



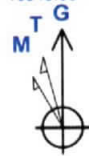
Well: Ten High 1N-03HM (K)
 Site: Ten High
 Project: Marshall County, West Virginia.
 Design: rev7
 Rig: Nabors X08

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	5908.00	17.29	105.62	5861.49	-168.42	304.18	0.00	0.00	-292.33	Survey @ 5908.00 MD 5861.49 TVD
2	6123.76	17.29	105.62	6067.50	-185.69	365.94	0.00	0.00	-336.77	KOP Begin 8°/100' build/turn
3	6924.68	51.00	330.50	6777.46	81.59	322.71	8.00	-142.43	-80.87	Begin 10°/100' build/turn
4	7324.81	91.00	329.59	6905.09	402.58	137.31	10.00	-1.41	289.65	Begin 91.00° lateral
5	15600.34	91.00	329.59	6760.04	7538.77	-4050.54	0.00	0.00	8558.03	PBHL/TD 15600.33 MD/6760.04 TVD

ANNOTATIONS SURVEYS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Annotation
188.00	0.07	181.66	188.00	0.01	0.20	-0.08	MWD surveys
15489.00	90.81	327.41	6720.15	7491.80	-4023.28	8503.75	Survey @ 15489.00 MD 6720.15 TVD
15543.00	90.81	327.41	6719.39	7537.29	-4052.36	8557.59	Survey projected to 15543.00 MD 6719.39 TVD



Azimuths to Grid North
 True North -0.20°
 Magnetic North -8.95°

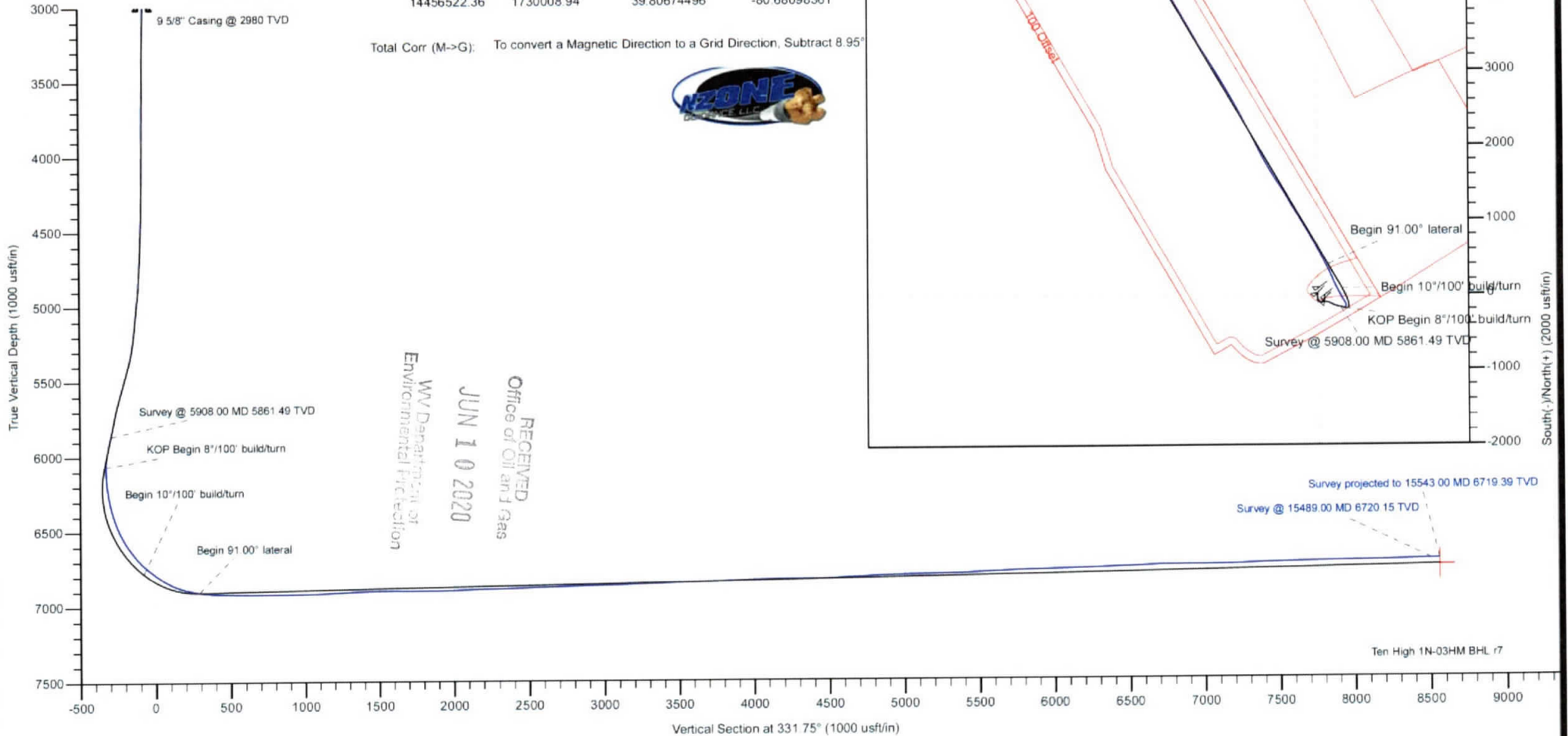
Magnetic Field
 Strength: 52034.5nT
 Dip Angle: 66.86°
 Date: 9/21/2018
 Model: IGRF2015

