



REPORT  
of  
SUB-SURFACE  
DIRECTIONAL  
SURVEY

Southern Union Supply Company  
COMPANY

Supco State #1  
WELL NAME

Lea County, New Mexico  
LOCATION

| JOB NUMBER  | TYPE OF SURVEY    | DATE    |
|-------------|-------------------|---------|
| WT177-G1505 | Gyroscopic Survey | 1/24/77 |
| WT477-G1545 | Gyroscopic Survey | 4/14/77 |

SURVEY BY

OFFICE

## SOUTHERN UNION SUPPLY COMPANY

LEA COUNTY, NEW MEXICO

SUFCO STATE

NO. 1

GYROSCOPIC SURVEY

AT177-501505

01-24-77

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\* SUBMITTED BY \*

\* EASTMAN-CHIPSTOCK \*

\* INC. \*

\* \*\*\*\*\*

## RECORD OF SURVEY

PRG. DIRECTION 0 0

| AS. COURSE<br>PTH LENGTH | TRUE<br>COURSE<br>LENGTH | TRUE<br>VERT.<br>DEPTH | ANGLE<br>OF<br>INCLIN<br>D M | COURSE<br>DIRECTION<br>D M | VERT.<br>SEC. | DOG LEG<br>DEGPER<br>100 | R E C T A N G U L A R<br>C O O R D I N A T E S |
|--------------------------|--------------------------|------------------------|------------------------------|----------------------------|---------------|--------------------------|------------------------------------------------|
| 0                        | 0.                       | 0.00                   | 0 0                          | 0 0                        | 0.00          | 0.00                     | 0.00                                           |
| 200                      | 200.                     | 200.00                 | 0 30                         | S 23 0 W                   | 0.00          | 0.25                     | 0.65 S 0.17W                                   |
| 400                      | 200.                     | 200.00                 | 0 0                          | S 0 0 W                    | 0.00          | 0.25                     | 1.70 S 0.35W                                   |
| 600                      | 200.                     | 200.00                 | 0 30                         | S 46 0 W                   | 0.00          | 0.25                     | 2.48 S 0.68W                                   |
| 800                      | 200.                     | 199.99                 | 0 30                         | S 7 0 E                    | 0.00          | 0.17                     | 4.01 S 0.08E                                   |
| 1000                     | 200.                     | 199.99                 | 0 30                         | N 89 0 W                   | 0.00          | 0.33                     | 2.94 S 1.10W                                   |
| 1200                     | 200.                     | 199.99                 | 0 45                         | S 77 0 W                   | 0.00          | 0.14                     | 3.21 S 3.26W                                   |
| 1400                     | 200.                     | 199.98                 | 1 0                          | S 45 0 W                   | 0.00          | 0.27                     | 4.67 S 5.90W                                   |
| 1600                     | 200.                     | 199.98                 | 0 45                         | S 49 0 W                   | 0.00          | 0.13                     | 6.75 S 8.13W                                   |
| 1800                     | 200.                     | 199.99                 | 0 30                         | N 48 0 W                   | 0.00          | 0.13                     | 5.31 S 9.77W                                   |

