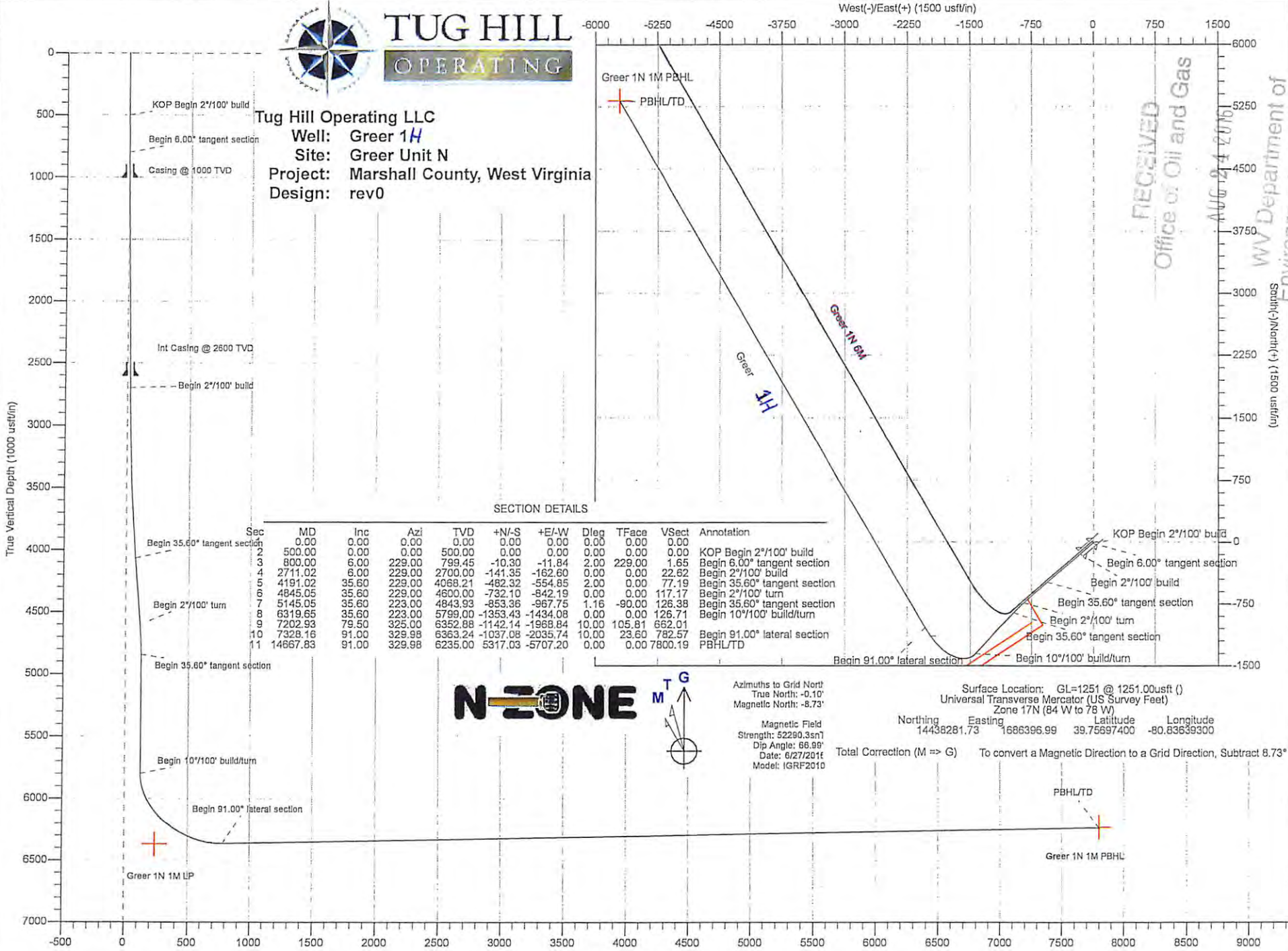


SI-01757400



TUG HILL OPERATING

Tug Hill Operating LLC
Well: Greer 1H
Site: Greer Unit N
Project: Marshall County, West Virginia
Design: rev0



