



COMPANY/RIG: Noble Energy/Production/CoreTech  
WELL/API: Norris C Unit 01/05-123-10626  
DECLINATION: 8.09 Degrees  
TD AS DRILLED: 7657 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.15713, Longitude: -104.56912  
Grid North = True North -0.60 degs (NAD 27)  
Grid Correction Applied = -0.60 degs



DEPTH REFERENCE : RKB = GL Elevation = 4892

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 6/5/2017 / 11:20

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / Norris C Unit 01

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	0.460	253.566	99.999	-0.114	-0.385	-0.114	0.401	253.566	0.460
200.000	0.270	269.259	199.997	-0.230	-1.006	-0.230	1.032	257.113	0.213
300.000	0.330	280.315	299.996	-0.182	-1.525	-0.182	1.535	263.205	0.083
400.000	0.417	333.310	399.994	0.195	-1.971	0.195	1.981	275.655	0.342
500.000	0.363	298.775	499.991	0.673	-2.412	0.673	2.505	285.588	0.237
600.000	0.419	306.016	599.989	1.041	-2.986	1.041	3.162	289.213	0.075
700.000	0.436	348.952	699.987	1.629	-3.355	1.629	3.729	295.898	0.313
800.000	0.403	328.530	799.984	2.302	-3.611	2.302	4.282	302.513	0.152
900.000	0.380	343.395	899.982	2.919	-3.889	2.919	4.862	306.888	0.104
1000.000	0.386	335.118	999.979	3.542	-4.126	3.542	5.438	310.648	0.056
1100.000	0.418	338.752	1099.977	4.188	-4.400	4.188	6.074	313.587	0.041
1200.000	0.447	324.717	1199.974	4.846	-4.757	4.846	6.791	315.531	0.110
1300.000	0.314	313.627	1299.972	5.354	-5.181	5.354	7.450	315.940	0.152
1400.000	0.339	316.666	1399.970	5.757	-5.582	5.757	8.019	315.888	0.030
1500.000	0.305	317.453	1499.969	6.168	-5.964	6.168	8.580	315.963	0.034
1600.000	0.355	331.517	1599.967	6.636	-6.292	6.636	9.145	316.527	0.095

