



**Company:** Noble Energy, Inc.  
**Rig:** Production/Lightning  
**Latitude:** 40.225  
**Longitude:** N/A  
**API #** 05-123-29445  
**Date:** 3/28/12

**Well:** Gutteresen State D 16-20  
**Location:** Weld, Colorado  
**North Reference:** Grid Corr = -0.61  
**Depth Reference:** RKB = Ground Level  
**Surveyor:** Jason Kinchelow  
**VS:** 0.000

MS Gyro Survey Calculations

Depth	Inc	AzG	N/-S	E/-W	TVD	DL	VS	CD	Cbrg
0.000	0.000	0.000	0.000	0.000	0.000	****	0.000	0.000	0.000
100.000	0.216	95.123	-0.017	0.188	100.000	0.216	-0.017	0.188	95.123
200.000	0.313	41.637	0.170	0.557	199.999	0.253	0.170	0.582	72.985
300.000	0.326	61.541	0.510	0.988	299.997	0.111	0.510	1.112	62.705
400.000	0.312	15.241	0.908	1.310	399.996	0.251	0.908	1.594	55.257
500.000	0.222	343.281	1.357	1.325	499.995	0.171	1.357	1.897	44.330
600.000	0.094	173.664	1.461	1.279	599.995	0.315	1.461	1.942	41.195
700.000	0.544	144.858	0.991	1.561	699.993	0.464	0.991	1.849	57.595
800.000	0.482	177.023	0.182	1.856	799.989	0.291	0.182	1.865	84.394
900.000	0.622	180.506	-0.781	1.874	899.984	0.143	-0.781	2.030	112.618
1000.000	1.087	161.211	-2.221	2.174	999.973	0.541	-2.221	3.108	135.610
1100.000	0.973	155.510	-3.892	2.832	1099.957	0.153	-3.892	4.813	143.959
1200.000	1.006	161.166	-5.496	3.467	1199.942	0.103	-5.496	6.498	147.752
1300.000	1.520	174.155	-7.646	3.886	1299.918	0.585	-7.646	8.577	153.060
1400.000	1.233	175.332	-10.038	4.109	1399.889	0.288	-10.038	10.846	157.741
1500.000	1.182	152.508	-12.025	4.672	1499.867	0.480	-12.025	12.901	158.768
1600.000	1.194	168.715	-13.962	5.352	1599.846	0.335	-13.962	14.952	159.026
1700.000	0.612	154.450	-15.465	5.786	1699.833	0.619	-15.465	16.512	159.487
1800.000	1.119	105.102	-16.202	6.960	1799.823	0.857	-16.202	17.633	156.753
1900.000	1.549	77.470	-16.163	9.222	1899.796	0.761	-16.163	18.609	150.293
2000.000	1.673	45.017	-14.838	11.574	1999.759	0.908	-14.838	18.818	142.045
2100.000	2.340	32.675	-12.087	13.709	2099.697	0.791	-12.087	18.276	131.403
2200.000	2.258	9.136	-8.423	15.124	2199.619	0.941	-8.423	17.311	119.117
2300.000	2.903	354.248	-3.959	15.183	2299.518	0.925	-3.959	15.690	104.615
2400.000	2.249	338.295	0.384	14.203	2399.418	0.964	0.384	14.208	88.452
2500.000	2.436	319.252	3.817	12.090	2499.336	0.796	3.817	12.679	72.478
2600.000	2.546	302.041	6.605	8.820	2599.243	0.753	6.605	11.019	53.171
2700.000	2.614	293.896	8.708	4.852	2699.142	0.373	8.708	9.968	29.129
2800.000	3.126	295.677	10.813	0.310	2799.016	0.520	10.813	10.817	1.642
2900.000	3.271	295.088	13.204	-4.732	2898.860	0.149	13.204	14.026	340.286
3000.000	1.700	299.328	15.140	-8.609	2998.763	1.581	15.140	17.417	330.377
3100.000	1.722	300.983	16.640	-11.190	3098.718	0.054	16.640	20.053	326.080
3200.000	0.503	317.329	17.736	-12.776	3198.698	1.248	17.736	21.859	324.235
3300.000	0.540	339.735	18.501	-13.236	3298.694	0.206	18.501	22.748	324.419
3400.000	0.201	101.923	18.907	-13.228	3398.693	0.669	18.907	23.075	325.022
3500.000	0.107	173.457	18.778	-13.046	3498.692	0.195	18.778	22.865	325.211
3600.000	0.100	132.844	18.626	-12.971	3598.692	0.072	18.626	22.697	325.146
3700.000	0.734	132.353	18.135	-12.434	3698.689	0.634	18.135	21.988	325.564

