



Company: Anadarko Petroleum
 Well: UPRC 19-15L
 API: 05-123-17445
 Rig Name: Production/ VES
 State/County: Colorado/Weld
 Latitude: 40.207, Longitude: -104.929
 Directions are relative to True North
 VS-Azi: 0.000 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB= Ground Level

DRILLOG GYRO SURVEY CALCULATIONS

Filename: gyro-de_01.ut
 Minimum Curvature Method
 Report Date/Time: 3/24/2014 / 16:46

Vaughn Energy Services
 Henderson, CO 80640
 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 | 0.090 | 321.836 | 100.000 | 0.062 | -0.049 | 0.062 | 0.079 | 321.836 | 0.090 |
| 200.000 | 0.215 | 61.824 | 200.000 | 0.213 | 0.068 | 0.213 | 0.223 | 17.674 | 0.247 |
| 300.000 | 0.244 | 348.672 | 299.999 | 0.510 | 0.191 | 0.510 | 0.545 | 20.534 | 0.275 |
| 400.000 | 0.261 | 61.120 | 399.998 | 0.830 | 0.349 | 0.830 | 0.900 | 22.801 | 0.299 |
| 500.000 | 0.073 | 57.828 | 499.998 | 0.973 | 0.602 | 0.973 | 1.144 | 31.729 | 0.189 |
| 600.000 | 0.274 | 338.669 | 599.997 | 1.230 | 0.568 | 1.230 | 1.355 | 24.796 | 0.270 |
| 700.000 | 0.195 | 45.175 | 699.997 | 1.573 | 0.602 | 1.573 | 1.684 | 20.934 | 0.266 |
| 800.000 | 0.118 | 258.733 | 799.997 | 1.673 | 0.622 | 1.673 | 1.785 | 20.390 | 0.300 |
| 900.000 | 0.351 | 273.661 | 899.996 | 1.673 | 0.215 | 1.673 | 1.686 | 7.337 | 0.240 |
| 1000.000 | 0.454 | 264.944 | 999.993 | 1.657 | -0.486 | 1.657 | 1.727 | 343.667 | 0.120 |
| 1100.000 | 0.472 | 308.708 | 1099.990 | 1.880 | -1.202 | 1.880 | 2.231 | 327.403 | 0.346 |
| 1200.000 | 0.304 | 271.854 | 1199.988 | 2.146 | -1.788 | 2.146 | 2.793 | 320.193 | 0.292 |
| 1300.000 | 0.452 | 320.761 | 1299.986 | 2.460 | -2.303 | 2.460 | 3.370 | 316.890 | 0.341 |
| 1400.000 | 0.623 | 292.379 | 1399.982 | 2.973 | -3.055 | 2.973 | 4.263 | 314.218 | 0.311 |
| 1500.000 | 0.975 | 316.203 | 1499.972 | 3.794 | -4.146 | 3.794 | 5.620 | 312.457 | 0.477 |
