## Results of Directional Survey

| | | | | |
|---|---|---|---|---|
| API number: | 30-025-40922 | | | |
| OGRID: | | Operator: | CHEVRON U S A INC | |
| | | Property: | PADUCA BREAKS 32 26 32 STATE | # 1H |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| surface | ULSTR: | A | 32 | T | 26S | R | 32E |
| | | | | 400 | FNL | 182 | FEL |
| BH Loc | ULSTR: | D | 32 | T | 26S | R | 32E |
| 13245 | MD | 8706.4 | TVD | 410 | FNL | 345 | FWL |
| | | | | | | 4935 | FEL |
| Top Perf/OH | ULSTR: | A | 32 | T | 26S | R | 32E |
| 9034 | MD | 8817.9 | TVD | 490 | FNL | 731 | FEL |
| Bot Perf/OH | ULSTR: | D | 32 | T | 26S | R | 32E |
| 13208 | MD | 8708.9 | TVD | 412 | FNL | 381 | FWL |
| | | | | | | 4899 | FEL |

| | MD | N/S | E/W | VD |
|---|---|---|---|---|
| | 9031 | -89.90 | -545.99 | 8817.78 |
| TOP PERFS/OH | **9034** | -89.93 | -548.99 | 8817.90 |
| | 9082 | -90.33 | -596.91 | 8819.87 |
| | 13176 | -13.84 | -4684.74 | 8711.12 |
| BOT PERFS/OH | **13208** | -11.89 | -4716.61 | 8708.94 |
| | 13245 | -9.63 | -4753.45 | 8706.43 |

| | | | | |
|---|---|---|---|---|
| NEXT TO LAST | 13176 | -13.84 | -4684.74 | 8711.12 |
| LAST READING | 13245 | -9.63 | -4753.45 | 8706.43 |
| TD | **13245** | -9.63 | -4753.45 | 8706.43 |

| | | | | |
|---|---|---|---|---|
| Surface Location | 400 | FN | 182 | FE |
| Projected BHL | 410 | FN | 4935 | FE |
| Location of | | | | |
| Top Perfs/OH | 490 | FN | 731 | FE |
| Bottom Perfs/OH | 412 | FN | 4899 | FE |

SUMMARY of Subsurface Locations

| | | | | | | |
|---|---|---|---|---|---|---|
| **Surface Location** | A-32-26S-32E | 400 | FN | 182 | FE | Vert. Depth |
| | | | | | | |
| **Top Perfs/OH** | A-32-26S-32E | 490 | FN | 731 | FE | 8817.90 |
| **Bottom Perfs/OH** | D-32-26S-32E | 412 | FN | 4899 | FE | 8708.94 |
| | | | | | | |
| **Projected TD** | D-32-26S-32E | 410 | FN | 4935 | FE | 8706.43 |

Chesapeake Operating Inc.

Paduca Breaks 32-26-32 State #1H
Lea County, NM (NAD27 NME)
Wellbore #1 / Job #1310147
Phoenix MWD Survey
KB Elev: 3118.00'
GL Elev: 3101.00'



Surface Loc.:
Northing: (Y) 699816.00
Easting: (X) 366121.00

SUR: A-32-26S-32E, 400/n & 182/e
BHL: D-32-26S-32E, 410/N & 4935/E
API # 30-025-40922

Survey Type Information:
H 171.00 - 13245.00 PHOENIX MWD SURVEY : MWD

| Measured Depth (ft) | Incl. | Azim. | Sub-Sea Depth (ft) | Vertical Depth (ft) | Local Coo (+N/-S) (ft) | (+E/-W) (ft) | UTM Coorc Northings (ft) | Eastings (ft) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | -3118 | 0 | 0 | 0 | 366121 | 699816 |
| 171 | 0.8 | 339.7 | -2947.01 | 170.99 | 1.12 | -0.41 | 366122.1 | 699815.6 |
| 298 | 0.8 | 348.9 | -2820.02 | 297.98 | 2.82 | -0.89 | 366123.8 | 699815.1 |
| 480 | 0.6 | 345.6 | -2638.03 | 479.97 | 4.99 | -1.37 | 366126 | 699814.6 |
| 670 | 0.8 | 286 | -2448.04 | 669.96 | 6.32 | -2.9 | 366127.3 | 699813.1 |
| 812 | 1.7 | 299.3 | -2306.08 | 811.92 | 7.62 | -5.69 | 366128.6 | 699810.3 |
| 989 | 1.2 | 291.9 | -2129.14 | 988.86 | 9.6 | -9.7 | 366130.6 | 699806.3 |
| 1179 | 1.2 | 283.4 | -1939.18 | 1178.82 | 10.8 | -13.48 | 366131.8 | 699802.5 |
| 1369 | 1.3 | 288.9 | -1749.22 | 1368.78 | 11.96 | -17.45 | 366133 | 699798.6 |
| 1559 | 1.1 | 278.4 | -1559.26 | 1558.74 | 12.93 | -21.29 | 366133.9 | 699794.7 |
| 1749 | 1 | 287.6 | -1369.3 | 1748.7 | 13.7 | -24.68 | 366134.7 | 699791.3 |
| 1939 | 1 | 260.4 | -1179.32 | 1938.68 | 13.92 | -27.89 | 366134.9 | 699788.1 |
| 2129 | 0.5 | 272 | -989.34 | 2128.66 | 13.67 | -30.36 | 366134.7 | 699785.6 |
| 2320 | 0.8 | 246.5 | -798.35 | 2319.65 | 13.17 | -32.41 | 366134.2 | 699783.6 |
| 2510 | 0.7 | 266.8 | -608.37 | 2509.63 | 12.58 | -34.79 | 366133.6 | 699781.2 |
| 2700 | 0.8 | 265.2 | -418.38 | 2699.62 | 12.4 | -37.27 | 366133.4 | 699778.7 |
| 2890 | 0.9 | 270 | -228.41 | 2889.59 | 12.29 | -40.08 | 366133.3 | 699775.9 |
| 3080 | 1.1 | 268.6 | -38.43 | 3079.57 | 12.24 | -43.4 | 366133.2 | 699772.6 |
| 3271 | 0.5 | 278.7 | 152.55 | 3270.55 | 12.33 | -46.06 | 366133.3 | 699769.9 |
| 3461 | 0.5 | 277.9 | 342.54 | 3460.54 | 12.57 | -47.7 | 366133.6 | 699768.3 |
| 3651 | 0.5 | 250.9 | 532.53 | 3650.53 | 12.41 | -49.3 | 366133.4 | 699766.7 |
| 3842 | 0.3 | 201 | 723.53 | 3841.53 | 11.67 | -50.27 | 366132.7 | 699765.7 |
| 4032 | 0.7 | 161.8 | 913.52 | 4031.52 | 10.1 | -50.08 | 366131.1 | 699765.9 |
| 4116 | 0.9 | 158.5 | 997.51 | 4115.51 | 9 | -49.68 | 366130 | 699766.3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4289 | 0.4 | 153.1 | 1170.5 | 4288.5 | 7.2 | -48.91 | 366128.2 | 699767.1 |
| 4479 | 0.2 | 163.9 | 1360.5 | 4478.5 | 6.29 | -48.52 | 366127.3 | 699767.5 |
| 4670 | 0.3 | 181.6 | 1551.5 | 4669.5 | 5.47 | -48.44 | 366126.5 | 699767.6 |
| 4860 | 0.5 | 233.7 | 1741.49 | 4859.49 | 4.48 | -49.12 | 366125.5 | 699766.9 |
| 5050 | 0.5 | 270.3 | 1931.49 | 5049.49 | 3.99 | -50.62 | 366125 | 699765.4 |
| 5241 | 0.7 | 273.2 | 2122.47 | 5240.47 | 4.06 | -52.62 | 366125.1 | 699763.4 |
| 5431 | 0.6 | 294.1 | 2312.46 | 5430.46 | 4.53 | -54.68 | 366125.5 | 699761.3 |
| 5621 | 0.7 | 278.3 | 2502.45 | 5620.45 | 5.11 | -56.74 | 366126.1 | 699759.3 |
| 5812 | 0.6 | 252.8 | 2693.44 | 5811.44 | 4.98 | -58.85 | 366126 | 699757.2 |
| 6002 | 0.6 | 247.3 | 2883.43 | 6001.43 | 4.3 | -60.72 | 366125.3 | 699755.3 |
| 6192 | 0.7 | 263.8 | 3073.42 | 6191.42 | 3.79 | -62.79 | 366124.8 | 699753.2 |
| 6377 | 0.6 | 241.9 | 3258.4 | 6376.4 | 3.21 | -64.77 | 366124.2 | 699751.2 |
| 6557 | 1 | 232.3 | 3438.39 | 6556.39 | 1.81 | -66.84 | 366122.8 | 699749.2 |
| 6738 | 1.2 | 239.2 | 3619.35 | 6737.35 | -0.13 | -69.72 | 366120.9 | 699746.3 |
| 6919 | 1.1 | 235.1 | 3800.32 | 6918.32 | -2.09 | -72.77 | 366118.9 | 699743.2 |
| 7099 | 1 | 219.5 | 3980.29 | 7098.29 | -4.29 | -75.19 | 366116.7 | 699740.8 |
| 7280 | 1.7 | 227.9 | 4161.24 | 7279.24 | -7.31 | -78.18 | 366113.7 | 699737.8 |
| 7460 | 1.7 | 221.2 | 4341.16 | 7459.16 | -11.11 | -81.92 | 366109.9 | 699734.1 |
| 7640 | 1.9 | 219.3 | 4521.07 | 7639.07 | -15.43 | -85.57 | 366105.6 | 699730.4 |
| 7821 | 1.9 | 209.9 | 4701.97 | 7819.97 | -20.35 | -88.97 | 366100.7 | 699727 |
| 8002 | 1.9 | 211.1 | 4882.87 | 8000.87 | -25.52 | -92.02 | 366095.5 | 699724 |
| 8178 | 1.9 | 212.6 | 5058.77 | 8176.77 | -30.48 | -95.09 | 366090.5 | 699720.9 |
| 8224 | 1.8 | 208.5 | 5104.75 | 8222.75 | -31.75 | -95.85 | 366089.3 | 699720.2 |
| 8269 | 2.9 | 278.6 | 5149.72 | 8267.72 | -32.21 | -97.31 | 366088.8 | 699718.7 |
| 8314 | 11 | 269.8 | 5194.35 | 8312.35 | -32.05 | -102.74 | 366089 | 699713.3 |
| 8359 | 18.1 | 257 | 5237.89 | 8355.89 | -33.64 | -113.86 | 366087.4 | 699702.1 |
| 8405 | 22.2 | 254.1 | 5281.07 | 8399.07 | -37.63 | -129.19 | 366083.4 | 699686.8 |
| 8450 | 24.5 | 255.4 | 5322.38 | 8440.38 | -42.31 | -146.4 | 366078.7 | 699669.6 |
| 8452.26 | 24.32 | 255.6 | 5324.44 | 8442.44 | -42.55 | -147.3 | 366078.5 | 699668.7 |
| 8496 | 20.9 | 260.1 | 5364.81 | 8482.81 | -46.13 | -163.72 | 366074.9 | 699652.3 |
| 8541 | 23.5 | 255.6 | 5406.48 | 8524.48 | -49.74 | -180.32 | 366071.3 | 699635.7 |
| 8586 | 31.1 | 254.7 | 5446.43 | 8564.43 | -55.05 | -200.25 | 366066 | 699615.8 |
| 8631 | 37.7 | 258.6 | 5483.55 | 8601.55 | -60.84 | -224.98 | 366060.2 | 699591 |
| 8676 | 40.5 | 262.8 | 5518.47 | 8636.47 | -65.39 | -252.97 | 366055.6 | 699563 |
| 8721 | 41.7 | 265.2 | 5552.39 | 8670.39 | -68.48 | -282.39 | 366052.5 | 699533.6 |
| 8766 | 45.5 | 268.3 | 5584.97 | 8702.97 | -70.21 | -313.36 | 366050.8 | 699502.6 |
| 8811 | 52 | 266.4 | 5614.63 | 8732.63 | -71.8 | -347.13 | 366049.2 | 699468.9 |
| 8857 | 57.7 | 264.8 | 5641.1 | 8759.1 | -74.7 | -384.61 | 366046.3 | 699431.4 |
| 8902 | 63.1 | 264.4 | 5663.32 | 8781.32 | -78.38 | -423.55 | 366042.6 | 699392.5 |
| 8947 | 70.4 | 263.6 | 5681.07 | 8799.07 | -82.71 | -464.64 | 366038.3 | 699351.4 |
| 8992 | 77.4 | 264.2 | 5693.54 | 8811.54 | -87.3 | -507.61 | 366033.7 | 699308.4 |
| 9031 | 84.2 | 268.3 | 5699.78 | 8817.78 | -89.8 | -545.99 | 366031.2 | 699270 |
| 9082 | 91.1 | 270.5 | 5701.87 | 8819.87 | -90.33 | -596.91 | 366030.7 | 699219.1 |
| 9172 | 94.7 | 270.5 | 5697.31 | 8815.31 | -89.55 | -686.78 | 366031.5 | 699129.2 |
| 9263 | 93.9 | 273.7 | 5690.49 | 8808.49 | -86.22 | -777.45 | 366034.8 | 699038.6 |
| 9353 | 90.2 | 273 | 5687.27 | 8805.27 | -80.97 | -867.22 | 366040 | 698948.8 |
| 9443 | 89 | 272.7 | 5687.9 | 8805.9 | -76.49 | -957.11 | 366044.5 | 698858.9 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 9533 | 89.8 | 271.3 | 5688.84 | 8806.84 | -73.35 | -1047.04 | 366047.7 | 698769 |
| 9624 | 89.5 | 270.8 | 5689.4 | 8807.4 | -71.68 | -1138.03 | 366049.3 | 698678 |
| 9714 | 90.9 | 270.5 | 5689.08 | 8807.08 | -70.66 | -1228.02 | 366050.3 | 698588 |
| 9804 | 90.5 | 269.5 | 5687.98 | 8805.98 | -70.66 | -1318.01 | 366050.3 | 698498 |
| 9894 | 92.6 | 270.3 | 5685.55 | 8803.55 | -70.82 | -1407.97 | 366050.2 | 698408 |
| 9985 | 93.7 | 270.8 | 5680.55 | 8798.55 | -69.95 | -1498.83 | 366051.1 | 698317.2 |
| 10075 | 91.7 | 270.1 | 5676.31 | 8794.31 | -69.24 | -1588.72 | 366051.8 | 698227.3 |
| 10165 | 90.6 | 270.8 | 5674.5 | 8792.5 | -68.54 | -1678.7 | 366052.5 | 698137.3 |
| 10256 | 91.4 | 270.1 | 5672.92 | 8790.92 | -67.82 | -1769.68 | 366053.2 | 698046.3 |
| 10346 | 96.1 | 270.9 | 5667.03 | 8785.03 | -67.04 | -1859.46 | 366054 | 697956.5 |
| 10436 | 97.8 | 271.5 | 5656.14 | 8774.14 | -65.17 | -1948.77 | 366055.8 | 697867.2 |
| 10527 | 95.6 | 270 | 5645.52 | 8763.52 | -63.99 | -2039.14 | 366057 | 697776.9 |
| 10617 | 94.5 | 270.7 | 5637.6 | 8755.6 | -63.44 | -2128.78 | 366057.6 | 697687.2 |
| 10707 | 93.7 | 270.2 | 5631.17 | 8749.17 | -62.74 | -2218.55 | 366058.3 | 697597.5 |
| 10797 | 89.1 | 269.6 | 5628.97 | 8746.97 | -62.89 | -2308.5 | 366058.1 | 697507.5 |
| 10887 | 88.4 | 269.1 | 5630.93 | 8748.93 | -63.91 | -2398.47 | 366057.1 | 697417.5 |
| 10978 | 91.5 | 269.2 | 5631.01 | 8749.01 | -65.26 | -2489.45 | 366055.7 | 697326.6 |
| 11068 | 94.1 | 269.6 | 5626.61 | 8744.61 | -66.21 | -2579.33 | 366054.8 | 697236.7 |
| 11158 | 92.5 | 268.7 | 5621.43 | 8739.43 | -67.54 | -2669.16 | 366053.5 | 697146.8 |
| 11248 | 91.8 | 268.1 | 5618.06 | 8736.06 | -70.05 | -2759.07 | 366051 | 697056.9 |
| 11338 | 91.8 | 270.8 | 5615.23 | 8733.23 | -70.91 | -2849.01 | 366050.1 | 696967 |
| 11429 | 89.9 | 270.5 | 5613.88 | 8731.88 | -69.88 | -2939.99 | 366051.1 | 696876 |
| 11519 | 88.3 | 270.3 | 5615.29 | 8733.29 | -69.25 | -3029.97 | 366051.8 | 696786 |
| 11610 | 89.2 | 270.6 | 5617.28 | 8735.28 | -68.54 | -3120.95 | 366052.5 | 696695.1 |
| 11700 | 91 | 272.1 | 5617.12 | 8735.12 | -66.42 | -3210.91 | 366054.6 | 696605.1 |
| 11790 | 93 | 273.4 | 5613.98 | 8731.98 | -62.1 | -3300.75 | 366058.9 | 696515.3 |
| 11880 | 92.8 | 272.2 | 5609.43 | 8727.43 | -57.71 | -3390.53 | 366063.3 | 696425.5 |
| 11971 | 90.5 | 270.3 | 5606.81 | 8724.81 | -55.73 | -3481.46 | 366065.3 | 696334.5 |
| 12061 | 89.5 | 270.4 | 5606.81 | 8724.81 | -55.18 | -3571.45 | 366065.8 | 696244.6 |
| 12151 | 88.9 | 270.4 | 5608.06 | 8726.06 | -54.55 | -3661.44 | 366066.5 | 696154.6 |
| 12242 | 90 | 271.6 | 5608.94 | 8726.94 | -52.96 | -3752.42 | 366068 | 696063.6 |
| 12332 | 90 | 271.9 | 5608.94 | 8726.94 | -50.22 | -3842.38 | 366070.8 | 695973.6 |
| 12422 | 88.2 | 271.5 | 5610.35 | 8728.35 | -47.55 | -3932.32 | 366073.5 | 695883.7 |
| 12512 | 88.2 | 272.1 | 5613.18 | 8731.18 | -44.72 | -4022.23 | 366076.3 | 695793.8 |
| 12603 | 88.7 | 272.4 | 5615.64 | 8733.64 | -41.15 | -4113.13 | 366079.9 | 695702.9 |
| 12693 | 90.3 | 272.4 | 5616.42 | 8734.42 | -37.38 | -4203.05 | 366083.6 | 695613 |
| 12783 | 90.7 | 272.4 | 5615.64 | 8733.64 | -33.61 | -4292.96 | 366087.4 | 695523 |
| 12874 | 92.5 | 272.2 | 5613.1 | 8731.1 | -29.96 | -4383.85 | 366091 | 695432.2 |
| 12964 | 93.9 | 273 | 5608.07 | 8726.07 | -25.89 | -4473.61 | 366095.1 | 695342.4 |
| 13054 | 93.9 | 273.2 | 5601.95 | 8719.95 | -21.03 | -4563.28 | 366100 | 695252.7 |
| 13144 | 94.4 | 273.5 | 5595.44 | 8713.44 | -15.78 | -4652.89 | 366105.2 | 695163.1 |
| 13176 | 93.9 | 273.5 | 5593.12 | 8711.12 | -13.84 | -4684.74 | 366107.2 | 695131.3 |
| 13245 | 93.9 | 273.5 | 5588.43 | 8706.43 | -9.63 | -4753.45 | 366111.4 | 695062.6 |

