



Company/Rig: NOBLE ENERGY/CORETECH  
WELL: HSR-OWENS 14-34  
DECLINATION: 8.37 DEGREES  
TD AS DRILLED: 7248 FEET  
COUNTY/STATE: WELD/COLORADO  
Latitude: 40.263, Longitude: -104.652  
GRID North is 0.550 Degrees East of True North  
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB=GL SURFACE ELEVATION=4752

DRILLOG MS GYRO SURVEY CALCULATIONS

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

Minimum Curvature Method

Report Date/Time: 8/20/2014 / 16:06

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

SURVEYOR: KEVIN MCDOWELL

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	0.433	22.214	99.999	0.350	0.143	0.350	0.378	22.214	0.433
200.000	0.425	17.868	199.996	1.052	0.399	1.052	1.125	20.783	0.033
300.000	0.512	346.395	299.993	1.839	0.408	1.839	1.884	12.504	0.268
400.000	0.523	342.756	399.989	2.710	0.168	2.710	2.715	3.540	0.034
500.000	0.477	329.389	499.985	3.503	-0.180	3.503	3.508	357.064	0.125
600.000	0.332	345.254	599.983	4.142	-0.465	4.142	4.168	353.589	0.182
700.000	0.402	329.833	699.981	4.725	-0.715	4.725	4.779	351.390	0.121
800.000	0.695	326.430	799.976	5.534	-1.227	5.534	5.668	347.496	0.295
900.000	0.497	340.286	899.971	6.448	-1.709	6.448	6.671	345.154	0.243
1000.000	0.824	330.986	999.964	7.486	-2.204	7.486	7.803	343.591	0.343
1100.000	0.718	332.118	1099.955	8.669	-2.846	8.669	9.124	341.822	0.107
1200.000	1.041	334.789	1199.943	10.045	-3.526	10.045	10.646	340.655	0.325
1300.000	1.032	305.998	1299.927	11.395	-4.642	11.395	12.305	337.838	0.515
1400.000	1.238	343.846	1399.909	12.962	-5.671	12.962	14.148	336.373	0.762
1500.000	1.215	328.963	1499.886	14.909	-6.518	14.909	16.271	336.386	0.319
1600.000	1.191	342.564	1599.864	16.809	-7.376	16.809	18.356	336.307	0.286
1700.000	0.910	328.253	1699.848	18.476	-8.106	18.476	20.176	336.313	0.382
1800.000	0.969	328.424	1799.834	19.873	-8.967	19.873	21.802	335.715	0.059
1900.000	0.927	355.958	1899.821	21.400	-9.467	21.400	23.401	336.138	0.453

