



Company: Noble Energy
Rig: Production / VES
API # 05-123-20688

Date: 11/24/2013

Surveyor: CJ Hines

VS: 0.000

Lat : 40.36455

Long: -104.801

Well: Carlson #15-29

Location: Weld County, Colorado

North Reference: GRID

Convergence: Grid north is 0.45 East of True N

Declination: 8.55

Depth Reference: Ground Level

Elevation: 4860

Total Depth as Drilled: 7495

Lat & Long obtained by handheld GPS at wellhead

HA Gyro Survey Calculations

Depth	Inc	AzG	N/-S	E/-W	TVD	DL	VS	CD	Cbrg
100.000	0.314	113.066	-0.107	0.252	99.999	0.314	-0.107	0.274	113.066
200.000	0.347	137.488	-0.438	0.709	199.998	0.143	-0.438	0.833	121.700
300.000	0.515	130.249	-0.951	1.256	299.995	0.176	-0.951	1.575	127.129
400.000	0.276	67.253	-1.148	1.821	399.993	0.461	-1.148	2.153	122.227
500.000	0.317	116.863	-1.180	2.290	499.992	0.252	-1.180	2.576	117.257
600.000	0.190	41.592	-1.181	2.647	599.991	0.326	-1.181	2.899	114.047
700.000	0.142	188.572	-1.180	2.739	699.991	0.318	-1.180	2.982	113.308
800.000	0.301	136.401	-1.492	2.901	799.990	0.241	-1.492	3.263	117.222
900.000	0.518	121.021	-1.916	3.470	899.988	0.242	-1.916	3.963	118.902
1000.000	0.294	121.562	-2.283	4.076	999.985	0.224	-2.283	4.672	119.253
1100.000	0.415	122.213	-2.610	4.600	1099.983	0.121	-2.610	5.289	119.567
1200.000	0.398	128.755	-3.020	5.178	1199.981	0.049	-3.020	5.994	120.258
1300.000	0.186	104.280	-3.278	5.606	1299.979	0.242	-3.278	6.494	120.317
1400.000	0.610	101.456	-3.424	6.285	1399.977	0.425	-3.424	7.157	118.580
1500.000	0.303	83.082	-3.498	7.069	1499.973	0.337	-3.498	7.887	116.325
1600.000	0.567	101.277	-3.563	7.817	1599.970	0.294	-3.563	8.590	114.502
1700.000	0.391	106.993	-3.759	8.628	1699.967	0.182	-3.759	9.411	113.542
1800.000	0.544	77.678	-3.757	9.417	1799.964	0.279	-3.757	10.139	111.752
1900.000	0.352	114.385	-3.783	10.160	1899.961	0.336	-3.783	10.841	110.421
2000.000	0.577	92.135	-3.928	10.943	1999.957	0.285	-3.928	11.627	109.747
2100.000	0.879	83.776	-3.864	12.209	2099.949	0.319	-3.864	12.805	107.562
2200.000	1.124	88.746	-3.759	13.952	2199.934	0.260	-3.759	14.449	105.080
2300.000	0.991	103.780	-3.944	15.772	2299.917	0.306	-3.944	16.258	104.039
2400.000	1.033	96.872	-4.258	17.507	2399.902	0.129	-4.258	18.017	103.669
2500.000	0.703	103.795	-4.512	18.997	2499.890	0.345	-4.512	19.526	103.360
2600.000	0.879	102.343	-4.822	20.343	2599.880	0.177	-4.822	20.906	103.335
2700.000	0.745	107.559	-5.182	21.711	2699.870	0.153	-5.182	22.321	103.424
2800.000	0.944	110.012	-5.660	23.105	2799.859	0.203	-5.660	23.788	103.765
2900.000	1.127	143.661	-6.734	24.461	2899.844	0.624	-6.734	25.371	105.391
3000.000	0.873	134.360	-8.059	25.589	2999.829	0.300	-8.059	26.828	107.481
3100.000	0.859	143.584	-9.194	26.578	3099.817	0.140	-9.194	28.124	109.082
3200.000	0.742	149.147	-10.353	27.355	3199.808	0.140	-10.353	29.249	110.730
3300.000	0.608	169.584	-11.431	27.783	3299.801	0.273	-11.431	30.043	112.364
3400.000	0.489	174.072	-12.378	27.923	3399.796	0.126	-12.378	30.544	113.907
3500.000	0.537	168.597	-13.262	28.060	3499.792	0.068	-13.262	31.036	115.297
3600.000	1.167	177.490	-14.739	28.198	3599.781	0.642	-14.739	31.817	117.596

