



Company: Noble Energy
Lease/Well: Henry/5-3
API: 05-123-13925
Rig Name: Production\ Lightning
State/County: Colorado/Weld
Latitude: 40.151, Longitude: -104.633
GRID North is 0.560 Degrees East of True North
VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: henry5-3-01_ed.ut
Minimum Curvature Method
Report Date/Time: 9/9/2011 / 16:31

Vaughn Energy Services
Henderson, Colorado
303-853-4976
Daniel Lynch

Measured 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
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	0.172	18.357	100.000	0.143	0.047	0.143	0.150	18.357	0.172
200.000	0.094	308.469	200.000	0.336	0.030	0.336	0.338	5.125	0.165
300.000	0.088	145.980	300.000	0.324	0.009	0.324	0.324	1.535	0.180
400.000	0.275	109.849	399.999	0.179	0.277	0.179	0.330	57.220	0.211
500.000	0.349	94.023	499.998	0.076	0.807	0.076	0.810	84.632	0.113
600.000	0.323	83.559	599.996	0.086	1.390	0.086	1.393	86.457	0.066
700.000	0.380	76.655	699.994	0.194	1.993	0.194	2.003	84.435	0.070
800.000	0.389	62.360	799.992	0.428	2.616	0.428	2.651	80.704	0.096
900.000	0.271	100.800	899.990	0.542	3.150	0.542	3.196	80.243	0.244
1000.000	0.331	26.967	999.989	0.755	3.513	0.755	3.593	77.870	0.365
1100.000	0.329	62.090	1099.988	1.147	3.898	1.147	4.063	73.601	0.199
1200.000	0.210	118.622	1199.987	1.194	4.312	1.194	4.475	74.525	0.276
1300.000	0.046	149.653	1299.986	1.071	4.493	1.071	4.619	76.589	0.172
1400.000	0.156	112.612	1399.986	0.984	4.640	0.984	4.743	78.023	0.122
1500.000	0.158	155.777	1499.986	0.806	4.822	0.806	4.889	80.513	0.116
1600.000	0.133	222.041	1599.986	0.593	4.801	0.593	4.837	82.954	0.161
1700.000	0.297	215.007	1699.985	0.295	4.574	0.295	4.584	86.311	0.165
1800.000	0.248	196.493	1799.984	-0.125	4.364	-0.125	4.366	91.634	0.100
1900.000	0.326	199.433	1899.982	-0.600	4.208	-0.600	4.251	98.117	0.080
2000.000	0.385	217.698	1999.981	-1.135	3.908	-1.135	4.069	106.191	0.127
2100.000	0.466	228.698	2099.978	-1.669	3.397	-1.669	3.785	116.169	0.114
2200.000	0.411	235.329	2199.975	-2.142	2.796	-2.142	3.522	127.450	0.075
2300.000	0.573	224.857	2299.971	-2.701	2.148	-2.701	3.451	141.499	0.185
2400.000	1.079	238.353	2399.961	-3.549	0.994	-3.549	3.686	164.356	0.538
2500.000	0.946	233.931	2499.945	-4.529	-0.475	-4.529	4.554	185.987	0.154
2600.000	1.106	247.719	2599.929	-5.381	-2.035	-5.381	5.753	200.716	0.293
2700.000	1.123	227.647	2699.911	-6.407	-3.652	-6.407	7.375	209.682	0.389
2800.000	1.151	238.654	2799.891	-7.590	-5.234	-7.590	9.219	214.590	0.220
2900.000	1.319	217.849	2899.868	-9.021	-6.798	-9.021	11.295	217.001	0.475
3000.000	1.240	221.181	2999.843	-10.744	-8.216	-10.744	13.526	217.407	0.108
3100.000	1.558	224.949	3099.813	-12.520	-9.889	-12.520	15.955	218.304	0.330
3200.000	1.498	227.226	3199.778	-14.370	-11.809	-14.370	18.599	219.413	0.085
3300.000	1.420	221.616	3299.745	-16.183	-13.591	-16.183	21.133	220.024	0.163
3400.000	1.181	220.049	3399.720	-17.899	-15.077	-17.899	23.403	220.109	0.241