All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North. Vertical depths are relative to KB. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100 feet.
Vertical Section is from Slot and calculated along an Azimuth of 269.530° (Grid).

Coordinate System is NAD 1927 (NADCON CONUS) US State Plane 1927 (Exact solution), New Mexico E
Grid Convergence at Surface is 0.342°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 13245.00ft.,
the Bottom Hole Displacement is 4753.46ft., in the Direction of 269.530° (Grid).

Chesapeake ENERGY

SUR: A-32-26S-32E, 400/n & 182/e
BHL: D-32-26S-32E, 410/N & 4935/E
API # 30-025-40922

# Chesapeake Operating Inc.

**Lea County, NM (NAD27 NME)**
**Paduca Breaks 32-26-32 State #1H**
**Wellbore #1 / Job #1310147**



**Survey: Phoenix MWD Survey**

# Phoenix Final Survey Report

**05 March, 2013**

PHOENIX
TECHNOLOGY SERVICES

| | | | |
|---|---|---|---|
| **Company:** | Chesapeake Operating Inc. | **Local Co-ordinate Reference:** | Well #1H |
| **Project:** | Lea County, NM (NAD27 NME) | **TVD Reference:** | KB @ 3118.00usft (Trinidad 110) |
| **Site:** | Paduca Breaks 32-26-32 State | **MD Reference:** | KB @ 3118.00usft (Trinidad 110) |
| **Well:** | #1H | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 / Job #1310147 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys (Trinidad 110) | **Database:** | GCR DB |

**Project** Lea County, NM (NAD27 NME)

| | | | |
|---|---|---|---|
| **Map System:** | US State Plane 1927 (Exact solution) | **System Datum:** | Mean Sea Level |
| **Geo Datum:** | NAD 1927 (NADCON CONUS) | | |
| **Map Zone:** | New Mexico East 3001 | | |

**Site** Paduca Breaks 32-26-32 State

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 366,121.00 usft | **Latitude:** | 32° 0' 17.7932 N |
| **From:** | Map | **Easting:** | 699,816.00 usft | **Longitude:** | 103° 41' 19.4134 W |
| **Position Uncertainty:** | 0.00 usft | **Slot Radius:** | 13-3/16 " | **Grid Convergence:** | 0.34 ° |

**Well** #1H

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.00 usft | **Northing:** | 366,121.00 usft | **Latitude:** | 32° 0' 17.7932 N |
| | **+E/-W** | 0.00 usft | **Easting:** | 699,816.00 usft | **Longitude:** | 103° 41' 19.4134 W |
| **Position Uncertainty** | | 0.00 usft | **Wellhead Elevation:** | usft | **Ground Level:** | 3,101.00 usft |

**Wellbore** Wellbore #1 / Job #1310147

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010_14 | 02/26/13 | 7.42 | 59.92 | 48,304 |

**Design** Surveys (Trinidad 110)

**Audit Notes:**

| | | | | | |
|---|---|---|---|---|---|
| **Version:** | 1.0 | **Phase:** | ACTUAL | **Tie On Depth:** | 0.00 |

| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
|---|---|---|---|---|
| | 0.00 | 0.00 | 0.00 | 269.53 |

**Survey Program** **Date** 03/05/13

| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 171.00 | 13,245.00 | Phoenix MWD Survey (Wellbore #1 / Job # | MWD | MWD - Standard |

| | | | |
|---|---|---|---|
| **Company:** | Chesapeake Operating Inc | **Local Co-ordinate Reference:** | Well #1H |
| **Project:** | Lea County, NM (NAD27-NME) | **TVD Reference:** | KB @ 3118.00usft (Trinidad 110) |
| **Site:** | Paduca Breaks 32-26-32 State | **MD Reference:** | KB @ 3118.00usft (Trinidad 110) |
| **Well:** | #1H | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 / Job #1310147 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys (Trinidad 110) | **Database:** | GCR DB |

**Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVDSS (usft) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 3,118.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 366,121.00 | 699,816.00 |
| 171.00 | 0.80 | 339.70 | 2,947.01 | 170.99 | 1.12 | -0.41 | 0.40 | 0.47 | 366,122.12 | 699,815.59 |
| **Phoenix First MWD Survey** | | | | | | | | | | |
| 298.00 | 0.80 | 348.90 | 2,820.02 | 297.98 | 2.82 | -0.89 | 0.87 | 0.10 | 366,123.82 | 699,815.11 |
| 480.00 | 0.60 | 345.60 | 2,638.03 | 479.97 | 4.99 | -1.37 | 1.33 | 0.11 | 366,125.99 | 699,814.63 |
| 670.00 | 0.80 | 286.00 | 2,448.04 | 669.96 | 6.32 | -2.90 | 2.84 | 0.38 | 366,127.32 | 699,813.10 |
| 812.00 | 1.70 | 299.30 | 2,306.08 | 811.92 | 7.62 | -5.69 | 5.62 | 0.66 | 366,128.62 | 699,810.31 |
| 989.00 | 1.20 | 291.90 | 2,129.14 | 988.86 | 9.60 | -9.70 | 9.62 | 0.30 | 366,130.60 | 699,806.30 |
| 1,179.00 | 1.20 | 283.40 | 1,939.18 | 1,178.82 | 10.80 | -13.48 | 13.39 | 0.09 | 366,131.80 | 699,802.52 |
| 1,369.00 | 1.30 | 288.90 | 1,749.22 | 1,368.78 | 11.96 | -17.45 | 17.35 | 0.08 | 366,132.96 | 699,798.55 |
| 1,559.00 | 1.10 | 278.40 | 1,559.26 | 1,558.74 | 12.93 | -21.29 | 21.19 | 0.16 | 366,133.93 | 699,794.71 |
| 1,749.00 | 1.00 | 287.60 | 1,369.30 | 1,748.70 | 13.70 | -24.68 | 24.57 | 0.10 | 366,134.70 | 699,791.32 |
| 1,939.00 | 1.00 | 260.40 | 1,179.32 | 1,938.68 | 13.92 | -27.89 | 27.78 | 0.25 | 366,134.92 | 699,788.11 |
| 2,129.00 | 0.50 | 272.00 | 989.34 | 2,128.66 | 13.67 | -30.36 | 30.24 | 0.27 | 366,134.67 | 699,785.64 |
| 2,320.00 | 0.80 | 246.50 | 798.35 | 2,319.65 | 13.17 | -32.41 | 32.30 | 0.21 | 366,134.17 | 699,783.59 |
| 2,510.00 | 0.70 | 266.80 | 608.37 | 2,509.63 | 12.58 | -34.79 | 34.68 | 0.15 | 366,133.58 | 699,781.21 |
| 2,700.00 | 0.80 | 265.20 | 418.38 | 2,699.62 | 12.40 | -37.27 | 37.17 | 0.05 | 366,133.40 | 699,778.73 |
| 2,890.00 | 0.90 | 270.00 | 228.41 | 2,889.59 | 12.29 | -40.08 | 39.98 | 0.06 | 366,133.29 | 699,775.92 |
| 3,080.00 | 1.10 | 268.60 | 38.43 | 3,079.57 | 12.24 | -43.40 | 43.30 | 0.11 | 366,133.24 | 699,772.60 |
| 3,271.00 | 0.50 | 278.70 | -152.55 | 3,270.55 | 12.33 | -46.06 | 45.95 | 0.32 | 366,133.33 | 699,769.94 |
| 3,461.00 | 0.50 | 277.90 | -342.54 | 3,460.54 | 12.57 | -47.70 | 47.59 | 0.00 | 366,133.57 | 699,768.30 |
| 3,651.00 | 0.50 | 250.90 | -532.53 | 3,650.53 | 12.41 | -49.30 | 49.20 | 0.12 | 366,133.41 | 699,766.70 |
| 3,842.00 | 0.30 | 201.00 | -723.53 | 3,841.53 | 11.67 | -50.27 | 50.17 | 0.20 | 366,132.67 | 699,765.73 |
| 4,032.00 | 0.70 | 161.80 | -913.52 | 4,031.52 | 10.10 | -50.08 | 50.00 | 0.27 | 366,131.10 | 699,765.92 |
| 4,116.00 | 0.90 | 158.50 | -997.51 | 4,115.51 | 9.00 | -49.68 | 49.61 | 0.24 | 366,130.00 | 699,766.32 |
| 4,289.00 | 0.40 | 153.10 | -1,170.50 | 4,288.50 | 7.20 | -48.91 | 48.85 | 0.29 | 366,128.20 | 699,767.09 |
| 4,479.00 | 0.20 | 163.90 | -1,360.50 | 4,478.50 | 6.29 | -48.52 | 48.46 | 0.11 | 366,127.29 | 699,767.48 |

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|---|---|---|---|
| **Company:** | Chesapeake Operating Inc. | **Local Co-ordinate Reference:** | Well #1H |
| **Project:** | Lea County, NM (NAD27-NME) | **TVD Reference:** | KB @ 3118.00usft (Trinidad 110) |
| **Site:** | Paduca Breaks 32-26-32 State | **MD Reference:** | KB @ 3118.00usft (Trinidad 110) |
| **Well:** | #1H | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 / Job #1310147 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys (Trinidad 110) | **Database:** | GCR DB |

**Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVDSS (usft) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4,670.00 | 0.30 | 181.60 | -1,551.50 | 4,669.50 | 5.47 | -48.44 | 48.39 | 0.07 | 366,126.47 | 699,767.56 |
| 4,860.00 | 0.50 | 233.70 | -1,741.49 | 4,859.49 | 4.48 | -49.12 | 49.08 | 0.21 | 366,125.48 | 699,766.88 |
| 5,050.00 | 0.50 | 270.30 | -1,931.49 | 5,049.49 | 3.99 | -50.62 | 50.58 | 0.17 | 366,124.99 | 699,765.38 |
| 5,241.00 | 0.70 | 273.20 | -2,122.47 | 5,240.47 | 4.06 | -52.62 | 52.58 | 0.11 | 366,125.06 | 699,763.38 |
| 5,431.00 | 0.60 | 294.10 | -2,312.46 | 5,430.46 | 4.53 | -54.68 | 54.64 | 0.13 | 366,125.53 | 699,761.32 |
| 5,621.00 | 0.70 | 278.30 | -2,502.45 | 5,620.45 | 5.11 | -56.74 | 56.70 | 0.11 | 366,126.11 | 699,759.26 |
| 5,812.00 | 0.60 | 252.80 | -2,693.44 | 5,811.44 | 4.98 | -58.85 | 58.81 | 0.16 | 366,125.98 | 699,757.15 |
| 6,002.00 | 0.60 | 247.30 | -2,883.43 | 6,001.43 | 4.30 | -60.72 | 60.68 | 0.03 | 366,125.30 | 699,755.28 |
| 6,192.00 | 0.70 | 263.80 | -3,073.42 | 6,191.42 | 3.79 | -62.79 | 62.76 | 0.11 | 366,124.79 | 699,753.21 |
| 6,377.00 | 0.60 | 241.90 | -3,258.40 | 6,376.40 | 3.21 | -64.77 | 64.74 | 0.14 | 366,124.21 | 699,751.23 |
| 6,557.00 | 1.00 | 232.30 | -3,438.39 | 6,556.39 | 1.81 | -66.84 | 66.82 | 0.23 | 366,122.81 | 699,749.16 |
| 6,738.00 | 1.20 | 239.20 | -3,619.35 | 6,737.35 | -0.13 | -69.72 | 69.72 | 0.13 | 366,120.87 | 699,746.28 |
| 6,919.00 | 1.10 | 235.10 | -3,800.32 | 6,918.32 | -2.09 | -72.77 | 72.79 | 0.07 | 366,118.91 | 699,743.23 |
| 7,099.00 | 1.00 | 219.50 | -3,980.29 | 7,098.29 | -4.29 | -75.19 | 75.22 | 0.17 | 366,116.71 | 699,740.81 |
| 7,280.00 | 1.70 | 227.90 | -4,161.24 | 7,279.24 | -7.31 | -78.18 | 78.24 | 0.40 | 366,113.69 | 699,737.82 |
| 7,460.00 | 1.70 | 221.20 | -4,341.16 | 7,459.16 | -11.11 | -81.92 | 82.01 | 0.11 | 366,109.89 | 699,734.08 |
| 7,640.00 | 1.90 | 219.30 | -4,521.07 | 7,639.07 | -15.43 | -85.57 | 85.70 | 0.12 | 366,105.57 | 699,730.43 |
| 7,821.00 | 1.90 | 209.90 | -4,701.97 | 7,819.97 | -20.35 | -88.97 | 89.13 | 0.17 | 366,100.65 | 699,727.03 |
| 8,002.00 | 1.90 | 211.10 | -4,882.87 | 8,000.87 | -25.52 | -92.02 | 92.22 | 0.02 | 366,095.48 | 699,723.98 |
| 8,178.00 | 1.90 | 212.60 | -5,058.77 | 8,176.77 | -30.48 | -95.09 | 95.34 | 0.03 | 366,090.52 | 699,720.91 |
| 8,224.00 | 1.80 | 208.50 | -5,104.75 | 8,222.75 | -31.75 | -95.85 | 96.11 | 0.36 | 366,089.25 | 699,720.15 |
| 8,269.00 | 2.90 | 278.60 | -5,149.72 | 8,267.72 | -32.21 | -97.31 | 97.57 | 6.32 | 366,088.79 | 699,718.69 |
| 8,314.00 | 11.00 | 269.80 | -5,194.35 | 8,312.35 | -32.05 | -102.74 | 103.00 | 18.10 | 366,088.95 | 699,713.26 |
| 8,359.00 | 18.10 | 257.00 | -5,237.89 | 8,355.89 | -33.64 | -113.86 | 114.13 | 17.23 | 366,087.36 | 699,702.14 |
| 8,405.00 | 22.20 | 254.10 | -5,281.07 | 8,399.07 | -37.63 | -129.19 | 129.49 | 9.17 | 366,083.37 | 699,686.81 |
| 8,450.00 | 24.50 | 255.40 | -5,322.38 | 8,440.38 | -42.31 | -146.40 | 146.74 | 5.24 | 366,078.69 | 699,669.60 |

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|---|---|---|---|
| **Company:** | Chesapeake Operating Inc. | **Local Co-ordinate Reference:** | Well #1H |
| **Project:** | Lea County, NM (NAD27-NME) | **TVD Reference:** | KB @ 3118.00usft (Trinidad 110) |
| **Site:** | Paduca Breaks 32-26-32 State | **MD Reference:** | KB @ 3118.00usft (Trinidad 110) |
| **Well:** | #1H | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 / Job #1310147 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys (Trinidad 110) | **Database:** | GCR DB |

**Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVDSS (usft) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 8,452.26 | 24.32 | 255.60 | -5,324.44 | 8,442.44 | -42.55 | -147.30 | 147.65 | 8.76 | 366,078.45 | 699,668.70 |
| **330' FEL Perf hardline** | | | | | | | | | | |
| 8,496.00 | 20.90 | 260.10 | -5,364.81 | 8,482.81 | -46.13 | -163.72 | 164.09 | 8.76 | 366,074.87 | 699,652.28 |
| 8,541.00 | 23.50 | 255.60 | -5,406.48 | 8,524.48 | -49.74 | -180.32 | 180.72 | 6.90 | 366,071.26 | 699,635.68 |
| 8,586.00 | 31.10 | 254.70 | -5,446.43 | 8,564.43 | -55.05 | -200.25 | 200.69 | 16.91 | 366,065.95 | 699,615.75 |
| 8,631.00 | 37.70 | 258.60 | -5,483.55 | 8,601.55 | -60.84 | -224.98 | 225.47 | 15.46 | 366,060.16 | 699,591.02 |
| 8,676.00 | 40.50 | 262.80 | -5,518.47 | 8,636.47 | -65.39 | -252.97 | 253.50 | 8.56 | 366,055.61 | 699,563.03 |
| 8,721.00 | 41.70 | 265.20 | -5,552.39 | 8,670.39 | -68.48 | -282.39 | 282.94 | 4.40 | 366,052.52 | 699,533.61 |
| 8,766.00 | 45.50 | 268.30 | -5,584.97 | 8,702.97 | -70.21 | -313.36 | 313.92 | 9.69 | 366,050.79 | 699,502.64 |
| 8,811.00 | 52.00 | 266.40 | -5,614.63 | 8,732.63 | -71.80 | -347.13 | 347.71 | 14.79 | 366,049.20 | 699,468.87 |
| 8,857.00 | 57.70 | 264.80 | -5,641.10 | 8,759.10 | -74.70 | -384.61 | 385.21 | 12.71 | 366,046.30 | 699,431.39 |
| 8,902.00 | 63.10 | 264.40 | -5,663.32 | 8,781.32 | -78.38 | -423.55 | 424.18 | 12.02 | 366,042.62 | 699,392.45 |
| 8,947.00 | 70.40 | 263.60 | -5,681.07 | 8,799.07 | -82.71 | -464.64 | 465.31 | 16.30 | 366,038.29 | 699,351.36 |
| 8,992.00 | 77.40 | 264.20 | -5,693.54 | 8,811.54 | -87.30 | -507.61 | 508.31 | 15.61 | 366,033.70 | 699,308.39 |
| 9,031.00 | 84.20 | 268.30 | -5,699.78 | 8,817.78 | -89.80 | -545.99 | 546.71 | 20.29 | 366,031.20 | 699,270.01 |
| 9,082.00 | 91.10 | 270.50 | -5,701.87 | 8,819.87 | -90.33 | -596.91 | 597.63 | 14.20 | 366,030.67 | 699,219.09 |
| 9,172.00 | 94.70 | 270.50 | -5,697.31 | 8,815.31 | -89.55 | -686.78 | 687.49 | 4.00 | 366,031.45 | 699,129.22 |
| 9,263.00 | 93.90 | 273.70 | -5,690.49 | 8,808.49 | -86.22 | -777.45 | 778.13 | 3.62 | 366,034.78 | 699,038.55 |
| 9,353.00 | 90.20 | 273.00 | -5,687.27 | 8,805.27 | -80.97 | -867.22 | 867.86 | 4.18 | 366,040.03 | 698,948.78 |
| 9,443.00 | 89.00 | 272.70 | -5,687.90 | 8,805.90 | -76.49 | -957.11 | 957.70 | 1.37 | 366,044.51 | 698,858.89 |
| 9,533.00 | 89.80 | 271.30 | -5,688.84 | 8,806.84 | -73.35 | -1,047.04 | 1,047.61 | 1.79 | 366,047.65 | 698,768.96 |
| 9,624.00 | 89.50 | 270.80 | -5,689.40 | 8,807.40 | -71.68 | -1,138.03 | 1,138.58 | 0.64 | 366,049.32 | 698,677.97 |
| 9,714.00 | 90.90 | 270.50 | -5,689.08 | 8,807.08 | -70.66 | -1,228.02 | 1,228.56 | 1.59 | 366,050.34 | 698,587.98 |
| 9,804.00 | 90.50 | 269.50 | -5,687.98 | 8,805.98 | -70.66 | -1,318.01 | 1,318.55 | 1.20 | 366,050.34 | 698,497.99 |
| 9,894.00 | 92.60 | 270.30 | -5,685.55 | 8,803.55 | -70.82 | -1,407.97 | 1,408.51 | 2.50 | 366,050.18 | 698,408.03 |
| 9,985.00 | 93.70 | 270.80 | -5,680.55 | 8,798.55 | -69.95 | -1,498.83 | 1,499.35 | 1.33 | 366,051.05 | 698,317.17 |
| 10,075.00 | 91.70 | 270.10 | -5,676.31 | 8,794.31 | -69.24 | -1,588.72 | 1,589.23 | 2.35 | 366,051.76 | 698,227.28 |

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|---|---|---|---|
| **Company:** | Chesapeake Operating Inc. | **Local Co-ordinate Reference:** | Well #1H |
| **Project:** | Lea County, NM (NAD27 NME) | **TVD Reference:** | KB @ 3118.00usft (Trinidad 110) |
| **Site:** | Paduca Breaks 32-26-32 State | **MD Reference:** | KB @ 3118.00usft (Trinidad 110) |
| **Well:** | #1H | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 / Job #1310147 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys (Trinidad 110) | **Database:** | GCR DB |

**Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVDSS (usft) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 10,165.00 | 90.60 | 270.80 | -5,674.50 | 8,792.50 | -68.54 | -1,678.70 | 1,679.20 | 1.45 | 366,052.46 | 698,137.30 |
| 10,256.00 | 91.40 | 270.10 | -5,672.92 | 8,790.92 | -67.82 | -1,769.68 | 1,770.18 | 1.17 | 366,053.18 | 698,046.32 |
| 10,346.00 | 96.10 | 270.90 | -5,667.03 | 8,785.03 | -67.04 | -1,859.46 | 1,859.94 | 5.30 | 366,053.96 | 697,956.54 |
| 10,436.00 | 97.80 | 271.50 | -5,656.14 | 8,774.14 | -65.17 | -1,948.77 | 1,949.24 | 2.00 | 366,055.83 | 697,867.23 |
| 10,527.00 | 95.60 | 270.00 | -5,645.52 | 8,763.52 | -63.99 | -2,039.14 | 2,039.59 | 2.92 | 366,057.01 | 697,776.86 |
| 10,617.00 | 94.50 | 270.70 | -5,637.60 | 8,755.60 | -63.44 | -2,128.78 | 2,129.23 | 1.45 | 366,057.56 | 697,687.22 |
| 10,707.00 | 93.70 | 270.20 | -5,631.17 | 8,749.17 | -62.74 | -2,218.55 | 2,218.99 | 1.05 | 366,058.26 | 697,597.45 |
| 10,797.00 | 89.10 | 269.60 | -5,628.97 | 8,746.97 | -62.89 | -2,308.50 | 2,308.94 | 5.15 | 366,058.11 | 697,507.50 |
| 10,887.00 | 88.40 | 269.10 | -5,630.93 | 8,748.93 | -63.91 | -2,398.47 | 2,398.91 | 0.96 | 366,057.09 | 697,417.53 |
| 10,978.00 | 91.50 | 269.20 | -5,631.01 | 8,749.01 | -65.26 | -2,489.45 | 2,489.90 | 3.41 | 366,055.74 | 697,326.55 |
| 11,068.00 | 94.10 | 269.60 | -5,626.61 | 8,744.61 | -66.21 | -2,579.33 | 2,579.78 | 2.92 | 366,054.79 | 697,236.67 |
| 11,158.00 | 92.50 | 268.70 | -5,621.43 | 8,739.43 | -67.54 | -2,669.16 | 2,669.63 | 2.04 | 366,053.46 | 697,146.84 |
| 11,248.00 | 91.80 | 268.10 | -5,618.06 | 8,736.06 | -70.05 | -2,759.07 | 2,759.55 | 1.02 | 366,050.95 | 697,056.93 |
| 11,338.00 | 91.80 | 270.80 | -5,615.23 | 8,733.23 | -70.91 | -2,849.01 | 2,849.49 | 3.00 | 366,050.09 | 696,966.99 |
| 11,429.00 | 89.90 | 270.50 | -5,613.88 | 8,731.88 | -69.88 | -2,939.99 | 2,940.46 | 2.11 | 366,051.12 | 696,876.01 |
| 11,519.00 | 88.30 | 270.30 | -5,615.29 | 8,733.29 | -69.25 | -3,029.97 | 3,030.44 | 1.79 | 366,051.75 | 696,786.03 |
| 11,610.00 | 89.20 | 270.60 | -5,617.28 | 8,735.28 | -68.54 | -3,120.95 | 3,121.40 | 1.04 | 366,052.46 | 696,695.05 |
| 11,700.00 | 91.00 | 272.10 | -5,617.12 | 8,735.12 | -66.42 | -3,210.91 | 3,211.35 | 2.60 | 366,054.58 | 696,605.09 |
| 11,790.00 | 93.00 | 273.40 | -5,613.98 | 8,731.98 | -62.10 | -3,300.75 | 3,301.15 | 2.65 | 366,058.90 | 696,515.25 |
| 11,880.00 | 92.80 | 272.20 | -5,609.43 | 8,727.43 | -57.71 | -3,390.53 | 3,390.89 | 1.35 | 366,063.29 | 696,425.47 |
| 11,971.00 | 90.50 | 270.30 | -5,606.81 | 8,724.81 | -55.73 | -3,481.46 | 3,481.80 | 3.28 | 366,065.27 | 696,334.54 |
| 12,061.00 | 89.50 | 270.40 | -5,606.81 | 8,724.81 | -55.18 | -3,571.45 | 3,571.79 | 1.12 | 366,065.82 | 696,244.55 |
| 12,151.00 | 88.90 | 270.40 | -5,608.06 | 8,726.06 | -54.55 | -3,661.44 | 3,661.77 | 0.67 | 366,066.45 | 696,154.56 |
| 12,242.00 | 90.00 | 271.60 | -5,608.94 | 8,726.94 | -52.96 | -3,752.42 | 3,752.73 | 1.79 | 366,068.04 | 696,063.58 |
| 12,332.00 | 90.00 | 271.90 | -5,608.94 | 8,726.94 | -50.22 | -3,842.38 | 3,842.66 | 0.33 | 366,070.78 | 695,973.62 |
| 12,422.00 | 88.20 | 271.50 | -5,610.35 | 8,728.35 | -47.55 | -3,932.32 | 3,932.58 | 2.05 | 366,073.45 | 695,883.68 |
| 12,512.00 | 88.20 | 272.10 | -5,613.18 | 8,731.18 | -44.72 | -4,022.23 | 4,022.47 | 0.67 | 366,076.28 | 695,793.77 |

| | | | |
|---|---|---|---|
| **Company:** | Chesapeake Operating Inc. | **Local Co-ordinate Reference:** | Well #1H |
| **Project:** | Lea County, NM (NAD27 NME) | **TVD Reference:** | KB @ 3118.00usft (Trinidad 110) |
| **Site:** | Paduca Breaks 32-26-32 State | **MD Reference:** | KB @ 3118.00usft (Trinidad 110) |
| **Well:** | #1H | **North Reference:** | Grid |
| **Wellbore:** | Wellbore #1 / Job #1310147 | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | Surveys (Trinidad 110) | **Database:** | GCR DB |

**Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVDSS (usft) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 12,603.00 | 88.70 | 272.40 | -5,615.64 | 8,733.64 | -41.15 | -4,113.13 | 4,113.33 | 0.64 | 366,079.85 | 695,702.87 |
| 12,693.00 | 90.30 | 272.40 | -5,616.42 | 8,734.42 | -37.38 | -4,203.05 | 4,203.21 | 1.78 | 366,083.62 | 695,612.95 |
| 12,783.00 | 90.70 | 272.40 | -5,615.64 | 8,733.64 | -33.61 | -4,292.96 | 4,293.09 | 0.44 | 366,087.39 | 695,523.04 |
| 12,874.00 | 92.50 | 272.20 | -5,613.10 | 8,731.10 | -29.96 | -4,383.85 | 4,383.95 | 1.99 | 366,091.04 | 695,432.15 |
| 12,964.00 | 93.90 | 273.00 | -5,608.07 | 8,726.07 | -25.89 | -4,473.61 | 4,473.68 | 1.79 | 366,095.11 | 695,342.39 |
| 13,054.00 | 93.90 | 273.20 | -5,601.95 | 8,719.95 | -21.03 | -4,563.28 | 4,563.29 | 0.22 | 366,099.97 | 695,252.72 |
| 13,144.00 | 94.40 | 273.50 | -5,595.44 | 8,713.44 | -15.78 | -4,652.89 | 4,652.86 | 0.65 | 366,105.22 | 695,163.11 |
| 13,176.00 | 93.90 | 273.50 | -5,593.12 | 8,711.12 | -13.84 | -4,684.74 | 4,684.70 | 1.56 | 366,107.16 | 695,131.26 |
| **Current MWD Survey** | | | | | | | | | | |
| 13,245.00 | 93.90 | 273.50 | -5,588.43 | 8,706.43 | -9.63 | -4,753.45 | 4,753.37 | 0.00 | 366,111.37 | 695,062.55 |
| **Projection to Bit** | | | | | | | | | | |

