



Company/Rig: NOBLE ENERGY / PRODUCTION
WELL/API#: WELLS RANCH USX BB 5-10 / 05-123-26196
DECLINATION: 8.26 DEGREES
TD AS DRILLED: 6978 FEET
COUNTY/STATE: WELD / COLORADO
VS-Azi: 0.000 Degrees
Latitude: 40.42663, Longitude: -104.45794
Grid Convergence Applied = -0.67 degs (NAD 27)
Grid North = True North -0.67 degs



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4725 FEET

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut
Minimum Curvature Method
Report Date/Time: 5/22/2015 / 10:37

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	0.612	215.857	99.998	-0.433	-0.313	-0.433	0.534	215.857	0.612
200.000	0.384	275.087	199.995	-0.836	-0.959	-0.836	1.273	228.923	0.531
300.000	0.409	309.018	299.993	-0.582	-1.570	-0.582	1.674	249.661	0.232
400.000	0.389	282.212	399.990	-0.286	-2.179	-0.286	2.197	262.531	0.186
500.000	0.587	275.149	499.987	-0.168	-3.020	-0.168	3.025	266.817	0.206
600.000	0.880	266.634	599.978	-0.167	-4.296	-0.167	4.299	267.773	0.312
700.000	0.914	257.850	699.966	-0.380	-5.842	-0.380	5.854	266.279	0.141
800.000	0.921	263.388	799.953	-0.640	-7.420	-0.640	7.447	265.068	0.089
900.000	1.189	257.261	899.936	-0.962	-9.231	-0.962	9.280	264.052	0.290
1000.000	1.270	258.564	999.913	-1.410	-11.329	-1.410	11.416	262.904	0.086
1100.000	1.399	247.149	1099.886	-2.104	-13.540	-2.104	13.703	261.167	0.295
1200.000	1.431	252.975	1199.856	-2.944	-15.859	-2.944	16.130	259.484	0.147
1300.000	1.439	249.652	1299.824	-3.746	-18.231	-3.746	18.612	258.388	0.084
1400.000	1.532	247.798	1399.791	-4.688	-20.646	-4.688	21.171	257.207	0.104
1500.000	1.616	236.258	1499.753	-5.976	-23.056	-5.976	23.818	255.468	0.328
1600.000	1.555	231.156	1599.715	-7.610	-25.285	-7.610	26.406	253.249	0.154
1700.000	1.487	219.436	1699.680	-9.464	-27.166	-9.464	28.767	250.794	0.318
1800.000	1.322	211.128	1799.650	-11.453	-28.587	-11.453	30.796	248.166	0.262

