



Company: Noble Energy
Rig: Production/VES
API # 05-123-31842

Date: 10/25/2013

Surveyor: Nick Kula

VS: 0.000

Lat : 40.521

Long: -104.463

Well: Cache USX AA 5-17

Location: Weld County, Colorado

North Reference: GRID

Convergence: GRID North is 0.670 Degrees East

Declination: 8.39

Depth Reference: Ground Level

Elevation: 4711'

Total Depth as Drilled: 7037'

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	0.660	299.995	0.288	-0.499	99.998	0.660	0.288	0.576	299.995
200.000	0.182	320.814	0.699	-1.098	199.995	0.494	0.699	1.302	302.484
300.000	0.473	244.846	0.647	-1.572	299.993	0.464	0.647	1.700	292.365
400.000	0.478	315.745	0.770	-2.237	399.991	0.552	0.770	2.366	289.001
500.000	0.432	293.721	1.221	-2.873	499.988	0.180	1.221	3.122	293.020
600.000	0.364	278.412	1.419	-3.533	599.985	0.125	1.419	3.807	291.884
700.000	0.309	271.899	1.474	-4.117	699.984	0.067	1.474	4.373	289.705
800.000	0.294	276.381	1.512	-4.642	799.982	0.028	1.512	4.882	288.042
900.000	0.531	349.044	1.996	-4.985	899.980	0.525	1.996	5.370	291.817
1000.000	0.245	283.971	2.502	-5.280	999.978	0.482	2.502	5.843	295.355
1100.000	0.377	351.155	2.878	-5.538	1099.977	0.361	2.878	6.241	297.463
1200.000	0.207	329.451	3.358	-5.680	1199.976	0.200	3.358	6.599	300.594
1300.000	0.389	33.791	3.796	-5.583	1299.974	0.353	3.796	6.751	304.215
1400.000	0.297	270.014	4.079	-5.653	1399.973	0.607	4.079	6.971	305.811
1500.000	0.314	345.011	4.344	-5.983	1499.972	0.372	4.344	7.394	305.978
1600.000	0.096	163.765	4.528	-6.031	1599.972	0.410	4.528	7.542	306.901
1700.000	0.428	81.757	4.502	-5.638	1699.971	0.425	4.502	7.215	308.605
1800.000	0.270	181.158	4.320	-5.274	1799.970	0.542	4.320	6.817	309.320
1900.000	0.244	229.658	3.946	-5.441	1899.969	0.212	3.946	6.721	305.954
2000.000	0.536	184.304	3.342	-5.638	1999.967	0.404	3.342	6.554	300.659
2100.000	0.584	202.934	2.406	-5.872	2099.962	0.187	2.406	6.346	292.286
2200.000	0.765	168.225	1.283	-5.934	2199.955	0.438	1.283	6.071	282.202
2300.000	0.814	183.437	-0.080	-5.840	2299.946	0.215	-0.080	5.841	269.214
2400.000	1.061	154.091	-1.623	-5.478	2399.933	0.532	-1.623	5.713	253.500
2500.000	1.001	146.934	-3.188	-4.597	2499.917	0.142	-3.188	5.594	235.257
2600.000	0.462	154.595	-4.285	-3.947	2599.908	0.547	-4.285	5.825	222.651
2700.000	0.414	199.730	-4.989	-3.896	2699.906	0.339	-4.989	6.330	217.987
2800.000	0.202	181.374	-5.505	-4.022	2799.904	0.231	-5.505	6.817	216.154
2900.000	0.580	232.690	-5.987	-4.429	2899.902	0.481	-5.987	7.447	216.490
3000.000	0.519	249.592	-6.452	-5.256	2999.898	0.172	-6.452	8.322	219.168
3100.000	0.595	247.588	-6.808	-6.161	3099.893	0.078	-6.808	9.182	222.143
3200.000	0.338	326.900	-6.759	-6.802	3199.890	0.627	-6.759	9.589	225.183
3300.000	0.437	33.327	-6.193	-6.754	3299.888	0.433	-6.193	9.163	227.481
3400.000	1.198	34.986	-5.017	-5.944	3399.877	0.762	-5.017	7.779	229.836
3500.000	1.633	50.482	-3.254	-4.246	3499.847	0.575	-3.254	5.349	232.535

