



Company/ Rig: Noble Energy/ CoreTech
 Well/API#: TYE USX A15-04D/05-123-33913
 Declination: 8.22 Degrees
 TD as Drilled: 7600 Feet
 County/State: Weld/Colorado
 VS-Azi: 0.000 Degrees
 Latitude: 40.48957, Longitude: -104.53683
 Grid North = True North -0.62 degs (NAD 27)
 Grid Correction Applied = -0.62 degs



Depth Reference : RKB= GL/ Elevation= 4797 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut
 Minimum Curvature Method
 Report Date/Time: 3/28/2016 / 13:31

Lat & Long Obtained by Handheld GPS at Wellhead

North Reference: Grid
 Henderson, Colorado
 303-853-4976

Surveyor: Sean Bratt / TYE USX A15-04D

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	0.279	160.128	100.000	-0.229	0.083	-0.229	0.243	160.128	0.279
200.000	0.304	257.937	199.999	-0.513	-0.094	-0.513	0.522	190.402	0.440
300.000	0.822	285.204	299.994	-0.381	-1.046	-0.381	1.114	250.003	0.569
400.000	0.631	310.243	399.986	0.163	-2.159	0.163	2.165	274.320	0.366
500.000	0.665	313.534	499.980	0.919	-3.000	0.919	3.138	287.026	0.051
600.000	0.576	345.688	599.974	1.805	-3.545	1.805	3.979	296.986	0.354
700.000	0.620	355.964	699.969	2.832	-3.708	2.832	4.666	307.373	0.116
800.000	1.146	336.260	799.957	4.288	-4.149	4.288	5.966	315.945	0.600
900.000	1.376	332.206	899.932	6.266	-5.111	6.266	8.086	320.795	0.247
1000.000	1.981	322.635	999.889	8.702	-6.720	8.702	10.994	322.322	0.664
1100.000	3.483	296.479	1099.776	11.430	-10.488	11.430	15.512	317.460	1.916
1200.000	4.667	285.656	1199.523	13.882	-17.124	13.882	22.044	309.030	1.406
1300.000	7.098	286.635	1298.989	16.749	-26.963	16.749	31.742	301.848	2.434
1400.000	10.029	286.540	1397.863	20.997	-41.233	20.997	46.271	296.987	2.930
1500.000	12.299	286.304	1495.965	26.467	-59.805	26.467	65.400	293.872	2.271
1600.000	14.530	285.744	1593.230	32.861	-82.104	32.861	88.436	291.813	2.235
1700.000	16.044	286.483	1689.689	40.187	-107.431	40.187	114.701	290.509	1.526
1800.000	16.653	286.643	1785.645	48.211	-134.411	48.211	142.796	289.732	0.611

