



Company/Rig: NOBLE ENERGY/CORE-TECH  
 WELL: GURTLER H 25-27  
 DECLINATION: 8.34  
 TD AS DRILLED: 7736'  
 COUNTY/STATE: WELD/COLORADO  
 Latitude: 40.205, Longitude: -104.606  
 GRID North is 0.580 Degrees East of True North  
 VS-Azi: 0.000 Degrees

DEPTH REFERENCE : RKB=SURFACE ELEVATION= 4735'

DRILLOG MS GYRO SURVEY CALCULATIONS

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

Minimum Curvature Method

Report Date/Time: 10/6/2014 / 12:09

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: NICK KULA

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	0.075	58.273	100.000	0.034	0.056	0.034	0.065	58.273	0.075
200.000	0.087	303.868	200.000	0.111	0.048	0.111	0.121	23.571	0.136
300.000	0.009	118.671	300.000	0.150	-0.007	0.150	0.150	357.157	0.096
400.000	0.064	33.233	400.000	0.192	0.030	0.192	0.195	8.916	0.064
500.000	0.322	59.393	499.999	0.382	0.302	0.382	0.487	38.368	0.266
600.000	0.255	49.075	599.998	0.671	0.712	0.671	0.978	46.718	0.084
700.000	0.466	176.818	699.997	0.410	0.903	0.410	0.992	65.553	0.654
800.000	0.670	187.575	799.992	-0.575	0.848	-0.575	1.025	124.116	0.229
900.000	0.675	189.022	899.985	-1.735	0.679	-1.735	1.863	158.630	0.018
1000.000	0.732	183.384	999.978	-2.954	0.549	-2.954	3.005	169.474	0.090
1100.000	0.791	186.021	1099.969	-4.279	0.439	-4.279	4.301	174.144	0.069
1200.000	0.820	199.660	1199.959	-5.640	0.126	-5.640	5.641	178.725	0.194
1300.000	0.815	198.165	1299.949	-6.989	-0.337	-6.989	6.998	182.760	0.022
1400.000	0.864	200.891	1399.938	-8.370	-0.828	-8.370	8.410	185.647	0.063
1500.000	0.883	205.341	1499.926	-9.771	-1.426	-9.771	9.874	188.306	0.071
1600.000	0.929	206.401	1599.914	-11.194	-2.117	-11.194	11.392	190.709	0.049
1700.000	0.941	205.030	1699.901	-12.664	-2.825	-12.664	12.975	192.575	0.026
1800.000	1.255	211.673	1799.882	-14.340	-3.747	-14.340	14.822	194.645	0.338
1900.000	2.506	220.209	1899.826	-16.942	-5.734	-16.942	17.886	198.698	1.279

