



Company/Rig: Noble Energy Inc/Production
 WELL/API#: Dechant D30-33D /05-123-33077
 DECLINATION: 8.13 Degrees
 TD AS DRILLED: 7804'
 COUNTY/STATE: Weld/Colorado
 VS-Azi: 0.000 Degrees
 Latitude: 40.19196, Longitude: -104.60631
 Grid North = True North -0.58 degs (NAD 27)
 Grid Correction Applied = -0.58 degs



DEPTH REFERENCE : RKB=GL/Elevation= 4799'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut
 Minimum Curvature Method
 Report Date/Time: 4/4/2017 / 14:03

Lat/Long Obtained By Handheld GPS at Wellhead
 North Reference: Grid
 Denver, Colorado
 303-853-4976
 Surveyor: Jason Kinchelov / API 05-123-33077

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	0.477	93.097	99.999	-0.022	0.416	-0.022	0.416	93.097	0.477
200.000	0.947	77.107	199.991	0.139	1.637	0.139	1.643	85.129	0.506
300.000	0.854	96.783	299.979	0.236	3.182	0.236	3.191	85.760	0.321
400.000	1.030	73.960	399.966	0.396	4.786	0.396	4.802	85.265	0.411
500.000	0.859	89.875	499.952	0.646	6.399	0.646	6.432	84.231	0.312
600.000	0.765	71.636	599.942	0.858	7.782	0.858	7.829	83.706	0.273
700.000	0.682	73.123	699.934	1.241	8.984	1.241	9.070	82.134	0.085
800.000	1.111	71.084	799.922	1.728	10.471	1.728	10.613	80.627	0.431
900.000	1.263	57.152	899.901	2.640	12.314	2.640	12.594	77.898	0.325
1000.000	2.889	70.237	999.832	4.090	15.611	4.090	16.138	75.319	1.684
1100.000	4.438	71.368	1099.625	6.179	21.650	6.179	22.514	74.072	1.551
1200.000	6.114	73.687	1199.198	8.911	30.428	8.911	31.706	73.677	1.689
1300.000	7.807	70.874	1298.457	12.632	41.957	12.632	43.818	73.244	1.727
1400.000	9.185	69.643	1397.357	17.634	55.858	17.634	58.575	72.479	1.389
1500.000	11.350	74.175	1495.752	23.095	72.810	23.095	76.385	72.401	2.309
1600.000	12.202	75.291	1593.646	28.462	92.499	28.462	96.778	72.897	0.882

