

COMPANY/RIG: Noble Energy/Production/CoreTech

WELL/API: Brunner 14-1/05-123-14826

DECLINATION:

TD AS DRILLED: 7008

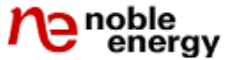
COUNTY/STATE: Weld/Colorado

VS-Azi: 0.000 Degrees

Latitude: 40.48430, Longitude: -104.52342

Grid Convergence Applied = -0.63 degs (NAD 27)

Grid North = True North -0.63 degs



DEPTH REFERENCE : RKB = GL Elevation = 4716

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyrosurvey.ut

Minimum Curvature Method

Report Date/Time: 6/8/2015 / 15:08

LAT &amp; 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	0.440	132.225	99.999	-0.258	0.284	-0.258	0.384	132.225	0.440
200.000	0.334	153.193	199.997	-0.777	0.700	-0.777	1.046	137.957	0.175
300.000	0.329	151.123	299.995	-1.289	0.971	-1.289	1.613	143.010	0.013
400.000	0.500	153.309	399.992	-1.930	1.305	-1.930	2.330	145.925	0.172
500.000	0.502	154.256	499.989	-2.714	1.691	-2.714	3.197	148.066	0.008
600.000	0.424	160.418	599.985	-3.456	2.005	-3.456	3.996	149.878	0.092
700.000	0.555	158.911	699.982	-4.256	2.303	-4.256	4.840	151.579	0.131
800.000	0.455	162.212	799.978	-5.086	2.599	-5.086	5.712	152.934	0.104
900.000	0.477	176.985	899.975	-5.879	2.742	-5.879	6.487	154.996	0.122
1000.000	0.553	183.697	999.970	-6.776	2.733	-6.776	7.307	158.037	0.097
1100.000	0.607	179.517	1099.965	-7.788	2.706	-7.788	8.244	160.838	0.068
1200.000	0.499	196.095	1199.961	-8.736	2.590	-8.736	9.112	163.488	0.192
1300.000	0.487	199.654	1299.957	-9.555	2.326	-9.555	9.834	166.317	0.033
1400.000	0.445	221.025	1399.954	-10.247	1.929	-10.247	10.427	169.342	0.178
1500.000	0.522	225.643	1499.950	-10.859	1.348	-10.859	10.942	172.923	0.087
1600.000	0.420	205.572	1599.947	-11.508	0.864	-11.508	11.540	175.705	0.193
1700.000	0.398	209.941	1699.944	-12.139	0.533	-12.139	12.151	177.488	0.038
1800.000	0.711	227.395	1799.940	-12.860	-0.097	-12.860	12.861	180.434	0.352

