	-4,866.71	7,130.43	0.76	-0.73	-0.20	
13,972.00	89.63	329.11	6,413.68	5,319.44	-4,912.00	7,218.63	1.49	-1.33	-0.69	
14,062.00	89.45	329.37	6,414.40	5,396.77	-4,958.02	7,307.85	0.35	-0.20	0.29	
14,152.00	89.05	329.37	6,415.58	5,474.21	-5,003.87	7,397.04	0.44	-0.44	0.00	
14,241.00	89.49	329.55	6,416.71	5,550.85	-5,049.10	7,485.23	0.53	0.49	0.20	
14,331.00	90.55	330.08	6,416.68	5,628.65	-5,094.35	7,574.33	1.32	1.18	0.59	
14,421.00	91.34	329.29	6,415.20	5,706.33	-5,139.77	7,663.45	1.24	0.88	-0.88	
14,511.00	90.42	328.58	6,413.81	5,783.41	-5,186.20	7,752.73	1.29	-1.02	-0.79	
14,601.00	90.73	328.76	6,412.91	5,860.29	-5,233.00	7,842.07	0.40	0.34	0.20	
14,690.00	91.43	328.14	6,411.23	5,936.12	-5,279.56	7,930.44	1.05	0.79	-0.70	
14,780.00	91.03	327.18	6,409.30	6,012.14	-5,327.69	8,019.93	1.16	-0.44	-1.07	
14,870.00	91.65	328.67	6,407.20	6,088.38	-5,375.47	8,109.38	1.79	0.69	1.66	
14,959.00	91.87	330.25	6,404.46	6,164.99	-5,420.67	8,197.53	1.79	0.25	1.78	
15,049.00	91.12	329.46	6,402.11	6,242.79	-5,465.85	8,286.59	1.21	-0.83	-0.88	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_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)	
15,139.00	90.81	329.20	6,400.60	6,320.19	-5,511.75	8,375.79	0.45	-0.34	-0.29	
15,228.00	90.07	329.37	6,399.92	6,396.70	-5,557.21	8,464.01	0.85	-0.83	0.19	
15,318.00	90.95	328.76	6,399.11	6,473.90	-5,603.47	8,553.27	1.19	0.98	-0.68	
15,408.00	90.37	328.67	6,398.08	6,550.81	-5,650.20	8,642.60	0.65	-0.64	-0.10	
15,497.00	89.67	328.67	6,398.05	6,626.83	-5,696.48	8,730.95	0.79	-0.79	0.00	
15,587.00	91.21	329.99	6,397.36	6,704.23	-5,742.39	8,820.15	2.25	1.71	1.47	
15,677.00	91.21	330.78	6,395.45	6,782.46	-5,786.85	8,909.10	0.88	0.00	0.88	
15,766.00	90.99	330.69	6,393.75	6,860.08	-5,830.35	8,996.99	0.27	-0.25	-0.10	
15,856.00	90.64	329.81	6,392.47	6,938.21	-5,875.01	9,085.99	1.05	-0.39	-0.98	
15,946.00	91.03	328.67	6,391.15	7,015.54	-5,921.03	9,175.20	1.34	0.43	-1.27	
16,035.00	90.90	328.32	6,389.66	7,091.41	-5,967.53	9,263.57	0.42	-0.15	-0.39	
16,125.00	91.87	328.76	6,387.48	7,168.16	-6,014.49	9,352.91	1.18	1.08	0.49	
16,214.00	91.47	329.29	6,384.89	7,244.43	-6,060.27	9,441.15	0.75	-0.45	0.60	
16,304.00	91.21	329.55	6,382.78	7,321.89	-6,106.05	9,530.32	0.41	-0.29	0.29	
16,394.00	90.90	329.72	6,381.12	7,399.53	-6,151.54	9,619.45	0.39	-0.34	0.19	
16,483.00	91.52	329.64	6,379.25	7,476.34	-6,196.46	9,707.57	0.70	0.70	-0.09	
16,573.00	90.90	328.85	6,377.34	7,553.67	-6,242.47	9,796.78	1.12	-0.69	-0.88	
16,663.00	90.77	328.85	6,376.03	7,630.68	-6,289.02	9,886.07	0.14	-0.14	0.00	
16,752.00	89.93	327.88	6,375.49	7,706.46	-6,335.70	9,974.47	1.44	-0.94	-1.09	
16,842.00	90.24	328.67	6,375.36	7,783.01	-6,383.02	10,063.89	0.94	0.34	0.88	
16,932.00	90.77	329.81	6,374.56	7,860.34	-6,429.05	10,153.11	1.40	0.59	1.27	
17,022.00	90.02	329.99	6,373.94	7,938.20	-6,474.18	10,242.19	0.86	-0.83	0.20	
17,111.00	91.38	329.64	6,372.85	8,015.13	-6,518.93	10,330.30	1.58	1.53	-0.39	
17,201.00	91.34	329.72	6,370.72	8,092.79	-6,564.35	10,419.41	0.10	-0.04	0.09	
17,291.00	90.99	329.72	6,368.89	8,170.50	-6,609.72	10,508.52	0.39	-0.39	0.00	
17,381.00	90.59	329.20	6,367.65	8,248.01	-6,655.45	10,597.69	0.73	-0.44	-0.58	
17,470.00	91.91	328.76	6,365.71	8,324.26	-6,701.30	10,685.95	1.56	1.48	-0.49	
17,560.00	91.52	328.05	6,363.01	8,400.88	-6,748.43	10,775.30	0.90	-0.43	-0.79	
17,650.00	91.21	327.79	6,360.87	8,477.12	-6,796.22	10,864.75	0.45	-0.34	-0.29	
17,739.00	90.24	329.29	6,359.74	8,553.03	-6,842.66	10,953.11	2.01	-1.09	1.69	
