

**REPORT OF**  
***SUB-SURFACE***  
***DIRECTIONAL***  
***SURVEY***

**API #**

**COLLINS AND WARE**

**T. D. POPE NO. 5**

**LEA COUNTY, NEW MEXICO**

**JOB NUMBER**

**430-1661**

**430-1661**

**TYPE OF SURVEY**

**GYROSCOPIC**

**M W D**

**DATE**

**DEC. 8, 1993**

**JAN. 24, 1994**

**SURVEY BY TIM STEPHENS/RALPH RICE**

**OFFICE: MIDLAND, TX**

# COLLINS AND WARE, INC.

Structure: POPE WELL NO. 5

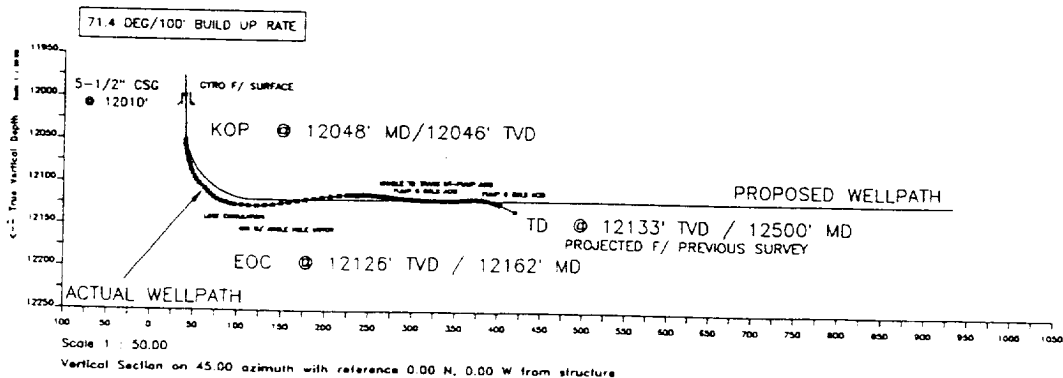
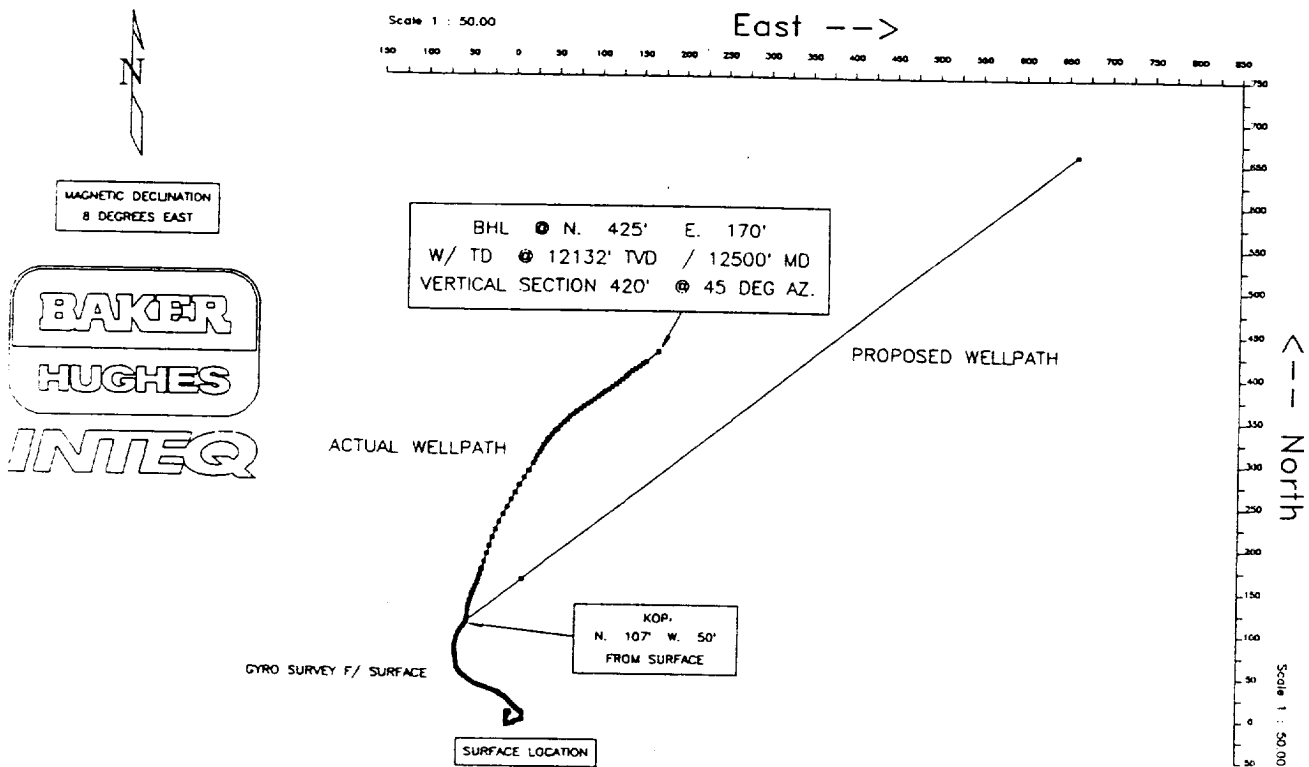
Well : #5

