



Company: Noble Energy
 Rig: Production/VES
 API # 05-123-24587
 Date: 10/25/2013
 Surveyor: Nick Kula
 VS: 0.000
 Lat : 40.519
 Long: -104.455

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: 4720'
 Total Depth as Drilled: 6991'

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
100.000	0.655	24.882	0.518	0.240	99.998	0.655	0.518	0.571	24.882
200.000	0.723	26.032	1.603	0.758	199.991	0.070	1.603	1.773	25.291
300.000	0.359	76.832	2.242	1.340	299.986	0.569	2.242	2.612	30.863
400.000	0.239	171.080	2.107	1.677	399.986	0.446	2.107	2.693	38.524
500.000	0.193	195.471	1.738	1.665	499.985	0.102	1.738	2.407	43.762
600.000	0.225	178.414	1.379	1.625	599.984	0.070	1.379	2.132	49.679
700.000	0.295	121.600	1.048	1.850	699.983	0.255	1.048	2.126	60.472
800.000	0.374	81.389	0.962	2.392	799.982	0.242	0.962	2.578	68.093
900.000	0.415	67.808	1.148	3.050	899.979	0.102	1.148	3.259	69.382
1000.000	0.334	74.553	1.362	3.667	999.977	0.092	1.362	3.911	69.621
1100.000	0.250	33.968	1.621	4.069	1099.976	0.217	1.621	4.380	68.285
1200.000	0.307	358.184	2.069	4.183	1199.975	0.180	2.069	4.666	63.678
1300.000	0.063	126.850	2.304	4.218	1299.974	0.350	2.304	4.806	61.358
1400.000	0.295	33.844	2.485	4.406	1399.974	0.305	2.485	5.058	60.580
1500.000	0.272	23.830	2.915	4.645	1499.973	0.055	2.915	5.484	57.887
1600.000	0.128	72.303	3.166	4.847	1599.972	0.210	3.166	5.790	56.849
1700.000	0.163	230.916	3.110	4.843	1699.972	0.286	3.110	5.756	57.292
1800.000	0.163	229.941	2.929	4.624	1799.972	0.003	2.929	5.473	57.648
1900.000	0.105	20.474	2.923	4.547	1899.972	0.259	2.923	5.406	57.263
2000.000	0.592	340.517	3.496	4.407	1999.970	0.516	3.496	5.625	51.571
2100.000	0.820	351.300	4.691	4.126	2099.962	0.263	4.691	6.248	41.334
2200.000	1.194	4.975	6.436	4.108	2199.946	0.441	6.436	7.636	32.551
2300.000	1.192	13.062	8.487	4.434	2299.925	0.168	8.487	9.575	27.584
2400.000	1.684	15.769	10.914	5.068	2399.893	0.497	10.914	12.033	24.909
2500.000	1.310	20.789	13.396	5.873	2499.859	0.396	13.396	14.627	23.673
2600.000	1.501	32.223	15.573	6.977	2599.829	0.339	15.573	17.065	24.134
2700.000	1.451	20.586	17.866	8.121	2699.796	0.303	17.866	19.625	24.443
2800.000	1.037	36.225	19.781	9.100	2799.772	0.532	19.781	21.774	24.705
2900.000	0.985	38.588	21.183	10.171	2899.757	0.066	21.183	23.498	25.649
3000.000	0.836	32.376	22.471	11.098	2999.744	0.179	22.471	25.062	26.284
3100.000	0.898	28.349	23.776	11.861	3099.733	0.087	23.776	26.570	26.512
3200.000	0.821	32.556	25.069	12.618	3199.722	0.099	25.069	28.066	26.717
3300.000	0.425	75.386	25.767	13.362	3299.716	0.586	25.767	29.025	27.411
3400.000	1.309	96.663	25.728	14.856	3399.704	0.926	25.728	29.709	30.003
3500.000	2.096	107.026	25.060	17.739	3499.659	0.841	25.060	30.703	35.293

3600.000	2.662	109.626	23.744	21.674	3599.572	0.576	23.744	32.149	42.390
3700.000	2.589	111.694	22.130	25.960	3699.467	0.120	22.130	34.112	49.554
3800.000	2.589	117.314	20.259	30.065	3799.366	0.254	20.259	36.253	56.027
3900.000	2.350	107.912	18.592	34.022	3899.273	0.470	18.592	38.771	61.346
4000.000	1.711	126.460	17.074	37.174	3999.211	0.909	17.074	40.907	65.331
4100.000	1.346	153.325	15.138	38.901	4099.176	0.794	15.138	41.743	68.737
4200.000	1.182	192.726	13.082	39.201	4199.154	0.866	13.082	41.326	71.545
4300.000	1.147	228.682	11.415	38.222	4299.134	0.720	11.415	39.890	73.372
4400.000	1.866	245.883	10.089	35.985	4399.100	0.842	10.089	37.372	74.338
4500.000	2.255	257.470	8.997	32.578	4499.035	0.568	8.997	33.798	74.562
4600.000	2.464	262.195	8.278	28.529	4598.951	0.285	8.278	29.705	73.819
4700.000	2.231	267.297	7.894	24.455	4698.867	0.312	7.894	25.698	72.109
4800.000	2.247	259.757	7.454	20.581	4798.791	0.295	7.454	21.889	70.091
4900.000	2.073	264.132	6.920	16.853	4898.720	0.240	6.920	18.218	67.675
5000.000	2.028	255.556	6.294	13.340	4998.656	0.310	6.294	14.750	64.741
5100.000	1.466	254.852	5.518	10.391	5098.609	0.562	5.518	11.766	62.029
5200.000	1.067	258.943	5.005	8.242	5198.584	0.409	5.005	9.643	58.730
5300.000	0.780	242.924	4.517	6.722	5298.571	0.384	4.517	8.099	56.101
5400.000	0.640	220.390	3.782	5.754	5398.564	0.310	3.782	6.886	56.686
5500.000	0.430	214.496	3.048	5.180	5498.559	0.217	3.048	6.010	59.531
5600.000	0.467	200.257	2.356	4.827	5598.556	0.117	2.356	5.371	63.983
5700.000	0.397	208.338	1.668	4.521	5698.553	0.093	1.668	4.819	69.746
5800.000	0.296	258.095	1.310	4.103	5798.552	0.306	1.310	4.307	72.297
5900.000	0.356	139.657	1.020	4.052	5898.551	0.561	1.020	4.178	75.875
6000.000	0.322	191.022	0.507	4.199	5998.549	0.295	0.507	4.230	83.113
6100.000	0.273	111.655	0.144	4.367	6098.549	0.381	0.144	4.369	88.114
6200.000	0.423	101.389	-0.017	4.950	6198.547	0.162	-0.017	4.950	90.196
6300.000	0.338	74.631	-0.012	5.596	6298.545	0.194	-0.012	5.596	90.118
6400.000	0.422	79.825	0.132	6.243	6398.542	0.091	0.132	6.244	88.791
6500.000	0.288	106.915	0.124	6.846	6498.540	0.211	0.124	6.847	88.966
6600.000	0.499	94.412	0.017	7.522	6598.538	0.226	0.017	7.522	89.872
6700.000	0.634	82.574	0.055	8.504	6698.533	0.178	0.055	8.504	89.631
6750.000	0.855	94.986	0.058	9.150	6748.529	0.545	0.058	9.150	89.636

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