17,829.00	89.98	329.20	6,359.57	8,630.37	-6,888.68	11,042.34	0.31	-0.29	-0.10	
17,919.00	90.20	329.99	6,359.43	8,707.99	-6,934.23	11,131.49	0.91	0.24	0.88	
18,008.00	89.41	329.90	6,359.73	8,785.02	-6,978.81	11,219.58	0.89	-0.89	-0.10	
18,098.00	90.24	330.16	6,360.01	8,862.99	-7,023.77	11,308.64	0.97	0.92	0.29	
18,188.00	89.76	329.90	6,360.01	8,940.95	-7,068.73	11,397.69	0.61	-0.53	-0.29	
18,238.00	89.45	329.64	6,360.35	8,984.15	-7,093.90	11,447.20	0.81	-0.62	-0.52	
Survey @ 18238.00 MD 6360.35 TVD										
18,288.00	89.45	329.64	6,360.83	9,027.29	-7,119.17	11,496.72	0.00	0.00	0.00	
Survey projected to 18288.00 MD 6360.83 TVD										

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
272.00	271.97	-2.65	2.01	MWD surveys	
18,238.00	6,360.35	8,984.15	-7,093.90	Survey @ 18238.00 MD 6360.35 TVD	
18,288.00	6,360.83	9,027.29	-7,119.17	Survey projected to 18288.00 MD 6360.83 TVD	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	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:	0.14 °

Well	Bryan N-02HM (slot M)					
Well Position	+N/-S	0.00 usft	Northing:	14,445,100.28 usft	Latitude:	39.77560007
	+E/-W	0.00 usft	Easting:	1,703,186.86 usft	Longitude:	-80.77659120
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	12/6/2018	-8.68	66.83	52,006.52436865

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	321.73	

Survey Program	Date 12/24/2018				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
272.00	898.00	MWD surf (Original Hole)	MWD	MWD - Standard	
988.00	18,238.00	MWD (Original Hole)	MWD	MWD - Standard	
18,288.00	18,288.00	Projection (Original Hole)	MWD	MWD - Standard	

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	14,445,100.28	1,703,186.86	39.77560007	-80.77659120	
272.00	1.40	142.81	271.97	-2.65	2.01	14,445,097.63	1,703,188.87	39.77559279	-80.77658408	
MWD surveys										
338.00	1.23	140.53	337.96	-3.84	2.95	14,445,096.44	1,703,189.81	39.77558952	-80.77658075	
433.00	0.59	165.31	432.94	-5.10	3.72	14,445,095.18	1,703,190.58	39.77558605	-80.77657801	
527.00	0.56	175.35	526.94	-6.02	3.88	14,445,094.25	1,703,190.74	39.77558351	-80.77657745	
621.00	0.46	196.51	620.94	-6.84	3.81	14,445,093.43	1,703,190.67	39.77558126	-80.77657771	
716.00	0.22	137.75	715.93	-7.34	3.82	14,445,092.93	1,703,190.68	39.77557988	-80.77657766	
809.00	0.30	184.10	808.93	-7.72	3.93	14,445,092.56	1,703,190.79	39.77557885	-80.77657730	
898.00	0.60	170.77	897.93	-8.41	3.98	14,445,091.87	1,703,190.84	39.77557695	-80.77657710	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
988.00	0.47	160.84	987.93	-9.22	4.18	14,445,091.05	1,703,191.04	39.77557471	-80.77657641	
1,077.00	0.97	217.36	1,076.92	-10.17	3.84	14,445,090.11	1,703,190.70	39.77557212	-80.77657761	
1,167.00	2.50	225.60	1,166.88	-12.15	1.98	14,445,088.13	1,703,188.84	39.77556670	-80.77658427	
1,257.00	3.88	224.07	1,256.73	-15.71	-1.54	14,445,084.57	1,703,185.32	39.77555694	-80.77659683	
1,346.00	5.12	222.27	1,345.46	-20.81	-6.31	14,445,079.47	1,703,180.55	39.77554296	-80.77661384	
1,436.00	3.61	220.18	1,435.19	-25.95	-10.84	14,445,074.33	1,703,176.02	39.77552889	-80.77663000	
1,526.00	1.36	197.87	1,525.11	-29.13	-12.99	14,445,071.15	1,703,173.87	39.77552016	-80.77663771	
1,615.00	1.04	134.10	1,614.09	-30.70	-12.74	14,445,069.58	1,703,174.12	39.77551586	-80.77663681	
1,705.00	1.26	165.49	1,704.07	-32.22	-11.90	14,445,068.05	1,703,174.96	39.77551166	-80.77663385	
1,795.00	2.59	215.06	1,794.02	-34.85	-12.82	14,445,065.43	1,703,174.04	39.77550446	-80.77663715	
