

Company: Anadarko Petroleum Corp.

Well/API: PSC #15-10/05-123-21625

Tool Type: North Seeking Rate Gyro

Rig Name: Production / Coretech

County/State: Weld/Colorado

Latitude: 40.234, Longitude: -104.875

GRID North is 0.000 Degrees West of True North

VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = GL Elevation = 4791 Feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: msgyro_run01-01-de_01.ut

Minimum Curvature Method

Report Date/Time: 11/6/2014 / 13:58

Lat/Long Obtained By Handheld GPS At Wellhead

Handheld GPS Reference: NAD83/Device Error: +/- 9 Feet

VES Survey International - Henderson, CO

Kevin McDowell

303-853-4976

| 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 | 0.123 | 27.525 | 100.000 | 0.095 | 0.050 | 0.095 | 0.107 | 27.525 | 0.123 |
| 200.000 | 0.020 | 196.608 | 200.000 | 0.173 | 0.094 | 0.173 | 0.197 | 28.501 | 0.143 |
| 300.000 | 0.060 | 237.740 | 300.000 | 0.128 | 0.045 | 0.128 | 0.136 | 19.207 | 0.047 |
| 400.000 | 0.276 | 286.178 | 399.999 | 0.167 | -0.231 | 0.167 | 0.285 | 305.972 | 0.240 |
| 500.000 | 0.270 | 213.369 | 499.999 | 0.038 | -0.592 | 0.038 | 0.593 | 273.646 | 0.324 |
| 600.000 | 0.331 | 204.135 | 599.997 | -0.422 | -0.839 | -0.422 | 0.939 | 243.280 | 0.077 |
| 700.000 | 0.341 | 202.183 | 699.995 | -0.961 | -1.069 | -0.961 | 1.438 | 228.057 | 0.015 |
| 800.000 | 0.301 | 206.099 | 799.994 | -1.472 | -1.297 | -1.472 | 1.962 | 221.385 | 0.045 |
| 900.000 | 0.520 | 194.745 | 899.991 | -2.147 | -1.528 | -2.147 | 2.635 | 215.445 | 0.233 |
| 1000.000 | 0.760 | 201.557 | 999.985 | -3.202 | -1.887 | -3.202 | 3.717 | 210.513 | 0.251 |
| 1100.000 | 0.819 | 212.425 | 1099.976 | -4.422 | -2.514 | -4.422 | 5.087 | 209.619 | 0.160 |
| 1200.000 | 0.823 | 224.414 | 1199.965 | -5.538 | -3.400 | -5.538 | 6.498 | 211.545 | 0.172 |
| 1300.000 | 0.797 | 228.577 | 1299.955 | -6.512 | -4.424 | -6.512 | 7.873 | 214.194 | 0.064 |
| 1400.000 | 0.574 | 269.894 | 1399.949 | -6.973 | -5.447 | -6.973 | 8.848 | 217.996 | 0.527 |