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
1	500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	Begin 6.00° tangent section
2	800.00	6.00	229.00	799.45	-10.30	-11.84	2.00	229.00	1.65	Begin 2°/100' build
3	2711.02	6.00	229.00	2700.00	-141.35	-162.60	0.00	0.00	22.62	Begin 2°/100' build
4	4191.02	35.60	229.00	4068.21	-482.32	-554.85	2.00	0.00	77.19	Begin 35.60° tangent section
5	4845.05	35.60	229.00	4600.00	-732.10	-842.19	0.00	0.00	117.17	Begin 2°/100' build
6	5145.05	35.60	223.00	4843.93	-853.36	-967.75	1.16	-90.00	126.38	Begin 35.60° tangent section
7	6319.65	35.60	223.00	5799.00	-1353.43	-1434.08	0.00	0.00	126.71	Begin 10°/100' build/turn
8	7202.93	79.50	325.00	6352.88	-1142.14	-1968.84	10.00	105.81	662.01	Begin 2°/100' turn
9	7328.16	91.00	329.98	6363.24	-1037.08	-2035.74	10.00	23.60	782.57	Begin 91.00° lateral section
10	14667.83	91.00	329.98	6235.00	5317.03	-5707.20	0.00	0.00	7800.19	PBHL/TD



Azimuths to Grid North:
 True North: -0.10°
 Magnetic North: -8.73°
 Magnetic Field Strength: 52290.3sn7
 Dip Angle: 66.99°
 Date: 6/27/2011
 Model: IGRF2010

Surface Location: GL=1251 @ 1251.00usft ()
 Universal Transverse Mercator (US Survey Feet)
 Zone 17N (84 W to 78 W)
 Northing: 14438281.73 Easting: 1686396.99 Latitude: 39.75697400 Longitude: -80.83639300

Total Correction (M => G) To convert a Magnetic Direction to a Grid Direction, Subtract 8.73°

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Vertical Section at 312.97° (1000 usft/in)



Standard_Report

LS10-15

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 Environmental Protection

Company:	Tug Hill Operating LLC	Local Co-ordinate Reference:	Well Greer 1H
Project:	Marshall County, West Virginia	TVD Reference:	GL=1251 @ 1251.00usft ()
Site:	Greer Unit N	MD Reference:	GL=1251 @ 1251.00usft ()
Well:	Greer 1N 1M	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	Dbase Nov0914

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	Greer Unit N			
Site Position:	Northing:	14,438,281.73 usft	Latitude:	39.75697400
From: Lat/Long	Easting:	1,686,396.99 usft	Longitude:	-80.83639300
Position Uncertainty: 0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.10 °

Well	Greer 1N 1M				
Well Position +N/-S	0.00 usft	Northing:	14,438,281.73 usft	Latitude:	39.75697400
+E/-W	0.00 usft	Easting:	1,686,396.99 usft	Longitude:	-80.83639300
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	1,251.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/27/2016	-8.62	66.99	52,290

Design	rev0			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	312.97

Survey Tool Program	Date	6/27/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	14,667.83	rev0 (Original Hole)	MWD	MWD - Standard

SL-01757



Standard_Report

Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Greer Unit N
 Well: Greer 1N 1M
 Wellbore: Original Hole
 Design: rev0

Local Co-ordinate Reference: Well Greer 1H
 TVD Reference: GL=1251 @ 1251.00usft ()
 MD Reference: GL=1251 @ 1251.00usft ()
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Dbase Nov0914