1,884.00	4.34	225.96	1,882.86	-38.83	-16.40	14,445,061.44	1,703,170.46	39.77549354	-80.77664992	
1,974.00	5.90	228.37	1,972.50	-44.27	-22.31	14,445,056.00	1,703,164.55	39.77547864	-80.77667098	
2,064.00	6.94	230.53	2,061.93	-50.80	-29.96	14,445,049.47	1,703,156.90	39.77546076	-80.77669829	
2,153.00	5.37	236.61	2,150.42	-56.51	-37.59	14,445,043.76	1,703,149.27	39.77544513	-80.77672549	
2,243.00	3.79	239.36	2,240.13	-60.35	-43.67	14,445,039.93	1,703,143.20	39.77543464	-80.77674715	
2,332.00	1.51	211.47	2,329.03	-62.85	-46.81	14,445,037.43	1,703,140.05	39.77542780	-80.77675836	
2,422.00	1.59	207.77	2,419.00	-64.96	-48.01	14,445,035.31	1,703,138.85	39.77542199	-80.77676265	
2,512.00	1.93	222.89	2,508.95	-67.18	-49.62	14,445,033.10	1,703,137.24	39.77541592	-80.77676841	
2,588.00	1.76	229.42	2,584.91	-68.87	-51.38	14,445,031.40	1,703,135.48	39.77541127	-80.77677468	
2,689.00	2.16	227.83	2,685.86	-71.16	-53.97	14,445,029.11	1,703,132.89	39.77540501	-80.77678391	
2,779.00	2.19	228.51	2,775.79	-73.44	-56.51	14,445,026.84	1,703,130.35	39.77539877	-80.77679299	
2,868.00	2.41	236.94	2,864.72	-75.59	-59.36	14,445,024.69	1,703,127.50	39.77539290	-80.77680313	
2,958.00	4.21	238.34	2,954.57	-78.35	-63.75	14,445,021.92	1,703,123.11	39.77538533	-80.77681881	
3,051.00	6.54	236.65	3,047.15	-83.06	-71.09	14,445,017.22	1,703,115.78	39.77537246	-80.77684494	
3,141.00	8.29	223.24	3,136.40	-90.60	-79.81	14,445,009.67	1,703,107.05	39.77535180	-80.77687607	
3,231.00	8.75	208.09	3,225.42	-101.37	-87.48	14,444,998.91	1,703,099.38	39.77532228	-80.77690346	
3,320.00	8.66	199.60	3,313.40	-113.65	-92.92	14,444,986.62	1,703,093.94	39.77528858	-80.77692291	
3,410.00	8.22	203.46	3,402.42	-125.94	-97.75	14,444,974.34	1,703,089.11	39.77525487	-80.77694023	
3,500.00	8.91	211.15	3,491.42	-137.81	-103.92	14,444,962.47	1,703,082.94	39.77522233	-80.77696228	
3,589.00	11.43	220.20	3,579.02	-150.44	-113.18	14,444,949.83	1,703,073.68	39.77518768	-80.77699535	
3,679.00	13.66	225.47	3,666.87	-164.71	-126.51	14,444,935.57	1,703,060.35	39.77514860	-80.77704293	
3,769.00	16.40	231.98	3,753.79	-179.99	-144.10	14,444,920.28	1,703,042.76	39.77510675	-80.77710567	
3,858.00	19.83	233.61	3,838.37	-196.69	-166.16	14,444,903.58	1,703,020.70	39.77506104	-80.77718432	
3,948.00	23.64	231.69	3,921.95	-216.94	-192.62	14,444,883.33	1,702,994.24	39.77500560	-80.77727867	
4,037.00	25.51	224.39	4,002.91	-241.71	-220.03	14,444,858.57	1,702,966.83	39.77493778	-80.77737646	
4,127.00	26.83	212.85	4,083.73	-272.64	-244.62	14,444,827.64	1,702,942.24	39.77485300	-80.77746426	
4,217.00	23.82	210.85	4,165.07	-305.31	-264.97	14,444,794.96	1,702,921.89	39.77476340	-80.77753695	
4,306.00	23.71	212.89	4,246.53	-335.77	-283.90	14,444,764.51	1,702,902.96	39.77467989	-80.77760460	
4,396.00	26.02	215.04	4,328.18	-367.13	-305.06	14,444,733.14	1,702,881.80	39.77459391	-80.77768020	
4,486.00	25.70	213.86	4,409.17	-399.50	-327.27	14,444,700.78	1,702,859.59	39.77450517	-80.77775953	
4,575.00	24.09	215.14	4,489.90	-430.38	-348.48	14,444,669.90	1,702,838.38	39.77442051	-80.77783528	
4,665.00	24.74	217.51	4,571.85	-460.34	-370.52	14,444,639.94	1,702,816.34	39.77433838	-80.77791399	
4,754.00	25.16	217.12	4,652.55	-490.20	-393.28	14,444,610.08	1,702,793.59	39.77425653	-80.77799524	
4,844.00	23.99	213.61	4,734.40	-520.69	-414.95	14,444,579.58	1,702,771.91	39.77417293	-80.77807266	
4,934.00	23.41	214.93	4,816.81	-550.59	-435.32	14,444,549.69	1,702,751.55	39.77409097	-80.77814540	
5,023.00	23.52	218.15	4,898.45	-579.05	-456.41	14,444,521.22	1,702,730.45	39.77401295	-80.77822072	
