



COMPANY/RIG: Noble Energy/Production/CoreTech
WELL: Wells Ranch AF 06-13
DECLINATION: 8.21
TD AS DRILLED: 6730
COUNTY/STATE: Weld/Colorado
Latitude: 40.423, Longitude: -104.373
GRID North is 0.730 Degrees East of True North
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB = GL Elevation = 4662

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro.ut
Minimum Curvature Method
Report Date/Time: 10/14/2014 / 14:06

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID
HENDERSON, COLORADO
303-853-4976

Surveyor: JUSTIN WILLIAMS

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	0.769	215.033	99.997	-0.550	-0.385	-0.550	0.671	215.033	0.769
200.000	0.407	216.423	199.992	-1.385	-0.981	-1.385	1.697	215.323	0.363
300.000	0.646	224.979	299.987	-2.069	-1.590	-2.069	2.609	217.548	0.251
400.000	0.812	231.474	399.979	-2.909	-2.543	-2.909	3.863	221.160	0.185
500.000	0.885	251.278	499.968	-3.598	-3.829	-3.598	5.254	226.780	0.301
600.000	0.878	273.655	599.957	-3.797	-5.325	-3.797	6.540	234.508	0.342
700.000	0.891	283.724	699.945	-3.564	-6.845	-3.564	7.717	242.497	0.156
800.000	0.920	285.094	799.933	-3.170	-8.376	-3.170	8.956	249.269	0.036
900.000	0.689	278.525	899.923	-2.872	-9.746	-2.872	10.160	253.580	0.248
1000.000	0.744	290.044	999.915	-2.560	-10.950	-2.560	11.245	256.839	0.154
1100.000	0.592	266.276	1099.908	-2.372	-12.076	-2.372	12.306	258.889	0.312
1200.000	0.748	278.209	1199.901	-2.312	-13.238	-2.312	13.438	260.093	0.208
1300.000	0.503	331.211	1299.896	-1.834	-14.095	-1.834	14.214	262.587	0.600
1400.000	0.587	296.704	1399.892	-1.219	-14.764	-1.219	14.814	265.281	0.333
1500.000	0.567	230.069	1499.888	-1.306	-15.601	-1.306	15.655	265.213	0.634
1600.000	0.587	244.060	1599.883	-1.848	-16.441	-1.848	16.545	263.586	0.142
1700.000	0.544	254.575	1699.878	-2.198	-17.359	-2.198	17.498	262.782	0.112
1800.000	0.174	297.734	1799.876	-2.254	-17.951	-2.254	18.092	262.843	0.433
1900.000	0.797	277.776	1899.872	-2.089	-18.775	-2.089	18.891	263.651	0.636