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 Environmental Protection

Planned Survey

MD (usft)	Inc (°)	Azl (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14,438,281.73	1,686,396.99	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	14,438,281.73	1,686,396.99	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	14,438,281.73	1,686,396.99	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	14,438,281.73	1,686,396.99	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	14,438,281.73	1,686,396.99	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	14,438,281.73	1,686,396.99	
KOP Begin 2°/100' build										
600.00	2.00	229.00	599.98	-1.14	-1.32	2.00	0.18	14,438,280.59	1,686,395.67	
700.00	4.00	229.00	699.84	-4.58	-5.27	2.00	0.73	14,438,277.15	1,686,391.72	
800.00	6.00	229.00	799.45	-10.30	-11.84	2.00	1.65	14,438,271.44	1,686,385.15	
Begin 6.00° tangent section										
900.00	6.00	229.00	898.90	-17.15	-19.73	0.00	2.75	14,438,264.58	1,686,377.26	
1,000.00	6.00	229.00	998.36	-24.01	-27.62	0.00	3.84	14,438,257.72	1,686,369.37	
1,100.00	6.00	229.00	1,097.81	-30.87	-35.51	0.00	4.94	14,438,250.86	1,686,361.48	
1,200.00	6.00	229.00	1,197.26	-37.73	-43.40	0.00	6.04	14,438,244.01	1,686,353.59	
1,300.00	6.00	229.00	1,296.71	-44.58	-51.29	0.00	7.14	14,438,237.15	1,686,345.70	
1,400.00	6.00	229.00	1,396.17	-51.44	-59.18	0.00	8.23	14,438,230.29	1,686,337.81	
1,500.00	6.00	229.00	1,495.62	-58.30	-67.07	0.00	9.33	14,438,223.43	1,686,329.92	
1,600.00	6.00	229.00	1,595.07	-65.16	-74.96	0.00	10.43	14,438,216.57	1,686,322.03	
1,700.00	6.00	229.00	1,694.52	-72.02	-82.84	0.00	11.53	14,438,209.72	1,686,314.15	
1,800.00	6.00	229.00	1,793.97	-78.87	-90.73	0.00	12.62	14,438,202.86	1,686,306.26	
1,900.00	6.00	229.00	1,893.43	-85.73	-98.62	0.00	13.72	14,438,196.00	1,686,298.37	
2,000.00	6.00	229.00	1,992.88	-92.59	-106.51	0.00	14.82	14,438,189.14	1,686,290.48	
2,100.00	6.00	229.00	2,092.33	-99.45	-114.40	0.00	15.92	14,438,182.29	1,686,282.59	
2,200.00	6.00	229.00	2,191.78	-106.30	-122.29	0.00	17.01	14,438,175.43	1,686,274.70	
2,300.00	6.00	229.00	2,291.23	-113.16	-130.18	0.00	18.11	14,438,168.57	1,686,266.81	
2,400.00	6.00	229.00	2,390.69	-120.02	-138.07	0.00	19.21	14,438,161.71	1,686,258.92	



Standard_Report

SJ-1757

Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Greer Unit N
 Well: Greer 1N 1M
 Wellbore: Original Hole
 Design: rev0

Local Co-ordinate Reference: Well Greer 1//
 TVD Reference: GL=1251 @ 1251.00usft ()
 MD Reference: GL=1251 @ 1251.00usft ()
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Dbase Nov0914

