



Company/Rig: Noble Energy/ CoreTech  
WELL/API#: Wells Ranch USX BB 11-8/05-123-26754  
DECLINATION: 8.21 Degrees  
TD AS DRILLED: 6797 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.41570, Longitude: -104.39685  
Grid North = True North -0.71 degs (NAD 27)  
Grid Convergence Applied = -0.71 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4679 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro\_run01-02-de\_01.ut

Minimum Curvature Method

Report Date/Time: 7/16/2015 / 08:24

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	0.417	230.351	99.999	-0.232	-0.280	-0.232	0.364	230.351	0.417
200.000	0.356	218.056	199.997	-0.709	-0.752	-0.709	1.034	226.685	0.103
300.000	0.209	136.174	299.996	-1.085	-0.817	-1.085	1.358	216.995	0.386
400.000	0.119	135.532	399.996	-1.290	-0.618	-1.290	1.431	205.603	0.089
500.000	0.316	195.154	499.995	-1.631	-0.618	-1.631	1.744	200.740	0.276
600.000	0.150	112.234	599.994	-1.946	-0.569	-1.946	2.028	196.282	0.333
700.000	0.304	180.660	699.994	-2.262	-0.451	-2.262	2.306	191.266	0.286
800.000	0.157	304.905	799.993	-2.449	-0.566	-2.449	2.513	193.009	0.413
900.000	0.409	206.096	899.992	-2.691	-0.835	-2.691	2.818	197.237	0.460
1000.000	0.361	231.161	999.990	-3.210	-1.238	-3.210	3.440	201.088	0.174
1100.000	0.300	204.989	1099.988	-3.645	-1.594	-3.645	3.978	203.621	0.161
1200.000	0.220	151.174	1199.987	-4.050	-1.612	-4.050	4.359	201.701	0.246
1300.000	0.290	125.946	1299.986	-4.367	-1.315	-4.367	4.560	196.754	0.130
1400.000	0.316	118.426	1399.985	-4.646	-0.867	-4.646	4.727	190.573	0.048
1500.000	0.248	152.001	1499.984	-4.969	-0.523	-4.969	4.997	186.006	0.176
1600.000	0.305	141.665	1599.983	-5.369	-0.256	-5.369	5.375	182.731	0.075
1700.000	0.488	115.060	1699.980	-5.758	0.295	-5.758	5.766	177.069	0.255
1800.000	0.378	137.000	1799.978	-6.180	0.905	-6.180	6.246	171.664	0.197

