



Company/Rig: Noble Energy/ CoreTech
WELL/API#: Wells Ranch USX BB 3-16/05-123-26324
DECLINATION: 8.11 Degrees
TD AS DRILLED: 6833 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.42278, Longitude: -104.41621
Grid North = True North -0.70 degs (NAD 27)
Grid Correction Applied = -0.70 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4693 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 8/11/2016 / 09:13

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Wells Ranch USX BB 3-16

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	0.714	297.396	99.997	0.287	-0.554	0.287	0.623	297.396	0.714
200.000	0.545	211.526	199.993	0.168	-1.356	0.168	1.366	277.075	0.867
300.000	0.457	239.687	299.989	-0.438	-1.949	-0.438	1.997	257.322	0.258
400.000	0.547	230.515	399.986	-0.943	-2.661	-0.943	2.823	250.485	0.121
500.000	0.244	275.396	499.983	-1.227	-3.242	-1.227	3.467	249.272	0.412
600.000	0.248	273.705	599.982	-1.193	-3.670	-1.193	3.859	251.996	0.008
700.000	0.211	293.505	699.982	-1.106	-4.055	-1.106	4.203	254.748	0.087
800.000	0.157	34.495	799.981	-0.919	-4.146	-0.919	4.246	257.497	0.286
900.000	0.177	14.732	899.981	-0.657	-4.029	-0.657	4.082	260.744	0.061
1000.000	0.157	194.416	999.981	-0.640	-4.023	-0.640	4.074	260.964	0.335
1100.000	0.198	195.261	1099.980	-0.940	-4.103	-0.940	4.209	257.101	0.041
1200.000	0.137	166.997	1199.980	-1.223	-4.122	-1.223	4.299	253.475	0.101
1300.000	0.198	4.364	1299.980	-1.167	-4.082	-1.167	4.245	254.043	0.331
1400.000	0.220	324.915	1399.979	-0.838	-4.179	-0.838	4.262	258.666	0.143
1500.000	0.175	12.602	1499.979	-0.531	-4.256	-0.531	4.289	262.885	0.165
1600.000	0.228	23.173	1599.978	-0.199	-4.145	-0.199	4.149	267.246	0.064

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
1700.000	0.182	320.847	1699.977	0.106	-4.166	0.106	4.168	271.462	0.216
1800.000	0.215	322.627	1799.977	0.379	-4.381	0.379	4.397	274.941	0.034
1900.000	0.313	297.223	1899.976	0.653	-4.738	0.653	4.783	277.849	0.150
2000.000	0.311	353.932	1999.974	1.048	-5.009	1.048	5.118	281.813	0.296
2100.000	0.224	28.022	2099.973	1.490	-4.946	1.490	5.166	286.763	0.177
2200.000	0.433	350.147	2199.972	2.035	-4.919	2.035	5.323	292.470	0.290
2300.000	0.477	7.810	2299.969	2.819	-4.927	2.819	5.676	299.774	0.146
2400.000	0.648	313.162	2399.965	3.618	-5.283	3.618	6.403	304.403	0.538
2500.000	0.720	307.991	2499.957	4.391	-6.191	4.391	7.590	305.350	0.095
2600.000	0.744	314.452	2599.949	5.233	-7.150	5.233	8.860	306.202	0.086
2700.000	0.798	301.232	2699.940	6.049	-8.209	6.049	10.197	306.386	0.186
2800.000	0.765	297.854	2799.931	6.722	-9.395	6.722	11.552	305.584	0.057
2900.000	0.954	289.795	2899.920	7.316	-10.768	7.316	13.018	304.192	0.224
3000.000	0.926	272.106	2999.906	7.628	-12.360	7.628	14.524	301.681	0.290
3100.000	0.957	260.894	3099.893	7.525	-13.992	7.525	15.888	298.271	0.187
3200.000	0.689	256.275	3199.883	7.250	-15.401	7.250	17.023	295.209	0.276
3300.000	0.315	302.087	3299.879	7.254	-16.218	7.254	17.766	294.097	0.521
3400.000	0.254	11.666	3399.878	7.616	-16.406	7.616	18.088	294.902	0.328
3500.000	0.315	279.251	3499.877	7.877	-16.632	7.877	18.403	295.342	0.412
3600.000	0.619	293.539	3599.874	8.137	-17.399	8.137	19.208	295.065	0.324
3700.000	0.731	283.524	3699.867	8.502	-18.514	8.502	20.373	294.665	0.162
3800.000	0.644	267.210	3799.860	8.624	-19.696	8.624	21.501	293.646	0.213
3900.000	0.757	269.192	3899.852	8.587	-20.918	8.587	22.612	292.319	0.115
4000.000	1.035	260.229	3999.840	8.424	-22.468	8.424	23.996	290.553	0.311
4100.000	1.182	253.902	4099.821	7.985	-24.350	7.985	25.626	288.156	0.191
4200.000	1.146	255.143	4199.801	7.443	-26.308	7.443	27.340	285.797	0.044
4300.000	0.867	257.673	4299.785	7.025	-28.013	7.025	28.881	284.077	0.283
4400.000	0.875	282.884	4399.774	7.033	-29.497	7.033	30.324	283.412	0.380
4500.000	0.146	55.281	4499.770	7.276	-30.136	7.276	31.002	283.574	0.979
4600.000	1.046	94.188	4599.764	7.282	-29.122	7.282	30.018	284.039	0.937
4700.000	1.827	77.515	4699.732	7.560	-26.654	7.560	27.706	285.835	0.878
4800.000	2.265	74.306	4799.668	8.439	-23.195	8.439	24.683	289.993	0.452
4900.000	1.851	92.481	4899.605	8.904	-19.679	8.904	21.600	294.344	0.768
5000.000	0.907	101.846	4999.575	8.671	-17.291	8.671	19.344	296.633	0.968
5100.000	0.334	151.291	5099.569	8.253	-16.377	8.253	18.339	296.746	0.735
5200.000	0.539	186.118	5199.566	7.529	-16.287	7.529	17.943	294.811	0.326
5300.000	0.907	199.123	5299.558	6.313	-16.596	6.313	17.757	290.827	0.401
5400.000	1.150	184.786	5399.542	4.565	-16.940	4.565	17.544	285.082	0.352
5500.000	1.155	192.204	5499.522	2.580	-17.236	2.580	17.428	278.512	0.149

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
5600.000	1.317	188.369	5599.499	0.458	-17.617	0.458	17.623	271.489	0.182
5700.000	1.425	174.672	5699.470	-1.917	-17.668	-1.917	17.772	263.806	0.344
5800.000	1.324	185.013	5799.442	-4.307	-17.654	-4.307	18.172	256.291	0.268
5900.000	1.245	140.102	5899.419	-6.291	-17.058	-6.291	18.181	249.755	0.984
6000.000	1.400	167.778	5999.393	-8.319	-16.102	-8.319	18.124	242.679	0.650
6100.000	1.234	173.120	6099.367	-10.581	-15.715	-10.581	18.945	236.046	0.207
6200.000	1.089	158.531	6199.346	-12.534	-15.238	-12.534	19.731	230.561	0.328
6300.000	1.050	138.628	6299.329	-14.106	-14.285	-14.106	20.076	225.362	0.372
6400.000	1.130	158.948	6399.312	-15.713	-13.325	-15.713	20.603	220.300	0.392
6500.000	1.083	159.079	6499.293	-17.516	-12.634	-17.516	21.597	215.802	0.047
6600.000	1.100	133.531	6599.275	-19.060	-11.600	-19.060	22.312	211.325	0.483