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD83 West Virginia - HARN
 Ellipsoid: GRS 1980
 Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level
 Depth Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)

Northing: 14456522.36 Easting: 1730008.94 Latitude: 39.80674496 Longitude: -80.68098361

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.95°



RECEIVED
 Office of Oil and Gas
 JUN 10 2020
 WV Department of
 Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Ten High 1N-03HM (K)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1310+33 @ 1343.00usft (Nabors X08)
Site:	Ten High	MD Reference:	RKB=1310+33 @ 1343.00usft (Nabors X08)
Well:	Ten High 1N-03HM (K)	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	Ten High				
Site Position:		Northing:	14,456,545.60 usft	Latitude:	39.80680885
From:	Lat/Long	Easting:	1,730,001.41 usft	Longitude:	-80.68101011
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.20 °

Well	Ten High 1N-03HM (K)					
Well Position	+N/-S	0.00 usft	Northing:	14,456,522.36 usft	Latitude:	39.80674496
	+E/-W	0.00 usft	Easting:	1,730,008.94 usft	Longitude:	-80.68098361
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	1,310.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/21/2018	-8.75	66.86	52,034.47996594

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	331.75	

Survey Program	Date 11/27/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
179.00	2,913.00	MWD surf (Original Hole)	MWD	MWD - Standard
2,975.00	5,908.00	MWD 8 3/4 (Original Hole)	MWD	MWD - Standard
5,978.00	15,489.00	MWD (Original Hole)	MWD	MWD - Standard
15,543.00	15,543.00	Projection (Original Hole)	MWD	MWD - Standard

RECEIVED
 Office of Oil and Gas
 JUN 10 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	14,456,522.36	1,730,008.94	39.80674496	-80.68098361	
179.00	0.12	85.57	179.00	0.01	0.19	14,456,522.38	1,730,009.13	39.80674500	-80.68098294	
188.00	0.07	181.68	188.00	0.01	0.20	14,456,522.37	1,730,009.14	39.80674499	-80.68098291	
MWD surveys										
210.00	0.39	230.09	210.00	-0.05	0.14	14,456,522.31	1,730,009.08	39.80674482	-80.68098312	
240.00	0.33	143.85	240.00	-0.19	0.11	14,456,522.18	1,730,009.05	39.80674445	-80.68098322	
272.00	0.43	129.18	272.00	-0.34	0.26	14,456,522.03	1,730,009.20	39.80674404	-80.68098269	
303.00	0.44	156.98	303.00	-0.52	0.40	14,456,521.85	1,730,009.34	39.80674353	-80.68098221	
342.00	0.35	167.52	342.00	-0.77	0.48	14,456,521.59	1,730,009.42	39.80674283	-80.68098191	

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Ten High 1N-03HM (K)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1310+33 @ 1343.00usft (Nabors X08)
Site:	Ten High	MD Reference:	RKB=1310+33 @ 1343.00usft (Nabors X08)
Well:	Ten High 1N-03HM (K)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

