



Company/Rig: Noble Energy/ CoreTech  
WELL/API#: Wells Ranch USX BB 3-11/05-123-26275  
DECLINATION: 8.12 Degrees  
TD AS DRILLED: 6906 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.42624, Longitude: -104.42524  
Grid North = True North -0.69 degs (NAD 27)  
Grid Correction Applied = -0.69 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4710 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

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

Minimum Curvature Method

Report Date/Time: 8/11/2016 / 08:36

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Wells Ranch USX BB 3-11

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	0.194	319.638	100.000	0.129	-0.109	0.129	0.169	319.638	0.194
200.000	0.291	139.321	199.999	0.065	-0.054	0.065	0.084	320.593	0.485
300.000	0.261	39.716	299.999	0.048	0.257	0.048	0.262	79.500	0.422
400.000	0.323	63.277	399.997	0.349	0.654	0.349	0.742	61.899	0.134
500.000	0.483	162.694	499.996	0.074	1.031	0.074	1.034	85.908	0.623
600.000	0.301	161.471	599.994	-0.577	1.240	-0.577	1.368	114.968	0.182
700.000	0.583	134.103	699.991	-1.181	1.689	-1.181	2.061	124.952	0.345
800.000	0.203	136.834	799.988	-1.664	2.176	-1.664	2.740	127.411	0.380
900.000	0.413	115.431	899.987	-1.949	2.623	-1.949	3.267	126.610	0.235
1000.000	0.196	125.121	999.985	-2.202	3.088	-2.202	3.793	125.488	0.222
1100.000	0.477	85.015	1099.983	-2.264	3.643	-2.264	4.289	121.860	0.351
1200.000	0.473	62.164	1199.980	-2.035	4.423	-2.035	4.869	114.708	0.188
1300.000	0.479	51.274	1299.977	-1.581	5.114	-1.581	5.353	107.174	0.091
1400.000	0.525	27.812	1399.973	-0.914	5.654	-0.914	5.728	99.182	0.209
1500.000	0.621	51.538	1499.968	-0.172	6.292	-0.172	6.294	91.566	0.253
1600.000	0.471	98.752	1599.964	0.102	7.122	0.102	7.123	89.177	0.458

