



Company/Rig: Noble Energy Inc/Production
WELL/API#: Hamilton F 25-25/05-123-26621
DECLINATION: 8.22 Degrees
TD AS DRILLED: 7185'
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.36598, Longitude: -104.61590
Grid North = True North -0.57 degs (NAD 27)
Grid Correction Applied = -0.57 degs



DEPTH REFERENCE : RKB=GL/Elevation=4691'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 7/28/2016 / 09:10

Lat/Long Obtained By Handheld GPS at Wellhead

North Reference: Grid

Denver, Colorado

303-853-4976

Surveyor: Jason Kinchelow / Hamilton F 25-25

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	0.570	74.894	99.998	0.130	0.480	0.130	0.497	74.894	0.570
200.000	0.329	72.365	199.995	0.346	1.233	0.346	1.281	74.328	0.242
300.000	0.334	57.122	299.994	0.591	1.751	0.591	1.848	71.349	0.088
400.000	0.379	74.339	399.992	0.839	2.315	0.839	2.462	70.083	0.116
500.000	0.203	82.766	499.990	0.950	2.810	0.950	2.966	71.311	0.180
600.000	0.650	104.623	599.987	0.830	3.535	0.830	3.631	76.792	0.467
700.000	0.623	105.532	699.981	0.541	4.607	0.541	4.639	83.307	0.029
800.000	0.622	121.280	799.975	0.113	5.595	0.113	5.596	88.841	0.171
900.000	0.587	115.686	899.970	-0.391	6.521	-0.391	6.533	93.430	0.068
1000.000	0.949	133.865	999.961	-1.187	7.580	-1.187	7.672	98.897	0.431
1100.000	1.039	142.967	1099.946	-2.484	8.723	-2.484	9.070	105.897	0.182
1200.000	0.632	144.973	1199.935	-3.660	9.586	-3.660	10.261	110.897	0.409
1300.000	0.415	182.397	1299.931	-4.473	9.887	-4.473	10.852	114.344	0.394
1400.000	0.379	197.123	1399.929	-5.152	9.775	-5.152	11.049	117.791	0.108
1500.000	0.228	260.272	1499.927	-5.502	9.481	-5.502	10.961	120.126	0.343
1600.000	0.476	282.737	1599.925	-5.444	8.879	-5.444	10.415	121.513	0.279

