



Rig Name: Production
 Location/County: Colorado/ Weld
 Latitude: 40.169
 GRID North is 0.000 Degrees West of True North
 VS-Azi: 0.000 Degrees

Depth Reference : RKB = Ground Level

DRILLOG MV GYRO SURVEY CALCULATIONS

Filename: magness red w6-6_ed.ut
 Minimum Curvature Method
 Report Date/Time: 8/6/2012 / 14:31

Vaughn Energy Services
 Henderson, Colorado
 Surveyor: Justin Williams
 303-853-4976

Magness Red W6 6 / API 05-123-16396

| 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 | 1.344 | 260.534 | 99.991 | -0.193 | -1.157 | -0.193 | 1.173 | 260.534 | 1.344 |
| 200.000 | 0.707 | 261.384 | 199.974 | -0.478 | -2.924 | -0.478 | 2.962 | 260.711 | 0.638 |
| 300.000 | 0.601 | 258.525 | 299.968 | -0.675 | -4.047 | -0.675 | 4.103 | 260.533 | 0.110 |
| 400.000 | 0.447 | 240.796 | 399.964 | -0.970 | -4.902 | -0.970 | 4.997 | 258.812 | 0.222 |
| 500.000 | 0.459 | 231.890 | 499.961 | -1.407 | -5.557 | -1.407 | 5.732 | 255.794 | 0.071 |
| 600.000 | 0.498 | 218.911 | 599.957 | -1.992 | -6.145 | -1.992 | 6.459 | 252.040 | 0.115 |
| 700.000 | 0.427 | 228.192 | 699.954 | -2.578 | -6.695 | -2.578 | 7.175 | 248.940 | 0.103 |
| 800.000 | 0.326 | 236.602 | 799.952 | -2.983 | -7.210 | -2.983 | 7.803 | 247.524 | 0.115 |
| 900.000 | 0.355 | 242.768 | 899.950 | -3.281 | -7.723 | -3.281 | 8.391 | 246.981 | 0.046 |
| 1000.000 | 0.442 | 261.140 | 999.948 | -3.482 | -8.379 | -3.482 | 9.074 | 247.433 | 0.154 |
| 1100.000 | 0.588 | 265.220 | 1099.943 | -3.584 | -9.271 | -3.584 | 9.940 | 248.863 | 0.150 |
| 1200.000 | 0.704 | 259.928 | 1199.937 | -3.735 | -10.387 | -3.735 | 11.038 | 250.225 | 0.131 |
| 1300.000 | 0.760 | 257.812 | 1299.929 | -3.982 | -11.640 | -3.982 | 12.303 | 251.115 | 0.062 |
| 1400.000 | 0.747 | 257.746 | 1399.920 | -4.260 | -12.926 | -4.260 | 13.610 | 251.757 | 0.013 |
| 1500.000 | 0.763 | 270.985 | 1499.912 | -4.387 | -14.228 | -4.387 | 14.889 | 252.863 | 0.175 |
| 1600.000 | 0.969 | 283.828 | 1599.900 | -4.174 | -15.715 | -4.174 | 16.260 | 255.126 | 0.282 |
| 1700.000 | 1.167 | 291.839 | 1699.883 | -3.593 | -17.481 | -3.593 | 17.847 | 258.386 | 0.247 |
| 1800.000 | 1.284 | 289.722 | 1799.860 | -2.836 | -19.481 | -2.836 | 19.686 | 261.717 | 0.125 |
| 1900.000 | 1.322 | 288.617 | 1899.834 | -2.090 | -21.629 | -2.090 | 21.729 | 264.481 | 0.046 |
| 2000.000 | 1.385 | 293.432 | 1999.806 | -1.241 | -23.831 | -1.241 | 23.863 | 267.019 | 0.130 |