| 1500.000 | 1.029 | 272.849 | 1499.939 | -6.929 | -6.845 | -6.929 | 9.740 | 224.652 | 0.457 |
| 1600.000 | 1.219 | 286.146 | 1599.919 | -6.589 | -8.764 | -6.589 | 10.965 | 233.066 | 0.321 |
| 1700.000 | 1.239 | 278.479 | 1699.897 | -6.133 | -10.855 | -6.133 | 12.468 | 240.533 | 0.166 |
| 1800.000 | 1.191 | 293.562 | 1799.874 | -5.559 | -12.877 | -5.559 | 14.025 | 246.651 | 0.322 |
| 1900.000 | 0.528 | 292.443 | 1899.863 | -4.967 | -14.255 | -4.967 | 15.096 | 250.789 | 0.663 |
| 2000.000 | 0.359 | 225.498 | 1999.860 | -5.011 | -14.905 | -5.011 | 15.725 | 251.416 | 0.509 |
| 2100.000 | 0.441 | 200.672 | 2099.858 | -5.591 | -15.264 | -5.591 | 16.256 | 249.882 | 0.190 |
| 2200.000 | 0.651 | 142.748 | 2199.854 | -6.404 | -15.056 | -6.404 | 16.362 | 246.960 | 0.560 |
| 2300.000 | 0.680 | 133.732 | 2299.847 | -7.266 | -14.284 | -7.266 | 16.026 | 243.039 | 0.109 |
| 2400.000 | 0.635 | 175.495 | 2399.841 | -8.229 | -13.811 | -8.229 | 16.077 | 239.214 | 0.471 |
| 2500.000 | 0.607 | 201.258 | 2499.835 | -9.275 | -13.960 | -9.275 | 16.760 | 236.401 | 0.278 |
| 2600.000 | 0.672 | 191.137 | 2599.829 | -10.343 | -14.265 | -10.343 | 17.620 | 234.055 | 0.130 |
| 2700.000 | 1.025 | 220.081 | 2699.818 | -11.603 | -14.954 | -11.603 | 18.928 | 232.193 | 0.545 |
| 2800.000 | 1.092 | 232.755 | 2799.802 | -12.864 | -16.289 | -12.864 | 20.756 | 231.700 | 0.243 |
| 2900.000 | 1.351 | 241.012 | 2899.779 | -14.012 | -18.079 | -14.012 | 22.873 | 232.222 | 0.312 |
| 3000.000 | 1.495 | 246.118 | 2999.748 | -15.111 | -20.302 | -15.111 | 25.309 | 233.339 | 0.192 |
| 3100.000 | 1.856 | 247.090 | 3099.705 | -16.270 | -22.986 | -16.270 | 28.161 | 234.709 | 0.362 |
| 3200.000 | 2.587 | 237.349 | 3199.630 | -18.117 | -26.377 | -18.117 | 32.000 | 235.517 | 0.820 |
| 3300.000 | 2.570 | 243.825 | 3299.529 | -20.324 | -30.290 | -20.324 | 36.476 | 236.139 | 0.292 |
| 3400.000 | 2.540 | 245.928 | 3399.429 | -22.217 | -34.325 | -22.217 | 40.888 | 237.087 | 0.098 |

