

Company/Rig: Noble Energy/ CoreTech
WELL/API#: Wells Ranch USX AA 23-16/05-123-25802
DECLINATION: 8.19 Degrees
TD AS DRILLED: 6954 Feet
COUNTY/STATE: Weld/Colorado
Latitude: 40.466, Longitude: -104.397
GRID North is 0.710 Degrees East of True North
VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

DEPTH REFERENCE : RKB=GL/ ELEVATION= 4819 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run02-01-de_01_mrg.ut

Minimum Curvature Method

Report Date/Time: 1/30/2015 / 13:58

LAT & LONG OBTAINED BY HANDHELD GPS AT WELLHEAD

NORTH REFERENCE: GRID

HENDERSON, COLORADO

303-853-4976

Sean Bratt

| 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 | 0.141 | 76.726 | 100.000 | 0.028 | 0.119 | 0.028 | 0.123 | 76.726 | 0.141 |
| 200.000 | 0.161 | 216.704 | 200.000 | -0.056 | 0.155 | -0.056 | 0.165 | 110.038 | 0.284 |
| 300.000 | 0.224 | 246.180 | 299.999 | -0.248 | -0.108 | -0.248 | 0.271 | 203.533 | 0.115 |
| 400.000 | 0.283 | 243.047 | 399.998 | -0.439 | -0.507 | -0.439 | 0.671 | 229.115 | 0.061 |
| 500.000 | 0.217 | 233.480 | 499.997 | -0.664 | -0.880 | -0.664 | 1.102 | 232.962 | 0.078 |
| 600.000 | 0.657 | 254.067 | 599.994 | -0.934 | -1.584 | -0.934 | 1.839 | 239.465 | 0.460 |
| 700.000 | 0.846 | 273.441 | 699.986 | -1.047 | -2.872 | -1.047 | 3.057 | 249.966 | 0.314 |
| 800.000 | 0.910 | 267.716 | 799.974 | -1.035 | -4.402 | -1.035 | 4.522 | 256.774 | 0.108 |
| 900.000 | 0.960 | 261.744 | 899.961 | -1.187 | -6.024 | -1.187 | 6.140 | 258.858 | 0.109 |
| 1000.000 | 0.974 | 252.125 | 999.946 | -1.568 | -7.662 | -1.568 | 7.821 | 258.437 | 0.163 |
| 1100.000 | 0.868 | 268.010 | 1099.934 | -1.855 | -9.229 | -1.855 | 9.413 | 258.635 | 0.275 |
| 1200.000 | 0.842 | 273.745 | 1199.923 | -1.833 | -10.720 | -1.833 | 10.875 | 260.295 | 0.090 |
| 1300.000 | 0.849 | 271.963 | 1299.912 | -1.760 | -12.193 | -1.760 | 12.320 | 261.787 | 0.027 |
| 1400.000 | 0.829 | 265.501 | 1399.901 | -1.791 | -13.655 | -1.791 | 13.772 | 262.527 | 0.097 |