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	12.949	74.058	1691.247	34.222	113.494	34.222	118.541	73.220	0.793
1800.000	13.499	74.531	1788.595	40.413	135.515	40.413	141.413	73.395	0.561
1900.000	14.285	77.878	1885.671	46.117	158.827	46.117	165.386	73.809	1.124
2000.000	14.427	75.409	1982.549	51.846	182.945	51.846	190.149	74.177	0.628
2100.000	14.585	76.057	2079.361	58.018	207.220	58.018	215.189	74.359	0.226
2200.000	14.623	72.639	2176.132	64.819	231.488	64.819	240.392	74.357	0.862
2300.000	14.840	74.520	2272.846	72.003	255.877	72.003	265.815	74.284	0.525
2400.000	14.324	75.402	2369.624	78.539	280.190	78.539	290.989	74.342	0.561
2500.000	13.838	78.773	2466.621	83.985	303.892	83.985	315.283	74.551	0.953
2600.000	13.682	75.837	2563.752	89.207	327.089	89.207	339.036	74.745	0.715
2700.000	14.256	77.124	2660.795	94.845	350.559	94.845	363.163	74.861	0.652
2800.000	15.230	76.622	2757.501	100.628	375.341	100.628	388.596	74.992	0.982
2900.000	15.837	77.690	2853.849	106.576	401.451	106.576	415.356	75.132	0.672
3000.000	16.908	78.086	2949.792	112.488	429.011	112.488	443.513	75.308	1.076
3100.000	16.333	77.011	3045.614	118.650	456.941	118.650	472.094	75.444	0.652
3200.000	16.367	78.268	3141.570	124.675	484.437	124.675	500.223	75.568	0.356
3300.000	17.125	79.128	3237.329	130.317	512.692	130.317	528.995	75.738	0.798
3400.000	14.961	77.029	3333.429	135.992	539.733	135.992	556.602	75.858	2.240
3500.000	14.376	77.171	3430.170	141.646	564.416	141.646	581.919	75.912	0.586
3600.000	14.134	74.291	3527.092	147.708	588.275	147.708	606.535	75.905	0.749
3700.000	14.262	75.087	3624.037	154.184	611.932	154.184	631.057	75.858	0.234
3800.000	14.385	75.418	3720.928	160.482	635.857	160.482	655.796	75.835	0.147
3900.000	13.159	76.730	3818.052	166.222	658.958	166.222	679.600	75.842	1.265
4000.000	13.596	77.965	3915.338	171.286	681.533	171.286	702.727	75.892	0.522
4100.000	13.703	77.709	4012.514	176.258	704.601	176.258	726.313	75.956	0.123
4200.000	12.993	78.650	4109.812	180.992	727.197	180.992	749.382	76.024	0.742
4300.000	12.691	77.451	4207.311	185.591	748.942	185.591	771.594	76.082	0.403
4400.000	10.874	75.112	4305.200	190.402	768.781	190.402	792.008	76.090	1.879
4500.000	9.860	74.661	4403.566	195.090	786.154	195.090	809.999	76.063	1.017
4600.000	9.078	74.907	4502.203	199.409	802.028	199.409	826.446	76.038	0.784
4700.000	6.665	74.366	4601.254	203.028	815.235	203.028	840.136	76.015	2.414
4800.000	4.870	70.317	4700.744	206.022	824.820	206.022	850.161	75.976	1.839
4900.000	4.107	68.415	4800.437	208.769	832.147	208.769	857.935	75.916	0.777
5000.000	3.632	69.034	4900.208	211.220	838.435	211.220	864.631	75.860	0.476
5100.000	1.942	74.525	5000.087	212.805	843.026	212.805	869.470	75.833	1.710
5200.000	0.685	93.879	5100.059	213.217	845.254	213.217	871.732	75.842	1.315
5300.000	0.635	85.091	5200.052	213.224	846.403	213.224	872.847	75.860	0.112
5400.000	0.228	49.036	5300.049	213.402	847.106	213.402	873.572	75.860	0.471
5500.000	0.224	36.353	5400.048	213.690	847.372	213.690	873.901	75.846	0.050

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	0.417	69.881	5500.047	213.972	847.829	213.972	874.413	75.836	0.261
5700.000	0.490	96.604	5600.044	214.048	848.596	214.048	875.175	75.843	0.221
5800.000	0.779	78.399	5700.038	214.136	849.686	214.136	876.254	75.855	0.349
5900.000	0.642	76.017	5800.030	214.408	850.896	214.408	877.494	75.857	0.140
6000.000	0.314	128.044	5900.027	214.374	851.656	214.374	878.222	75.871	0.513
6100.000	0.680	102.826	6000.023	214.073	852.451	214.073	878.920	75.903	0.418
6200.000	0.794	116.949	6100.015	213.628	853.648	213.628	879.973	75.950	0.214
6300.000	1.245	119.774	6199.999	212.774	855.209	212.774	881.280	76.029	0.453
6400.000	1.431	118.250	6299.971	211.643	857.252	211.643	882.991	76.132	0.190
6500.000	1.914	120.319	6399.928	210.209	859.794	210.209	885.118	76.261	0.487
6600.000	1.218	134.134	6499.891	208.626	861.999	208.626	886.886	76.395	0.787
6700.000	1.628	129.932	6599.860	206.973	863.851	206.973	888.300	76.526	0.423
6800.000	0.865	103.622	6699.836	205.884	865.675	205.884	889.821	76.622	0.935
6900.000	3.338	85.480	6799.762	205.935	869.312	205.935	893.371	76.673	2.530
7000.000	1.015	124.752	6899.687	205.660	872.943	205.660	896.842	76.743	2.632
7100.000	3.053	152.452	6999.620	202.793	874.903	202.793	898.098	76.950	2.205
7200.000	3.280	169.266	7099.470	197.621	876.667	197.621	898.666	77.297	0.952
7300.000	2.719	178.320	7199.333	192.440	877.270	192.440	898.129	77.627	0.733
7400.000	1.917	185.400	7299.250	188.404	877.182	188.404	897.187	77.878	0.851
7500.000	1.895	215.599	7399.197	185.395	876.062	185.395	895.464	78.051	0.993
7600.000	1.159	218.814	7499.161	183.263	874.466	183.263	893.463	78.164	0.740