



Company/Rig: Noble Energy Inc/Production  
 WELL/API#: Gulley 17-15/05-123-29438  
 DECLINATION: 8.18 Degrees  
 TD AS DRILLED: 7177 Feet  
 COUNTY/STATE: Weld/Colorado  
 VS-Azi: 0.000 Degrees  
 Latitude: 40.49071, Longitude: -104.57071  
 Grid North = True North -0.60 degs (NAD 27)  
 Grid Correction Applied = -0.60 degs



DEPTH REFERENCE : RKB=GL/Elevation= 4773'

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-01-de\_01.ut  
 Minimum Curvature Method  
 Report Date/Time: 10/31/2016 / 08:18

Lat/Long Obtained By Handheld GPS at Wellhead  
 North Reference: Grid  
 Denver, Colorado  
 303-853-4976  
 Surveyor: Jason Kinchelov / Gulley 17-15

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	0.406	3.617	99.999	0.354	0.022	0.354	0.355	3.617	0.406
200.000	0.477	9.643	199.996	1.118	0.114	1.118	1.124	5.844	0.084
300.000	0.363	316.195	299.994	1.757	-0.035	1.757	1.758	358.856	0.391
400.000	0.371	326.384	399.992	2.256	-0.434	2.256	2.297	349.117	0.066
500.000	0.333	342.713	499.990	2.803	-0.699	2.803	2.889	345.990	0.107
600.000	0.206	19.671	599.989	3.249	-0.725	3.249	3.329	347.419	0.209
700.000	0.124	199.408	699.989	3.317	-0.701	3.317	3.390	348.074	0.330
800.000	0.230	152.087	799.988	3.038	-0.643	3.038	3.105	348.057	0.172
900.000	0.244	185.973	899.987	2.649	-0.571	2.649	2.709	347.838	0.139
1000.000	0.076	127.506	999.987	2.396	-0.540	2.396	2.456	347.297	0.214
1100.000	0.267	176.482	1099.987	2.123	-0.473	2.123	2.175	347.440	0.225
1200.000	0.178	165.404	1199.986	1.740	-0.420	1.740	1.790	346.442	0.099
1300.000	0.166	52.295	1299.986	1.678	-0.266	1.678	1.699	350.987	0.286
1400.000	0.287	78.139	1399.985	1.818	0.093	1.818	1.820	2.930	0.156
1500.000	0.318	135.176	1499.984	1.673	0.534	1.673	1.756	17.693	0.290
1600.000	0.154	144.632	1599.983	1.367	0.807	1.367	1.587	30.560	0.168