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
1700.000	0.341	311.527	1699.965	7.106	-6.662	7.106	9.741	316.847	0.122
1800.000	0.381	327.026	1799.963	7.582	-7.066	7.582	10.364	317.019	0.105
1900.000	0.328	311.884	1899.961	8.052	-7.460	8.052	10.976	317.188	0.107
2000.000	0.293	320.024	1999.960	8.439	-7.836	8.439	11.516	317.119	0.056
2100.000	0.170	296.897	2099.959	8.701	-8.133	8.701	11.910	316.934	0.152
2200.000	0.093	328.763	2199.959	8.838	-8.307	8.838	12.129	316.772	0.104
2300.000	0.143	326.928	2299.959	9.012	-8.418	9.012	12.332	316.953	0.051
2400.000	0.144	271.298	2399.958	9.120	-8.612	9.120	12.543	316.641	0.134
2500.000	0.165	257.842	2499.958	9.092	-8.878	9.092	12.708	315.683	0.042
2600.000	0.138	336.354	2599.958	9.172	-9.067	9.172	12.897	315.331	0.193
2700.000	0.154	17.986	2699.958	9.411	-9.074	9.411	13.073	316.045	0.105
2800.000	0.039	272.547	2799.957	9.541	-9.066	9.541	13.161	316.461	0.169
2900.000	0.080	136.280	2899.957	9.492	-9.052	9.492	13.116	316.358	0.111
3000.000	0.240	218.063	2999.957	9.277	-9.133	9.277	13.018	315.448	0.242
3100.000	0.428	233.357	3099.955	8.889	-9.562	8.889	13.055	312.912	0.207
3200.000	0.393	230.469	3199.953	8.448	-10.126	8.448	13.187	309.837	0.041
3300.000	0.523	235.441	3299.950	7.971	-10.766	7.971	13.396	306.515	0.136
3400.000	0.788	245.063	3399.943	7.422	-11.766	7.422	13.911	302.244	0.286
3500.000	0.816	244.407	3499.933	6.824	-13.032	6.824	14.710	297.640	0.029
3600.000	0.911	248.462	3599.922	6.225	-14.413	6.225	15.700	293.360	0.113
3700.000	0.931	253.614	3699.909	5.704	-15.932	5.704	16.922	289.698	0.085
3800.000	0.858	243.485	3799.897	5.140	-17.382	5.140	18.126	286.475	0.174
3900.000	1.025	229.909	3899.883	4.230	-18.736	4.230	19.208	282.723	0.278
4000.000	0.990	228.644	3999.868	3.083	-20.069	3.083	20.304	278.734	0.041
4100.000	1.188	244.934	4099.850	2.073	-21.656	2.073	21.755	275.468	0.365
4200.000	1.337	253.470	4199.826	1.302	-23.714	1.302	23.749	273.143	0.240
4300.000	1.366	242.432	4299.798	0.418	-25.889	0.418	25.892	270.926	0.262
4400.000	1.487	246.359	4399.767	-0.654	-28.134	-0.654	28.142	268.669	0.156
4500.000	1.533	257.276	4499.733	-1.469	-30.628	-1.469	30.663	267.255	0.291
4600.000	1.688	258.609	4599.693	-2.054	-33.377	-2.054	33.440	266.478	0.160
4700.000	1.736	256.700	4699.648	-2.694	-36.294	-2.694	36.394	265.756	0.074
4800.000	1.824	251.561	4799.600	-3.545	-39.278	-3.545	39.438	264.842	0.183
4900.000	1.830	254.874	4899.549	-4.466	-42.330	-4.466	42.565	263.978	0.106
5000.000	1.757	258.487	4999.500	-5.189	-45.374	-5.189	45.670	263.477	0.135
5100.000	1.808	277.876	5099.453	-5.278	-48.439	-5.278	48.726	263.781	0.602
5200.000	2.232	297.113	5199.392	-4.175	-51.735	-4.175	51.903	265.387	0.794
5300.000	2.461	316.161	5299.309	-1.738	-54.956	-1.738	54.983	268.188	0.809
5400.000	2.508	321.391	5399.215	1.520	-57.809	1.520	57.829	271.506	0.232
5500.000	2.410	334.511	5499.124	5.128	-60.079	5.128	60.298	274.879	0.570

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
5600.000	1.881	347.648	5599.054	8.630	-61.335	8.630	61.939	278.009	0.719
5700.000	1.999	3.069	5698.998	11.975	-61.593	11.975	62.746	281.002	0.533
5800.000	1.645	13.519	5798.947	15.112	-61.164	15.112	63.003	283.879	0.484
5900.000	1.010	14.771	5898.920	17.360	-60.604	17.360	63.041	285.985	0.636
6000.000	1.541	11.875	5998.895	19.528	-60.102	19.528	63.195	288.000	0.534
6100.000	1.189	11.985	6098.866	21.858	-59.610	21.858	63.491	290.137	0.352
6200.000	0.956	11.444	6198.849	23.690	-59.229	23.690	63.791	291.800	0.233
6300.000	0.065	20.646	6298.844	24.561	-59.044	24.561	63.948	292.586	0.891
6400.000	0.555	19.442	6398.842	25.071	-58.863	25.071	63.979	293.070	0.490
6500.000	0.709	94.901	6498.837	25.475	-58.085	25.475	63.425	293.681	0.783
6600.000	0.543	86.316	6598.831	25.452	-56.995	25.452	62.420	294.064	0.190
6700.000	0.630	112.628	6698.826	25.272	-56.015	25.272	61.452	294.283	0.280
6800.000	0.789	114.953	6798.818	24.770	-54.884	24.770	60.214	294.290	0.162
6900.000	0.725	123.809	6898.810	24.127	-53.734	24.127	58.902	294.181	0.133
7000.000	0.642	95.227	6998.803	23.724	-52.650	23.724	57.748	294.256	0.347
7100.000	0.699	104.762	7098.796	23.518	-51.502	23.518	56.618	294.543	0.125
7200.000	0.587	72.778	7198.790	23.514	-50.423	23.514	55.636	295.001	0.370
7300.000	0.443	82.976	7298.786	23.713	-49.549	23.713	54.931	295.575	0.170
7400.000	0.332	12.909	7398.784	24.042	-49.100	24.042	54.671	296.089	0.454
7450.000	0.336	26.202	7448.783	24.315	-49.003	24.315	54.704	296.390	0.155