

30-015-37800



## Survey Report

MIN. CURVATURE CALCULATIONS (SPE-3302)

OPERATOR: Chosapenko Operating  
 WELL: PLU Ross Ranch 10 Fed #1H  
 LOCATION: Delaware Basin North

START: 6/27/2010  
 FINISH: 7/10/2010  
 JOB #: 2010027

PROPOSED DIRECTION: 0.64  
 MAGNETIC TO TRUE: 7.85

| STATION<br>NUMBER | SURVEY<br>DEPTH | INC   | AZMTH  | TVD     | N-S     | E-W    | VERT.<br>SECTION | DLS/<br>100 |
|-------------------|-----------------|-------|--------|---------|---------|--------|------------------|-------------|
| Tie-In            | 7600.00         | 1.73  | 268.24 | 7597.97 | -129.89 | -11.60 |                  |             |
| 1                 | 7677.00         | 2.70  | 288.00 | 7674.91 | -129.41 | -14.48 | -129.56          | 1.65        |
| 2                 | 7740.00         | 10.50 | 358.40 | 7737.51 | -123.19 | -16.06 | -123.37          | 15.75       |
| 3                 | 7771.00         | 16.80 | 354.50 | 7767.62 | -116.90 | -16.57 | -116.08          | 20.53       |
| 4                 | 7803.00         | 22.60 | 353.30 | 7797.73 | -105.18 | -17.73 | -105.30          | 18.17       |
| 5                 | 7834.00         | 26.50 | 352.80 | 7825.92 | -92.40  | -19.29 | -92.61           | 12.60       |
| 6                 | 7865.00         | 20.20 | 356.10 | 7853.33 | -77.99  | -20.67 | -78.22           | 10.03       |
| 7                 | 7896.00         | 32.40 | 357.80 | 7879.06 | -62.14  | -21.51 | -62.38           | 10.70       |
| 8                 | 7927.00         | 37.20 | 357.10 | 7905.40 | -44.48  | -22.30 | -44.72           | 15.64       |
| 9                 | 7959.00         | 41.50 | 357.50 | 7930.14 | -24.21  | -23.25 | -24.47           | 13.46       |
| 10                | 7990.00         | 45.80 | 359.20 | 7952.57 | -2.83   | -23.88 | -3.10            | 14.38       |
| 11                | 8021.00         | 48.40 | 359.90 | 7973.67 | 19.88   | -24.03 | 19.01            | 8.55        |
| 12                | 8053.00         | 51.60 | 0.60   | 7994.26 | 44.37   | -23.82 | 44.10            | 9.83        |
| 13                | 8084.00         | 55.90 | 0.20   | 8012.61 | 69.34   | -23.75 | 69.08            | 14.23       |
| 14                | 8115.00         | 60.80 | 0.30   | 8028.87 | 95.73   | -23.63 | 95.46            | 15.81       |
| 15                | 8146.00         | 65.00 | 0.90   | 8042.99 | 123.31  | -23.34 | 123.05           | 13.66       |
| 16                | 8178.00         | 68.00 | 1.80   | 8055.75 | 152.65  | -22.85 | 152.39           | 9.72        |
| 17                | 8209.00         | 72.10 | 2.80   | 8068.32 | 181.76  | -21.48 | 181.51           | 13.57       |
| 18                | 8241.00         | 75.60 | 2.80   | 8075.22 | 212.45  | -19.98 | 212.22           | 10.94       |
| 19                | 8272.00         | 78.70 | 2.50   | 8082.11 | 242.64  | -18.58 | 242.42           | 10.04       |
| 20                | 8303.00         | 81.80 | 1.60   | 8087.36 | 273.17  | -17.49 | 272.96           | 10.40       |
| 21                | 8335.00         | 83.40 | 1.00   | 8091.49 | 304.89  | -16.77 | 304.69           | 5.33        |
| 22                | 8366.00         | 83.20 | 0.90   | 8095.10 | 335.68  | -16.26 | 335.48           | 0.72        |
| 23                | 8397.00         | 85.10 | 0.90   | 8098.26 | 366.51  | -15.77 | 366.31           | 6.13        |
| 24                | 8428.00         | 87.10 | 0.40   | 8100.37 | 397.44  | -15.42 | 397.24           | 6.65        |
| 25                | 8460.00         | 87.20 | 0.10   | 8101.96 | 429.40  | -15.28 | 429.20           | 0.99        |
| 26                | 8491.00         | 88.80 | 359.80 | 8103.04 | 460.38  | -15.31 | 460.18           | 5.25        |
| 27                | 8522.00         | 91.00 | 0.20   | 8103.10 | 491.37  | -15.31 | 491.17           | 7.21        |
| 28                | 8616.00         | 91.20 | 0.10   | 8101.29 | 585.36  | -15.08 | 585.15           | 0.24        |
| 29                | 8710.00         | 90.50 | 0.90   | 8099.90 | 679.34  | -14.24 | 679.14           | 1.13        |
| 30                | 8804.00         | 88.80 | 0.10   | 8100.47 | 773.33  | -13.42 | 773.13           | 2.00        |
| 31                | 8897.00         | 87.90 | 359.90 | 8103.15 | 866.29  | -13.42 | 866.09           | 0.99        |
| 32                | 8991.00         | 88.70 | 0.30   | 8105.94 | 960.25  | -13.26 | 960.04           | 0.95        |
| 33                | 9085.00         | 89.50 | 0.60   | 8107.42 | 1054.23 | -12.52 | 1054.03          | 0.91        |
| 34                | 9179.00         | 89.60 | 0.40   | 8108.15 | 1148.23 | -11.70 | 1148.03          | 0.24        |
| 35                | 9273.00         | 93.80 | 2.20   | 8105.37 | 1242.14 | -9.57  | 1241.95          | 4.86        |
| 36                | 9367.00         | 91.80 | 2.20   | 8100.77 | 1335.95 | -5.97  | 1335.80          | 2.13        |
| 37                | 9461.00         | 89.40 | 1.00   | 8099.79 | 1429.90 | -3.34  | 1429.77          | 2.85        |
| 38                | 9555.00         | 89.50 | 0.60   | 8100.69 | 1523.89 | -2.03  | 1523.77          | 0.44        |