Field : DENTON

Location : LEA COUNTY, NEW MEXICO

## WELL PROFILE DATA

| Point        | MD    | Inc   | Dir   | TVD   | North | East |
|--------------|-------|-------|-------|-------|-------|------|
| Tie in       | 12000 | 1.72  | 27.20 | 11998 | 106   | -50  |
| KOP          | 12044 | 1.72  | 27.20 | 12042 | 106   | -50  |
| End of Build | 12188 | 90.00 | 52.18 | 12120 | 158   | 13   |
| Target       | 12287 | 80.00 | 52.18 | 12120 | 560   | 690  |



COLLINS AND WARE, INC.  
T.D. POPE

#5  
slot #1  
DENTON  
LEA COUNTY, NEW MEXICO

S U R V E Y L I S T I N G

by  
Baker Hughes INTEQ

Your ref :  
Our ref : svy248  
License :

Date printed : 23-Feb-94  
Date created : 15-Dec-93  
Last revised : 23-Feb-94

Field is centred on 0.000,0.000,0.00000,+  
Structure is centred on 0.000,0.000,0.00000,N

Slot location is n0 0 0.000,w4 29 18.843  
Slot Grid coordinates are N 0.000, E 0.000  
Slot local coordinates are 0.00 N 0.00 E  
Reference North is Grid North

COLLINS AND WARE, INC.  
T.D. POPE, #5  
DENTON, LEA COUNTY, NEW MEXICO

SURVEY LISTING Page 1  
Your ref :  
Last revised : 23-Feb-94

| Measured<br>Depth | Inclin.<br>Degrees | Azimuth<br>Degrees | True Vert.<br>Depth | R E C T A N G U L A R<br>C O O R D I N A T E S | Dogleg<br>Deg/100Ft | Vert<br>Sect |
|-------------------|--------------------|--------------------|---------------------|------------------------------------------------|---------------------|--------------|
| 0.00              | 0.00               | 0.00               | 0.00                | 0.00 N                                         | 0.00 E              | 0.00         |
| 100.00            | 0.06               | 308.59             | 100.00              | 0.03 N                                         | 0.04 W              | 0.06         |
| 200.00            | 0.11               | 293.11             | 200.00              | 0.10 N                                         | 0.17 W              | 0.05         |
| 300.00            | 0.16               | 234.58             | 300.00              | 0.06 N                                         | 0.37 W              | 0.14         |
| 400.00            | 0.31               | 256.39             | 400.00              | 0.08 S                                         | 0.75 W              | 0.17         |
| 500.00            | 0.31               | 239.04             | 500.00              | 0.29 S                                         | 1.24 W              | 0.09         |
| 600.00            | 0.44               | 219.06             | 600.00              | 0.72 S                                         | 1.72 W              | 0.18         |
| 700.00            | 0.40               | 193.33             | 699.99              | 1.36 S                                         | 2.04 W              | 0.19         |
| 800.00            | 0.25               | 208.05             | 799.99              | 1.89 S                                         | 2.22 W              | 0.17         |
| 900.00            | 0.41               | 189.48             | 899.99              | 2.44 S                                         | 2.38 W              | 0.19         |
| 1000.00           | 0.31               | 161.14             | 999.99              | 3.05 S                                         | 2.36 W              | 0.20         |
| 1100.00           | 0.24               | 157.68             | 1099.99             | 3.50 S                                         | 2.19 W              | 0.07         |
| 1200.00           | 0.16               | 175.81             | 1199.98             | 3.83 S                                         | 2.10 W              | 0.10         |
| 1300.00           | 0.40               | 136.67             | 1299.98             | 4.22 S                                         | 1.85 W              | 0.29         |
| 1400.00           | 0.27               | 187.63             | 1399.98             | 4.71 S                                         | 1.64 W              | 0.31         |
| 1500.00           | 0.42               | 185.90             | 1499.98             | 5.31 S                                         | 1.71 W              | 0.15         |
| 1600.00           | 0.65               | 189.98             | 1599.98             | 6.23 S                                         | 1.85 W              | 0.23         |
| 1700.00           | 0.47               | 185.67             | 1699.97             | 7.20 S                                         | 1.98 W              | 0.18         |
| 1800.00           | 0.56               | 211.48             | 1799.97             | 8.02 S                                         | 2.28 W              | 0.25         |
| 1900.00           | 0.17               | 157.97             | 1899.96             | 8.58 S                                         | 2.48 W              | 0.48         |
| 2000.00           | 0.55               | 157.56             | 1999.96             | 9.16 S                                         | 2.24 W              | 0.38         |
| 2100.00           | 0.94               | 151.49             | 2099.96             | 10.32 S                                        | 1.67 W              | 0.40         |
| 2200.00           | 0.52               | 161.08             | 2199.95             | 11.48 S                                        | 1.13 W              | 0.44         |
| 2300.00           | 0.60               | 176.38             | 2299.94             | 12.43 S                                        | 0.95 W              | 0.17         |
| 2400.00           | 0.17               | 202.94             | 2399.94             | 13.09 S                                        | 0.97 W              | 0.45         |
| 2500.00           | 0.37               | 214.82             | 2499.94             | 13.49 S                                        | 1.22 W              | 0.21         |
| 2600.00           | 0.22               | 266.78             | 2599.94             | 13.76 S                                        | 1.59 W              | 0.29         |
| 2700.00           | 0.09               | 104.54             | 2699.94             | 13.79 S                                        | 1.71 W              | 0.31         |
| 2800.00           | 0.04               | 213.40             | 2799.94             | 13.84 S                                        | 1.65 W              | 0.11         |
| 2900.00           | 0.31               | 83.87              | 2899.94             | 13.84 S                                        | 1.40 W              | 0.34         |
| 3000.00           | 0.44               | 47.75              | 2999.93             | 13.56 S                                        | 0.85 W              | 0.26         |
| 3100.00           | 0.38               | 29.04              | 3099.93             | 13.01 S                                        | 0.40 W              | 0.14         |
| 3200.00           | 0.54               | 38.25              | 3199.93             | 12.35 S                                        | 0.05 E              | 0.18         |
| 3300.00           | 0.44               | 59.58              | 3299.92             | 11.78 S                                        | 0.67 E              | 0.21         |
| 3400.00           | 0.43               | 109.37             | 3399.92             | 11.71 S                                        | 1.36 E              | 0.37         |
| 3500.00           | 0.50               | 102.43             | 3499.92             | 11.93 S                                        | 2.14 E              | 0.09         |
| 3600.00           | 0.77               | 83.80              | 3599.91             | 11.95 S                                        | 3.23 E              | 0.34         |
| 3700.00           | 0.78               | 83.91              | 3699.90             | 11.81 S                                        | 4.58 E              | 0.01         |
| 3800.00           | 0.53               | 93.96              | 3799.90             | 11.77 S                                        | 5.72 E              | 0.27         |
| 3900.00           | 0.51               | 43.62              | 3899.89             | 11.48 S                                        | 6.48 E              | 0.44         |
| 4000.00           | 0.66               | 25.69              | 3999.89             | 10.64 S                                        | 7.04 E              | 0.23         |
| 4100.00           | 0.59               | 2.96               | 4099.88             | 9.60 S                                         | 7.32 E              | 0.26         |
| 4200.00           | 0.30               | 87.73              | 4199.88             | 9.08 S                                         | 7.60 E              | 0.64         |
| 4300.00           | 0.60               | 86.00              | 4299.88             | 9.03 S                                         | 8.39 E              | 0.30         |
| 4400.00           | 0.68               | 69.52              | 4399.87             | 8.79 S                                         | 9.47 E              | 0.20         |
| 4500.00           | 0.60               | 82.93              | 4499.86             | 8.52 S                                         | 10.54 E             | 0.17         |
| 4600.00           | 0.56               | 83.21              | 4599.86             | 8.39 S                                         | 11.55 E             | 0.04         |
| 4700.00           | 0.65               | 86.67              | 4699.85             | 8.30 S                                         | 12.60 E             | 0.10         |
| 4800.00           | 0.44               | 91.55              | 4799.85             | 8.28 S                                         | 13.55 E             | 0.21         |
| 4900.00           | 0.39               | 44.82              | 4899.85             | 8.05 S                                         | 14.17 E             | 0.33         |