| 1600.000 | 0.684 | 324.523 | 1599.962 | 4.894 | -5.082 | 4.894 | 7.055 | 313.922 | 0.315 |
| 1700.000 | 0.666 | 284.777 | 1699.955 | 5.528 | -5.990 | 5.528 | 8.151 | 312.705 | 0.459 |
| 1800.000 | 0.591 | 316.288 | 1799.950 | 6.050 | -6.908 | 6.050 | 9.183 | 311.208 | 0.349 |
| 1900.000 | 0.607 | 358.372 | 1899.945 | 6.952 | -7.280 | 6.952 | 10.066 | 313.678 | 0.430 |
| 2000.000 | 0.447 | 357.062 | 1999.940 | 7.871 | -7.315 | 7.871 | 10.745 | 317.095 | 0.160 |
| 2100.000 | 0.708 | 349.465 | 2099.935 | 8.868 | -7.448 | 8.868 | 11.581 | 319.973 | 0.272 |
| 2200.000 | 0.502 | 355.038 | 2199.930 | 9.912 | -7.599 | 9.912 | 12.489 | 322.523 | 0.215 |
| 2300.000 | 0.546 | 14.208 | 2299.925 | 10.809 | -7.520 | 10.809 | 13.168 | 325.174 | 0.180 |
| 2400.000 | 0.839 | 316.023 | 2399.919 | 11.798 | -7.912 | 11.798 | 14.205 | 326.154 | 0.720 |
| 2500.000 | 0.868 | 356.261 | 2499.909 | 13.081 | -8.469 | 13.081 | 15.583 | 327.078 | 0.588 |
| 2600.000 | 0.917 | 323.652 | 2599.897 | 14.482 | -8.993 | 14.482 | 17.047 | 328.160 | 0.504 |
| 2700.000 | 0.699 | 348.837 | 2699.888 | 15.725 | -9.586 | 15.725 | 18.416 | 328.634 | 0.412 |
| 2800.000 | 0.573 | 337.773 | 2799.882 | 16.786 | -9.893 | 16.786 | 19.484 | 329.486 | 0.175 |
| 2900.000 | 0.637 | 314.198 | 2899.876 | 17.637 | -10.481 | 17.637 | 20.516 | 329.278 | 0.255 |
| 3000.000 | 0.266 | 275.526 | 2999.873 | 18.046 | -11.110 | 18.046 | 21.192 | 328.382 | 0.461 |
| 3100.000 | 0.516 | 235.752 | 3099.871 | 17.815 | -11.714 | 17.815 | 21.321 | 326.675 | 0.356 |
| 3200.000 | 0.852 | 188.691 | 3199.864 | 16.826 | -12.199 | 16.826 | 20.783 | 324.059 | 0.627 |
| 3300.000 | 1.319 | 194.059 | 3299.846 | 14.975 | -12.591 | 14.975 | 19.564 | 319.943 | 0.478 |
| 3400.000 | 1.574 | 179.694 | 3399.814 | 12.484 | -12.863 | 12.484 | 17.925 | 314.144 | 0.441 |
| 3500.000 | 1.603 | 170.268 | 3499.776 | 9.733 | -12.619 | 9.733 | 15.936 | 307.641 | 0.263 |