RECEIVED
Office of Oil and Gas
JUN 10 2020

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
374.00	0.23	143.99	374.00	-0.92	0.54	14,456,521.44	1,730,009.48	39.80674243	-80.68098171
406.00	0.48	132.35	406.00	-1.06	0.68	14,456,521.30	1,730,009.62	39.80674204	-80.68098122
437.00	0.15	61.25	437.00	-1.13	0.81	14,456,521.23	1,730,009.75	39.80674185	-80.68098075
469.00	0.60	95.30	468.99	-1.13	1.01	14,456,521.24	1,730,009.95	39.80674186	-80.68098003
500.00	0.14	252.12	499.99	-1.15	1.14	14,456,521.21	1,730,010.08	39.80674178	-80.68097958
532.00	0.33	246.58	531.99	-1.20	1.01	14,456,521.16	1,730,009.95	39.80674165	-80.68098001
563.00	0.54	263.99	562.99	-1.25	0.79	14,456,521.11	1,730,009.73	39.80674151	-80.68098082
595.00	0.30	236.05	594.99	-1.31	0.57	14,456,521.05	1,730,009.51	39.80674135	-80.68098161
626.00	0.80	181.75	625.99	-1.58	0.49	14,456,520.79	1,730,009.43	39.80674063	-80.68098187
658.00	0.26	271.01	657.99	-1.80	0.41	14,456,520.57	1,730,009.35	39.80674002	-80.68098216
689.00	0.20	85.08	688.99	-1.79	0.40	14,456,520.57	1,730,009.34	39.80674003	-80.68098222
721.00	0.19	63.11	720.99	-1.76	0.50	14,456,520.60	1,730,009.44	39.80674011	-80.68098185
752.00	0.22	251.80	751.99	-1.76	0.49	14,456,520.61	1,730,009.43	39.80674013	-80.68098189
784.00	0.82	211.02	783.99	-1.97	0.31	14,456,520.39	1,730,009.25	39.80673954	-80.68098252
816.00	0.35	105.36	815.99	-2.20	0.29	14,456,520.17	1,730,009.23	39.80673893	-80.68098261
847.00	0.56	109.04	846.99	-2.27	0.52	14,456,520.09	1,730,009.46	39.80673872	-80.68098177
879.00	0.52	119.95	878.98	-2.39	0.80	14,456,519.97	1,730,009.74	39.80673838	-80.68098080
910.00	0.49	80.66	909.98	-2.44	1.05	14,456,519.92	1,730,009.99	39.80673824	-80.68097990
942.00	0.79	213.28	941.98	-2.61	1.06	14,456,519.76	1,730,010.00	39.80673780	-80.68097985
964.00	0.44	123.70	963.98	-2.78	1.05	14,456,519.59	1,730,009.99	39.80673732	-80.68097990
1,005.00	0.37	135.95	1,004.98	-2.96	1.27	14,456,519.40	1,730,010.21	39.80673682	-80.68097911
1,036.00	0.35	196.78	1,035.98	-3.12	1.32	14,456,519.24	1,730,010.26	39.80673637	-80.68097896
1,068.00	0.30	227.90	1,067.98	-3.27	1.23	14,456,519.09	1,730,010.17	39.80673596	-80.68097928
1,100.00	0.10	168.89	1,099.98	-3.36	1.17	14,456,519.01	1,730,010.11	39.80673573	-80.68097949
1,119.00	0.33	169.76	1,118.98	-3.43	1.18	14,456,518.94	1,730,010.12	39.80673554	-80.68097944
1,177.00	0.10	248.94	1,176.98	-3.61	1.17	14,456,518.75	1,730,010.11	39.80673504	-80.68097951
1,272.00	0.22	217.68	1,271.98	-3.78	0.98	14,456,518.58	1,730,009.92	39.80673456	-80.68098018
1,366.00	0.56	180.39	1,365.98	-4.39	0.86	14,456,517.98	1,730,009.80	39.80673291	-80.68098059
1,461.00	0.73	203.81	1,460.97	-5.40	0.62	14,456,516.96	1,730,009.56	39.80673011	-80.68098149
1,556.00	1.29	226.64	1,555.96	-6.69	-0.41	14,456,515.67	1,730,008.53	39.80672659	-80.68098514
1,650.00	1.45	241.81	1,649.93	-7.98	-2.22	14,456,514.38	1,730,006.72	39.80672307	-80.68099163
1,745.00	1.66	202.94	1,744.90	-9.82	-3.82	14,456,512.55	1,730,005.12	39.80671804	-80.68099734
1,840.00	3.42	188.77	1,839.80	-13.88	-4.79	14,456,508.48	1,730,004.15	39.80670688	-80.68100084
1,934.00	4.19	183.16	1,933.59	-20.08	-5.40	14,456,502.28	1,730,003.54	39.80668986	-80.68100311
2,029.00	4.47	177.76	2,028.32	-27.25	-5.45	14,456,495.12	1,730,003.49	39.80667018	-80.68100337
2,123.00	4.73	169.01	2,122.02	-34.71	-4.57	14,456,487.65	1,730,004.37	39.80664968	-80.68100032
2,218.00	5.45	166.84	2,216.64	-42.95	-2.80	14,456,479.41	1,730,006.14	39.80662703	-80.68099411
2,313.00	5.05	165.00	2,311.25	-51.38	-0.69	14,456,470.98	1,730,008.25	39.80660386	-80.68098671
2,408.00	3.83	174.74	2,405.96	-58.58	0.69	14,456,463.78	1,730,009.63	39.80658408	-80.68098191
2,503.00	3.04	182.78	2,500.79	-64.26	0.86	14,456,458.11	1,730,009.80	39.80656849	-80.68098138
2,598.00	3.33	188.23	2,595.64	-69.50	0.34	14,456,452.86	1,730,009.28	39.80655408	-80.68098329
2,692.00	2.23	198.33	2,689.53	-73.94	-0.63	14,456,448.42	1,730,008.31	39.80654190	-80.68098678
2,787.00	1.49	210.12	2,784.48	-76.77	-1.83	14,456,445.60	1,730,007.11	39.80653416	-80.68099110
2,882.00	1.74	226.00	2,879.44	-78.84	-3.49	14,456,443.53	1,730,005.45	39.80652849	-80.68099702
2,913.00	1.77	228.81	2,910.43	-79.48	-4.18	14,456,442.89	1,730,004.76	39.80652674	-80.68099952
2,975.00	2.25	235.54	2,972.39	-80.80	-5.91	14,456,441.57	1,730,003.03	39.80652313	-80.68100568
3,069.00	1.43	197.45	3,066.35	-82.96	-7.78	14,456,439.40	1,730,001.16	39.80651721	-80.68101237
3,163.00	1.50	126.17	3,160.32	-84.81	-7.14	14,456,437.56	1,730,001.80	39.80651214	-80.68101011
3,258.00	1.55	113.53	3,255.29	-86.05	-4.96	14,456,436.31	1,730,003.98	39.80650869	-80.68100236
3,352.00	1.39	105.02	3,349.26	-86.86	-2.69	14,456,435.51	1,730,006.25	39.80650646	-80.68099430
3,446.00	1.63	80.59	3,443.23	-86.93	-0.27	14,456,435.43	1,730,008.67	39.80650623	-80.68098568
3,541.00	1.73	85.64	3,538.18	-86.60	2.49	14,456,435.76	1,730,011.43	39.80650711	-80.68097584
3,636.00	1.07	71.66	3,633.16	-86.21	4.76	14,456,436.15	1,730,013.70	39.80650815	-80.68096775
3,730.00	1.11	72.70	3,727.14	-85.67	6.46	14,456,436.70	1,730,015.41	39.80650964	-80.68096168
3,825.00	1.22	49.89	3,822.12	-84.74	8.12	14,456,437.62	1,730,017.06	39.80651216	-80.68095578