3600.000	1.609	52.548	-1.494	-2.032	3599.807	0.063	-1.494	2.522	233.688
3700.000	1.498	57.474	0.063	0.184	3699.770	0.174	0.063	0.195	71.125
3800.000	1.370	43.483	1.633	2.109	3799.739	0.372	1.633	2.667	52.246
3900.000	1.547	76.136	2.824	4.242	3899.709	0.837	2.824	5.096	56.348
4000.000	0.965	93.637	3.094	6.392	3999.684	0.691	3.094	7.101	64.173
4100.000	1.103	133.369	2.379	7.932	4099.669	0.715	2.379	8.281	73.301
4200.000	1.001	161.892	0.888	8.903	4199.653	0.528	0.888	8.947	84.302
4300.000	1.116	171.008	-0.904	9.326	4299.636	0.203	-0.904	9.370	95.534
4400.000	1.363	198.472	-2.993	9.102	4399.614	0.636	-2.993	9.581	108.205
4500.000	2.118	203.834	-5.812	7.978	4499.567	0.771	-5.812	9.871	126.071
4600.000	2.319	210.600	-9.243	6.202	4599.492	0.330	-9.243	11.131	146.139
4700.000	2.659	204.897	-13.088	4.196	4699.398	0.420	-13.088	13.744	162.225
4800.000	3.539	209.311	-17.883	1.708	4799.251	0.912	-17.883	17.965	174.544
4900.000	3.485	210.487	-23.194	-1.345	4899.063	0.090	-23.194	23.233	183.319
5000.000	3.019	213.755	-28.003	-4.350	4998.902	0.501	-28.003	28.339	188.830
5100.000	2.169	222.056	-31.598	-7.081	5098.799	0.928	-31.598	32.381	192.632
5200.000	0.994	244.024	-33.382	-9.128	5198.759	1.302	-33.382	34.608	195.293
5300.000	0.656	305.741	-33.428	-10.372	5298.751	0.894	-33.428	35.000	197.238
5400.000	1.112	359.267	-32.124	-10.849	5398.740	0.894	-32.124	33.906	198.661
5500.000	0.530	8.413	-30.696	-10.794	5498.729	0.594	-30.696	32.538	199.373
5600.000	0.418	323.639	-29.944	-10.942	5598.726	0.376	-29.944	31.881	200.073
5700.000	0.236	294.828	-29.564	-11.345	5698.725	0.240	-29.564	31.666	200.994
5800.000	0.488	271.420	-29.467	-11.957	5798.723	0.287	-29.467	31.801	202.087
5900.000	0.420	295.913	-29.297	-12.712	5898.720	0.204	-29.297	31.936	203.457
6000.000	0.635	264.515	-29.189	-13.593	5998.716	0.353	-29.189	32.199	204.971
6100.000	0.391	279.724	-29.185	-14.481	6098.711	0.277	-29.185	32.580	206.390
6200.000	0.313	281.767	-29.071	-15.085	6198.710	0.078	-29.071	32.752	207.425
6300.000	0.269	305.145	-28.881	-15.545	6298.708	0.126	-28.881	32.798	208.291
6400.000	0.502	263.659	-28.794	-16.172	6398.706	0.349	-28.794	33.025	209.320
6500.000	0.041	84.194	-28.839	-16.572	6498.705	0.543	-28.839	33.261	209.883
6600.000	0.154	236.317	-28.910	-16.648	6598.705	0.191	-28.910	33.360	209.936
6700.000	0.150	302.669	-28.913	-16.869	6698.705	0.166	-28.913	33.475	210.261
6750.000	0.358	248.255	-28.936	-17.069	6748.704	0.594	-28.936	33.595	210.537

of True North