



Job Number: SVGJ-130836

Company: PDC

Lease/Well: Stroh 24-21

Location: Weld County, CO

Rig Name: MS Wireline

RKB: 0'

G.L. or M.S.L.: GL

State/Country: Colorado/USA

Declination: 8.60°

Grid: East To True North

File name: F:\SURVEY\2013SU~1\PDC\GJ\STROH\24-21.SVY

Date/Time: 27-Aug-13 / 11:21

Curve Name: Surface - 7300' M.D. (Rate Gyro)

WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane .00
 Vertical Section Referenced to Wellhead
 Rectangular Coordinates Referenced to Wellhead

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | True Vertical Depth | N-S FT | E-W FT | Vertical Section FT | C L O S U R E | | Dogleg Severity Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
| | | | | | | | Distance FT | Direction Deg | |
| .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 100.00 | .31 | 254.33 | 100.00 | -.07 | -.26 | -.07 | .27 | 254.33 | .31 |
| 200.00 | .24 | 240.57 | 200.00 | -.25 | -.70 | -.25 | .75 | 250.50 | .10 |
| 300.00 | .23 | 195.32 | 300.00 | -.55 | -.94 | -.55 | 1.09 | 239.84 | .18 |
| 400.00 | .15 | 223.27 | 400.00 | -.83 | -1.08 | -.83 | 1.37 | 232.35 | .12 |
| 500.00 | .21 | 173.70 | 500.00 | -1.11 | -1.15 | -1.11 | 1.60 | 225.99 | .16 |
| 600.00 | .04 | 309.72 | 600.00 | -1.27 | -1.16 | -1.27 | 1.72 | 222.32 | .24 |
| 700.00 | .05 | 337.48 | 700.00 | -1.21 | -1.20 | -1.21 | 1.70 | 224.82 | .02 |
| 800.00 | .25 | 182.73 | 800.00 | -1.39 | -1.23 | -1.39 | 1.85 | 221.54 | .30 |
| 900.00 | .11 | 164.04 | 900.00 | -1.70 | -1.21 | -1.70 | 2.09 | 215.55 | .15 |

