



**Company:** Noble Energy

**Rig:** Production/Core-Tech

**API #** 05-123-31178

**Date:** 3/6/2014

**Surveyor:** Nick Kula

**VS:** 0.000

**Lat :** 40.296

**Long:** -104.469

**Well:** Guttersen State CC 20-33D

**Location:** Weld County, Colorado

**North Reference:** GRID

**Convergence:** GRID North is 0.670 Degrees East

**Declination:** 8.33

**Depth Reference:** Ground Level

**Elevation:** 4712'

**Total Depth as Drilled:** 7021'

**Lat & Long obtained by handheld GPS at wellhead**

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	0.486	247.158	-0.165	-0.391	99.999	0.486	-0.165	0.424	247.158
200.000	0.458	271.512	-0.319	-1.182	199.996	0.201	-0.319	1.224	254.905
300.000	0.308	264.558	-0.334	-1.850	299.993	0.157	-0.334	1.880	259.773
400.000	0.256	250.213	-0.435	-2.328	399.992	0.088	-0.435	2.368	259.418
500.000	0.234	237.431	-0.621	-2.711	499.991	0.059	-0.621	2.781	257.104
600.000	0.449	209.381	-1.072	-3.075	599.989	0.266	-1.072	3.257	250.778
700.000	0.923	225.323	-1.980	-3.840	699.982	0.507	-1.980	4.321	242.721
800.000	3.438	221.025	-4.809	-6.382	799.902	2.518	-4.809	7.991	232.998
900.000	5.743	219.170	-10.951	-11.511	899.574	2.310	-10.951	15.888	226.427
1000.000	7.563	218.618	-19.973	-18.779	998.897	1.821	-19.973	27.415	223.235
1100.000	8.737	212.743	-31.504	-26.995	1097.887	1.438	-31.504	41.487	220.593
1200.000	9.847	215.072	-44.890	-36.016	1196.573	1.172	-44.890	57.553	218.741
1300.000	12.071	213.056	-60.654	-46.634	1294.744	2.257	-60.654	76.509	217.555
1400.000	14.617	212.112	-80.108	-59.047	1392.036	2.555	-80.108	99.518	216.394
1500.000	15.457	213.256	-101.939	-73.062	1488.612	0.891	-101.939	125.418	215.630
1600.000	15.299	210.187	-124.487	-87.004	1585.033	0.829	-124.487	151.877	214.950
1700.000	15.505	212.444	-147.171	-100.809	1681.442	0.634	-147.171	178.386	214.410
1800.000	15.143	214.734	-169.185	-115.421	1777.887	0.705	-169.185	204.807	214.303
1900.000	14.762	215.788	-190.254	-130.314	1874.501	0.468	-190.254	230.604	214.409
2000.000	14.829	213.115	-211.307	-144.755	1971.187	0.686	-211.307	256.134	214.413
2100.000	16.377	213.932	-233.723	-159.617	2067.499	1.564	-233.723	283.027	214.330
2200.000	15.606	213.659	-256.617	-174.942	2163.629	0.775	-256.617	310.575	214.283
2300.000	15.192	216.414	-278.358	-190.175	2260.040	0.840	-278.358	337.119	214.341
2400.000	16.085	212.780	-300.550	-205.454	2356.339	1.325	-300.550	364.063	214.356
2500.000	16.410	208.584	-324.602	-219.713	2452.349	1.218	-324.602	391.970	214.093
2600.000	15.332	207.979	-348.682	-232.674	2548.535	1.091	-348.682	419.185	213.715
2700.000	15.733	211.006	-371.978	-245.860	2644.885	0.904	-371.978	445.887	213.463
2800.000	15.337	210.820	-394.956	-259.620	2741.231	0.399	-394.956	472.645	213.318
2900.000	14.952	208.953	-417.602	-272.641	2837.758	0.621	-417.602	498.723	213.139
3000.000	14.894	208.645	-440.169	-285.047	2934.386	0.099	-440.169	524.405	212.926
3100.000	16.015	214.137	-462.868	-298.950	3030.774	1.842	-462.868	551.015	212.857
3200.000	15.113	211.210	-485.435	-313.446	3127.107	1.196	-485.435	577.837	212.850
3300.000	14.565	210.227	-507.449	-326.532	3223.772	0.603	-507.449	603.430	212.760
3400.000	15.505	213.080	-529.514	-340.158	3320.349	1.196	-529.514	629.359	212.717
3500.000	15.055	214.134	-551.464	-354.741	3416.814	0.529	-551.464	655.709	212.752