| MEAS. DEPTH | COURSE LENGTH | TRUE COURSE LENGTH | TRUE VERT. DEPTH | ANGLE OF INCLIN |    | COURSE DIRECTION | VERT. SEC. | DOG LFC DECFER |  | RECTANGULAR COORDINATES |        |
|-------------|---------------|--------------------|------------------|-----------------|----|------------------|------------|----------------|--|-------------------------|--------|
|             |               |                    |                  | D               | M  |                  |            | 100            |  |                         |        |
| 2000        | 200.          | 199.99             | 1999.69          | 1               | 0  | N 53             | 0.00       | 0.25           |  | 3.64 S                  | 11.799 |
| 2200        | 200.          | 199.96             | 2199.65          | 1               | 15 | N 31             | 0.00       | 0.25           |  | 0.74 S                  | 14.400 |
| 2400        | 200.          | 199.96             | 2399.61          | 1               | 0  | N 10             | 0.00       | 0.24           |  | 2.92 N                  | 15.774 |
| 2600        | 200.          | 199.95             | 2599.76          | 1               | 30 | N 32             | 0.00       | 0.34           |  | 6.96 N                  | 14.214 |
| 2800        | 200.          | 199.93             | 2799.69          | 1               | 30 | N 29             | 0.00       | 0.04           |  | 11.48 N                 | 11.560 |
| 3000        | 200.          | 199.95             | 2999.65          | 1               | 0  | N 22             | 0.00       | 0.26           |  | 15.41 N                 | 9.654  |
| 3200        | 200.          | 199.99             | 3199.63          | 0               | 15 | N 18             | 0.00       | 0.38           |  | 17.46 N                 | 10.428 |
| 3400        | 200.          | 200.00             | 3399.63          | 0               | 15 | S 82             | 0.00       | 0.13           |  | 16.93 N                 | 11.060 |
| 3600        | 200.          | 200.00             | 3599.63          | 0               | 30 | S 76             | 0.00       | 0.13           |  | 16.68 N                 | 12.344 |
| 3800        | 200.          | 199.99             | 3799.62          | 0               | 30 | S 84             | 0.00       | 0.04           |  | 16.38 N                 | 14.064 |
| 4000        | 200.          | 199.99             | 3999.61          | 0               | 30 | S 80             | 0.00       | 0.02           |  | 16.13 N                 | 15.794 |
| 4200        | 200.          | 199.99             | 4199.60          | 0               | 30 | N 89             | 0.00       | 0.04           |  | 16.30 N                 | 17.524 |
| 4400        | 200.          | 199.99             | 4399.59          | 0               | 30 | N 75             | 0.00       | 0.06           |  | 16.54 N                 | 19.254 |
| 4600        | 200.          | 199.99             | 4599.59          | 0               | 30 | N 73             | 0.00       | 0.01           |  | 17.02 N                 | 20.934 |
| 4800        | 200.          | 199.99             | 4799.58          | 0               | 30 | N 86             | 0.00       | 0.06           |  | 17.34 N                 | 22.644 |
| 5000        | 200.          | 200.00             | 4999.57          | 0               | 15 | N 66             | 0.00       | 0.14           |  | 17.66 N                 | 23.904 |
| 5200        | 200.          | 200.00             | 5199.57          | 0               | 30 | N 54             | 0.00       | 0.13           |  | 18.31 N                 | 25.034 |
| 5400        | 200.          | 199.99             | 5399.56          | 0               | 45 | N 52             | 0.00       | 0.13           |  | 19.62 N                 | 26.764 |
| 5600        | 200.          | 199.98             | 5599.54          | 0               | 45 | N 54             | 0.00       | 0.02           |  | 21.20 N                 | 28.874 |
| 5800        | 200.          | 199.99             | 5799.53          | 0               | 30 | N 43             | 0.00       | 0.14           |  | 22.64 N                 | 30.504 |



