



Company: Noble Energy Inc

Rig: Production/ CoreTech

API # 05-123-21060

Date: 5/2/2014

Surveyor: Jay Hinman

VS: 0.000

Lat : 40.12935

Long: -104.51168

Well: Haffner 41-23

Location: Weld County, Colorado

North Reference: GRID

Convergence: Grid North is 0.64 Deg

Declination: 8.31

Depth Reference: Ground Level

Elevation: 4943'

Total Depth as Drilled: 7684'

Lat & Long obtained by handheld GPS at wellhead

MS Gyro Survey Calculations

Depth	Inc	AzG	N/-S	E/-W	TVD	DL	VS	CD
0.000	0.000	0.000	0.000	0.000	0.000	****	0.000	0.000
100.000	0.980	115.474	-0.368	0.772	99.995	0.980	-0.368	0.855
200.000	1.358	120.172	-1.332	2.569	199.974	0.390	-1.332	2.894
300.000	1.512	154.017	-3.113	4.172	299.945	0.848	-3.113	5.205
400.000	1.615	185.272	-5.702	4.620	399.909	0.848	-5.702	7.339
500.000	1.900	216.335	-8.441	3.509	499.864	0.980	-8.441	9.141
600.000	2.879	220.969	-11.673	0.880	599.776	0.997	-11.673	11.706
700.000	4.309	240.864	-15.398	-4.049	699.581	1.877	-15.398	15.922
800.000	5.581	255.535	-18.442	-12.039	799.210	1.784	-18.442	22.024
900.000	6.581	268.791	-19.778	-22.478	898.651	1.718	-19.778	29.941
1000.000	7.422	280.458	-18.727	-34.560	997.910	1.648	-18.727	39.307
1100.000	7.767	283.566	-15.969	-47.480	1097.033	0.536	-15.969	50.094
1200.000	7.799	279.803	-13.229	-60.734	1196.112	0.511	-13.229	62.158
1300.000	7.556	277.230	-11.247	-73.942	1295.216	0.421	-11.247	74.793
1400.000	7.329	276.574	-9.689	-86.801	1394.374	0.243	-9.689	87.340
1500.000	7.507	274.129	-8.488	-99.652	1493.537	0.362	-8.488	100.013
1600.000	7.069	275.673	-7.410	-112.290	1592.729	0.479	-7.410	112.534
1700.000	7.384	274.108	-6.341	-124.823	1691.935	0.371	-6.341	124.984
1800.000	7.002	274.709	-5.380	-137.307	1791.147	0.390	-5.380	137.413
1900.000	6.239	272.932	-4.602	-148.809	1890.480	0.790	-4.602	148.880
2000.000	5.748	272.955	-4.066	-159.237	1989.933	0.491	-4.066	159.289
2100.000	5.635	272.668	-3.579	-169.143	2089.440	0.116	-3.579	169.181
2200.000	4.752	268.865	-3.433	-178.189	2189.029	0.948	-3.433	178.222
2300.000	4.402	269.379	-3.556	-186.168	2288.710	0.352	-3.556	186.202
2400.000	3.960	270.417	-3.573	-193.458	2388.443	0.449	-3.573	193.491
2500.000	4.098	274.239	-3.284	-200.474	2488.196	0.302	-3.284	200.501
2600.000	3.393	265.662	-3.243	-206.987	2587.983	0.899	-3.243	207.013
2700.000	3.043	261.221	-3.872	-212.561	2687.825	0.429	-3.872	212.596
2800.000	2.600	256.523	-4.806	-217.389	2787.704	0.500	-4.806	217.443
2900.000	2.676	250.440	-6.116	-221.794	2887.598	0.290	-6.116	221.878
3000.000	2.540	257.524	-7.376	-226.157	2987.495	0.350	-7.376	226.277
3100.000	2.520	247.345	-8.701	-230.349	3087.398	0.449	-8.701	230.513
3200.000	1.837	265.170	-9.683	-233.975	3187.326	0.954	-9.683	234.175
3300.000	1.493	278.957	-9.615	-236.859	3287.284	0.526	-9.615	237.054
3400.000	1.353	315.808	-8.566	-238.969	3387.255	0.909	-8.566	239.122
3500.000	1.260	316.377	-6.923	-240.550	3487.229	0.094	-6.923	240.650

