



Company/Rig: Noble Energy/ CoreTech  
WELL/API#: Pauline 2/05-123-12139  
DECLINATION: 8.28 Degrees  
TD AS DRILLED: 6960 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.41187, Longitude: -104.58134  
Grid North = True North -0.59 degs (NAD 27)  
Grid Correction Applied = -0.59 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4595 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

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

Minimum Curvature Method

Report Date/Time: 12/1/2015 / 10:27

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Pauline 2

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	0.524	278.733	99.999	0.069	-0.452	0.069	0.458	278.733	0.524
200.000	0.354	227.993	199.996	-0.068	-1.135	-0.068	1.137	266.567	0.407
300.000	1.111	271.987	299.988	-0.241	-2.334	-0.241	2.346	264.092	0.891
400.000	1.692	272.143	399.957	-0.153	-4.778	-0.153	4.780	268.170	0.581
500.000	1.796	276.997	499.911	0.093	-7.808	0.093	7.809	270.686	0.180
600.000	1.542	271.337	599.869	0.316	-10.708	0.316	10.713	271.689	0.302
700.000	1.431	281.970	699.835	0.606	-13.275	0.606	13.289	272.614	0.297
800.000	1.195	286.135	799.809	1.155	-15.499	1.155	15.541	274.262	0.255
900.000	0.779	279.618	899.794	1.558	-17.170	1.558	17.241	275.186	0.430
1000.000	0.872	272.277	999.783	1.702	-18.600	1.702	18.678	275.228	0.141
1100.000	0.942	291.084	1099.771	2.028	-20.128	2.028	20.230	275.753	0.304
1200.000	0.822	283.106	1199.759	2.486	-21.593	2.486	21.736	276.568	0.171
1300.000	0.270	332.550	1299.755	2.858	-22.401	2.858	22.582	277.271	0.678
1400.000	0.446	192.521	1399.754	2.688	-22.594	2.688	22.753	276.784	0.676
1500.000	0.317	186.038	1499.752	2.033	-22.707	2.033	22.798	275.115	0.136
1600.000	0.558	115.851	1599.749	1.545	-22.298	1.545	22.352	273.964	0.540
1700.000	0.221	222.554	1699.748	1.191	-21.990	1.191	22.022	273.100	0.657
1800.000	0.393	173.886	1799.746	0.708	-22.084	0.708	22.095	271.836	0.297

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	0.608	294.260	1899.744	0.585	-22.531	0.585	22.539	271.488	0.875
2000.000	0.866	274.455	1999.736	0.862	-23.769	0.862	23.784	272.078	0.359
2100.000	0.863	291.607	2099.725	1.198	-25.222	1.198	25.251	272.720	0.258
2200.000	0.804	277.207	2199.714	1.563	-26.619	1.563	26.664	273.361	0.217
2300.000	0.553	278.253	2299.707	1.721	-27.793	1.721	27.846	273.543	0.251
2400.000	0.458	245.002	2399.703	1.621	-28.633	1.621	28.679	273.240	0.303
2500.000	0.475	196.667	2499.701	1.055	-29.115	1.055	29.134	272.074	0.383
2600.000	0.486	224.677	2599.697	0.356	-29.532	0.356	29.534	270.690	0.233
2700.000	0.538	192.857	2699.693	-0.403	-29.934	-0.403	29.937	269.228	0.285
2800.000	0.588	202.351	2799.689	-1.335	-30.234	-1.335	30.263	267.471	0.105
2900.000	0.491	205.060	2899.684	-2.198	-30.611	-2.198	30.689	265.893	0.100
3000.000	0.478	161.650	2999.681	-2.982	-30.661	-2.982	30.806	264.445	0.359
3100.000	1.042	166.666	3099.672	-4.262	-30.320	-4.262	30.618	261.999	0.567
3200.000	1.756	166.131	3199.641	-6.634	-29.743	-6.634	30.474	257.427	0.715
3300.000	1.582	154.523	3299.599	-9.368	-28.782	-9.368	30.268	251.972	0.379
3400.000	1.637	170.163	3399.560	-12.021	-27.944	-12.021	30.420	246.723	0.441
3500.000	2.301	167.983	3499.500	-15.392	-27.282	-15.392	31.325	240.569	0.668
3600.000	1.964	181.165	3599.432	-19.069	-26.899	-19.069	32.972	234.667	0.593
3700.000	2.269	179.032	3699.363	-22.761	-26.900	-22.761	35.238	229.764	0.316
3800.000	1.890	177.056	3799.297	-26.387	-26.782	-26.387	37.598	225.426	0.386
3900.000	1.543	191.821	3899.253	-29.351	-26.973	-29.351	39.863	222.582	0.559
4000.000	1.266	207.475	3999.223	-31.649	-27.759	-31.649	42.098	221.253	0.471
4100.000	0.923	208.946	4099.205	-33.334	-28.658	-33.334	43.960	220.687	0.344
4200.000	1.311	238.688	4199.186	-34.633	-30.025	-34.633	45.837	220.924	0.685
4300.000	1.822	248.740	4299.149	-35.804	-32.484	-35.804	48.344	222.216	0.578
4400.000	1.969	248.575	4399.094	-37.008	-35.564	-37.008	51.327	223.860	0.148
4500.000	1.916	235.472	4499.037	-38.583	-38.541	-38.583	54.535	224.969	0.446
4600.000	1.780	228.862	4598.985	-40.552	-41.087	-40.552	57.729	225.376	0.253
4700.000	1.476	228.812	4698.945	-42.422	-43.226	-42.422	60.565	225.538	0.303
4800.000	1.190	232.904	4798.918	-43.897	-45.024	-43.897	62.881	225.726	0.301
4900.000	1.059	218.890	4898.898	-45.242	-46.433	-45.242	64.829	225.744	0.304
5000.000	0.865	229.174	4998.884	-46.455	-47.584	-46.455	66.500	225.688	0.259
5100.000	0.836	233.528	5098.873	-47.382	-48.742	-47.382	67.976	225.810	0.071
5200.000	0.888	245.597	5198.862	-48.136	-50.034	-48.136	69.429	226.108	0.188
5300.000	0.705	237.118	5298.852	-48.790	-51.256	-48.790	70.765	226.412	0.217
5400.000	0.927	254.305	5398.842	-49.343	-52.552	-49.343	72.086	226.804	0.328
5500.000	0.412	292.494	5498.836	-49.424	-53.664	-49.424	72.956	227.355	0.655
5600.000	0.599	253.401	5598.832	-49.436	-54.497	-49.436	73.578	227.788	0.381
5700.000	0.091	68.406	5698.830	-49.556	-54.923	-49.556	73.975	227.941	0.689
5800.000	0.150	90.771	5798.830	-49.528	-54.719	-49.528	73.805	227.850	0.074

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	0.037	41.563	5898.830	-49.506	-54.567	-49.506	73.677	227.784	0.129
6000.000	0.628	162.996	5998.828	-50.005	-54.385	-50.005	73.880	227.402	0.648
6100.000	0.219	92.338	6098.826	-50.537	-54.034	-50.537	73.984	226.915	0.592
6200.000	0.323	137.699	6198.825	-50.753	-53.653	-50.753	73.855	226.591	0.230
6300.000	0.170	147.996	6298.824	-51.088	-53.385	-51.088	73.891	226.259	0.159
6400.000	0.391	74.857	6398.823	-51.125	-52.977	-51.125	73.623	226.019	0.378
6450.000	0.414	80.239	6448.821	-51.050	-52.635	-51.050	73.325	225.876	0.089