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Planned Survey

MD (usft)	Inc (°)	Azl (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
2,500.00	6.00	229.00	2,490.14	-126.88	-145.95	0.00	20.31	14,438,154.86	1,686,251.03
2,600.00	6.00	229.00	2,589.59	-133.73	-153.84	0.00	21.40	14,438,148.00	1,686,243.15
2,700.00	6.00	229.00	2,689.04	-140.59	-161.73	0.00	22.50	14,438,141.14	1,686,235.26
2,711.02	6.00	229.00	2,700.00	-141.35	-162.60	0.00	22.62	14,438,140.38	1,686,234.39
Begin 2°/100' build									
2,800.00	7.78	229.00	2,788.34	-148.35	-170.66	2.00	23.74	14,438,133.38	1,686,226.33
2,900.00	9.78	229.00	2,887.16	-158.36	-182.18	2.00	25.34	14,438,123.37	1,686,214.81
3,000.00	11.78	229.00	2,985.39	-170.63	-196.29	2.00	27.31	14,438,111.10	1,686,200.70
3,100.00	13.78	229.00	3,082.91	-185.14	-212.98	2.00	29.63	14,438,096.59	1,686,184.01
3,200.00	15.78	229.00	3,179.60	-201.88	-232.24	2.00	32.31	14,438,079.85	1,686,164.75
3,300.00	17.78	229.00	3,275.33	-220.82	-254.02	2.00	35.34	14,438,060.91	1,686,142.97
3,400.00	19.78	229.00	3,370.00	-241.94	-278.32	2.00	38.72	14,438,039.79	1,686,118.67
3,500.00	21.78	229.00	3,463.49	-265.21	-305.09	2.00	42.44	14,438,016.52	1,686,091.90
3,600.00	23.78	229.00	3,555.69	-290.61	-334.31	2.00	46.51	14,437,991.12	1,686,062.68
3,700.00	25.78	229.00	3,646.48	-318.11	-365.94	2.00	50.91	14,437,963.62	1,686,031.05
3,800.00	27.78	229.00	3,735.75	-347.67	-399.95	2.00	55.64	14,437,934.06	1,685,997.04
3,900.00	29.78	229.00	3,823.39	-379.25	-436.28	2.00	60.70	14,437,902.48	1,685,960.71
4,000.00	31.78	229.00	3,909.30	-412.82	-474.90	2.00	66.07	14,437,868.91	1,685,922.09
4,100.00	33.78	229.00	3,993.37	-448.34	-515.76	2.00	71.75	14,437,833.39	1,685,881.23
4,191.02	35.60	229.00	4,068.21	-482.32	-554.85	2.00	77.19	14,437,799.41	1,685,842.14
Begin 35.60° tangent section									
4,200.00	35.60	229.00	4,075.51	-485.75	-558.80	0.00	77.74	14,437,795.98	1,685,838.19
4,300.00	35.60	229.00	4,156.82	-523.94	-602.73	0.00	83.85	14,437,757.79	1,685,794.26
4,400.00	35.60	229.00	4,238.13	-562.14	-646.66	0.00	89.96	14,437,719.60	1,685,750.33
4,500.00	35.60	229.00	4,319.44	-600.33	-690.60	0.00	96.08	14,437,681.41	1,685,706.39
4,600.00	35.60	229.00	4,400.75	-638.52	-734.53	0.00	102.19	14,437,643.22	1,685,662.46
4,700.00	35.60	229.00	4,482.06	-676.71	-778.46	0.00	108.30	14,437,605.02	1,685,618.53

51-01757



Standard_Report

Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Greer Unit N
 Well: Greer 1N 1M
 Wellbore: Original Hole
 Design: rev0

Local Co-ordinate Reference: Well Greer 1 H
 TVD Reference: GL=1251 @ 1251.00usft ()
 MD Reference: GL=1251 @ 1251.00usft ()
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Dbase Nov0914