All data is in feet unless otherwise stated  
Coordinates from structure and TVD from wellhead.  
Vertical section is from N 0.00 E 0.00 on azimuth 45.00 degrees.  
Declination is 0.00 degrees, Convergence is 0.00 degrees.  
Calculation uses the minimum curvature method.  
Presented by Baker Hughes INTEQ

COLLINS AND WARE, INC.  
T.D. POPE, #5  
DENTON, LEA COUNTY, NEW MEXICO

SURVEY LISTING Page 2  
Your ref :  
Last revised : 23-Feb-94

| Measured<br>Depth | Inclin.<br>Degrees | Azimuth<br>Degrees | True Vert.<br>Depth | RECTANGULAR<br>COORDINATES |         | Dogleg<br>Deg/100Ft | Vert<br>Sect |
|-------------------|--------------------|--------------------|---------------------|----------------------------|---------|---------------------|--------------|
| 5000.00           | 0.36               | 51.85              | 4999.84             | 7.61 S                     | 14.66 E | 0.05                | 4.98         |
| 5100.00           | 0.40               | 36.61              | 5099.84             | 7.14 S                     | 15.12 E | 0.11                | 5.64         |
| 5200.00           | 0.44               | 32.07              | 5199.84             | 6.53 S                     | 15.53 E | 0.05                | 6.36         |
| 5300.00           | 0.56               | 21.38              | 5299.84             | 5.75 S                     | 15.91 E | 0.15                | 7.18         |
| 5400.00           | 0.53               | 10.91              | 5399.83             | 4.84 S                     | 16.18 E | 0.10                | 8.01         |
| 5500.00           | 0.56               | 12.35              | 5499.83             | 3.91 S                     | 16.37 E | 0.03                | 8.81         |
| 5600.00           | 0.78               | 354.24             | 5599.82             | 2.76 S                     | 16.40 E | 0.30                | 9.65         |
| 5700.00           | 0.79               | 356.06             | 5699.81             | 1.39 S                     | 16.29 E | 0.03                | 10.53        |
| 5800.00           | 0.53               | 334.64             | 5799.80             | 0.29 S                     | 16.04 E | 0.35                | 11.14        |
| 5900.00           | 0.62               | 327.69             | 5899.80             | 0.59 N                     | 15.56 E | 0.11                | 11.41        |
| 6000.00           | 0.62               | 307.82             | 5999.79             | 1.38 N                     | 14.84 E | 0.21                | 11.46        |
| 6100.00           | 0.73               | 307.00             | 6099.79             | 2.09 N                     | 13.90 E | 0.11                | 11.31        |
| 6200.00           | 0.70               | 302.87             | 6199.78             | 2.80 N                     | 12.88 E | 0.06                | 11.09        |
| 6300.00           | 0.79               | 297.69             | 6299.77             | 3.46 N                     | 11.76 E | 0.11                | 10.76        |
| 6400.00           | 1.03               | 312.79             | 6399.76             | 4.39 N                     | 10.49 E | 0.34                | 10.52        |
| 6500.00           | 0.94               | 312.40             | 6499.74             | 5.55 N                     | 9.22 E  | 0.09                | 10.45        |
| 6600.00           | 0.95               | 312.39             | 6599.73             | 6.66 N                     | 8.00 E  | 0.01                | 10.37        |
| 6700.00           | 0.92               | 313.19             | 6699.72             | 7.77 N                     | 6.81 E  | 0.03                | 10.31        |
| 6800.00           | 1.00               | 317.88             | 6799.70             | 8.97 N                     | 5.64 E  | 0.11                | 10.33        |
| 6900.00           | 1.04               | 313.47             | 6899.69             | 10.24 N                    | 4.39 E  | 0.09                | 10.35        |
| 7000.00           | 0.90               | 313.16             | 6999.67             | 11.40 N                    | 3.16 E  | 0.14                | 10.30        |
| 7100.00           | 0.94               | 316.64             | 7099.66             | 12.54 N                    | 2.02 E  | 0.07                | 10.30        |
| 7200.00           | 0.89               | 316.87             | 7199.65             | 13.70 N                    | 0.93 E  | 0.05                | 10.34        |
| 7300.00           | 0.90               | 315.95             | 7299.63             | 14.83 N                    | 0.15 W  | 0.02                | 10.38        |
| 7400.00           | 0.77               | 321.42             | 7399.62             | 15.92 N                    | 1.11 W  | 0.15                | 10.47        |
| 7500.00           | 0.93               | 315.33             | 7499.61             | 17.02 N                    | 2.10 W  | 0.18                | 10.55        |
| 7600.00           | 0.87               | 311.07             | 7599.60             | 18.10 N                    | 3.24 W  | 0.09                | 10.50        |
| 7700.00           | 0.97               | 303.82             | 7699.59             | 19.07 N                    | 4.52 W  | 0.15                | 10.29        |
| 7800.00           | 1.00               | 297.21             | 7799.57             | 19.94 N                    | 6.00 W  | 0.12                | 9.86         |
| 7900.00           | 0.97               | 297.91             | 7899.56             | 20.73 N                    | 7.52 W  | 0.03                | 9.34         |
| 8000.00           | 0.85               | 306.83             | 7999.54             | 21.57 N                    | 8.86 W  | 0.18                | 8.99         |
| 8100.00           | 0.95               | 307.16             | 8099.53             | 22.52 N                    | 10.12 W | 0.10                | 8.77         |
| 8200.00           | 0.93               | 306.98             | 8199.52             | 23.51 N                    | 11.43 W | 0.02                | 8.54         |
| 8300.00           | 0.94               | 306.78             | 8299.51             | 24.49 N                    | 12.73 W | 0.01                | 8.31         |
| 8400.00           | 0.96               | 298.41             | 8399.49             | 25.38 N                    | 14.13 W | 0.14                | 7.96         |
| 8500.00           | 2.04               | 281.62             | 8499.46             | 26.14 N                    | 16.61 W | 1.15                | 6.74         |
| 8600.00           | 1.99               | 291.24             | 8599.40             | 27.12 N                    | 19.97 W | 0.34                | 5.06         |
| 8700.00           | 1.95               | 290.19             | 8699.34             | 28.34 N                    | 23.18 W | 0.05                | 3.64         |
| 8800.00           | 1.71               | 294.44             | 8799.28             | 29.54 N                    | 26.14 W | 0.28                | 2.41         |
| 8900.00           | 1.66               | 288.97             | 8899.24             | 30.63 N                    | 28.87 W | 0.17                | 1.25         |
| 9000.00           | 1.60               | 285.29             | 8999.20             | 31.47 N                    | 31.58 W | 0.12                | -0.08        |
| 9100.00           | 1.64               | 288.17             | 9099.16             | 32.28 N                    | 34.29 W | 0.09                | -1.42        |
| 9200.00           | 1.53               | 294.47             | 9199.12             | 33.28 N                    | 36.86 W | 0.20                | -2.53        |
| 9300.00           | 1.66               | 301.59             | 9299.08             | 34.60 N                    | 39.31 W | 0.24                | -3.34        |
| 9400.00           | 1.98               | 301.60             | 9399.03             | 36.26 N                    | 42.02 W | 0.32                | -4.07        |
| 9500.00           | 1.66               | 304.13             | 9498.98             | 37.98 N                    | 44.69 W | 0.33                | -4.75        |
| 9600.00           | 1.62               | 310.17             | 9598.94             | 39.70 N                    | 46.97 W | 0.18                | -5.14        |
| 9700.00           | 1.65               | 309.34             | 9698.90             | 41.53 N                    | 49.16 W | 0.04                | -5.40        |
| 9800.00           | 1.68               | 305.22             | 9798.86             | 43.28 N                    | 51.47 W | 0.12                | -5.79        |
| 9900.00           | 1.54               | 312.01             | 9898.82             | 45.03 N                    | 53.67 W | 0.24                | -6.11        |

