



Company/Rig: Noble Energy/ CoreTech
WELL/API#: GWAA 3-11/05-123-26992
DECLINATION: 8.33 Degrees
TD AS DRILLED: 7136 Feet
COUNTY/STATE: Weld/Colorado
Latitude: 40.433, Longitude: -104.643
GRID North is 0.550 Degrees East of True North
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4658 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 1/12/2015 / 13:36

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt

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	0.328	99.409	99.999	-0.047	0.283	-0.047	0.287	99.409	0.328
200.000	0.069	96.081	199.999	-0.100	0.625	-0.100	0.633	99.094	0.260
300.000	0.337	256.250	299.998	-0.176	0.400	-0.176	0.437	113.803	0.402
400.000	0.939	290.387	399.992	0.039	-0.654	0.039	0.655	273.452	0.687
500.000	1.170	259.683	499.976	0.142	-2.426	0.142	2.430	273.353	0.601
600.000	1.654	273.054	599.945	0.036	-4.872	0.036	4.872	270.426	0.583
700.000	1.602	283.926	699.905	0.450	-7.670	0.450	7.683	273.355	0.313
800.000	2.127	283.362	799.852	1.215	-10.832	1.215	10.900	276.399	0.525
900.000	2.665	281.922	899.764	2.124	-14.912	2.124	15.063	278.106	0.542
1000.000	2.406	277.492	999.666	2.878	-19.268	2.878	19.482	278.495	0.325
1100.000	2.647	272.310	1099.569	3.245	-23.656	3.245	23.877	277.810	0.332
1200.000	3.084	281.430	1199.444	3.871	-28.599	3.871	28.860	277.708	0.630
1300.000	2.988	275.761	1299.304	4.665	-33.829	4.665	34.149	277.852	0.315
1400.000	3.102	278.296	1399.163	5.317	-39.100	5.317	39.460	277.744	0.177
1500.000	3.006	280.377	1499.021	6.180	-44.357	6.180	44.785	277.932	0.147
1600.000	2.925	282.345	1598.887	7.198	-49.428	7.198	49.949	278.285	0.130
1700.000	2.631	278.840	1698.770	8.096	-54.188	8.096	54.789	278.497	0.339
1800.000	2.392	278.556	1798.673	8.759	-58.519	8.759	59.171	278.513	0.239
1900.000	2.344	276.198	1898.588	9.290	-62.616	9.290	63.301	278.439	0.108

