



Company/Rig: NOBLE ENERGY / PRODUCTION
WELL/API#: WELLS RANCH USX AA 33-15 / 05-123-26384
DECLINATION: 8.25 DEGREES
TD AS DRILLED: 6972 FEET
COUNTY/STATE: WELD / COLORADO
VS-Azi: 0.000 Degrees
Latitude: 40.43759, Longitude: -104.43952
Grid Convergence Applied = -0.69 degs (NAD 27)
Grid North = True North -0.69 degs



DEPTH REFERENCE : RKB=SURFACE ELEVATION=4775 FEET

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 5/14/2015 / 13:09

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	0.387	225.653	99.999	-0.236	-0.241	-0.236	0.338	225.653	0.387
200.000	0.556	237.035	199.996	-0.736	-0.890	-0.736	1.155	230.410	0.193
300.000	0.442	233.942	299.992	-1.227	-1.609	-1.227	2.024	232.669	0.117
400.000	0.345	262.383	399.990	-1.494	-2.219	-1.494	2.675	236.046	0.215
500.000	0.386	271.366	499.988	-1.526	-2.854	-1.526	3.236	241.867	0.071
600.000	0.494	308.400	599.985	-1.250	-3.529	-1.250	3.744	250.489	0.297
700.000	0.690	319.712	699.980	-0.524	-4.255	-0.524	4.288	262.984	0.227
800.000	0.631	317.573	799.973	0.342	-5.016	0.342	5.028	273.897	0.064
900.000	0.682	316.229	899.966	1.178	-5.799	1.178	5.918	281.483	0.054
1000.000	0.714	319.491	999.959	2.082	-6.616	2.082	6.936	287.467	0.051
1100.000	0.629	314.786	1099.952	2.942	-7.410	2.942	7.973	291.655	0.101
1200.000	0.639	308.495	1199.946	3.676	-8.237	3.676	9.020	294.052	0.070
1300.000	0.632	307.663	1299.940	4.360	-9.110	4.360	10.099	295.578	0.012
1400.000	0.605	312.297	1399.934	5.052	-9.937	5.052	11.147	296.951	0.057
1500.000	0.586	306.319	1499.929	5.710	-10.739	5.710	12.163	298.002	0.065
1600.000	0.549	298.977	1599.924	6.246	-11.570	6.246	13.148	298.360	0.082
1700.000	0.378	294.317	1699.920	6.613	-12.290	6.613	13.956	298.286	0.175
1800.000	0.026	289.718	1799.920	6.757	-12.611	6.757	14.307	298.181	0.352