5,113.00	25.21	218.50	4,980.43	-608.18	-479.44	14,444,492.10	1,702,707.42	39.77393312	-80.77830293	
5,203.00	26.07	215.71	5,061.57	-639.24	-502.91	14,444,461.04	1,702,683.95	39.77384798	-80.77838676	
5,292.00	24.92	213.78	5,141.91	-670.70	-524.75	14,444,429.57	1,702,662.11	39.77376172	-80.77846477	
5,382.00	24.50	214.50	5,223.66	-701.84	-545.87	14,444,398.43	1,702,641.00	39.77367634	-80.77854018	
5,471.00	22.32	215.98	5,305.33	-730.73	-566.25	14,444,369.55	1,702,620.61	39.77359715	-80.77861298	
5,561.00	22.47	217.69	5,388.55	-758.17	-586.81	14,444,342.11	1,702,600.06	39.77352193	-80.77868639	
5,651.00	22.61	218.67	5,471.67	-785.29	-608.13	14,444,314.99	1,702,578.73	39.77344760	-80.77876252	
5,740.00	22.10	219.66	5,553.98	-811.53	-629.51	14,444,288.74	1,702,557.35	39.77337566	-80.77883883	
5,830.00	23.57	221.33	5,636.93	-838.08	-652.20	14,444,262.20	1,702,534.66	39.77330291	-80.77891981	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,857.00	24.10	221.90	5,661.63	-846.24	-659.44	14,444,254.04	1,702,527.42	39.77328056	-80.77894568
5,902.00	23.60	222.06	5,702.78	-859.76	-671.61	14,444,240.51	1,702,515.25	39.77324349	-80.77898911
5,946.00	23.96	233.13	5,743.07	-871.67	-684.67	14,444,228.61	1,702,502.19	39.77321089	-80.77903567
5,991.00	23.69	242.10	5,784.25	-881.39	-699.97	14,444,218.89	1,702,486.89	39.77318431	-80.77909023
6,036.00	24.13	249.04	5,825.39	-888.91	-716.55	14,444,211.37	1,702,470.31	39.77316376	-80.77914931
6,081.00	24.62	256.16	5,866.39	-894.44	-734.25	14,444,205.83	1,702,452.61	39.77314869	-80.77921233
6,126.00	24.48	264.60	5,907.34	-897.56	-752.64	14,444,202.71	1,702,434.22	39.77314024	-80.77927781
6,171.00	24.92	271.45	5,948.23	-898.20	-771.40	14,444,202.08	1,702,415.46	39.77313862	-80.77934459
6,216.00	25.19	276.46	5,989.00	-896.88	-790.40	14,444,203.39	1,702,396.46	39.77314236	-80.77941219
6,260.00	27.12	282.35	6,028.50	-893.68	-809.50	14,444,206.59	1,702,377.36	39.77315128	-80.77948016
6,305.00	29.63	288.50	6,068.10	-887.96	-830.08	14,444,212.32	1,702,356.78	39.77316714	-80.77955334
6,350.00	32.70	293.51	6,106.60	-879.58	-851.78	14,444,220.70	1,702,335.08	39.77319031	-80.77963051
6,395.00	33.76	298.70	6,144.25	-868.72	-873.90	14,444,231.56	1,702,312.96	39.77322027	-80.77970914
6,440.00	36.22	300.98	6,181.12	-855.87	-896.27	14,444,244.41	1,702,290.59	39.77325571	-80.77978864
6,485.00	37.89	303.27	6,217.03	-841.44	-919.23	14,444,258.83	1,702,267.63	39.77329548	-80.77987021
6,530.00	40.70	304.50	6,251.85	-825.55	-942.88	14,444,274.73	1,702,243.98	39.77333929	-80.77995424
6,574.00	43.08	307.14	6,284.61	-808.35	-966.68	14,444,291.93	1,702,220.18	39.77338670	-80.78003882
6,619.00	45.19	308.81	6,316.90	-789.06	-991.38	14,444,311.22	1,702,195.48	39.77343983	-80.78012653
6,709.00	49.49	310.39	6,377.88	-746.86	-1,042.34	14,444,353.41	1,702,144.52	39.77355606	-80.78030754
6,754.00	54.99	311.44	6,405.42	-723.56	-1,069.20	14,444,376.71	1,702,117.66	39.77362023	-80.78040295
6,799.00	59.78	311.88	6,429.67	-698.37	-1,097.51	14,444,401.91	1,702,089.35	39.77368960	-80.78050348
6,844.00	65.36	312.41	6,450.39	-671.58	-1,127.11	14,444,428.70	1,702,059.75	39.77376338	-80.78060859
6,889.00	70.51	314.34	6,467.29	-642.94	-1,157.40	14,444,457.34	1,702,029.46	39.77384224	-80.78071615
6,933.00	76.48	315.66	6,479.79	-613.12	-1,187.21	14,444,487.16	1,701,999.65	39.77392434	-80.78082199
6,978.00	80.57	314.70	6,488.74	-581.84	-1,218.29	14,444,518.43	1,701,968.57	39.77401043	-80.78093233