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | True Vertical Depth | N-S FT | E-W FT | Vertical Section FT | C L O S U R E | | Dogleg Severity Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
| | | | | | | | Distance FT | Direction Deg | |
| 1000.00 | .26 | 185.62 | 1000.00 | -2.02 | -1.21 | -2.02 | 2.35 | 210.95 | .16 |
| 1100.00 | .17 | 233.38 | 1099.99 | -2.33 | -1.35 | -2.33 | 2.69 | 210.09 | .19 |
| 1200.00 | .26 | 204.58 | 1199.99 | -2.62 | -1.56 | -2.62 | 3.05 | 210.78 | .14 |
| 1300.00 | .42 | 220.80 | 1299.99 | -3.11 | -1.90 | -3.11 | 3.64 | 211.40 | .19 |
| 1400.00 | .43 | 275.88 | 1399.99 | -3.35 | -2.51 | -3.35 | 4.18 | 216.86 | .39 |
| 1500.00 | .54 | 263.62 | 1499.99 | -3.36 | -3.35 | -3.36 | 4.75 | 224.92 | .15 |
| 1600.00 | .67 | 293.34 | 1599.98 | -3.18 | -4.36 | -3.18 | 5.39 | 233.86 | .33 |
| 1700.00 | .87 | 321.62 | 1699.97 | -2.35 | -5.36 | -2.35 | 5.86 | 246.30 | .42 |
| 1800.00 | 1.34 | 327.30 | 1799.95 | -.78 | -6.47 | -.78 | 6.51 | 263.16 | .48 |
| 1900.00 | 1.73 | 333.11 | 1899.92 | 1.55 | -7.78 | 1.55 | 7.94 | 281.30 | .42 |
| 2000.00 | 1.88 | 348.64 | 1999.87 | 4.51 | -8.79 | 4.51 | 9.88 | 297.16 | .51 |
| 2100.00 | 1.93 | 350.30 | 2099.81 | 7.78 | -9.39 | 7.78 | 12.20 | 309.62 | .07 |
| 2200.00 | 1.75 | 344.90 | 2199.76 | 10.91 | -10.08 | 10.91 | 14.85 | 317.28 | .25 |
| 2300.00 | 1.07 | 352.36 | 2299.73 | 13.31 | -10.60 | 13.31 | 17.01 | 321.47 | .70 |
| 2400.00 | .84 | 338.21 | 2399.72 | 14.92 | -10.99 | 14.92 | 18.53 | 323.61 | .33 |
| 2500.00 | 1.05 | 325.64 | 2499.70 | 16.35 | -11.78 | 16.35 | 20.16 | 324.23 | .29 |
| 2600.00 | .95 | 338.36 | 2599.69 | 17.88 | -12.61 | 17.88 | 21.88 | 324.82 | .24 |
| 2700.00 | .96 | 322.66 | 2699.67 | 19.32 | -13.42 | 19.32 | 23.52 | 325.21 | .26 |
| 2800.00 | 1.04 | 325.27 | 2799.66 | 20.73 | -14.45 | 20.73 | 25.27 | 325.13 | .09 |
| 2900.00 | 1.20 | 357.41 | 2899.64 | 22.52 | -15.01 | 22.52 | 27.06 | 326.32 | .64 |
| 3000.00 | 1.14 | 2.59 | 2999.62 | 24.56 | -15.01 | 24.56 | 28.79 | 328.57 | .12 |
| 3100.00 | .97 | 7.44 | 3099.60 | 26.39 | -14.86 | 26.39 | 30.29 | 330.62 | .19 |
| 3200.00 | .93 | 3.94 | 3199.59 | 28.04 | -14.69 | 28.04 | 31.66 | 332.35 | .07 |
| 3300.00 | 1.27 | 6.50 | 3299.57 | 29.95 | -14.51 | 29.95 | 33.28 | 334.15 | .34 |
| 3400.00 | 2.05 | 352.74 | 3399.53 | 32.83 | -14.61 | 32.83 | 35.93 | 336.01 | .87 |
| 3500.00 | 2.85 | 7.13 | 3499.44 | 37.07 | -14.53 | 37.07 | 39.82 | 338.60 | 1.00 |
| 3600.00 | 2.95 | 14.88 | 3599.31 | 42.02 | -13.56 | 42.02 | 44.16 | 342.12 | .40 |
| 3700.00 | 2.92 | 17.76 | 3699.18 | 46.94 | -12.12 | 46.94 | 48.48 | 345.52 | .15 |
| 3800.00 | 2.70 | 17.62 | 3799.06 | 51.61 | -10.63 | 51.61 | 52.69 | 348.36 | .22 |

