



Company: Noble Energy
Rig: Production/ VES
API # 05-123-09981
Date: 8/30/2013
Surveyor: Sean Bratt
VS: 0.000
Lat : 40.33883
Long: -104.95853

Well: Abrams 1
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid North is .350 Deg
Declination: 8.67 Degrees
Depth Reference: Ground Level
Elevation: 4968 Feet
Total Depth as Drilled: 7755 Feet

Lat & Long obtained by handheld GPS at wellhead

HA 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	0.844	58.494	0.385	0.628	99.996	0.844	0.385	0.736
200.000	0.320	57.593	0.920	1.492	199.991	0.524	0.920	1.752
300.000	0.314	62.559	1.195	1.971	299.989	0.028	1.195	2.305
400.000	0.322	69.721	1.419	2.477	399.988	0.041	1.419	2.855
500.000	0.239	65.513	1.603	2.931	499.987	0.086	1.603	3.341
600.000	0.235	73.741	1.747	3.318	599.986	0.034	1.747	3.749
700.000	0.097	58.008	1.849	3.587	699.985	0.144	1.849	4.035
800.000	0.086	97.196	1.885	3.733	799.985	0.062	1.885	4.182
900.000	0.024	293.457	1.883	3.788	899.985	0.109	1.883	4.231
1000.000	0.124	179.703	1.784	3.770	999.985	0.135	1.784	4.170
1100.000	0.242	211.530	1.495	3.660	1099.985	0.152	1.495	3.953
1200.000	0.172	262.264	1.295	3.400	1199.984	0.189	1.295	3.638
1300.000	0.387	232.905	1.071	2.982	1299.983	0.251	1.071	3.169
1400.000	0.475	232.532	0.615	2.384	1399.980	0.088	0.615	2.462
1500.000	0.704	237.863	0.036	1.535	1499.975	0.235	0.036	1.536
1600.000	0.742	235.934	-0.653	0.479	1599.967	0.045	-0.653	0.810
1700.000	0.919	237.357	-1.448	-0.733	1699.956	0.179	-1.448	1.623
1800.000	0.961	233.687	-2.377	-2.084	1799.943	0.073	-2.377	3.161
1900.000	0.947	238.929	-3.300	-3.467	1899.929	0.088	-3.300	4.786
2000.000	1.003	248.381	-4.049	-4.988	1999.914	0.170	-4.049	6.425
2100.000	0.982	249.732	-4.668	-6.606	2099.899	0.032	-4.668	8.089
2200.000	0.845	264.890	-5.031	-8.143	2199.887	0.277	-5.031	9.572
2300.000	0.859	269.121	-5.108	-9.627	2299.876	0.065	-5.108	10.898
2400.000	0.945	273.081	-5.075	-11.200	2399.863	0.106	-5.075	12.296
2500.000	0.859	261.340	-5.143	-12.764	2499.851	0.203	-5.143	13.761
2600.000	0.855	257.637	-5.416	-14.233	2599.840	0.056	-5.416	15.229
2700.000	0.854	249.623	-5.835	-15.661	2699.829	0.119	-5.835	16.712
2800.000	0.792	251.240	-6.317	-17.014	2799.819	0.066	-6.317	18.149
2900.000	0.599	258.212	-6.646	-18.180	2899.811	0.211	-6.646	19.357
3000.000	0.507	256.229	-6.858	-19.122	2999.806	0.094	-6.858	20.314
3100.000	0.554	268.164	-6.979	-20.035	3099.802	0.120	-6.979	21.216
3200.000	0.386	319.974	-6.737	-20.736	3199.799	0.438	-6.737	21.802
3300.000	0.439	312.873	-6.218	-21.233	3299.797	0.073	-6.218	22.125
3400.000	0.243	256.642	-6.006	-21.720	3399.795	0.365	-6.006	22.535

