



**Company:** Noble Energy  
**Rig:** Production/VES  
**API #** 05-123-18711  
**Date:** 12/19/13  
**Surveyor:** Levi Sheldon  
**VS:** 0.000  
**Lat :** 40.467  
**Long:** -104.666

**Well:** Bickling E21-15  
**Location:** Weld County, Colorado  
**North Reference:** GRID  
**Convergence:** GRID North is 0.540 Degrees East  
**Declination:** 8.48  
**Depth Reference:** Ground Level  
**Elevation:** 4,707 Feet  
**Total Depth as Drilled:** 7,261 Feet

**Lat & Long obtained by handheld GPS at wellhead**

HA Gyro Survey Calculations

| Depth    | Inc   | AzG     | N/-S    | E/-W    | TVD      | DL    | VS      | CD     | Cbrg    |
|----------|-------|---------|---------|---------|----------|-------|---------|--------|---------|
| 0.000    | 0.000 | 0.000   | 0.000   | 0.000   | 0.000    | ****  | 0.000   | 0.000  | 0.000   |
| 100.000  | 0.271 | 331.522 | 0.208   | -0.113  | 100.000  | 0.271 | 0.208   | 0.236  | 331.522 |
| 200.000  | 0.154 | 339.836 | 0.542   | -0.272  | 199.999  | 0.120 | 0.542   | 0.606  | 333.361 |
| 300.000  | 0.186 | 341.784 | 0.822   | -0.369  | 299.998  | 0.032 | 0.822   | 0.901  | 335.839 |
| 400.000  | 0.109 | 224.398 | 0.909   | -0.486  | 399.998  | 0.255 | 0.909   | 1.031  | 331.844 |
| 500.000  | 0.142 | 224.312 | 0.752   | -0.639  | 499.998  | 0.033 | 0.752   | 0.987  | 319.637 |
| 600.000  | 0.223 | 212.429 | 0.499   | -0.830  | 599.998  | 0.089 | 0.499   | 0.969  | 301.027 |
| 700.000  | 0.233 | 225.734 | 0.193   | -1.080  | 699.997  | 0.054 | 0.193   | 1.097  | 280.123 |
| 800.000  | 0.720 | 221.585 | -0.419  | -1.643  | 799.993  | 0.488 | -0.419  | 1.696  | 255.681 |
| 900.000  | 0.914 | 223.348 | -1.469  | -2.608  | 899.983  | 0.195 | -1.469  | 2.993  | 240.600 |
| 1000.000 | 1.013 | 221.179 | -2.714  | -3.737  | 999.969  | 0.106 | -2.714  | 4.618  | 234.007 |
| 1100.000 | 1.127 | 227.802 | -4.040  | -5.047  | 1099.951 | 0.169 | -4.040  | 6.465  | 231.325 |
| 1200.000 | 1.330 | 226.877 | -5.494  | -6.623  | 1199.928 | 0.204 | -5.494  | 8.606  | 230.323 |
| 1300.000 | 1.239 | 233.172 | -6.936  | -8.336  | 1299.903 | 0.168 | -6.936  | 10.844 | 230.238 |