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | True Vertical Depth | N-S FT | E-W FT | Vertical Section FT | C L O S U R E | | Dogleg Severity Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
| | | | | | | | Distance FT | Direction Deg | |
| 3900.00 | 2.35 | 16.21 | 3898.96 | 55.82 | -9.35 | 55.82 | 56.60 | 350.49 | .36 |
| 4000.00 | 1.70 | 14.64 | 3998.90 | 59.22 | -8.40 | 59.22 | 59.82 | 351.93 | .65 |
| 4100.00 | .51 | 353.08 | 4098.88 | 61.10 | -8.08 | 61.10 | 61.63 | 352.47 | 1.24 |
| 4200.00 | .60 | 258.23 | 4198.87 | 61.44 | -8.64 | 61.44 | 62.04 | 351.99 | .82 |
| 4300.00 | .87 | 252.84 | 4298.87 | 61.11 | -9.88 | 61.11 | 61.90 | 350.81 | .28 |
| 4400.00 | .84 | 238.35 | 4398.86 | 60.50 | -11.23 | 60.50 | 61.53 | 349.48 | .22 |
| 4500.00 | .97 | 246.22 | 4498.84 | 59.77 | -12.63 | 59.77 | 61.09 | 348.07 | .18 |
| 4600.00 | 1.22 | 258.46 | 4598.82 | 59.22 | -14.45 | 59.22 | 60.95 | 346.29 | .34 |
| 4700.00 | 1.42 | 279.92 | 4698.80 | 59.22 | -16.71 | 59.22 | 61.53 | 344.24 | .53 |
| 4800.00 | 1.47 | 280.33 | 4798.77 | 59.66 | -19.19 | 59.66 | 62.67 | 342.17 | .05 |
| 4900.00 | 1.15 | 292.62 | 4898.74 | 60.28 | -21.38 | 60.28 | 63.96 | 340.47 | .42 |
| 5000.00 | 1.19 | 290.77 | 4998.72 | 61.03 | -23.28 | 61.03 | 65.32 | 339.12 | .06 |
| 5100.00 | 1.12 | 289.50 | 5098.70 | 61.73 | -25.17 | 61.73 | 66.66 | 337.81 | .07 |
| 5200.00 | 1.05 | 293.97 | 5198.68 | 62.42 | -26.93 | 62.42 | 67.99 | 336.66 | .11 |
| 5300.00 | 1.25 | 297.18 | 5298.66 | 63.29 | -28.74 | 63.29 | 69.51 | 335.58 | .21 |
| 5400.00 | 1.50 | 291.42 | 5398.63 | 64.27 | -30.93 | 64.27 | 71.32 | 334.30 | .29 |
| 5500.00 | 2.08 | 305.50 | 5498.58 | 65.80 | -33.62 | 65.80 | 73.89 | 332.93 | .72 |
| 5600.00 | 1.06 | 323.43 | 5598.55 | 67.60 | -35.65 | 67.60 | 76.42 | 332.19 | 1.12 |
| 5700.00 | .78 | 66.88 | 5698.54 | 68.61 | -35.58 | 68.61 | 77.28 | 332.59 | 1.45 |
| 5800.00 | .26 | 56.52 | 5798.53 | 69.00 | -34.76 | 69.00 | 77.26 | 333.26 | .53 |
| 5900.00 | .22 | 335.87 | 5898.53 | 69.30 | -34.65 | 69.30 | 77.48 | 333.44 | .31 |
| 6000.00 | .68 | 318.74 | 5998.53 | 69.92 | -35.12 | 69.92 | 78.25 | 333.33 | .47 |
| 6100.00 | .61 | 289.50 | 6098.52 | 70.55 | -36.01 | 70.55 | 79.21 | 332.96 | .33 |
| 6200.00 | .65 | 300.78 | 6198.52 | 71.02 | -37.00 | 71.02 | 80.08 | 332.48 | .13 |
| 6300.00 | .83 | 287.20 | 6298.51 | 71.52 | -38.18 | 71.52 | 81.07 | 331.90 | .25 |
| 6400.00 | 1.02 | 285.27 | 6398.50 | 71.97 | -39.73 | 71.97 | 82.21 | 331.10 | .19 |
| 6500.00 | .61 | 299.71 | 6498.49 | 72.47 | -41.05 | 72.47 | 83.29 | 330.47 | .46 |
| 6600.00 | 1.20 | 281.52 | 6598.47 | 72.94 | -42.54 | 72.94 | 84.44 | 329.75 | .65 |
| 6700.00 | .93 | 278.38 | 6698.46 | 73.27 | -44.37 | 73.27 | 85.65 | 328.80 | .28 |

| Measured Depth FT | Incl Angle Deg | Drift Direction Deg | True Vertical Depth | N-S FT | E-W FT | Vertical Section FT | C L O S U R E | | Dogleg Severity Deg/100 |
|-------------------------|----------------------|---------------------------|---------------------------|-----------|-----------|---------------------------|----------------|------------------|-------------------------------|
| | | | | | | | Distance FT | Direction Deg | |
| 6800.00 | .87 | 272.20 | 6798.44 | 73.41 | -45.93 | 73.41 | 86.60 | 327.97 | .11 |
| 6900.00 | .68 | 292.99 | 6898.43 | 73.68 | -47.24 | 73.68 | 87.52 | 327.33 | .34 |
| 7000.00 | .78 | 273.04 | 6998.43 | 73.94 | -48.46 | 73.94 | 88.41 | 326.76 | .27 |
| 7100.00 | .61 | 300.03 | 7098.42 | 74.25 | -49.60 | 74.25 | 89.29 | 326.25 | .36 |
| 7200.00 | .32 | 262.66 | 7198.42 | 74.48 | -50.34 | 74.48 | 89.89 | 325.94 | .41 |

| Last Survey Depth Recorded | | | | | | | | | |
|----------------------------|-----|--------|---------|-------|--------|-------|-------|--------|-----|
| 7300.00 | .30 | 247.07 | 7298.41 | 74.34 | -50.86 | 74.34 | 90.07 | 325.62 | .09 |