

**SUB-SURFACE  
DIRECTIONAL  
SURVEY  
REPORT**

NEWHALL RESOURCES

COMPANY

SPEIGHT WELL NO. 1

WELL NAME

LEA COUNTY, NEW MEXICO

STATE AND COUNTY

**CERTIFIED REPORT**

RECEIVED  
OCT 21 1986  
HOBBS

# NEWHALL RESOURCES

WELL #  
SPEIGHT NO. 1

LOCATION  
LEA COUNTY, NEW MEXICO

DATE  
10/4/86

JOB TYPE  
MAGNETIC MULTISHOT

JOB #  
MS-1753, MS-1787

SURVEYOR  
ALAN HARBERT, RICK EATON

DEPTHS  
8991' - 11838'

DECL.  
9 DEGREES EAST

ELEV.  
0'

FILE #  
WT-22S

\*\*\*\*\*

## FINAL STATION DATA

MD. 11890.00

TVD. 11886.98

N/S -6.18

E/W 66.96

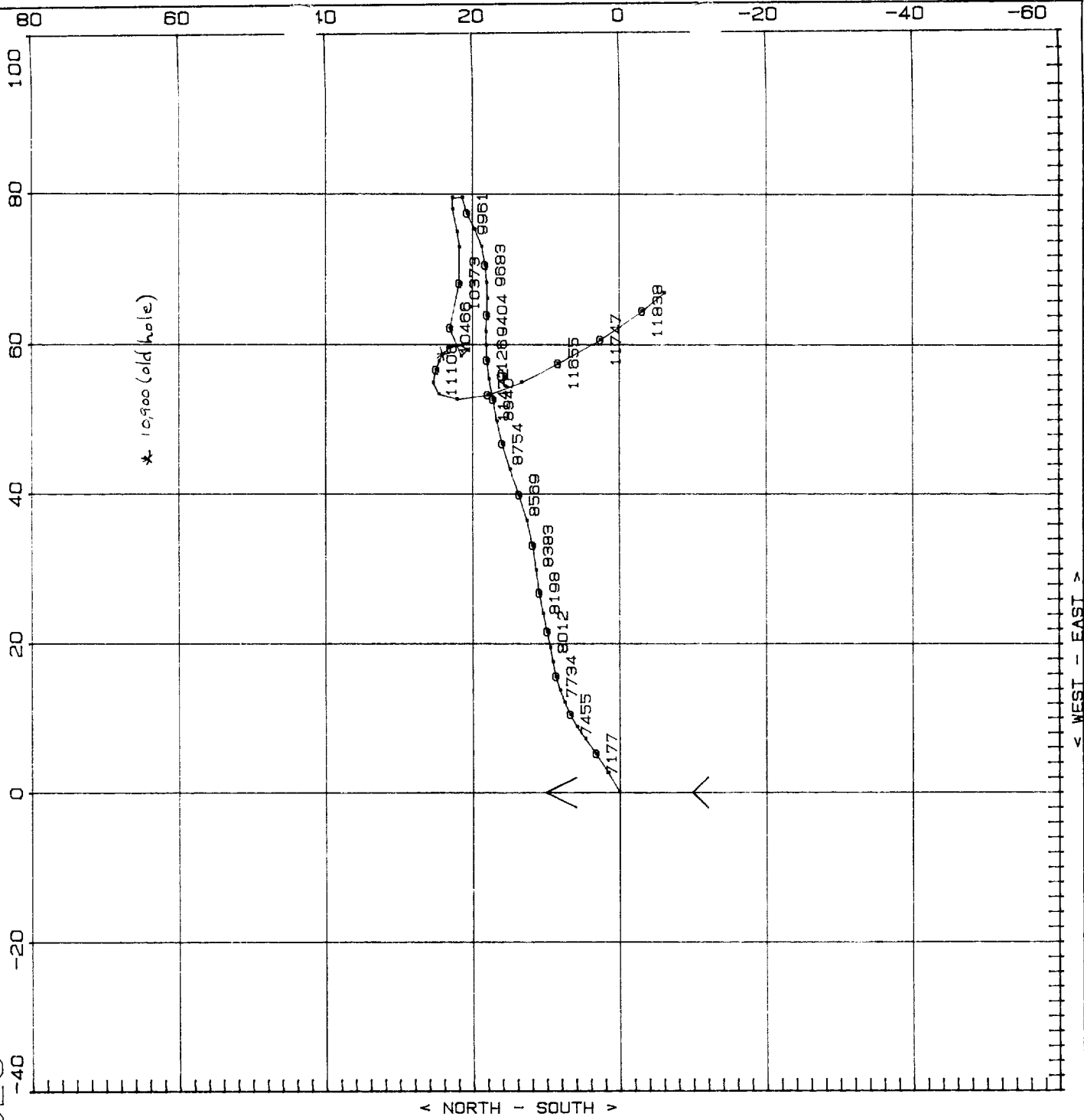
CLOSURE DISTANCE

67.24 FEET

CLOSURE DIRECTION

S 84.73 E

1 IN. = 20 FT.



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CUSTOMER : NEWHALL RESOURCES  
 WELL # : SPEIGHT NO.1  
 LOCATION : LEA COUNTY, NEW MEXICO  
 DATE : 10/4/86  
 JOB TYPE : MAGNETIC MULTISHOT  
 JOB # : MS-1753, MS-1787  
 SURVEYOR : ALAN HARBERT, RICK EATON  
 DEPTHS : 6991' - 11838'  
 DECL. : 19 DEGREES EAST  
 LEV. : 10'  
 TILE # : WT-225

METHOD : RADIUS OF CURVATURE  
 SECTION : 0

