



COMPANY/RIG: Noble Energy/Production/CoreTech  
WELL/API: Rothe 2/05-123-12960  
DECLINATION: 8.17 Degrees  
TD AS DRILLED: 6844 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.33598, Longitude: -104.51537  
Grid North = True North -0.64 degs (NAD 27)  
Grid Correction Applied = -0.64 degs



DEPTH REFERENCE : RKB = GL Elevation = 4615

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 7/1/2016 / 12:13

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / Rothe 2

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	0.406	187.742	99.999	-0.351	-0.048	-0.351	0.354	187.742	0.406
200.000	0.197	161.357	199.998	-0.864	-0.040	-0.864	0.865	182.683	0.245
300.000	0.450	154.776	299.996	-1.382	0.182	-1.382	1.394	172.505	0.256
400.000	0.329	140.217	399.994	-1.959	0.533	-1.959	2.030	164.772	0.156
500.000	0.568	131.947	499.991	-2.511	1.086	-2.511	2.735	156.616	0.247
600.000	0.561	153.108	599.986	-3.278	1.676	-3.278	3.682	152.928	0.207
700.000	0.556	152.956	699.981	-4.147	2.118	-4.147	4.656	152.950	0.005
800.000	0.464	143.623	799.977	-4.905	2.578	-4.905	5.542	152.272	0.124
900.000	0.464	143.303	899.974	-5.556	3.061	-5.556	6.343	151.151	0.003
1000.000	0.593	167.147	999.970	-6.385	3.418	-6.385	7.242	151.841	0.252
1100.000	0.519	194.797	1099.965	-7.327	3.417	-7.327	8.085	154.997	0.275
1200.000	0.495	210.357	1199.961	-8.138	3.083	-8.138	8.703	159.252	0.139
1300.000	0.466	223.481	1299.958	-8.806	2.585	-8.806	9.178	163.640	0.114
1400.000	0.428	235.948	1399.955	-9.310	1.996	-9.310	9.521	167.897	0.104
1500.000	0.494	248.695	1499.952	-9.675	1.286	-9.675	9.760	172.431	0.122
1600.000	0.553	252.125	1599.947	-9.980	0.425	-9.980	9.989	177.564	0.067
1700.000	0.550	269.865	1699.943	-10.130	-0.515	-10.130	10.143	182.913	0.170
1800.000	0.598	276.383	1799.938	-10.073	-1.514	-10.073	10.186	188.549	0.081

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
1900.000	0.539	265.837	1899.933	-10.049	-2.502	-10.049	10.356	193.979	0.120
2000.000	0.558	262.952	1999.928	-10.143	-3.454	-10.143	10.715	198.807	0.034
2100.000	0.416	260.106	2099.925	-10.265	-4.296	-10.265	11.128	202.710	0.144
2200.000	0.423	253.620	2199.922	-10.432	-5.008	-10.432	11.571	205.645	0.048
2300.000	0.400	226.025	2299.920	-10.778	-5.613	-10.778	12.152	207.511	0.198
2400.000	0.699	225.336	2399.915	-11.449	-6.298	-11.449	13.067	208.815	0.299
2500.000	0.592	239.765	2499.909	-12.138	-7.178	-12.138	14.102	210.601	0.194
2600.000	0.505	217.610	2599.904	-12.747	-7.894	-12.747	14.994	211.769	0.228
2700.000	0.621	241.489	2699.899	-13.355	-8.639	-13.355	15.906	212.898	0.259
2800.000	0.600	245.627	2799.894	-13.829	-9.592	-13.829	16.830	214.744	0.049
2900.000	0.551	245.489	2899.889	-14.245	-10.505	-14.245	17.700	216.409	0.049
3000.000	0.542	243.678	2999.884	-14.654	-11.367	-14.654	18.546	217.800	0.019
3100.000	0.455	256.427	3099.880	-14.957	-12.177	-14.957	19.287	219.150	0.140
3200.000	0.291	332.963	3199.879	-14.824	-12.679	-14.824	19.506	220.540	0.480
3300.000	1.090	357.842	3299.871	-13.647	-12.830	-13.647	18.731	223.233	0.835
3400.000	1.906	16.703	3399.836	-11.103	-12.388	-11.103	16.635	228.130	0.943
3500.000	2.206	30.969	3499.773	-7.859	-10.919	-7.859	13.454	234.254	0.591
3600.000	2.336	31.608	3599.694	-4.473	-8.861	-4.473	9.926	243.212	0.132
3700.000	2.133	32.382	3699.618	-1.166	-6.796	-1.166	6.895	260.262	0.205
3800.000	1.689	24.012	3799.562	1.751	-5.199	1.751	5.487	288.616	0.524
3900.000	1.415	16.693	3899.526	4.280	-4.245	4.280	6.029	315.238	0.337
4000.000	1.301	11.303	3999.497	6.577	-3.668	6.577	7.531	330.853	0.171
4100.000	1.469	4.124	4099.468	8.969	-3.353	8.969	9.576	339.503	0.241
4200.000	1.133	353.166	4199.442	11.230	-3.378	11.230	11.727	343.256	0.417
4300.000	1.428	336.028	4299.418	13.350	-4.002	13.350	13.937	343.311	0.481
4400.000	1.845	350.470	4399.377	16.076	-4.775	16.076	16.770	343.456	0.583
4500.000	1.846	358.411	4499.325	19.273	-5.086	19.273	19.933	345.216	0.256
4600.000	1.924	12.768	4599.272	22.520	-4.760	22.520	23.018	348.065	0.477
4700.000	1.660	21.299	4699.223	25.507	-3.863	25.507	25.798	351.387	0.375
4800.000	0.816	20.064	4799.199	27.525	-3.093	27.525	27.698	353.589	0.844
4900.000	0.609	18.847	4899.191	28.697	-2.677	28.697	28.821	354.671	0.207
5000.000	0.884	356.396	4999.183	29.970	-2.554	29.970	30.079	355.130	0.397
5100.000	0.710	17.454	5099.173	31.331	-2.416	31.331	31.424	355.590	0.338
5200.000	0.538	43.126	5199.167	32.264	-1.910	32.264	32.321	356.612	0.324
5300.000	0.412	97.134	5299.164	32.562	-1.233	32.562	32.586	357.832	0.446
5400.000	0.799	73.061	5399.159	32.721	-0.209	32.721	32.721	359.633	0.455
5500.000	0.728	80.176	5499.150	33.032	1.084	33.032	33.050	1.879	0.118
5600.000	0.872	80.202	5599.140	33.270	2.460	33.270	33.361	4.229	0.144
5700.000	0.574	73.232	5699.132	33.544	3.689	33.544	33.746	6.276	0.311
5800.000	0.773	112.256	5799.126	33.433	4.793	33.433	33.775	8.158	0.488

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
5900.000	0.589	126.091	5899.119	32.875	5.833	32.875	33.388	10.061	0.246
6000.000	0.608	139.030	5999.113	32.171	6.596	32.171	32.840	11.587	0.136
6100.000	0.597	169.684	6099.108	31.258	7.038	31.258	32.040	12.689	0.319
6200.000	0.780	165.162	6199.101	30.087	7.305	30.087	30.961	13.647	0.191
6300.000	0.601	168.236	6299.093	28.916	7.586	28.916	29.895	14.701	0.183
6400.000	0.546	142.795	6399.089	28.024	7.981	28.024	29.138	15.897	0.258
6500.000	0.539	141.312	6499.084	27.277	8.563	27.277	28.590	17.428	0.016
6600.000	0.742	141.602	6599.078	26.403	9.259	26.403	27.979	19.325	0.204