



COMPANY/RIG: Noble Energy/Production/CoreTech
WELL: Gurtler H24-21
DECLINATION: 8.33
TD AS DRILLED: 7236
COUNTY/STATE: Weld/Colorado
Latitude: 40.210, Longitude: -104.612
GRID North is 0.570 Degrees East of True North
VS-Azi: 0.000 Degrees



DEPTH REFERENCE : RKB = GL Elevation = 4820

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run.ut

Minimum Curvature Method

Report Date/Time: 10/2/2014 / 15:58

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS

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	0.142	95.105	100.000	-0.011	0.124	-0.011	0.124	95.105	0.142
200.000	0.390	321.837	199.999	0.245	0.037	0.245	0.248	8.635	0.498
300.000	0.343	114.911	299.998	0.386	0.099	0.386	0.399	14.353	0.713
400.000	0.402	227.744	399.997	0.025	0.111	0.025	0.114	77.547	0.622
500.000	0.239	321.298	499.996	-0.048	-0.279	-0.048	0.283	260.163	0.480
600.000	0.434	198.737	599.995	-0.244	-0.531	-0.244	0.584	245.287	0.598
700.000	0.885	277.466	699.990	-0.503	-1.418	-0.503	1.504	250.476	0.906
800.000	0.952	309.449	799.978	0.126	-2.825	0.126	2.828	272.544	0.510
900.000	0.697	263.723	899.968	0.587	-4.071	0.587	4.113	278.205	0.683
1000.000	1.113	288.209	999.956	0.824	-5.599	0.824	5.659	278.374	0.560
1100.000	0.712	299.844	1099.943	1.437	-7.060	1.437	7.205	281.503	0.441
1200.000	0.758	286.858	1199.935	1.938	-8.232	1.938	8.457	283.245	0.173
1300.000	0.720	294.211	1299.927	2.387	-9.438	2.387	9.735	284.193	0.102
1400.000	0.690	296.187	1399.919	2.910	-10.551	2.910	10.945	285.421	0.038
1500.000	0.748	286.499	1499.911	3.362	-11.718	3.362	12.191	286.007	0.135
1600.000	0.690	286.030	1599.903	3.713	-12.923	3.713	13.446	286.032	0.059
1700.000	0.650	282.647	1699.897	4.004	-14.055	4.004	14.614	285.901	0.056
1800.000	0.652	246.106	1799.891	3.898	-15.129	3.898	15.623	284.446	0.408
1900.000	1.187	201.463	1899.878	2.703	-16.028	2.703	16.255	279.573	0.856