| PLAS. DEPTH | COURSE LENGTH | TRUE COURSE LENGTH | TRUE DEPTH | ANGLE OF INCLIN | COURSE DIRECTION |    | VERT. SEC. | DOG LEG DEEPER 100 | P E C T A N G U L A R C O O R D I N A T E S |        |
|-------------|---------------|--------------------|------------|-----------------|------------------|----|------------|--------------------|---------------------------------------------|--------|
|             |               |                    |            |                 | D                | M  |            |                    |                                             |        |
| 10000       | 200.          | 199.99             | 9999.18    | 1 0             | S                | 89 | 0.00       | 0.14               | 54.61 N                                     | 57.90E |
| 10100       | 100.          | 99.99              | 10099.16   | 1 0             | S                | 87 | 0.00       | 0.04               | 54.55 N                                     | 55.64E |
| 10200       | 100.          | 99.99              | 10199.15   | 0 45            | N                | 80 | 0.00       | 0.27               | 54.72 N                                     | 61.16E |
| 10300       | 100.          | 99.99              | 10299.14   | 0 45            | S                | 89 | 0.00       | 0.12               | 54.59 N                                     | 62.45E |
| 10400       | 100.          | 99.99              | 10399.13   | 0 45            | N                | 61 | 0.00       | 0.36               | 54.93 N                                     | 63.71E |
| 10500       | 100.          | 99.99              | 10499.12   | 0 45            | N                | 45 | 0.00       | 0.21               | 55.71 N                                     | 64.75E |
| 10600       | 100.          | 99.99              | 10599.12   | 0 45            | N                | 21 | 0.00       | 0.31               | 56.80 N                                     | 65.46E |
| 10700       | 100.          | 99.99              | 10699.11   | 0 45            | N                | 34 | 0.00       | 0.17               | 57.96 N                                     | 66.06E |
| 10800       | 100.          | 99.99              | 10799.10   | 1 0             | N                | 18 | 0.00       | 0.35               | 59.33 N                                     | 66.73E |
| 10900       | 100.          | 99.99              | 10899.08   | 1 0             | N                | 16 | 0.00       | 0.04               | 61.00 N                                     | 67.24E |
| 11000       | 100.          | 99.99              | 10999.07   | 0 45            | N                | 20 | 0.00       | 0.28               | 62.45 N                                     | 67.71E |
| 11100       | 100.          | 99.99              | 11099.06   | 0 45            | N                | 39 | 0.00       | 0.25               | 63.59 N                                     | 67.07E |
| 11200       | 100.          | 99.99              | 11199.05   | 1 0             | N                | 70 | 0.00       | 0.53               | 64.46 N                                     | 65.84E |
| 11300       | 100.          | 99.99              | 11299.03   | 1 0             | S                | 80 | 0.00       | 0.18               | 64.01 N                                     | 64.16E |
| 11400       | 100.          | 99.99              | 11399.03   | 0 30            | S                | 68 | 0.00       | 0.52               | 63.65 E                                     | 62.90E |
| 11500       | 100.          | 100.00             | 11499.03   | 0 0             | S                | 0  | 0.00       | 0.50               | 63.31 E                                     | 62.67E |
| 11600       | 100.          | 100.00             | 11599.03   | 0 30            | N                | 52 | 0.00       | 0.50               | 63.69 N                                     | 62.86E |
| 11700       | 100.          | 99.99              | 11699.02   | 0 45            | N                | 83 | 0.00       | 0.41               | 64.10 N                                     | 63.85E |
| 11800       | 100.          | 99.99              | 11799.01   | 0 45            | N                | 87 | 0.00       | 0.06               | 64.21 N                                     | 65.16E |
| 11900       | 100.          | 99.99              | 11899.00   | 1 0             | N                | 82 | 0.00       | 0.26               | 64.36 N                                     | 66.68E |

| MEAS. DEPTH | COURSE LENGTH | TRUE COURSE LENGTH | TRUE VERT. DEPTH | ANGLE OF INCLIN D M | COURSE DIRECTION | VERT. SEC. | DOG LEG DEGP | RECTANGULAR COORDINATES |
|-------------|---------------|--------------------|------------------|---------------------|------------------|------------|--------------|-------------------------|
| 12000       | 100.          | 99.98              | 11992.98         | 1 30                | N 85 0 W         | 0.00       | 100          | 54.61 N 68.94 W         |
| 12100       | 100.          | 99.97              | 12093.95         | 1 15                | S 86 0 W         | 0.00       | 0.25         | 64.42 N 71.23 W         |
| 12200       | 100.          | 99.97              | 12198.92         | 1 30                | N 90 0 W         | 0.00       | 0.27         | 64.50 N 73.53 W         |
| 12300       | 100.          | 99.97              | 12298.89         | 1 15                | S 89 0 W         | 0.00       | 0.25         | 64.48 N 76.03 W         |

\*\*(METHOD OF COMPUTATION--RADIUS OF CURVATURE)\*\*

SOUTHERN UNION SUPPLY COMPANY  
 LEA COUNTY, NEW MEXICO  
 SUPCO STATE  
 WELL NO. 1  
 GYROSCOPIC SURVEY  
 WT477-61545  
 APRIL 14, 1977

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 \* SUBMITTED BY \*  
 \* EASTMAN-WHIPSTOCK \*  
 \* INC. \*  
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RECORD OF SURVEY  
 PRO. DIRECTION 0 0