3600.000	15.224	211.235	-573.441	-368.837	3513.345	0.775	-573.441	681.817	212.749
3700.000	16.262	213.562	-596.335	-383.386	3609.593	1.215	-596.335	708.943	212.737
3800.000	17.145	211.897	-620.517	-398.915	3705.373	1.005	-620.517	737.682	212.736
3900.000	17.680	212.715	-645.808	-414.911	3800.790	0.588	-645.808	767.606	212.719
4000.000	16.786	214.251	-670.520	-431.245	3896.301	1.004	-670.520	797.227	212.747
4100.000	15.724	212.718	-693.857	-446.697	3992.302	1.145	-693.857	825.213	212.773
4200.000	14.251	211.660	-715.736	-460.482	4088.898	1.498	-715.736	851.071	212.756
4300.000	14.846	210.053	-737.302	-473.359	4185.691	0.718	-737.302	876.175	212.701
4400.000	14.179	214.506	-758.485	-486.713	4282.503	1.299	-758.485	901.215	212.688
4500.000	14.646	211.597	-779.347	-500.276	4379.357	0.861	-779.347	926.098	212.697
4600.000	13.458	212.147	-799.969	-513.093	4476.362	1.196	-799.969	950.376	212.676
4700.000	12.452	212.561	-818.908	-525.087	4573.816	1.011	-818.908	972.794	212.668
4800.000	9.125	223.771	-833.727	-536.379	4672.045	3.919	-833.727	991.364	212.755
4900.000	6.718	214.331	-844.285	-545.165	4771.088	2.728	-844.285	1004.998	212.851
5000.000	6.133	207.496	-853.854	-550.930	4870.461	0.962	-853.854	1016.165	212.831
5100.000	3.932	208.215	-861.614	-555.018	4970.069	2.203	-861.614	1024.902	212.788
5200.000	2.125	232.312	-865.769	-558.106	5069.929	2.172	-865.769	1030.068	212.807
5300.000	0.456	302.625	-866.689	-559.909	5169.903	2.018	-866.689	1031.817	212.864
5400.000	0.404	334.770	-866.156	-560.394	5269.901	0.243	-866.156	1031.633	212.902
5500.000	0.423	332.117	-865.511	-560.716	5369.898	0.027	-865.511	1031.267	212.937
5600.000	0.692	27.909	-864.652	-560.606	5469.894	0.573	-864.652	1030.486	212.958
5700.000	0.915	25.271	-863.396	-559.983	5569.884	0.227	-863.396	1029.094	212.967
5800.000	0.547	3.747	-862.198	-559.611	5669.876	0.453	-862.198	1027.886	212.986
5900.000	0.354	354.233	-861.414	-559.611	5769.873	0.206	-861.414	1027.228	213.009
6000.000	0.350	343.465	-860.814	-559.729	5869.871	0.066	-860.814	1026.789	213.033
6100.000	0.458	1.122	-860.121	-559.808	5969.868	0.164	-860.121	1026.252	213.058
6200.000	0.319	46.143	-859.528	-559.599	6069.866	0.324	-859.528	1025.641	213.066
6300.000	0.334	357.084	-859.044	-559.413	6169.865	0.272	-859.044	1025.134	213.072
6400.000	0.581	33.937	-858.332	-559.145	6269.862	0.372	-858.332	1024.391	213.082
6500.000	1.497	55.954	-857.180	-557.780	6369.845	0.983	-857.180	1022.681	213.053
6600.000	1.961	71.515	-855.906	-555.075	6469.799	0.656	-855.906	1020.139	212.964
6700.000	1.083	81.901	-855.230	-552.516	6569.763	0.917	-855.230	1018.181	212.864

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