WV Department of Environmental Protection



Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Ten High 1N-03HM (K)
Project:	Marshall County, West Virginia.	TVD Reference:	RKB=1310+33 @ 1343.00usft (Nabors X08)
Site:	Ten High	MD Reference:	RKB=1310+33 @ 1343.00usft (Nabors X08)
Well:	Ten High 1N-03HM (K)	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys Original Hole	Database:	DB_Jul2216dt_v14

RECEIVED
Office of Oil and Gas

JUN 10 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	
3,919.00	1.09	193.62	3,916.11	-84.97	8.67	14,456,437.40	1,730,017.61	39.80651154	-80.68095381	
4,014.00	1.82	211.17	4,011.08	-87.13	7.68	14,456,435.23	1,730,016.62	39.80650559	-80.68095738	
4,108.00	2.11	212.17	4,105.03	-89.88	5.98	14,456,432.49	1,730,014.92	39.80649808	-80.68096344	
4,202.00	1.74	203.54	4,198.97	-92.65	4.49	14,456,429.71	1,730,013.43	39.80649048	-80.68096879	
4,297.00	1.79	201.33	4,293.93	-95.35	3.38	14,456,427.01	1,730,012.32	39.80648306	-80.68097280	
4,391.00	0.97	141.42	4,387.90	-97.34	3.34	14,456,425.02	1,730,012.28	39.80647760	-80.68097296	
4,485.00	2.35	106.47	4,481.86	-98.51	5.68	14,456,423.85	1,730,014.62	39.80647437	-80.68096462	
4,580.00	2.90	97.97	4,576.76	-99.40	9.93	14,456,422.97	1,730,018.87	39.80647189	-80.68094951	
4,675.00	3.36	112.26	4,671.62	-100.79	14.89	14,456,421.58	1,730,023.83	39.80646803	-80.68093188	
4,770.00	3.65	106.75	4,766.45	-102.71	20.36	14,456,419.65	1,730,029.30	39.80646269	-80.68091242	
4,865.00	6.02	105.04	4,861.10	-104.88	28.07	14,456,417.49	1,730,037.01	39.80645667	-80.68088500	
4,960.00	10.43	100.12	4,955.10	-107.68	41.35	14,456,414.68	1,730,050.29	39.80644884	-80.68083774	
5,054.00	13.30	87.13	5,047.10	-108.64	60.53	14,456,413.73	1,730,069.47	39.80644603	-80.68076945	
5,152.00	16.52	78.56	5,141.80	-105.31	85.46	14,456,417.06	1,730,094.40	39.80645493	-80.68068066	
5,246.00	14.97	92.56	5,232.30	-103.20	110.70	14,456,419.17	1,730,119.64	39.80646047	-80.68059077	
5,341.00	16.47	106.94	5,323.78	-107.67	135.85	14,456,414.69	1,730,144.79	39.80644794	-80.68050127	
5,435.00	18.84	114.57	5,413.36	-117.87	162.40	14,456,404.50	1,730,171.34	39.80641968	-80.68040683	
5,530.00	19.14	116.48	5,503.19	-131.19	190.30	14,456,391.17	1,730,199.24	39.80638282	-80.68030769	
5,625.00	19.80	113.54	5,592.76	-144.56	218.99	14,456,377.80	1,730,227.93	39.80634582	-80.68020570	
5,719.00	18.82	105.98	5,681.49	-155.10	248.17	14,456,367.27	1,730,257.11	39.80631660	-80.68010194	
5,814.00	17.45	100.87	5,771.77	-162.00	276.89	14,456,360.36	1,730,285.83	39.80629735	-80.67999976	
5,908.00	17.29	105.62	5,861.49	-168.42	304.18	14,456,353.94	1,730,313.12	39.80627946	-80.67990265	
6,025.00	17.14	106.36	5,973.25	-177.96	337.47	14,456,344.41	1,730,346.41	39.80625294	-80.67984424	
6,119.00	11.91	70.68	6,064.38	-178.65	359.97	14,456,343.71	1,730,368.91	39.80625081	-80.67970413	
6,214.00	11.47	27.17	6,157.59	-166.98	373.56	14,456,355.38	1,730,382.50	39.80628272	-80.67965559	