3500.000	0.331	236.231	-6.216	-22.166	3499.794	0.134	-6.216	23.021
3600.000	0.347	235.141	-6.550	-22.655	3599.792	0.017	-6.550	23.582
3700.000	0.350	225.244	-6.938	-23.120	3699.790	0.060	-6.938	24.138
3800.000	0.490	225.905	-7.450	-23.644	3799.787	0.140	-7.450	24.790
3900.000	0.324	226.790	-7.942	-24.157	3899.785	0.166	-7.942	25.429
4000.000	0.400	221.210	-8.398	-24.594	3999.783	0.084	-8.398	25.988
4100.000	0.315	227.724	-8.846	-25.028	4099.781	0.094	-8.846	26.545
4200.000	0.414	233.286	-9.248	-25.521	4199.779	0.105	-9.248	27.145
4300.000	0.548	246.443	-9.655	-26.249	4299.775	0.173	-9.655	27.969
4400.000	0.781	253.651	-10.038	-27.342	4399.769	0.247	-10.038	29.127
4500.000	0.908	254.477	-10.442	-28.760	4499.758	0.128	-10.442	30.597
4600.000	0.757	257.627	-10.796	-30.169	4599.747	0.158	-10.796	32.042
4700.000	0.653	269.386	-10.943	-31.384	4699.740	0.177	-10.943	33.238
4800.000	0.526	267.740	-10.968	-32.414	4799.734	0.128	-10.968	34.219
4900.000	0.516	263.602	-11.036	-33.320	4899.730	0.039	-11.036	35.100
5000.000	0.612	268.991	-11.095	-34.301	4999.725	0.110	-11.095	36.051
5100.000	0.438	266.372	-11.129	-35.217	5099.721	0.176	-11.129	36.934
5200.000	0.536	257.668	-11.253	-36.055	5199.717	0.122	-11.253	37.771
5300.000	0.562	264.434	-11.400	-37.000	5299.713	0.070	-11.400	38.717
5400.000	0.676	295.968	-11.190	-38.018	5399.707	0.354	-11.190	39.631
5500.000	0.596	314.063	-10.570	-38.922	5499.701	0.215	-10.570	40.332
5600.000	0.406	318.974	-9.941	-39.528	5599.697	0.195	-9.941	40.759
5700.000	0.378	328.163	-9.394	-39.934	5699.695	0.069	-9.394	41.024
5800.000	0.358	344.974	-8.812	-40.189	5799.693	0.109	-8.812	41.144
5900.000	0.360	346.928	-8.205	-40.341	5899.691	0.012	-8.205	41.167
6000.000	0.392	341.307	-7.575	-40.522	5999.689	0.049	-7.575	41.224
6100.000	0.351	8.470	-6.948	-40.586	6099.687	0.179	-6.948	41.177
6200.000	0.225	313.775	-6.509	-40.683	6199.686	0.287	-6.509	41.200
6300.000	0.409	285.481	-6.279	-41.169	6299.684	0.237	-6.279	41.645
6400.000	0.316	288.429	-6.096	-41.775	6399.682	0.095	-6.096	42.217
6500.000	0.313	285.118	-5.937	-42.301	6499.681	0.018	-5.937	42.715
6600.000	0.235	258.955	-5.905	-42.766	6599.680	0.146	-5.905	43.172
6700.000	0.438	275.568	-5.907	-43.348	6699.678	0.224	-5.907	43.749
6800.000	0.464	262.978	-5.920	-44.130	6799.675	0.102	-5.920	44.526
6900.000	0.246	272.505	-5.960	-44.746	6899.673	0.225	-5.960	45.142
7000.000	0.242	277.192	-5.924	-45.170	6999.672	0.020	-5.924	45.557
7100.000	0.369	342.629	-5.590	-45.476	7099.671	0.347	-5.590	45.818
7200.000	0.430	337.115	-4.938	-45.718	7199.668	0.072	-4.938	45.984
7300.000	0.341	31.176	-4.337	-45.710	7299.666	0.359	-4.337	45.915
7400.000	0.386	306.685	-3.882	-45.826	7399.665	0.490	-3.882	45.990
7500.000	0.401	331.651	-3.372	-46.263	7499.663	0.171	-3.372	46.385

0

rees East of True North

Cbrg

0.000

58.494

58.351

58.758

60.196

61.325

62.233

62.726

63.214

63.565

64.680

67.778

69.155

70.247

75.531

88.641

143.725

206.837

221.236

226.412

230.934

234.751

238.294

242.051

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