| MEAS. DEPTH | COURSE LENGTH | TRUE COURSE LENGTH | TRUE VERT. DEPTH | ANGLE OF INCLIN D M | COURSE DIRECTION D M | VERT. SEC. | DOG LEG DEGPER 100 | RECTANGULAR COORDINATES |          |
|-------------|---------------|--------------------|------------------|---------------------|----------------------|------------|--------------------|-------------------------|----------|
|             |               |                    |                  |                     |                      |            |                    |                         |          |
| 12400       | 0.            | 0.00               | 12398.87         | 1 15                | S 82 0 W             | 0.00       | 0.00               | 64.31 N                 | 78.21 W  |
| 12500       | 100.          | 99.98              | 12498.85         | 1 15                | S 76 0 W             | 0.00       | 0.13               | 63.89 N                 | 80.35 W  |
| 12600       | 100.          | 99.98              | 12598.83         | 1 0                 | S 23 0 W             | 0.00       | 1.03               | 62.66 N                 | 81.79 W  |
| 12700       | 100.          | 99.89              | 12698.72         | 4 0                 | S 51 0 W             | 0.00       | 3.15               | 59.22 N                 | 84.39 W  |
| 12800       | 100.          | 99.77              | 12798.49         | 3 45                | S 56 0 W             | 0.00       | 0.42               | 55.20 N                 | 89.82 W  |
| 12900       | 100.          | 99.81              | 12898.30         | 3 15                | S 60 0 W             | 0.00       | 0.56               | 51.96 N                 | 95.00 W  |
| 13000       | 100.          | 99.84              | 12998.14         | 3 15                | S 58 0 W             | 0.00       | 0.12               | 49.04 N                 | 99.86 W  |
| 13100       | 100.          | 99.85              | 13098.00         | 3 0                 | S 65 0 W             | 0.00       | 0.46               | 46.44 N                 | 104.64 W |
| 13200       | 100.          | 99.82              | 13197.82         | 3 45                | S 75 0 W             | 0.00       | 0.95               | 44.43 N                 | 110.17 W |
| 13300       | 100.          | 99.79              | 13297.60         | 3 45                | S 81 0 W             | 0.00       | 0.39               | 43.07 N                 | 116.56 W |