3800.000	0.869	159.195	16.994	-11.691	3798.679	0.395	16.994	20.627	325.474
3900.000	1.873	185.850	14.659	-11.588	3898.650	1.164	14.659	18.686	321.673
4000.000	2.319	191.275	11.049	-12.150	3998.583	0.488	11.049	16.423	312.281
4100.000	3.163	189.407	6.342	-12.997	4098.468	0.849	6.342	14.462	296.010
4200.000	3.086	189.584	0.966	-13.896	4198.319	0.078	0.966	13.930	273.975
4300.000	2.940	197.778	-4.131	-15.127	4298.182	0.454	-4.131	15.681	254.727
4400.000	2.893	203.854	-8.881	-16.931	4398.052	0.312	-8.881	19.119	242.322
4500.000	2.822	192.416	-13.593	-18.481	4497.929	0.574	-13.593	22.942	233.664
4600.000	3.657	184.826	-19.175	-19.279	4597.768	0.936	-19.175	27.191	225.154
4700.000	0.685	101.207	-22.470	-18.960	4697.697	3.645	-22.470	29.401	220.158
4800.000	0.877	25.300	-21.894	-18.046	4797.690	0.973	-21.894	28.373	219.498
4900.000	1.262	345.484	-20.136	-17.995	4897.673	0.813	-20.136	27.005	221.787
5000.000	1.268	342.625	-18.014	-18.602	4997.649	0.063	-18.014	25.894	225.920
5100.000	0.961	337.761	-16.181	-19.249	5097.630	0.321	-16.181	25.147	229.949
5200.000	0.599	354.268	-14.885	-19.619	5197.621	0.422	-14.885	24.627	232.812
5300.000	0.242	196.831	-14.567	-19.732	5297.619	0.828	-14.567	24.527	233.563
5400.000	0.499	25.485	-14.377	-19.606	5397.618	0.739	-14.377	24.312	233.748
5500.000	0.238	287.226	-13.922	-19.618	5497.617	0.583	-13.922	24.056	234.637
5600.000	0.349	288.408	-13.764	-20.106	5597.616	0.111	-13.764	24.366	235.604
5700.000	0.424	211.162	-13.985	-20.586	5697.614	0.487	-13.985	24.887	235.810
5800.000	0.247	246.261	-14.389	-20.976	5797.612	0.264	-14.389	25.437	235.550
5900.000	0.207	51.383	-14.363	-21.032	5897.612	0.451	-14.363	25.468	235.670
6000.000	0.405	216.004	-14.536	-21.099	5997.611	0.607	-14.536	25.621	235.434
6100.000	0.569	192.982	-15.306	-21.418	6097.608	0.252	-15.306	26.325	234.449
6200.000	0.330	205.226	-16.050	-21.652	6197.605	0.256	-16.050	26.952	233.451
6300.000	0.234	7.962	-16.109	-21.747	6297.604	0.558	-16.109	27.063	233.471
6400.000	0.381	326.759	-15.628	-21.901	6397.603	0.257	-15.628	26.905	234.489
6500.000	0.761	275.285	-15.288	-22.745	6497.598	0.603	-15.288	27.406	236.092
6600.000	0.447	247.010	-15.380	-23.766	6597.593	0.424	-15.380	28.308	237.092
6700.000	0.541	277.048	-15.474	-24.594	6697.589	0.271	-15.474	29.057	237.822
6800.000	1.054	259.208	-15.589	-25.965	6797.579	0.564	-15.589	30.285	239.020
6900.000	0.167	314.800	-15.658	-26.971	6897.573	0.969	-15.658	31.187	239.862
7000.000	0.396	277.304	-15.512	-27.417	6997.572	0.283	-15.512	31.501	240.499
7100.000	0.212	257.444	-15.508	-27.941	7097.570	0.209	-15.508	31.956	240.968
7200.000	0.192	313.905	-15.433	-28.242	7197.570	0.192	-15.433	32.183	241.346
7300.000	0.536	168.075	-15.774	-28.266	7297.569	0.702	-15.774	32.369	240.836