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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)	
4,800.00	35.60	229.00	4,563.37	-714.90	-822.40	0.00	114.41	14,437,566.83	1,685,574.59	
4,845.05	35.60	229.00	4,600.00	-732.10	-842.19	0.00	117.17	14,437,549.63	1,685,554.80	
Begin 2°/100' turn										
4,900.00	35.60	227.90	4,644.68	-753.32	-866.13	1.16	120.22	14,437,528.41	1,685,530.86	
5,000.00	35.60	225.90	4,725.99	-793.09	-908.63	1.16	124.21	14,437,488.64	1,685,488.36	
5,100.00	35.60	223.90	4,807.30	-834.32	-949.72	1.16	126.17	14,437,447.41	1,685,447.27	
5,145.05	35.60	223.00	4,843.93	-853.36	-967.75	1.16	126.38	14,437,428.37	1,685,429.24	
Begin 35.60° tangent section										
5,200.00	35.60	223.00	4,888.61	-876.75	-989.57	0.00	126.40	14,437,404.98	1,685,407.42	
5,300.00	35.60	223.00	4,969.92	-919.33	-1,029.27	0.00	126.43	14,437,362.40	1,685,367.72	
5,400.00	35.60	223.00	5,051.23	-961.90	-1,068.97	0.00	126.45	14,437,319.83	1,685,328.02	
5,500.00	35.60	223.00	5,132.54	-1,004.48	-1,108.67	0.00	126.48	14,437,277.26	1,685,288.32	
5,600.00	35.60	223.00	5,213.85	-1,047.05	-1,148.37	0.00	126.51	14,437,234.68	1,685,248.62	
5,700.00	35.60	223.00	5,295.16	-1,089.62	-1,188.07	0.00	126.54	14,437,192.11	1,685,208.92	
5,800.00	35.60	223.00	5,376.47	-1,132.20	-1,227.77	0.00	126.56	14,437,149.53	1,685,169.22	
5,900.00	35.60	223.00	5,457.78	-1,174.77	-1,267.47	0.00	126.59	14,437,106.96	1,685,129.52	
6,000.00	35.60	223.00	5,539.09	-1,217.35	-1,307.17	0.00	126.62	14,437,064.39	1,685,089.81	
6,100.00	35.60	223.00	5,620.40	-1,259.92	-1,346.88	0.00	126.65	14,437,021.81	1,685,050.11	
6,200.00	35.60	223.00	5,701.71	-1,302.49	-1,386.58	0.00	126.67	14,436,979.24	1,685,010.41	
6,300.00	35.60	223.00	5,783.02	-1,345.07	-1,426.28	0.00	126.70	14,436,936.67	1,684,970.71	
6,319.65	35.60	223.00	5,799.00	-1,353.43	-1,434.08	0.00	126.71	14,436,928.30	1,684,962.91	
Begin 10°/100' build/turn										
6,400.00	34.18	236.85	5,865.01	-1,382.93	-1,468.98	10.00	132.14	14,436,898.81	1,684,928.01	
6,500.00	34.69	254.56	5,947.70	-1,405.92	-1,520.06	10.00	153.84	14,436,875.81	1,684,876.93	
6,600.00	37.61	270.82	6,028.63	-1,413.07	-1,578.14	10.00	191.46	14,436,868.66	1,684,818.85	
6,700.00	42.43	284.49	6,105.34	-1,404.17	-1,641.47	10.00	243.86	14,436,877.56	1,684,755.52	
6,800.00	48.58	295.57	6,175.51	-1,379.48	-1,708.12	10.00	309.46	14,436,902.25	1,684,688.87	
6,900.00	55.60	304.62	6,236.99	-1,339.76	-1,776.06	10.00	386.25	14,436,941.97	1,684,620.93	

151-01757



Standard_Report

Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Greer Unit N
 Well: Greer 1N 1M
 Wellbore: Original Hole
 Design: rev0