FINAL STATION DATA!

| MEASURED | INCL. | HOLE      | COURSE | VERTICAL | TRUE   | REGULAR   | C L O S U R E | BUG-LEG   |
|----------|-------|-----------|--------|----------|--------|-----------|---------------|-----------|
| DEPTH    | ANGLE | DIRECTION | LENGTH | DEPTH    | DEPTH  | CURDINALS | DISTANCE      | DIRECTION |
| FEET     | DEGS. | DEGS.     | FEET   | FEET     | FEET   | N/S       | FEET          | DEGS.     |
| 11890.00 | 4.30  | S 39.00 E | 52.00  | 11086.98 | 6.18 S | 66.96 E   | 67.24         | S 84.73 E |
|          |       |           |        |          |        |           |               | 0.00      |

THIS SURVEY IS CORRECT TO THE  
 BEST OF MY KNOWLEDGE AND IS  
 SUPPORTED BY ACTUAL FIELD DATA.

DIG REPRESENTATIVE

POSTAGE  
PAID  
007 21 1986

NEWMALL RESOURCES  
SPEIGHT NO.1  
WT-225

PAGE 1  
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MEASURED INCL. HOLE COURSE VERTICAL RECT AN 3 U L A R C L O S U R E DUG-LEG  
DEPTH ANGLE DIRECTION DEGS. FEET FEET N/S FEET E/W DISTANCE DIRECTION SEVERITY  
FEET DEGS. FEET TRUE