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	0.949	246.443	1999.861	-2.326	-20.223	-2.326	20.356	263.440	0.493
2100.000	0.713	253.483	2099.850	-2.833	-21.578	-2.833	21.764	262.519	0.256
2200.000	1.031	260.670	2199.839	-3.156	-23.063	-3.156	23.278	262.207	0.336
2300.000	1.259	272.215	2299.819	-3.260	-25.049	-3.260	25.260	262.585	0.323
2400.000	1.382	299.957	2399.793	-2.615	-27.191	-2.615	27.316	264.506	0.644
2500.000	1.276	285.977	2499.766	-1.707	-29.306	-1.707	29.356	266.667	0.340
2600.000	1.308	283.225	2599.741	-1.139	-31.488	-1.139	31.508	267.929	0.070
2700.000	1.127	286.029	2699.718	-0.606	-33.544	-0.606	33.550	268.965	0.191
2800.000	1.016	282.696	2799.701	-0.140	-35.355	-0.140	35.355	269.774	0.127
2900.000	1.169	282.257	2899.683	0.272	-37.217	0.272	37.218	270.419	0.153
3000.000	1.026	284.124	2999.664	0.707	-39.083	0.707	39.089	271.037	0.147
3100.000	1.157	299.810	3099.646	1.427	-40.827	1.427	40.852	272.002	0.325
3200.000	1.013	274.298	3199.629	1.995	-42.584	1.995	42.631	272.683	0.499
3300.000	1.146	258.154	3299.611	1.856	-44.444	1.856	44.483	272.392	0.330
3400.000	1.969	251.004	3399.574	1.092	-47.046	1.092	47.059	271.330	0.844
3500.000	2.065	263.315	3499.512	0.323	-50.460	0.323	50.461	270.367	0.443
3600.000	2.075	250.701	3599.448	-0.485	-53.959	-0.485	53.961	269.485	0.455
3700.000	2.089	274.573	3699.383	-0.938	-57.484	-0.938	57.492	269.065	0.861
3800.000	2.276	266.029	3799.311	-0.930	-61.281	-0.930	61.288	269.130	0.375
3900.000	1.988	260.776	3899.242	-1.346	-64.974	-1.346	64.988	268.814	0.347
4000.000	1.920	253.469	3999.184	-2.100	-68.292	-2.100	68.325	268.238	0.258
4100.000	1.782	245.715	4099.132	-3.217	-71.316	-3.217	71.388	267.417	0.286
4200.000	1.286	253.253	4199.096	-4.180	-73.808	-4.180	73.927	266.759	0.534
4300.000	1.167	244.789	4299.073	-4.937	-75.805	-4.937	75.965	266.274	0.217
4400.000	1.304	213.538	4399.051	-6.319	-77.355	-6.319	77.613	265.330	0.678
4500.000	1.342	194.950	4499.025	-8.399	-78.286	-8.399	78.735	263.876	0.429
4600.000	1.384	170.631	4598.997	-10.723	-78.391	-10.723	79.121	262.211	0.576
4700.000	1.399	180.804	4698.968	-13.135	-78.212	-13.135	79.307	260.467	0.247
4800.000	0.994	178.344	4798.946	-15.223	-78.204	-15.223	79.672	258.985	0.408
4900.000	0.540	166.963	4898.937	-16.548	-78.073	-16.548	79.807	258.033	0.477
5000.000	0.459	115.449	4998.933	-17.179	-77.605	-17.179	79.484	257.518	0.440
5100.000	0.332	29.494	5098.932	-17.099	-77.101	-17.099	78.974	257.496	0.547
5200.000	0.926	351.714	5198.925	-16.047	-77.075	-16.047	78.728	258.239	0.695
5300.000	0.987	25.523	5298.912	-14.470	-76.821	-14.470	78.171	259.333	0.559
5400.000	0.909	26.813	5398.899	-12.984	-76.092	-12.984	77.192	260.316	0.081
5500.000	0.589	333.051	5498.891	-11.818	-75.967	-11.818	76.881	261.157	0.735
5600.000	0.873	20.976	5598.884	-10.649	-75.927	-10.649	76.670	262.016	0.648
5700.000	0.971	39.428	5698.871	-9.283	-75.116	-9.283	75.688	262.955	0.311
5800.000	0.848	60.321	5798.859	-8.262	-73.935	-8.262	74.395	263.624	0.351
5900.000	0.308	46.042	5898.853	-7.709	-73.099	-7.709	73.504	263.980	0.555

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	0.348	31.727	5998.851	-7.264	-72.746	-7.264	73.107	264.298	0.091
6100.000	0.405	58.320	6098.849	-6.820	-72.285	-6.820	72.606	264.610	0.182
6200.000	0.503	63.035	6198.846	-6.436	-71.594	-6.436	71.882	264.863	0.105
6300.000	0.805	93.033	6298.840	-6.274	-70.501	-6.274	70.780	264.915	0.446
6400.000	1.148	65.057	6398.826	-5.888	-68.892	-5.888	69.143	265.115	0.578
6450.000	1.075	72.721	6448.816	-5.538	-67.989	-5.538	68.215	265.344	0.331