**Survey Annotations**

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates +N/-S (usft) | Local Coordinates +E/-W (usft) | Comment |
|---|---|---|---|---|
| 171.00 | 170.99 | 1.12 | -0.41 | Phoenix First MWD Survey |
| 8,452.26 | 8,442.44 | -42.55 | -147.30 | 330' FEL Perf hardline |
| 13,176.00 | 8,711.12 | -13.84 | -4,684.74 | Current MWD Survey |
| 13,245.00 | 8,706.43 | -9.63 | -4,753.45 | Projection to Bit |

Checked By: _____ Approved By: _____ Date: _____

Chesapeake ENERGY

# Project: Lea County, NM (NAD27 NME)
# Site: Paduca Breaks 32-26-32 State
# Well: #1H
# Wellbore: Wellbore #1 / Job #1310147
# Design: Plan #4 03-03-13

PHOENIX TECHNOLOGY SERVICES

T G M

Azimuths to Grid North
True North: -0.34°
Magnetic North: 7.07°

Magnetic Field
Strength: 48303.5snT
Dip Angle: 59.92°
Date: 02/26/2013
Model: IGRF2010_14

## WELL DETAILS

Ground Level: 3101.00

| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 366121.00 | 699816.00 | 32° 0' 17.7932 N | 103° 41' 19.4134 W |

## SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect | Target | Annotation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10256.00 | 91.40 | 270.10 | 8790.92 | -67.82 | -1769.68 | 0.00 | 0.00 | 1770.17 | | Tie-on to MWD Survey |
| 2 | 10325.00 | 91.40 | 270.10 | 8789.23 | -67.70 | -1838.66 | 0.00 | 0.00 | 1839.15 | | Start DLS 2.00 TFO 16.22 |
| 3 | 10408.32 | 93.00 | 270.57 | 8786.03 | -67.22 | -1921.91 | 2.00 | 16.22 | 1922.40 | PBHL-PB 32-26-32 #1H v2 | Start 500.00 hold at 10408.32 MD |
| 4 | 10908.32 | 93.00 | 270.57 | 8759.86 | -62.28 | -2421.20 | 0.00 | 0.00 | 2421.63 | | Start Drop -2.00 |
| 5 | 10992.92 | 91.31 | 270.57 | 8756.68 | -61.45 | -2505.74 | 2.00 | 180.00 | 2506.16 | | Start 2272.97 hold at 10992.92 MD |
| 6 | 13265.89 | 91.31 | 270.57 | 8704.80 | -39.00 | -4778.00 | 0.00 | 0.00 | 4778.16 | PBHL-PB 32-26-32 #1H v2 | TD at 13265.89 |

## DESIGN TARGET DETAILS

| Name | TVD | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | Shape |
|---|---|---|---|---|---|---|---|---|
| PBHL-PB 32-26-32 #1H v2 | 8704.80 | -39.00 | -4778.00 | 366082.00 | 695038.00 | 32° 0' 17.6859 N | 103° 42' 14.9030 W | Rectangle (Sides: L40.00 W100.00) |
| | - plan hits target center | | | | | | | |

## PROJECT DETAILS: Lea County, NM (NAD27 NME)

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001

System Datum: Mean Sea Level

## SITE DETAILS: Paduca Breaks 32-26-32 State

Site Centre Northing: 366121.00
Easting: 699816.00

Positional Uncertainty: 0.00
Convergence: 0.34
Local North: Grid

## CASING DETAILS

| TVD | MD | Name | Size |
|---|---|---|---|
| 900.00 | | 13 3/8" Surface | 13-3/8 |
| 4200.00 | | 8 5/8" Intermediate | 8-5/8 |
| | 13394.14 | 5 1/2" Production | 5-1/2 |

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

Local Origin: Well #1H, Grid North

Latitude: 32° 0' 17.7932 N
Longitude: 103° 41' 19.4134 W

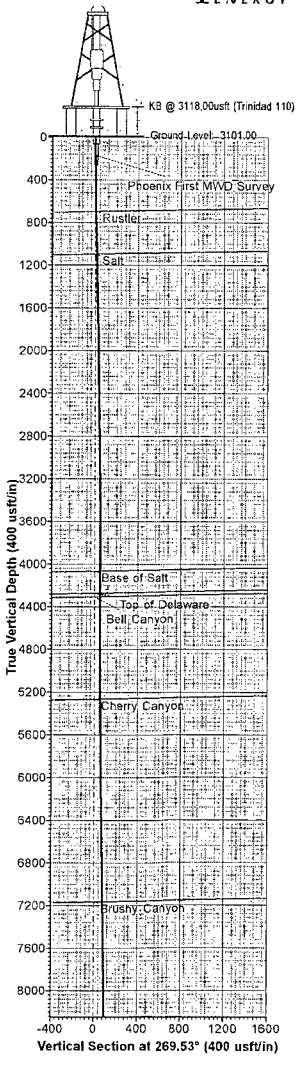
Grid East: 699816.00
Grid North: 366121.00
Scale Factor: 1.000

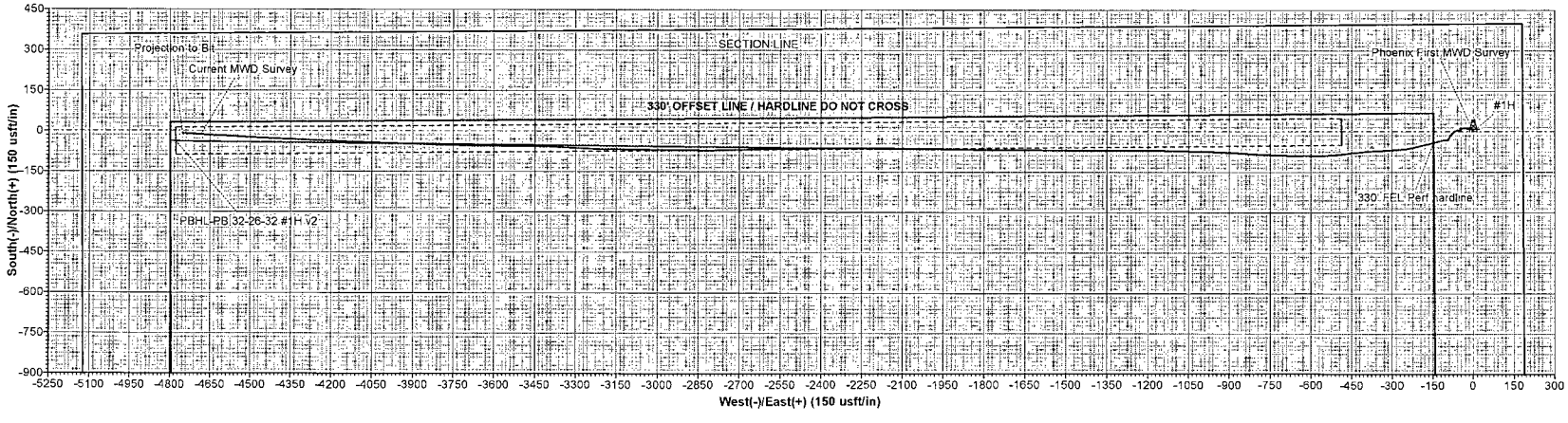
Geomagnetic Model: IGRF2010_14
Sample Date: 26-Feb-13
Magnetic Declination: 7.42°
Dip Angle from Horizontal: 59.92°
Magnetic Field Strength: 48304

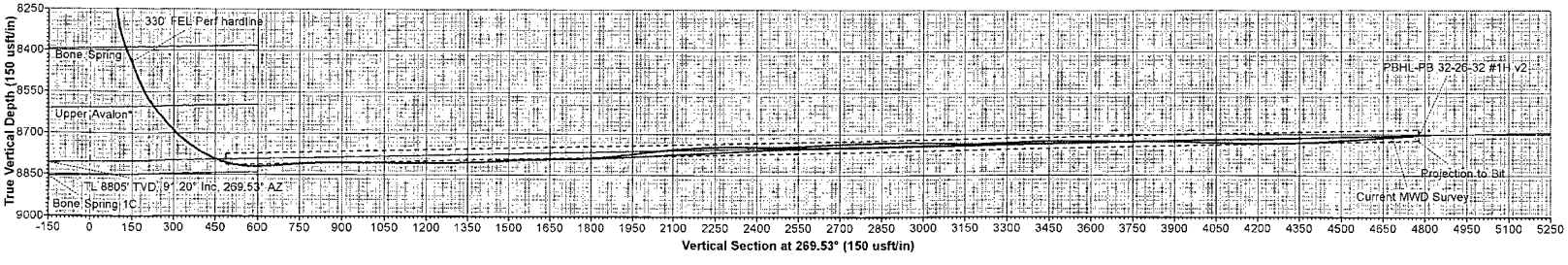
To convert a Magnetic Direction to a Grid Direction, Add 7.07°
To convert a Magnetic Direction to a True Direction, Add 7.42° East
To convert a True Direction to a Grid Direction, Subtract 0.34°

## LEGEND

#1H, Wellbore #1 / Job #1310147, Surveys (Trinidad 110) V0
Plan #4 03-03-13




## FORMATION TOP DETAILS

| TVDPath | MDPath | Formation | DipAngle | DipDir |
|---|---|---|---|---|
| 8706.15 | 13206.66 | TL 8805' TVD, 91.20° Inc, 269.53° AZ | -1.20 | 269.53 |

Created By: Julio Piña Date: 15:42, March 05 2013

Chesapeake Operating Inc.

Paduca Breaks 32-26-32 State #1H
Lea County, NM (NAD27 NME)
Wellbore #1 / Job #1310147
Phoenix MWD Survey
KB Elev: 3118.00'
GL Elev: 3101.00'