|   |      |           |       |         |         |         |       |           |      |
|---|------|-----------|-------|---------|---------|---------|-------|-----------|------|
| 6991.00   | 1.80 | N 61.00 E | 0.00  | 6991.00 | 0.00 N  | 0.00 E  | 0.00  | N 00.00 E | 0.00 |
| ASSUME VERTICAL TO FIRST SURVEY STATION AT 6991.00. |      |           |       |         |         |         |       |           |      |
| 7084.00   | 2.00 | N 50.00 E | 93.00 | 7083.95 | 1.56 N  | 2.66 E  | 3.00  | N 59.50 E | .24  |
| 7177.00   | 1.70 | N 55.00 E | 93.00 | 7176.90 | 3.22 N  | 5.16 E  | 6.08  | N 58.02 E | .34  |
| 7269.00   | 1.40 | N 53.00 E | 92.00 | 7268.87 | 4.68 N  | 7.17 E  | 8.57  | N 56.85 E | .33  |
| 7362.00   | 1.10 | N 58.00 E | 93.00 | 7361.84 | 5.83 N  | 8.84 E  | 10.59 | N 56.59 E | .34  |
| 7455.00   | 1.20 | N 64.00 E | 93.00 | 7454.83 | 6.74 N  | 10.48 E | 12.46 | N 57.25 E | .17  |
| 7548.00   | 1.10 | N 68.00 E | 93.00 | 7547.81 | 7.50 N  | 12.18 E | 14.30 | N 58.39 E | .14  |
| 7641.00   | 1.10 | N 71.00 E | 93.00 | 7640.79 | 8.12 N  | 13.85 E | 16.06 | N 59.62 E | .06  |
| 7734.00   | 1.20 | N 74.00 E | 93.00 | 7733.77 | 8.68 N  | 15.63 E | 17.80 | N 60.95 E | .13  |
| 7826.00   | 1.30 | N 86.00 E | 92.00 | 7825.75 | 9.08 N  | 17.60 E | 19.80 | N 62.70 E | .24  |
| 7919.00   | 1.10 | N 76.00 E | 93.00 | 7918.73 | 9.44 N  | 19.51 E | 21.67 | N 64.19 E | .27  |
| 8012.00   | 1.50 | N 80.00 E | 93.00 | 8011.70 | 9.88 N  | 21.57 E | 23.73 | N 65.40 E | .34  |
| 8105.00   | 1.60 | N 76.00 E | 93.00 | 8104.67 | 10.40 N | 24.03 E | 26.19 | N 66.60 E | .16  |
| 8198.00   | 1.80 | N 81.00 E | 93.00 | 8197.63 | 10.95 N | 26.74 E | 28.89 | N 67.73 E | .2   |
| 8290.00   | 2.00 | N 84.00 E | 92.00 | 8289.58 | 11.35 N | 29.76 E | 31.85 | N 69.13 E | .24  |
| 8383.00   | 2.10 | N 75.00 E | 93.00 | 8382.52 | 11.84 N | 33.83 E | 35.11 | N 70.29 E | .22  |
| 8476.00   | 2.20 | N 72.00 E | 93.00 | 8475.45 | 12.62 N | 36.45 E | 38.57 | N 70.99 E | .19  |
| 8569.00   | 2.20 | N 70.00 E | 93.00 | 8568.39 | 13.70 N | 39.85 E | 42.14 | N 71.03 E | .21  |
| 8662.00   | 2.30 | N 71.00 E | 93.00 | 8661.31 | 14.92 N | 43.29 E | 45.79 | N 70.99 E | .12  |
| 8754.00   | 2.10 | N 74.00 E | 92.00 | 8753.25 | 15.98 N | 46.66 E | 49.32 | N 71.19 E | .25  |
| 8847.00   | 1.80 | N 89.00 E | 93.00 | 8846.19 | 16.69 N | 49.74 E | 52.47 | N 71.45 E | .39  |
| 8940.00   | 1.80 | N 79.00 E | 93.00 | 8939.15 | 17.22 N | 52.62 E | 55.36 | N 71.88 E | .03  |
| 9033.00   | 1.70 | N 79.00 E | 93.00 | 9032.10 | 17.76 N | 55.40 E | 58.18 | N 72.22 E | .11  |
| 9126.00   | 1.40 | N 87.00 E | 93.00 | 9125.07 | 18.07 N | 57.90 E | 60.65 | N 72.67 E | .40  |
| 9219.00   | 1.10 | N 89.00 E | 93.00 | 9218.05 | 18.14 N | 59.93 E | 62.61 | N 73.15 E | .33  |

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[illegible]

