



Company/Rig: NOBLE ENERGY / PRODUCTION
WELL/API#: WELLS RANCH USX BB 11-10 / 05-123-26756
DECLINATION: 8.21 DEGREES
TD AS DRILLED: 6769 FEET
COUNTY/STATE: WELD/ COLORADO
VS-Azi: 0.000 Degrees
Latitude: 40.41179, Longitude: -104.40172
Grid North = True North -0.71 degs (NAD 27)
Grid Convergence Applied = -0.71 degs



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4662 FEET

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut
Minimum Curvature Method
Report Date/Time: 7/16/2015 / 14:18

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD
NORTH REFERENCE: GRID
HENDERSON, COLORADO
303-853-4976
SURVEYOR: NORMAN COWAN

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	0.525	228.403	99.999	-0.304	-0.343	-0.304	0.458	228.403	0.525
200.000	0.982	193.218	199.990	-1.442	-0.881	-1.442	1.690	211.419	0.630
300.000	1.248	195.387	299.971	-3.327	-1.366	-3.327	3.596	202.324	0.270
400.000	1.356	211.837	399.946	-5.382	-2.279	-5.382	5.845	202.952	0.388
500.000	1.438	238.851	499.917	-7.037	-3.977	-7.037	8.083	209.476	0.657
600.000	1.330	234.727	599.888	-8.356	-5.998	-8.356	10.286	215.673	0.147
700.000	1.625	228.218	699.855	-9.970	-8.002	-9.970	12.785	218.752	0.339
800.000	2.099	236.678	799.802	-11.921	-10.590	-11.921	15.945	221.616	0.547
900.000	2.172	238.919	899.732	-13.905	-13.743	-13.905	19.550	224.664	0.111
1000.000	2.080	240.029	999.663	-15.790	-16.938	-15.790	23.156	227.009	0.101
1100.000	2.204	237.567	1099.594	-17.728	-20.133	-17.728	26.825	228.635	0.154
1200.000	1.909	228.343	1199.529	-19.866	-23.000	-19.866	30.391	229.181	0.442
1300.000	1.864	241.299	1299.476	-21.754	-25.670	-21.754	33.648	229.721	0.428
1400.000	1.676	246.119	1399.428	-23.127	-28.434	-23.127	36.652	230.877	0.239
1500.000	1.321	234.448	1499.394	-24.389	-30.709	-24.389	39.216	231.543	0.466
1600.000	1.169	210.840	1599.371	-25.935	-32.169	-25.935	41.322	231.125	0.531
1700.000	0.950	209.742	1699.354	-27.530	-33.104	-27.530	43.055	230.252	0.219
1800.000	1.184	214.115	1799.336	-29.105	-34.094	-29.105	44.828	229.513	0.247

