



**Company:** Noble Energy

**Rig:** Production/Coretech

**API #** 05-123-24135

**Date:** 2/24/2014

**Surveyor:** Randy Holcomb

**VS:** 0.000

**Lat :** 40.491

**Long:** -104.505

**Well:** McKenney 13-22

**Location:** Weld County, Colorado

**North Reference:** GRID

**Convergence:** Grid north is 0.64 East of True North

**Declination:** 8.37

**Depth Reference:** Ground Level

**Elevation:** 4669 Feet

**Total Depth as Drilled:** 7000 Feet

**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
100.000	0.414	56.350	0.200	0.301	99.999	0.414	0.200	0.361	56.350
200.000	0.341	133.228	0.197	0.818	199.998	0.473	0.197	0.842	76.462
300.000	0.233	217.168	-0.169	0.912	299.997	0.392	-0.169	0.927	100.493
400.000	0.599	232.596	-0.649	0.374	399.994	0.379	-0.649	0.749	150.041
500.000	0.662	208.710	-1.472	-0.319	499.988	0.268	-1.472	1.507	192.209
600.000	0.871	232.943	-2.437	-1.203	599.979	0.382	-2.437	2.718	206.269
700.000	0.669	204.893	-3.425	-2.055	699.970	0.422	-3.425	3.994	210.970
800.000	0.582	218.474	-4.352	-2.617	799.965	0.171	-4.352	5.078	211.022
900.000	0.948	227.233	-5.311	-3.540	899.955	0.383	-5.311	6.382	213.686
1000.000	0.605	205.276	-6.350	-4.372	999.946	0.448	-6.350	7.709	214.552
1100.000	0.839	202.289	-7.505	-4.876	1099.938	0.237	-7.505	8.949	213.011
1200.000	0.777	200.961	-8.815	-5.396	1199.928	0.066	-8.815	10.335	211.471
1300.000	0.718	229.949	-9.851	-6.118	1299.920	0.378	-9.851	11.596	211.842
1400.000	0.798	216.921	-10.811	-7.016	1399.912	0.189	-10.811	12.888	212.982
1500.000	0.828	223.938	-11.888	-7.935	1499.902	0.104	-11.888	14.293	213.724
1600.000	0.598	209.302	-12.863	-8.692	1599.894	0.291	-12.863	15.524	214.048
1700.000	0.604	237.336	-13.602	-9.391	1699.889	0.291	-13.602	16.529	214.621
1800.000	0.663	229.913	-14.259	-10.277	1799.882	0.101	-14.259	17.577	215.782
1900.000	0.609	230.136	-14.973	-11.128	1899.876	0.054	-14.973	18.655	216.620
2000.000	0.837	220.194	-15.871	-12.007	1999.868	0.259	-15.871	19.902	217.109
2100.000	0.521	232.342	-16.707	-12.838	2099.861	0.345	-16.707	21.070	217.541
2200.000	0.713	225.763	-17.418	-13.644	2199.855	0.205	-17.418	22.126	218.072
2300.000	0.597	228.192	-18.200	-14.478	2299.849	0.119	-18.200	23.256	218.502
2400.000	0.597	186.658	-19.065	-14.927	2399.844	0.423	-19.065	24.213	218.060
2500.000	0.741	196.952	-20.200	-15.176	2499.837	0.187	-20.200	25.266	216.917
2600.000	0.590	216.273	-21.233	-15.669	2599.830	0.268	-21.233	26.389	216.425
2700.000	0.790	204.524	-22.276	-16.260	2699.823	0.244	-22.276	27.579	216.127
2800.000	0.823	197.098	-23.590	-16.757	2799.813	0.110	-23.590	28.936	215.388
2900.000	0.434	192.012	-24.647	-17.047	2899.807	0.393	-24.647	29.968	214.670
3000.000	0.586	201.662	-25.492	-17.315	2999.803	0.174	-25.492	30.817	214.185
3100.000	0.398	143.313	-26.246	-17.296	3099.800	0.507	-26.246	31.432	213.385
3200.000	0.933	108.273	-26.780	-16.315	3199.793	0.649	-26.780	31.358	211.351
3300.000	0.510	124.225	-27.285	-15.173	3299.785	0.464	-27.285	31.221	209.078
3400.000	0.408	149.673	-27.844	-14.625	3399.782	0.226	-27.844	31.451	207.711
3500.000	0.394	154.617	-28.462	-14.298	3499.779	0.037	-28.462	31.851	206.673
3600.000	0.254	111.457	-28.854	-13.944	3599.778	0.272	-28.854	32.046	205.793
3700.000	0.615	108.800	-29.108	-13.229	3699.775	0.361	-29.108	31.973	204.442

