



Company: Noble Energy

Rig: Production / CoreTech

API # 05-123-07233

Date: 11/19/2013

Surveyor: CJ Hines

VS: 0.000

Lat : 40.28111

Long: -104.747

Well: Chris Lorenz #1

Location: Weld County, Colorado

North Reference: GRID

Convergence: Grid north is 0.49 East of True N

Declination: 8.51

Depth Reference: Ground Level

Elevation: 4766

Total Depth as Drilled: 7945

Lat & Long obtained by handheld GPS at wellhead

MS Gyro Survey Calculations

Depth	Inc	AzG	N/-S	E/-W	TVD	DL	VS	CD	Cbrg
100.000	0.429	141.817	-0.295	0.232	99.999	0.429	-0.295	0.375	141.817
200.000	0.150	137.770	-0.686	0.551	199.998	0.280	-0.686	0.880	141.215
300.000	0.072	323.340	-0.733	0.602	299.998	0.222	-0.733	0.948	140.599
400.000	0.125	309.959	-0.612	0.481	399.997	0.058	-0.612	0.779	141.860
500.000	0.185	173.629	-0.703	0.415	499.997	0.289	-0.703	0.816	149.426
600.000	0.263	229.746	-1.012	0.258	599.997	0.222	-1.012	1.044	165.707
700.000	0.225	255.355	-1.210	-0.107	699.996	0.115	-1.210	1.215	185.069
800.000	0.238	234.809	-1.379	-0.467	799.995	0.083	-1.379	1.456	198.695
900.000	0.265	235.826	-1.629	-0.828	899.994	0.027	-1.629	1.827	206.937
1000.000	0.269	212.408	-1.957	-1.145	999.993	0.108	-1.957	2.267	210.327
1100.000	0.151	236.307	-2.228	-1.380	1099.992	0.145	-2.228	2.621	211.772
1200.000	0.395	234.233	-2.502	-1.769	1199.991	0.245	-2.502	3.065	215.257
1300.000	0.376	232.150	-2.905	-2.308	1299.989	0.024	-2.905	3.710	218.463
1400.000	0.291	267.836	-3.116	-2.821	1399.987	0.220	-3.116	4.203	222.152
1500.000	0.545	224.172	-3.467	-3.406	1499.985	0.390	-3.467	4.860	224.492
1600.000	0.398	233.915	-4.012	-4.018	1599.981	0.167	-4.012	5.678	225.039
1700.000	0.771	217.697	-4.749	-4.710	1699.976	0.405	-4.749	6.689	224.761
1800.000	0.713	208.020	-5.832	-5.414	1799.968	0.138	-5.832	7.957	222.873
1900.000	0.835	231.243	-6.837	-6.275	1899.959	0.334	-6.837	9.280	222.543
2000.000	0.683	261.792	-7.379	-7.433	1999.950	0.426	-7.379	10.473	225.210
2100.000	0.997	262.472	-7.578	-8.885	2099.939	0.314	-7.578	11.678	229.541
2200.000	1.061	266.135	-7.754	-10.671	2199.923	0.091	-7.754	13.191	233.996
2300.000	1.055	269.503	-7.824	-12.515	2299.906	0.062	-7.824	14.760	237.987
2400.000	1.165	277.848	-7.694	-14.443	2399.888	0.195	-7.694	16.364	241.956
2500.000	0.889	278.578	-7.439	-16.217	2499.871	0.276	-7.439	17.842	245.358
2600.000	1.008	290.851	-7.010	-17.807	2599.858	0.234	-7.010	19.137	248.511
2700.000	0.927	291.815	-6.397	-19.379	2699.844	0.082	-6.397	20.408	251.733
2800.000	0.772	285.163	-5.920	-20.780	2799.833	0.184	-5.920	21.607	254.099
2900.000	0.692	291.713	-5.520	-21.992	2899.824	0.115	-5.520	22.674	255.909
3000.000	0.701	284.343	-5.145	-23.146	2999.817	0.090	-5.145	23.711	257.468
3100.000	0.753	302.742	-4.638	-24.291	3099.809	0.238	-4.638	24.730	259.190
3200.000	0.654	278.583	-4.198	-25.408	3199.802	0.310	-4.198	25.753	260.618
3300.000	0.599	289.329	-3.940	-26.466	3299.796	0.130	-3.940	26.758	261.533
3400.000	0.573	301.420	-3.506	-27.386	3399.791	0.126	-3.506	27.609	262.704
3500.000	0.600	338.596	-2.758	-28.004	3499.786	0.375	-2.758	28.139	264.376
3600.000	0.570	312.585	-1.933	-28.561	3599.781	0.265	-1.933	28.627	266.128