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	0.587	124.093	1699.960	-0.247	7.952	-0.247	7.956	91.781	0.258
1800.000	0.466	161.997	1799.956	-0.921	8.502	-0.921	8.551	96.181	0.361
1900.000	0.842	192.622	1899.949	-2.024	8.467	-2.024	8.705	103.445	0.501
2000.000	1.117	211.539	1999.935	-3.572	7.796	-3.572	8.575	114.617	0.421
2100.000	1.462	214.340	2099.909	-5.456	6.566	-5.456	8.538	129.726	0.350
2200.000	1.478	234.881	2199.877	-7.252	4.792	-7.252	8.692	146.546	0.524
2300.000	1.577	249.192	2299.842	-8.483	2.450	-8.483	8.830	163.890	0.393
2400.000	1.384	243.342	2399.809	-9.514	0.084	-9.514	9.514	179.492	0.245
2500.000	1.602	250.702	2499.775	-10.517	-2.314	-10.517	10.769	192.409	0.290
2600.000	1.291	254.799	2599.743	-11.275	-4.720	-11.275	12.223	202.718	0.328
2700.000	1.482	251.772	2699.714	-11.974	-7.035	-11.974	13.888	210.436	0.204
2800.000	1.322	256.886	2799.684	-12.641	-9.387	-12.641	15.745	216.598	0.203
2900.000	1.571	259.205	2899.652	-13.159	-11.857	-13.159	17.713	222.020	0.256
3000.000	1.352	261.753	2999.619	-13.585	-14.371	-13.585	19.775	226.610	0.228
3100.000	1.448	241.878	3099.590	-14.350	-16.652	-14.350	21.982	229.248	0.492
3200.000	1.073	284.396	3199.568	-14.712	-18.673	-14.712	23.772	231.766	0.978
3300.000	0.587	246.556	3299.557	-14.683	-20.049	-14.683	24.851	233.782	0.708
3400.000	0.321	238.441	3399.554	-15.033	-20.757	-15.033	25.629	234.086	0.273
3500.000	0.416	243.357	3499.552	-15.343	-21.321	-15.343	26.267	234.260	0.101
3600.000	0.593	214.943	3599.548	-15.930	-21.942	-15.930	27.115	234.020	0.301
3700.000	0.564	260.403	3699.544	-16.437	-22.724	-16.437	28.045	234.121	0.448
3800.000	0.692	253.203	3799.538	-16.693	-23.787	-16.693	29.060	234.940	0.150
3900.000	0.237	207.486	3899.534	-17.051	-24.461	-17.051	29.818	235.120	0.553
4000.000	0.484	106.951	3999.533	-17.358	-24.153	-17.358	29.743	234.296	0.576
4100.000	1.224	95.042	4099.521	-17.575	-22.685	-17.575	28.697	232.234	0.757
4200.000	2.112	93.651	4199.478	-17.786	-19.783	-17.786	26.603	228.042	0.889
4300.000	3.083	93.447	4299.374	-18.065	-15.260	-18.065	23.648	220.189	0.971
4400.000	3.195	92.566	4399.224	-18.352	-9.792	-18.352	20.801	208.083	0.122
4500.000	3.436	87.388	4499.057	-18.340	-4.014	-18.340	18.774	192.345	0.384
4600.000	4.384	82.872	4598.823	-17.729	2.773	-17.729	17.944	171.111	0.996
4700.000	4.041	78.245	4698.553	-16.537	10.015	-16.537	19.333	148.800	0.483
4800.000	2.621	71.399	4798.382	-15.090	15.631	-15.090	21.726	133.990	1.472
4900.000	1.728	71.229	4898.309	-13.875	19.226	-13.875	23.710	125.819	0.893
5000.000	1.325	99.656	4998.275	-13.584	21.792	-13.584	25.680	121.937	0.845
5100.000	0.833	107.209	5098.257	-13.993	23.626	-13.993	27.459	120.637	0.510
5200.000	0.670	115.787	5198.248	-14.463	24.847	-14.463	28.750	120.202	0.198
5300.000	0.607	101.255	5298.242	-14.820	25.894	-14.820	29.835	119.785	0.173
5400.000	0.457	50.922	5398.238	-14.672	26.723	-14.672	30.486	118.769	0.473
5500.000	0.519	67.644	5498.235	-14.249	27.451	-14.249	30.929	117.432	0.154

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	0.563	73.212	5598.230	-13.935	28.340	-13.935	31.581	116.183	0.069
5700.000	0.811	41.843	5698.223	-13.266	29.283	-13.266	32.147	114.372	0.442
5800.000	1.086	27.847	5798.209	-11.900	30.197	-11.900	32.458	111.508	0.358
5900.000	1.464	21.320	5898.185	-9.872	31.105	-9.872	32.634	107.608	0.404
6000.000	2.063	356.709	5998.138	-6.885	31.466	-6.885	32.210	102.342	0.952
6100.000	3.948	349.200	6097.996	-1.706	30.718	-1.706	30.765	93.179	1.922
6200.000	2.286	339.748	6197.846	3.547	29.382	3.547	29.595	83.116	1.734
6300.000	0.848	316.507	6297.806	5.956	28.182	5.956	28.805	78.067	1.544
6400.000	0.844	294.748	6397.796	6.801	27.004	6.801	27.847	75.864	0.319
6500.000	1.160	273.678	6497.781	7.174	25.324	7.174	26.321	74.182	0.481
6600.000	1.158	277.309	6597.760	7.368	23.311	7.368	24.448	72.460	0.073