6,309.00	9.98	355.36	6,251.01	-150.36	377.21	14,456,372.00	1,730,386.15	39.80632834	-80.67964238	
6,404.00	13.49	337.25	6,344.04	-131.92	372.26	14,456,390.44	1,730,381.20	39.80637901	-80.67965979	
6,498.00	20.04	330.92	6,434.00	-107.71	360.18	14,456,414.66	1,730,369.12	39.80644563	-80.67970250	
6,545.00	23.78	328.55	6,477.60	-92.58	351.32	14,456,429.78	1,730,360.26	39.80648726	-80.67973386	
6,593.00	26.37	328.46	6,521.07	-75.24	340.69	14,456,447.13	1,730,349.63	39.80653500	-80.67977148	
6,640.00	30.15	330.48	6,562.46	-56.06	329.41	14,456,466.30	1,730,338.35	39.80658777	-80.67981140	
6,687.00	33.45	331.19	6,602.40	-34.44	317.35	14,456,487.93	1,730,326.29	39.80664728	-80.67985407	
6,782.00	41.10	331.63	6,677.94	16.06	289.85	14,456,538.42	1,730,298.79	39.80678621	-80.67995133	
6,829.00	45.89	332.59	6,712.03	44.64	274.73	14,456,567.01	1,730,283.67	39.80686487	-80.68000479	
6,876.00	50.02	332.51	6,743.50	75.61	258.65	14,456,597.97	1,730,267.59	39.80695007	-80.68006168	
6,971.00	56.35	335.41	6,800.40	143.93	225.35	14,456,666.30	1,730,234.29	39.80713803	-80.68017936	
7,018.00	57.67	336.02	6,826.00	179.87	209.14	14,456,702.23	1,730,218.08	39.80723687	-80.68023663	
7,065.00	63.65	336.81	6,849.01	217.40	192.77	14,456,739.76	1,730,201.71	39.80734011	-80.68029446	
7,112.00	69.80	336.20	6,867.58	256.97	175.56	14,456,779.34	1,730,184.50	39.80744895	-80.68035524	
7,160.00	73.93	335.49	6,882.52	298.58	156.89	14,456,820.95	1,730,165.83	39.80756341	-80.68042117	
7,207.00	78.29	334.53	6,893.80	339.93	137.62	14,456,862.29	1,730,146.56	39.80767714	-80.68048927	
7,254.00	79.74	332.77	6,902.75	381.27	117.14	14,456,903.63	1,730,126.08	39.80779087	-80.68056167	
7,295.00	83.30	331.80	6,908.80	417.16	98.28	14,456,939.53	1,730,107.22	39.80788962	-80.68062836	
7,349.00	87.65	331.63	6,913.06	464.55	72.78	14,456,986.92	1,730,081.72	39.80802003	-80.68071857	
7,444.00	88.35	331.01	6,916.37	547.85	27.21	14,457,070.21	1,730,036.15	39.80824922	-80.68087975	
7,539.00	88.75	331.27	6,918.78	631.02	-18.62	14,457,153.39	1,729,990.32	39.80847808	-80.68104192	
7,633.00	88.84	331.80	6,920.75	713.64	-63.42	14,457,236.00	1,729,945.52	39.80870541	-80.68120037	
7,728.00	90.33	330.84	6,921.44	796.98	-109.01	14,457,319.34	1,729,899.93	39.80893472	-80.68136165	
7,822.00	91.08	330.04	6,920.28	878.74	-155.38	14,457,401.10	1,729,853.56	39.80915970	-80.68152572	
7,917.00	90.86	328.64	6,918.68	960.44	-203.81	14,457,482.81	1,729,805.13	39.80938456	-80.68169716	
8,012.00	90.86	327.23	6,917.25	1,040.94	-254.24	14,457,563.30	1,729,754.70	39.80960611	-80.68187570	
8,107.00	92.75	328.29	6,914.26	1,121.25	-304.89	14,457,643.61	1,729,704.05	39.80982715	-80.68205505	
8,201.00	92.40	330.13	6,910.03	1,201.91	-352.96	14,457,724.28	1,729,655.98	39.81004915	-80.68222519	
8,295.00	92.57	330.57	6,905.96	1,283.53	-399.42	14,457,805.89	1,729,609.53	39.81027374	-80.68238959	
8,390.00	91.82	328.73	6,902.32	1,365.44	-447.38	14,457,887.81	1,729,561.56	39.81049917	-80.68255935	

