



Company/Rig: Noble Energy/ CoreTech  
WELL: Wells Ranch USX BB 1-23  
DECLINATION: 8.22 Degrees  
TD AS DRILLED: 6749 Feet  
COUNTY/STATE: Weld/Colorado  
Latitude: 40.425, Longitude: -104.380  
GRID North is 0.720 Degrees East of True North  
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4664 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-01-de\_01.ut

Minimum Curvature Method

Report Date/Time: 10/13/2014 / 13:39

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	****
100.000	0.976	332.379	99.995	0.754	-0.395	0.754	0.851	332.379	0.976
200.000	0.421	323.291	199.987	1.804	-1.009	1.804	2.067	330.768	0.563
300.000	0.850	320.023	299.981	2.667	-1.706	2.667	3.166	327.397	0.430
400.000	0.957	340.217	399.969	4.021	-2.465	4.021	4.716	328.492	0.334
500.000	0.836	358.193	499.957	5.536	-2.770	5.536	6.190	333.414	0.305
600.000	1.110	28.013	599.943	7.120	-2.339	7.120	7.494	341.817	0.566
700.000	1.046	29.021	699.925	8.773	-1.441	8.773	8.891	350.672	0.067
800.000	1.230	22.791	799.905	10.561	-0.582	10.561	10.577	356.843	0.222
900.000	1.024	26.808	899.886	12.348	0.236	12.348	12.350	1.097	0.221
1000.000	1.041	22.048	999.870	13.988	0.980	13.988	14.022	4.010	0.087
1100.000	0.830	354.590	1099.857	15.551	1.253	15.551	15.601	4.607	0.489
1200.000	0.576	13.692	1199.849	16.761	1.304	16.761	16.812	4.448	0.342
1300.000	1.045	0.400	1299.839	18.162	1.429	18.162	18.218	4.500	0.502
1400.000	0.990	15.910	1399.824	19.905	1.673	19.905	19.975	4.803	0.280
1500.000	0.917	9.318	1499.810	21.525	2.039	21.525	21.621	5.411	0.132
1600.000	0.791	15.444	1599.799	22.980	2.352	22.980	23.100	5.845	0.155
1700.000	0.807	1.012	1699.789	24.350	2.549	24.350	24.483	5.975	0.201
1800.000	0.628	327.595	1799.782	25.517	2.267	25.517	25.617	5.078	0.447
1900.000	0.642	337.609	1899.776	26.498	1.760	26.498	26.556	3.800	0.112

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
2000.000	1.066	319.872	1999.764	27.727	0.947	27.727	27.743	1.956	0.495
2100.000	1.203	347.149	2099.745	29.462	0.114	29.462	29.462	0.221	0.551
2200.000	1.424	340.735	2199.719	31.659	-0.530	31.659	31.663	359.041	0.265
2300.000	1.073	344.780	2299.695	33.736	-1.186	33.736	33.757	357.987	0.361
2400.000	0.964	340.274	2399.679	35.432	-1.716	35.432	35.473	357.228	0.135
2500.000	1.069	357.837	2499.664	37.156	-2.035	37.156	37.212	356.865	0.327
2600.000	1.276	327.826	2599.644	39.031	-2.663	39.031	39.121	356.097	0.639
2700.000	1.125	353.971	2699.623	40.950	-3.359	40.950	41.087	355.311	0.563
2800.000	1.171	348.547	2799.603	42.928	-3.665	42.928	43.084	355.120	0.118
2900.000	1.175	334.684	2899.582	44.857	-4.306	44.857	45.063	354.516	0.283
3000.000	1.631	348.852	2999.552	47.180	-5.020	47.180	47.447	353.926	0.569
3100.000	0.967	340.309	3099.526	49.371	-5.580	49.371	49.685	353.552	0.690
3200.000	0.996	359.503	3199.511	51.034	-5.871	51.034	51.371	353.437	0.328
3300.000	1.028	39.399	3299.497	52.596	-5.309	52.596	52.864	354.236	0.691
3400.000	1.070	83.050	3399.482	53.403	-3.812	53.403	53.539	355.917	0.781
3500.000	0.957	81.175	3499.466	53.644	-2.060	53.644	53.684	357.801	0.118
3600.000	1.359	71.757	3599.445	54.143	-0.108	54.143	54.143	359.885	0.443
3700.000	1.530	86.340	3699.414	54.600	2.350	54.600	54.650	2.464	0.404
3800.000	1.104	96.516	3799.387	54.576	4.639	54.576	54.772	4.859	0.484
3900.000	1.514	80.478	3899.361	54.685	6.899	54.685	55.118	7.191	0.546
4000.000	1.329	97.877	3999.331	54.744	9.351	54.744	55.537	9.693	0.467
4100.000	1.408	104.541	4099.303	54.277	11.689	54.277	55.521	12.153	0.177
4200.000	1.531	97.482	4199.270	53.795	14.202	53.795	55.638	14.789	0.219
4300.000	0.977	88.426	4299.246	53.644	16.380	53.644	56.089	16.980	0.587
4400.000	1.063	96.109	4399.230	53.569	18.155	53.569	56.562	18.722	0.161
4500.000	0.757	100.604	4499.217	53.348	19.727	53.348	56.879	20.293	0.314
4600.000	0.798	144.391	4599.209	52.661	20.782	52.661	56.613	21.536	0.581
4700.000	0.903	153.072	4699.198	51.392	21.544	51.392	55.725	22.744	0.166
4800.000	1.017	174.877	4799.184	49.806	21.980	49.806	54.440	23.813	0.380
4900.000	0.960	153.167	4899.169	48.174	22.438	48.174	53.143	24.974	0.376
5000.000	0.829	187.941	4999.158	46.711	22.716	46.711	51.942	25.934	0.549
5100.000	0.916	180.656	5099.146	45.195	22.607	45.195	50.534	26.574	0.141
5200.000	0.953	187.639	5199.133	43.572	22.487	43.572	49.033	27.298	0.119
5300.000	1.405	177.938	5299.112	41.523	22.421	41.523	47.190	28.367	0.493
5400.000	1.413	174.067	5399.082	39.072	22.592	39.072	45.134	30.037	0.095
5500.000	1.515	187.440	5499.049	36.535	22.549	36.535	42.933	31.682	0.356
5600.000	1.235	195.329	5599.020	34.186	22.093	34.186	40.703	32.873	0.338
5700.000	1.516	188.145	5698.992	31.837	21.620	31.837	38.484	34.180	0.330
5800.000	1.402	175.551	5798.959	29.307	21.528	29.307	36.364	36.300	0.340
5900.000	1.292	176.536	5898.932	26.961	21.691	26.961	34.603	38.818	0.112

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
6000.000	1.239	190.624	5998.908	24.773	21.560	24.773	32.841	41.033	0.315
6100.000	1.331	199.879	6098.883	22.619	20.966	22.619	30.841	42.828	0.227
6200.000	1.107	189.079	6198.860	20.573	20.418	20.573	28.986	44.784	0.319
6300.000	1.074	186.977	6298.842	18.688	20.152	18.688	27.484	47.158	0.052
6400.000	1.086	202.406	6398.824	16.881	19.677	16.881	25.926	49.373	0.290
6500.000	1.572	193.994	6498.797	14.674	18.984	14.674	23.994	52.297	0.522