|      |          |       |        |         |         |       |         |      |
|------|----------|-------|--------|---------|---------|-------|---------|------|
| 39   | 9649.00  | 88.20 | 0.20   | 8102.58 | 1617.86 | -1.37 | 1617.75 | 1.45 |
| 40   | 9743.00  | 87.70 | 359.60 | 8105.94 | 1711.80 | -1.54 | 1711.68 | 0.83 |
| 41   | 9837.00  | 90.40 | 359.80 | 8107.50 | 1805.78 | -2.03 | 1805.64 | 2.88 |
| 42   | 9931.00  | 92.00 | 0.60   | 8105.53 | 1899.75 | -1.70 | 1899.62 | 1.90 |
| 43   | 10025.00 | 92.60 | 0.60   | 8101.76 | 1993.67 | -0.72 | 1993.54 | 0.64 |
| 44   | 10119.00 | 92.30 | 2.20   | 8097.74 | 2087.56 | 1.58  | 2087.44 | 1.73 |
| 45   | 10213.00 | 91.70 | 1.40   | 8094.46 | 2181.45 | 4.53  | 2181.37 | 1.06 |
| 46   | 10306.00 | 90.10 | 2.00   | 8093.00 | 2274.40 | 7.29  | 2274.33 | 1.84 |
| 47   | 10400.00 | 90.30 | 2.00   | 8092.67 | 2368.34 | 10.57 | 2368.31 | 0.21 |
| 48   | 10494.00 | 90.30 | 1.70   | 8092.18 | 2462.29 | 13.60 | 2462.29 | 0.32 |
| 49   | 10588.00 | 90.20 | 1.10   | 8091.77 | 2556.28 | 15.90 | 2556.28 | 0.65 |
| 50   | 10682.00 | 89.80 | 0.80   | 8091.77 | 2650.24 | 17.46 | 2650.27 | 0.53 |
| 51   | 10776.00 | 92.00 | 0.30   | 8090.29 | 2744.22 | 18.36 | 2744.26 | 2.40 |
| 52   | 10870.00 | 91.60 | 359.90 | 8087.34 | 2838.18 | 18.52 | 2838.21 | 0.60 |
| 53   | 10963.00 | 92.30 | 0.00   | 8084.17 | 2931.12 | 18.44 | 2931.14 | 0.76 |
| 54   | 11057.00 | 92.30 | 1.30   | 8080.40 | 3025.04 | 19.51 | 3025.07 | 1.38 |
| 55   | 11151.00 | 90.90 | 1.30   | 8077.78 | 3118.97 | 21.64 | 3119.02 | 1.40 |
| 56   | 11245.00 | 89.50 | 1.70   | 8077.45 | 3212.94 | 24.10 | 3213.01 | 1.55 |
| 57   | 11339.00 | 88.30 | 1.40   | 8079.25 | 3306.89 | 26.64 | 3306.90 | 1.32 |
| 58   | 11432.00 | 91.20 | 1.60   | 8079.66 | 3399.84 | 29.07 | 3399.96 | 3.13 |
| 59   | 11526.00 | 92.50 | 1.70   | 8076.62 | 3493.75 | 31.78 | 3493.89 | 1.39 |
| 60   | 11620.00 | 90.20 | 0.60   | 8074.41 | 3587.70 | 33.67 | 3587.85 | 2.71 |
| 61   | 11713.00 | 91.30 | 0.90   | 8073.19 | 3680.68 | 34.88 | 3680.84 | 1.23 |
| 62   | 11807.00 | 90.20 | 0.60   | 8071.96 | 3774.66 | 36.11 | 3774.83 | 1.21 |
| 63   | 11901.00 | 90.00 | 0.50   | 8071.80 | 3868.66 | 37.02 | 3868.83 | 0.24 |
| 64   | 11995.00 | 90.60 | 0.60   | 8071.31 | 3962.65 | 37.02 | 3962.83 | 0.65 |
| 65   | 12088.00 | 89.20 | 359.80 | 8071.47 | 4055.65 | 38.24 | 4055.82 | 1.73 |
| 66   | 12181.00 | 89.60 | 358.50 | 8072.44 | 4148.63 | 36.86 | 4148.79 | 1.46 |
| 67   | 12275.00 | 90.20 | 357.80 | 8072.61 | 4242.58 | 33.83 | 4242.70 | 0.98 |
| 68   | 12369.00 | 91.90 | 358.30 | 8070.88 | 4336.51 | 30.63 | 4336.68 | 1.89 |
| 69   | 12463.00 | 93.10 | 1.40   | 8066.78 | 4430.41 | 30.38 | 4430.47 | 3.53 |
| 70   | 12557.00 | 92.20 | 1.10   | 8062.44 | 4524.28 | 32.43 | 4524.36 | 1.01 |
| 71   | 12651.00 | 92.30 | 0.60   | 8058.75 | 4618.20 | 33.82 | 4618.29 | 0.54 |
| 72   | 12745.00 | 92.80 | 0.90   | 8054.56 | 4712.10 | 35.05 | 4712.19 | 0.62 |
| 73   | 12839.00 | 93.10 | 0.70   | 8049.73 | 4805.96 | 36.36 | 4806.07 | 0.38 |
| PBHL | 12890.00 | 93.10 | 0.70   | 8046.97 | 4856.88 | 36.99 | 4856.99 | 0.00 |

