



Company: Noble Energy
Rig: Production/Coretech
API # 05-123-22780
Date: 1/2/14
Surveyor: Brian Brewbaker
VS: 0.000
Lat : 40.492
Long: -104.495

Well: Foss 13-12
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid north is 0.65 degrees East of
Declination: 8.38
Depth Reference: Ground Level
Elevation: 4680
Total Depth as Drilled: 6970

Lat & Long obtained by handheld GPS at wellhead

MS Gyro Survey Calculations

Depth	Inc	AzG	N/-S	E/-W	TVD	DL	VS	CD	Cbrg
100.000	0.270	97.465	-0.031	0.233	100.000	0.270	-0.031	0.235	97.465
200.000	0.254	70.977	0.011	0.676	199.999	0.121	0.011	0.676	89.059
300.000	0.191	128.982	-0.022	1.016	299.998	0.223	-0.022	1.016	91.225
400.000	0.336	115.158	-0.251	1.411	399.997	0.157	-0.251	1.433	100.104
500.000	0.384	132.911	-0.604	1.922	499.995	0.121	-0.604	2.014	107.455
600.000	0.226	157.751	-1.015	2.242	599.994	0.203	-1.015	2.461	114.355
700.000	0.288	173.297	-1.447	2.346	699.993	0.093	-1.447	2.756	121.663
800.000	0.500	206.007	-2.089	2.183	799.990	0.301	-2.089	3.021	133.729
900.000	0.455	222.617	-2.774	1.723	899.987	0.145	-2.774	3.265	148.153
1000.000	0.607	217.797	-3.484	1.129	999.982	0.158	-3.484	3.663	162.041
1100.000	0.590	211.864	-4.340	0.533	1099.977	0.064	-4.340	4.373	173.000
1200.000	0.537	217.907	-5.147	-0.027	1199.972	0.080	-5.147	5.147	180.298
1300.000	0.502	226.660	-5.818	-0.633	1299.968	0.086	-5.818	5.852	186.213
1400.000	0.504	232.917	-6.384	-1.303	1399.964	0.055	-6.384	6.515	191.538
1500.000	0.438	232.269	-6.883	-1.957	1499.961	0.066	-6.883	7.156	195.870
1600.000	0.335	210.014	-7.370	-2.405	1599.959	0.180	-7.370	7.753	198.075
1700.000	0.287	193.756	-7.866	-2.611	1699.957	0.100	-7.866	8.288	198.362
1800.000	0.403	147.027	-8.405	-2.479	1799.956	0.294	-8.405	8.763	196.433
1900.000	0.519	153.971	-9.107	-2.088	1899.952	0.128	-9.107	9.344	192.916
2000.000	0.626	146.668	-9.971	-1.589	1999.947	0.129	-9.971	10.097	189.057
2100.000	0.594	135.115	-10.795	-0.923	2099.942	0.127	-10.795	10.834	184.888
2200.000	0.513	142.443	-11.517	-0.284	2199.937	0.108	-11.517	11.521	181.414
2300.000	0.609	129.927	-12.213	0.396	2299.932	0.155	-12.213	12.220	178.143
2400.000	0.397	132.377	-12.787	1.059	2399.928	0.213	-12.787	12.831	175.265
2500.000	0.496	108.913	-13.161	1.725	2499.925	0.206	-13.161	13.274	172.535
2600.000	0.460	98.702	-13.362	2.531	2599.922	0.092	-13.362	13.600	169.274
2700.000	0.329	111.862	-13.530	3.194	2699.920	0.159	-13.530	13.902	166.716
2800.000	0.319	101.802	-13.694	3.733	2799.918	0.058	-13.694	14.193	164.750
2900.000	0.240	91.860	-13.757	4.216	2899.917	0.092	-13.757	14.389	162.964
3000.000	0.237	89.011	-13.761	4.633	2999.916	0.012	-13.761	14.519	161.394
3100.000	0.414	111.248	-13.888	5.177	3099.914	0.214	-13.888	14.822	159.557
3200.000	0.551	122.318	-14.276	5.920	3199.911	0.164	-14.276	15.455	157.477
3300.000	1.190	133.305	-15.245	7.082	3299.899	0.658	-15.245	16.810	155.084
3400.000	1.344	114.559	-16.445	8.904	3399.875	0.440	-16.445	18.701	151.567
3500.000	1.950	88.406	-16.885	11.671	3499.834	0.951	-16.885	20.526	145.346
3600.000	2.025	86.747	-16.737	15.136	3599.774	0.095	-16.737	22.566	137.876

