



Company: Noble Energy

Rig: Production / CoreTech

API # 05-123-16185

Date: 11/7/2013

Surveyor: Norman Cowan

VS: 0.000

Lat : 40.309

Long: -104.770

Well: McWilliams 15-32

Location: Weld County, Colorado

North Reference: GRID

Convergence: Grid north is 0.47 Deg East of True

Declination: 8.54 Degrees

Depth Reference: Ground Level

Elevation: 4747 Feet

Total Depth as Drilled: 7404 Feet

Lat & Long obtained by handheld GPS at wellhead

ms 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	0.230	222.900	-0.147	-0.137	100.000	0.230	-0.147	0.201	222.900
200.000	0.316	231.477	-0.466	-0.489	199.999	0.095	-0.466	0.675	226.391
300.000	0.229	0.548	-0.438	-0.703	299.998	0.493	-0.438	0.828	238.074
400.000	0.059	49.958	-0.205	-0.662	399.998	0.196	-0.205	0.693	252.766
500.000	0.194	344.512	-0.009	-0.667	499.997	0.177	-0.009	0.667	269.195
600.000	0.093	348.558	0.233	-0.729	599.997	0.101	0.233	0.765	287.719
700.000	0.160	75.325	0.348	-0.609	699.997	0.180	0.348	0.702	299.694
800.000	0.252	9.238	0.600	-0.439	799.996	0.237	0.600	0.743	323.802
900.000	0.116	331.945	0.906	-0.451	899.996	0.174	0.906	1.012	333.523
1000.000	0.081	186.389	0.925	-0.507	999.996	0.188	0.925	1.055	331.300
1100.000	0.045	123.818	0.834	-0.482	1099.996	0.072	0.834	0.963	329.977
1200.000	0.109	230.783	0.752	-0.522	1199.996	0.129	0.752	0.916	325.204
1300.000	0.292	292.752	0.790	-0.831	1299.995	0.259	0.790	1.147	313.577
1400.000	0.257	295.557	0.986	-1.268	1399.994	0.037	0.986	1.606	307.865
1500.000	0.513	317.866	1.414	-1.770	1499.992	0.292	1.414	2.265	308.622
1600.000	0.564	333.320	2.186	-2.291	1599.987	0.154	2.186	3.167	313.652
1700.000	0.685	335.842	3.172	-2.757	1699.981	0.124	3.172	4.202	319.000
1800.000	0.734	345.758	4.338	-3.159	1799.974	0.132	4.338	5.366	323.933
1900.000	0.924	353.696	5.760	-3.405	1899.963	0.222	5.760	6.691	329.407
2000.000	1.276	15.780	7.633	-3.191	1999.945	0.545	7.633	8.273	337.311
2100.000	1.484	20.179	9.919	-2.442	2099.916	0.233	9.919	10.215	346.171
2200.000	1.582	21.078	12.422	-1.499	2199.880	0.101	12.422	12.512	353.120
2300.000	1.579	20.854	14.998	-0.512	2299.842	0.007	14.998	15.007	358.046
2400.000	1.501	37.458	17.325	0.775	2399.807	0.451	17.325	17.343	2.562
2500.000	1.337	44.183	19.201	2.385	2499.776	0.233	19.201	19.349	7.080
2600.000	1.344	52.264	20.756	4.126	2599.749	0.189	20.756	21.162	11.242
2700.000	1.220	52.156	22.127	5.894	2699.724	0.124	22.127	22.899	14.916
2800.000	1.015	57.618	23.255	7.483	2799.705	0.230	23.255	24.429	17.837
2900.000	0.592	37.579	24.139	8.546	2899.695	0.502	24.139	25.607	19.496
3000.000	0.556	10.079	25.025	8.946	2999.690	0.275	25.025	26.576	19.671
3100.000	0.679	9.631	26.086	9.130	3099.684	0.123	26.086	27.638	19.289
3200.000	0.541	18.653	27.118	9.380	3199.678	0.167	27.118	28.694	19.080
3300.000	0.457	71.023	27.695	9.908	3299.675	0.447	27.695	29.414	19.685
3400.000	0.946	124.145	27.361	10.968	3399.668	0.765	27.361	29.478	21.844
3500.000	1.360	164.654	25.753	11.966	3499.649	0.888	25.753	28.397	24.921