Company: Tug Hill Operating LLC
Project: Marshall County, West Virginia.
Site: Ten High
Well: Ten High 1N-03HM (K)
Wellbore: Original Hole
Design: Surveys Original Hole

Local Co-ordinate Reference: Well Ten High 1N-03HM (K)
TVD Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)
MD Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Jul2216dt_v14

 RECEIVED
 Office of Oil and Gas

JUN 10 2020

 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
8,485.00	91.38	326.70	6,899.67	1,445.72	-498.10	14,457,968.08	1,729,510.84	39.81072012	-80.68273895
8,580.00	89.54	326.97	6,898.90	1,525.24	-550.07	14,458,047.60	1,729,458.87	39.81093900	-80.68292299
8,674.00	89.63	327.32	6,899.58	1,604.20	-601.06	14,458,126.56	1,729,407.88	39.81115635	-80.68310358
8,768.00	89.89	330.13	6,899.98	1,684.53	-649.85	14,458,206.90	1,729,359.09	39.81137743	-80.68327632
8,863.00	90.73	330.22	6,899.46	1,766.95	-697.10	14,458,289.31	1,729,311.84	39.81160422	-80.68344353
8,957.00	92.22	332.94	6,897.04	1,849.58	-741.82	14,458,371.95	1,729,267.12	39.81183159	-80.68360173
9,051.00	91.82	333.74	6,893.73	1,933.53	-783.97	14,458,455.90	1,729,224.97	39.81206256	-80.68375077
9,146.00	91.56	333.74	6,890.93	2,018.69	-825.98	14,458,541.06	1,729,182.96	39.81229683	-80.68389931
9,240.00	91.03	333.91	6,888.80	2,103.03	-867.44	14,458,625.40	1,729,141.50	39.81252884	-80.68404587
9,335.00	91.91	331.63	6,886.37	2,187.47	-910.89	14,458,709.83	1,729,098.05	39.81276115	-80.68419953
9,430.00	92.00	331.45	6,883.13	2,270.94	-956.13	14,458,793.30	1,729,052.81	39.81299082	-80.68435960
9,524.00	91.74	330.92	6,880.06	2,353.26	-1,001.42	14,458,875.62	1,729,007.52	39.81321732	-80.68451982
9,619.00	91.56	331.98	6,877.32	2,436.67	-1,046.80	14,458,959.03	1,728,962.14	39.81344683	-80.68468039
9,714.00	91.74	330.13	6,874.59	2,519.76	-1,092.76	14,459,042.13	1,728,916.18	39.81367547	-80.68484300
9,808.00	91.65	330.75	6,871.81	2,601.49	-1,139.11	14,459,123.86	1,728,869.83	39.81390037	-80.68500704
9,903.00	91.30	330.84	6,869.36	2,684.39	-1,185.45	14,459,206.75	1,728,823.49	39.81412847	-80.68517101
9,998.00	91.08	330.75	6,867.39	2,767.29	-1,231.79	14,459,289.66	1,728,777.15	39.81435659	-80.68533501
10,092.00	92.62	329.34	6,864.35	2,848.69	-1,278.70	14,459,371.05	1,728,730.24	39.81458058	-80.68550104
10,187.00	92.44	328.73	6,860.16	2,930.07	-1,327.53	14,459,452.44	1,728,681.41	39.81480454	-80.68567391
10,282.00	91.96	328.29	6,856.51	3,011.02	-1,377.12	14,459,533.38	1,728,631.82	39.81502733	-80.68584948
10,376.00	91.43	327.23	6,853.73	3,090.49	-1,427.24	14,459,612.86	1,728,581.70	39.81524606	-80.68602699
10,471.00	90.77	327.50	6,851.91	3,170.48	-1,478.46	14,459,692.84	1,728,530.48	39.81546621	-80.68620840
10,566.00	91.03	328.46	6,850.42	3,251.01	-1,528.83	14,459,773.38	1,728,480.11	39.81568787	-80.68638675
10,660.00	92.35	330.75	6,847.65	3,332.05	-1,576.36	14,459,854.42	1,728,432.58	39.81591088	-80.68655502
10,755.00	92.35	330.31	6,843.75	3,414.69	-1,623.06	14,459,937.05	1,728,385.88	39.81613827	-80.68672029