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|-------------------------|----------------------|---------------------------|-----------|-------------|-------------|---------------------------|---------------------------|-----------------------------|-------------------------------|
| 2100.000 | 1.552 | 292.775 | 2099.773 | -0.236 | -26.188 | -0.236 | 26.189 | 269.483 | 0.167 |
| 2200.000 | 1.700 | 295.006 | 2199.733 | 0.915 | -28.781 | 0.915 | 28.796 | 271.821 | 0.162 |
| 2300.000 | 1.778 | 289.573 | 2299.687 | 2.062 | -31.588 | 2.062 | 31.655 | 273.735 | 0.182 |
| 2400.000 | 1.824 | 287.917 | 2399.638 | 3.072 | -34.564 | 3.072 | 34.700 | 275.078 | 0.069 |
| 2500.000 | 1.719 | 284.632 | 2499.590 | 3.940 | -37.530 | 3.940 | 37.737 | 275.993 | 0.146 |
| 2600.000 | 1.719 | 291.153 | 2599.545 | 4.861 | -40.381 | 4.861 | 40.672 | 276.864 | 0.196 |
| 2700.000 | 1.855 | 289.157 | 2699.496 | 5.933 | -43.308 | 5.933 | 43.713 | 277.800 | 0.149 |
| 2800.000 | 1.892 | 282.957 | 2799.443 | 6.834 | -46.446 | 6.834 | 46.946 | 278.370 | 0.206 |
| 2900.000 | 1.926 | 281.881 | 2899.388 | 7.550 | -49.699 | 7.550 | 50.269 | 278.638 | 0.050 |
| 3000.000 | 1.844 | 285.896 | 2999.333 | 8.337 | -52.891 | 8.337 | 53.544 | 278.957 | 0.155 |
| 3100.000 | 1.874 | 294.699 | 3099.281 | 9.461 | -55.924 | 9.461 | 56.719 | 279.602 | 0.287 |
| 3200.000 | 1.855 | 296.692 | 3199.228 | 10.871 | -58.856 | 10.871 | 59.851 | 280.465 | 0.068 |
| 3300.000 | 1.850 | 305.594 | 3299.176 | 12.538 | -61.614 | 12.538 | 62.877 | 281.502 | 0.288 |
| 3400.000 | 1.692 | 312.382 | 3399.128 | 14.473 | -64.018 | 14.473 | 65.634 | 282.739 | 0.263 |
| 3500.000 | 1.479 | 327.487 | 3499.090 | 16.556 | -65.802 | 16.556 | 67.853 | 284.123 | 0.467 |
| 3600.000 | 1.588 | 335.044 | 3599.055 | 18.901 | -67.081 | 18.901 | 69.692 | 285.736 | 0.229 |
| 3700.000 | 1.481 | 335.235 | 3699.019 | 21.330 | -68.206 | 21.330 | 71.464 | 287.366 | 0.106 |
| 3800.000 | 1.514 | 338.109 | 3798.985 | 23.730 | -69.240 | 23.730 | 73.194 | 288.917 | 0.082 |
| 3900.000 | 1.323 | 330.601 | 3898.954 | 25.962 | -70.300 | 25.962 | 74.940 | 290.269 | 0.266 |
| 4000.000 | 1.231 | 335.491 | 3998.929 | 27.944 | -71.312 | 27.944 | 76.592 | 291.398 | 0.143 |
| 4100.000 | 1.299 | 331.209 | 4098.905 | 29.915 | -72.303 | 29.915 | 78.247 | 292.477 | 0.116 |
| 4200.000 | 1.298 | 326.935 | 4198.879 | 31.857 | -73.467 | 31.857 | 80.077 | 293.443 | 0.097 |
| 4300.000 | 1.240 | 319.124 | 4298.855 | 33.625 | -74.794 | 33.625 | 82.005 | 294.207 | 0.182 |
| 4400.000 | 1.102 | 327.048 | 4398.834 | 35.251 | -76.025 | 35.251 | 83.800 | 294.876 | 0.212 |
| 4500.000 | 1.338 | 333.232 | 4498.811 | 37.100 | -77.074 | 37.100 | 85.539 | 295.704 | 0.270 |
| 4600.000 | 1.409 | 332.481 | 4598.782 | 39.234 | -78.168 | 39.234 | 87.462 | 296.653 | 0.074 |
| 4700.000 | 1.157 | 336.892 | 4698.757 | 41.253 | -79.133 | 41.253 | 89.240 | 297.534 | 0.271 |
| 4800.000 | 1.110 | 339.829 | 4798.738 | 43.091 | -79.863 | 43.091 | 90.746 | 298.349 | 0.075 |
| 4900.000 | 1.131 | 343.768 | 4898.719 | 44.947 | -80.473 | 44.947 | 92.174 | 299.185 | 0.080 |
| 5000.000 | 0.987 | 343.398 | 4998.702 | 46.720 | -80.995 | 46.720 | 93.503 | 299.978 | 0.144 |
| 5100.000 | 1.045 | 341.349 | 5098.686 | 48.409 | -81.532 | 48.409 | 94.821 | 300.699 | 0.069 |
| 5200.000 | 1.022 | 343.445 | 5198.670 | 50.128 | -82.078 | 50.128 | 96.175 | 301.414 | 0.045 |
| 5300.000 | 0.807 | 358.561 | 5298.657 | 51.686 | -82.350 | 51.686 | 97.226 | 302.114 | 0.321 |
| 5400.000 | 0.827 | 7.813 | 5398.647 | 53.106 | -82.269 | 53.106 | 97.921 | 302.843 | 0.133 |
| 5500.000 | 1.142 | 33.262 | 5498.632 | 54.654 | -81.624 | 54.654 | 98.232 | 303.805 | 0.532 |
| 5600.000 | 1.201 | 25.281 | 5598.612 | 56.435 | -80.630 | 56.435 | 98.418 | 304.989 | 0.173 |
| 5700.000 | 0.880 | 61.682 | 5698.596 | 57.747 | -79.507 | 57.747 | 98.265 | 305.991 | 0.718 |
| 5800.000 | 0.362 | 84.116 | 5798.590 | 58.143 | -78.517 | 58.143 | 97.701 | 306.521 | 0.562 |
| 5900.000 | 0.541 | 86.547 | 5898.587 | 58.204 | -77.732 | 58.204 | 97.108 | 306.825 | 0.180 |
| 6000.000 | 0.909 | 77.589 | 5998.579 | 58.403 | -76.486 | 58.403 | 96.234 | 307.364 | 0.384 |
| 6100.000 | 0.506 | 102.588 | 6098.571 | 58.477 | -75.281 | 58.477 | 95.324 | 307.839 | 0.498 |
| 6200.000 | 0.440 | 168.209 | 6198.568 | 58.005 | -74.771 | 58.005 | 94.632 | 307.803 | 0.516 |