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	1.036	204.330	1899.629	-13.265	-29.556	-13.265	32.396	245.829	0.318
2000.000	0.881	189.583	1999.615	-14.846	-30.056	-14.846	33.523	243.713	0.290
2100.000	0.782	224.987	2099.605	-16.086	-30.666	-16.086	34.629	242.320	0.514
2200.000	1.055	219.747	2199.592	-17.277	-31.737	-17.277	36.135	241.438	0.285
2300.000	0.622	239.960	2299.582	-18.256	-32.796	-18.256	37.535	240.897	0.518
2400.000	0.837	240.484	2399.573	-18.888	-33.902	-18.888	38.808	240.876	0.215
2500.000	0.732	232.944	2499.564	-19.633	-35.047	-19.633	40.171	240.743	0.147
2600.000	0.389	263.362	2599.559	-20.057	-35.894	-20.057	41.118	240.804	0.443
2700.000	0.363	287.694	2699.557	-20.000	-36.533	-20.000	41.649	241.301	0.161
2800.000	0.327	263.262	2799.555	-19.937	-37.118	-19.937	42.133	241.758	0.150
2900.000	0.301	300.159	2899.554	-19.839	-37.628	-19.839	42.538	242.200	0.200
3000.000	0.472	75.598	2999.553	-19.605	-37.456	-19.605	42.277	242.372	0.718
3100.000	0.625	88.638	3099.548	-19.489	-36.512	-19.489	41.388	241.908	0.197
3200.000	0.608	77.621	3199.543	-19.363	-35.449	-19.363	40.392	241.356	0.120
3300.000	1.014	84.443	3299.532	-19.163	-34.050	-19.163	39.072	240.629	0.417
3400.000	1.144	85.767	3399.515	-19.004	-32.173	-19.004	37.367	239.431	0.132
3500.000	1.519	98.035	3499.488	-19.115	-29.866	-19.115	35.459	237.379	0.469
3600.000	2.067	105.886	3599.439	-19.794	-26.819	-19.794	33.333	233.571	0.600
3700.000	2.277	110.300	3699.367	-20.977	-23.221	-20.977	31.293	227.907	0.269
3800.000	2.620	113.147	3799.275	-22.565	-19.257	-22.565	29.665	220.478	0.363
3900.000	2.740	109.220	3899.166	-24.250	-14.898	-24.250	28.461	211.565	0.220
4000.000	2.557	102.112	3999.059	-25.505	-10.459	-25.505	27.566	202.298	0.376
4100.000	2.152	98.581	4098.975	-26.253	-6.421	-26.253	27.027	193.744	0.430
4200.000	2.063	99.264	4198.907	-26.823	-2.788	-26.823	26.968	185.933	0.092
4300.000	1.910	88.882	4298.847	-27.081	0.655	-27.081	27.089	178.613	0.390
4400.000	1.696	96.947	4398.798	-27.227	3.791	-27.227	27.490	172.074	0.332
4500.000	1.863	88.212	4498.750	-27.355	6.884	-27.355	28.208	165.875	0.318
4600.000	1.575	95.386	4598.705	-27.434	9.876	-27.434	29.157	160.201	0.359
4700.000	1.339	77.745	4698.673	-27.315	12.386	-27.315	29.992	155.607	0.504
4800.000	0.481	52.081	4798.660	-26.809	13.860	-26.809	30.179	152.662	0.929
4900.000	0.427	72.461	4898.657	-26.438	14.546	-26.438	30.176	151.181	0.169
5000.000	0.815	31.302	4998.651	-25.718	15.271	-25.718	29.910	149.298	0.568
5100.000	0.692	27.676	5098.642	-24.575	15.921	-24.575	29.282	147.062	0.132
5200.000	0.743	31.289	5198.634	-23.486	16.539	-23.486	28.725	144.846	0.068
5300.000	1.047	2.800	5298.623	-22.018	16.921	-22.018	27.769	142.459	0.530
5400.000	0.733	24.428	5398.611	-20.523	17.230	-20.523	26.797	139.986	0.455
5500.000	0.425	131.431	5498.607	-20.187	17.772	-20.187	26.895	138.640	0.948
5600.000	0.808	138.218	5598.602	-20.958	18.520	-20.958	27.969	138.534	0.390
5700.000	0.922	141.702	5698.590	-22.116	19.489	-22.116	29.478	138.613	0.125
5800.000	0.989	131.266	5798.576	-23.317	20.636	-23.317	31.137	138.490	0.186

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	1.028	130.303	5898.561	-24.466	21.969	-24.466	32.882	138.078	0.043
6000.000	1.115	129.900	5998.543	-25.671	23.400	-25.671	34.736	137.649	0.087
6100.000	1.155	139.909	6098.524	-27.066	24.796	-27.066	36.708	137.507	0.202
6200.000	1.730	139.896	6198.492	-28.992	26.418	-28.992	39.223	137.660	0.575
6300.000	1.642	123.252	6298.449	-30.933	28.589	-30.933	42.121	137.255	0.496
6400.000	1.142	155.600	6398.421	-32.626	30.199	-32.626	44.457	137.212	0.912
6500.000	1.330	133.822	6498.398	-34.337	31.448	-34.337	46.562	137.515	0.502
6600.000	1.503	128.859	6598.367	-35.963	33.306	-35.963	49.017	137.197	0.212
6700.000	2.132	142.422	6698.317	-38.260	35.462	-38.260	52.167	137.174	0.758