10,850.00	92.13	330.31	6,840.04	3,497.16	-1,670.08	14,460,019.52	1,728,338.86	39.81636519	-80.68688670
10,944.00	91.78	330.13	6,836.83	3,578.69	-1,716.74	14,460,101.06	1,728,292.20	39.81658956	-80.68705185
11,039.00	91.25	330.04	6,834.32	3,661.01	-1,764.10	14,460,183.37	1,728,244.84	39.81681607	-80.68721949
11,133.00	90.99	329.78	6,832.48	3,742.32	-1,811.22	14,460,264.69	1,728,197.72	39.81703984	-80.68738628
11,228.00	90.64	329.60	6,831.13	3,824.33	-1,859.16	14,460,346.69	1,728,149.78	39.81726551	-80.68755598
11,321.00	89.93	329.69	6,830.67	3,904.58	-1,906.15	14,460,426.94	1,728,102.79	39.81748634	-80.68772235
11,416.00	90.42	329.25	6,830.38	3,986.41	-1,954.41	14,460,508.77	1,728,054.53	39.81771152	-80.68789320
11,510.00	93.32	329.43	6,827.31	4,067.22	-2,002.32	14,460,589.58	1,728,006.62	39.81793390	-80.68806279
11,605.00	93.10	329.60	6,821.99	4,148.95	-2,050.44	14,460,671.32	1,727,958.50	39.81815884	-80.68823314
11,699.00	92.88	330.04	6,817.09	4,230.10	-2,097.63	14,460,752.47	1,727,911.31	39.81838214	-80.68840020
11,794.00	92.48	329.96	6,812.65	4,312.28	-2,145.07	14,460,834.65	1,727,863.87	39.81860828	-80.68856816
11,888.00	92.00	329.43	6,808.97	4,393.38	-2,192.47	14,460,915.74	1,727,816.47	39.81883144	-80.68873594
11,983.00	91.74	329.08	6,805.87	4,474.98	-2,241.01	14,460,997.35	1,727,767.93	39.81905600	-80.68890780
12,078.00	91.03	328.02	6,803.57	4,556.00	-2,290.56	14,461,078.36	1,727,718.38	39.81927897	-80.68908327
12,173.00	90.73	327.67	6,802.12	4,636.42	-2,341.12	14,461,158.78	1,727,667.82	39.81950030	-80.68926231
12,267.00	90.90	329.08	6,800.78	4,716.45	-2,390.40	14,461,238.81	1,727,618.54	39.81972056	-80.68943684
12,362.00	92.31	330.31	6,798.12	4,798.43	-2,438.32	14,461,320.80	1,727,570.62	39.81994616	-80.68960648
12,457.00	92.88	330.66	6,793.82	4,881.02	-2,485.07	14,461,403.38	1,727,523.87	39.82017340	-80.68977196
12,552.00	92.79	330.40	6,789.12	4,963.62	-2,531.75	14,461,485.99	1,727,477.19	39.82040071	-80.68993719
12,646.00	92.22	330.48	6,785.01	5,045.31	-2,578.08	14,461,567.68	1,727,430.86	39.82062548	-80.69010118
12,741.00	91.91	329.96	6,781.59	5,127.71	-2,625.23	14,461,650.08	1,727,383.71	39.82085222	-80.69026809
12,835.00	91.69	331.54	6,778.63	5,209.68	-2,671.14	14,461,732.05	1,727,337.80	39.82107777	-80.69043058
12,930.00	91.43	332.68	6,776.05	5,293.62	-2,715.56	14,461,815.98	1,727,293.38	39.82130869	-80.69058775
13,025.00	91.65	329.78	6,773.49	5,376.85	-2,761.26	14,461,899.21	1,727,247.68	39.82153770	-80.69074949
13,119.00	91.03	329.52	6,771.30	5,457.94	-2,808.74	14,461,980.31	1,727,200.20	39.82176086	-80.69091760
13,214.00	92.31	328.29	6,768.53	5,539.26	-2,857.78	14,462,061.62	1,727,151.16	39.82198463	-80.69109126
13,309.00	91.69	328.64	6,765.21	5,620.18	-2,907.44	14,462,142.54	1,727,101.50	39.82220733	-80.69126711
13,403.00	91.12	327.85	6,762.91	5,700.08	-2,956.90	14,462,222.45	1,727,052.04	39.82242723	-80.69144227
13,497.00	92.84	327.93	6,759.66	5,779.65	-3,006.83	14,462,302.02	1,727,002.11	39.82264622	-80.69161913
13,592.00	92.62	327.93	6,755.13	5,860.06	-3,057.21	14,462,382.43	1,726,951.73	39.82286753	-80.69179759