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	0.311	127.808	1699.982	1.091	1.099	1.091	1.548	45.200	0.169
1800.000	0.087	127.409	1799.981	0.879	1.373	0.879	1.630	57.378	0.224
1900.000	0.334	2.758	1899.981	1.124	1.447	1.124	1.832	52.168	0.390
2000.000	0.348	15.638	1999.979	1.707	1.543	1.707	2.301	42.106	0.078
2100.000	0.647	343.185	2099.975	2.540	1.462	2.540	2.931	29.917	0.400
2200.000	1.218	325.930	2199.962	3.961	0.703	3.961	4.023	10.064	0.630
2300.000	1.009	329.527	2299.943	5.600	-0.339	5.600	5.610	356.537	0.220
2400.000	1.200	349.773	2399.925	7.389	-0.971	7.389	7.452	352.512	0.431
2500.000	0.744	7.464	2499.910	9.062	-1.073	9.062	9.126	353.249	0.541
2600.000	0.425	52.502	2599.905	9.932	-0.694	9.932	9.956	356.003	0.536
2700.000	0.412	55.900	2699.903	10.359	-0.102	10.359	10.360	359.438	0.028
2800.000	0.650	65.559	2799.898	10.796	0.713	10.796	10.819	3.778	0.253
2900.000	0.409	51.463	2899.894	11.253	1.508	11.253	11.353	7.634	0.273
3000.000	0.317	81.722	2999.892	11.515	2.061	11.515	11.698	10.148	0.209
3100.000	0.522	99.067	3099.889	11.483	2.784	11.483	11.815	13.630	0.238
3200.000	0.551	104.147	3199.885	11.293	3.700	11.293	11.884	18.140	0.056
3300.000	1.032	163.525	3299.877	10.313	4.422	10.313	11.220	23.208	0.888
3400.000	0.910	220.636	3399.864	8.846	4.160	8.846	9.775	25.184	0.934
3500.000	1.829	234.013	3499.835	7.306	2.351	7.306	7.675	17.840	0.966
3600.000	2.049	256.074	3599.779	5.938	-0.675	5.938	5.976	353.512	0.773
3700.000	1.857	261.503	3699.721	5.268	-4.013	5.268	6.623	322.702	0.267
3800.000	1.968	242.310	3799.666	4.231	-7.136	4.231	8.296	300.661	0.647
3900.000	2.028	239.174	3899.606	2.526	-10.176	2.526	10.485	283.941	0.124
4000.000	2.063	244.702	3999.542	0.850	-13.322	0.850	13.350	273.653	0.200
4100.000	1.762	239.101	4099.486	-0.708	-16.269	-0.708	16.284	267.508	0.354
4200.000	0.896	248.574	4199.459	-1.783	-18.316	-1.783	18.403	264.439	0.890
4300.000	0.364	211.455	4299.452	-2.340	-19.210	-2.340	19.352	263.056	0.645
4400.000	0.599	118.233	4399.450	-2.858	-18.915	-2.858	19.130	261.409	0.718
4500.000	0.617	121.710	4499.444	-3.388	-17.997	-3.388	18.313	259.340	0.041
4600.000	0.710	100.952	4599.438	-3.788	-16.931	-3.788	17.349	257.387	0.256
4700.000	0.437	0.387	4699.435	-3.525	-16.320	-3.525	16.696	257.813	0.900
4800.000	0.968	344.215	4799.427	-2.331	-16.547	-2.331	16.710	261.983	0.561
4900.000	1.087	346.611	4899.411	-0.595	-16.996	-0.595	17.006	267.994	0.126
5000.000	0.907	320.829	4999.396	0.940	-17.715	0.940	17.740	273.039	0.478
5100.000	0.757	335.962	5099.386	2.157	-18.484	2.157	18.610	276.656	0.265
5200.000	0.669	355.361	5199.378	3.342	-18.800	3.342	19.095	280.081	0.255
5300.000	0.466	348.083	5299.373	4.322	-18.932	4.322	19.419	282.861	0.216
5400.000	0.299	75.170	5399.371	4.787	-18.763	4.787	19.364	284.312	0.541
5500.000	0.317	270.761	5499.371	4.857	-18.787	4.857	19.405	284.497	0.610

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	0.371	69.299	5599.370	4.976	-18.760	4.976	19.409	284.854	0.676
5700.000	0.913	91.026	5699.364	5.076	-17.660	5.076	18.375	286.036	0.584
5800.000	1.637	97.452	5799.338	4.877	-15.448	4.877	16.200	287.520	0.737
5900.000	1.961	108.360	5899.289	4.152	-12.408	4.152	13.084	288.503	0.471
6000.000	1.982	115.098	5999.230	2.880	-9.218	2.880	9.657	287.350	0.233
6100.000	1.739	120.767	6099.177	1.370	-6.348	1.370	6.494	282.180	0.304
6200.000	1.629	130.224	6199.134	-0.324	-3.959	-0.324	3.972	265.324	0.299
6300.000	1.519	145.097	6299.097	-2.329	-2.116	-2.329	3.146	222.255	0.422
6400.000	1.701	159.886	6399.058	-4.810	-0.847	-4.810	4.884	189.982	0.452
6500.000	2.117	158.313	6499.002	-7.920	0.347	-7.920	7.928	177.495	0.419
6600.000	2.433	168.442	6598.924	-11.716	1.454	-11.716	11.806	172.924	0.510
6700.000	3.288	172.233	6698.798	-16.637	2.267	-16.637	16.790	172.240	0.875
6800.000	3.282	174.571	6798.634	-22.327	2.926	-22.327	22.518	172.535	0.134
6900.000	2.835	176.617	6898.491	-27.646	3.342	-27.646	27.847	173.107	0.460