| 1400.000 | 1.336 | 231.058 | -8.316  | -10.108 | 1399.878 | 0.108 | -8.316  | 13.089 | 230.553 |
| 1500.000 | 1.217 | 233.131 | -9.686  | -11.863 | 1499.853 | 0.128 | -9.686  | 15.315 | 230.770 |
| 1600.000 | 0.893 | 234.655 | -10.773 | -13.348 | 1599.836 | 0.325 | -10.773 | 17.153 | 231.093 |
| 1700.000 | 0.444 | 168.104 | -11.603 | -13.903 | 1699.830 | 0.824 | -11.603 | 18.109 | 230.154 |
| 1800.000 | 0.992 | 128.372 | -12.519 | -13.145 | 1799.822 | 0.710 | -12.519 | 18.152 | 226.396 |
| 1900.000 | 1.160 | 114.639 | -13.478 | -11.546 | 1899.805 | 0.306 | -13.478 | 17.748 | 220.585 |
| 2000.000 | 1.435 | 111.997 | -14.369 | -9.466  | 1999.779 | 0.282 | -14.369 | 17.207 | 213.375 |
| 2100.000 | 1.240 | 88.264  | -14.805 | -7.223  | 2099.753 | 0.582 | -14.805 | 16.473 | 206.006 |
| 2200.000 | 1.235 | 80.086  | -14.587 | -5.079  | 2199.729 | 0.177 | -14.587 | 15.446 | 199.199 |
| 2300.000 | 1.228 | 72.451  | -14.078 | -2.996  | 2299.706 | 0.164 | -14.078 | 14.394 | 192.015 |
| 2400.000 | 0.457 | 96.025  | -13.797 | -1.578  | 2399.695 | 0.829 | -13.797 | 13.887 | 186.523 |
| 2500.000 | 0.498 | 101.740 | -13.928 | -0.755  | 2499.692 | 0.063 | -13.928 | 13.948 | 183.102 |
| 2600.000 | 0.476 | 115.473 | -14.195 | 0.046   | 2599.688 | 0.119 | -14.195 | 14.195 | 179.815 |
| 2700.000 | 0.600 | 134.617 | -14.741 | 0.793   | 2699.684 | 0.217 | -14.741 | 14.762 | 176.921 |
| 2800.000 | 0.655 | 137.763 | -15.532 | 1.550   | 2799.678 | 0.065 | -15.532 | 15.609 | 174.300 |
| 2900.000 | 0.612 | 207.635 | -16.429 | 1.687   | 2899.673 | 0.727 | -16.429 | 16.515 | 174.138 |
| 3000.000 | 1.009 | 219.979 | -17.577 | 0.873   | 2999.663 | 0.431 | -17.577 | 17.598 | 177.155 |
| 3100.000 | 1.007 | 215.821 | -18.964 | -0.206  | 3099.647 | 0.073 | -18.964 | 18.965 | 180.624 |
| 3200.000 | 0.938 | 223.786 | -20.267 | -1.287  | 3199.633 | 0.152 | -20.267 | 20.308 | 183.633 |
| 3300.000 | 1.126 | 268.399 | -20.885 | -2.835  | 3299.618 | 0.802 | -20.885 | 21.077 | 187.731 |
| 3400.000 | 1.542 | 291.794 | -20.413 | -5.067  | 3399.592 | 0.677 | -20.413 | 21.033 | 193.939 |
| 3500.000 | 0.783 | 303.157 | -19.540 | -6.887  | 3499.570 | 0.790 | -19.540 | 20.719 | 199.416 |

