



**Tug Hill Operating LLC**  
**Well: Greer 1N-01M**  
**Site: Greer Unit N**  
**Project: Marshall County, WV**  
**Design: rev5**

**SECTION DETAILS**

MD	Inc	Azi	+N-S	+E-W	Dleg	TFace	VSec	Annotation
6089.00	35.53	220.85	5610.59	-1215.44	-1295.01	0.00	0.00	119.01
6170.00	35.53	220.85	5676.51	-1251.05	-1325.60	0.00	0.00	117.27
6360.73	35.53	220.85	5848.00	-1343.68	-1405.90	0.00	0.00	112.73
7250.19	80.00	319.70	6384.40	-1174.47	-1958.38	10.00	102.98	632.31
7401.22	91.00	330.10	6396.26	-1051.59	-2044.62	10.00	43.83	779.17
14749.03	91.00	330.10	6268.00	5317.03	-5707.20	0.00	0.00	7800.19

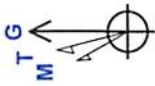
  

MD	Inc	Azi	+N-S	+E-W	VSecDeparture	Annotation
100.00	0.37	67.33	100.00	0.30	-0.13	0.32
2647.00	8.05	229.52	2637.48	-102.72	-125.72	22.35
14640.00	91.16	329.34	6357.08	-5679.75	7747.63	10000.64
14692.00	91.16	329.34	6356.02	5314.12	-5706.26	7797.51

