



Company/ Rig: Noble Energy/ CoreTech  
Well/API#: Hoffner 34-35/05-123-23564  
Declination: 8.21 Degrees  
TD as Drilled: 6950 Feet  
County/State: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.43796, Longitude: -104.51434  
Grid North = True North -0.64 degs (NAD 27)  
Grid Correction Applied = -0.64 degs



Depth Reference : RKB= GL/ Elevation= 4634 Feet

**DRILLOG MS GYRO SURVEY CALCULATIONS**

Filename: msgyro\_run02-01-de\_01\_mrg.ut

Minimum Curvature Method

Report Date/Time: 3/16/2016 / 15:05

Lat & Long Obtained by Handheld GPS at Wellhead

North Reference: Grid

Henderson, Colorado

303-853-4976

Surveyor: Sean Bratt / Hoffner 34-35

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	0.902	35.142	99.996	0.644	0.453	0.644	0.787	35.142	0.902
200.000	1.036	38.634	199.982	1.993	1.470	1.993	2.477	36.415	0.146
300.000	1.008	53.636	299.966	3.221	2.743	3.221	4.231	40.420	0.268
400.000	1.011	53.660	399.950	4.265	4.162	4.265	5.960	44.299	0.002
500.000	0.920	57.272	499.936	5.222	5.548	5.222	7.619	46.734	0.110
600.000	0.789	55.105	599.925	6.049	6.787	6.049	9.092	48.290	0.135
700.000	0.794	61.172	699.915	6.777	7.959	6.777	10.453	49.585	0.084
800.000	0.845	48.929	799.905	7.596	9.122	7.596	11.870	50.215	0.182
900.000	0.755	60.100	899.896	8.409	10.249	8.409	13.257	50.633	0.180
1000.000	0.671	54.487	999.888	9.078	11.297	9.078	14.492	51.217	0.109
1100.000	0.616	37.633	1099.882	9.844	12.103	9.844	15.600	50.876	0.196
1200.000	0.341	41.954	1199.878	10.491	12.630	10.491	16.419	50.285	0.278
1300.000	0.330	86.419	1299.877	10.731	13.116	10.731	16.947	50.714	0.254
1400.000	0.797	45.344	1399.872	11.237	13.899	11.237	17.873	51.044	0.589
1500.000	0.630	15.955	1499.864	12.255	14.544	12.255	19.019	49.884	0.396
1600.000	0.357	351.246	1599.861	13.092	14.648	13.092	19.646	48.212	0.340
1700.000	0.799	29.639	1699.856	14.006	14.946	14.006	20.483	46.859	0.565
1800.000	0.684	356.897	1799.848	15.208	15.258	15.208	21.543	45.094	0.433