3700.000	1.058	196.183	-16.643	27.985	3699.762	0.377	-16.643	32.560	120.740
3800.000	1.034	191.288	-18.414	27.551	3799.746	0.092	-18.414	33.138	123.757
3900.000	1.173	187.195	-20.315	27.246	3899.727	0.160	-20.315	33.986	126.708
4000.000	1.030	200.879	-22.171	26.798	3999.709	0.298	-22.171	34.780	129.602
4100.000	0.872	229.743	-23.502	25.897	4099.695	0.498	-23.502	34.971	132.225
4200.000	1.009	253.688	-24.241	24.471	4199.682	0.413	-24.241	34.445	134.730
4300.000	0.945	255.891	-24.690	22.826	4299.668	0.075	-24.690	33.624	137.246
4400.000	0.875	262.469	-24.991	21.269	4399.655	0.125	-24.991	32.816	139.599
4500.000	1.317	274.761	-24.995	19.367	4499.637	0.499	-24.995	31.620	142.231
4600.000	1.338	268.512	-24.930	17.054	4599.610	0.146	-24.930	30.205	145.625
4700.000	1.680	251.293	-25.431	14.498	4699.576	0.565	-25.431	29.273	150.312
4800.000	1.474	247.307	-26.397	11.923	4799.538	0.234	-26.397	28.965	155.693
4900.000	1.010	234.145	-27.410	10.022	4899.514	0.541	-27.410	29.184	159.917
5000.000	0.804	249.465	-28.172	8.650	4999.502	0.317	-28.172	29.470	162.932
5100.000	0.587	235.815	-28.707	7.569	5099.494	0.271	-28.707	29.688	165.229
5200.000	0.394	237.003	-29.182	6.856	5199.491	0.193	-29.182	29.977	166.778
5300.000	0.338	216.798	-29.605	6.391	5299.489	0.140	-29.605	30.287	167.818
5400.000	0.123	268.845	-29.844	6.107	5399.488	0.279	-29.844	30.462	168.435
5500.000	0.196	127.303	-29.949	6.135	5499.488	0.302	-29.949	30.571	168.423
5600.000	0.687	161.174	-30.620	6.465	5599.484	0.536	-30.620	31.295	168.079
5700.000	1.148	174.166	-32.184	6.760	5699.471	0.503	-32.184	32.887	168.138
5800.000	1.080	173.301	-34.117	6.972	5799.453	0.070	-34.117	34.822	168.451
5900.000	0.784	178.844	-35.737	7.095	5899.439	0.310	-35.737	36.435	168.770
6000.000	0.657	147.826	-36.906	7.414	5999.432	0.404	-36.906	37.643	168.640
6100.000	0.574	136.656	-37.755	8.064	6099.426	0.145	-37.755	38.607	167.944
6200.000	0.562	113.319	-38.314	8.858	6199.421	0.230	-38.314	39.325	166.982
6300.000	0.346	112.393	-38.623	9.588	6299.418	0.216	-38.623	39.796	166.059
6400.000	0.207	119.262	-38.827	10.025	6399.417	0.143	-38.827	40.100	165.523
6500.000	0.210	123.081	-39.015	10.336	6499.416	0.014	-39.015	40.361	165.162
6600.000	0.257	127.317	-39.251	10.668	6599.415	0.049	-39.251	40.675	164.795
6700.000	0.048	78.751	-39.378	10.887	6699.415	0.228	-39.378	40.856	164.546
6800.000	0.195	68.662	-39.308	11.086	6799.415	0.148	-39.308	40.842	164.250
6900.000	0.542	60.708	-39.015	11.657	6899.412	0.350	-39.015	40.719	163.364
7000.000	0.429	51.212	-38.549	12.362	6999.409	0.138	-38.549	40.482	162.219
7100.000	0.747	21.895	-37.709	12.897	7099.404	0.427	-37.709	39.854	161.118
7200.000	1.131	341.859	-36.167	12.833	7199.391	0.737	-36.167	38.376	160.464

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