| 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 |
|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 3600.000 | 1.429 | 149.658 | 3599.742 | 7.278 | -11.753 | 7.278 | 13.824 | 301.768 | 0.569 |
| 3700.000 | 1.417 | 177.266 | 3699.712 | 4.967 | -11.064 | 4.967 | 12.128 | 294.176 | 0.679 |
| 3800.000 | 1.562 | 171.701 | 3799.678 | 2.383 | -10.808 | 2.383 | 11.068 | 282.435 | 0.205 |
| 3900.000 | 1.302 | 194.482 | 3899.648 | -0.065 | -10.896 | -0.065 | 10.896 | 269.657 | 0.620 |
| 4000.000 | 0.903 | 200.408 | 3999.629 | -1.904 | -11.455 | -1.904 | 11.612 | 260.563 | 0.414 |
| 4100.000 | 0.984 | 256.969 | 4099.618 | -2.836 | -12.566 | -2.836 | 12.882 | 257.282 | 0.897 |
| 4200.000 | 0.786 | 247.234 | 4199.606 | -3.295 | -14.034 | -3.295 | 14.415 | 256.788 | 0.248 |
| 4300.000 | 0.773 | 235.606 | 4299.597 | -3.941 | -15.223 | -3.941 | 15.725 | 255.484 | 0.158 |
| 4400.000 | 1.075 | 271.567 | 4399.584 | -4.297 | -16.717 | -4.297 | 17.261 | 255.585 | 0.639 |
| 4500.000 | 1.087 | 281.564 | 4499.567 | -4.081 | -18.584 | -4.081 | 19.027 | 257.614 | 0.189 |
| 4600.000 | 0.798 | 265.072 | 4599.553 | -3.951 | -20.207 | -3.951 | 20.590 | 258.937 | 0.393 |
| 4700.000 | 0.739 | 254.122 | 4699.544 | -4.187 | -21.521 | -4.187 | 21.925 | 258.990 | 0.158 |
| 4800.000 | 0.556 | 287.954 | 4799.538 | -4.214 | -22.602 | -4.214 | 22.992 | 259.439 | 0.415 |
| 4900.000 | 0.408 | 235.137 | 4899.535 | -4.268 | -23.356 | -4.268 | 23.743 | 259.644 | 0.449 |
| 5000.000 | 0.808 | 290.689 | 4999.530 | -4.223 | -24.308 | -4.223 | 24.672 | 260.145 | 0.668 |
| 5100.000 | 0.419 | 230.681 | 5099.525 | -4.205 | -25.250 | -4.205 | 25.598 | 260.544 | 0.700 |
| 5200.000 | 0.928 | 315.679 | 5199.519 | -3.857 | -26.099 | -3.857 | 26.382 | 261.592 | 0.984 |
| 5300.000 | 0.908 | 319.566 | 5299.507 | -2.675 | -27.178 | -2.675 | 27.310 | 264.379 | 0.065 |
| 5400.000 | 1.535 | 326.636 | 5399.483 | -0.953 | -28.429 | -0.953 | 28.445 | 268.080 | 0.644 |
| 5500.000 | 0.953 | 319.852 | 5499.459 | 0.801 | -29.702 | 0.801 | 29.713 | 271.545 | 0.600 |
| 5600.000 | 1.273 | 330.538 | 5599.441 | 2.404 | -30.784 | 2.404 | 30.878 | 274.465 | 0.380 |
| 5700.000 | 1.670 | 333.544 | 5699.407 | 4.675 | -31.979 | 4.675 | 32.319 | 278.317 | 0.405 |
| 5800.000 | 1.721 | 351.658 | 5799.364 | 7.465 | -32.846 | 7.465 | 33.684 | 282.804 | 0.536 |
| 5900.000 | 2.601 | 354.546 | 5899.292 | 11.209 | -33.280 | 11.209 | 35.117 | 288.614 | 0.887 |
| 6000.000 | 2.945 | 6.858 | 5999.176 | 16.018 | -33.189 | 16.018 | 36.852 | 295.763 | 0.686 |
| 6100.000 | 2.901 | 15.442 | 6099.046 | 21.007 | -32.208 | 21.007 | 38.454 | 303.114 | 0.439 |
| 6200.000 | 2.073 | 3.526 | 6198.952 | 25.252 | -31.423 | 25.252 | 40.312 | 308.786 | 0.972 |
| 6300.000 | 1.198 | 355.163 | 6298.910 | 28.099 | -31.400 | 28.099 | 42.137 | 311.825 | 0.905 |
| 6400.000 | 0.602 | 343.240 | 6398.898 | 29.644 | -31.639 | 29.644 | 43.357 | 313.135 | 0.622 |
| 6500.000 | 0.361 | 241.267 | 6498.895 | 29.995 | -32.067 | 29.995 | 43.909 | 313.088 | 0.763 |
| 6600.000 | 0.738 | 310.918 | 6598.891 | 30.266 | -32.830 | 30.266 | 44.652 | 312.673 | 0.700 |
| 6700.000 | 0.537 | 276.603 | 6698.886 | 30.742 | -33.782 | 30.742 | 45.676 | 312.302 | 0.422 |
| 6800.000 | 0.658 | 295.188 | 6798.880 | 31.040 | -34.768 | 31.040 | 46.608 | 311.758 | 0.227 |
| 6900.000 | 0.653 | 272.562 | 6898.874 | 31.310 | -35.856 | 31.310 | 47.603 | 311.127 | 0.257 |
| 7000.000 | 1.616 | 268.885 | 6998.853 | 31.308 | -37.835 | 31.308 | 49.109 | 309.607 | 0.965 |
| 7100.000 | 1.375 | 241.318 | 7098.820 | 30.705 | -40.297 | 30.705 | 50.662 | 307.306 | 0.750 |

HORIZONTAL DISPLACEMENT IS
50.662 FEET AT 307.306 DEGREES