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	0.681	213.738	1899.323	-30.454	-35.003	-30.454	46.397	228.975	0.503
2000.000	0.585	227.304	1999.317	-31.295	-35.709	-31.295	47.481	228.769	0.177
2100.000	0.286	287.443	2099.314	-31.566	-36.322	-31.566	48.122	229.007	0.507
2200.000	0.332	276.894	2199.313	-31.456	-36.848	-31.456	48.448	229.513	0.073
2300.000	0.431	322.193	2299.311	-31.124	-37.366	-31.124	48.630	230.207	0.308
2400.000	0.481	9.171	2399.308	-30.412	-37.530	-30.412	48.305	230.980	0.367
2500.000	1.074	3.629	2499.298	-29.062	-37.403	-29.062	47.367	232.153	0.597
2600.000	1.315	354.626	2599.276	-26.984	-37.451	-26.984	46.160	234.227	0.305
2700.000	1.181	337.344	2699.253	-24.890	-37.956	-24.890	45.389	236.744	0.398
2800.000	1.369	340.637	2799.228	-22.812	-38.749	-22.812	44.965	239.514	0.202
2900.000	1.194	337.766	2899.203	-20.720	-39.540	-20.720	44.640	242.344	0.186
3000.000	1.078	327.378	2999.184	-18.963	-40.441	-18.963	44.666	244.878	0.236
3100.000	1.281	313.445	3099.163	-17.402	-41.760	-17.402	45.241	247.378	0.350
3200.000	1.261	317.854	3199.138	-15.817	-43.310	-15.817	46.108	249.938	0.100
3300.000	1.261	327.625	3299.114	-14.072	-44.638	-14.072	46.803	252.503	0.215
3400.000	1.150	334.189	3399.092	-12.239	-45.664	-12.239	47.276	254.996	0.177
3500.000	1.281	346.595	3499.069	-10.249	-46.360	-10.249	47.479	257.534	0.293
3600.000	1.083	339.792	3599.048	-8.275	-46.945	-8.275	47.669	260.003	0.242
3700.000	0.914	326.722	3699.033	-6.722	-47.709	-6.722	48.180	261.981	0.282
3800.000	1.608	330.080	3799.008	-4.839	-48.847	-4.839	49.086	264.343	0.698
3900.000	2.309	349.851	3898.950	-1.639	-49.902	-1.639	49.929	268.118	0.964
4000.000	2.805	351.637	3998.850	2.764	-50.612	2.764	50.688	273.126	0.502
4100.000	3.329	356.506	4098.707	8.083	-51.145	8.083	51.780	278.981	0.585
4200.000	3.317	347.156	4198.540	13.802	-51.965	13.802	53.767	284.874	0.542
4300.000	3.496	357.590	4298.364	19.669	-52.737	19.669	56.285	290.453	0.644
4400.000	3.217	4.808	4398.193	25.511	-52.630	25.511	58.487	295.861	0.506
4500.000	2.636	17.798	4498.063	30.497	-51.692	30.497	60.017	300.539	0.879
4600.000	2.571	35.068	4597.961	34.521	-49.700	34.521	60.513	304.783	0.784
4700.000	2.454	55.949	4697.867	37.556	-46.638	37.556	59.879	308.843	0.917
4800.000	1.955	69.003	4797.794	39.366	-43.272	39.366	58.499	312.294	0.705
4900.000	2.006	98.197	4897.736	39.727	-39.947	39.727	56.338	314.842	0.999
5000.000	1.597	115.132	4997.687	38.886	-36.952	38.886	53.643	316.460	0.667
5100.000	1.346	123.321	5097.654	37.648	-34.709	37.648	51.207	317.326	0.327
5200.000	1.157	147.795	5197.631	36.149	-33.190	36.149	49.075	317.444	0.562
5300.000	1.445	159.466	5297.606	34.115	-32.210	34.115	46.918	316.645	0.390
5400.000	1.338	164.902	5397.576	31.808	-31.464	31.808	44.740	315.312	0.170
5500.000	0.955	168.894	5497.556	29.863	-30.999	29.863	43.043	313.931	0.390
5600.000	1.236	189.613	5597.538	27.982	-31.018	27.982	41.775	312.054	0.481
5700.000	0.883	188.515	5697.521	26.157	-31.313	26.157	40.801	309.874	0.354
5800.000	0.849	193.358	5797.509	24.675	-31.598	24.675	40.091	307.986	0.080

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	0.533	195.973	5897.502	23.506	-31.897	23.506	39.623	306.388	0.318
6000.000	0.585	209.286	5997.497	22.613	-32.275	22.613	39.409	305.017	0.140
6100.000	0.703	214.721	6097.491	21.664	-32.874	21.664	39.370	303.384	0.132
6200.000	0.761	206.861	6197.483	20.567	-33.524	20.567	39.330	301.529	0.116
6300.000	0.556	194.701	6297.476	19.504	-33.947	19.504	39.152	299.879	0.247
6400.000	0.789	207.268	6397.469	18.423	-34.386	18.423	39.010	298.181	0.274
6500.000	0.743	207.244	6497.460	17.235	-34.998	17.235	39.012	296.218	0.046