



**Company:** Noble Energy  
**Rig:** Production/Lightning  
**Latitude:** 40.345  
**Longitude:** -104.664  
**API #** 05-123-24665  
**Date:** 1/31/13

**Well:** McClellan 4-15  
**Location:** Weld County, Colorado  
**North Reference:** -0.54 To Grid  
**Depth Reference:** RKB = Ground Level  
**Surveyor:** Justin Williams  
**VS:**

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	0.000
100.000	0.388	357.366	0.338	-0.016	99.999	0.388	0.338	0.338	357.366
200.000	0.331	293.842	0.793	-0.295	199.998	0.381	0.793	0.846	339.574
300.000	0.292	288.092	0.989	-0.802	299.996	0.050	0.989	1.273	320.968
400.000	0.369	327.202	1.339	-1.218	399.995	0.233	1.339	1.810	317.697
500.000	0.545	192.142	1.145	-1.493	499.993	0.847	1.145	1.881	307.491
600.000	0.998	182.994	-0.189	-1.638	599.984	0.468	-0.189	1.649	263.416
700.000	1.083	188.287	-1.994	-1.820	699.967	0.128	-1.994	2.700	222.386
800.000	1.104	190.698	-3.876	-2.135	799.949	0.051	-3.876	4.425	208.846
900.000	1.066	188.834	-5.742	-2.457	899.931	0.052	-5.742	6.246	203.164
1000.000	0.873	205.883	-7.347	-2.932	999.917	0.345	-7.347	7.910	201.758
1100.000	0.967	193.127	-8.854	-3.456	1099.904	0.225	-8.854	9.505	201.325
1200.000	0.817	178.557	-10.389	-3.630	1199.892	0.271	-10.389	11.005	199.261
1300.000	0.909	207.111	-11.808	-3.974	1299.881	0.435	-11.808	12.459	198.600
1400.000	0.579	172.955	-13.015	-4.273	1399.873	0.539	-13.015	13.699	198.177
1500.000	0.474	175.001	-13.929	-4.175	1499.869	0.106	-13.929	14.541	196.687
1600.000	0.146	216.172	-14.444	-4.215	1599.867	0.377	-14.444	15.046	196.267
1700.000	0.463	245.135	-14.717	-4.657	1699.866	0.343	-14.717	15.436	197.558
1800.000	0.320	187.226	-15.164	-5.059	1799.864	0.399	-15.164	15.985	198.448
1900.000	0.333	176.368	-15.731	-5.075	1899.862	0.063	-15.731	16.529	197.881
2000.000	0.301	186.238	-16.281	-5.085	1999.861	0.063	-16.281	17.057	197.346
2100.000	0.412	79.912	-16.479	-4.760	2099.860	0.575	-16.479	17.153	196.110
2200.000	0.321	42.098	-16.208	-4.218	2199.858	0.253	-16.208	16.748	194.586
2300.000	0.391	12.271	-15.667	-3.957	2299.856	0.195	-15.667	16.159	194.176
2400.000	0.311	12.378	-15.069	-3.827	2399.854	0.080	-15.069	15.547	194.249
2500.000	0.420	9.501	-14.442	-3.708	2499.852	0.110	-14.442	14.910	194.400
2600.000	0.296	27.856	-13.852	-3.527	2599.850	0.167	-13.852	14.294	194.284
2700.000	0.494	47.681	-13.333	-3.087	2699.848	0.238	-13.333	13.686	193.036
2800.000	0.700	52.098	-12.668	-2.286	2799.842	0.211	-12.668	12.873	190.231
2900.000	0.737	73.376	-12.108	-1.188	2899.835	0.268	-12.108	12.167	185.603
3000.000	1.060	75.389	-11.691	0.323	2999.822	0.324	-11.691	11.696	178.416
3100.000	1.045	87.326	-11.415	2.130	3099.805	0.219	-11.415	11.612	169.433
3200.000	0.887	88.186	-11.348	3.814	3199.791	0.159	-11.348	11.972	161.423
3300.000	0.729	99.366	-11.427	5.216	3299.781	0.222	-11.427	12.561	155.468
3400.000	0.481	117.887	-11.727	6.214	3399.776	0.313	-11.727	13.272	152.080
3500.000	0.239	53.143	-11.798	6.752	3499.774	0.436	-11.798	13.594	150.218
3600.000	0.170	191.308	-11.819	6.890	3599.774	0.383	-11.819	13.680	149.761
3700.000	0.324	279.897	-11.916	6.582	3699.773	0.362	-11.916	13.613	151.086
3800.000	0.099	211.034	-11.941	6.259	3799.772	0.303	-11.941	13.482	152.339

