



Job Number: SVGJ-120132

Company: PDC

Lease/Well: Dillard 34-20

Location: Weld County, CO

Rig Name: MS Wireline

RKB: 0'

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

State/Country: Colorado/USA

Declination: 8.70°

Grid: East To True

File name: F:\SURVEY\2012SU~1\PDC\LORENZ\DILLARD\34-20.SVY

Date/Time: 09-Feb-12 / 12:32

Curve Name: Surface - 7100' 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 | .74 | 327.34 | 100.00 | .54 | -.35 | .54 | .65 | 327.34 | .74 |
| 200.00 | .48 | 298.90 | 199.99 | 1.29 | -1.06 | 1.29 | 1.67 | 320.49 | .39 |
| 300.00 | .42 | 302.90 | 299.99 | 1.69 | -1.74 | 1.69 | 2.43 | 314.22 | .07 |
| 400.00 | .10 | 48.77 | 399.99 | 1.95 | -1.98 | 1.95 | 2.78 | 314.53 | .46 |
| 500.00 | .04 | 161.89 | 499.99 | 1.97 | -1.90 | 1.97 | 2.74 | 316.01 | .12 |
| 600.00 | .22 | 84.43 | 599.99 | 1.96 | -1.70 | 1.96 | 2.59 | 319.00 | .21 |
| 700.00 | .20 | 254.27 | 699.99 | 1.93 | -1.68 | 1.93 | 2.56 | 318.97 | .42 |
| 800.00 | .10 | 77.90 | 799.99 | 1.90 | -1.76 | 1.90 | 2.59 | 317.17 | .30 |
| 900.00 | .12 | 58.88 | 899.99 | 1.97 | -1.59 | 1.97 | 2.53 | 321.19 | .04 |

| 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 | .20 | 322.01 | 999.99 | 2.16 | -1.60 | 2.16 | 2.69 | 323.45 | .25 |
| 1100.00 | .10 | 350.73 | 1099.99 | 2.39 | -1.73 | 2.39 | 2.95 | 324.14 | .12 |
| 1200.00 | .05 | 311.31 | 1199.99 | 2.50 | -1.77 | 2.50 | 3.07 | 324.69 | .07 |
| 1300.00 | .39 | 188.12 | 1299.99 | 2.19 | -1.85 | 2.19 | 2.87 | 319.82 | .42 |
| 1400.00 | .38 | 200.05 | 1399.98 | 1.55 | -2.02 | 1.55 | 2.54 | 307.50 | .08 |
| 1500.00 | .38 | 192.84 | 1499.98 | .91 | -2.20 | .91 | 2.38 | 292.48 | .05 |
| 1600.00 | .29 | 231.51 | 1599.98 | .43 | -2.47 | .43 | 2.51 | 279.87 | .24 |
| 1700.00 | .12 | 359.92 | 1699.98 | .38 | -2.67 | .38 | 2.70 | 278.04 | .38 |
| 1800.00 | .20 | 8.30 | 1799.98 | .66 | -2.65 | .66 | 2.73 | 283.90 | .08 |
| 1900.00 | .11 | 182.29 | 1899.98 | .73 | -2.63 | .73 | 2.73 | 285.57 | .31 |
| 2000.00 | .34 | 337.90 | 1999.98 | .91 | -2.74 | .91 | 2.89 | 288.38 | .44 |
| 2100.00 | .42 | 228.77 | 2099.98 | .94 | -3.13 | .94 | 3.27 | 286.79 | .62 |
| 2200.00 | .46 | 357.03 | 2199.98 | 1.10 | -3.43 | 1.10 | 3.60 | 287.86 | .79 |
| 2300.00 | .98 | 287.91 | 2299.97 | 1.77 | -4.26 | 1.77 | 4.61 | 292.53 | .92 |
| 2400.00 | 1.20 | 278.58 | 2399.95 | 2.19 | -6.11 | 2.19 | 6.49 | 289.69 | .28 |
| 2500.00 | 1.30 | 292.13 | 2499.93 | 2.77 | -8.20 | 2.77 | 8.65 | 288.68 | .31 |
| 2600.00 | 1.43 | 277.39 | 2599.90 | 3.36 | -10.48 | 3.36 | 11.01 | 287.76 | .37 |
| 2700.00 | 1.24 | 296.39 | 2699.87 | 4.00 | -12.69 | 4.00 | 13.31 | 287.49 | .48 |
| 2800.00 | 1.22 | 292.05 | 2799.85 | 4.88 | -14.65 | 4.88 | 15.44 | 288.43 | .10 |
| 2900.00 | 1.24 | 285.41 | 2899.83 | 5.57 | -16.68 | 5.57 | 17.58 | 288.46 | .14 |
| 3000.00 | 1.02 | 315.03 | 2999.81 | 6.48 | -18.35 | 6.48 | 19.46 | 289.46 | .62 |
| 3100.00 | 1.05 | 298.17 | 3099.79 | 7.55 | -19.78 | 7.55 | 21.18 | 290.88 | .30 |
| 3200.00 | 1.02 | 273.34 | 3199.78 | 8.03 | -21.48 | 8.03 | 22.93 | 290.50 | .45 |
| 3300.00 | .99 | 270.33 | 3299.76 | 8.09 | -23.23 | 8.09 | 24.60 | 289.19 | .06 |
| 3400.00 | .93 | 302.65 | 3399.75 | 8.53 | -24.78 | 8.53 | 26.21 | 289.00 | .54 |
| 3500.00 | 1.08 | 280.16 | 3499.73 | 9.13 | -26.39 | 9.13 | 27.93 | 289.09 | .42 |
| 3600.00 | .77 | 337.23 | 3599.72 | 9.92 | -27.58 | 9.92 | 29.31 | 289.78 | .92 |
| 3700.00 | 1.07 | 285.50 | 3699.71 | 10.79 | -28.74 | 10.79 | 30.70 | 290.58 | .85 |
| 3800.00 | .56 | 346.72 | 3799.70 | 11.51 | -29.75 | 11.51 | 31.90 | 291.16 | .94 |