3600.000	1.111	357.697	-5.158	-241.348	3587.210	0.848	-5.158	241.403
3700.000	0.989	25.395	-3.410	-241.017	3687.194	0.517	-3.410	241.041
3800.000	1.318	31.569	-1.650	-240.045	3787.173	0.351	-1.650	240.051
3900.000	0.928	8.440	0.130	-239.324	3887.154	0.590	0.130	239.324
4000.000	1.120	5.205	1.904	-239.117	3987.138	0.201	1.904	239.124
4100.000	1.086	2.541	3.825	-238.986	4087.120	0.062	3.825	239.017
4200.000	1.167	29.532	5.658	-238.442	4187.101	0.532	5.658	238.509
4300.000	1.000	21.372	7.356	-237.622	4287.083	0.227	7.356	237.736
4400.000	1.191	22.366	9.130	-236.909	4387.065	0.192	9.130	237.084
4500.000	0.977	11.274	10.927	-236.346	4487.047	0.299	10.927	236.599
4600.000	1.166	41.284	12.527	-235.509	4587.030	0.584	12.527	235.841
4700.000	1.662	34.924	14.481	-234.007	4687.000	0.520	14.481	234.454
4800.000	1.279	33.890	16.597	-232.554	4786.967	0.384	16.597	233.146
4900.000	0.518	13.117	17.964	-231.829	4886.954	0.816	17.964	232.524
5000.000	0.778	37.614	18.942	-231.312	4986.947	0.374	18.942	232.086
5100.000	0.625	29.575	19.954	-230.629	5086.940	0.181	19.954	231.490
5200.000	0.181	45.949	20.539	-230.246	5186.937	0.455	20.539	231.160
5300.000	0.468	98.655	20.587	-229.729	5286.936	0.386	20.587	230.650
5400.000	0.449	98.539	20.467	-228.938	5386.932	0.018	20.467	229.851
5500.000	1.063	96.659	20.302	-227.629	5486.923	0.614	20.302	228.533
5600.000	0.926	108.797	19.933	-225.943	5586.908	0.250	19.933	226.820
5700.000	1.222	110.988	19.291	-224.182	5686.891	0.298	19.291	225.011
5800.000	2.092	122.017	17.942	-221.639	5786.848	0.923	17.942	222.364
5900.000	2.992	115.980	15.831	-217.745	5886.749	0.938	15.831	218.320
6000.000	3.902	119.619	13.006	-212.441	5986.567	0.935	13.006	212.839
6100.000	1.296	132.664	10.557	-208.651	6086.456	2.655	10.557	208.918
6200.000	0.517	177.267	9.340	-207.798	6186.444	0.996	9.340	208.007
6300.000	0.816	270.875	8.900	-208.488	6286.439	0.993	8.900	208.678
6400.000	0.459	7.134	9.308	-209.151	6386.435	0.979	9.308	209.358
6500.000	0.918	345.057	10.479	-209.307	6486.428	0.521	10.479	209.569
6600.000	1.008	344.947	12.103	-209.742	6586.414	0.091	12.103	210.091
6700.000	0.975	313.583	13.539	-210.587	6686.399	0.537	13.539	211.022
6800.000	1.148	334.179	15.027	-211.640	6786.382	0.416	15.027	212.173
6900.000	1.303	339.896	16.997	-212.467	6886.360	0.197	16.997	213.146
7000.000	1.274	9.595	19.161	-212.673	6986.335	0.661	19.161	213.534
7100.000	1.231	4.070	21.328	-212.411	7086.312	0.128	21.328	213.479
7200.000	1.043	53.357	22.943	-211.605	7186.294	0.963	22.943	212.845
7250.000	0.719	39.781	23.455	-211.039	7236.288	0.767	23.455	212.338

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Cbrg

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115.474

117.397

126.731

140.983

157.429

175.690

194.732

213.137

228.656

241.549

251.410

257.712

261.352

263.631

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