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	0.117	144.283	1899.920	6.682	-12.573	6.682	14.238	297.987	0.138
2000.000	0.196	112.113	1999.919	6.535	-12.355	6.535	13.977	297.874	0.115
2100.000	0.329	130.418	2099.918	6.284	-11.978	6.284	13.526	297.683	0.156
2200.000	0.397	116.364	2199.916	5.944	-11.449	5.944	12.900	297.436	0.111
2300.000	0.682	83.980	2299.912	5.852	-10.547	5.852	12.061	299.026	0.407
2400.000	0.964	69.284	2399.902	6.212	-9.168	6.212	11.074	304.123	0.350
2500.000	1.077	62.040	2499.886	6.951	-7.550	6.951	10.263	312.632	0.171
2600.000	1.095	62.074	2599.868	7.839	-5.876	7.839	9.797	323.143	0.018
2700.000	1.016	62.371	2699.851	8.697	-4.247	8.697	9.679	333.971	0.079
2800.000	1.097	60.252	2799.834	9.583	-2.631	9.583	9.938	344.648	0.090
2900.000	1.081	59.928	2899.816	10.531	-0.983	10.531	10.577	354.665	0.017
3000.000	0.999	59.246	2999.799	11.449	0.582	11.449	11.464	2.910	0.083
3100.000	1.036	56.328	3099.783	12.396	2.083	12.396	12.570	9.540	0.064
3200.000	0.843	66.427	3199.770	13.192	3.510	13.192	13.651	14.901	0.254
3300.000	0.554	112.271	3299.763	13.303	4.632	13.303	14.086	19.198	0.606
3400.000	1.160	170.584	3399.753	12.121	5.245	12.121	13.207	23.399	0.989
3500.000	1.137	181.773	3499.733	10.130	5.380	10.130	11.470	27.972	0.225
3600.000	1.100	180.493	3599.714	8.178	5.341	8.178	9.768	33.148	0.045
3700.000	1.117	189.045	3699.695	6.255	5.179	6.255	8.121	39.625	0.166
3800.000	1.060	195.935	3799.677	4.403	4.772	4.403	6.493	47.305	0.143
3900.000	1.152	203.580	3899.659	2.592	4.116	2.592	4.864	57.800	0.174
4000.000	1.158	208.437	3999.639	0.782	3.233	0.782	3.326	76.399	0.098
4100.000	0.960	201.857	4099.621	-0.884	2.440	-0.884	2.595	109.918	0.232
4200.000	0.968	215.283	4199.607	-2.351	1.640	-2.351	2.867	145.110	0.226
4300.000	1.752	232.536	4299.579	-3.971	-0.062	-3.971	3.971	180.891	0.876
4400.000	1.604	215.235	4399.537	-6.044	-2.083	-6.044	6.393	199.014	0.526
4500.000	1.590	191.295	4499.499	-8.547	-3.162	-8.547	9.113	200.301	0.662
4600.000	1.999	182.850	4599.450	-11.649	-3.520	-11.649	12.169	196.815	0.486
4700.000	2.034	179.850	4699.388	-15.166	-3.602	-15.166	15.588	193.362	0.111
4800.000	1.651	196.455	4799.337	-18.322	-4.006	-18.322	18.754	192.333	0.653
4900.000	1.370	191.215	4899.302	-20.876	-4.646	-20.876	21.387	192.548	0.312
5000.000	1.207	190.896	4999.277	-23.083	-5.078	-23.083	23.635	192.407	0.163
5100.000	0.774	184.585	5099.261	-24.791	-5.331	-24.791	25.358	192.136	0.446
5200.000	0.540	193.663	5199.255	-25.923	-5.496	-25.923	26.499	191.971	0.256
5300.000	0.486	126.314	5299.252	-26.631	-5.266	-26.631	27.147	191.186	0.570
5400.000	0.328	7.772	5399.250	-26.598	-4.886	-26.598	27.043	190.409	0.704
5500.000	0.515	65.236	5499.248	-26.127	-4.439	-26.127	26.501	189.644	0.437
5600.000	0.579	43.426	5599.243	-25.571	-3.684	-25.571	25.836	188.199	0.216
5700.000	0.667	39.809	5699.238	-24.757	-2.964	-24.757	24.934	186.827	0.096
5800.000	0.754	81.626	5799.230	-24.214	-1.940	-24.214	24.292	184.581	0.514

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	0.767	48.535	5899.222	-23.675	-0.787	-23.675	23.688	181.905	0.433
6000.000	0.799	26.757	5999.213	-22.609	0.028	-22.609	22.609	179.929	0.298
6100.000	0.868	16.544	6099.203	-21.261	0.558	-21.261	21.268	178.498	0.163
6200.000	1.002	4.470	6199.189	-19.663	0.841	-19.663	19.681	177.550	0.238
6300.000	0.953	8.716	6299.175	-17.969	1.036	-17.969	17.999	176.702	0.087
6400.000	1.052	353.852	6399.160	-16.234	1.063	-16.234	16.269	176.253	0.277
6500.000	0.745	8.590	6499.147	-14.679	1.062	-14.679	14.717	175.862	0.382
6600.000	0.706	2.804	6599.139	-13.421	1.189	-13.421	13.473	174.936	0.083
6700.000	0.693	11.894	6699.132	-12.213	1.344	-12.213	12.287	173.719	0.112