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
2000.000	2.181	273.297	1998.510	9.621	-66.549	9.621	67.241	278.226	0.200
2100.000	2.084	271.284	2098.441	9.771	-70.266	9.771	70.942	277.916	0.123
2200.000	1.879	279.025	2198.381	10.069	-73.703	10.069	74.387	277.779	0.337
2300.000	2.087	264.189	2298.322	10.141	-77.133	10.141	77.797	277.490	0.552
2400.000	1.669	258.973	2398.268	9.679	-80.373	9.679	80.954	276.866	0.451
2500.000	1.844	277.529	2498.222	9.611	-83.398	9.611	83.950	276.574	0.592
2600.000	2.267	263.117	2598.158	9.585	-86.957	9.585	87.484	276.290	0.665
2700.000	2.396	271.698	2698.075	9.410	-91.010	9.410	91.495	275.903	0.372
2800.000	2.743	272.482	2797.975	9.575	-95.490	9.575	95.969	275.726	0.348
2900.000	2.676	266.267	2897.863	9.527	-100.210	9.527	100.662	275.431	0.301
3000.000	2.924	270.104	2997.744	9.379	-105.090	9.379	105.508	275.100	0.310
3100.000	2.702	266.762	3097.623	9.251	-109.994	9.251	110.382	274.807	0.276
3200.000	2.503	261.014	3197.520	8.777	-114.503	8.777	114.839	274.383	0.328
3300.000	2.280	261.654	3297.433	8.147	-118.628	8.147	118.907	273.929	0.224
3400.000	2.114	257.019	3397.360	7.444	-122.393	7.444	122.619	273.480	0.243
3500.000	2.099	262.151	3497.292	6.780	-126.004	6.780	126.187	273.080	0.189
3600.000	1.971	264.448	3597.229	6.363	-129.530	6.363	129.686	272.812	0.152
3700.000	1.793	259.268	3697.175	5.906	-132.779	5.906	132.910	272.547	0.246
3800.000	2.049	266.951	3797.119	5.519	-136.100	5.519	136.212	272.322	0.362
3900.000	2.006	262.842	3897.057	5.206	-139.622	5.206	139.719	272.135	0.151
4000.000	2.173	263.821	3996.990	4.784	-143.243	4.784	143.323	271.913	0.170
4100.000	2.489	263.712	4096.907	4.342	-147.286	4.342	147.350	271.689	0.316
4200.000	2.595	266.753	4196.809	3.976	-151.704	3.976	151.756	271.501	0.172
4300.000	2.865	260.939	4296.696	3.454	-156.432	3.454	156.470	271.265	0.386
4400.000	2.483	273.573	4396.587	3.196	-161.062	3.196	161.094	271.137	0.700
4500.000	2.536	277.183	4496.492	3.607	-165.419	3.607	165.458	271.249	0.167
4600.000	2.177	281.597	4596.407	4.266	-169.475	4.266	169.529	271.442	0.401
4700.000	1.890	285.283	4696.344	5.082	-172.926	5.082	173.001	271.683	0.316
4800.000	1.885	291.215	4796.290	6.112	-176.050	6.112	176.156	271.988	0.195
4900.000	1.763	294.046	4896.239	7.334	-178.987	7.334	179.138	272.346	0.151
5000.000	1.939	298.659	4996.187	8.772	-181.877	8.772	182.088	272.761	0.230
5100.000	1.265	284.090	5096.148	9.852	-184.432	9.852	184.695	273.058	0.782
5200.000	0.806	309.153	5196.131	10.565	-186.048	10.565	186.348	273.250	0.635
5300.000	0.620	320.716	5296.124	11.428	-186.936	11.428	187.285	273.498	0.234
5400.000	0.572	332.586	5396.118	12.290	-187.509	12.290	187.911	273.750	0.132
5500.000	0.663	317.693	5496.113	13.161	-188.128	13.161	188.588	274.002	0.183
5600.000	0.792	251.024	5596.106	13.364	-189.171	13.364	189.642	274.041	0.807
5700.000	0.913	218.580	5696.096	12.516	-190.321	12.516	190.733	273.763	0.490
5800.000	1.010	224.401	5796.082	11.264	-191.435	11.264	191.766	273.367	0.138
5900.000	0.981	234.440	5896.067	10.136	-192.748	10.136	193.014	273.010	0.177

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
6000.000	0.811	220.119	5996.054	9.097	-193.901	9.097	194.114	272.686	0.280
6100.000	0.542	211.198	6096.047	8.151	-194.602	8.151	194.772	272.399	0.289
6200.000	0.490	203.839	6196.043	7.356	-195.019	7.356	195.158	272.160	0.084
6300.000	0.240	115.876	6296.042	6.874	-195.003	6.874	195.124	272.019	0.538
6400.000	0.874	110.469	6396.037	6.516	-194.100	6.516	194.210	271.923	0.635
6500.000	1.021	92.385	6496.023	6.212	-192.496	6.212	192.596	271.848	0.331
6600.000	1.467	96.887	6595.999	6.021	-190.335	6.021	190.430	271.812	0.456
6700.000	1.983	87.866	6695.954	5.932	-187.335	5.932	187.429	271.814	0.581
6800.000	2.212	82.718	6795.887	6.241	-183.692	6.241	183.798	271.946	0.297
6850.000	2.347	73.479	6845.847	6.655	-181.753	6.655	181.875	272.097	0.782