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
2000.000	0.941	331.476	1999.808	22.929	-9.916	22.929	24.981	336.614	0.396
2100.000	0.377	345.583	2099.801	23.969	-10.389	23.969	26.124	336.565	0.582
2200.000	0.277	303.461	2199.800	24.421	-10.673	24.421	26.651	336.392	0.253
2300.000	0.377	279.985	2299.798	24.611	-11.199	24.611	27.039	335.534	0.165
2400.000	0.391	283.174	2399.796	24.746	-11.855	24.746	27.439	334.403	0.026
2500.000	0.306	284.147	2499.794	24.889	-12.447	24.889	27.828	333.431	0.085
2600.000	0.292	278.430	2599.793	24.992	-12.958	24.992	28.152	332.593	0.033
2700.000	0.375	259.306	2699.791	24.969	-13.532	24.969	28.400	331.545	0.137
2800.000	0.417	258.862	2799.788	24.838	-14.210	24.838	28.615	330.225	0.043
2900.000	0.286	265.973	2899.787	24.750	-14.816	24.750	28.846	329.094	0.138
3000.000	0.440	281.270	2999.785	24.807	-15.442	24.807	29.221	328.099	0.181
3100.000	0.408	267.761	3099.782	24.869	-16.175	24.869	29.666	326.960	0.105
3200.000	0.469	222.134	3199.779	24.551	-16.805	24.551	29.752	325.609	0.345
3300.000	0.385	142.998	3299.777	23.980	-16.877	23.980	29.324	324.862	0.547
3400.000	0.222	174.664	3399.776	23.519	-16.657	23.519	28.820	324.692	0.228
3500.000	0.800	237.823	3499.772	22.954	-17.230	22.954	28.701	323.107	0.727
3600.000	1.073	293.965	3599.760	22.962	-18.676	22.962	29.598	320.878	0.913
3700.000	1.365	264.970	3699.739	23.238	-20.718	23.238	31.133	318.281	0.673
3800.000	1.285	291.744	3799.713	23.549	-22.946	23.549	32.880	315.743	0.618
3900.000	1.224	262.146	3899.690	23.818	-25.045	23.818	34.563	313.562	0.643
4000.000	1.202	254.141	3999.668	23.386	-27.112	23.386	35.804	310.780	0.171
4100.000	0.691	210.375	4099.655	22.579	-28.426	22.579	36.302	308.460	0.851
4200.000	0.593	214.939	4199.648	21.635	-29.027	21.635	36.203	306.698	0.110
4300.000	0.748	212.516	4299.642	20.661	-29.674	20.661	36.158	304.847	0.157
4400.000	0.778	203.959	4399.633	19.490	-30.301	19.490	36.028	302.751	0.118
4500.000	0.552	215.468	4499.626	18.478	-30.856	18.478	35.965	300.915	0.261
4600.000	0.159	327.847	4599.624	18.203	-31.209	18.203	36.130	300.253	0.630
4700.000	0.528	345.122	4699.623	18.766	-31.401	18.766	36.582	300.864	0.380
4800.000	0.508	14.934	4799.619	19.640	-31.406	19.640	37.041	302.021	0.267
4900.000	0.482	341.967	4899.615	20.469	-31.422	20.469	37.501	303.082	0.282
5000.000	0.264	4.144	4999.613	21.099	-31.535	21.099	37.943	303.785	0.258
5100.000	0.207	31.808	5099.612	21.483	-31.423	21.483	38.065	304.359	0.125
5200.000	0.306	282.403	5199.612	21.694	-31.588	21.694	38.320	304.480	0.422
5300.000	0.374	276.275	5299.610	21.787	-32.174	21.787	38.856	304.104	0.078
5400.000	0.771	308.926	5399.605	22.245	-33.022	22.245	39.816	303.966	0.499
5500.000	0.676	286.924	5499.597	22.840	-34.110	22.840	41.051	303.806	0.292
5600.000	0.575	211.778	5599.593	22.585	-34.938	22.585	41.602	302.879	0.767
5700.000	1.045	271.692	5699.584	22.185	-36.114	22.185	42.384	301.562	0.905
5800.000	1.086	325.688	5799.569	22.994	-37.559	22.994	44.039	301.476	0.968
5900.000	0.661	337.030	5899.557	24.308	-38.318	24.308	45.378	302.390	0.456

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
6000.000	0.405	18.405	5999.553	25.174	-38.432	25.174	45.943	303.226	0.446
6100.000	0.431	37.942	6099.550	25.806	-38.089	25.806	46.008	304.119	0.144
6200.000	0.339	1.896	6199.548	26.398	-37.848	26.398	46.145	304.895	0.254
6300.000	0.657	8.872	6299.544	27.260	-37.750	27.260	46.564	305.834	0.323
6400.000	0.846	64.974	6399.537	28.138	-36.993	28.138	46.479	307.258	0.726
6500.000	0.749	27.126	6499.528	29.032	-36.026	29.032	46.269	308.864	0.525
6600.000	0.764	34.827	6599.519	30.162	-35.348	30.162	46.467	310.474	0.103
6700.000	0.856	353.845	6699.510	31.452	-35.047	31.452	47.090	311.906	0.574
6800.000	1.196	348.079	6799.494	33.216	-35.342	33.216	48.501	313.223	0.355
6900.000	1.109	338.792	6899.474	35.139	-35.908	35.139	50.240	314.380	0.206
7000.000	1.701	333.762	6999.443	37.372	-36.914	37.372	52.529	315.353	0.605