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Coordinates from structure and TVD from wellhead.  
Vertical section is from N 0.00 E 0.00 on azimuth 45.00 degrees.  
Declination is 0.00 degrees, Convergence is 0.00 degrees.  
Calculation uses the minimum curvature method.  
Presented by Baker Hughes INTEQ

COLLINS AND WARE, INC.  
T.D. POPE, #5  
DENTON, LEA COUNTY, NEW MEXICO

SURVEY LISTING Page 3  
Your ref :  
Last revised : 23-Feb-94

| Measured<br>Depth | Inclin.<br>Degrees | Azimuth<br>Degrees | True Vert.<br>Depth | R E C T A N G U L A R<br>C O O R D I N A T E S |         | Dogleg<br>Deg/100Ft | Vert<br>Sect |                         |
|-------------------|--------------------|--------------------|---------------------|------------------------------------------------|---------|---------------------|--------------|-------------------------|
| 10000.00          | 1.37               | 318.82             | 9998.79             | 46.83 N                                        | 55.45 W | 0.24                | -6.10        |                         |
| 10100.00          | 1.35               | 324.60             | 10098.76            | 48.69 N                                        | 56.92 W | 0.14                | -5.82        |                         |
| 10200.00          | 1.57               | 328.62             | 10198.73            | 50.82 N                                        | 58.32 W | 0.24                | -5.30        |                         |
| 10300.00          | 1.54               | 330.30             | 10298.69            | 53.16 N                                        | 59.70 W | 0.05                | -4.63        |                         |
| 10400.00          | 2.16               | 358.30             | 10398.64            | 56.21 N                                        | 60.42 W | 1.08                | -2.98        |                         |
| 10500.00          | 2.42               | 357.67             | 10498.56            | 60.20 N                                        | 60.56 W | 0.26                | -0.26        |                         |
| 10600.00          | 1.97               | 352.74             | 10598.49            | 64.01 N                                        | 60.86 W | 0.49                | 2.23         |                         |
| 10700.00          | 1.58               | 353.67             | 10698.44            | 67.09 N                                        | 61.23 W | 0.39                | 4.14         |                         |
| 10800.00          | 1.46               | 351.01             | 10798.40            | 69.72 N                                        | 61.58 W | 0.14                | 5.75         |                         |
| 10900.00          | 1.37               | 355.73             | 10898.37            | 72.17 N                                        | 61.87 W | 0.15                | 7.28         |                         |
| 11000.00          | 1.51               | 349.77             | 10998.34            | 74.66 N                                        | 62.20 W | 0.20                | 8.81         |                         |
| 11100.00          | 1.89               | 359.17             | 11098.30            | 77.60 N                                        | 62.45 W | 0.47                | 10.71        |                         |
| 11200.00          | 1.93               | 7.16               | 11198.24            | 80.92 N                                        | 62.27 W | 0.27                | 13.19        |                         |
| 11300.00          | 2.29               | 15.12              | 11298.17            | 84.52 N                                        | 61.54 W | 0.46                | 16.25        |                         |
| 11400.00          | 2.47               | 18.18              | 11398.09            | 88.50 N                                        | 60.34 W | 0.22                | 19.91        |                         |
| 11500.00          | 2.23               | 22.90              | 11498.00            | 92.34 N                                        | 58.92 W | 0.31                | 23.63        |                         |
| 11600.00          | 2.05               | 29.02              | 11597.93            | 95.69 N                                        | 57.29 W | 0.29                | 27.15        |                         |
| 11700.00          | 1.93               | 33.08              | 11697.87            | 98.67 N                                        | 55.50 W | 0.18                | 30.52        |                         |
| 11800.00          | 1.85               | 34.07              | 11797.82            | 101.42 N                                       | 53.68 W | 0.09                | 33.75        |                         |
| 11900.00          | 1.68               | 37.93              | 11897.77            | 103.91 N                                       | 51.87 W | 0.21                | 36.79        |                         |
| 12000.00          | 1.72               | 27.20              | 11997.73            | 106.40 N                                       | 50.29 W | 0.32                | 39.68        | GYRO F/ SURFACE         |
| 12048.00          | 0.70               | 208.40             | 12045.72            | 106.78 N                                       | 50.10 W | 5.04                | 40.08        | SHORT RADIUS KOP        |
| 12053.00          | 0.20               | 7.60               | 12050.72            | 106.76 N                                       | 50.11 W | 17.80               | 40.06        |                         |