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	0.848	17.598	1899.839	16.510	15.450	16.510	22.611	43.100	0.319
2000.000	0.521	337.180	1999.832	17.634	15.497	17.634	23.476	41.309	0.564
2100.000	0.760	314.041	2099.826	18.515	14.844	18.515	23.730	38.720	0.348
2200.000	0.831	318.343	2199.816	19.518	13.885	19.518	23.953	35.428	0.092
2300.000	0.547	293.978	2299.809	20.254	12.966	20.254	24.049	32.627	0.402
2400.000	0.714	269.455	2399.803	20.442	11.907	20.442	23.657	30.220	0.313
2500.000	0.595	256.748	2499.797	20.317	10.779	20.317	22.999	27.948	0.187
2600.000	0.631	292.168	2599.791	20.406	9.764	20.406	22.621	25.570	0.375
2700.000	0.851	278.712	2699.783	20.726	8.519	20.726	22.409	22.344	0.279
2800.000	0.805	268.023	2799.773	20.815	7.083	20.815	21.987	18.792	0.161
2900.000	0.775	264.379	2899.763	20.724	5.708	20.724	21.496	15.399	0.058
3000.000	0.685	253.050	2999.755	20.484	4.463	20.484	20.964	12.291	0.169
3100.000	0.817	188.530	3099.748	19.604	3.785	19.604	19.966	10.927	0.810
3200.000	1.263	160.825	3199.732	17.858	4.041	17.858	18.309	12.751	0.660
3300.000	1.557	124.347	3299.703	16.051	5.524	16.051	16.975	18.993	0.925
3400.000	1.745	124.080	3399.662	14.431	7.907	14.431	16.455	28.717	0.188
3500.000	1.774	128.872	3499.615	12.607	10.372	12.607	16.326	39.446	0.150
3600.000	2.204	149.960	3599.556	9.971	12.540	9.971	16.021	51.511	0.842
3700.000	2.435	165.472	3699.475	6.250	14.036	6.250	15.364	65.997	0.666
3800.000	2.117	185.056	3799.397	2.354	14.406	2.354	14.597	80.721	0.835
3900.000	1.352	203.735	3899.351	-0.567	13.768	-0.567	13.780	92.357	0.942
4000.000	1.853	232.949	3999.314	-2.621	12.003	-2.621	12.286	102.318	0.942
4100.000	2.513	249.609	4099.241	-4.359	8.658	-4.359	9.693	116.724	0.909
4200.000	2.997	266.323	4199.127	-5.290	3.994	-5.290	6.629	142.945	0.933
4300.000	3.105	284.411	4298.988	-4.784	-1.237	-4.784	4.941	194.499	0.965
4400.000	3.053	296.621	4398.845	-2.917	-6.240	-2.917	6.888	244.948	0.657
4500.000	1.736	274.423	4498.757	-1.607	-10.131	-1.607	10.257	260.987	1.587
4600.000	1.474	250.376	4598.719	-1.922	-12.852	-1.922	12.995	261.494	0.716
4700.000	1.174	265.529	4698.692	-2.434	-15.085	-2.434	15.280	260.835	0.458
4800.000	1.689	249.929	4798.661	-3.019	-17.491	-3.019	17.749	260.205	0.641
4900.000	1.729	261.846	4898.617	-3.739	-20.368	-3.739	20.709	259.598	0.357
5000.000	1.518	243.435	4998.577	-4.546	-23.047	-4.546	23.491	258.843	0.560
5100.000	1.659	248.744	5098.539	-5.663	-25.581	-5.663	26.200	257.518	0.203
5200.000	1.668	246.486	5198.497	-6.768	-28.264	-6.768	29.063	256.533	0.066
5300.000	1.489	267.036	5298.460	-7.416	-30.897	-7.416	31.774	256.503	0.590
5400.000	1.741	289.072	5398.421	-6.987	-33.630	-6.987	34.348	258.263	0.665
5500.000	1.071	284.692	5498.390	-6.253	-35.970	-6.253	36.509	260.138	0.678
5600.000	0.752	272.213	5598.378	-5.991	-37.529	-5.991	38.005	260.930	0.374
5700.000	0.235	300.479	5698.374	-5.862	-38.361	-5.862	38.807	261.312	0.556
5800.000	0.235	179.762	5798.373	-5.963	-38.537	-5.963	38.996	261.203	0.408

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	0.432	114.858	5898.372	-6.327	-38.194	-6.327	38.714	260.593	0.395
6000.000	0.715	102.566	5998.367	-6.622	-37.243	-6.622	37.827	259.918	0.306
6100.000	1.019	90.958	6098.355	-6.772	-35.745	-6.772	36.381	259.272	0.350
6200.000	0.811	78.230	6198.343	-6.643	-34.164	-6.643	34.803	258.997	0.289
6300.000	1.667	55.845	6298.319	-5.682	-32.267	-5.682	32.763	260.013	0.968
6400.000	2.579	46.686	6398.249	-3.322	-29.426	-3.322	29.613	263.560	0.970
6500.000	3.018	36.133	6498.130	0.348	-26.237	0.348	26.239	270.761	0.675
6600.000	2.423	23.198	6598.018	4.418	-23.851	4.418	24.257	280.493	0.852
6700.000	1.823	1.809	6697.951	7.951	-22.969	7.951	24.306	289.094	0.984