7,023.00	81.67	314.43	6,495.69	-550.65	-1,249.97	14,444,549.63	1,701,936.89	39.77409632	-80.78104480
7,068.00	86.51	313.82	6,500.32	-519.49	-1,282.09	14,444,580.78	1,701,904.77	39.77418209	-80.78115885
7,113.00	90.77	312.50	6,501.39	-488.73	-1,314.90	14,444,611.55	1,701,871.96	39.77426680	-80.78127535
7,158.00	90.68	312.32	6,500.82	-458.38	-1,348.12	14,444,641.90	1,701,838.74	39.77435037	-80.78139332
7,248.00	90.20	312.06	6,500.13	-397.94	-1,414.80	14,444,702.34	1,701,772.06	39.77451680	-80.78163012
7,337.00	90.37	312.41	6,499.68	-338.12	-1,480.70	14,444,762.16	1,701,706.16	39.77468153	-80.78186412
7,427.00	89.58	311.97	6,499.72	-277.67	-1,547.38	14,444,822.60	1,701,639.48	39.77484797	-80.78210093
7,517.00	91.21	314.61	6,499.10	-215.97	-1,612.88	14,444,884.31	1,701,573.98	39.77501786	-80.78233352
7,606.00	91.03	315.13	6,497.36	-153.19	-1,675.94	14,444,947.08	1,701,510.92	39.77519069	-80.78255742
7,696.00	91.30	317.42	6,495.53	-88.17	-1,738.13	14,445,012.10	1,701,448.73	39.77536967	-80.78277820
7,786.00	91.60	319.18	6,493.25	-21.00	-1,797.98	14,445,079.28	1,701,388.88	39.77555455	-80.78299064
7,875.00	91.08	321.11	6,491.17	47.30	-1,855.00	14,445,147.58	1,701,331.86	39.77574250	-80.78319298
7,965.00	89.71	323.40	6,490.55	118.46	-1,910.09	14,445,218.74	1,701,276.77	39.77593828	-80.78338843
8,055.00	90.24	329.37	6,490.59	193.38	-1,959.89	14,445,293.65	1,701,226.97	39.77614435	-80.78356504
8,144.00	90.73	332.54	6,489.84	271.17	-2,003.09	14,445,371.45	1,701,183.77	39.77635829	-80.78371813
8,234.00	90.37	331.22	6,488.97	350.54	-2,045.51	14,445,450.82	1,701,141.35	39.77657654	-80.78386841
8,324.00	89.85	330.52	6,488.80	429.16	-2,089.32	14,445,529.43	1,701,097.54	39.77679273	-80.78402367
8,414.00	90.37	332.01	6,488.63	508.07	-2,132.58	14,445,608.35	1,701,054.28	39.77700974	-80.78417699
8,503.00	90.55	331.83	6,487.91	586.59	-2,174.48	14,445,686.87	1,701,012.39	39.77722566	-80.78432541
8,593.00	90.15	332.01	6,487.36	666.00	-2,216.84	14,445,766.27	1,700,970.02	39.77744401	-80.78447551
8,682.00	89.89	331.66	6,487.33	744.46	-2,258.85	14,445,844.74	1,700,928.01	39.77765976	-80.78462436
8,772.00	90.59	332.27	6,486.96	823.90	-2,301.15	14,445,924.17	1,700,885.71	39.77787820	-80.78477423
8,861.00	90.24	331.75	6,486.31	902.48	-2,342.92	14,446,002.76	1,700,843.95	39.77809430	-80.78492223
8,951.00	91.43	331.31	6,485.00	981.59	-2,385.81	14,446,081.87	1,700,801.05	39.77831183	-80.78507423
9,041.00	90.95	331.13	6,483.13	1,060.46	-2,429.13	14,446,160.73	1,700,757.73	39.77852870	-80.78522775
9,131.00	90.42	331.04	6,482.06	1,139.23	-2,472.65	14,446,239.51	1,700,714.21	39.77874532	-80.78538195
9,220.00	91.12	331.13	6,480.86	1,217.13	-2,515.67	14,446,317.40	1,700,671.19	39.77895953	-80.78553444
9,310.00	90.81	330.34	6,479.34	1,295.63	-2,559.66	14,446,395.91	1,700,627.20	39.77917541	-80.78569034
9,400.00	90.55	329.99	6,478.28	1,373.69	-2,604.44	14,446,473.97	1,700,582.42	39.77939009	-80.78584904
9,489.00	91.12	331.31	6,476.98	1,451.26	-2,648.05	14,446,551.54	1,700,538.81	39.77960340	-80.78600362

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
9,579.00	91.03	330.96	6,475.29	1,530.06	-2,691.49	14,446,630.34	1,700,495.37	39.77982010	-80.78615757	
9,669.00	90.90	330.34	6,473.77	1,608.50	-2,735.60	14,446,708.78	1,700,451.26	39.78003580	-80.78631389	
9,758.00	91.43	330.60	6,471.96	1,685.92	-2,779.46	14,446,786.20	1,700,407.40	39.78024871	-80.78646934	
9,848.00	90.90	329.90	6,470.13	1,764.04	-2,824.11	14,446,864.32	1,700,362.75	39.78046354	-80.78662760	