| 12058.00          | 6.20               | 17.80              | 12055.71            | 107.03 N                                       | 50.03 W | 120.06              | 40.31        |                         |
| 12063.00          | 11.50              | 17.30              | 12060.65            | 107.76 N                                       | 49.80 W | 106.01              | 40.99        |                         |
| 12068.00          | 13.30              | 16.60              | 12065.54            | 108.79 N                                       | 49.48 W | 36.12               | 41.94        |                         |
| 12073.00          | 16.30              | 12.10              | 12070.37            | 110.03 N                                       | 49.17 W | 64.21               | 43.03        |                         |
| 12078.00          | 18.50              | 6.70               | 12075.14            | 111.50 N                                       | 48.93 W | 54.54               | 44.24        |                         |
| 12083.00          | 20.50              | 3.90               | 12079.85            | 113.16 N                                       | 48.78 W | 44.14               | 45.53        |                         |
| 12088.00          | 25.40              | 5.80               | 12084.46            | 115.11 N                                       | 48.61 W | 99.10               | 47.02        |                         |
| 12093.00          | 30.30              | 6.40               | 12088.88            | 117.43 N                                       | 48.36 W | 98.16               | 48.84        |                         |
| 12098.00          | 35.80              | 5.60               | 12093.06            | 120.14 N                                       | 48.08 W | 110.34              | 50.95        |                         |
| 12103.00          | 40.80              | 6.60               | 12096.99            | 123.22 N                                       | 47.75 W | 100.76              | 53.36        |                         |
| 12108.00          | 46.70              | 10.90              | 12100.60            | 126.63 N                                       | 47.22 W | 132.08              | 56.16        |                         |
| 12113.00          | 49.60              | 14.30              | 12103.93            | 130.26 N                                       | 46.40 W | 76.99               | 59.30        | LOST CIRCULATION        |
| 12118.00          | 49.10              | 18.30              | 12107.19            | 133.90 N                                       | 45.34 W | 61.51               | 62.62        |                         |
| 12123.00          | 47.40              | 21.10              | 12110.52            | 137.42 N                                       | 44.08 W | 53.86               | 66.00        |                         |
| 12128.00          | 48.20              | 22.40              | 12113.88            | 140.86 N                                       | 42.71 W | 25.04               | 69.40        |                         |
| 12133.00          | 54.60              | 21.00              | 12117.00            | 144.49 N                                       | 41.27 W | 129.85              | 72.99        |                         |
| 12138.00          | 61.60              | 20.10              | 12119.64            | 148.46 N                                       | 39.78 W | 140.83              | 76.85        |                         |
| 12144.00          | 68.80              | 19.60              | 12122.15            | 153.58 N                                       | 37.93 W | 120.24              | 81.77        |                         |
| 12150.00          | 74.80              | 19.00              | 12124.03            | 158.96 N                                       | 36.05 W | 100.45              | 86.91        |                         |
| 12155.00          | 79.40              | 17.90              | 12125.14            | 163.58 N                                       | 34.51 W | 94.46               | 91.27        |                         |
| 12160.00          | 84.00              | 16.90              | 12125.86            | 168.30 N                                       | 33.03 W | 94.10               | 95.65        |                         |
| 12162.00          | 84.60              | 16.94              | 12126.06            | 170.20 N                                       | 32.45 W | 30.07               | 97.40        | GIH W/ ANGLE HOLE MOTOR |
| 12170.00          | 87.00              | 17.10              | 12126.65            | 177.83 N                                       | 30.11 W | 30.07               | 104.45       |                         |
| 12180.00          | 87.90              | 17.60              | 12127.09            | 187.36 N                                       | 27.14 W | 10.29               | 113.30       |                         |
| 12190.00          | 89.80              | 17.50              | 12127.30            | 196.90 N                                       | 24.12 W | 19.03               | 122.17       |                         |
| 12200.00          | 93.20              | 18.90              | 12127.03            | 206.39 N                                       | 21.00 W | 36.77               | 131.09       |                         |
| 12210.00          | 97.60              | 21.50              | 12126.09            | 215.73 N                                       | 17.56 W | 51.04               | 140.13       |                         |

