



Company/Rig: Noble Energy Inc/Production
 WELL/API#: Monfort E 30-9/05-123-23542
 DECLINATION: 8.30 Degrees
 TD AS DRILLED: 7302'
 COUNTY/STATE: Weld/Colorado
 VS-Azi: 0.000 Degrees
 Latitude: 40.45732, Longitude: -104.69930
 Grid North = True North -0.52 degs (NAD 27)
 Grid Correction Applied = -0.52 degs



DEPTH REFERENCE : RKB=GL/Elevation=4708'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 4/12/2016 / 10:35

Lat/Long Obtained By Handheld GPS at Wellhead

North Reference: Grid

Denver, Colorado

303-853-4976

Surveyor: Jason Kinchelow / Monfort E 30-9

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	0.771	337.568	99.997	0.622	-0.257	0.622	0.673	337.568	0.771
200.000	0.822	340.475	199.987	1.919	-0.753	1.919	2.062	338.578	0.065
300.000	0.707	343.684	299.978	3.187	-1.166	3.187	3.394	339.906	0.123
400.000	0.697	2.543	399.971	4.387	-1.312	4.387	4.579	343.345	0.230
500.000	0.869	358.899	499.962	5.752	-1.300	5.752	5.897	347.266	0.179
600.000	0.827	354.078	599.951	7.227	-1.389	7.227	7.360	349.122	0.083
700.000	0.722	3.315	699.942	8.574	-1.427	8.574	8.692	350.552	0.162
800.000	0.754	4.691	799.933	9.859	-1.337	9.859	9.949	352.279	0.036
900.000	0.792	358.894	899.924	11.205	-1.296	11.205	11.280	353.402	0.087
1000.000	0.763	3.574	999.915	12.561	-1.268	12.561	12.625	354.236	0.070
1100.000	0.856	0.691	1099.905	13.973	-1.217	13.973	14.026	355.021	0.101
1200.000	0.871	349.659	1199.894	15.468	-1.345	15.468	15.527	355.031	0.167
1300.000	0.906	328.862	1299.882	16.893	-1.890	16.893	16.998	353.616	0.322
1400.000	0.865	344.603	1399.870	18.297	-2.499	18.297	18.467	352.222	0.246
1500.000	0.772	341.260	1499.860	19.663	-2.916	19.663	19.878	351.564	0.104
1600.000	0.543	341.272	1599.853	20.750	-3.285	20.750	21.009	351.005	0.230
1700.000	0.500	338.786	1699.849	21.606	-3.595	21.606	21.903	350.553	0.048
1800.000	0.392	318.348	1799.846	22.269	-3.980	22.269	22.621	349.866	0.191

