



**Company:** Noble Energy  
**Rig:** Production/VES  
**API #** 05-123-26810

**Date:** 3/30/2013  
**Surveyor:** Nick Kula

**VS:** 0.000  
**Lat :** 40.46666  
**Long:** -104.44

**Well:** Wells Ranch AA 21-15  
**Location:** Weld County, Colorado  
**North Reference:** GRID  
**Convergence:** Grid north is 0.69 Degrees East of

**Declination:** 8.45  
**Depth Reference:** Ground Level  
**Elevation:** 4729'

**Total Depth as Drilled:** 6960'

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

#### HA 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	0.769	77.230	0.148	0.654	99.997	0.769	0.148	0.671	77.230
200.000	0.768	60.787	0.624	1.893	199.988	0.220	0.624	1.993	71.771
300.000	0.246	40.940	1.112	2.619	299.984	0.543	1.112	2.845	66.982
400.000	0.436	67.904	1.418	3.112	399.982	0.244	1.418	3.419	65.507
500.000	0.239	3.958	1.769	3.479	499.981	0.395	1.769	3.903	63.043
600.000	0.638	353.322	2.530	3.429	599.978	0.405	2.530	4.261	53.572
700.000	0.995	329.950	3.834	2.929	699.968	0.481	3.834	4.825	37.377
800.000	0.894	327.893	5.247	2.080	799.954	0.106	5.247	5.644	21.624
900.000	0.914	333.930	6.624	1.315	899.942	0.097	6.624	6.753	11.225
1000.000	0.886	341.653	8.074	0.721	999.929	0.125	8.074	8.106	5.101
1100.000	1.066	340.902	9.686	0.173	1099.915	0.180	9.686	9.688	1.025
1200.000	1.149	339.712	11.505	-0.479	1199.896	0.086	11.505	11.515	357.618
1300.000	1.178	345.147	13.439	-1.090	1299.875	0.114	13.439	13.483	355.365
1400.000	0.871	338.496	15.140	-1.632	1399.859	0.328	15.140	15.228	353.848
1500.000	0.746	330.188	16.412	-2.234	1499.849	0.172	16.412	16.563	352.248
1600.000	0.601	4.544	17.499	-2.516	1599.843	0.421	17.499	17.679	351.818
1700.000	0.538	345.275	18.476	-2.594	1699.838	0.200	18.476	18.657	352.009
1800.000	0.297	27.373	19.161	-2.594	1799.835	0.375	19.161	19.335	352.290
1900.000	0.500	328.771	19.764	-2.701	1899.833	0.429	19.764	19.948	352.217
2000.000	0.700	15.064	20.728	-2.769	1999.828	0.507	20.728	20.912	352.391
2100.000	0.875	14.986	22.056	-2.412	2099.819	0.175	22.056	22.187	353.758
2200.000	1.211	22.243	23.772	-1.815	2199.802	0.360	23.772	23.841	355.634
2300.000	1.273	31.075	25.701	-0.842	2299.779	0.201	25.701	25.715	358.124
2400.000	1.130	39.068	27.418	0.353	2399.757	0.220	27.418	27.420	0.738
2500.000	0.796	30.394	28.782	1.326	2499.743	0.364	28.782	28.813	2.638
2600.000	0.954	48.108	29.937	2.297	2599.731	0.312	29.937	30.025	4.388
2700.000	0.646	67.277	30.711	3.437	2699.721	0.404	30.711	30.903	6.385
2800.000	0.608	59.073	31.201	4.412	2799.715	0.097	31.201	31.512	8.048
2900.000	0.640	111.805	31.267	5.386	2899.710	0.555	31.267	31.727	9.774
3000.000	0.754	95.905	30.991	6.559	2999.703	0.223	30.991	31.678	11.950
3100.000	0.535	90.398	30.920	7.680	3099.697	0.227	30.920	31.860	13.948
3200.000	0.564	67.239	31.107	8.600	3199.692	0.222	31.107	32.274	15.454
3300.000	1.195	41.973	32.073	9.751	3299.680	0.726	32.073	33.523	16.911
3400.000	1.431	53.482	33.591	11.452	3399.654	0.352	33.591	35.490	18.825