All data is in feet unless otherwise stated  
Coordinates from structure and TVD from wellhead.  
Vertical section is from N 0.00 E 0.00 on azimuth 45.00 degrees.  
Declination is 0.00 degrees, Convergence is 0.00 degrees.  
Calculation uses the minimum curvature method.  
Presented by Baker Hughes INTEQ

COLLINS AND WARE, INC.  
T.D. POPE, #5  
DENTON, LEA COUNTY, NEW MEXICO

SURVEY LISTING Page 4  
Your ref :  
Last revised : 23-Feb-94

| Measured<br>Depth | Inclin.<br>Degrees | Azimuth<br>Degrees | True Vert.<br>Depth | R E C T A N G U L A R<br>C O O R D I N A T E S |          | Dogleg<br>Deg/100Ft | Vert<br>Sect |                              |
|-------------------|--------------------|--------------------|---------------------|------------------------------------------------|----------|---------------------|--------------|------------------------------|
| 12220.00          | 101.10             | 26.20              | 12124.47            | 224.75 N                                       | 13.58 W  | 58.09               | 149.32       |                              |
| 12230.00          | 99.50              | 28.40              | 12122.68            | 233.50 N                                       | 9.06 W   | 26.92               | 158.70       |                              |
| 12240.00          | 97.20              | 30.00              | 12121.23            | 242.13 N                                       | 4.24 W   | 27.92               | 168.22       |                              |
| 12250.00          | 97.40              | 27.10              | 12119.96            | 250.84 N                                       | 0.50 E   | 28.83               | 177.73       |                              |
| 12260.00          | 98.50              | 26.80              | 12118.57            | 259.67 N                                       | 4.99 E   | 11.39               | 187.14       |                              |
| 12270.00          | 98.70              | 28.30              | 12117.08            | 268.44 N                                       | 9.56 E   | 14.96               | 196.58       |                              |
| 12280.00          | 98.10              | 31.00              | 12115.62            | 277.03 N                                       | 14.46 E  | 27.38               | 206.12       |                              |
| 12290.00          | 94.80              | 32.60              | 12114.49            | 285.48 N                                       | 19.69 E  | 36.63               | 215.79       |                              |
| 12300.00          | 92.10              | 32.70              | 12113.89            | 293.88 N                                       | 25.08 E  | 27.02               | 225.54       |                              |
| 12305.00          | 91.60              | 30.30              | 12113.73            | 298.14 N                                       | 27.69 E  | 49.00               | 230.40       |                              |
| 12310.00          | 91.50              | 28.60              | 12113.59            | 302.49 N                                       | 30.14 E  | 34.05               | 235.21       |                              |
| 12315.00          | 91.70              | 27.30              | 12113.46            | 306.91 N                                       | 32.49 E  | 26.30               | 239.99       |                              |
| 12320.00          | 90.20              | 30.20              | 12113.37            | 311.29 N                                       | 34.89 E  | 65.29               | 244.79       |                              |
| 12325.00          | 87.50              | 33.00              | 12113.47            | 315.55 N                                       | 37.51 E  | 77.78               | 249.65       |                              |
| 12330.00          | 85.50              | 34.20              | 12113.78            | 319.70 N                                       | 40.27 E  | 46.62               | 254.54       |                              |
| 12332.00          | 84.42              | 35.68              | 12113.95            | 321.34 N                                       | 41.41 E  | 91.29               | 256.50       | UNABLE TO TRANS WT-PUMP ACID |
| 12335.00          | 82.80              | 37.90              | 12114.29            | 323.73 N                                       | 43.20 E  | 91.29               | 259.46       |                              |
| 12340.00          | 83.20              | 41.00              | 12114.90            | 327.56 N                                       | 46.35 E  | 62.06               | 264.39       |                              |
| 12345.00          | 83.50              | 43.10              | 12115.48            | 331.24 N                                       | 49.68 E  | 42.15               | 269.35       |                              |
| 12348.00          | 83.44              | 43.82              | 12115.82            | 333.41 N                                       | 51.73 E  | 23.93               | 272.33       | PUMP 6 BBLs ACID             |
| 12350.00          | 83.40              | 44.30              | 12116.05            | 334.84 N                                       | 53.11 E  | 23.93               | 274.32       |                              |
| 12355.00          | 83.40              | 44.80              | 12116.62            | 338.38 N                                       | 56.59 E  | 9.93                | 279.29       |                              |