SUR: A-32-26S-32E, 400/n & 182/e
BHL: D-32-26S-32E, 410/N & 4935/E
API # 30-025-40922

Surface Loc.:
Northing: (Y) 699816.00
Easting: (X) 366121.00

Survey Type Information:
H 171.00 - 13245.00 PHOENIX MWD SURVEY : MWD

| Measured Depth (ft) | Incl. (ft) | Azim. | Sub-Sea Depth (ft) | Vertical Section (ft) | Vertical Depth (ft) | Dogleg Rate (°/100ft) | Local Coordinates (+N/-S) (ft) (+E/-W) (ft) | UTM Coordinates Northings (ft) | Eastings (ft) | Annotation |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | -3118.00 | | 0.00 | | 0.00 | 0.00 | 366121.00 | 699816.00 | |
| 171.00 | 0.80 | 339.70 | -2947.01 | 0.00 | 170.99 | 0.00 | 1.12 | -0.41 | 366122.12 | 699815.59 | Phoenix First MWD Survey - MWD |
| 298.00 | 0.80 | 348.90 | -2820.02 | 0.40 | 297.98 | 0.47 | 2.82 | -0.89 | 366123.82 | 699815.11 | |
| 480.00 | 0.60 | 345.60 | -2638.03 | 0.87 | 479.97 | 0.10 | 4.99 | -1.37 | 366125.99 | 699814.63 | |
| 670.00 | 0.80 | 286.00 | -2448.04 | 1.33 | 669.96 | 0.11 | 6.32 | -2.90 | 366127.32 | 699813.10 | |
| 812.00 | 1.70 | 299.30 | -2306.08 | 2.84 | 811.92 | 0.38 | 7.62 | -5.69 | 366128.62 | 699810.31 | |
| 989.00 | 1.20 | 291.90 | -2129.14 | 5.62 | 988.86 | 0.66 | 9.60 | -9.70 | 366130.60 | 699806.30 | |
| 1179.00 | 1.20 | 283.40 | -1939.18 | 9.62 | 1178.82 | 0.30 | 10.80 | -13.48 | 366131.80 | 699802.52 | |
| 1369.00 | 1.30 | 288.90 | -1749.22 | 13.39 | 1368.78 | 0.09 | 11.96 | -17.45 | 366132.96 | 699798.55 | |
| 1559.00 | 1.10 | 278.40 | -1559.26 | 17.35 | 1558.74 | 0.08 | 12.93 | -21.29 | 366133.93 | 699794.71 | |
| 1749.00 | 1.00 | 287.60 | -1369.30 | 21.19 | 1748.70 | 0.16 | 13.70 | -24.68 | 366134.70 | 699791.32 | |
| 1939.00 | 1.00 | 260.40 | -1179.32 | 24.57 | 1938.68 | 0.10 | 13.92 | -27.89 | 366134.92 | 699788.11 | |
| 2129.00 | 0.50 | 272.00 | -989.34 | 27.78 | 2128.66 | 0.25 | 13.67 | -30.36 | 366134.67 | 699785.64 | |
| 2320.00 | 0.80 | 246.50 | -798.35 | 30.24 | 2319.65 | 0.27 | 13.17 | -32.41 | 366134.17 | 699783.59 | |
| 2510.00 | 0.70 | 266.80 | -608.37 | 32.30 | 2509.63 | 0.21 | 12.58 | -34.79 | 366133.58 | 699781.21 | |
| 2700.00 | 0.80 | 265.20 | -418.38 | 34.68 | 2699.62 | 0.15 | 12.40 | -37.27 | 366133.40 | 699778.73 | |
| 2890.00 | 0.90 | 270.00 | -228.41 | 37.17 | 2889.59 | 0.05 | 12.29 | -40.08 | 366133.29 | 699775.92 | |
| 3080.00 | 1.10 | 268.60 | -38.43 | 39.98 | 3079.57 | 0.06 | 12.24 | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| -43.40 | 366133.24 | 699772.60 | | 43.30 | 0.11 | |
| 3271.00 | 0.50 | 278.70 | 152.55 | 3270.55 | | 12.33 |
| -46.06 | 366133.33 | 699769.94 | | 45.95 | 0.32 | |
| 3461.00 | 0.50 | 277.90 | 342.54 | 3460.54 | | 12.57 |
| -47.70 | 366133.57 | 699768.30 | | 47.59 | 0.00 | |
| 3651.00 | 0.50 | 250.90 | 532.53 | 3650.53 | | 12.41 |
| -49.30 | 366133.41 | 699766.70 | | 49.20 | 0.12 | |
| 3842.00 | 0.30 | 201.00 | 723.53 | 3841.53 | | 11.67 |
| -50.27 | 366132.67 | 699765.73 | | 50.17 | 0.20 | |
| 4032.00 | 0.70 | 161.80 | 913.52 | 4031.52 | | 10.10 |
| -50.08 | 366131.10 | 699765.92 | | 50.00 | 0.27 | |
| 4116.00 | 0.90 | 158.50 | 997.51 | 4115.51 | | 9.00 |
| -49.68 | 366130.00 | 699766.32 | | 49.61 | 0.24 | |
| 4289.00 | 0.40 | 153.10 | 1170.50 | 4288.50 | | 7.20 |
| -48.91 | 366128.20 | 699767.09 | | 48.85 | 0.29 | |
| 4479.00 | 0.20 | 163.90 | 1360.50 | 4478.50 | | 6.29 |
| -48.52 | 366127.29 | 699767.48 | | 48.46 | 0.11 | |
| 4670.00 | 0.30 | 181.60 | 1551.50 | 4669.50 | | 5.47 |
| -48.44 | 366126.47 | 699767.56 | | 48.39 | 0.07 | |
| 4860.00 | 0.50 | 233.70 | 1741.49 | 4859.49 | | 4.48 |
| -49.12 | 366125.48 | 699766.88 | | 49.08 | 0.21 | |
| 5050.00 | 0.50 | 270.30 | 1931.49 | 5049.49 | | 3.99 |
| -50.62 | 366124.99 | 699765.38 | | 50.58 | 0.17 | |
| 5241.00 | 0.70 | 273.20 | 2122.47 | 5240.47 | | 4.06 |
| -52.62 | 366125.06 | 699763.38 | | 52.58 | 0.11 | |
| 5431.00 | 0.60 | 294.10 | 2312.46 | 5430.46 | | 4.53 |
| -54.68 | 366125.53 | 699761.32 | | 54.64 | 0.13 | |
| 5621.00 | 0.70 | 278.30 | 2502.45 | 5620.45 | | 5.11 |
| -56.74 | 366126.11 | 699759.26 | | 56.70 | 0.11 | |
| 5812.00 | 0.60 | 252.80 | 2693.44 | 5811.44 | | 4.98 |
| -58.85 | 366125.98 | 699757.15 | | 58.81 | 0.16 | |
| 6002.00 | 0.60 | 247.30 | 2883.43 | 6001.43 | | 4.30 |
| -60.72 | 366125.30 | 699755.28 | | 60.68 | 0.03 | |
| 6192.00 | 0.70 | 263.80 | 3073.42 | 6191.42 | | 3.79 |
| -62.79 | 366124.79 | 699753.21 | | 62.76 | 0.11 | |
| 6377.00 | 0.60 | 241.90 | 3258.40 | 6376.40 | | 3.21 |
| -64.77 | 366124.21 | 699751.23 | | 64.74 | 0.14 | |
| 6557.00 | 1.00 | 232.30 | 3438.39 | 6556.39 | | 1.81 |
| -66.84 | 366122.81 | 699749.16 | | 66.82 | 0.23 | |
| 6738.00 | 1.20 | 239.20 | 3619.35 | 6737.35 | | -0.13 |
| -69.72 | 366120.87 | 699746.28 | | 69.72 | 0.13 | |
| 6919.00 | 1.10 | 235.10 | 3800.32 | 6918.32 | | -2.09 |
| -72.77 | 366118.91 | 699743.23 | | 72.79 | 0.07 | |
| 7099.00 | 1.00 | 219.50 | 3980.29 | 7098.29 | | -4.29 |
| -75.19 | 366116.71 | 699740.81 | | 75.22 | 0.17 | |
| 7280.00 | 1.70 | 227.90 | 4161.24 | 7279.24 | | -7.31 |
| -78.18 | 366113.69 | 699737.82 | | 78.24 | 0.40 | |
| 7460.00 | 1.70 | 221.20 | 4341.16 | 7459.16 | | -11.11 |
| -81.92 | 366109.89 | 699734.08 | | 82.01 | 0.11 | |
| 7640.00 | 1.90 | 219.30 | 4521.07 | 7639.07 | | -15.43 |
| -85.57 | 366105.57 | 699730.43 | | 85.70 | 0.12 | |
| 7821.00 | 1.90 | 209.90 | 4701.97 | 7819.97 | | -20.35 |
| -88.97 | 366100.65 | 699727.03 | | 89.13 | 0.17 | |
| 8002.00 | 1.90 | 211.10 | 4882.87 | 8000.87 | | -25.52 |
| -92.02 | 366095.48 | 699723.98 | | 92.22 | 0.02 | |
| 8178.00 | 1.90 | 212.60 | 5058.77 | 8176.77 | | -30.48 |
| -95.09 | 366090.52 | 699720.91 | | 95.34 | 0.03 | |
| 8224.00 | 1.80 | 208.50 | 5104.75 | 8222.75 | | -31.75 |
| -95.85 | 366089.25 | 699720.15 | | 96.11 | 0.36 | |
| 8269.00 | 2.90 | 278.60 | 5149.72 | 8267.72 | | -32.21 |
| -97.31 | 366088.79 | 699718.69 | | 97.57 | 6.32 | |
| 8314.00 | 11.00 | 269.80 | 5194.35 | 8312.35 | | -32.05 |
| -102.74 | 366088.95 | 699713.26 | | 103.00 | 18.10 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8359.00 | 18.10 | 257.00 | 5237.89 | 8355.89 | -33.64 | |
| -113.86 | 366087.36 | 699702.14 | 114.13 | 17.23 | | |
| 8405.00 | 22.20 | 254.10 | 5281.07 | 8399.07 | -37.63 | |
| -129.19 | 366083.37 | 699686.81 | 129.49 | 9.17 | | |
| 8450.00 | 24.50 | 255.40 | 5322.38 | 8440.38 | -42.31 | |
| -146.40 | 366078.69 | 699669.60 | 146.74 | 5.24 | | |
| 8452.26 | 24.32 | 255.60 | 5324.44 | 8442.44 | -42.55 | |
| -147.30 | 366078.45 | 699668.70 | 147.65 | 8.76 | 330' FEL | |
| Perf hardline | | | | | | |
| 8496.00 | 20.90 | 260.10 | 5364.81 | 8482.81 | -46.13 | |
| -163.72 | 366074.87 | 699652.28 | 164.09 | 8.76 | | |
| 8541.00 | 23.50 | 255.60 | 5406.48 | 8524.48 | -49.74 | |
| -180.32 | 366071.26 | 699635.68 | 180.72 | 6.90 | | |
| 8586.00 | 31.10 | 254.70 | 5446.43 | 8564.43 | -55.05 | |
| -200.25 | 366065.95 | 699615.75 | 200.69 | 16.91 | | |
| 8631.00 | 37.70 | 258.60 | 5483.55 | 8601.55 | -60.84 | |
| -224.98 | 366060.16 | 699591.02 | 225.47 | 15.46 | | |
| 8676.00 | 40.50 | 262.80 | 5518.47 | 8636.47 | -65.39 | |
| -252.97 | 366055.61 | 699563.03 | 253.50 | 8.56 | | |
| 8721.00 | 41.70 | 265.20 | 5552.39 | 8670.39 | -68.48 | |
| -282.39 | 366052.52 | 699533.61 | 282.94 | 4.40 | | |
| 8766.00 | 45.50 | 268.30 | 5584.97 | 8702.97 | -70.21 | |
| -313.36 | 366050.79 | 699502.64 | 313.92 | 9.69 | | |
| 8811.00 | 52.00 | 266.40 | 5614.63 | 8732.63 | -71.80 | |
| -347.13 | 366049.20 | 699468.87 | 347.71 | 14.79 | | |
| 8857.00 | 57.70 | 264.80 | 5641.10 | 8759.10 | -74.70 | |
| -384.61 | 366046.30 | 699431.39 | 385.21 | 12.71 | | |
| 8902.00 | 63.10 | 264.40 | 5663.32 | 8781.32 | -78.38 | |
| -423.55 | 366042.62 | 699392.45 | 424.18 | 12.02 | | |
| 8947.00 | 70.40 | 263.60 | 5681.07 | 8799.07 | -82.71 | |
| -464.64 | 366038.29 | 699351.36 | 465.31 | 16.30 | | |
| 8992.00 | 77.40 | 264.20 | 5693.54 | 8811.54 | -87.30 | |
| -507.61 | 366033.70 | 699308.39 | 508.31 | 15.61 | | |
| 9031.00 | 84.20 | 268.30 | 5699.78 | 8817.78 | -89.80 | |
| -545.99 | 366031.20 | 699270.01 | 546.71 | 20.29 | | |
| 9082.00 | 91.10 | 270.50 | 5701.87 | 8819.87 | -90.33 | |
| -596.91 | 366030.67 | 699219.09 | 597.63 | 14.20 | | |
| 9172.00 | 94.70 | 270.50 | 5697.31 | 8815.31 | -89.55 | |
| -686.78 | 366031.45 | 699129.22 | 687.49 | 4.00 | | |
| 9263.00 | 93.90 | 273.70 | 5690.49 | 8808.49 | -86.22 | |
| -777.45 | 366034.78 | 699038.55 | 778.13 | 3.62 | | |
| 9353.00 | 90.20 | 273.00 | 5687.27 | 8805.27 | -80.97 | |
| -867.22 | 366040.03 | 698948.78 | 867.86 | 4.18 | | |
| 9443.00 | 89.00 | 272.70 | 5687.90 | 8805.90 | -76.49 | |
| -957.11 | 366044.51 | 698858.89 | 957.70 | 1.37 | | |
| 9533.00 | 89.80 | 271.30 | 5688.84 | 8806.84 | -73.35 | |
| -1047.04 | 366047.65 | 698768.96 | 1047.61 | 1.79 | | |
| 9624.00 | 89.50 | 270.80 | 5689.40 | 8807.40 | -71.68 | |
| -1138.03 | 366049.32 | 698677.97 | 1138.58 | 0.64 | | |
| 9714.00 | 90.90 | 270.50 | 5689.08 | 8807.08 | -70.66 | |
| -1228.02 | 366050.34 | 698587.98 | 1228.56 | 1.59 | | |
| 9804.00 | 90.50 | 269.50 | 5687.98 | 8805.98 | -70.66 | |
| -1318.01 | 366050.34 | 698497.99 | 1318.55 | 1.20 | | |
| 9894.00 | 92.60 | 270.30 | 5685.55 | 8803.55 | -70.82 | |
| -1407.97 | 366050.18 | 698408.03 | 1408.51 | 2.50 | | |
| 9985.00 | 93.70 | 270.80 | 5680.55 | 8798.55 | -69.95 | |
| -1498.83 | 366051.05 | 698317.17 | 1499.35 | 1.33 | | |
| 10075.00 | 91.70 | 270.10 | 5676.31 | 8794.31 | -69.24 | |
| -1588.72 | 366051.76 | 698227.28 | 1589.23 | 2.35 | | |
| 10165.00 | 90.60 | 270.80 | 5674.50 | 8792.50 | -68.54 | |
| -1678.70 | 366052.46 | 698137.30 | 1679.20 | 1.45 | | |
| 10256.00 | 91.40 | 270.10 | 5672.92 | 8790.92 | -67.82 | |
| -1769.68 | 366053.18 | 698046.32 | 1770.18 | 1.17 | | |