3600.000	1.497	191.027	23.326	12.030	3599.619	0.665	23.326	26.246	27.281
3700.000	1.467	220.854	21.076	10.943	3699.587	0.763	21.076	23.747	27.439
3800.000	1.515	215.075	19.026	9.346	3799.554	0.158	19.026	21.197	26.161
3900.000	1.613	223.536	16.923	7.617	3899.516	0.250	16.923	18.558	24.231
4000.000	1.574	229.986	15.020	5.595	3999.478	0.183	15.020	16.028	20.431
4100.000	1.630	251.600	13.688	3.194	4099.440	0.603	13.688	14.055	13.133
4200.000	1.862	263.678	13.060	0.229	4199.393	0.434	13.060	13.062	1.005
4300.000	1.791	268.066	12.828	-2.947	4299.343	0.157	12.828	13.162	347.061
4400.000	1.488	280.772	13.018	-5.784	4399.302	0.471	13.018	14.245	336.042
4500.000	1.439	290.985	13.711	-8.233	4499.269	0.265	13.711	15.992	329.016
4600.000	1.431	290.730	14.602	-10.574	4599.238	0.010	14.602	18.029	324.091
4700.000	1.327	280.760	15.261	-12.879	4699.209	0.261	15.261	19.969	319.837
4800.000	1.422	280.899	15.711	-15.235	4799.180	0.095	15.711	21.885	315.882
4900.000	1.317	282.573	16.196	-17.575	4899.152	0.112	16.196	23.900	312.662
5000.000	0.988	272.448	16.483	-19.558	4999.132	0.386	16.483	25.577	310.124
5100.000	0.733	252.102	16.324	-21.027	5099.121	0.394	16.324	26.619	307.823
5200.000	0.628	240.736	15.859	-22.113	5199.114	0.170	15.859	27.212	305.648
5300.000	0.592	229.448	15.256	-22.984	5299.108	0.125	15.256	27.586	303.574
5400.000	0.690	246.818	14.683	-23.930	5399.102	0.216	14.683	28.075	301.532
5500.000	0.754	216.607	13.917	-24.876	5499.094	0.382	13.917	28.504	299.225
5600.000	0.870	237.527	12.981	-25.909	5599.084	0.316	12.981	28.979	296.611
5700.000	1.145	274.443	12.650	-27.546	5699.070	0.689	12.650	30.312	294.667
5800.000	0.447	273.053	12.749	-28.931	5799.059	0.698	12.749	31.616	293.781
5900.000	0.743	161.645	12.154	-29.117	5899.056	0.997	12.154	31.552	292.657
6000.000	0.767	144.872	10.992	-28.528	5999.048	0.221	10.992	30.572	291.072
6100.000	0.923	190.639	9.653	-28.291	6099.038	0.673	9.653	29.893	288.839
6200.000	1.359	183.568	7.677	-28.514	6199.018	0.457	7.677	29.529	285.069
6300.000	1.028	214.493	5.754	-29.096	6298.997	0.712	5.754	29.659	281.186
6400.000	0.709	221.803	4.553	-30.016	6398.985	0.337	4.553	30.360	278.625
6500.000	1.331	204.543	3.035	-30.911	6498.969	0.687	3.035	31.060	275.608
6600.000	1.606	209.636	0.761	-32.087	6598.936	0.305	0.761	32.096	271.358
6700.000	1.932	212.482	-1.880	-33.685	6698.889	0.337	-1.880	33.738	266.806
6800.000	2.077	213.042	-4.820	-35.578	6798.827	0.146	-4.820	35.903	262.284
6900.000	2.178	235.862	-7.405	-38.139	6898.760	0.847	-7.405	38.851	259.012
7000.000	2.601	243.227	-9.494	-41.738	6998.673	0.522	-9.494	42.804	257.185
7100.000	1.756	256.661	-10.870	-45.255	7098.601	0.982	-10.870	46.542	256.494
7200.000	2.639	246.779	-12.131	-48.862	7198.527	0.958	-12.131	50.345	256.057

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