| 12360.00          | 83.30              | 45.20              | 12117.20            | 341.89 N                                       | 60.10 E  | 8.19                | 284.25       |                              |
| 12365.00          | 83.40              | 46.20              | 12117.78            | 345.36 N                                       | 63.66 E  | 19.96               | 289.22       |                              |
| 12370.00          | 84.60              | 47.90              | 12118.30            | 348.74 N                                       | 67.30 E  | 41.46               | 294.19       |                              |
| 12375.00          | 85.40              | 49.40              | 12118.74            | 352.03 N                                       | 71.04 E  | 33.90               | 299.16       |                              |
| 12380.00          | 86.40              | 51.70              | 12119.10            | 355.20 N                                       | 74.89 E  | 50.05               | 304.12       |                              |
| 12385.00          | 86.80              | 54.20              | 12119.39            | 358.21 N                                       | 78.87 E  | 50.55               | 309.06       |                              |
| 12390.00          | 87.20              | 56.40              | 12119.65            | 361.05 N                                       | 82.98 E  | 44.66               | 313.98       |                              |
| 12395.00          | 87.90              | 56.20              | 12119.87            | 363.82 N                                       | 87.13 E  | 14.56               | 318.88       |                              |
| 12400.00          | 88.50              | 55.10              | 12120.02            | 366.64 N                                       | 91.26 E  | 25.05               | 323.79       |                              |
| 12405.00          | 89.50              | 53.50              | 12120.11            | 369.56 N                                       | 95.32 E  | 37.73               | 328.72       |                              |
| 12410.00          | 90.00              | 53.10              | 12120.13            | 372.55 N                                       | 99.33 E  | 12.81               | 333.67       |                              |
| 12415.00          | 91.00              | 54.30              | 12120.09            | 375.51 N                                       | 103.36 E | 31.24               | 338.61       |                              |
| 12420.00          | 91.30              | 55.40              | 12119.99            | 378.39 N                                       | 107.44 E | 22.80               | 343.54       |                              |
| 12425.00          | 91.20              | 56.30              | 12119.88            | 381.19 N                                       | 111.58 E | 18.11               | 348.44       |                              |
| 12430.00          | 92.40              | 55.90              | 12119.72            | 383.98 N                                       | 115.73 E | 25.30               | 353.35       |                              |
| 12435.00          | 94.40              | 54.60              | 12119.43            | 386.82 N                                       | 119.83 E | 47.68               | 358.26       |                              |
| 12440.00          | 95.10              | 52.40              | 12119.01            | 389.79 N                                       | 123.84 E | 46.03               | 363.19       |                              |
| 12445.00          | 94.30              | 49.60              | 12118.60            | 392.92 N                                       | 127.71 E | 58.06               | 368.14       |                              |
| 12450.00          | 88.50              | 49.00              | 12118.48            | 396.18 N                                       | 131.50 E | 116.62              | 373.12       |                              |
| 12452.00          | 87.30              | 49.56              | 12118.55            | 397.49 N                                       | 133.01 E | 66.19               | 375.12       | PUMP 6 BBLs ACID             |
| 12455.00          | 85.50              | 50.40              | 12118.74            | 399.41 N                                       | 135.30 E | 66.19               | 378.10       |                              |
| 12460.00          | 80.40              | 53.30              | 12119.36            | 402.48 N                                       | 139.20 E | 117.11              | 383.02       |                              |
| 12465.00          | 78.80              | 54.10              | 12120.26            | 405.39 N                                       | 143.17 E | 35.66               | 387.89       |                              |
| 12470.00          | 74.30              | 54.50              | 12121.42            | 408.22 N                                       | 147.11 E | 90.34               | 392.68       |                              |
| 12475.00          | 72.50              | 54.60              | 12122.85            | 411.00 N                                       | 151.02 E | 36.05               | 397.41       |                              |
| 12480.00          | 70.30              | 54.20              | 12124.44            | 413.76 N                                       | 154.87 E | 44.65               | 402.08       |                              |
| 12500.00          | 61.50              | 53.60              | 12132.60            | 424.50 N                                       | 169.61 E | 44.08               | 420.10       | PROJECTED F/ PREVIOUS SURVEY |