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	16.740	287.708	1881.429	56.696	-161.860	56.696	171.502	289.304	0.318
2000.000	18.390	292.941	1976.769	67.226	-190.110	67.226	201.646	289.475	2.283
2100.000	20.125	293.067	2071.170	80.116	-220.466	80.116	234.572	289.971	1.735
2200.000	22.180	288.338	2164.435	92.798	-254.217	92.798	270.625	290.054	2.670
2300.000	24.459	288.313	2256.260	105.243	-291.793	105.243	310.193	289.833	2.280
2400.000	25.808	289.399	2346.790	118.978	-331.981	118.978	352.658	289.717	1.425
2500.000	27.513	288.523	2436.155	133.547	-374.417	133.547	397.521	289.630	1.750
2600.000	29.281	287.597	2524.120	148.279	-419.632	148.279	445.059	289.461	1.822
2700.000	31.657	289.838	2610.307	164.580	-467.636	164.580	495.752	289.389	2.633
2800.000	31.990	293.439	2695.282	184.024	-516.627	184.024	548.424	289.606	1.927
2900.000	32.268	291.642	2779.970	204.405	-565.743	204.405	601.537	289.865	0.995
3000.000	32.775	291.254	2864.289	224.062	-615.781	224.062	655.279	289.995	0.548
3100.000	35.096	292.825	2947.252	245.029	-667.511	245.029	711.063	290.157	2.481
3200.000	34.971	293.149	3029.133	267.446	-720.358	267.446	768.403	290.368	0.224
3300.000	34.844	290.723	3111.145	288.822	-773.431	288.822	825.599	290.477	1.394
3400.000	35.734	290.494	3192.769	309.154	-827.504	309.154	883.367	290.486	0.899
3500.000	32.869	289.436	3275.370	328.411	-880.458	328.411	939.712	290.456	2.926
3600.000	30.329	289.518	3360.537	345.879	-929.853	345.879	992.098	290.404	2.541
3700.000	30.108	289.263	3446.948	362.589	-977.327	362.589	1042.420	290.355	0.256
3800.000	29.360	290.262	3533.782	379.354	-1024.00	379.354	1092.013	290.328	0.897
3900.000	29.462	294.485	3620.903	398.038	-1069.39	398.038	1141.062	290.416	2.076
4000.000	28.772	297.982	3708.271	419.525	-1113.02	419.525	1189.464	290.653	1.835
4100.000	30.692	296.966	3795.103	442.392	-1157.03	442.392	1238.719	290.924	1.984
4200.000	32.457	295.852	3880.297	465.667	-1203.93	465.667	1290.847	291.146	1.860
4300.000	34.659	296.594	3963.624	490.101	-1253.51	490.101	1345.912	291.355	2.240
4400.000	35.460	295.668	4045.479	515.396	-1305.08	515.396	1403.162	291.550	0.961
4500.000	33.906	294.684	4127.709	539.609	-1356.57	539.609	1459.952	291.691	1.652
4600.000	31.746	295.533	4211.737	562.599	-1405.66	562.599	1514.064	291.813	2.208
4700.000	30.058	296.770	4297.539	585.221	-1451.76	585.221	1565.276	291.955	1.803
4800.000	27.638	295.462	4385.123	606.475	-1495.07	606.475	1613.394	292.080	2.501
4900.000	24.442	297.233	4474.962	625.919	-1534.42	625.919	1657.168	292.192	3.289
5000.000	22.291	295.775	4566.756	643.635	-1569.89	643.635	1696.712	292.293	2.227
5100.000	20.819	295.654	4659.760	659.576	-1602.99	659.576	1733.386	292.365	1.473
5200.000	18.932	297.031	4753.800	674.644	-1633.46	674.644	1767.301	292.441	1.944
5300.000	17.130	298.675	4848.886	689.084	-1660.84	689.084	1798.116	292.534	1.872
5400.000	15.118	301.148	4944.948	702.897	-1684.92	702.897	1825.658	292.644	2.126
5500.000	13.476	299.305	5041.848	715.346	-1706.24	715.346	1850.133	292.746	1.703
5600.000	13.463	298.799	5139.098	726.657	-1726.61	726.657	1873.286	292.824	0.119
5700.000	8.801	290.382	5237.196	734.935	-1743.99	734.935	1892.519	292.851	4.925
5800.000	6.150	281.645	5336.340	738.681	-1756.41	738.681	1905.420	292.810	2.877

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	6.096	269.604	5435.774	739.726	-1766.97	739.726	1915.558	292.716	1.283
6000.000	7.270	265.839	5535.093	739.230	-1778.59	739.230	1926.092	292.569	1.252
6100.000	7.758	254.162	5634.240	736.929	-1791.39	736.929	1937.045	292.361	1.600
6200.000	6.881	255.354	5733.424	733.572	-1803.68	733.572	1947.149	292.132	0.890
6300.000	5.702	266.280	5832.824	731.735	-1814.43	731.735	1956.427	291.964	1.675
6400.000	4.544	268.980	5932.423	731.342	-1823.35	731.342	1964.554	291.856	1.183
6500.000	2.403	269.585	6032.233	731.256	-1829.41	731.256	1970.145	291.788	2.141
6600.000	0.920	281.776	6132.189	731.405	-1832.29	731.405	1972.878	291.761	1.516
6700.000	0.523	337.373	6232.181	731.991	-1833.25	731.991	1973.988	291.766	0.759
6800.000	0.333	263.406	6332.179	732.379	-1833.72	732.379	1974.563	291.772	0.537
6900.000	0.464	50.624	6432.178	732.602	-1833.69	732.602	1974.624	291.778	0.766
7000.000	0.315	273.345	6532.177	732.875	-1833.66	732.875	1974.689	291.786	0.728
7100.000	0.307	73.980	6632.177	732.965	-1833.67	732.965	1974.739	291.788	0.613
7200.000	0.053	319.028	6732.176	733.074	-1833.45	733.074	1974.568	291.793	0.332
7300.000	0.416	79.679	6832.175	733.174	-1833.12	733.174	1974.302	291.799	0.445