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	3.503	224.922	1999.688	-20.774	-9.302	-20.774	22.762	204.122	1.026
2100.000	4.640	220.482	2099.434	-26.014	-14.085	-26.014	29.583	208.433	1.180
2200.000	6.118	222.568	2198.991	-33.016	-20.316	-33.016	38.766	211.607	1.490
2300.000	7.831	219.317	2298.248	-42.211	-28.238	-42.211	50.785	213.781	1.757
2400.000	8.597	219.516	2397.221	-53.247	-37.310	-53.247	65.018	215.019	0.767
2500.000	9.654	225.172	2495.956	-64.925	-48.013	-64.925	80.749	216.484	1.385
2600.000	11.105	224.204	2594.317	-77.740	-60.675	-77.740	98.615	217.971	1.461
2700.000	13.295	223.696	2692.053	-92.959	-75.334	-92.959	119.652	219.021	2.193
2800.000	13.662	225.304	2789.299	-109.579	-91.673	-109.579	142.868	219.916	0.524
2900.000	14.136	222.892	2886.372	-126.831	-108.378	-126.831	166.829	220.514	0.748
3000.000	14.191	221.360	2983.332	-144.978	-124.789	-144.978	191.288	220.720	0.379
3100.000	12.883	223.244	3080.552	-162.300	-140.528	-162.300	214.685	220.888	1.380
3200.000	12.494	223.547	3178.110	-178.261	-155.618	-178.261	236.631	221.120	0.395
3300.000	10.574	222.400	3276.086	-192.879	-169.259	-192.879	256.614	221.268	1.933
3400.000	9.450	223.971	3374.562	-205.563	-181.146	-205.563	273.989	221.387	1.157
3500.000	9.866	224.158	3473.144	-217.617	-192.814	-217.617	290.748	221.542	0.417
3600.000	10.139	226.022	3571.625	-229.875	-205.116	-229.875	308.083	221.742	0.424
3700.000	9.729	219.313	3670.128	-242.525	-216.803	-242.525	325.303	221.795	1.227
3800.000	10.336	220.477	3768.599	-255.887	-227.980	-255.887	342.714	221.699	0.639
3900.000	12.537	222.130	3866.608	-270.762	-241.087	-270.762	362.539	221.682	2.226
4000.000	13.213	222.514	3964.093	-287.236	-256.091	-287.236	384.821	221.719	0.681
4100.000	13.140	220.276	4061.461	-304.332	-271.162	-304.332	407.611	221.701	0.515
4200.000	12.506	222.164	4158.967	-321.029	-285.778	-321.029	429.801	221.675	0.760
4300.000	13.028	224.663	4256.495	-337.071	-300.969	-337.071	451.884	221.761	0.760
4400.000	12.991	226.137	4353.928	-352.877	-316.996	-352.877	474.351	221.934	0.334
4500.000	13.139	225.885	4451.340	-368.577	-333.260	-368.577	496.901	222.119	0.159
4600.000	13.406	225.456	4548.669	-384.621	-349.682	-384.621	519.817	222.276	0.285
4700.000	12.662	227.652	4646.092	-400.136	-366.044	-400.136	542.307	222.452	0.894
4800.000	11.826	227.838	4743.817	-414.397	-381.740	-414.397	563.428	222.651	0.837
4900.000	9.926	221.801	4842.019	-427.702	-395.083	-427.702	582.253	222.730	2.213
5000.000	8.553	219.414	4940.720	-439.872	-405.550	-439.872	598.296	222.675	1.425
5100.000	9.525	218.412	5039.477	-452.101	-415.412	-452.101	613.972	222.578	0.984
5200.000	9.602	211.951	5138.090	-465.660	-424.966	-465.660	630.425	222.384	1.076
5300.000	8.053	211.973	5236.903	-478.680	-433.089	-478.680	645.523	222.137	1.549
5400.000	6.713	214.970	5336.072	-489.411	-440.148	-489.411	658.220	221.966	1.394
5500.000	5.305	217.277	5435.520	-497.879	-446.298	-497.879	668.630	221.873	1.428
5600.000	3.864	219.782	5535.197	-504.148	-451.254	-504.148	676.606	221.831	1.454
5700.000	2.776	225.406	5635.028	-508.438	-455.135	-508.438	682.391	221.834	1.135
5800.000	2.010	223.724	5734.940	-511.405	-458.072	-511.405	686.560	221.851	0.770
5900.000	1.530	243.750	5834.893	-513.263	-460.481	-513.263	689.551	221.897	0.776

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	0.912	229.145	5934.870	-514.374	-462.280	-514.374	691.580	221.947	0.687
6100.000	0.619	239.483	6034.861	-515.169	-463.348	-515.169	692.885	221.969	0.323
6200.000	0.802	227.874	6134.854	-515.913	-464.332	-515.913	694.097	221.988	0.232
6300.000	0.606	235.359	6234.846	-516.683	-465.287	-516.683	695.308	222.004	0.216
6400.000	0.586	239.769	6334.841	-517.241	-466.164	-517.241	696.310	222.027	0.050
6500.000	0.580	243.165	6434.835	-517.727	-467.057	-517.727	697.269	222.055	0.035
6600.000	0.563	235.026	6534.831	-518.237	-467.911	-518.237	698.220	222.079	0.083
6700.000	0.497	209.302	6634.826	-518.897	-468.526	-518.897	699.121	222.080	0.244
6800.000	0.385	219.483	6734.823	-519.534	-468.952	-519.534	699.880	222.071	0.136
6900.000	0.303	191.818	6834.822	-520.053	-469.220	-520.053	700.444	222.058	0.183
7000.000	0.326	205.265	6934.820	-520.569	-469.395	-520.569	700.945	222.041	0.077