



COMPANY/RIG: Noble Energy/Production/CoreTech  
WELL/API: UPRC 23-14A/05-123-15899  
DECLINATION: 8.17 Degrees  
TD AS DRILLED: 6836 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.37854, Longitude: -104.52012  
Grid North = True North -0.63 degs (NAD 27)  
Grid Correction Applied = -0.63 degs



DEPTH REFERENCE : RKB = GL Elevation = 4592

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 7/21/2016 / 13:13

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / UPRC 23-14A

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	0.246	350.433	100.000	0.211	-0.036	0.211	0.214	350.433	0.246
200.000	0.208	326.489	199.999	0.574	-0.172	0.574	0.599	343.360	0.101
300.000	0.246	324.384	299.998	0.900	-0.397	0.900	0.984	336.207	0.038
400.000	0.285	342.198	399.997	1.312	-0.598	1.312	1.441	335.492	0.091
500.000	0.244	328.887	499.996	1.730	-0.784	1.730	1.900	335.630	0.074
600.000	0.296	324.134	599.995	2.122	-1.045	2.122	2.365	333.778	0.057
700.000	0.335	320.009	699.993	2.555	-1.384	2.555	2.906	331.554	0.045
800.000	0.340	316.326	799.992	2.993	-1.777	2.993	3.481	329.309	0.022
900.000	0.332	308.563	899.990	3.388	-2.208	3.388	4.044	326.911	0.046
1000.000	0.372	302.840	999.988	3.744	-2.707	3.744	4.620	324.140	0.053
1100.000	0.477	318.888	1099.985	4.234	-3.253	4.234	5.339	322.467	0.158
1200.000	0.517	296.171	1199.982	4.747	-3.932	4.747	6.164	320.365	0.200
1300.000	0.435	284.602	1299.978	5.041	-4.704	5.041	6.895	316.982	0.126
1400.000	0.425	304.163	1399.975	5.345	-5.378	5.345	7.583	314.825	0.146
1500.000	0.391	323.315	1499.973	5.827	-5.888	5.827	8.284	314.699	0.140
1600.000	0.313	324.095	1599.971	6.322	-6.252	6.322	8.891	315.316	0.078

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	0.113	304.552	1699.970	6.599	-6.494	6.599	9.258	315.459	0.210
1800.000	0.063	96.935	1799.970	6.648	-6.521	6.648	9.312	315.556	0.172
1900.000	0.167	139.114	1899.970	6.532	-6.370	6.532	9.124	315.716	0.127
2000.000	0.392	158.844	1999.969	6.103	-6.152	6.103	8.666	314.772	0.241
2100.000	0.367	162.826	2099.967	5.479	-5.934	5.479	8.076	312.715	0.036
2200.000	0.323	140.784	2199.965	4.955	-5.662	4.955	7.524	311.192	0.139
2300.000	0.271	137.695	2299.964	4.562	-5.324	4.562	7.011	310.589	0.054
2400.000	0.216	151.553	2399.963	4.221	-5.075	4.221	6.601	309.749	0.080
2500.000	0.220	156.510	2499.962	3.879	-4.909	3.879	6.257	308.316	0.019
2600.000	0.198	155.882	2599.961	3.545	-4.762	3.545	5.937	306.670	0.022
2700.000	0.234	169.338	2699.961	3.187	-4.653	3.187	5.640	304.409	0.062
2800.000	0.371	166.914	2799.959	2.671	-4.542	2.671	5.270	300.460	0.139
2900.000	0.417	160.981	2899.957	2.012	-4.351	2.012	4.793	294.819	0.061
3000.000	0.522	197.695	2999.954	1.235	-4.370	1.235	4.542	285.775	0.312
3100.000	0.800	217.526	3099.947	0.248	-4.934	0.248	4.940	272.872	0.356
3200.000	1.029	224.772	3199.934	-0.943	-5.991	-0.943	6.065	261.055	0.256
3300.000	1.324	218.874	3299.913	-2.480	-7.348	-2.480	7.755	251.353	0.319
3400.000	1.541	212.496	3399.882	-4.513	-8.796	-4.513	9.886	242.838	0.268
3500.000	1.880	197.741	3499.838	-7.209	-10.018	-7.209	12.342	234.260	0.553
3600.000	1.599	191.513	3599.792	-10.138	-10.796	-10.138	14.810	226.799	0.338
3700.000	1.602	191.094	3699.753	-12.877	-11.343	-12.877	17.161	221.376	0.012
3800.000	1.426	189.536	3799.718	-15.476	-11.818	-15.476	19.472	217.368	0.181
3900.000	1.011	207.364	3899.695	-17.486	-12.430	-17.486	21.454	215.407	0.557
4000.000	1.042	202.432	3999.679	-19.111	-13.183	-19.111	23.216	214.598	0.093
4100.000	0.815	210.020	4099.666	-20.567	-13.886	-20.567	24.815	214.025	0.258
4200.000	0.874	231.877	4199.655	-21.654	-14.841	-21.654	26.252	214.427	0.325
4300.000	0.927	237.555	4299.643	-22.559	-16.124	-22.559	27.729	215.556	0.104
4400.000	0.734	187.471	4399.634	-23.628	-16.891	-23.628	29.044	215.559	0.725
4500.000	1.275	151.883	4499.619	-25.245	-16.449	-25.245	30.131	213.088	0.802
4600.000	1.833	136.881	4599.582	-27.394	-14.832	-27.394	31.151	208.432	0.686
4700.000	1.880	140.604	4699.530	-29.829	-12.697	-29.829	32.419	203.058	0.129
4800.000	1.705	146.695	4799.481	-32.340	-10.840	-32.340	34.108	198.530	0.259
4900.000	1.679	150.762	4899.437	-34.861	-9.307	-34.861	36.082	194.949	0.123
5000.000	1.715	149.210	4999.393	-37.425	-7.826	-37.425	38.234	191.811	0.059
5100.000	1.560	157.548	5099.353	-39.968	-6.540	-39.968	40.499	189.293	0.284
5200.000	1.418	151.660	5199.319	-42.315	-5.433	-42.315	42.662	187.317	0.208
5300.000	1.640	158.653	5299.283	-44.736	-4.325	-44.736	44.945	185.522	0.290
5400.000	2.179	167.662	5399.228	-47.926	-3.398	-47.926	48.046	184.055	0.615
5500.000	2.244	170.603	5499.153	-51.715	-2.672	-51.715	51.784	182.958	0.131

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	2.343	171.269	5599.073	-55.667	-2.042	-55.667	55.704	182.101	0.102
5700.000	2.540	171.140	5698.982	-59.876	-1.391	-59.876	59.892	181.330	0.197
5800.000	2.534	172.942	5798.884	-64.259	-0.778	-64.259	64.263	180.693	0.080
5900.000	2.368	168.887	5898.793	-68.480	-0.108	-68.480	68.480	180.090	0.239
6000.000	2.194	164.771	5998.714	-72.354	0.793	-72.354	72.359	179.372	0.239
6100.000	1.811	173.193	6098.653	-75.770	1.483	-75.770	75.785	178.879	0.482
6200.000	1.662	160.225	6198.607	-78.704	2.161	-78.704	78.734	178.427	0.419
6300.000	1.631	157.367	6298.566	-81.382	3.199	-81.382	81.444	177.749	0.088
6400.000	1.499	150.738	6398.529	-83.836	4.386	-83.836	83.951	177.005	0.223
6500.000	1.388	139.939	6498.497	-85.905	5.805	-85.905	86.101	176.134	0.293
6600.000	1.174	132.443	6598.472	-87.523	7.341	-87.523	87.831	175.206	0.272