



COMPANY/RIG: Noble Energy/Production/CoreTech
WELL/API: Guttersen USX D 23-17/05-123-28038
DECLINATION: 8.03 Degrees
TD AS DRILLED: 7099 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.21445, Longitude: -104.51388
Grid North = True North -0.64 degs (NAD 27)
Grid Correction Applied = -0.64 degs



DEPTH REFERENCE : RKB = GL Elevation = 4816

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 9/12/2017 / 14:47

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: JUSTIN WILLIAMS / Guttersen USX D 23-17

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	0.116	168.809	100.000	-0.099	0.020	-0.099	0.101	168.809	0.116
200.000	0.118	146.767	200.000	-0.285	0.096	-0.285	0.301	161.415	0.045
300.000	0.361	240.154	299.999	-0.528	-0.121	-0.528	0.542	192.895	0.386
400.000	0.617	239.561	399.995	-0.958	-0.858	-0.958	1.286	221.872	0.256
500.000	0.511	228.017	499.990	-1.529	-1.654	-1.529	2.252	227.256	0.155
600.000	0.563	227.645	599.986	-2.158	-2.349	-2.158	3.190	227.423	0.052
700.000	0.716	231.521	699.980	-2.878	-3.201	-2.878	4.305	228.042	0.158
800.000	0.895	240.842	799.970	-3.647	-4.372	-3.647	5.694	230.166	0.222
900.000	0.945	243.432	899.957	-4.397	-5.792	-4.397	7.272	232.798	0.065
1000.000	1.001	234.328	999.943	-5.275	-7.239	-5.275	8.957	233.920	0.164
1100.000	1.088	242.870	1099.926	-6.217	-8.794	-6.217	10.770	234.739	0.178
1200.000	1.200	220.128	1199.907	-7.451	-10.313	-7.451	12.723	234.154	0.464
1300.000	1.181	212.584	1299.885	-9.120	-11.543	-9.120	14.711	231.689	0.158
1400.000	1.298	225.257	1399.862	-10.785	-12.902	-10.785	16.816	230.107	0.297
1500.000	1.236	239.907	1499.838	-12.123	-14.639	-12.123	19.007	230.372	0.329
1600.000	1.303	241.459	1599.813	-13.207	-16.571	-13.207	21.190	231.446	0.075