CHESAPEAKE ENERGY  
WELL NUMBER : PLU ROSS RANCH 19 #1H  
4 1/2" DRILLPIPE SURVEY  
DATE RUN : 230610  
JOB NUMBER : MD0610GVCW261

| MD   | INC  | AZ     | TVD     | LOCAL<br>N | LOCAL<br>E | V/S    | DOG/<br>100FT |
|------|------|--------|---------|------------|------------|--------|---------------|
| 200  | 0.59 | 147.41 | 200     | -0.87      | 0.55       | -0.9   | 0.29          |
| 400  | 1.12 | 164.35 | 399.97  | -3.62      | 1.64       | -3.6   | 0.29          |
| 600  | 1.86 | 149.84 | 599.91  | -8.32      | 3.8        | -8.3   | 0.41          |
| 800  | 1.61 | 148.22 | 799.81  | -13.51     | 6.91       | -13.5  | 0.13          |
| 1000 | 1.78 | 148.95 | 999.73  | -18.56     | 9.99       | -18.6  | 0.09          |
| 1200 | 1.79 | 158.58 | 1199.63 | -24.13     | 12.74      | -24.1  | 0.15          |
| 1400 | 1.3  | 183.84 | 1399.56 | -29.31     | 13.73      | -29.3  | 0.41          |
| 1600 | 1.21 | 238.21 | 1599.52 | -32.7      | 11.77      | -32.7  | 0.58          |
| 1800 | 1.26 | 239.5  | 1799.47 | -34.93     | 8.08       | -34.9  | 0.03          |
| 2000 | 1.48 | 245.6  | 1999.41 | -37.1      | 3.84       | -37.1  | 0.13          |
| 2200 | 1.42 | 256.75 | 2199.35 | -38.74     | -0.92      | -38.7  | 0.14          |
| 2400 | 1.38 | 258.89 | 2399.29 | -39.77     | -5.7       | -39.8  | 0.03          |
| 2600 | 1.41 | 267.81 | 2599.23 | -40.33     | -10.52     | -40.3  | 0.11          |
| 2800 | 0.9  | 271.11 | 2799.19 | -40.39     | -14.55     | -40.4  | 0.25          |
| 3000 | 1.67 | 101.49 | 2999.17 | -40.94     | -13.26     | -40.9  | 1.28          |
| 3200 | 1.57 | 126.57 | 3199.09 | -43.16     | -8.2       | -43.2  | 0.36          |
| 3400 | 2.1  | 133.68 | 3398.99 | -47.33     | -3.34      | -47.3  | 0.29          |
| 3600 | 1.46 | 140.51 | 3598.89 | -51.83     | 0.93       | -51.8  | 0.34          |
| 3800 | 1.45 | 145.76 | 3798.82 | -55.89     | 3.98       | -55.9  | 0.07          |
| 4000 | 1.16 | 153.06 | 3998.77 | -59.78     | 6.31       | -59.8  | 0.16          |
| 4200 | 1.04 | 172.1  | 4198.74 | -63.39     | 7.48       | -63.4  | 0.19          |
| 4400 | 0.96 | 174.07 | 4398.71 | -66.86     | 7.91       | -66.9  | 0.04          |
| 4600 | 0.93 | 185.02 | 4598.68 | -70.15     | 7.94       | -70.2  | 0.09          |
| 4800 | 0.97 | 194.85 | 4798.65 | -73.41     | 7.36       | -73.4  | 0.08          |
| 5000 | 0.99 | 198.29 | 4998.62 | -76.7      | 6.38       | -76.7  | 0.03          |