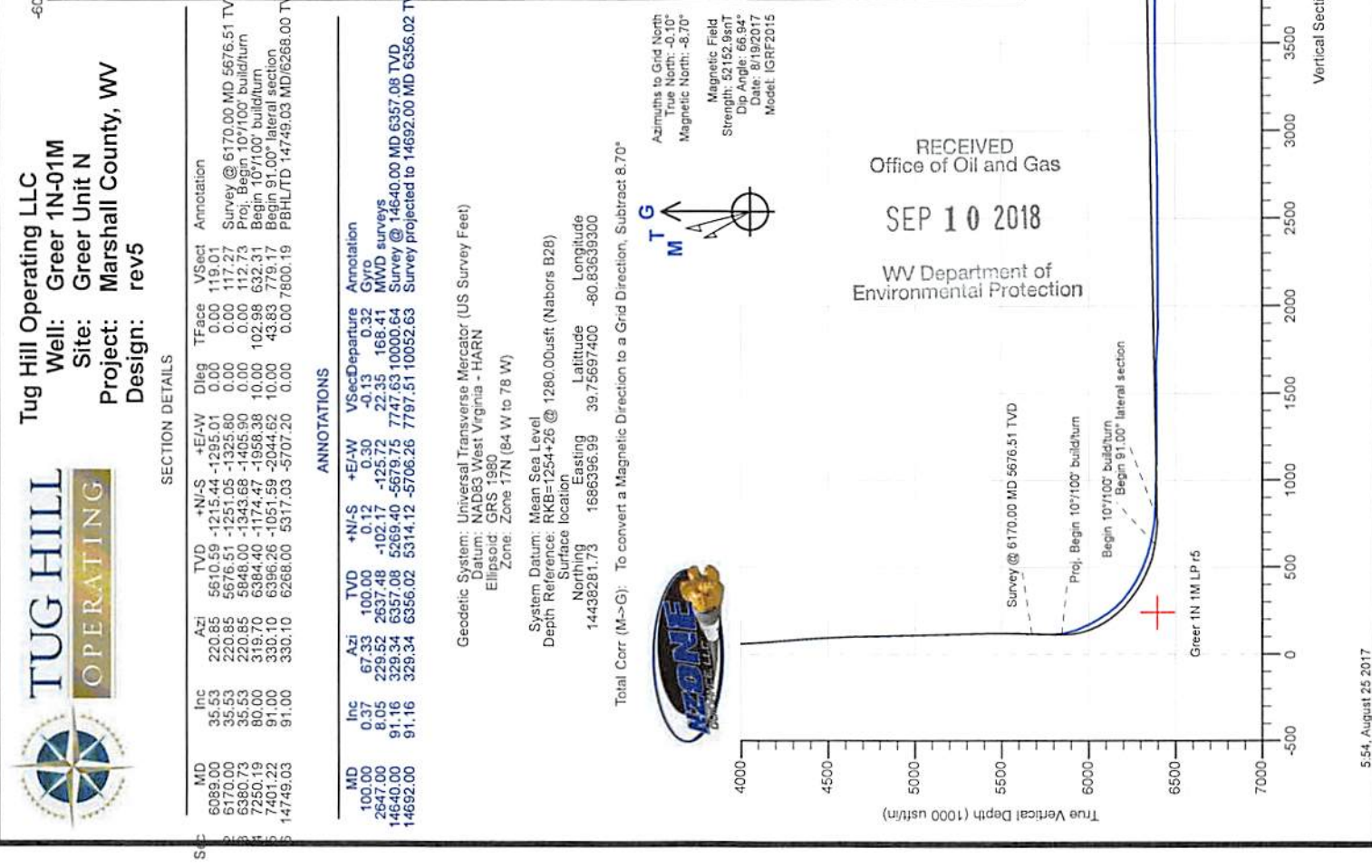
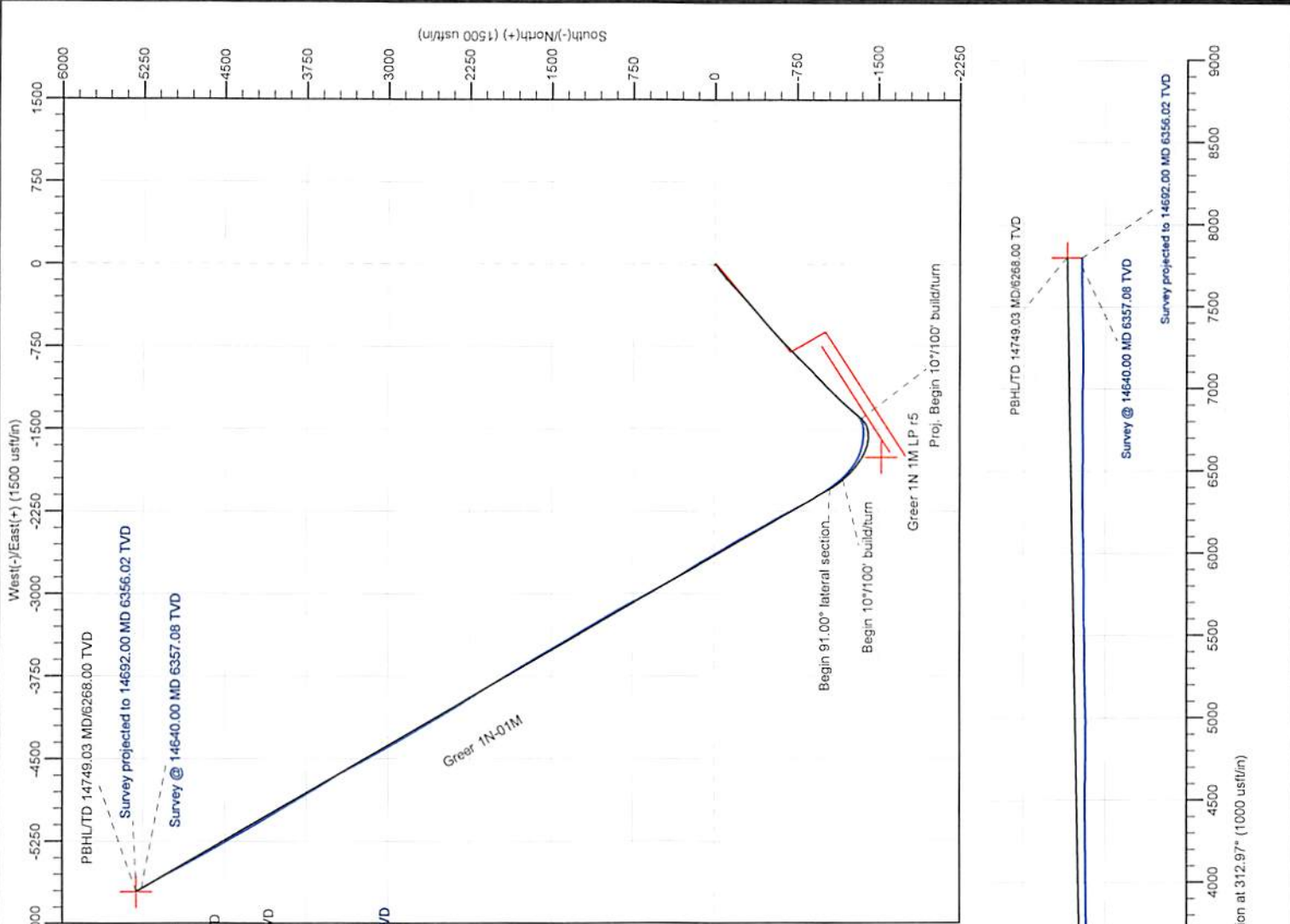
Geocentric System: Universal Transverse Mercator (US Survey Feet)  
 Datum: NAD83 West Virginia - HARN  
 Ellipsoid: GRS 1980  
 Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level  
 Depth Reference: RKB=1254+26 @ 1280.00usft (Nabors B28)  
 Surface location  
 Northing 14438281.73 Easting 1686396.99  
 Latitude 39.75697400 Longitude -80.83639300

