



Company/Rig: Noble Energy/ CoreTech
WELL/API#: Sian E 27-5/05-123-23631
DECLINATION: 8.33 Degrees
TD AS DRILLED: 7190 Feet
COUNTY/STATE: Weld/Colorado
VS-Azi: 0.000 Degrees
Latitude: 40.45837, Longitude: -104.65582
Grid North = True North -0.55 degs (NAD 27)
Grid Convergence Applied = -0.55 degs



DEPTH REFERENCE : RKB=GL/ ELEVATION= 4693 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 10/13/2015 / 09:53

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Surveyor: Sean Bratt / Sian E 27-5

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	0.813	100.332	99.997	-0.127	0.698	-0.127	0.710	100.332	0.813
200.000	0.377	125.428	199.991	-0.445	1.664	-0.445	1.722	104.975	0.498
300.000	0.489	115.542	299.988	-0.820	2.317	-0.820	2.457	109.482	0.134
400.000	0.425	100.776	399.985	-1.073	3.066	-1.073	3.248	109.286	0.133
500.000	0.227	15.295	499.984	-0.951	3.483	-0.951	3.610	105.278	0.466
600.000	0.368	225.097	599.983	-0.987	3.308	-0.987	3.452	106.612	0.575
700.000	0.267	198.099	699.982	-1.435	3.008	-1.435	3.333	115.502	0.177
800.000	0.432	220.004	799.980	-1.945	2.693	-1.945	3.322	125.841	0.209
900.000	0.421	221.371	899.977	-2.510	2.208	-2.510	3.343	138.665	0.015
1000.000	0.050	290.391	999.976	-2.771	1.924	-2.771	3.374	145.221	0.406
1100.000	0.381	231.527	1099.975	-2.963	1.624	-2.963	3.378	151.276	0.358
1200.000	0.154	244.934	1199.974	-3.226	1.242	-3.226	3.457	158.946	0.234
1300.000	0.043	84.218	1299.974	-3.279	1.157	-3.279	3.478	160.560	0.195
1400.000	0.067	66.935	1399.974	-3.253	1.248	-3.253	3.484	159.008	0.029
1500.000	0.150	80.849	1499.974	-3.209	1.431	-3.209	3.514	155.971	0.087
1600.000	0.088	147.938	1599.974	-3.253	1.600	-3.253	3.625	153.805	0.141
1700.000	0.112	44.156	1699.974	-3.248	1.709	-3.248	3.670	152.244	0.158
1800.000	0.175	141.689	1799.974	-3.297	1.872	-3.297	3.792	150.416	0.220