| | | | | | |
|---|---|---|---|---|---|
| 10346.00 | 96.10 | 270.90 | 5667.03 | 8785.03 | -67.04 |
| -1859.46 | 366053.96 | 697956.54 | 1859.94 | 5.30 | |
| 10436.00 | 97.80 | 271.50 | 5656.14 | 8774.14 | -65.17 |
| -1948.77 | 366055.83 | 697867.23 | 1949.24 | 2.00 | |
| 10527.00 | 95.60 | 270.00 | 5645.52 | 8763.52 | -63.99 |
| -2039.14 | 366057.01 | 697776.86 | 2039.59 | 2.92 | |
| 10617.00 | 94.50 | 270.70 | 5637.60 | 8755.60 | -63.44 |
| -2128.78 | 366057.56 | 697687.22 | 2129.23 | 1.45 | |
| 10707.00 | 93.70 | 270.20 | 5631.17 | 8749.17 | -62.74 |
| -2218.55 | 366058.26 | 697597.45 | 2218.99 | 1.05 | |
| 10797.00 | 89.10 | 269.60 | 5628.97 | 8746.97 | -62.89 |
| -2308.50 | 366058.11 | 697507.50 | 2308.94 | 5.15 | |
| 10887.00 | 88.40 | 269.10 | 5630.93 | 8748.93 | -63.91 |
| -2398.47 | 366057.09 | 697417.53 | 2398.91 | 0.96 | |
| 10978.00 | 91.50 | 269.20 | 5631.01 | 8749.01 | -65.26 |
| -2489.45 | 366055.74 | 697326.55 | 2489.90 | 3.41 | |
| 11068.00 | 94.10 | 269.60 | 5626.61 | 8744.61 | -66.21 |
| -2579.33 | 366054.79 | 697236.67 | 2579.78 | 2.92 | |
| 11158.00 | 92.50 | 268.70 | 5621.43 | 8739.43 | -67.54 |
| -2669.16 | 366053.46 | 697146.84 | 2669.63 | 2.04 | |
| 11248.00 | 91.80 | 268.10 | 5618.06 | 8736.06 | -70.05 |
| -2759.07 | 366050.95 | 697056.93 | 2759.55 | 1.02 | |
| 11338.00 | 91.80 | 270.80 | 5615.23 | 8733.23 | -70.91 |
| -2849.01 | 366050.09 | 696966.99 | 2849.49 | 3.00 | |
| 11429.00 | 89.90 | 270.50 | 5613.88 | 8731.88 | -69.88 |
| -2939.99 | 366051.12 | 696876.01 | 2940.46 | 2.11 | |
| 11519.00 | 88.30 | 270.30 | 5615.29 | 8733.29 | -69.25 |
| -3029.97 | 366051.75 | 696786.03 | 3030.44 | 1.79 | |
| 11610.00 | 89.20 | 270.60 | 5617.28 | 8735.28 | -68.54 |
| -3120.95 | 366052.46 | 696695.05 | 3121.40 | 1.04 | |
| 11700.00 | 91.00 | 272.10 | 5617.12 | 8735.12 | -66.42 |
| -3210.91 | 366054.58 | 696605.09 | 3211.35 | 2.60 | |
| 11790.00 | 93.00 | 273.40 | 5613.98 | 8731.98 | -62.10 |
| -3300.75 | 366058.90 | 696515.25 | 3301.15 | 2.65 | |
| 11880.00 | 92.80 | 272.20 | 5609.43 | 8727.43 | -57.71 |
| -3390.53 | 366063.29 | 696425.47 | 3390.89 | 1.35 | |
| 11971.00 | 90.50 | 270.30 | 5606.81 | 8724.81 | -55.73 |
| -3481.46 | 366065.27 | 696334.54 | 3481.80 | 3.28 | |
| 12061.00 | 89.50 | 270.40 | 5606.81 | 8724.81 | -55.18 |
| -3571.45 | 366065.82 | 696244.55 | 3571.79 | 1.12 | |
| 12151.00 | 88.90 | 270.40 | 5608.06 | 8726.06 | -54.55 |
| -3661.44 | 366066.45 | 696154.56 | 3661.77 | 0.67 | |
| 12242.00 | 90.00 | 271.60 | 5608.94 | 8726.94 | -52.96 |
| -3752.42 | 366068.04 | 696063.58 | 3752.73 | 1.79 | |
| 12332.00 | 90.00 | 271.90 | 5608.94 | 8726.94 | -50.22 |
| -3842.38 | 366070.78 | 695973.62 | 3842.66 | 0.33 | |
| 12422.00 | 88.20 | 271.50 | 5610.35 | 8728.35 | -47.55 |
| -3932.32 | 366073.45 | 695883.68 | 3932.58 | 2.05 | |
| 12512.00 | 88.20 | 272.10 | 5613.18 | 8731.18 | -44.72 |
| -4022.23 | 366076.28 | 695793.77 | 4022.47 | 0.67 | |
| 12603.00 | 88.70 | 272.40 | 5615.64 | 8733.64 | -41.15 |
| -4113.13 | 366079.85 | 695702.87 | 4113.33 | 0.64 | |
| 12693.00 | 90.30 | 272.40 | 5616.42 | 8734.42 | -37.38 |
| -4203.05 | 366083.62 | 695612.95 | 4203.21 | 1.78 | |
| 12783.00 | 90.70 | 272.40 | 5615.64 | 8733.64 | -33.61 |
| -4292.96 | 366087.39 | 695523.04 | 4293.09 | 0.44 | |
| 12874.00 | 92.50 | 272.20 | 5613.10 | 8731.10 | -29.96 |
| -4383.85 | 366091.04 | 695432.15 | 4383.95 | 1.99 | |
| 12964.00 | 93.90 | 273.00 | 5608.07 | 8726.07 | -25.89 |
| -4473.61 | 366095.11 | 695342.39 | 4473.68 | 1.79 | |
| 13054.00 | 93.90 | 273.20 | 5601.95 | 8719.95 | -21.03 |
| -4563.28 | 366099.97 | 695252.72 | 4563.29 | 0.22 | |
| 13144.00 | 94.40 | 273.50 | 5595.44 | 8713.44 | -15.78 |

| | | | | | |
|---|---|---|---|---|---|
| -4652.89 | 366105.22 | 695163.11 | 4652.86 | 0.65 | |
| 13176.00 | 93.90 | 273.50 | 5593.12 | 8711.12 | -13.84 |
| -4684.74 | 366107.16 | 695131.26 | 4684.70 | 1.56 | Current MWD Survey |
| 13245.00 | 93.90 | 273.50 | 5588.43 | 8706.43 | -9.63 |
| -4753.45 | 366111.37 | 695062.55 | 4753.37 | 0.00 | Projection to Bit |

All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to KB. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100 feet.
Vertical Section is from Slot and calculated along an Azimuth of 269.530° (Grid).

Coordinate System is NAD 1927 (NADCON CONUS) US State Plane 1927 (Exact solution), New Mexico East 3001.
Grid Convergence at Surface is 0.342°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 13245.00ft., the Bottom Hole Displacement is 4753.46ft., in the Direction of 269.530° (Grid).

# IBURTON

# SPECTRAL DENSITY
# DUAL SPACED NEUTRON
# SPECTRAL GAMMA RAY

TEXAS

| | |
|---|---|
| COMPANY | **CHESAPEAKE OPERATING, INC.** |
| WELL | **PADUCA BREAKS WEST 32-26-32 STATE No. 1H** |
| FIELD/BLOCK | **BONE SPRING** |
| COUNTY | **LEA** STATE **TEXAS** |

STATE

API No. 30-025-40922

Location 400' FNL & 182' FEL
SECTION 32, TOWNSHIP 26 S, RANGE 32 E
WM. J. DANIEL SURVEY

CONFIDENTIAL

Other Services:
DLLT-MSFL

| | | | |
|---|---|---|---|
| GL | Elev. 3101.0 ft | Elev.: K.B. | 3118.0 ft |
| KB | 17.0 ft above perm. Datum | D.F. | 3117.0 ft |
| KB | | G.L. | 3101.0 ft |

| | | | |
|---|---|---|---|
| 01-Mar-13 | | | |
| ONE | | | |
| 9100.00 ft | | | |
| 8948.0 ft | | | |
| 8895.0 ft | | | |
| 200.0 ft | | | |
| 8.625 in @ 4200.0 ft | | @ | @ |
| 4195.0 ft | | | |
| 7.875 in | | @ | @ |
| CUT BRINE | | | |
| 9.1 ppg | 28.00 s/qt | | |
| 9.00 pH | | | |
| FLOWLINE | | | |
| 0.106 ohmm @ 66.00 degF | | @ | @ |
| 0.09 ohmm @ 66.00 degF | | @ | @ |
| 0.133 ohmm @ 66.00 degF | | @ | @ |
| MEAS | MEAS | | |
| 0.05 ohmm @ 153.0 degF | | @ | @ |
| 20.0 hr | | | |
| 01-Mar-13 23:46 | | | |
| 153.0 degF @ 8948.0 ft | | @ | @ |
| 11153035 | ODESSA, TX | | |
| BRADLEY FLITCH | | | |

Fold here

e Ticket No.: 900259216 API Serial No.: 30-025-40922 PGM Version: WL INSITE R3.8.0 (Build 2)

CHANGE IN MUD TYPE OR ADDITIVES

LIBURTON

# DUAL LATEROLOG MICRO-SPHERICALLY FOCUSED LOG

LEA TEXAS

COMPANY **CHESAPEAKE OPERATING, INC.**

WELL **PADUCA BREAKS WEST 32-26-32 STATE No. 1H**

FIELD/BLOCK **BONE SPRING**

COUNTY **LEA** STATE **TEXAS**

STATE

API No. 30-025-40922

Location 400' FNL & 182' FEL
SECTION 32, TOWNSHIP 26 S, RANGE 32 E
WM. J. DANIEL SURVEY

CONFIDENTIAL

Other Services:
CSNG-DSNT-SDLT

| | | | |
|---|---|---|---|
| GL | Elev. 3101.0 ft | Elev.: K.B. | 3118.0 ft |
| KB | 17.0 ft above perm. Datum | D.F. | 3117.0 ft |
| KB | | G.L. | 3101.0 ft |

| | | | |
|---|---|---|---|
| 01-Mar-13 | | | |
| ONE | | | |
| 9100.00 ft | | | |
| 8948.0 ft | | | |
| 8943.0 ft | | | |
| 4195.0 ft | | | |
| 8.625 in @ 4200.0 ft | | @ | @ |
| 4195.0 ft | | | |
| 7.875 in | | @ | @ |
| CUT BRINE | | | |
| 9.1 ppg | 28.00 s/qt | | |
| 9.00 pH | | | |
| FLOWLINE | | | |
| 0.106 ohmm @ 66.00 degF | | @ | @ |
| 0.09 ohmm @ 66.00 degF | | @ | @ |
| 0.133 ohmm @ 66.00 degF | | @ | @ |
| MEAS | MEAS | | |
| 0.05 ohmm @ 153.0 degF | | @ | @ |
| 20.0 hr | | | |
| 01-Mar-13 23:46 | | | |
| 153.0 degF @ 8948.0 ft | | @ | @ |
| 11153035 | ODESSA, TX | | |
| BRADLEY FUTCH | | | |