3800.000	0.560	93.741	-29.313	-12.234	3799.770	0.163	-29.313	31.763	202.654
3900.000	0.742	95.673	-29.408	-11.102	3899.763	0.184	-29.408	31.434	200.682
4000.000	0.352	126.071	-29.653	-10.209	3999.759	0.473	-29.653	31.362	198.998
4100.000	0.363	115.647	-29.971	-9.676	4099.757	0.066	-29.971	31.494	197.893
4200.000	0.404	111.661	-30.238	-9.063	4199.755	0.049	-30.238	31.567	196.685
4300.000	0.505	70.377	-30.220	-8.321	4299.752	0.334	-30.220	31.345	195.395
4400.000	0.313	77.205	-30.011	-7.640	4399.749	0.198	-30.011	30.969	194.282
4500.000	0.460	176.058	-30.352	-7.346	4499.748	0.595	-30.352	31.228	193.606
4600.000	1.179	230.112	-31.412	-8.108	4599.738	0.982	-31.412	32.442	194.473
4700.000	2.063	246.021	-32.803	-10.542	4699.697	0.983	-32.803	34.456	197.816
4800.000	2.699	251.573	-34.279	-14.420	4799.611	0.676	-34.279	37.189	202.815
4900.000	3.298	247.876	-36.107	-19.319	4899.473	0.628	-36.107	40.950	208.149
5000.000	3.550	247.594	-38.370	-24.845	4999.295	0.253	-38.370	45.712	212.924
5100.000	3.252	246.831	-40.666	-30.315	5099.119	0.302	-40.666	50.722	216.704
5200.000	2.452	243.717	-42.729	-34.841	5198.994	0.814	-42.729	55.134	219.194
5300.000	2.123	241.264	-44.567	-38.384	5298.914	0.343	-44.567	58.818	220.737
5400.000	1.939	240.003	-46.304	-41.474	5398.851	0.189	-46.304	62.162	221.850
5500.000	1.318	245.284	-47.631	-43.984	5498.810	0.638	-47.631	64.833	222.720
5600.000	0.768	261.162	-48.215	-45.691	5598.794	0.617	-48.215	66.425	223.460
5700.000	0.584	255.067	-48.449	-46.845	5698.787	0.197	-48.449	67.392	224.036
5800.000	0.132	263.399	-48.593	-47.451	5798.784	0.454	-48.593	67.919	224.319
5900.000	0.166	300.075	-48.534	-47.691	5898.784	0.099	-48.534	68.044	224.498
6000.000	0.043	114.126	-48.477	-47.782	5998.784	0.209	-48.477	68.067	224.587
6100.000	0.405	115.338	-48.643	-47.428	6098.783	0.362	-48.643	67.938	224.275
6200.000	0.366	124.312	-48.975	-46.845	6198.781	0.072	-48.975	67.772	223.727
6300.000	0.516	121.742	-49.392	-46.198	6298.778	0.152	-49.392	67.630	223.086
6400.000	0.479	162.455	-50.028	-45.689	6398.774	0.348	-50.028	67.751	222.405
6500.000	0.654	142.419	-50.878	-45.215	6498.770	0.261	-50.878	68.066	221.627
6600.000	0.680	144.325	-51.813	-44.521	6598.763	0.035	-51.813	68.313	220.671
6700.000	0.875	172.827	-53.052	-44.079	6698.754	0.427	-53.052	68.975	219.722