| 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 | .90 | 279.11 | 3899.69 | 12.11 | -30.64 | 12.11 | 32.95 | 291.57 | .86 |
| 4000.00 | .72 | 338.15 | 3999.69 | 12.82 | -31.65 | 12.82 | 34.15 | 292.06 | .81 |
| 4100.00 | .78 | 299.50 | 4099.68 | 13.74 | -32.47 | 13.74 | 35.26 | 292.93 | .50 |
| 4200.00 | .90 | 317.18 | 4199.67 | 14.65 | -33.60 | 14.65 | 36.66 | 293.56 | .28 |
| 4300.00 | .80 | 307.45 | 4299.66 | 15.65 | -34.69 | 15.65 | 38.06 | 294.29 | .18 |
| 4400.00 | .92 | 324.93 | 4399.64 | 16.73 | -35.70 | 16.73 | 39.43 | 295.11 | .29 |
| 4500.00 | .81 | 318.31 | 4499.63 | 17.92 | -36.64 | 17.92 | 40.78 | 296.06 | .15 |
| 4600.00 | .97 | 325.88 | 4599.62 | 19.15 | -37.58 | 19.15 | 42.18 | 297.00 | .20 |
| 4700.00 | 1.01 | 301.14 | 4699.61 | 20.30 | -38.81 | 20.30 | 43.80 | 297.62 | .43 |
| 4800.00 | 1.23 | 332.62 | 4799.59 | 21.71 | -40.06 | 21.71 | 45.56 | 298.46 | .64 |
| 4900.00 | 1.34 | 299.02 | 4899.56 | 23.23 | -41.57 | 23.23 | 47.63 | 299.20 | .75 |
| 5000.00 | .39 | 325.81 | 4999.55 | 24.08 | -42.79 | 24.08 | 49.10 | 299.37 | 1.01 |
| 5100.00 | .91 | 180.00 | 5099.55 | 23.57 | -42.98 | 23.57 | 49.02 | 298.74 | 1.25 |
| 5200.00 | 1.45 | 168.42 | 5199.53 | 21.54 | -42.72 | 21.54 | 47.85 | 296.75 | .59 |
| 5300.00 | 1.21 | 154.04 | 5299.50 | 19.35 | -42.01 | 19.35 | 46.25 | 294.73 | .41 |
| 5400.00 | .74 | 112.45 | 5399.49 | 18.15 | -40.95 | 18.15 | 44.79 | 293.91 | .82 |
| 5500.00 | .29 | 20.13 | 5499.48 | 18.14 | -40.27 | 18.14 | 44.16 | 294.25 | .81 |
| 5600.00 | .22 | 291.79 | 5599.48 | 18.45 | -40.36 | 18.45 | 44.37 | 294.57 | .36 |
| 5700.00 | .85 | 308.83 | 5699.48 | 18.99 | -41.11 | 18.99 | 45.29 | 294.79 | .64 |
| 5800.00 | .78 | 358.04 | 5799.47 | 20.13 | -41.71 | 20.13 | 46.32 | 295.76 | .68 |
| 5900.00 | 1.02 | 302.27 | 5899.46 | 21.29 | -42.49 | 21.29 | 47.52 | 296.61 | .87 |
| 6000.00 | .98 | 316.56 | 5999.44 | 22.38 | -43.83 | 22.38 | 49.22 | 297.05 | .25 |
| 6100.00 | .57 | 8.32 | 6099.44 | 23.50 | -44.35 | 23.50 | 50.19 | 297.92 | .77 |
| 6200.00 | .65 | 11.24 | 6199.43 | 24.55 | -44.16 | 24.55 | 50.53 | 299.06 | .09 |
| 6300.00 | .69 | 354.94 | 6299.42 | 25.70 | -44.11 | 25.70 | 51.05 | 300.23 | .19 |
| 6400.00 | .71 | 325.58 | 6399.42 | 26.81 | -44.51 | 26.81 | 51.96 | 301.06 | .36 |
| 6500.00 | .68 | 358.95 | 6499.41 | 27.92 | -44.87 | 27.92 | 52.85 | 301.89 | .40 |
| 6600.00 | .77 | 347.30 | 6599.40 | 29.17 | -45.03 | 29.17 | 53.65 | 302.93 | .17 |
| 6700.00 | .55 | 37.93 | 6699.40 | 30.20 | -44.88 | 30.20 | 54.10 | 303.94 | .60 |

| 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 | .62 | 333.28 | 6799.39 | 31.06 | -44.83 | 31.06 | 54.54 | 304.72 | .63 |
| 6900.00 | .66 | 337.62 | 6899.38 | 32.08 | -45.29 | 32.08 | 55.50 | 305.31 | .06 |
| 7000.00 | .70 | 59.08 | 6999.38 | 32.92 | -44.99 | 32.92 | 55.75 | 306.20 | .89 |
| Last Survey Depth Recorded | | | | | | | | | |
| 7100.00 | 1.65 | 31.59 | 7099.36 | 34.46 | -43.71 | 34.46 | 55.66 | 308.26 | 1.08 |