Local Co-ordinate Reference: Well Greer 1H
 TVD Reference: GL=1251 @ 1251.00usft ()
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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (*/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
7,000.00	63.18	312.21	6,287.93	-1,286.21	-1,843.23	10.00	471.90	14,436,995.52	1,684,553.76
7,100.00	71.11	318.82	6,326.78	-1,220.45	-1,907.59	10.00	563.81	14,437,061.28	1,684,489.40
7,200.00	79.26	324.83	6,352.34	-1,144.50	-1,967.19	10.00	659.19	14,437,137.24	1,684,429.80
7,202.93	79.50	325.00	6,352.88	-1,142.14	-1,968.84	10.00	662.01	14,437,139.59	1,684,428.15
7,300.00	88.41	328.87	6,363.10	-1,061.32	-2,021.42	10.00	755.57	14,437,220.41	1,684,375.57
7,328.16	91.00	329.98	6,363.24	-1,037.08	-2,035.74	10.00	782.57	14,437,244.65	1,684,361.25
Begin 91.00° lateral section									
7,400.00	91.00	329.98	6,361.99	-974.89	-2,071.68	0.00	851.26	14,437,306.84	1,684,325.31
7,500.00	91.00	329.98	6,360.24	-888.32	-2,121.70	0.00	946.87	14,437,393.42	1,684,275.29
7,600.00	91.00	329.98	6,358.49	-801.74	-2,171.72	0.00	1,042.48	14,437,479.99	1,684,225.27
7,700.00	91.00	329.98	6,356.75	-715.17	-2,221.75	0.00	1,138.09	14,437,566.56	1,684,175.24
7,800.00	91.00	329.98	6,355.00	-628.60	-2,271.77	0.00	1,233.71	14,437,653.13	1,684,125.22
7,900.00	91.00	329.98	6,353.25	-542.03	-2,321.79	0.00	1,329.32	14,437,739.70	1,684,075.20
8,000.00	91.00	329.98	6,351.50	-455.46	-2,371.81	0.00	1,424.93	14,437,826.28	1,684,025.18
8,100.00	91.00	329.98	6,349.76	-368.88	-2,421.83	0.00	1,520.54	14,437,912.85	1,683,975.16
8,200.00	91.00	329.98	6,348.01	-282.31	-2,471.86	0.00	1,616.16	14,437,999.42	1,683,925.13
8,300.00	91.00	329.98	6,346.26	-195.74	-2,521.88	0.00	1,711.77	14,438,085.99	1,683,875.11
8,400.00	91.00	329.98	6,344.52	-109.17	-2,571.90	0.00	1,807.38	14,438,172.57	1,683,825.09
8,500.00	91.00	329.98	6,342.77	-22.59	-2,621.92	0.00	1,902.99	14,438,259.14	1,683,775.07
8,600.00	91.00	329.98	6,341.02	63.98	-2,671.94	0.00	1,998.60	14,438,345.71	1,683,725.05
8,700.00	91.00	329.98	6,339.27	150.55	-2,721.97	0.00	2,094.22	14,438,432.28	1,683,675.02
8,800.00	91.00	329.98	6,337.53	237.12	-2,771.99	0.00	2,189.83	14,438,518.85	1,683,625.00
8,900.00	91.00	329.98	6,335.78	323.69	-2,822.01	0.00	2,285.44	14,438,605.43	1,683,574.98
9,000.00	91.00	329.98	6,334.03	410.27	-2,872.03	0.00	2,381.05	14,438,692.00	1,683,524.96
9,100.00	91.00	329.98	6,332.28	496.84	-2,922.05	0.00	2,476.66	14,438,778.57	1,683,474.94
9,200.00	91.00	329.98	6,330.54	583.41	-2,972.08	0.00	2,572.28	14,438,865.14	1,683,424.91
9,300.00	91.00	329.98	6,328.79	669.98	-3,022.10	0.00	2,667.89	14,438,951.71	1,683,374.89

LS110-15



Standard_Report

Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Greer Unit N
 Well: Greer 1N 1M
 Wellbore: Original Hole
 Design: rev0

Local Co-ordinate Reference: Well Greer 1H
 TVD Reference: GL=1251 @ 1251.00usft ()
 MD Reference: GL=1251 @ 1251.00usft ()
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Dbase Nov0914

