



Company: Noble Energy
Rig: Producton / V.E.S.
API # 05-123-16685
Date: 4/21/2014
Surveyor: Norman Cowan
VS: 0.000
Lat : 40.382
Long: -104.533

Well: Emancipator 22-10
Location: Weld County, Colorado
North Reference: GRID
Convergence: Grid north is 0.62 Deg East of Tru
Declination: 8.36 Degrees
Depth Reference: Ground Level
Elevation: 4599 Feet
Total Depth as Drilled: 6860 Feet

Lat & Long obtained by handheld GPS at wellhead

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	0.847	169.618	-0.727	0.133	99.996	0.847	-0.727	0.739	169.618
200.000	0.904	168.217	-2.225	0.427	199.985	0.061	-2.225	2.266	169.130
300.000	0.959	157.358	-3.770	0.911	299.972	0.185	-3.770	3.878	166.420
400.000	0.873	195.054	-5.279	1.035	399.960	0.598	-5.279	5.379	168.907
500.000	0.941	194.868	-6.808	0.626	499.947	0.068	-6.808	6.837	174.743
600.000	0.872	183.267	-8.361	0.372	599.935	0.196	-8.361	8.370	177.450
700.000	0.591	167.244	-9.624	0.443	699.927	0.345	-9.624	9.634	177.365
800.000	0.391	176.457	-10.468	0.578	799.923	0.214	-10.468	10.484	176.840
900.000	0.118	30.698	-10.721	0.651	899.922	0.493	-10.721	10.740	176.523
1000.000	0.042	23.937	-10.599	0.719	999.922	0.076	-10.599	10.623	176.122
1100.000	0.478	3.861	-10.150	0.761	1099.921	0.439	-10.150	10.179	175.711
1200.000	0.359	2.756	-9.422	0.804	1199.918	0.119	-9.422	9.456	175.120
1300.000	0.575	350.476	-8.614	0.736	1299.915	0.237	-8.614	8.645	175.113
1400.000	0.509	337.511	-7.708	0.483	1399.910	0.139	-7.708	7.723	176.412
1500.000	0.604	354.495	-6.773	0.263	1499.906	0.189	-6.773	6.778	177.778
1600.000	0.651	356.788	-5.682	0.180	1599.900	0.053	-5.682	5.684	178.181
1700.000	0.313	62.034	-4.987	0.390	1699.897	0.592	-4.987	5.002	175.533
1800.000	0.116	67.322	-4.820	0.724	1799.896	0.197	-4.820	4.874	171.458
1900.000	0.415	155.509	-5.110	0.967	1899.895	0.427	-5.110	5.201	169.281
2000.000	0.537	173.833	-5.906	1.168	1999.891	0.194	-5.906	6.020	168.815
2100.000	0.674	171.356	-6.954	1.307	2099.886	0.139	-6.954	7.075	169.358
2200.000	0.378	158.016	-7.841	1.519	2199.882	0.318	-7.841	7.987	169.039
2300.000	0.840	171.505	-8.873	1.751	2299.876	0.480	-8.873	9.044	168.839
2400.000	0.691	140.402	-10.063	2.243	2399.867	0.435	-10.063	10.310	167.432
2500.000	0.969	145.734	-11.226	3.104	2499.857	0.288	-11.226	11.647	164.545
2600.000	1.104	152.480	-12.779	4.025	2599.840	0.182	-12.779	13.398	162.518
2700.000	1.210	142.582	-14.472	5.112	2699.820	0.226	-14.472	15.348	160.546
2800.000	1.098	130.792	-15.937	6.479	2799.800	0.262	-15.937	17.203	157.877
2900.000	0.974	128.008	-17.086	7.874	2899.783	0.133	-17.086	18.813	155.258
3000.000	1.342	167.956	-18.755	8.788	2999.764	0.863	-18.755	20.712	154.893
3100.000	0.864	212.566	-20.536	8.627	3099.747	0.947	-20.536	22.274	157.213
3200.000	0.612	238.727	-21.448	7.765	3199.739	0.415	-21.448	22.811	160.098
3300.000	0.728	241.193	-22.032	6.752	3299.732	0.120	-22.032	23.043	162.961
3400.000	1.281	290.860	-21.940	5.150	3399.718	0.982	-21.940	22.536	166.789