3700.000	1.856	93.348	-16.732	18.517	3699.717	0.280	-16.732	24.957	132.100
3800.000	1.929	85.788	-16.703	21.812	3799.662	0.260	-16.703	27.473	127.443
3900.000	1.777	87.179	-16.503	25.040	3899.610	0.158	-16.503	29.989	123.388
4000.000	1.499	92.513	-16.484	27.896	3999.569	0.317	-16.484	32.402	120.579
4100.000	1.187	111.322	-16.918	30.167	4099.542	0.536	-16.918	34.587	119.284
4200.000	1.157	120.675	-17.809	32.000	4199.521	0.193	-17.809	36.622	119.098
4300.000	0.932	123.293	-18.771	33.549	4299.505	0.230	-18.771	38.444	119.228
4400.000	0.883	118.133	-19.581	34.909	4399.492	0.096	-19.581	40.026	119.289
4500.000	0.606	138.505	-20.340	35.938	4499.484	0.379	-20.340	41.295	119.509
4600.000	0.680	159.931	-21.294	36.492	4599.477	0.250	-21.294	42.250	120.264
4700.000	1.043	187.519	-22.753	36.576	4699.466	0.541	-22.753	43.076	121.884
4800.000	1.442	197.795	-24.853	36.073	4799.443	0.455	-24.853	43.806	124.566
4900.000	1.529	194.018	-27.345	35.365	4899.409	0.131	-27.345	44.704	127.712
5000.000	1.460	198.514	-29.848	34.638	4999.375	0.136	-29.848	45.724	130.752
5100.000	1.187	191.854	-32.069	34.020	5099.349	0.313	-32.069	46.753	133.309
5200.000	1.028	199.215	-33.930	33.512	5199.330	0.213	-33.930	47.690	135.354
5300.000	1.094	175.956	-35.728	33.285	5299.313	0.433	-35.728	48.830	137.028
5400.000	0.271	181.669	-36.917	33.345	5399.305	0.825	-36.917	49.747	137.910
5500.000	0.477	295.722	-36.972	32.963	5499.304	0.638	-36.972	49.533	138.281
5600.000	0.536	289.525	-36.635	32.147	5599.300	0.080	-36.635	48.740	138.733
5700.000	0.493	302.168	-36.250	31.343	5699.296	0.121	-36.250	47.921	139.152
5800.000	0.575	306.012	-35.726	30.573	5799.292	0.090	-35.726	47.021	139.444
5900.000	0.413	336.115	-35.101	30.021	5899.288	0.300	-35.101	46.188	139.461
6000.000	0.417	325.327	-34.472	29.668	5999.286	0.078	-34.472	45.481	139.284
6100.000	0.322	356.635	-33.893	29.444	6099.284	0.219	-33.893	44.896	139.017
6200.000	0.372	7.742	-33.291	29.472	6199.282	0.084	-33.291	44.462	138.482
6300.000	0.595	359.431	-32.450	29.510	6299.278	0.233	-32.450	43.862	137.717
6400.000	0.708	38.578	-31.448	29.891	6399.272	0.450	-31.448	43.387	136.455
6500.000	0.975	69.379	-30.665	31.072	6499.262	0.516	-30.665	43.656	134.622
6600.000	1.009	31.796	-29.617	32.332	6599.248	0.640	-29.617	43.847	132.491
6700.000	1.625	12.303	-27.484	33.098	6699.221	0.754	-27.484	43.022	129.705

True North