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	0.613	239.642	1899.933	-13.550	-1.015	-13.550	13.588	184.286	0.171
2000.000	0.629	275.040	1999.928	-13.773	-2.023	-13.773	13.920	188.358	0.378
2100.000	0.622	290.621	2099.922	-13.533	-3.078	-13.533	13.879	192.814	0.170
2200.000	0.713	297.260	2199.915	-13.057	-4.139	-13.057	13.697	197.589	0.119
2300.000	0.779	321.986	2299.907	-12.236	-5.111	-12.236	13.261	202.669	0.326
2400.000	0.822	337.287	2399.897	-11.039	-5.807	-11.039	12.473	207.744	0.217
2500.000	0.792	337.386	2499.887	-9.739	-6.349	-9.739	11.626	213.100	0.030
2600.000	0.715	353.136	2599.879	-8.482	-6.690	-8.482	10.803	218.261	0.220
2700.000	0.683	355.646	2699.871	-7.269	-6.809	-7.269	9.960	223.130	0.044
2800.000	0.687	351.840	2799.864	-6.081	-6.940	-6.081	9.227	228.772	0.046
2900.000	0.642	0.883	2899.857	-4.928	-7.016	-4.928	8.574	234.918	0.114
3000.000	0.590	6.397	2999.851	-3.855	-6.950	-3.855	7.948	240.981	0.079
3100.000	0.491	14.823	3099.847	-2.929	-6.783	-2.929	7.388	246.643	0.127
3200.000	0.465	20.983	3199.844	-2.136	-6.528	-2.136	6.869	251.881	0.058
3300.000	0.613	13.631	3299.839	-1.238	-6.257	-1.238	6.378	258.811	0.163
3400.000	0.686	3.800	3399.833	-0.120	-6.091	-0.120	6.092	268.869	0.133
3500.000	0.774	8.246	3499.825	1.146	-5.955	1.146	6.064	280.891	0.104
3600.000	1.014	11.823	3599.812	2.680	-5.676	2.680	6.277	295.276	0.247
3700.000	1.186	24.471	3699.794	4.489	-5.066	4.489	6.769	311.542	0.297
3800.000	1.550	35.385	3799.766	6.534	-3.854	6.534	7.586	329.464	0.446
3900.000	1.453	34.201	3899.731	8.685	-2.358	8.685	8.999	344.808	0.102
4000.000	1.730	40.687	3999.693	10.878	-0.662	10.878	10.898	356.518	0.330
4100.000	2.059	40.828	4099.638	13.382	1.497	13.382	13.465	6.382	0.330
4200.000	2.408	41.918	4199.562	16.304	4.074	16.304	16.805	14.031	0.351
4300.000	2.551	47.814	4299.468	19.362	7.127	19.362	20.632	20.208	0.293
4400.000	2.615	55.185	4399.367	22.159	10.649	22.159	24.585	25.668	0.338
4500.000	2.380	61.867	4499.272	24.441	14.354	24.441	28.344	30.425	0.374
4600.000	1.729	70.671	4599.207	25.919	17.609	25.919	31.335	34.191	0.722
4700.000	1.451	85.843	4699.169	26.510	20.295	26.510	33.387	37.436	0.502
4800.000	0.871	78.537	4799.148	26.753	22.303	26.753	34.830	39.816	0.598
4900.000	0.223	23.023	4899.144	27.083	23.124	27.083	35.612	40.491	0.767
5000.000	0.457	1.016	4999.142	27.661	23.207	27.661	36.107	39.996	0.264
5100.000	0.999	17.921	5099.134	28.889	23.482	28.889	37.229	39.105	0.577
5200.000	0.242	12.553	5199.127	29.924	23.796	29.924	38.232	38.492	0.758
5300.000	0.513	193.636	5299.126	29.695	23.736	29.695	38.016	38.637	0.755
5400.000	0.440	189.803	5399.122	28.881	23.565	28.881	37.275	39.212	0.080
5500.000	1.145	144.978	5499.113	27.684	24.074	27.684	36.687	41.009	0.889
5600.000	0.502	106.686	5599.103	26.740	25.067	26.740	36.652	43.151	0.813
5700.000	0.308	94.950	5699.100	26.591	25.755	26.591	37.019	44.085	0.210
5800.000	0.480	273.233	5799.099	26.591	25.604	26.591	36.914	43.917	0.788

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	0.199	220.283	5899.098	26.483	25.074	26.483	36.469	43.435	0.394
6000.000	0.110	336.217	5999.097	26.438	24.923	26.438	36.333	43.310	0.266
6100.000	0.221	59.637	6099.097	26.623	25.051	26.623	36.556	43.257	0.236
6200.000	0.420	21.840	6199.096	27.061	25.354	27.061	37.083	43.134	0.280
6300.000	0.692	19.478	6299.091	27.971	25.692	27.971	37.979	42.568	0.273
6400.000	0.783	20.700	6399.083	29.179	26.135	29.179	39.172	41.849	0.092
6500.000	0.990	15.074	6499.071	30.653	26.601	30.653	40.586	40.952	0.225
6600.000	1.156	7.004	6599.053	32.489	26.949	32.489	42.211	39.675	0.224
6700.000	1.652	11.241	6699.023	34.904	27.353	34.904	44.345	38.084	0.506
6800.000	2.064	20.218	6798.970	38.007	28.256	38.007	47.360	36.629	0.503