3700.000	0.530	311.630	-1.289	-29.273	3699.776	0.042	-1.289	29.302	267.478
3800.000	0.662	337.241	-0.449	-29.842	3799.771	0.294	-0.449	29.846	269.137
3900.000	0.329	355.474	0.369	-30.089	3899.767	0.364	0.369	30.091	270.703
4000.000	0.356	357.737	0.966	-30.123	3999.765	0.030	0.966	30.139	271.836
4100.000	0.272	344.686	1.505	-30.198	4099.764	0.109	1.505	30.236	272.853
4200.000	0.370	335.119	2.027	-30.397	4199.762	0.111	2.027	30.465	273.815
4300.000	0.400	348.141	2.662	-30.605	4299.760	0.092	2.662	30.720	274.971
4400.000	0.443	336.168	3.357	-30.833	4399.757	0.098	3.357	31.015	276.214
4500.000	0.350	345.275	4.007	-31.067	4499.755	0.112	4.007	31.324	277.349
4600.000	0.396	356.181	4.647	-31.167	4599.753	0.085	4.647	31.512	278.481
4700.000	0.510	22.882	5.402	-31.017	4699.750	0.237	5.402	31.484	279.880
4800.000	0.772	41.403	6.318	-30.399	4799.743	0.331	6.318	31.048	281.741
4900.000	0.520	313.320	7.135	-30.283	4899.739	0.917	7.135	31.112	283.257
5000.000	0.706	46.945	7.867	-30.163	4999.735	0.903	7.867	31.172	284.618
5100.000	0.740	53.610	8.671	-29.193	5099.727	0.091	8.671	30.453	286.543
5200.000	0.709	69.578	9.270	-28.093	5199.719	0.204	9.270	29.583	288.263
5300.000	0.280	78.396	9.536	-27.273	5299.715	0.434	9.536	28.892	289.271
5400.000	0.319	96.065	9.555	-26.756	5399.714	0.100	9.555	28.411	289.653
5500.000	0.435	102.902	9.441	-26.109	5499.712	0.124	9.441	27.764	289.880
5600.000	0.387	119.677	9.189	-25.445	5599.709	0.129	9.189	27.054	289.856
5700.000	0.934	135.367	8.441	-24.579	5699.702	0.571	8.441	25.988	288.955
5800.000	0.855	149.424	7.219	-23.626	5799.690	0.233	7.219	24.705	286.991
5900.000	1.214	157.981	5.595	-22.850	5899.674	0.391	5.595	23.525	283.758
6000.000	1.325	165.729	3.491	-22.167	5999.649	0.204	3.491	22.441	278.950
6100.000	1.972	165.206	0.707	-21.443	6099.607	0.647	0.707	21.455	271.888
6200.000	2.204	160.143	-2.765	-20.350	6199.541	0.296	-2.765	20.537	262.262
6300.000	2.012	171.190	-6.308	-19.429	6299.474	0.448	-6.308	20.427	252.012
6400.000	2.108	171.215	-9.860	-18.879	6399.409	0.096	-9.860	21.299	242.422
6500.000	2.368	158.132	-13.596	-17.828	6499.333	0.572	-13.596	22.421	232.671
6600.000	2.468	152.071	-17.415	-16.050	6599.244	0.274	-17.415	23.683	222.665
6700.000	2.769	156.155	-21.527	-14.065	6699.140	0.355	-21.527	25.715	213.160
6800.000	3.055	151.665	-26.082	-11.824	6799.011	0.365	-26.082	28.637	204.386
6900.000	3.165	152.532	-30.877	-9.286	6898.864	0.120	-30.877	32.243	196.738
7000.000	3.472	161.617	-36.200	-7.057	6998.696	0.608	-36.200	36.882	191.032
7100.000	3.197	160.556	-41.703	-5.174	7098.527	0.282	-41.703	42.023	187.073

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