



COMPANY/RIG: Noble Energy/Production/CoreTech
WELL/API: Loloff B 35-22/05-123-24425
DECLINATION: 8.17 Degrees
TD AS DRILLED: 6900 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.35643, Longitude: -104.51193
Grid North = True North -0.64 degs (NAD 27)
Grid Correction Applied = -0.64 degs



DEPTH REFERENCE : RKB = GL Elevation = 4605

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 6/28/2016 / 12:15

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / Loloff B 35-22

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	0.964	282.072	99.995	0.176	-0.823	0.176	0.842	282.072	0.964
200.000	0.559	280.241	199.986	0.439	-2.126	0.439	2.171	281.661	0.406
300.000	0.633	262.619	299.981	0.454	-3.154	0.454	3.186	278.200	0.197
400.000	0.700	268.064	399.974	0.363	-4.312	0.363	4.327	274.811	0.092
500.000	0.212	296.465	499.971	0.425	-5.087	0.425	5.105	274.771	0.523
600.000	0.151	277.519	599.970	0.524	-5.383	0.524	5.409	275.561	0.084
700.000	0.142	223.866	699.970	0.452	-5.600	0.452	5.618	274.619	0.133
800.000	0.154	230.189	799.970	0.277	-5.789	0.277	5.795	272.744	0.020
900.000	0.132	228.211	899.969	0.115	-5.977	0.115	5.979	271.102	0.023
1000.000	0.096	257.253	999.969	0.020	-6.145	0.020	6.145	270.185	0.067
1100.000	0.270	261.499	1099.969	-0.033	-6.460	-0.033	6.460	269.703	0.175
1200.000	0.134	274.024	1199.968	-0.060	-6.809	-0.060	6.810	269.494	0.143
1300.000	0.195	294.739	1299.968	0.019	-7.081	0.019	7.081	270.157	0.085
1400.000	0.229	282.363	1399.967	0.133	-7.430	0.133	7.432	271.029	0.056
1500.000	0.263	320.268	1499.966	0.352	-7.772	0.352	7.780	272.596	0.163
1600.000	0.163	353.645	1599.965	0.670	-7.934	0.670	7.962	274.825	0.155
1700.000	0.319	354.501	1699.964	1.088	-7.976	1.088	8.050	277.764	0.156
1800.000	0.465	349.788	1799.962	1.763	-8.075	1.763	8.265	282.319	0.150

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	0.265	19.012	1899.960	2.382	-8.071	2.382	8.415	286.439	0.267
2000.000	0.373	23.162	1999.959	2.899	-7.868	2.899	8.385	290.229	0.110
2100.000	0.372	11.466	2099.956	3.516	-7.676	3.516	8.443	294.612	0.076
2200.000	0.334	357.861	2199.955	4.125	-7.622	4.125	8.667	298.425	0.091
2300.000	0.412	300.446	2299.953	4.599	-7.943	4.599	9.178	300.072	0.365
2400.000	0.413	301.998	2399.950	4.972	-8.559	4.972	9.898	300.156	0.011
2500.000	0.447	300.820	2499.947	5.363	-9.199	5.363	10.649	300.242	0.036
2600.000	0.433	296.869	2599.944	5.734	-9.872	5.734	11.416	300.150	0.033
2700.000	0.525	314.392	2699.941	6.226	-10.537	6.226	12.238	300.577	0.172
2800.000	0.231	353.388	2799.939	6.747	-10.887	6.747	12.808	301.786	0.375
2900.000	0.238	78.594	2899.938	6.988	-10.707	6.988	12.786	303.132	0.318
3000.000	1.233	140.374	2999.929	6.201	-9.818	6.201	11.612	302.277	1.140
3100.000	2.142	148.612	3099.885	3.777	-8.158	3.777	8.990	294.843	0.939
3200.000	2.817	159.020	3199.792	-0.113	-6.305	-0.113	6.306	268.977	0.809
3300.000	2.990	161.642	3299.663	-4.883	-4.604	-4.883	6.711	223.316	0.218
3400.000	3.221	158.918	3399.516	-9.979	-2.772	-9.979	10.357	195.523	0.273
3500.000	3.188	162.199	3499.360	-15.247	-0.911	-15.247	15.275	183.421	0.186
3600.000	2.933	159.228	3599.217	-20.287	0.846	-20.287	20.304	177.613	0.300
3700.000	2.332	156.444	3699.111	-24.543	2.566	-24.543	24.677	174.031	0.614
3800.000	1.724	162.580	3799.048	-27.844	3.830	-27.844	28.106	172.169	0.644
3900.000	1.507	167.515	3899.009	-30.563	4.564	-30.563	30.902	171.506	0.257
4000.000	1.351	174.385	3998.978	-33.021	4.964	-33.021	33.392	171.451	0.232
4100.000	1.236	187.027	4098.952	-35.264	4.947	-35.264	35.609	172.014	0.307
4200.000	0.992	180.971	4198.933	-37.199	4.801	-37.199	37.508	172.646	0.271
4300.000	0.483	166.677	4298.925	-38.474	4.883	-38.474	38.783	172.766	0.537
4400.000	0.113	157.900	4398.923	-38.976	5.017	-38.976	39.297	172.664	0.372
4500.000	0.740	12.151	4498.921	-38.436	5.190	-38.436	38.785	172.309	0.836
4600.000	1.215	11.467	4598.906	-36.765	5.537	-36.765	37.179	171.435	0.476
4700.000	1.648	17.859	4698.875	-34.356	6.189	-34.356	34.909	169.788	0.461
4800.000	1.639	17.019	4798.834	-31.620	7.049	-31.620	32.396	167.433	0.026
4900.000	1.649	17.139	4898.792	-28.877	7.892	-28.877	29.936	164.715	0.011
5000.000	1.751	17.020	4998.748	-26.041	8.763	-26.041	27.476	161.402	0.102
5100.000	2.216	22.785	5098.688	-22.798	9.959	-22.798	24.878	156.403	0.505
5200.000	2.570	17.079	5198.601	-18.872	11.366	-18.872	22.030	148.941	0.427
5300.000	2.621	9.966	5298.499	-14.477	12.420	-14.477	19.075	139.373	0.326
5400.000	2.648	15.413	5398.393	-9.998	13.430	-9.998	16.743	126.666	0.252
5500.000	2.291	13.927	5498.300	-5.831	14.525	-5.831	15.651	111.872	0.363
5600.000	2.092	14.976	5598.227	-2.128	15.478	-2.128	15.623	97.828	0.203
5700.000	1.854	11.803	5698.168	1.219	16.280	1.219	16.326	85.717	0.261
5800.000	1.704	5.067	5798.119	4.283	16.742	4.283	17.282	75.649	0.258

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	1.378	15.663	5898.083	6.922	17.198	6.922	18.539	68.076	0.431
6000.000	1.506	18.144	5998.052	9.329	17.932	9.329	20.214	62.516	0.142
6100.000	1.491	13.359	6098.018	11.843	18.642	11.843	22.086	57.573	0.126
6200.000	1.505	24.239	6197.984	14.306	19.482	14.306	24.170	53.709	0.284
6300.000	1.428	28.213	6297.951	16.601	20.610	16.601	26.464	51.148	0.128
6400.000	1.387	28.621	6397.921	18.762	21.779	18.762	28.745	49.256	0.042
6500.000	1.495	30.075	6497.889	20.953	23.012	20.953	31.122	47.681	0.114
6600.000	1.792	29.291	6597.848	23.445	24.431	23.445	33.861	46.179	0.297