3500.000	1.475	261.005	-21.743	2.835	3499.690	0.734	-21.743	21.927	172.572
3600.000	1.076	285.518	-21.693	0.659	3599.666	0.667	-21.693	21.703	178.259
3700.000	1.372	288.387	-21.064	-1.381	3699.643	0.303	-21.064	21.109	183.752
3800.000	1.255	313.072	-19.938	-3.318	3799.618	0.573	-19.938	20.212	189.448
3900.000	1.134	339.932	-18.261	-4.457	3899.597	0.567	-18.261	18.797	193.717
4000.000	0.822	297.346	-17.002	-5.434	3999.583	0.767	-17.002	17.850	197.725
4100.000	0.072	219.143	-16.721	-6.111	4099.580	0.811	-16.721	17.803	200.076
4200.000	0.281	247.830	-16.862	-6.378	4199.579	0.221	-16.862	18.028	200.719
4300.000	0.296	219.227	-17.155	-6.769	4299.578	0.143	-17.155	18.442	201.533
4400.000	0.375	241.262	-17.513	-7.220	4399.576	0.150	-17.513	18.943	202.404
4500.000	0.176	314.894	-17.562	-7.616	4499.576	0.367	-17.562	19.143	203.443
4600.000	0.145	353.163	-17.328	-7.739	4599.575	0.109	-17.328	18.978	204.067
4700.000	0.497	339.547	-16.796	-7.906	4699.573	0.357	-16.796	18.564	205.206
4800.000	0.168	320.480	-16.277	-8.151	4799.572	0.343	-16.277	18.203	206.600
4900.000	0.581	306.351	-15.863	-8.652	4899.569	0.421	-15.863	18.069	208.610
5000.000	0.490	335.900	-15.171	-9.236	4999.565	0.287	-15.171	17.762	211.332
5100.000	0.861	306.717	-14.331	-10.013	5099.558	0.495	-14.331	17.483	214.942
5200.000	0.343	229.269	-14.077	-10.843	5199.554	0.855	-14.077	17.769	217.604
5300.000	0.690	205.028	-14.818	-11.324	5299.549	0.403	-14.818	18.650	217.388
5400.000	0.714	184.357	-15.985	-11.627	5399.542	0.253	-15.985	19.766	216.030
5500.000	1.271	155.201	-17.613	-11.209	5499.527	0.735	-17.613	20.877	212.472
5600.000	0.470	166.263	-19.018	-10.646	5599.515	0.815	-19.018	21.795	209.239
5700.000	0.895	136.688	-19.985	-10.013	5699.508	0.538	-19.985	22.353	206.612
5800.000	0.850	167.307	-21.277	-9.314	5799.497	0.463	-21.277	23.226	203.642
5900.000	0.535	128.838	-22.293	-8.788	5899.490	0.545	-22.293	23.963	201.514
6000.000	0.702	111.999	-22.815	-7.856	5999.484	0.245	-22.815	24.130	199.001
6100.000	0.460	132.575	-23.316	-6.993	6099.479	0.316	-23.316	24.342	196.695
6200.000	0.358	102.288	-23.654	-6.392	6199.477	0.235	-23.654	24.502	195.122
6300.000	0.365	106.140	-23.809	-5.780	6299.475	0.025	-23.809	24.501	193.646
6400.000	0.639	93.344	-23.930	-4.918	6399.471	0.294	-23.930	24.430	191.613
6500.000	0.701	81.404	-23.871	-3.757	6499.464	0.153	-23.871	24.165	188.943
6600.000	0.926	102.966	-23.961	-2.364	6599.454	0.376	-23.961	24.077	185.635
6650.000	0.613	126.327	-24.210	-1.755	6649.450	0.874	-24.210	24.274	184.147

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