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
1700.000	0.862	244.448	1699.795	-14.074	-18.248	-14.074	23.045	232.358	0.444
1800.000	0.987	248.237	1799.782	-14.718	-19.726	-14.718	24.612	233.274	0.139
1900.000	0.775	278.165	1899.771	-14.941	-21.196	-14.941	25.932	234.820	0.499
2000.000	1.229	301.638	1999.756	-14.282	-22.778	-14.282	26.886	237.912	0.603
2100.000	1.579	316.860	2099.726	-12.714	-24.634	-12.714	27.721	242.700	0.509
2200.000	1.477	297.755	2199.691	-11.109	-26.716	-11.109	28.934	247.422	0.517
2300.000	1.833	297.192	2299.649	-9.778	-29.279	-9.778	30.869	251.533	0.357
2400.000	1.594	306.437	2399.604	-8.221	-31.821	-8.221	32.865	255.514	0.365
2500.000	1.321	306.211	2499.572	-6.714	-33.869	-6.714	34.529	258.788	0.273
2600.000	0.622	339.505	2599.558	-5.524	-34.990	-5.524	35.423	261.028	0.871
2700.000	0.717	54.676	2699.552	-4.654	-34.669	-4.654	34.980	262.354	0.820
2800.000	0.943	94.597	2799.543	-4.359	-33.338	-4.359	33.622	262.552	0.605
2900.000	0.426	135.556	2899.536	-4.690	-32.257	-4.690	32.596	261.728	0.681
3000.000	0.816	197.292	2999.531	-5.635	-32.208	-5.635	32.698	260.076	0.720
3100.000	1.541	217.198	3099.509	-7.386	-33.233	-7.386	34.044	257.469	0.823
3200.000	2.187	232.091	3199.456	-9.630	-35.551	-9.630	36.833	254.844	0.802
3300.000	2.629	239.297	3299.368	-11.973	-39.029	-11.973	40.824	252.945	0.535
3400.000	1.829	242.857	3399.292	-13.872	-42.421	-13.872	44.631	251.892	0.812
3500.000	1.595	221.849	3499.248	-15.637	-44.769	-15.637	47.422	250.747	0.665
3600.000	1.651	214.243	3599.208	-17.864	-46.509	-17.864	49.822	248.988	0.222
3700.000	1.546	228.618	3699.169	-19.947	-48.331	-19.947	52.286	247.573	0.413
3800.000	1.588	209.143	3799.133	-22.049	-50.018	-22.049	54.663	246.211	0.532
3900.000	1.506	193.109	3899.097	-24.539	-50.991	-24.539	56.589	244.301	0.439
4000.000	1.224	194.015	3999.068	-26.856	-51.548	-26.856	58.124	242.481	0.282
4100.000	1.078	201.481	4099.048	-28.768	-52.151	-28.768	59.560	241.118	0.209
4200.000	0.518	213.371	4199.038	-30.021	-52.744	-30.021	60.690	240.352	0.582
4300.000	0.632	254.712	4299.033	-30.544	-53.525	-30.544	61.627	240.289	0.420
4400.000	0.697	265.452	4399.027	-30.737	-54.663	-30.737	62.713	240.651	0.140
4500.000	0.603	242.582	4499.020	-31.028	-55.737	-31.028	63.791	240.896	0.274
4600.000	0.631	216.244	4599.015	-31.714	-56.529	-31.714	64.818	240.707	0.282
4700.000	0.778	212.901	4699.007	-32.728	-57.223	-32.728	65.921	240.233	0.153
4800.000	0.711	232.865	4798.999	-33.672	-58.086	-33.672	67.140	239.900	0.266
4900.000	1.587	256.857	4898.978	-34.361	-59.929	-34.361	69.081	240.171	0.981
5000.000	1.459	284.002	4998.944	-34.368	-62.513	-34.368	71.338	241.199	0.725
5100.000	0.867	281.286	5098.923	-33.912	-64.490	-33.912	72.863	242.262	0.594
5200.000	0.552	282.213	5198.915	-33.662	-65.703	-33.662	73.824	242.872	0.316
5300.000	0.506	298.876	5298.911	-33.347	-66.561	-33.347	74.447	243.389	0.160
5400.000	0.577	319.220	5398.907	-32.752	-67.276	-32.752	74.825	244.042	0.203
5500.000	0.261	121.411	5498.906	-32.490	-67.410	-32.490	74.832	244.267	0.829

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
5600.000	0.154	59.260	5598.905	-32.540	-67.100	-32.540	74.574	244.129	0.233
5700.000	0.275	341.495	5698.904	-32.244	-67.060	-32.244	74.409	244.321	0.285
5800.000	0.520	345.106	5798.902	-31.578	-67.253	-31.578	74.298	244.848	0.246
5900.000	0.304	352.165	5898.899	-30.877	-67.406	-30.877	74.141	245.388	0.222
6000.000	0.187	333.458	5998.898	-30.469	-67.515	-30.469	74.071	245.711	0.140
6100.000	0.201	32.693	6098.898	-30.176	-67.493	-30.176	73.931	245.911	0.192
6200.000	0.788	57.068	6198.894	-29.655	-66.821	-29.655	73.106	246.069	0.611
6300.000	1.493	65.603	6298.873	-28.743	-65.058	-28.743	71.124	246.164	0.723
6400.000	2.276	56.781	6398.819	-27.117	-62.210	-27.117	67.863	246.448	0.833
6500.000	1.918	61.061	6498.752	-25.220	-59.085	-25.220	64.242	246.885	0.390
6600.000	1.401	85.110	6598.711	-24.306	-56.402	-24.306	61.417	246.687	0.857
6700.000	1.169	99.357	6698.686	-24.367	-54.178	-24.367	59.406	245.784	0.393
6800.000	0.740	108.439	6798.672	-24.737	-52.560	-24.737	58.090	244.796	0.453
6850.000	0.512	133.612	6848.669	-24.994	-52.092	-24.994	57.777	244.368	0.704