Total Corr (M->G): To convert a Magnetic Direction to a Grid Direction, Subtract 8.70°



Azimuths to Grid North  
 True North: -0.10°  
 Magnetic North: -8.70°  
 Magnetic Field  
 Strength: 52152.9nT  
 Dip Angle: 66.94°  
 Date: 8/19/2017  
 Model: IGRF2015



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Company: Tug Hill Operations LLC  
 Well: Greer 1N1HM  
 API: 47-051-01757  
 Rig Name: Nabors B-28  
 State/County: West Virginia/Marshall  
 VS-Azi: 0.00 Degrees  
 Latitude: 39.75697, Longitude: -80.83639  
 Grid North = True North +0.85 degs (NAD 27)  
 Grid Correction Applied = +0.85 degs



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = 25.625 feet  
 DRILLOG HA GYRO SURVEY CALCULATIONS  
 Error Model: VESSI\_GYROFLEX.IPM  
 Minimum Curvature Method  
 Report Date/Time: 3/14/2017 / 00:57  
 VES Survey International  
 Morgantown, WV  
 304-777-2189  
 James Hollis

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Measured Incl Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	N/S FT	E/W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.37	67.33	100.00	0.12	0.29	0.12	0.32	67.33	0.37
200.00	0.18	27.58	200.00	0.39	0.66	0.39	0.77	59.62	0.25
300.00	0.55	275.62	300.00	0.58	0.26	0.58	0.63	24.32	0.64
400.00	0.22	221.84	399.99	0.48	-0.34	0.48	0.59	324.45	0.45
500.00	0.19	187.49	499.99	0.18	-0.49	0.18	0.52	289.56	0.13
600.00	0.21	7.19	599.99	0.20	-0.49	0.20	0.53	291.64	0.40
700.00	0.50	178.94	699.99	-0.06	-0.46	-0.06	0.47	262.87	0.71
800.00	0.21	72.17	799.99	-0.44	-0.28	-0.44	0.52	212.64	0.59
900.00	0.30	129.78	899.99	-0.55	0.10	-0.55	0.56	169.92	0.26
Tie in point from previous VES Survey									
935.00	0.25	96.89	934.99	-0.62	0.24	-0.62	0.66	158.37	0.47
1000.00	0.11	100.36	999.99	-0.65	0.45	-0.65	0.79	145.31	0.22
1100.00	0.23	115.56	1099.99	-0.75	0.72	-0.75	1.04	136.05	0.13
1200.00	2.05	208.04	1199.97	-2.42	0.07	-2.42	2.42	178.44	2.07
1300.00	4.13	219.12	1299.82	-6.79	-3.05	-6.79	7.44	204.17	2.15

1400.00	4.93	225.87	1399.51	-12.57	-8.40	-12.57	15.12	213.75	0.96
1500.00	6.09	235.75	1499.04	-18.54	-15.86	-18.54	24.40	220.55	1.49
1600.00	7.90	237.43	1598.30	-25.23	-26.04	-25.23	36.26	225.91	1.83
1700.00	8.58	235.25	1697.26	-33.18	-37.96	-33.18	50.42	228.85	0.75
1800.00	7.62	234.68	1796.26	-41.26	-49.50	-41.26	64.45	230.19	0.97
1900.00	7.43	232.19	1895.40	-49.06	-60.02	-49.06	77.51	230.74	0.38
2000.00	6.89	228.90	1994.63	-56.96	-69.64	-56.96	89.97	230.72	0.67
2100.00	7.74	227.58	2093.81	-65.45	-79.14	-65.45	102.69	230.41	0.86
2200.00	6.47	227.83	2193.04	-73.77	-88.28	-73.77	115.05	230.12	1.27
2300.00	4.82	229.35	2292.55	-80.29	-95.64	-80.29	124.87	229.99	1.66
2400.00	4.90	230.16	2392.19	-85.76	-102.11	-85.76	133.34	229.97	0.11
2500.00	6.74	238.98	2491.68	-91.52	-110.42	-91.52	143.42	230.35	2.04
2564.00	7.10	237.27	2555.21	-95.60	-116.97	-95.60	151.07	230.74	0.65

HORIZONTAL DISPLACEMENT IS  
151.07 FEET AT 230.74 DEGREES

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