



Company/Rig: Noble Energy/ CoreTech  
WELL/API#: Cervi 11-35/05-123-21032  
DECLINATION: 8.11 Degrees  
TD AS DRILLED: 7297 Feet  
COUNTY/STATE: Weld/Colorado  
VS-Azi: 0.000 Degrees  
Latitude: 40.27429, Longitude: -104.41039  
Grid North = True North -0.70 degs (NAD 27)  
Grid Correction Applied = -0.70 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4750 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

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

Minimum Curvature Method

Report Date/Time: 7/19/2016 / 13:47

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Cervi 11-35

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	0.305	334.683	100.000	0.241	-0.114	0.241	0.266	334.683	0.305
200.000	0.377	294.987	199.998	0.621	-0.526	0.621	0.814	319.701	0.242
300.000	0.365	333.168	299.996	1.044	-0.969	1.044	1.424	317.143	0.243
400.000	0.089	33.620	399.995	1.393	-1.070	1.393	1.756	322.483	0.330
500.000	0.068	320.339	499.995	1.503	-1.064	1.503	1.842	324.700	0.095
600.000	0.701	315.850	599.992	1.988	-1.528	1.988	2.507	322.447	0.633
700.000	0.572	325.506	699.986	2.838	-2.237	2.838	3.613	321.755	0.167
800.000	0.764	317.709	799.979	3.742	-2.968	3.742	4.776	321.583	0.212
900.000	0.835	304.650	899.970	4.649	-4.015	4.649	6.143	319.183	0.195
1000.000	0.805	319.696	999.960	5.599	-5.069	5.599	7.553	317.844	0.217
1100.000	1.006	307.158	1099.947	6.665	-6.223	6.665	9.119	316.964	0.281
1200.000	0.980	314.317	1199.932	7.793	-7.535	7.793	10.840	315.964	0.127
1300.000	1.204	310.283	1299.914	9.070	-8.949	9.070	12.742	315.386	0.237
1400.000	1.463	304.817	1399.887	10.479	-10.799	10.479	15.047	314.138	0.288
1500.000	1.295	307.655	1499.858	11.898	-12.741	11.898	17.433	313.039	0.182
1600.000	1.104	304.976	1599.836	13.140	-14.425	13.140	19.513	312.331	0.199
1700.000	0.818	316.413	1699.822	14.209	-15.706	14.209	21.180	312.135	0.343
1800.000	0.976	315.065	1799.809	15.329	-16.800	15.329	22.743	312.379	0.160

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	0.693	286.972	1899.799	16.109	-17.980	16.109	24.141	311.858	0.490
2000.000	0.949	272.928	1999.789	16.328	-19.385	16.328	25.345	310.106	0.324
2100.000	0.743	285.094	2099.778	16.539	-20.838	16.539	26.604	308.438	0.272
2200.000	0.650	275.865	2199.771	16.766	-22.028	16.766	27.683	307.274	0.146
2300.000	0.878	237.563	2299.762	16.412	-23.239	16.412	28.451	305.231	0.546
2400.000	1.071	214.849	2399.748	15.234	-24.420	15.234	28.782	301.958	0.428
2500.000	0.896	213.718	2499.733	13.817	-25.388	13.817	28.905	298.556	0.176
2600.000	0.863	189.923	2599.722	12.424	-25.953	12.424	28.773	295.582	0.364
2700.000	0.470	166.494	2699.715	11.283	-25.986	11.283	28.330	293.470	0.470
2800.000	0.482	165.655	2799.712	10.477	-25.786	10.477	27.833	292.111	0.013
2900.000	0.158	313.754	2899.711	10.165	-25.782	10.165	27.713	291.517	0.621
3000.000	0.876	292.476	2999.706	10.552	-26.587	10.552	28.605	291.647	0.731
3100.000	1.436	295.908	3099.685	11.392	-28.421	11.392	30.619	291.842	0.565
3200.000	1.963	310.669	3199.641	13.056	-30.847	13.056	33.496	292.940	0.681
3300.000	2.296	297.416	3299.573	15.094	-33.925	15.094	37.131	293.986	0.592
3400.000	2.180	289.208	3399.497	16.643	-37.500	16.643	41.027	293.932	0.341
3500.000	2.478	278.685	3499.415	17.595	-41.433	17.595	45.014	293.009	0.520
3600.000	2.558	276.196	3599.318	18.162	-45.788	18.162	49.258	291.636	0.136
3700.000	2.593	272.803	3699.217	18.514	-50.266	18.514	53.567	290.220	0.156
3800.000	2.381	269.239	3799.123	18.597	-54.602	18.597	57.682	288.808	0.262
3900.000	2.160	268.504	3899.044	18.520	-58.563	18.520	61.421	287.549	0.223
4000.000	2.104	270.031	3998.975	18.472	-62.282	18.472	64.963	286.520	0.080
4100.000	1.844	282.245	4098.916	18.814	-65.689	18.814	68.330	285.982	0.493
4200.000	1.107	286.938	4198.882	19.437	-68.186	19.437	70.902	285.910	0.747
4300.000	0.963	290.801	4298.866	20.016	-69.895	20.016	72.705	285.981	0.159
4400.000	0.649	262.127	4398.856	20.237	-71.242	20.237	74.061	285.858	0.502
4500.000	0.648	208.740	4498.851	19.664	-72.075	19.664	74.709	285.260	0.583
4600.000	1.349	182.553	4598.835	17.992	-72.399	17.992	74.602	283.956	0.819
4700.000	2.010	169.081	4698.792	15.094	-72.120	15.094	73.682	281.821	0.766
4800.000	1.816	178.911	4798.737	11.787	-71.757	11.787	72.719	279.328	0.381
4900.000	1.766	181.745	4898.688	8.663	-71.774	8.663	72.295	276.882	0.102
5000.000	1.439	175.774	4998.649	5.871	-71.728	5.871	71.968	274.679	0.367
5100.000	0.885	210.048	5098.629	3.950	-72.023	3.950	72.131	273.139	0.865
5200.000	0.794	247.728	5198.619	3.019	-73.050	3.019	73.113	272.367	0.549
5300.000	0.812	274.044	5298.609	2.807	-74.399	2.807	74.452	272.160	0.366
5400.000	0.779	261.976	5398.600	2.762	-75.779	2.762	75.830	272.087	0.171
5500.000	0.323	247.777	5498.595	2.560	-76.714	2.560	76.757	271.911	0.472
5600.000	0.255	60.598	5598.595	2.563	-76.781	2.563	76.824	271.912	0.578
5700.000	0.280	81.622	5698.594	2.708	-76.345	2.708	76.393	272.031	0.101
5800.000	0.468	139.432	5798.592	2.433	-75.837	2.433	75.876	271.837	0.397

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	0.509	122.278	5898.588	1.885	-75.196	1.885	75.220	271.436	0.151
6000.000	0.129	332.456	5998.587	1.748	-74.872	1.748	74.893	271.337	0.625
6100.000	0.371	103.594	6098.586	1.772	-74.610	1.772	74.631	271.361	0.466
6200.000	0.494	109.872	6198.583	1.550	-73.890	1.550	73.906	271.201	0.132
6300.000	0.359	78.132	6298.581	1.467	-73.178	1.467	73.192	271.149	0.267
6400.000	0.583	37.419	6398.578	1.936	-72.562	1.936	72.587	271.528	0.389
6450.000	0.988	23.131	6448.573	2.534	-72.238	2.534	72.282	272.009	0.894