| 1500.000 | 0.648 | 265.861 | 1499.893 | -1.889 | -14.940 | -1.889 | 15.059 | 262.794 | 0.181 |
| 1600.000 | 0.651 | 272.346 | 1599.886 | -1.906 | -16.072 | -1.906 | 16.184 | 263.235 | 0.074 |
| 1700.000 | 0.626 | 269.217 | 1699.880 | -1.891 | -17.185 | -1.891 | 17.289 | 263.722 | 0.043 |
| 1800.000 | 0.632 | 258.224 | 1799.874 | -2.011 | -18.271 | -2.011 | 18.381 | 263.720 | 0.121 |
| 1900.000 | 0.637 | 274.271 | 1899.868 | -2.082 | -19.365 | -2.082 | 19.477 | 263.864 | 0.177 |
| 2000.000 | 0.967 | 264.726 | 1999.858 | -2.118 | -20.760 | -2.118 | 20.867 | 264.175 | 0.355 |
| 2100.000 | 1.079 | 278.183 | 2099.842 | -2.062 | -22.532 | -2.062 | 22.626 | 264.772 | 0.264 |
| 2200.000 | 1.028 | 272.025 | 2199.825 | -1.896 | -24.360 | -1.896 | 24.434 | 265.550 | 0.124 |
| 2300.000 | 1.215 | 277.357 | 2299.806 | -1.728 | -26.308 | -1.728 | 26.365 | 266.241 | 0.214 |
| 2400.000 | 1.148 | 277.634 | 2399.785 | -1.459 | -28.353 | -1.459 | 28.390 | 267.053 | 0.067 |
| 2500.000 | 0.959 | 261.564 | 2499.768 | -1.449 | -30.174 | -1.449 | 30.209 | 267.251 | 0.349 |
| 2600.000 | 0.562 | 265.274 | 2599.759 | -1.612 | -31.490 | -1.612 | 31.532 | 267.069 | 0.399 |
| 2700.000 | 0.442 | 232.990 | 2699.756 | -1.885 | -32.288 | -1.885 | 32.343 | 266.659 | 0.302 |
| 2800.000 | 0.403 | 199.031 | 2799.753 | -2.450 | -32.711 | -2.450 | 32.803 | 265.716 | 0.250 |
| 2900.000 | 0.484 | 202.014 | 2899.750 | -3.175 | -32.984 | -3.175 | 33.137 | 264.502 | 0.084 |
| 3000.000 | 0.416 | 233.682 | 2999.747 | -3.781 | -33.435 | -3.781 | 33.648 | 263.548 | 0.254 |
| 3100.000 | 0.898 | 151.332 | 3099.742 | -4.683 | -33.351 | -4.683 | 33.679 | 262.007 | 0.938 |
| 3200.000 | 0.821 | 119.703 | 3199.731 | -5.726 | -32.353 | -5.726 | 32.856 | 259.964 | 0.474 |
| 3300.000 | 1.114 | 106.284 | 3299.717 | -6.354 | -30.797 | -6.354 | 31.446 | 258.343 | 0.368 |
| 3400.000 | 1.152 | 57.881 | 3399.700 | -6.092 | -29.013 | -6.092 | 29.646 | 258.142 | 0.929 |