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|-------------------------------------|-------------------|------------------------|-----------|-------------|-------------|------------------------|------------------------|--------------------------|----------------------------|
| 6300.000 | 0.386 | 208.031 | 6298.566 | 57.331 | -74.851 | 57.331 | 94.284 | 307.450 | 0.286 |
| 6400.000 | 0.316 | 234.693 | 6398.564 | 56.874 | -75.234 | 56.874 | 94.313 | 307.088 | 0.176 |
| 6500.000 | 0.237 | 243.563 | 6498.563 | 56.623 | -75.644 | 56.623 | 94.489 | 306.817 | 0.089 |
| 6600.000 | 0.739 | 326.745 | 6598.560 | 57.070 | -76.183 | 57.070 | 95.188 | 306.838 | 0.749 |
| 6700.000 | 1.299 | 355.370 | 6698.544 | 58.739 | -76.628 | 58.739 | 96.551 | 307.472 | 0.740 |
| 6800.000 | 1.836 | 359.077 | 6798.506 | 61.470 | -76.745 | 61.470 | 98.328 | 308.694 | 0.547 |
| 6900.000 | 2.091 | 11.231 | 6898.448 | 64.861 | -76.416 | 64.861 | 100.231 | 310.325 | 0.486 |
| 7000.000 | 2.730 | 15.214 | 6998.359 | 68.949 | -75.435 | 68.949 | 102.198 | 312.428 | 0.661 |
| 7100.000 | 2.992 | 14.555 | 7098.234 | 73.773 | -74.154 | 73.773 | 104.601 | 314.852 | 0.264 |
| 7200.000 | 2.935 | 17.125 | 7198.101 | 78.746 | -72.745 | 78.746 | 107.204 | 317.268 | 0.145 |
| 21.9' Ellipse of Uncertainty | | | | | | | | | |
| 7300.000 | 1.472 | 33.737 | 7298.025 | 82.245 | -71.273 | 82.245 | 108.831 | 319.088 | 0.598 |