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
1900.000	0.329	112.928	1899.976	-6.532	1.394	-6.532	6.680	167.951	0.155
2000.000	0.268	155.658	1999.975	-6.857	1.755	-6.857	7.078	165.645	0.225
2100.000	0.472	219.863	2099.973	-7.387	1.587	-7.387	7.555	167.874	0.430
2200.000	0.724	263.234	2199.968	-7.778	0.695	-7.778	7.809	174.891	0.500
2300.000	1.120	276.658	2299.955	-7.739	-0.903	-7.739	7.791	186.654	0.448
2400.000	1.056	270.880	2399.937	-7.611	-2.795	-7.611	8.108	200.161	0.127
2500.000	1.367	242.242	2499.915	-8.153	-4.771	-8.153	9.446	210.337	0.671
2600.000	1.353	241.178	2599.887	-9.278	-6.861	-9.278	11.539	216.485	0.029
2700.000	1.542	241.318	2699.855	-10.493	-9.076	-10.493	13.873	220.860	0.188
2800.000	1.203	246.497	2799.826	-11.557	-11.219	-11.557	16.107	224.150	0.360
2900.000	1.265	264.485	2899.803	-12.082	-13.281	-12.082	17.954	227.707	0.391
3000.000	1.253	262.588	2999.779	-12.329	-15.463	-12.329	19.777	231.435	0.044
3100.000	0.723	286.150	3099.764	-12.294	-17.153	-12.294	21.104	234.369	0.657
3200.000	0.511	263.677	3199.759	-12.168	-18.202	-12.168	21.895	236.237	0.317
3300.000	0.564	232.020	3299.754	-12.520	-19.033	-12.520	22.782	236.663	0.298
3400.000	0.986	191.555	3399.746	-13.666	-19.594	-13.666	23.888	235.106	0.666
3500.000	1.003	167.317	3499.731	-15.362	-19.574	-15.362	24.882	231.874	0.418
3600.000	1.163	169.202	3599.713	-17.213	-19.191	-17.213	25.780	228.111	0.164
3700.000	1.315	163.888	3699.690	-19.312	-18.683	-19.312	26.870	224.051	0.190
3800.000	1.296	163.581	3799.664	-21.500	-18.045	-21.500	28.069	220.007	0.020
3900.000	0.960	196.103	3899.645	-23.390	-17.957	-23.390	29.488	217.515	0.709
4000.000	1.043	248.136	3999.632	-24.534	-19.034	-24.534	31.052	217.806	0.882
4100.000	1.440	281.537	4099.610	-24.621	-21.110	-24.621	32.432	220.609	0.808
4200.000	2.041	291.139	4199.563	-23.728	-24.002	-23.728	33.750	225.329	0.666
4300.000	2.810	279.122	4299.474	-22.697	-28.083	-22.697	36.108	231.054	0.918
4400.000	3.259	293.491	4399.335	-21.175	-33.110	-21.175	39.302	237.399	0.880
4500.000	3.527	290.563	4499.159	-18.962	-38.597	-18.962	43.003	243.836	0.318
4600.000	2.895	295.254	4599.002	-16.804	-43.761	-16.804	46.876	248.993	0.683
4700.000	3.449	302.829	4698.849	-14.096	-48.573	-14.096	50.577	253.817	0.694
4800.000	2.606	310.872	4798.709	-10.977	-52.819	-10.977	53.948	258.260	0.943
4900.000	1.734	318.720	4898.636	-8.353	-55.536	-8.353	56.161	261.447	0.919
5000.000	0.541	326.046	4998.615	-6.824	-56.798	-6.824	57.207	263.149	1.199
5100.000	0.316	90.403	5098.613	-6.435	-56.787	-6.435	57.150	263.535	0.765
5200.000	0.572	87.362	5198.610	-6.414	-56.012	-6.414	56.378	263.468	0.257
5300.000	0.639	101.604	5298.605	-6.503	-54.968	-6.503	55.351	263.253	0.164
5400.000	0.577	87.610	5398.599	-6.594	-53.918	-6.594	54.320	263.028	0.160
5500.000	0.707	97.846	5498.593	-6.657	-52.803	-6.657	53.221	262.815	0.173
5600.000	0.751	127.604	5598.585	-7.141	-51.673	-7.141	52.164	262.132	0.377
5700.000	1.065	109.506	5698.573	-7.851	-50.278	-7.851	50.887	261.125	0.422
5800.000	1.439	134.296	5798.549	-9.038	-48.503	-9.038	49.338	259.444	0.650

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
5900.000	1.441	147.215	5898.518	-10.972	-46.923	-10.972	48.189	256.839	0.324
6000.000	1.753	153.940	5998.479	-13.403	-45.571	-13.403	47.501	253.611	0.363
6100.000	2.633	162.513	6098.405	-16.967	-44.209	-16.967	47.353	249.003	0.937
6200.000	1.326	176.897	6198.344	-20.314	-43.456	-20.314	47.970	244.946	1.388
6300.000	0.646	215.749	6298.329	-21.927	-43.723	-21.927	48.913	243.367	0.918
6400.000	0.645	309.521	6398.325	-22.026	-44.486	-22.026	49.640	243.659	0.942
6500.000	0.685	349.791	6498.319	-21.080	-45.026	-21.080	49.716	244.913	0.459