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	1.754	189.825	1999.845	0.232	-16.669	0.232	16.670	270.796	0.639
2100.000	2.676	179.838	2099.770	-3.611	-16.923	-3.611	17.304	257.955	0.996
2200.000	3.010	170.382	2199.647	-8.535	-16.478	-8.535	18.557	242.618	0.575
2300.000	2.385	157.341	2299.537	-13.044	-15.237	-13.044	20.058	229.435	0.872
2400.000	1.889	163.283	2399.467	-16.543	-13.961	-16.543	21.647	220.162	0.543
2500.000	1.648	148.777	2499.420	-19.351	-12.742	-19.351	23.170	213.363	0.507
2600.000	1.489	116.082	2599.384	-21.152	-10.830	-21.152	23.763	207.112	0.896
2700.000	0.828	125.958	2699.363	-22.148	-9.078	-22.148	23.936	202.287	0.688
2800.000	0.796	87.790	2799.354	-22.545	-7.799	-22.545	23.856	199.081	0.532
2900.000	0.960	91.194	2899.342	-22.536	-6.267	-22.536	23.391	195.542	0.171
3000.000	0.325	59.618	2999.336	-22.410	-5.185	-22.410	23.002	193.028	0.703
3100.000	0.329	94.578	3099.334	-22.289	-4.655	-22.289	22.770	191.795	0.196
3200.000	0.251	105.356	3199.333	-22.370	-4.157	-22.370	22.753	190.527	0.094
3300.000	0.715	139.134	3299.329	-22.900	-3.537	-22.900	23.171	188.781	0.525
3400.000	1.234	141.270	3399.314	-24.211	-2.456	-24.211	24.335	185.792	0.520
3500.000	0.857	111.071	3499.298	-25.320	-1.084	-25.320	25.343	182.452	0.655
3600.000	1.134	67.391	3599.285	-25.208	0.527	-25.208	25.214	178.801	0.784
3700.000	1.947	62.220	3699.248	-24.036	2.944	-24.036	24.216	173.017	0.824
3800.000	2.614	75.584	3799.169	-22.677	6.656	-22.677	23.633	163.642	0.849
3900.000	2.895	60.347	3899.054	-20.860	11.059	-20.860	23.610	152.069	0.781
4000.000	2.770	67.979	3998.932	-18.704	15.493	-18.704	24.288	140.365	0.397
4100.000	2.698	56.395	4098.819	-16.496	19.693	-16.496	25.689	129.952	0.556
4200.000	2.740	64.586	4198.707	-14.168	23.812	-14.168	27.708	120.753	0.391
4300.000	3.452	59.041	4298.561	-11.594	28.552	-11.594	30.816	112.100	0.771
4400.000	3.344	58.595	4398.385	-8.525	33.623	-8.525	34.687	104.228	0.111
4500.000	3.541	65.256	4498.205	-5.713	38.917	-5.713	39.334	98.351	0.445
4600.000	3.343	57.699	4598.025	-2.862	44.186	-2.862	44.278	93.706	0.495
4700.000	3.306	55.361	4697.857	0.334	49.022	0.334	49.023	89.609	0.140
4800.000	3.331	65.869	4797.690	3.161	54.046	3.161	54.138	86.653	0.608
4900.000	3.374	71.936	4897.519	5.261	59.495	5.261	59.727	84.946	0.357
5000.000	2.754	68.742	4997.376	7.045	64.531	7.045	64.915	83.770	0.642
5100.000	2.869	62.041	5097.256	9.089	68.981	9.089	69.577	82.494	0.348
5200.000	1.942	64.338	5197.167	10.997	72.719	10.997	73.546	81.401	0.932
5300.000	1.286	59.553	5297.126	12.299	75.214	12.299	76.213	80.713	0.670
5400.000	1.348	60.887	5397.100	13.440	77.209	13.440	78.370	80.125	0.070
5500.000	1.272	63.514	5497.074	14.507	79.230	14.507	80.547	79.624	0.097
5600.000	1.831	79.158	5597.037	15.303	81.792	15.303	83.211	79.403	0.697
5700.000	1.264	49.225	5697.002	16.323	84.197	16.323	85.764	79.028	0.969
5800.000	1.506	17.586	5796.974	18.297	85.429	18.297	87.366	77.911	0.790
5900.000	1.756	0.153	5896.934	21.081	85.830	21.081	88.381	76.200	0.552

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6000.000	1.828	4.695	5996.885	24.203	85.965	24.203	89.307	74.276	0.159
6100.000	1.672	2.803	6096.839	27.250	86.167	27.250	90.373	72.451	0.166
6200.000	2.032	3.633	6196.786	30.476	86.350	30.476	91.571	70.560	0.361
6300.000	2.375	359.920	6296.712	34.318	86.460	34.318	93.021	68.351	0.371
6400.000	2.448	353.385	6396.624	38.511	86.211	38.511	94.422	65.929	0.285
6500.000	2.618	347.495	6496.526	42.863	85.470	42.863	95.616	63.367	0.310
6600.000	2.417	341.173	6596.430	47.088	84.295	47.088	96.556	60.812	0.342
6700.000	2.794	332.499	6696.327	51.246	82.489	51.246	97.111	58.150	0.545
6800.000	3.240	331.355	6796.188	55.888	80.009	55.888	97.596	55.065	0.450
6900.000	3.219	342.517	6896.030	61.046	77.811	61.046	98.900	51.884	0.628
7000.000	4.027	348.324	6995.830	67.163	76.257	67.163	101.616	48.628	0.887