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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
9,400.00	91.00	329.98	6,327.04	756.56	-3,072.12	0.00	2,763.50	14,439,038.29	1,683,324.87
9,500.00	91.00	329.98	6,325.30	843.13	-3,122.14	0.00	2,859.11	14,439,124.86	1,683,274.85
9,600.00	91.00	329.98	6,323.55	929.70	-3,172.16	0.00	2,954.73	14,439,211.43	1,683,224.83
9,700.00	91.00	329.98	6,321.80	1,016.27	-3,222.19	0.00	3,050.34	14,439,298.00	1,683,174.80
9,800.00	91.00	329.98	6,320.05	1,102.84	-3,272.21	0.00	3,145.95	14,439,384.58	1,683,124.78
9,900.00	91.00	329.98	6,318.31	1,189.42	-3,322.23	0.00	3,241.56	14,439,471.15	1,683,074.76
10,000.00	91.00	329.98	6,316.56	1,275.99	-3,372.25	0.00	3,337.17	14,439,557.72	1,683,024.74
10,100.00	91.00	329.98	6,314.81	1,362.56	-3,422.27	0.00	3,432.79	14,439,644.29	1,682,974.71
10,200.00	91.00	329.98	6,313.06	1,449.13	-3,472.30	0.00	3,528.40	14,439,730.86	1,682,924.69
10,300.00	91.00	329.98	6,311.32	1,535.70	-3,522.32	0.00	3,624.01	14,439,817.44	1,682,874.67
10,400.00	91.00	329.98	6,309.57	1,622.28	-3,572.34	0.00	3,719.62	14,439,904.01	1,682,824.65
10,500.00	91.00	329.98	6,307.82	1,708.85	-3,622.36	0.00	3,815.23	14,439,990.58	1,682,774.63
10,600.00	91.00	329.98	6,306.08	1,795.42	-3,672.39	0.00	3,910.85	14,440,077.15	1,682,724.60
10,700.00	91.00	329.98	6,304.33	1,881.99	-3,722.41	0.00	4,006.46	14,440,163.73	1,682,674.58
10,800.00	91.00	329.98	6,302.58	1,968.57	-3,772.43	0.00	4,102.07	14,440,250.30	1,682,624.56
10,900.00	91.00	329.98	6,300.83	2,055.14	-3,822.45	0.00	4,197.68	14,440,336.87	1,682,574.54
11,000.00	91.00	329.98	6,299.09	2,141.71	-3,872.47	0.00	4,293.30	14,440,423.44	1,682,524.52
11,100.00	91.00	329.98	6,297.34	2,228.28	-3,922.50	0.00	4,388.91	14,440,510.01	1,682,474.49
11,200.00	91.00	329.98	6,295.59	2,314.85	-3,972.52	0.00	4,484.52	14,440,596.59	1,682,424.47
11,300.00	91.00	329.98	6,293.84	2,401.43	-4,022.54	0.00	4,580.13	14,440,683.16	1,682,374.45
11,400.00	91.00	329.98	6,292.10	2,488.00	-4,072.56	0.00	4,675.74	14,440,769.73	1,682,324.43
11,500.00	91.00	329.98	6,290.35	2,574.57	-4,122.58	0.00	4,771.36	14,440,856.30	1,682,274.41
11,600.00	91.00	329.98	6,288.60	2,661.14	-4,172.61	0.00	4,866.97	14,440,942.87	1,682,224.38
11,700.00	91.00	329.98	6,286.86	2,747.72	-4,222.63	0.00	4,962.58	14,441,029.45	1,682,174.36
11,800.00	91.00	329.98	6,285.11	2,834.29	-4,272.65	0.00	5,058.19	14,441,116.02	1,682,124.34
11,900.00	91.00	329.98	6,283.36	2,920.86	-4,322.67	0.00	5,153.80	14,441,202.59	1,682,074.32
12,000.00	91.00	329.98	6,281.61	3,007.43	-4,372.69	0.00	5,249.42	14,441,289.16	1,682,024.30

SI-01757



Standard_Report

Company: Tug Hill Operating LLC
 Project: Marshall County, West Virginia
 Site: Greer Unit N
 Well: Greer 1N 1M
 Wellbore: Original Hole
 Design: rev0

Local Co-ordinate Reference: Well Greer 1 H
 TVD Reference: GL=1251 @ 1251.00usft ()
 MD Reference: GL=1251 @ 1251.00usft ()
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Dbase Nov0914