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	0.421	317.351	1899.844	22.795	-4.457	22.795	23.226	348.937	0.030
2000.000	0.291	264.922	1999.842	23.043	-4.959	23.043	23.570	347.854	0.336
2100.000	0.437	233.884	2099.840	22.795	-5.521	22.795	23.454	346.386	0.240
2200.000	0.475	224.423	2199.837	22.274	-6.119	22.274	23.100	344.639	0.084
2300.000	0.371	214.756	2299.834	21.712	-6.594	21.712	22.691	343.107	0.125
2400.000	0.473	209.463	2399.831	21.087	-6.981	21.087	22.213	341.682	0.109
2500.000	0.490	187.532	2499.828	20.303	-7.240	20.303	21.556	340.373	0.184
2600.000	0.400	168.883	2599.825	19.537	-7.229	19.537	20.832	339.694	0.170
2700.000	0.385	151.816	2699.823	18.898	-7.003	18.898	20.154	339.667	0.117
2800.000	0.504	138.233	2799.820	18.274	-6.551	18.274	19.413	340.277	0.158
2900.000	1.221	154.549	2899.808	16.984	-5.800	16.984	17.947	341.144	0.750
3000.000	1.266	157.909	2999.784	14.998	-4.927	14.998	15.787	341.814	0.086
3100.000	1.358	163.723	3099.758	12.837	-4.180	12.837	13.501	341.966	0.161
3200.000	1.189	179.839	3199.734	10.662	-3.845	10.662	11.334	340.172	0.394
3300.000	0.867	188.779	3299.718	8.877	-3.957	8.877	9.719	335.974	0.359
3400.000	0.970	189.118	3399.705	7.293	-4.207	7.293	8.419	330.022	0.104
3500.000	0.648	210.104	3499.695	5.968	-4.625	5.968	7.550	322.225	0.433
3600.000	0.596	203.850	3599.689	5.003	-5.119	5.003	7.157	314.343	0.086
3700.000	0.716	215.384	3699.682	4.018	-5.691	4.018	6.966	305.224	0.178
3800.000	1.041	204.911	3799.671	2.685	-6.435	2.685	6.973	292.650	0.361
3900.000	1.112	205.894	3899.653	0.989	-7.241	0.989	7.308	277.775	0.074
4000.000	1.112	210.279	3999.634	-0.722	-8.154	-0.722	8.186	264.938	0.085
4100.000	1.822	229.110	4099.601	-2.601	-9.845	-2.601	10.183	255.200	0.849
4200.000	1.914	229.591	4199.548	-4.725	-12.319	-4.725	13.194	249.017	0.093
4300.000	1.833	235.787	4299.495	-6.707	-14.914	-6.707	16.352	245.786	0.218
4400.000	1.970	244.704	4399.440	-8.341	-17.791	-8.341	19.649	244.881	0.325
4500.000	2.402	251.998	4499.367	-9.723	-21.338	-9.723	23.448	245.503	0.513
4600.000	2.470	250.907	4599.277	-11.075	-25.367	-11.075	27.679	246.414	0.083
4700.000	2.550	249.472	4699.181	-12.560	-29.487	-12.560	32.051	246.928	0.102
4800.000	2.743	252.954	4799.074	-14.042	-33.858	-14.042	36.654	247.475	0.251
4900.000	2.942	252.638	4898.951	-15.509	-38.595	-15.509	41.595	248.108	0.200
5000.000	2.758	250.513	4998.827	-17.078	-43.313	-17.078	46.558	248.481	0.212
5100.000	1.926	251.392	5098.743	-18.416	-47.173	-18.416	50.641	248.674	0.833
5200.000	1.638	254.404	5198.694	-19.337	-50.142	-19.337	53.742	248.911	0.302
5300.000	1.012	239.914	5298.667	-20.164	-52.284	-20.164	56.037	248.910	0.705
5400.000	0.974	193.807	5398.654	-21.432	-53.251	-21.432	57.402	248.076	0.779
5500.000	1.062	138.377	5498.640	-22.951	-52.838	-22.951	57.607	246.522	0.950
5600.000	1.033	126.808	5598.624	-24.184	-51.501	-24.184	56.896	244.846	0.213
5700.000	0.981	110.144	5698.609	-25.018	-49.975	-25.018	55.888	243.407	0.296
5800.000	0.927	117.798	5798.595	-25.690	-48.457	-25.690	54.846	242.069	0.138

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	1.115	107.008	5898.579	-26.352	-46.811	-26.352	53.718	240.623	0.269
6000.000	1.244	104.455	5998.558	-26.908	-44.828	-26.908	52.284	239.026	0.139
6100.000	1.226	102.285	6098.534	-27.406	-42.731	-27.406	50.765	237.325	0.050
6200.000	1.274	99.072	6198.511	-27.809	-40.588	-27.809	49.201	235.582	0.085
6300.000	1.179	95.383	6298.488	-28.081	-38.466	-28.081	47.625	233.869	0.123
6400.000	1.113	87.417	6398.468	-28.134	-36.471	-28.134	46.061	232.353	0.172
6500.000	1.016	67.329	6498.451	-27.749	-34.683	-27.749	44.417	231.338	0.383
6600.000	1.188	52.199	6598.433	-26.771	-33.045	-26.771	42.529	230.988	0.337
6700.000	1.467	19.442	6698.407	-24.929	-31.800	-24.929	40.407	231.906	0.795
6800.000	1.679	358.573	6798.370	-22.258	-31.411	-22.258	38.497	234.678	0.607
6900.000	1.385	1.463	6898.334	-19.585	-31.416	-19.585	37.021	238.061	0.304
7000.000	1.015	9.107	6998.312	-17.502	-31.245	-17.502	35.813	240.745	0.402