| MEASURED<br>DEPTH<br>FEET | INCL.<br>ANGLE<br>DEGS. | HOLE<br>DIRECTION<br>DEGS. | COURSE<br>LENGTH<br>FEET | VERTICAL<br>DEPTH<br>FEET | TRUE<br>BATHY<br>DEPTH<br>FEET | RELATIVE<br>CORRECTION<br>N/S | RELATIVE<br>CORRECTION<br>E/W | CUMULATIVE<br>DISTANCE<br>FEET | CUMULATIVE<br>DIRECTION<br>DEGS. | DUE-LEG<br>SEVERITY<br>DL/100FT |
|---------------------------|-------------------------|----------------------------|--------------------------|---------------------------|--------------------------------|-------------------------------|-------------------------------|--------------------------------|----------------------------------|---------------------------------|
| 9311.00                   | 1.20                    | N 87.00 E                  | 92.00                    | 9310.03                   | 9310.03                        | 10.17 N                       | 61.77 E                       | 64.39' N 73.61 E               | .11                              |                                 |
| 9404.00                   | 1.50                    | S 86.00 E                  | 93.00                    | 9403.00                   | 9403.00                        | 10.06 N                       | 63.96 E                       | 66.46' N 74.23 E               | .36                              |                                 |
| 9497.00                   | 1.30                    | N 88.00 E                  | 93.00                    | 9495.97                   | 9495.97                        | 17.96 N                       | 66.23 E                       | 68.62' N 74.83 E               | .32                              |                                 |
| 9590.00                   | 1.36                    | N 85.00 E                  | 93.00                    | 9589.95                   | 9589.95                        | 18.09 N                       | 68.33 E                       | 70.69' N 75.17 E               | .67                              |                                 |
| 9683.00                   | 1.50                    | N 85.00 E                  | 93.00                    | 9681.92                   | 9681.92                        | 18.29 N                       | 70.60 E                       | 72.93' N 75.40 E               | .22                              |                                 |
| 9775.00                   | 1.70                    | N 74.00 E                  | 92.00                    | 9773.89                   | 9773.89                        | 16.75 N                       | 73.12 E                       | 75.48' N 75.62 E               | .49                              |                                 |
| 9868.00                   | 1.30                    | N 61.00 E                  | 93.00                    | 9866.85                   | 9866.85                        | 19.68 N                       | 75.36 E                       | 77.89' N 75.33 E               | .56                              |                                 |
| 9961.00                   | 1.60                    | N 65.00 E                  | 93.00                    | 9959.82                   | 9959.82                        | 20.75 N                       | 77.43 E                       | 80.19' N 75.00 E               | .34                              |                                 |
| 10054.00                  | 1.10                    | N 80.00 E                  | 93.00                    | 10052.80                  | 10052.80                       | 21.41 N                       | 79.54 E                       | 82.37' N 74.94 E               | .65                              |                                 |
| 10147.00                  | 1.30                    | N 82.00 W                  | 93.00                    | 10145.78                  | 10145.78                       | 22.77 N                       | 79.52 E                       | 82.71' N 74.02 E               | 2.55                             |                                 |
| 10187.00                  | 3.10                    | S 78.00 W                  | 40.00                    | 10185.75                  | 10185.75                       | 22.71 N                       | 77.99 E                       | 81.23' N 73.76 E               | 4.83                             |                                 |
| 10240.00                  | 3.40                    | S 79.00 W                  | 53.00                    | 10238.66                  | 10238.66                       | 22.09 N                       | 75.05 E                       | 78.24' N 73.50 E               | .57                              |                                 |
| 10280.00                  | 2.50                    | S 87.00 W                  | 40.00                    | 10278.61                  | 10278.61                       | 21.82 N                       | 73.01 E                       | 76.21' N 73.36 E               | 2.52                             |                                 |
| 10373.00                  | 3.50                    | N 67.00 W                  | 93.00                    | 10371.48                  | 10371.48                       | 21.82 N                       | 68.15 E                       | 71.56' N 72.24 E               | 1.10                             |                                 |
| 10466.00                  | 4.00                    | N 67.00 W                  | 93.00                    | 10464.28                  | 10464.28                       | 23.00 N                       | 62.22 E                       | 66.37' N 67.65 E               | 1.37                             |                                 |
| 10557.00                  | 1.60                    | S 24.00 W                  | 91.00                    | 10555.16                  | 10555.16                       | 21.54 N                       | 58.58 E                       | 62.34' N 69.79 E               | 4.65                             |                                 |
| 10649.00                  | 1.20                    | N 66.00 E                  | 92.00                    | 10647.15                  | 10647.15                       | 20.75 N                       | 59.29 E                       | 62.82' N 70.72 E               | 1.91                             |                                 |
| 10740.00                  | 1.00                    | N 16.00 E                  | 91.00                    | 10738.15                  | 10738.15                       | 21.44 N                       | 59.90 E                       | 63.62' N 70.30 E               | .97                              |                                 |
| 10832.00                  | 1.10                    | N 31.00 W                  | 92.00                    | 10830.13                  | 10830.13                       | 23.07 N                       | 59.68 E                       | 63.99' N 68.67 E               | .92                              |                                 |
| 10923.00                  | 1.70                    | N 54.00 W                  | 91.00                    | 10921.12                  | 10921.12                       | 24.11 N                       | 58.73 E                       | 63.48' N 67.68 E               | .56                              |                                 |
| 11015.00                  | 1.60                    | N 76.00 W                  | 92.00                    | 11013.11                  | 11013.11                       | 24.55 N                       | 57.79 E                       | 62.79' N 66.98 E               | .29                              |                                 |
| 11106.00                  | 1.00                    | N 65.00 W                  | 91.00                    | 11104.10                  | 11104.10                       | 24.90 N                       | 56.59 E                       | 61.86' N 66.12 E               | .47                              |                                 |
| 11198.00                  | 1.20                    | N 87.00 W                  | 92.00                    | 11196.09                  | 11196.09                       | 25.37 N                       | 54.88 E                       | 60.46' N 65.19 E               | .54                              |                                 |
| 11289.00                  | 1.00                    | S 34.00 W                  | 91.00                    | 11287.07                  | 11287.07                       | 24.60 N                       | 53.39 E                       | 58.79' N 65.27 E               | 1.17                             |                                 |
| 11381.00                  | 2.30                    | S 01.00 E                  | 92.00                    | 11379.03                  | 11379.03                       | 22.10 N                       | 52.69 E                       | 57.10' N 67.23 E               | 1.23                             |                                 |