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Planned Survey

MD (usft)	Inc (°)	Azl (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
12,100.00	91.00	329.98	6,279.87	3,094.00	-4,422.72	0.00	5,345.03	14,441,375.74	1,681,974.27
12,200.00	91.00	329.98	6,278.12	3,180.58	-4,472.74	0.00	5,440.64	14,441,462.31	1,681,924.25
12,300.00	91.00	329.98	6,276.37	3,267.15	-4,522.76	0.00	5,536.25	14,441,548.88	1,681,874.23
12,400.00	91.00	329.98	6,274.62	3,353.72	-4,572.78	0.00	5,631.87	14,441,635.45	1,681,824.21
12,500.00	91.00	329.98	6,272.88	3,440.29	-4,622.80	0.00	5,727.48	14,441,722.02	1,681,774.19
12,600.00	91.00	329.98	6,271.13	3,526.86	-4,672.83	0.00	5,823.09	14,441,808.60	1,681,724.16
12,700.00	91.00	329.98	6,269.38	3,613.44	-4,722.85	0.00	5,918.70	14,441,895.17	1,681,674.14
12,800.00	91.00	329.98	6,267.64	3,700.01	-4,772.87	0.00	6,014.31	14,441,981.74	1,681,624.12
12,900.00	91.00	329.98	6,265.89	3,786.58	-4,822.89	0.00	6,109.93	14,442,068.31	1,681,574.10
13,000.00	91.00	329.98	6,264.14	3,873.15	-4,872.91	0.00	6,205.54	14,442,154.89	1,681,524.08
13,100.00	91.00	329.98	6,262.39	3,959.73	-4,922.94	0.00	6,301.15	14,442,241.46	1,681,474.05
13,200.00	91.00	329.98	6,260.65	4,046.30	-4,972.96	0.00	6,396.76	14,442,328.03	1,681,424.03
13,300.00	91.00	329.98	6,258.90	4,132.87	-5,022.98	0.00	6,492.37	14,442,414.60	1,681,374.01
13,400.00	91.00	329.98	6,257.15	4,219.44	-5,073.00	0.00	6,587.99	14,442,501.17	1,681,323.99
13,500.00	91.00	329.98	6,255.41	4,306.01	-5,123.02	0.00	6,683.60	14,442,587.75	1,681,273.96
13,600.00	91.00	329.98	6,253.66	4,392.59	-5,173.05	0.00	6,779.21	14,442,674.32	1,681,223.94
13,700.00	91.00	329.98	6,251.91	4,479.16	-5,223.07	0.00	6,874.82	14,442,760.89	1,681,173.92
13,800.00	91.00	329.98	6,250.16	4,565.73	-5,273.09	0.00	6,970.44	14,442,847.46	1,681,123.90
13,900.00	91.00	329.98	6,248.42	4,652.30	-5,323.11	0.00	7,066.05	14,442,934.03	1,681,073.88
14,000.00	91.00	329.98	6,246.67	4,738.87	-5,373.14	0.00	7,161.66	14,443,020.61	1,681,023.85
14,100.00	91.00	329.98	6,244.92	4,825.45	-5,423.16	0.00	7,257.27	14,443,107.18	1,680,973.83
14,200.00	91.00	329.98	6,243.17	4,912.02	-5,473.18	0.00	7,352.88	14,443,193.75	1,680,923.81
14,300.00	91.00	329.98	6,241.43	4,998.59	-5,523.20	0.00	7,448.50	14,443,280.32	1,680,873.79
14,400.00	91.00	329.98	6,239.68	5,085.16	-5,573.22	0.00	7,544.11	14,443,366.90	1,680,823.77
14,500.00	91.00	329.98	6,237.93	5,171.74	-5,623.25	0.00	7,639.72	14,443,453.47	1,680,773.74
14,600.00	91.00	329.98	6,236.19	5,258.31	-5,673.27	0.00	7,735.33	14,443,540.04	1,680,723.72

51-01757



Standard_Report

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Company: Tug Hill Operating LLC
Project: Marshall County, West Virginia
Site: Greer Unit N
Well: Greer 1N 1M
Wellbore: Original Hole
Design: rev0

Local Co-ordinate Reference: Well Greer 1#
TVD Reference: GL=1251 @ 1251.00usft ()
MD Reference: GL=1251 @ 1251.00usft ()
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Dbase Nov0914

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
14,667.83	91.00	329.98	6,235.00	5,317.03	-5,707.20	0.00	7,800.19	14,443,598.77	1,680,689.79
PBHL/TD									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,001.65	1,000.00	Casing @ 1000 TVD	13-3/8	17
2,610.47	2,600.00	Int Casing @ 2600 TVD	9-5/8	12-1/4

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/S (usft)	+E/W (usft)	
500.00	500.00	0.00	0.00	KOP Begin 2°/100' build
800.00	799.45	-10.30	-11.84	Begin 6.00° tangent section
2,711.02	2,700.00	-141.35	-162.60	Begin 2°/100' build
4,191.02	4,068.21	-482.32	-554.85	Begin 35.60° tangent section
4,845.05	4,600.00	-732.10	-842.19	Begin 2°/100' turn
5,145.05	4,843.93	-853.36	-967.75	Begin 35.60° tangent section
6,319.65	5,799.00	-1,353.43	-1,434.08	Begin 10°/100' build/turn
7,202.93	6,352.88	-1,142.14	-1,968.84	
7,328.16	6,363.24	-1,037.08	-2,035.74	Begin 91.00° lateral section
14,667.83	6,235.00	5,317.03	-5,707.20	PBHL/TD