9,938.00	90.64	329.81	6,468.93	1,841.87	-2,869.30	14,446,942.14	1,700,317.56	39.78067756	-80.78678780	
10,027.00	90.33	330.16	6,468.17	1,918.93	-2,913.82	14,447,019.20	1,700,273.04	39.78088948	-80.78694561	
10,117.00	90.99	330.08	6,467.14	1,996.96	-2,958.65	14,447,097.23	1,700,228.21	39.78110407	-80.78710453	
10,207.00	90.99	330.25	6,465.58	2,075.02	-3,003.42	14,447,175.29	1,700,183.44	39.78131873	-80.78726322	
10,296.00	90.64	330.43	6,464.31	2,152.35	-3,047.46	14,447,252.62	1,700,139.40	39.78153139	-80.78741931	
10,386.00	91.52	330.43	6,462.62	2,230.61	-3,091.86	14,447,330.89	1,700,095.00	39.78174662	-80.78757671	
10,476.00	90.90	329.81	6,460.72	2,308.63	-3,136.69	14,447,408.91	1,700,050.17	39.78196117	-80.78773561	
10,565.00	90.42	329.29	6,459.69	2,385.35	-3,181.79	14,447,485.63	1,700,005.07	39.78217215	-80.78789550	
10,655.00	89.93	328.67	6,459.42	2,462.48	-3,228.17	14,447,562.75	1,699,958.69	39.78238427	-80.78805993	
10,745.00	90.90	328.49	6,458.77	2,539.28	-3,275.09	14,447,639.55	1,699,911.78	39.78259549	-80.78822628	
10,834.00	90.42	327.26	6,457.74	2,614.64	-3,322.41	14,447,714.92	1,699,864.45	39.78280277	-80.78839410	
10,924.00	90.81	329.11	6,456.77	2,691.11	-3,369.85	14,447,791.39	1,699,817.01	39.78301309	-80.78856232	
11,014.00	91.21	329.64	6,455.19	2,768.55	-3,415.69	14,447,868.82	1,699,771.17	39.78322604	-80.78872484	
11,103.00	90.95	329.46	6,453.51	2,845.26	-3,460.79	14,447,945.53	1,699,726.08	39.78343700	-80.78888471	
11,193.00	90.42	328.67	6,452.43	2,922.45	-3,507.05	14,448,022.73	1,699,679.81	39.78364929	-80.78904874	
11,283.00	91.21	329.99	6,451.15	2,999.85	-3,552.95	14,448,100.13	1,699,633.91	39.78386215	-80.78921148	
11,372.00	90.95	329.55	6,449.48	3,076.73	-3,597.75	14,448,177.01	1,699,589.11	39.78407358	-80.78937031	
11,462.00	90.68	329.37	6,448.20	3,154.24	-3,643.48	14,448,254.52	1,699,543.38	39.78428673	-80.78953243	
11,552.00	90.20	328.93	6,447.51	3,231.50	-3,689.63	14,448,331.78	1,699,497.23	39.78449922	-80.78969606	
11,641.00	90.77	330.43	6,446.75	3,308.32	-3,734.56	14,448,408.60	1,699,452.31	39.78471048	-80.78985534	
11,731.00	91.34	330.16	6,445.09	3,386.48	-3,779.15	14,448,486.76	1,699,407.71	39.78492541	-80.79001341	
11,821.00	91.12	329.55	6,443.16	3,464.29	-3,824.33	14,448,564.57	1,699,362.53	39.78513939	-80.79017361	
11,910.00	90.51	328.41	6,441.90	3,540.56	-3,870.19	14,448,640.83	1,699,316.67	39.78534912	-80.79033621	
12,000.00	90.51	330.08	6,441.10	3,617.89	-3,916.21	14,448,718.17	1,699,270.65	39.78556181	-80.79049938	
12,090.00	90.11	329.37	6,440.61	3,695.62	-3,961.58	14,448,795.89	1,699,225.28	39.78577555	-80.79066025	
12,179.00	89.58	329.37	6,440.85	3,772.20	-4,006.93	14,448,872.47	1,699,179.93	39.78598616	-80.79082102	
12,269.00	90.68	329.72	6,440.65	3,849.78	-4,052.54	14,448,950.06	1,699,134.32	39.78619951	-80.79098276	
12,359.00	91.38	329.55	6,439.03	3,927.42	-4,098.03	14,449,027.70	1,699,088.83	39.78641302	-80.79114403	
12,448.00	90.42	329.11	6,437.63	4,003.96	-4,143.42	14,449,104.24	1,699,043.44	39.78662351	-80.79130498	
12,538.00	92.26	329.29	6,435.53	4,081.24	-4,189.49	14,449,181.52	1,698,997.37	39.78683605	-80.79146833	
12,628.00	91.34	329.11	6,432.70	4,158.51	-4,235.55	14,449,258.79	1,698,951.31	39.78704854	-80.79163165	
12,717.00	90.90	328.85	6,430.96	4,234.77	-4,281.41	14,449,335.04	1,698,905.45	39.78725825	-80.79179426	
12,807.00	90.15	327.79	6,430.13	4,311.35	-4,328.67	14,449,411.63	1,698,858.19	39.78746888	-80.79196187	
12,897.00	90.15	329.55	6,429.90	4,388.22	-4,375.47	14,449,488.50	1,698,811.39	39.78768029	-80.79212781	