| 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 | 2.652 | 258.062 | 3499.327 | -23.599 | -38.612 | -23.599 | 45.253 | 238.567 | 0.560 |
| 3600.000 | 2.577 | 263.876 | 3599.223 | -24.318 | -43.110 | -24.318 | 49.496 | 240.574 | 0.275 |
| 3700.000 | 2.392 | 266.746 | 3699.129 | -24.676 | -47.429 | -24.676 | 53.464 | 242.513 | 0.223 |
| 3800.000 | 2.342 | 266.078 | 3799.044 | -24.934 | -51.550 | -24.934 | 57.264 | 244.188 | 0.057 |
| 3900.000 | 1.756 | 264.734 | 3898.980 | -25.214 | -55.114 | -25.214 | 60.608 | 245.416 | 0.588 |
| 4000.000 | 0.907 | 272.743 | 3998.952 | -25.317 | -57.430 | -25.317 | 62.763 | 246.211 | 0.866 |
| 4100.000 | 1.060 | 277.905 | 4098.937 | -25.152 | -59.138 | -25.152 | 64.264 | 246.959 | 0.177 |
| 4200.000 | 0.670 | 263.687 | 4198.926 | -25.089 | -60.635 | -25.089 | 65.621 | 247.522 | 0.443 |
| 4300.000 | 0.617 | 282.129 | 4298.919 | -25.040 | -61.743 | -25.040 | 66.627 | 247.925 | 0.213 |
| 4400.000 | 0.569 | 240.647 | 4398.915 | -25.170 | -62.702 | -25.170 | 67.566 | 248.128 | 0.422 |
| 4500.000 | 0.783 | 232.731 | 4498.908 | -25.827 | -63.678 | -25.827 | 68.716 | 247.923 | 0.233 |
| 4600.000 | 0.917 | 263.116 | 4598.897 | -26.336 | -65.016 | -26.336 | 70.147 | 247.948 | 0.464 |
| 4700.000 | 0.923 | 237.225 | 4698.885 | -26.868 | -66.487 | -26.868 | 71.711 | 247.996 | 0.412 |
| 4800.000 | 0.746 | 253.867 | 4798.874 | -27.485 | -67.790 | -27.485 | 73.150 | 247.930 | 0.298 |
| 4900.000 | 1.343 | 246.213 | 4898.857 | -28.139 | -69.488 | -28.139 | 74.969 | 247.955 | 0.611 |
| 5000.000 | 1.032 | 256.449 | 4998.836 | -28.822 | -71.435 | -28.822 | 77.030 | 248.027 | 0.375 |
| 5100.000 | 1.017 | 247.063 | 5098.820 | -29.379 | -73.127 | -29.379 | 78.808 | 248.112 | 0.168 |
| 5200.000 | 0.668 | 249.433 | 5198.809 | -29.929 | -74.490 | -29.929 | 80.278 | 248.110 | 0.350 |
| 5300.000 | 0.514 | 222.158 | 5298.804 | -30.467 | -75.337 | -30.467 | 81.265 | 247.981 | 0.316 |
| 5400.000 | 0.471 | 123.923 | 5398.801 | -31.029 | -75.298 | -31.029 | 81.440 | 247.604 | 0.745 |
| 5500.000 | 1.187 | 97.174 | 5498.790 | -31.387 | -73.929 | -31.387 | 80.316 | 246.996 | 0.796 |
| 5600.000 | 0.911 | 82.833 | 5598.774 | -31.418 | -72.112 | -31.418 | 78.659 | 246.458 | 0.379 |
| 5700.000 | 0.773 | 49.774 | 5698.764 | -30.882 | -70.808 | -30.882 | 77.250 | 246.436 | 0.497 |
| 5800.000 | 0.437 | 357.789 | 5798.758 | -30.065 | -70.307 | -30.065 | 76.466 | 246.847 | 0.611 |
| 5900.000 | 0.685 | 2.177 | 5898.754 | -29.087 | -70.299 | -29.087 | 76.079 | 247.522 | 0.251 |
| 6000.000 | 0.576 | 5.187 | 5998.748 | -27.989 | -70.231 | -27.989 | 75.603 | 248.271 | 0.113 |
| 6100.000 | 0.764 | 355.090 | 6098.741 | -26.824 | -70.243 | -26.824 | 75.190 | 249.100 | 0.221 |
| 6200.000 | 0.573 | 5.972 | 6198.734 | -25.662 | -70.248 | -25.662 | 74.788 | 249.932 | 0.229 |
| 6300.000 | 0.917 | 8.615 | 6298.725 | -24.374 | -70.076 | -24.374 | 74.194 | 250.821 | 0.345 |
| 6400.000 | 1.191 | 8.499 | 6398.708 | -22.555 | -69.803 | -22.555 | 73.356 | 252.093 | 0.274 |
| 6500.000 | 1.171 | 4.321 | 6498.687 | -20.508 | -69.572 | -20.508 | 72.532 | 253.576 | 0.088 |
| 6600.000 | 1.307 | 6.416 | 6598.664 | -18.356 | -69.368 | -18.356 | 71.755 | 255.178 | 0.143 |
| 6700.000 | 1.745 | 32.542 | 6698.629 | -15.939 | -68.421 | -15.939 | 70.253 | 256.886 | 0.811 |
| 6800.000 | 2.409 | 44.425 | 6798.563 | -13.155 | -66.131 | -13.155 | 67.426 | 258.750 | 0.788 |
| 6900.000 | 3.255 | 54.063 | 6898.441 | -9.987 | -62.361 | -9.987 | 63.155 | 260.901 | 0.968 |
| 6950.000 | 3.085 | 48.575 | 6948.364 | -8.264 | -60.202 | -8.264 | 60.767 | 262.184 | 0.696 |
| HORIZONTAL DISPLACEMENT IS 60.767 FEET AT 262.184 DEGREES | | | | | | | | | |