Company: Tug Hill Operating LLC
Project: Marshall County, West Virginia.
Site: Ten High
Well: Ten High 1N-03HM (K)
Wellbore: Original Hole
Design: Surveys Original Hole

Local Co-ordinate Reference: Well Ten High 1N-03HM (K)
TVD Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)
MD Reference: RKB=1310+33 @ 1343.00usft (Nabors X08)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Jul2216dt_v14

RECEIVED
 Office of Oil and Gas
 JUN 10 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
13,686.00	91.25	327.58	6,751.96	5,939.52	-3,107.34	14,462,461.88	1,726,901.60	39.82308620	-80.69197513
13,778.00	89.89	328.37	6,751.04	6,017.51	-3,156.12	14,462,539.88	1,726,852.82	39.82330085	-80.69214791
13,872.00	90.29	329.43	6,750.90	6,098.00	-3,204.67	14,462,620.36	1,726,804.27	39.82352235	-80.69231985
13,966.00	89.98	330.22	6,750.68	6,179.26	-3,251.92	14,462,701.62	1,726,757.02	39.82374596	-80.69248713
14,061.00	91.16	330.92	6,749.73	6,261.99	-3,298.60	14,462,784.36	1,726,710.34	39.82397361	-80.69265236
14,155.00	90.81	331.10	6,748.11	6,344.20	-3,344.15	14,462,866.57	1,726,664.79	39.82419981	-80.69281359
14,249.00	91.91	330.57	6,745.88	6,426.26	-3,389.94	14,462,948.63	1,726,619.00	39.82442559	-80.69297569
14,344.00	91.69	330.48	6,742.90	6,508.93	-3,436.66	14,463,031.29	1,726,572.28	39.82465304	-80.69314108
14,438.00	91.91	330.40	6,739.95	6,590.65	-3,483.01	14,463,113.02	1,726,525.93	39.82487791	-80.69330517
14,532.00	91.87	330.48	6,736.85	6,672.37	-3,529.36	14,463,194.74	1,726,479.58	39.82510277	-80.69346925
14,626.00	91.21	329.43	6,734.32	6,753.71	-3,576.41	14,463,276.07	1,726,432.53	39.82532659	-80.69363582
14,721.00	90.90	328.73	6,732.57	6,835.19	-3,625.21	14,463,357.56	1,726,383.73	39.82555083	-80.69380866
14,815.00	90.95	328.37	6,731.05	6,915.37	-3,674.25	14,463,437.74	1,726,334.69	39.82577148	-80.69398234
14,909.00	90.81	329.52	6,729.61	6,995.89	-3,722.74	14,463,518.26	1,726,286.20	39.82599305	-80.69415404
15,004.00	90.55	329.17	6,728.48	7,077.61	-3,771.17	14,463,599.97	1,726,237.77	39.82621793	-80.69432556
15,099.00	89.80	328.99	6,728.19	7,159.11	-3,819.98	14,463,681.47	1,726,188.96	39.82644220	-80.69449843
15,193.00	91.69	329.25	6,726.97	7,239.77	-3,868.22	14,463,762.14	1,726,140.72	39.82666417	-80.69466926
15,287.00	91.43	328.90	6,724.41	7,320.38	-3,916.51	14,463,842.74	1,726,092.43	39.82688599	-80.69484028
15,381.00	91.25	328.11	6,722.21	7,400.51	-3,965.61	14,463,922.87	1,726,043.33	39.82710651	-80.69501417
15,476.00	90.99	327.41	6,720.36	7,480.85	-4,016.28	14,464,003.21	1,725,992.66	39.82732760	-80.69519366
15,489.00	90.81	327.41	6,720.15	7,491.80	-4,023.28	14,464,014.16	1,725,985.66	39.82735775	-80.69521847
Survey @ 15489.00 MD 6720.15 TVD									
15,543.00	90.81	327.41	6,719.39	7,537.29	-4,052.36	14,464,059.65	1,725,956.58	39.82748295	-80.69532150
Survey projected to 15543.00 MD 6719.39 TVD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
188.00	188.00	0.01	0.20	MWD surveys
15,489.00	6,720.15	7,491.80	-4,023.28	Survey @ 15489.00 MD 6720.15 TVD
15,543.00	6,719.39	7,537.29	-4,052.36	Survey projected to 15543.00 MD 6719.39 TVD