12,986.00	90.24	329.55	6,429.60	4,464.95	-4,420.57	14,449,565.23	1,698,766.29	39.78789129	-80.79228774	
13,076.00	90.64	329.64	6,428.90	4,542.57	-4,466.12	14,449,642.84	1,698,720.74	39.78810474	-80.79244924	
13,166.00	90.46	328.93	6,428.04	4,619.94	-4,512.09	14,449,720.22	1,698,674.77	39.78831751	-80.79261223	
13,255.00	89.98	329.64	6,427.70	4,696.45	-4,557.55	14,449,796.73	1,698,629.32	39.78852793	-80.79277342	
13,345.00	90.95	331.31	6,426.97	4,774.76	-4,601.89	14,449,875.04	1,698,584.97	39.78874326	-80.79293065	
13,434.00	91.25	331.92	6,425.26	4,853.04	-4,644.20	14,449,953.32	1,698,542.66	39.78895852	-80.79308059	
13,524.00	90.51	330.69	6,423.88	4,931.98	-4,687.40	14,450,032.26	1,698,499.46	39.78917558	-80.79323375	
13,614.00	92.26	329.99	6,421.70	5,010.16	-4,731.92	14,450,110.44	1,698,454.94	39.78939057	-80.79339160	
13,703.00	91.91	329.99	6,418.46	5,087.18	-4,776.41	14,450,187.45	1,698,410.45	39.78960236	-80.79354932	
13,793.00	91.47	329.90	6,415.81	5,165.04	-4,821.46	14,450,265.32	1,698,365.40	39.78981648	-80.79370907	
13,883.00	90.81	329.72	6,414.02	5,242.82	-4,866.71	14,450,343.10	1,698,320.15	39.79003037	-80.79386951	
13,972.00	89.63	329.11	6,413.68	5,319.44	-4,912.00	14,450,419.71	1,698,274.86	39.79024106	-80.79403009	
14,062.00	89.45	329.37	6,414.40	5,396.77	-4,958.02	14,450,497.05	1,698,228.84	39.79045374	-80.79419331	
14,152.00	89.05	329.37	6,415.58	5,474.21	-5,003.87	14,450,574.48	1,698,182.99	39.79066669	-80.79435590	
14,241.00	89.49	329.55	6,416.71	5,550.85	-5,049.10	14,450,651.13	1,698,137.77	39.79087747	-80.79451626	
14,331.00	90.55	330.08	6,416.68	5,628.65	-5,094.35	14,450,728.93	1,698,092.51	39.79109140	-80.79467671	
14,421.00	91.34	329.29	6,415.20	5,706.33	-5,139.77	14,450,806.61	1,698,047.09	39.79130502	-80.79483777	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
14,511.00	90.42	328.58	6,413.81	5,783.41	-5,186.20	14,450,883.69	1,698,000.66	39.79151700	-80.79500245	
14,601.00	90.73	328.76	6,412.91	5,860.29	-5,233.00	14,450,960.56	1,697,953.86	39.79172841	-80.79516841	
14,690.00	91.43	328.14	6,411.23	5,936.12	-5,279.56	14,451,036.39	1,697,907.31	39.79193695	-80.79533354	
14,780.00	91.03	327.18	6,409.30	6,012.14	-5,327.69	14,451,112.41	1,697,859.17	39.79214603	-80.79550428	
14,870.00	91.65	328.67	6,407.20	6,088.38	-5,375.47	14,451,188.65	1,697,811.39	39.79235570	-80.79567375	
14,959.00	91.87	330.25	6,404.46	6,164.99	-5,420.67	14,451,265.27	1,697,766.19	39.79256639	-80.79583404	
15,049.00	91.12	329.46	6,402.11	6,242.79	-5,465.85	14,451,343.07	1,697,721.01	39.79278033	-80.79599426	
15,139.00	90.81	329.20	6,400.60	6,320.19	-5,511.75	14,451,420.47	1,697,675.11	39.79299318	-80.79615704	
15,228.00	90.07	329.37	6,399.92	6,396.70	-5,557.21	14,451,496.98	1,697,629.65	39.79320359	-80.79631825	
15,318.00	90.95	328.76	6,399.11	6,473.90	-5,603.47	14,451,574.17	1,697,583.39	39.79341587	-80.79648232	
15,408.00	90.37	328.67	6,398.08	6,550.81	-5,650.20	14,451,651.08	1,697,536.66	39.79362737	-80.79664807	
15,497.00	89.67	328.67	6,398.05	6,626.83	-5,696.48	14,451,727.10	1,697,490.38	39.79383644	-80.79681221	
15,587.00	91.21	329.99	6,397.36	6,704.23	-5,742.39	14,451,804.51	1,697,444.47	39.79404930	-80.79697501	
15,677.00	91.21	330.78	6,395.45	6,782.46	-5,786.85	14,451,882.73	1,697,400.01	39.79426440	-80.79713267	
15,766.00	90.99	330.69	6,393.75	6,860.08	-5,830.35	14,451,960.36	1,697,356.51	39.79447786	-80.79728691	
15,856.00	90.64	329.81	6,392.47	6,938.21	-5,875.01	14,452,038.49	1,697,311.86	39.79469270	-80.79744526	