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API Serial No.: 30-025-40922

Ticket No.: 900259216

# BURTON

## ANNULAR HOLE VOLUME

## (5.5 INCH CASING)

TEXAS

| | |
|---|---|
| COMPANY | **CHESAPEAKE OPERATING, INC.** |
| WELL | **PADUCA BREAKS WEST 32-26-32 STATE No. 1H** |
| FIELD/BLOCK | **BONE SPRING** |
| COUNTY | **LEA** STATE **TEXAS** |

API No. 30-025-40922

Location 400' FNL & 182' FEL
SECTION 32, TOWNSHIP 26 S, RANGE 32 E
WM. J. DANIEL SURVEY

Other Services:
NONE

STATE

CONFIDENTIAL

| | | | |
|---|---|---|---|
| GL | Elev. 3101.0 ft | Elev.: K.B. | 3118.0 ft |
| KB | 17.0 ft above perm. Datum | D.F. | 3117.0 ft |
| KB | | G.L. | 3101.0 ft |

| | | | | | |
|---|---|---|---|---|---|
| 01-Mar-13 | | | | | |
| ONE | | | | | |
| 9100.00 ft | | | | | |
| 8948.0 ft | | | | | |
| 8895.0 ft | | | | | |
| 4195.0 ft | | | | | |
| 8.625 in | @ 4200.0 ft | @ | | @ | |
| 4195.0 ft | | | | | |
| 7.875 in | | @ | | @ | |
| CUT BRINE | | | | | |
| 9.1 ppg | 28.00 s/qt | | | | |
| 9.00 pH | | | | | |
| FLOWLINE | | | | | |
| 0.106 ohmm | @ 66.00 degF | @ | | @ | |
| 0.09 ohmm | @ 66.00 degF | @ | | @ | |
| 0.133 ohmm | @ 66.00 degF | @ | | @ | |
| MEAS | MEAS | | | | |
| 0.05 ohmm | @ 153.0 degF | @ | | @ | |
| 20.0 hr | | | | | |
| 01-Mar-13 23:46 | | | | | |
| 153.0 degF | @ 8948.0 ft | @ | | @ | |
| 11153035 | ODESSA, TX | | | | |
| BRADLEY FUTCH | | | | | |

Fold here

ice Ticket No.: 900259216 API Serial No.: 30-025-40922 PGM Version: WL INSITE R3.8.0 (Build 2)

CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE RESISTIVITY SCALE CHANGES

## Hydraulic Fracturing Fluid Product Component Information Disclosure

| | |
|---|---|
| Fracture Date: | 4/22/2013 |
| State: | NEW MEXICO |
| County: | LEA |
| API Number: | 3002540922 |
| Operator Name: | CHESAPEAKE |
| Well Name and Number: | PADUCA BREAKS 32-26-32 STATE 1H(CVX) |
| Longitude: | -103.688724 |
| Latitude: | 32.004942 |
| Long/Lat Projection: | NAD27 |
| Production Type: | GAS |
| True Vertical Depth (TVD): | 8,820 |
| Total Water Volume (gal)*: | 1,830,654 |

**Hydraulic Fracturing Fluid Composition:**

| Trade Name | Supplier | Purpose | Ingredients | Chemical Abstract Service Number (CAS #) | Maximum Ingredient Concentration in Additive (% by Mass)** | Maximum Ingredient Concentration in HF Fluid (% by Mass)** | Comments |
|---|---|---|---|---|---|---|---|
| Fresh Water | CHESAPEAKE ENERGY | Carrier/Base Fluid | Water | 007732-18-5 | 100.00% | 85.08522% | |
| ParaSorb | BAKER HUGHES | Scale Inhibitor | Calcined Diatomaceous Earth | 091053-39-3 | 65.00% | 0.02460% | |
| | | | Crystalline Silica (Quartz Sand, Silicon Dioxide) | 014808-60-7 | 5.00% | 0.00189% | |
| | | | Mineral Oil (Paraffin Oil, White Mineral Oil) | 008042-47-5 | 30.00% | 0.01136% | |
| | | | Paraffin Inhibitor | NA | 25.00% | 0.00946% | |
| Northern White Sand | FTS INTERNATIONAL | Proppant - Natural | Crystalline Silica (Quartz Sand, Silicon Dioxide) | 014808-60-7 | 100.00% | 9.89665% | |
| Resin Coated Sand | FTS INTERNATIONAL | Proppant - Resin Coated | Crystalline Silica (Quartz Sand, Silicon Dioxide) | 014808-60-7 | 97.00% | 2.30893% | |
| | | | Hexamethylenetetramine (Hexamine) | 000100-97-0 | 1.00% | 0.02380% | |
| | | | Phenol/Formaldehyde Resin | 009003-35-4 | 5.00% | 0.11902% | |
| 100 Mesh Sand | FTS INTERNATIONAL | Proppant - Natural | Crystalline Silica (Quartz Sand, Silicon Dioxide) | 014808-60-7 | 100.00% | 0.90641% | |
| 10.1 - 15 HCL | FTS INTERNATIONAL | Acid | Hydrochloric Acid | 007647-01-0 | 15.00% | 0.16941% | |
| | | | Water | 007732-18-5 | 85.00% | 0.96000% | |
| B10 (HIGH PH BUFFER) | FTS INTERNATIONAL | pH Adjusting Agent | Potassium Carbonate | 000584-08-7 | 48.00% | 0.01281% | |
| | | | Potassium Hydroxide | 001310-58-3 | 20.00% | 0.00534% | |
| NE 100 | FTS INTERNATIONAL | Non-Emulsifier | 2-Butoxyethanol (Ethylene Glycol Monobutyl Ether) | 000111-76-2 | 10.00% | 0.00759% | |
| | | | Dodecylbenzenesulfonic Acid | 027176-87-0 | 5.00% | 0.00380% | |
| | | | Isopropanol (Isopropyl Alcohol, Propan-2-ol) | 000067-63-0 | 10.00% | 0.00759% | |
| HVG01 (TURQUOISE-1 BULK) | FTS INTERNATIONAL | Gelling Agent | Crystalline Silica (Quartz Sand, Silicon Dioxide) | 014808-60-7 | 2.00% | 0.00575% | |
| | | | Guar Gum | 009000-30-0 | 50.00% | 0.14385% | |
| | | | Petroleum Distillate Hydrotreated Light | 064742-47-8 | 55.00% | 0.15823% | |
| | | | Surfactant | 068439-51-0 | 2.00% | 0.00575% | |
| BXL02 Borate XL | FTS INTERNATIONAL | Cross Linker | Boric Acid | 010043-35-3 | 15.00% | 0.00568% | |
| | | | Potassium Hydroxide | 001310-58-3 | 12.00% | 0.00454% | |
| | | | Sodium Metaborate Tetrahydrate | 010555-76-7 | 25.00% | 0.00946% | |
| FRW-200 | FTS INTERNATIONAL | Friction Reducer | Petroleum Distillate Hydrotreated Light | 064742-47-8 | 26.00% | 0.00542% | |
| APB01 (AMMONIUM PERSUFATE BREAKER) | FTS INTERNATIONAL | Breaker | Ammonium Persulfate | 007727-54-0 | 100.00% | 0.00294% | |
| FE-100L | FTS INTERNATIONAL | Iron Control Agent | Citric Acid | 000077-92-9 | 55.00% | 0.00204% | |
| CI-150 | FTS INTERNATIONAL | Corrosion Inhibitor | Dimethyl Formamide | 000068-12-2 | 10.00% | 0.00030% | |
| | | | Isopropanol (Isopropyl Alcohol, Propan-2-ol) | 000067-63-0 | 60.00% | 0.00180% | |
| | | | Proprietary Aromatic Aldehyde | TRADE SECRET | 10.00% | 0.00030% | |
| | | | Proprietary Organic Amine Resin Salt | TRADE SECRET | 30.00% | 0.00090% | |
| | | | Proprietary Quaternary Ammonium Compound | TRADE SECRET | 10.00% | 0.00030% | |
| LEB-300 | FTS INTERNATIONAL | Breaker | No Hazardous Components | NONE | | 0.00000% | |
| MC S-2510T (WS) | MULTI-CHEM | Scale Inhibitor | Ethylene Glycol | 000107-21-1 | 60.00% | 0.00553% | |
| | | | Sodium Hydroxide | 001310-73-2 | 5.00% | 0.00046% | |
| MC MX 664-5 | MULTI-CHEM | Surfactant | Isopropanol (Isopropyl Alcohol, Propan-2-ol) | 000067-63-0 | 5.00% | 0.00366% | |
| | | | Methanol (Methyl Alcohol) | 000067-56-1 | 70.00% | 0.05131% | |
| | | | Proprietary Sulfonate | TRADE SECRET | 30.00% | 0.02199% | |
| MC B 8642 WS | MULTI-CHEM | Anti-Bacterial Agent | Ethanol | 000064-17-5 | 1.00% | 0.00023% | |
| | | | Glutaraldehyde (Pentanediol) | 000111-30-8 | 60.00% | 0.01353% | |
| | | | Quaternary Ammonium Compound | 068424-85-1 | 10.00% | 0.00225% | |

| Additional Ingredients Not Listed on MSDS | | | | | | | |
|---|---|---|---|---|---|---|---|
| ParaSorb | BAKER HUGHES | Scale Inhibitor | Proprietary Polymer | TRADE SECRET | | 0.04360% | |
| APB01 (AMMONIUM PERSUFATE BREAKER), B10 (HIGH PH BUFFER), BXL02 Borate XL, CI-150, FE-100L, FRW-200, LEB-300, NE 100, Resin Coated Sand | FTS INTERNATIONAL | Breaker, Corrosion Inhibitor, Cross Linker, Friction Reducer, Iron Control Agent, Non-Emulsifier, pH Adjusting Agent, Proppant - Resin Coated | Non-MSDS Components Not Provided by Supplier | NOT PROVIDED | | | |
| | | | Proprietary Breaker (APB01) Additive | TRADE SECRET | | 0.00017% | |
| | | | Proprietary Corrosion Inhibitor Additive (CI-150) | TRADE SECRET | | 0.00156% | |
| | | | Proprietary Enzyme | TRADE SECRET | | 0.00000% | |
| | | | Proprietary Friction Reducer Additive (FRW-200 and FRW-200W) | TRADE SECRET | | 0.01977% | |
| | | | Sodium Chloride | 007647-14-5 | | 0.00009% | |
| | | | Water | 007732-18-5 | | 0.15180% | |
| MC B 8642 WS, MC MX 664-5, MC S-2510T (WS) | MULTI-CHEM | Anti-Bacterial Agent, Scale Inhibitor, Surfactant | Methanol (Methyl Alcohol) | 000067-56-1 | | | |
| | | | Neutralized Polymer | TRADE SECRET | | | |
| | | | Phosphoric Acid | 007664-38-2 | | | |
| | | | Water | 007732-18-5 | | | |

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

"Additional Ingredients Not Listed on MSDS" component information were obtained directly from the supplier. As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of this information should be directed to the supplier who provided it.

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.