| 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 |
|--|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 3500.000 | 1.880 | 32.349 | 3499.665 | -4.171 | -27.284 | -4.171 | 27.601 | 261.308 | 0.977 |
| 3600.000 | 2.546 | 15.519 | 3599.591 | -0.645 | -25.811 | -0.645 | 25.819 | 268.569 | 0.924 |
| 3700.000 | 2.665 | 8.000 | 3699.488 | 3.798 | -24.894 | 3.798 | 25.182 | 278.674 | 0.362 |
| 3800.000 | 2.933 | 17.034 | 3799.369 | 8.546 | -23.820 | 8.546 | 25.307 | 289.737 | 0.515 |
| 3900.000 | 2.876 | 6.020 | 3899.241 | 13.487 | -22.808 | 13.487 | 26.497 | 300.597 | 0.560 |
| 4000.000 | 2.631 | 353.989 | 3999.126 | 18.265 | -22.785 | 18.265 | 29.202 | 308.716 | 0.626 |
| 4050.000 | 2.281 | 349.914 | 4049.080 | 20.386 | -23.080 | 20.386 | 30.794 | 311.454 | 0.782 |
| 4100.000 | 1.772 | 326.576 | 4099.050 | 22.011 | -23.680 | 22.011 | 32.330 | 312.908 | 1.919 |
| 4200.000 | 1.371 | 292.873 | 4199.014 | 23.766 | -25.633 | 23.766 | 34.955 | 312.835 | 0.988 |
| 4300.000 | 1.857 | 263.768 | 4298.976 | 24.055 | -28.346 | 24.055 | 37.177 | 310.319 | 0.937 |
| 4400.000 | 2.696 | 249.949 | 4398.897 | 23.073 | -32.165 | 23.073 | 39.585 | 305.652 | 0.997 |
| 4500.000 | 2.142 | 231.730 | 4498.809 | 21.109 | -35.842 | 21.109 | 41.596 | 300.496 | 0.941 |
| 4600.000 | 1.172 | 238.397 | 4598.766 | 19.416 | -38.180 | 19.416 | 42.833 | 296.955 | 0.987 |
| 4700.000 | 1.442 | 226.531 | 4698.740 | 18.014 | -39.964 | 18.014 | 43.837 | 294.264 | 0.380 |
| 4800.000 | 0.954 | 239.694 | 4798.718 | 16.729 | -41.596 | 16.729 | 44.834 | 291.909 | 0.557 |
| 4900.000 | 0.882 | 236.923 | 4898.705 | 15.889 | -42.959 | 15.889 | 45.803 | 290.298 | 0.085 |
| 5000.000 | 0.753 | 209.279 | 4998.695 | 14.896 | -43.925 | 14.896 | 46.382 | 288.734 | 0.410 |
| 5100.000 | 0.809 | 162.839 | 5098.687 | 13.649 | -44.037 | 13.649 | 46.104 | 287.220 | 0.618 |
| 5200.000 | 0.961 | 165.872 | 5198.675 | 12.161 | -43.625 | 12.161 | 45.288 | 285.577 | 0.159 |
| 5300.000 | 2.272 | 140.721 | 5298.634 | 9.814 | -42.165 | 9.814 | 43.292 | 283.102 | 1.460 |
| 5400.000 | 3.031 | 129.786 | 5398.527 | 6.588 | -38.879 | 6.588 | 39.433 | 279.617 | 0.909 |
| 5500.000 | 2.496 | 126.426 | 5498.410 | 3.603 | -35.095 | 3.603 | 35.280 | 275.862 | 0.559 |
| 5600.000 | 1.993 | 107.372 | 5598.335 | 1.792 | -31.684 | 1.792 | 31.735 | 273.236 | 0.893 |
| 5700.000 | 1.895 | 111.038 | 5698.277 | 0.679 | -28.481 | 0.679 | 28.490 | 271.365 | 0.158 |
| 5800.000 | 1.458 | 89.275 | 5798.235 | 0.101 | -25.666 | 0.101 | 25.666 | 270.226 | 0.765 |
| 5900.000 | 1.201 | 59.856 | 5898.209 | 0.643 | -23.488 | 0.643 | 23.497 | 271.569 | 0.719 |
| 6000.000 | 0.849 | 62.086 | 5998.193 | 1.516 | -21.928 | 1.516 | 21.980 | 273.955 | 0.354 |
| 6100.000 | 0.434 | 150.659 | 6098.188 | 1.533 | -21.088 | 1.533 | 21.144 | 274.158 | 0.943 |
| 6200.000 | 1.139 | 208.458 | 6198.180 | 0.329 | -21.376 | 0.329 | 21.379 | 270.883 | 0.979 |
| 6300.000 | 3.484 | 213.538 | 6298.091 | -3.078 | -23.529 | -3.078 | 23.729 | 262.548 | 2.352 |
| 6400.000 | 3.519 | 205.324 | 6397.905 | -8.385 | -26.520 | -8.385 | 27.814 | 252.455 | 0.502 |
| 6500.000 | 3.513 | 205.959 | 6497.717 | -13.913 | -29.174 | -13.913 | 32.322 | 244.503 | 0.040 |
| 6600.000 | 2.876 | 196.424 | 6597.562 | -19.074 | -31.225 | -19.074 | 36.590 | 238.580 | 0.827 |
| 6700.000 | 2.504 | 194.520 | 6697.451 | -23.596 | -32.482 | -23.596 | 40.148 | 234.004 | 0.383 |
| HORIZONTAL DISPLACEMENT IS 40.148 FEET AT 234.004 DEGREES | | | | | | | | | |