3900.000	0.217	339.087	-11.838	6.147	3899.772	0.289	-11.838	13.339	152.560
4000.000	0.319	289.948	-11.566	5.817	3999.771	0.242	-11.566	12.946	153.299
4100.000	0.802	337.746	-10.823	5.290	4099.766	0.634	-10.823	12.046	153.950
4200.000	0.651	298.868	-9.901	4.528	4199.759	0.504	-9.901	10.887	155.424
4300.000	0.819	256.021	-9.799	3.337	4299.751	0.559	-9.799	10.352	161.193
4400.000	1.062	259.046	-10.148	1.734	4399.738	0.248	-10.148	10.295	170.301
4500.000	1.106	266.716	-10.379	-0.138	4499.720	0.151	-10.379	10.380	180.764
4600.000	0.989	292.362	-10.106	-1.900	4599.704	0.479	-10.106	10.283	190.649
4700.000	0.816	327.479	-9.177	-3.082	4699.692	0.569	-9.177	9.680	198.562
4800.000	0.790	358.243	-7.887	-3.486	4799.683	0.427	-7.887	8.623	203.842
4900.000	0.749	10.516	-6.555	-3.387	4899.674	0.169	-6.555	7.379	207.328
5000.000	0.780	9.875	-5.242	-3.151	4999.665	0.032	-5.242	6.116	211.014
5100.000	0.650	8.649	-4.011	-2.949	5099.657	0.131	-4.011	4.979	216.329
5200.000	0.616	1.096	-2.913	-2.854	5199.651	0.090	-2.913	4.078	224.415
5300.000	0.296	350.311	-2.121	-2.887	5299.648	0.330	-2.121	3.582	233.700
5400.000	0.310	14.675	-1.605	-2.862	5399.646	0.128	-1.605	3.281	240.715
5500.000	0.069	6.164	-1.284	-2.787	5499.646	0.242	-1.284	3.069	245.263
5600.000	0.121	192.091	-1.327	-2.803	5599.646	0.189	-1.327	3.101	244.657
5700.000	0.327	112.822	-1.541	-2.562	5699.645	0.327	-1.541	2.989	238.969
5800.000	0.445	127.994	-1.891	-1.992	5799.643	0.155	-1.891	2.747	226.496
5900.000	0.530	167.612	-2.582	-1.587	5899.639	0.340	-2.582	3.030	211.582
6000.000	0.298	178.986	-3.293	-1.483	5999.637	0.245	-3.293	3.612	204.247
6100.000	0.784	201.220	-4.191	-1.726	6099.632	0.520	-4.191	4.532	202.387
6200.000	1.094	256.530	-5.051	-2.902	6199.620	0.914	-5.051	5.825	209.884
6300.000	1.513	295.851	-4.697	-5.020	6299.596	0.962	-4.697	6.875	226.899
6400.000	1.584	327.490	-2.956	-6.951	6399.561	0.847	-2.956	7.553	246.963
6500.000	1.620	310.345	-0.875	-8.771	6499.523	0.479	-0.875	8.815	264.303
6600.000	1.869	304.589	0.966	-11.191	6599.477	0.305	0.966	11.233	274.933
6700.000	1.964	290.493	2.492	-14.139	6699.421	0.479	2.492	14.357	279.994
6800.000	2.025	285.550	3.565	-17.446	6799.361	0.183	3.565	17.806	281.549
6900.000	1.706	275.676	4.186	-20.629	6899.308	0.451	4.186	21.050	281.470
7000.000	1.359	311.107	5.113	-23.004	6999.274	0.990	5.113	23.565	282.530
7020.000	1.368	310.509	5.424	-23.364	7019.268	0.085	5.424	23.986	283.069