15,946.00	91.03	328.67	6,391.15	7,015.54	-5,921.03	14,452,115.82	1,697,265.83	39.79490535	-80.79760848	
16,035.00	90.90	328.32	6,389.66	7,091.41	-5,967.53	14,452,191.69	1,697,219.33	39.79511400	-80.79777343	
16,125.00	91.87	328.76	6,387.48	7,168.16	-6,014.49	14,452,268.43	1,697,172.37	39.79532506	-80.79793998	
16,214.00	91.47	329.29	6,384.89	7,244.43	-6,060.27	14,452,344.71	1,697,126.59	39.79553481	-80.79810238	
16,304.00	91.21	329.55	6,382.78	7,321.89	-6,106.05	14,452,422.17	1,697,080.81	39.79574783	-80.79826472	
16,394.00	90.90	329.72	6,381.12	7,399.53	-6,151.54	14,452,499.81	1,697,035.32	39.79596133	-80.79842604	
16,483.00	91.52	329.64	6,379.25	7,476.34	-6,196.46	14,452,576.62	1,696,990.41	39.79617255	-80.79858535	
16,573.00	90.90	328.85	6,377.34	7,553.67	-6,242.47	14,452,653.94	1,696,944.39	39.79638519	-80.79874854	
16,663.00	90.77	328.85	6,376.03	7,630.68	-6,289.02	14,452,730.96	1,696,897.84	39.79659698	-80.79891365	
16,752.00	89.93	327.88	6,375.49	7,706.46	-6,335.70	14,452,806.73	1,696,851.16	39.79680536	-80.79907923	
16,842.00	90.24	328.67	6,375.36	7,783.01	-6,383.02	14,452,883.28	1,696,803.84	39.79701588	-80.79924711	
16,932.00	90.77	329.81	6,374.56	7,860.34	-6,429.05	14,452,960.62	1,696,757.81	39.79722854	-80.79941036	
17,022.00	90.02	329.99	6,373.94	7,938.20	-6,474.18	14,453,038.48	1,696,712.68	39.79744265	-80.79957043	
17,111.00	91.38	329.64	6,372.85	8,015.13	-6,518.93	14,453,115.40	1,696,667.93	39.79765418	-80.79972912	
17,201.00	91.34	329.72	6,370.72	8,092.79	-6,564.35	14,453,193.07	1,696,622.51	39.79786776	-80.79989022	
17,291.00	90.99	329.72	6,368.89	8,170.50	-6,609.72	14,453,270.78	1,696,577.14	39.79808143	-80.80005113	
17,381.00	90.59	329.20	6,367.65	8,248.01	-6,655.45	14,453,348.28	1,696,531.41	39.79829457	-80.80021332	
17,470.00	91.91	328.76	6,365.71	8,324.26	-6,701.30	14,453,424.54	1,696,485.56	39.79850426	-80.80037597	
17,560.00	91.52	328.05	6,363.01	8,400.88	-6,748.43	14,453,501.16	1,696,438.43	39.79871498	-80.80054316	
17,650.00	91.21	327.79	6,360.87	8,477.12	-6,796.22	14,453,577.40	1,696,390.64	39.79892464	-80.80071269	
17,739.00	90.24	329.29	6,359.74	8,553.03	-6,842.66	14,453,653.30	1,696,344.20	39.79913339	-80.80087744	
17,829.00	89.98	329.20	6,359.57	8,630.37	-6,888.68	14,453,730.65	1,696,298.18	39.79934607	-80.80104068	
17,919.00	90.20	329.99	6,359.43	8,707.99	-6,934.23	14,453,808.27	1,696,252.63	39.79955952	-80.80120224	
18,008.00	89.41	329.90	6,359.73	8,785.02	-6,978.81	14,453,885.30	1,696,208.05	39.79977134	-80.80136033	
18,098.00	90.24	330.16	6,360.01	8,862.99	-7,023.77	14,453,963.27	1,696,163.09	39.79998573	-80.80151979	
18,188.00	89.76	329.90	6,360.01	8,940.95	-7,068.73	14,454,041.23	1,696,118.14	39.80020012	-80.80167924	
18,238.00	89.45	329.64	6,360.35	8,984.15	-7,093.90	14,454,084.43	1,696,092.96	39.80031891	-80.80176853	
Survey @ 18238.00 MD 6360.35 TVD										
18,288.00	89.45	329.64	6,360.83	9,027.29	-7,119.17	14,454,127.57	1,696,067.69	39.80043754	-80.80185816	
Survey projected to 18288.00 MD 6360.83 TVD										

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Bryan N-02HM (slot M)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Site:	Bryan Pad	MD Reference:	RKB=1191+28 @ 1219.00usft (PD 110)
Well:	Bryan N-02HM (slot M)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
272.00	271.97	-2.65	2.01	MWD surveys
18,238.00	6,360.35	8,984.15	-7,093.90	Survey @ 18238.00 MD 6360.35 TVD
18,288.00	6,360.83	9,027.29	-7,119.17	Survey projected to 18288.00 MD 6360.83 TVD