| 5200 | 1.14 | 202.25 | 5198.59 | -80.19     | 5.08       | -80.2  | 0.08          |
| 5400 | 1.19 | 198.58 | 5398.55 | -84.01     | 3.66       | -84    | 0.04          |
| 5600 | 1.32 | 189.26 | 5598.5  | -88.24     | 2.63       | -88.2  | 0.12          |
| 5800 | 1.49 | 191.45 | 5798.44 | -93.06     | 1.75       | -93.1  | 0.09          |
| 6000 | 1.49 | 196.67 | 5998.37 | -98.1      | 0.48       | -98.1  | 0.07          |
| 6200 | 1.32 | 200.75 | 6198.31 | -102.74    | -1.07      | -102.7 | 0.1           |
| 6400 | 1.18 | 197.55 | 6398.26 | -106.85    | -2.51      | -106.9 | 0.07          |
| 6600 | 1.1  | 187.22 | 6598.22 | -110.73    | -3.38      | -110.7 | 0.11          |
| 6800 | 1.2  | 190.1  | 6798.18 | -114.69    | -3.98      | -114.7 | 0.06          |
| 7000 | 1.32 | 190.72 | 6998.13 | -119.02    | -4.78      | -119   | 0.06          |
| 7200 | 1.37 | 191.35 | 7198.08 | -123.63    | -5.68      | -123.6 | 0.03          |
| 7400 | 1.29 | 212.56 | 7398.03 | -127.88    | -7.36      | -127.9 | 0.25          |
| 7600 | 1.73 | 266.24 | 7597.97 | -129.98    | -11.6      | -130   | 0.71          |
| 7800 | 3    | 305.28 | 7797.8  | -127.15    | -18.89     | -127.2 | 0.99          |
| 8000 | 2.82 | 297.15 | 7997.55 | -121.88    | -27.55     | -121.9 | 0.22          |
| 8200 | 1.64 | 269.65 | 8197.4  | -119.65    | -34.79     | -119.6 | 0.78          |
| 8400 | 0.39 | 0.09   | 8397.37 | -118.99    | -37.65     | -119   | 0.84          |
| 8600 | 1.01 | 30.21  | 8597.35 | -116.8     | -36.76     | -116.8 | 0.35          |
| 8800 | 1.18 | 284.46 | 8797.33 | -114.76    | -37.86     | -114.8 | 0.87          |
| 9000 | 1.32 | 268.47 | 8997.28 | -114.31    | -42.16     | -114.3 | 0.19          |

|       |      |        |          |         |        |        |      |
|-------|------|--------|----------|---------|--------|--------|------|
| 9200  | 1.59 | 174.22 | 9197.24  | -117.13 | -44.19 | -117.1 | 1.07 |
| 9400  | 2.19 | 163.74 | 9397.13  | -123.56 | -42.84 | -123.6 | 0.35 |
| 9600  | 2.59 | 134.36 | 9596.96  | -130.4  | -38.53 | -130.4 | 0.64 |
| 9800  | 3.98 | 104.24 | 9796.65  | -135.26 | -28.57 | -135.3 | 1.09 |
| 10000 | 1.81 | 102.71 | 9996.38  | -137.67 | -18.76 | -137.7 | 1.09 |
| 10200 | 0.74 | 203.23 | 10196.34 | -139.54 | -16.18 | -139.5 | 1.04 |
| 10400 | 2.91 | 239.66 | 10396.23 | -143.28 | -21.07 | -143.3 | 1.18 |
| 10432 | 3    | 241.84 | 10428.19 | -144.09 | -22.51 | -144.1 | 0.46 |