|          |       |         |         |         |          |       |         |        |         |
|----------|-------|---------|---------|---------|----------|-------|---------|--------|---------|
| 3600.000 | 0.790 | 328.563 | -18.578 | -7.819  | 3599.561 | 0.346 | -18.578 | 20.157 | 202.824 |
| 3700.000 | 0.943 | 320.406 | -17.356 | -8.703  | 3699.550 | 0.196 | -17.356 | 19.416 | 206.631 |
| 3800.000 | 0.989 | 325.951 | -16.006 | -9.711  | 3799.536 | 0.104 | -16.006 | 18.722 | 211.245 |
| 3900.000 | 1.001 | 338.234 | -14.480 | -10.518 | 3899.521 | 0.213 | -14.480 | 17.897 | 215.995 |
| 4000.000 | 0.748 | 331.634 | -13.094 | -11.152 | 3999.509 | 0.271 | -13.094 | 17.200 | 220.422 |
| 4100.000 | 0.364 | 298.945 | -12.365 | -11.741 | 4099.504 | 0.484 | -12.365 | 17.051 | 223.517 |
| 4200.000 | 0.362 | 300.408 | -12.052 | -12.292 | 4199.502 | 0.010 | -12.052 | 17.214 | 225.565 |
| 4300.000 | 0.215 | 298.055 | -11.804 | -12.729 | 4299.501 | 0.147 | -11.804 | 17.360 | 227.161 |
| 4400.000 | 0.260 | 250.142 | -11.793 | -13.109 | 4399.500 | 0.197 | -11.793 | 17.632 | 228.025 |
| 4500.000 | 0.424 | 202.518 | -12.211 | -13.464 | 4499.499 | 0.314 | -12.211 | 18.177 | 227.793 |
| 4600.000 | 0.475 | 199.869 | -12.943 | -13.746 | 4599.496 | 0.056 | -12.943 | 18.881 | 226.725 |
| 4700.000 | 0.686 | 209.696 | -13.852 | -14.184 | 4699.490 | 0.232 | -13.852 | 19.826 | 225.677 |
| 4800.000 | 0.673 | 203.915 | -14.908 | -14.718 | 4799.483 | 0.070 | -14.908 | 20.950 | 224.632 |
| 4900.000 | 0.404 | 203.393 | -15.769 | -15.096 | 4899.479 | 0.268 | -15.769 | 21.830 | 223.751 |
| 5000.000 | 0.316 | 228.694 | -16.274 | -15.443 | 4999.477 | 0.180 | -16.274 | 22.435 | 223.499 |
| 5100.000 | 0.221 | 271.030 | -16.453 | -15.843 | 5099.476 | 0.213 | -16.453 | 22.841 | 223.918 |
| 5200.000 | 0.423 | 278.206 | -16.397 | -16.401 | 5199.474 | 0.206 | -16.397 | 23.192 | 225.008 |
| 5300.000 | 0.318 | 245.703 | -16.458 | -17.020 | 5299.472 | 0.231 | -16.458 | 23.676 | 225.961 |
| 5400.000 | 0.282 | 213.670 | -16.777 | -17.409 | 5399.471 | 0.169 | -16.777 | 24.177 | 226.059 |
| 5500.000 | 0.769 | 227.979 | -17.431 | -18.044 | 5499.467 | 0.501 | -17.431 | 25.088 | 225.990 |
| 5600.000 | 1.468 | 230.115 | -18.701 | -19.525 | 5599.447 | 0.700 | -18.701 | 27.036 | 226.234 |
| 5700.000 | 1.148 | 254.755 | -19.786 | -21.474 | 5699.421 | 0.639 | -19.786 | 29.200 | 227.343 |
| 5800.000 | 0.613 | 260.321 | -20.139 | -22.968 | 5799.409 | 0.542 | -20.139 | 30.547 | 228.754 |
| 5900.000 | 0.170 | 332.770 | -20.097 | -23.563 | 5899.407 | 0.584 | -20.097 | 30.969 | 229.538 |
| 6000.000 | 0.269 | 346.695 | -19.737 | -23.684 | 5999.406 | 0.112 | -19.737 | 30.830 | 230.195 |
| 6100.000 | 0.510 | 309.937 | -19.223 | -24.080 | 6099.404 | 0.336 | -19.223 | 30.811 | 231.400 |
| 6200.000 | 0.294 | 288.946 | -18.854 | -24.663 | 6199.402 | 0.258 | -18.854 | 31.044 | 232.604 |
| 6300.000 | 0.439 | 323.676 | -18.462 | -25.133 | 6299.400 | 0.259 | -18.462 | 31.185 | 233.700 |
| 6400.000 | 0.575 | 325.825 | -17.738 | -25.642 | 6399.396 | 0.137 | -17.738 | 31.179 | 235.326 |
| 6500.000 | 0.584 | 295.168 | -17.106 | -26.385 | 6499.391 | 0.307 | -17.106 | 31.445 | 237.044 |
| 6600.000 | 0.817 | 296.779 | -16.568 | -27.483 | 6599.383 | 0.234 | -16.568 | 32.091 | 238.917 |

of True North