All data is in feet unless otherwise stated  
Coordinates from structure and TVD from wellhead.  
Vertical section is from N 0.00 E 0.00 on azimuth 45.00 degrees.  
Declination is 0.00 degrees, Convergence is 0.00 degrees.  
Calculation uses the minimum curvature method.  
Presented by Baker Hughes INTEQ

COLLINS AND WARE, INC.  
T.D. POPE, #5  
DENTON, LEA COUNTY, NEW MEXICO

SURVEY LISTING Page 5  
Your ref :  
Last revised : 23-Feb-94

|          |          |                     |          | Comments in wellpath         |
|----------|----------|---------------------|----------|------------------------------|
|          |          |                     |          | =====                        |
| MD       | TVD      | Rectangular Coords. |          | Comment                      |
| 12000.00 | 11997.73 | 106.40 N            | 50.29 W  | GYRO F/ SURFACE              |
| 12048.00 | 12045.72 | 106.78 N            | 50.10 W  | SHORT RADIUS KOP             |
| 12113.00 | 12103.93 | 130.26 N            | 46.40 W  | LOST CIRCULATION             |
| 12162.00 | 12126.06 | 170.20 N            | 32.45 W  | GIH W/ ANGLE HOLE MOTOR      |
| 12332.00 | 12113.95 | 321.34 N            | 41.41 E  | UNABLE TO TRANS WT-PUMP ACID |
| 12348.00 | 12115.82 | 333.41 N            | 51.73 E  | PUMP 6 BBLS ACID             |
| 12452.00 | 12118.55 | 397.49 N            | 133.01 E | PUMP 6 BBLS ACID             |
| 12500.00 | 12132.60 | 424.50 N            | 169.61 E | PROJECTED F/ PREVIOUS SURVEY |

All data is in feet unless otherwise stated  
Coordinates from structure and TVD from wellhead.  
Bottom hole distance is 457.14 on azimuth 21.78 degrees from wellhead.  
Vertical section is from N 0.00 E 0.00 on azimuth 45.00 degrees.  
Declination is 0.00 degrees, Convergence is 0.00 degrees.  
Calculation uses the minimum curvature method.  
Presented by Baker Hughes INTEQ



2105 Market Street Midland, Texas 79703  
915-694-9517 Fax 915-694-5648

### SURVEY CERTIFICATION SHEET

STATE OF TEXAS  
COUNTY OF MIDLAND

I, Tim Stephens, in the employ of Baker Hughes INTEQ did on the days of December 8, 1993 thru December 8, 1993 conduct or supervise the taking of a Gyroscopic survey by the method of magnetic orientation from a depth of 0 feet to 12000 feet, with recordings of inclination and direction being obtained at approximate intervals of 100 feet.

This survey was conducted at the request of Collins and Ware, Inc. for their T. D. Pope No. 5, Lea County, State of New Mexico.

The data for this survey and the calculation were obtained and performed by me according to standards and procedures as set forth by Baker Hughes INTEQ and is true and correct to the best of my knowledge.

Tim Stephens  
Directional Supervisor/Surveyor



2105 Market Street Midland, Texas 79703  
915-694-9517 Fax 915-694-5648

## SURVEY CERTIFICATION SHEET

STATE OF TEXAS  
COUNTY OF MIDLAND

I, Ralph Rice, in the employ of Baker Hughes INTEQ did on the days of January 3, 1994 thru January 24, 1994 conduct or supervise the taking of a M W D survey by the method of magnetic orientation from a depth of 12048 feet to 12500 feet, with recordings of inclination and direction being obtained at approximate intervals of 5 feet.

This survey was conducted at the request of Collins and Ware, Inc. for their T. D. Pope No. 5, Lea County, State of New Mexico.

The data for this survey and the calculation were obtained and performed by me according to standards and procedures as set forth by Baker Hughes INTEQ and is true and correct to the best of my knowledge.

A handwritten signature in cursive script that reads "Ralph A. Rice".

Directional Supervisor/Surveyor