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NEWHALL RESOURCES  
SPEIGHT NO. 1  
WT-225

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MEASURED INCL. HOLE DIRECTION DEGS. DEGS. DEGS. TRUE COURSE VERTICAL DEPTH FEET LENGTH FEET N/S FEET E/W FEET DISTANCE FEET C L O S U R E DIRECTION DEGS. SEVERITY

|          |      |           |       |          |         |         |                  |      |
|----------|------|-----------|-------|----------|---------|---------|------------------|------|
| 11472.00 | 3.00 | S 15.09 E | 91.00 | 11469.93 | 17.94 N | 53.24 E | 56.18' N 71.30 E | 1.04 |
| 11564.00 | 3.20 | S 25.00 E | 92.00 | 11561.80 | 18.27 N | 54.94 E | 56.52' N 76.42 E | .63  |
| 11655.00 | 3.80 | S 29.00 E | 91.00 | 11652.63 | 8.32 N  | 57.46 E | 59.06' N 81.76 E | .71  |
| 11747.00 | 4.40 | S 29.00 E | 92.00 | 11744.39 | 2.57 N  | 60.65 E | 60.70' N 87.57 E | .65  |
| 11838.00 | 4.30 | S 39.00 E | 91.00 | 11835.13 | 3.15 S  | 64.50 E | 64.56' S 87.21 E | .84  |

FINAL STATION IS PROJECTED

|          |      |           |       |          |        |         |                  |      |
|----------|------|-----------|-------|----------|--------|---------|------------------|------|
| 11890.00 | 4.30 | S 39.00 E | 52.00 | 11806.93 | 6.18 S | 66.96 E | 67.24' S 84.73 E | 0.00 |
|----------|------|-----------|-------|----------|--------|---------|------------------|------|

CLOSURE DISTANCE = 67.24 FEET.  
CLOSURE DIRECTION = S 84.73 E

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## SURVEY CERTIFICATION

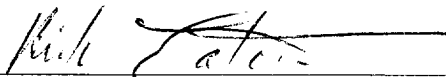
STATE TEXAS

COUNTY OF MIDLAND

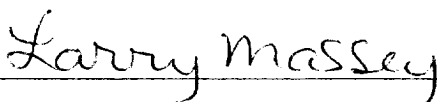
I, Rick Eaton, in the employ of D.I.G., Inc., did on the days of October 4, 19<sup>86</sup> through October 4, 19<sup>86</sup> conduct or supervise the taking of a Magnetic Multiple Shot survey by the method of magnetic orientation from a depth of 10466 feet to 11838 feet, with recordings of inclination being obtained at approximate intervals of 93 feet.

This survey was conducted at the request of Newhall Resources for their Speight Well No. 1, Lea County, State of New Mexico in the \_\_\_\_\_ field.

The data for this survey were obtained by me according to standards and procedures as set forth by D.I.G., Inc., and is true and correct to the best of my knowledge.

  
Rick Eaton

The data for this survey has been examined by me and conforms to the principles and procedures as set forth by D.I.G., Inc.

  
Larry Massey



## SURVEY CERTIFICATION

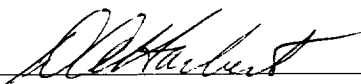
STATE TEXAS

COUNTY OF MIDLAND

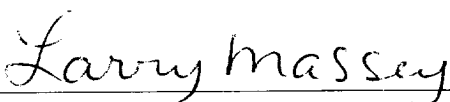
I, D.A. Harbert, in the employ of D.I.G., Inc., did on the days of May 14, 1986 through May 14, 1986 conduct or supervise the taking of a Magnetic Multiple Shot survey by the method of magnetic orientation from a depth of 6991 feet to 10466 feet, with recordings of inclination being obtained at approximate intervals of 93 feet.

This survey was conducted at the request of Newhall Resources for their Speight Well No. 1, Lea County, State of New Mexico in the \_\_\_\_\_ field.

The data for this survey were obtained by me according to standards and procedures as set forth by D.I.G., Inc., and is true and correct to the best of my knowledge.

  
D.A. Harbert

The data for this survey has been examined by me and conforms to the principles and procedures as set forth by D.I.G., Inc.

  
Larry Massey

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