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	0.228	171.559	1899.973	-3.614	1.996	-3.614	4.128	151.090	0.116
2000.000	0.225	195.012	1999.972	-4.000	1.974	-4.000	4.460	153.732	0.092
2100.000	0.281	275.833	2099.971	-4.164	1.680	-4.164	4.490	158.033	0.330
2200.000	0.660	296.744	2199.968	-3.880	0.922	-3.880	3.988	166.638	0.410
2300.000	0.639	293.506	2299.962	-3.399	-0.104	-3.399	3.400	181.757	0.042
2400.000	0.452	297.821	2399.957	-2.992	-0.965	-2.992	3.144	197.870	0.191
2500.000	0.218	186.633	2499.956	-2.997	-1.335	-2.997	3.281	204.021	0.568
2600.000	0.244	145.174	2599.955	-3.360	-1.236	-3.360	3.580	200.189	0.165
2700.000	0.141	259.554	2699.955	-3.558	-1.235	-3.558	3.766	199.141	0.329
2800.000	0.256	113.508	2799.955	-3.669	-1.151	-3.669	3.845	197.416	0.381
2900.000	0.500	115.697	2899.952	-3.947	-0.553	-3.947	3.986	187.969	0.245
3000.000	0.710	142.957	2999.947	-4.631	0.214	-4.631	4.636	177.352	0.350
3100.000	0.147	117.336	3099.944	-5.185	0.701	-5.185	5.232	172.299	0.581
3200.000	0.242	274.337	3199.943	-5.227	0.604	-5.227	5.262	173.408	0.381
3300.000	0.750	279.205	3299.939	-5.107	-0.253	-5.107	5.113	182.836	0.510
3400.000	1.273	285.733	3399.923	-4.701	-1.968	-4.701	5.096	202.720	0.534
3500.000	1.625	293.219	3499.891	-3.841	-4.340	-3.841	5.796	228.495	0.399
3600.000	2.560	297.567	3599.824	-2.248	-7.623	-2.248	7.948	253.569	0.948
3700.000	2.891	298.851	3699.710	0.002	-11.811	0.002	11.811	270.010	0.336
3800.000	2.879	301.620	3799.584	2.535	-16.158	2.535	16.356	278.917	0.140
3900.000	2.759	299.951	3899.463	5.053	-20.381	5.053	20.998	283.925	0.145
4000.000	2.659	304.438	3999.351	7.567	-24.379	7.567	25.527	287.243	0.234
4100.000	1.826	309.011	4099.274	9.881	-27.530	9.881	29.250	289.744	0.852
4200.000	1.553	311.999	4199.230	11.790	-29.775	11.790	32.025	291.603	0.286
4300.000	1.889	314.151	4299.185	13.845	-31.964	13.845	34.834	293.419	0.342
4400.000	1.812	317.362	4399.133	16.156	-34.218	16.156	37.840	295.274	0.129
4500.000	2.130	314.595	4499.074	18.624	-36.612	18.624	41.077	296.962	0.332
4600.000	2.314	318.567	4598.998	21.442	-39.271	21.442	44.744	298.635	0.239
4700.000	2.492	320.153	4698.911	24.625	-42.000	24.625	48.687	300.383	0.190
4800.000	2.661	322.311	4798.809	28.130	-44.812	28.130	52.910	302.118	0.195
4900.000	2.475	318.806	4898.709	31.592	-47.653	31.592	57.174	303.543	0.243
5000.000	2.353	304.474	4998.621	34.379	-50.768	34.379	61.313	304.105	0.614
5100.000	1.703	300.776	5098.558	36.301	-53.737	36.301	64.849	304.040	0.663
5200.000	1.434	292.671	5198.521	37.544	-56.169	37.544	67.561	303.759	0.348
5300.000	1.242	262.342	5298.495	37.882	-58.397	37.882	69.608	302.971	0.724
5400.000	0.951	223.689	5398.477	37.137	-60.044	37.137	70.601	301.737	0.776
5500.000	0.368	143.089	5498.472	36.281	-60.424	36.281	70.479	300.982	0.962
5600.000	1.151	89.660	5598.463	36.030	-59.227	36.030	69.325	301.314	0.977
5700.000	1.185	83.269	5698.442	36.157	-57.196	36.157	67.666	302.300	0.135
5800.000	1.196	83.995	5798.421	36.387	-55.130	36.387	66.056	303.426	0.018

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	1.189	89.271	5898.399	36.510	-53.055	36.510	64.403	304.534	0.110
6000.000	1.133	95.480	5998.379	36.429	-51.033	36.429	62.701	305.520	0.137
6100.000	1.042	97.079	6098.361	36.222	-49.146	36.222	61.052	306.391	0.096
6200.000	0.942	96.710	6198.346	36.014	-47.427	36.014	59.551	307.211	0.101
6300.000	0.969	94.137	6298.332	35.857	-45.768	35.857	58.141	308.077	0.051
6400.000	0.817	89.082	6398.320	35.807	-44.211	35.807	56.893	309.005	0.171
6500.000	0.801	140.218	6498.311	35.281	-43.050	35.281	55.661	309.336	0.699
6600.000	1.227	138.529	6598.295	33.941	-41.894	33.941	53.918	309.014	0.427
6700.000	1.232	165.810	6698.273	32.096	-40.921	32.096	52.007	308.109	0.580
6800.000	1.489	151.507	6798.245	29.912	-40.038	29.912	49.977	306.763	0.424
6900.000	1.088	140.447	6898.219	28.038	-38.813	28.038	47.881	305.844	0.470
6950.000	1.210	119.370	6948.210	27.413	-38.050	27.413	46.897	305.770	0.874