Measured 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
3500.000	1.004	216.237	3499.701	-19.394	-16.258	-19.394	25.307	219.973	0.192
3600.000	0.862	209.124	3599.688	-20.758	-17.142	-20.758	26.920	219.550	0.183
3700.000	0.640	222.361	3699.680	-21.827	-17.884	-21.827	28.218	219.329	0.280
3800.000	0.742	225.795	3799.672	-22.691	-18.724	-22.691	29.419	219.529	0.110
3900.000	0.487	246.759	3899.667	-23.310	-19.579	-23.310	30.441	220.028	0.336
4000.000	1.163	294.659	3999.657	-23.054	-20.892	-23.054	31.112	222.183	0.911
4100.000	1.457	329.573	4099.632	-21.534	-22.458	-21.534	31.114	226.204	0.835
4200.000	1.656	326.519	4199.595	-19.232	-23.900	-19.232	30.677	231.176	0.215
4300.000	1.451	319.432	4299.558	-17.065	-25.521	-17.065	30.700	236.231	0.281
4400.000	1.625	324.591	4399.522	-14.947	-27.165	-14.947	31.006	241.179	0.222
4500.000	1.254	333.118	4499.491	-12.816	-28.481	-12.816	31.232	245.773	0.428
4600.000	1.061	331.853	4599.470	-11.024	-29.413	-11.024	31.411	249.453	0.194
4700.000	1.375	321.393	4699.448	-9.270	-30.598	-9.270	31.972	253.145	0.384
4800.000	1.205	323.343	4799.422	-7.488	-31.975	-7.488	32.840	256.819	0.175
4900.000	1.146	316.202	4899.401	-5.923	-33.295	-5.923	33.818	259.913	0.158
5000.000	0.690	310.199	4999.388	-4.813	-34.447	-4.813	34.781	262.046	0.465
5100.000	0.687	307.013	5099.381	-4.064	-35.385	-4.064	35.617	263.448	0.038
5200.000	0.811	318.182	5199.372	-3.176	-36.335	-3.176	36.473	265.005	0.191
5300.000	0.640	304.511	5299.364	-2.332	-37.267	-2.332	37.340	266.419	0.242
5400.000	0.489	305.026	5399.360	-1.771	-38.076	-1.771	38.117	267.337	0.151
5500.000	0.709	325.082	5499.354	-1.019	-38.780	-1.019	38.793	268.495	0.301
5600.000	0.558	321.002	5599.348	-0.133	-39.441	-0.133	39.441	269.807	0.158
5700.000	0.503	327.639	5699.344	0.617	-39.982	0.617	39.987	270.884	0.082
5800.000	0.337	315.785	5799.341	1.198	-40.422	1.198	40.440	271.698	0.187
5900.000	0.441	13.164	5899.339	1.784	-40.540	1.784	40.579	272.520	0.384
6000.000	0.450	69.753	5999.336	2.294	-40.084	2.294	40.150	273.276	0.422
6100.000	0.518	53.154	6099.333	2.701	-39.354	2.701	39.447	273.926	0.155
6200.000	0.627	84.334	6199.328	3.026	-38.449	3.026	38.568	274.500	0.325
6300.000	0.728	61.875	6299.321	3.379	-37.344	3.379	37.497	275.170	0.282
6400.000	0.695	83.127	6399.314	3.751	-36.182	3.751	36.376	275.919	0.264
6500.000	0.928	53.442	6499.304	4.306	-34.930	4.306	35.194	277.028	0.473
6600.000	0.611	77.446	6599.295	4.905	-33.759	4.905	34.113	278.266	0.446
6700.000	0.609	80.943	6699.290	5.104	-32.714	5.104	33.109	278.868	0.037
6800.000	0.489	95.247	6799.285	5.149	-31.764	5.149	32.179	279.207	0.182
6900.000	0.474	98.821	6899.281	5.046	-30.930	5.046	31.339	279.266	0.033
7000.000	0.594	80.910	6999.277	5.065	-30.010	5.065	30.434	279.579	0.204
HORIZONTAL DISPLACEMENT IS 30.434 FEET AT 279.579 DEGREES									