3500.000	1.528	27.515	35.517	13.071	3499.622	0.672	35.517	37.846	20.205
3600.000	1.205	21.677	37.677	14.076	3599.593	0.352	37.677	40.220	20.485
3700.000	0.529	43.855	38.987	14.784	3699.582	0.742	38.987	41.696	20.767
3800.000	0.778	21.353	39.952	15.351	3799.575	0.353	39.952	42.800	21.019
3900.000	0.863	27.204	41.254	15.943	3899.565	0.119	41.254	44.227	21.129
4000.000	0.938	32.979	42.610	16.732	3999.553	0.118	42.610	45.778	21.439
4100.000	1.240	53.919	43.934	18.053	4099.535	0.495	43.934	47.499	22.338
4200.000	2.102	66.202	45.312	20.606	4199.492	0.929	45.312	49.777	24.454
4300.000	3.044	70.172	46.953	24.781	4299.390	0.957	46.953	53.091	27.825
4400.000	4.024	70.287	49.037	30.582	4399.198	0.981	49.037	57.792	31.950
4500.000	4.406	70.990	51.472	37.518	4498.928	0.385	51.472	63.694	36.088
4600.000	3.519	77.291	53.398	44.144	4598.688	0.987	53.398	69.282	39.580
4700.000	3.005	62.608	55.279	49.465	4698.527	0.977	55.279	74.179	41.823
4800.000	2.893	55.972	57.897	53.884	4798.395	0.359	57.897	79.092	42.944
4900.000	2.468	57.388	60.470	57.788	4898.286	0.430	60.470	83.643	43.701
5000.000	1.936	70.172	62.203	61.191	4998.212	0.721	62.203	87.256	44.530
5100.000	1.156	77.641	62.992	63.766	5098.175	0.804	62.992	89.633	45.350
5200.000	0.717	93.762	63.167	65.375	5198.162	0.508	63.167	90.907	45.984
5300.000	0.947	81.735	63.245	66.817	5298.151	0.287	63.245	92.002	46.573
5400.000	1.045	97.987	63.237	68.537	5398.136	0.298	63.237	93.254	47.303
5500.000	0.909	119.600	62.718	70.130	5498.122	0.390	62.718	94.084	48.193
5600.000	1.122	133.414	61.653	71.531	5598.106	0.323	61.653	94.434	49.241
5700.000	1.151	142.562	60.184	72.852	5698.087	0.184	60.184	94.496	50.440
5800.000	1.731	134.136	58.334	74.547	5798.055	0.617	58.334	94.658	51.956
5900.000	2.649	128.356	55.848	77.443	5897.981	0.942	55.848	95.480	54.203
6000.000	3.570	122.987	52.719	81.867	5997.833	0.965	52.719	97.373	57.220
6100.000	1.232	170.028	49.965	84.665	6097.745	2.876	49.965	98.309	59.453
6200.000	1.836	297.131	49.637	83.425	6197.727	2.759	49.637	97.075	59.248
6300.000	2.639	307.841	51.780	80.182	6297.651	0.902	51.780	95.448	57.147
6400.000	2.811	313.142	54.868	76.575	6397.538	0.305	54.868	94.203	54.377
6500.000	2.421	318.302	58.122	73.381	6497.433	0.455	58.122	93.611	51.619
6600.000	1.751	335.457	61.088	71.342	6597.367	0.909	61.088	93.923	49.427
6700.000	1.480	337.399	63.670	70.211	6697.328	0.276	63.670	94.781	47.797
6750.000	1.328	348.042	64.833	69.843	6747.313	0.602	64.833	95.296	47.131

True North