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	0.979	274.644	1699.917	-5.283	7.622	-5.283	9.274	124.727	0.512
1800.000	1.087	268.136	1799.901	-5.244	5.822	-5.244	7.836	132.014	0.160
1900.000	0.989	275.488	1899.884	-5.193	4.014	-5.193	6.563	142.295	0.165
2000.000	0.819	292.204	1999.872	-4.840	2.494	-4.840	5.445	152.744	0.312
2100.000	0.905	289.364	2099.861	-4.308	1.087	-4.308	4.443	165.841	0.097
2200.000	0.965	276.260	2199.848	-3.955	-0.495	-3.955	3.986	187.141	0.222
2300.000	1.605	265.704	2299.822	-3.968	-2.729	-3.968	4.816	214.518	0.679
2400.000	1.743	275.273	2399.780	-3.933	-5.639	-3.933	6.875	235.107	0.311
2500.000	1.627	279.480	2499.736	-3.559	-8.554	-3.559	9.265	247.407	0.169
2600.000	1.666	285.194	2599.695	-2.945	-11.357	-2.945	11.732	255.464	0.169
2700.000	1.586	285.767	2699.655	-2.187	-14.091	-2.187	14.260	261.176	0.081
2800.000	1.773	287.992	2799.612	-1.334	-16.895	-1.334	16.947	265.487	0.197
2900.000	2.582	283.910	2899.539	-0.314	-20.552	-0.314	20.555	269.124	0.824
3000.000	3.228	286.228	2999.410	1.014	-25.442	1.014	25.462	272.282	0.656
3100.000	3.678	281.209	3099.228	2.424	-31.291	2.424	31.385	274.430	0.542
3200.000	2.797	279.793	3199.068	3.463	-36.842	3.463	37.004	275.369	0.884
3300.000	1.999	277.331	3298.979	4.100	-40.976	4.100	41.181	275.714	0.804
3400.000	1.053	273.248	3398.943	4.375	-43.624	4.375	43.842	275.727	0.952
3500.000	0.724	224.583	3498.932	3.977	-44.984	3.977	45.160	275.052	0.791
3600.000	1.062	222.440	3598.920	2.843	-46.053	2.843	46.140	273.533	0.339
3700.000	1.510	219.969	3698.894	1.150	-47.524	1.150	47.538	271.386	0.452
3800.000	1.722	219.748	3798.855	-1.014	-49.331	-1.014	49.341	268.822	0.212
3900.000	1.801	219.068	3898.807	-3.390	-51.282	-3.390	51.394	266.218	0.082
4000.000	2.048	202.925	3998.752	-6.255	-52.968	-6.255	53.336	263.265	0.593
4100.000	2.130	196.274	4098.685	-9.685	-54.185	-9.685	55.044	259.866	0.256
4200.000	2.111	189.515	4198.617	-13.285	-55.010	-13.285	56.592	256.423	0.251
4300.000	2.211	208.833	4298.547	-16.791	-56.245	-16.791	58.698	253.378	0.732
4400.000	1.554	214.148	4398.493	-19.603	-57.936	-19.603	61.163	251.307	0.679
4500.000	0.840	208.571	4498.470	-21.369	-59.048	-21.369	62.796	250.105	0.722
4600.000	0.860	171.130	4598.460	-22.755	-59.283	-22.755	63.500	249.002	0.546
4700.000	1.571	162.855	4698.437	-24.807	-58.763	-24.807	63.784	247.113	0.730
4800.000	2.476	169.629	4798.374	-28.242	-57.970	-28.242	64.483	244.026	0.934
4900.000	1.610	179.094	4898.309	-31.771	-57.559	-31.771	65.745	241.102	0.927
5000.000	0.882	178.337	4998.285	-33.945	-57.514	-33.945	66.784	239.451	0.729
5100.000	1.248	182.793	5098.268	-35.802	-57.545	-35.802	67.773	238.112	0.375
5200.000	1.441	203.027	5198.241	-38.047	-58.090	-38.047	69.441	236.777	0.509
5300.000	1.731	198.515	5298.202	-40.637	-59.062	-40.637	71.691	235.471	0.316
5400.000	1.851	201.327	5398.153	-43.573	-60.128	-43.573	74.257	234.070	0.148
5500.000	2.048	175.416	5498.097	-46.859	-60.573	-46.859	76.582	232.275	0.895

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	2.079	155.110	5598.034	-50.285	-59.667	-50.285	78.030	229.877	0.728
5700.000	1.891	128.163	5697.976	-52.950	-57.606	-52.950	78.244	227.412	0.943
5800.000	1.509	99.357	5797.934	-54.184	-55.010	-54.184	77.214	225.433	0.923
5900.000	1.604	72.523	5897.898	-53.978	-52.376	-53.978	75.212	224.137	0.728
6000.000	1.836	61.283	5997.853	-52.787	-49.636	-52.787	72.459	223.238	0.409
6100.000	1.427	54.496	6097.813	-51.294	-47.217	-51.294	69.718	222.630	0.452
6200.000	1.345	52.513	6197.783	-49.857	-45.272	-49.857	67.344	222.241	0.095
6300.000	1.457	48.219	6297.753	-48.296	-43.393	-48.296	64.926	221.939	0.153
6400.000	2.086	49.158	6397.705	-46.258	-41.068	-46.258	61.858	221.599	0.630
6500.000	2.223	70.056	6497.636	-44.407	-37.868	-44.407	58.361	220.456	0.793
6600.000	3.803	44.043	6597.499	-41.361	-33.739	-41.361	53.376	219.205	2.052
6700.000	8.662	52.527	6696.880	-34.391	-25.452	-34.391	42.785	216.504	4.932
6800.000	8.195	58.799	6795.802	-26.117	-13.379	-26.117	29.345	207.124	1.030
6900.000	8.173	58.759	6894.783	-18.739	-1.205	-18.739	18.777	183.680	0.023