BOTTOM HOLE CLOSURE 124.27 FEET AT N 69 43 10 W

\*\*(METHOD OF COMPUTATION--RADIUS OF CURVATURE)\*\*

SOUTHERN UNION SUPPLY COMPANY

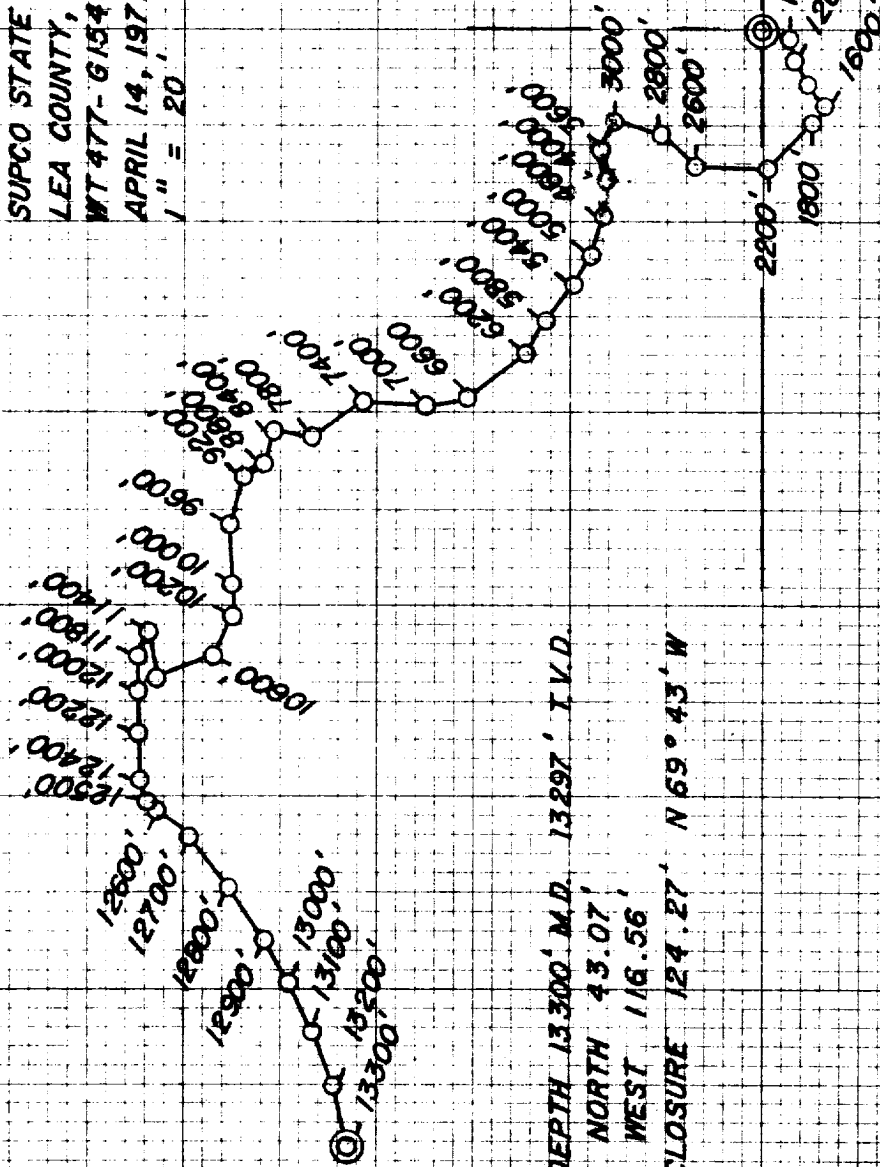
SUPCO STATE NO. 1

LEA COUNTY, NEW MEXICO

WT 477- G1545 and G01505

APRIL 14, 1977

1" = 20'



DEPTH 13300' M.D. 13297' T.V.D.

NORTH 43.07'

WEST 116.56'

CLOSURE 124.27' N 69° 43' W

SURFACE  
LOCATION





P. O. Box 5577/Midland, Texas 79701/(915) 563-0511  
TWX 910-881-5066/Cable: EASTCO

STATE OF TEXAS  
COUNTY OF MIDLAND

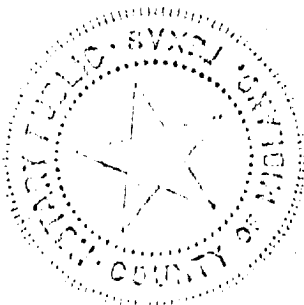
I, James Blackledge, in the employ of the Directional Drilling Department of Eastman Whipstock, Inc. did on the days of January 24, 1977 ~~XXXX~~, 19\_\_\_\_ conduct or supervise the taking of a gyroscopic survey by the method of Magnetic Oriented Survey from a depth of 0 feet to 12,900 feet, with records of inclination being taken at approximately every 200 feet.

This survey was conducted at the request of Southern Union Supply Company for their Supco State Well No. 1, Lea \_\_\_\_\_ county, State of New Mexico, in the \_\_\_\_\_ field.

STATE OF TEXAS  
COUNTY OF MIDLAND

Before me, the undersigned authority, on this day personally appeared James Blackledge, known to me to be the person whose name is subscribed to this instrument, who after being by me duly sworn on oath, states that he has knowledge of all the facts stated above and that the same is a true and correct statement of facts therein recited.

Subscribed and sworn to before me on this third day of March, 19 77.



Larry Massey  
Notary Public in and for the county of  
Midland, Texas



P. O. Box 5577/Midland, Texas 79701/(915) 563-0511  
TWX 910-881-5066/Cable: EASTCO

STATE OF Texas  
COUNTY OF Midland

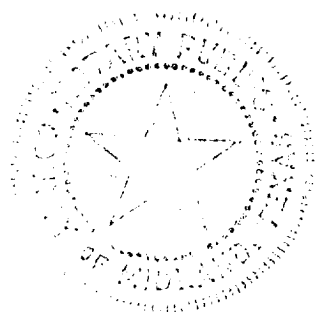
I, James Blackledge, in the employ of the Directional Drilling Department of Eastman Whipstock, Inc. did on the days of April 14, 19 77 thru \_\_\_\_\_, 19 \_\_\_\_\_ conduct or supervise the taking of a Gyroscopic Survey by the method of Magnetic Oriented Survey from a depth of 12,400 feet to 13,300 feet, with records of inclination being taken at approximately every 100 feet.

This survey was conducted at the request of Southern Union Supply Company for their Supco State Well No. 1, Lea county, State of New Mexico, in the \_\_\_\_\_ field.

STATE OF Texas  
COUNTY OF Midland

Before me, the undersigned authority, on this day personally appeared James Blackledge, known to me to be the person whose name is subscribed to this instrument, who after being by me duly sworn on oath, states that he has knowledge of all the facts stated above and that the same is a true and correct statement of facts therein recited.

Subscribed and sworn to before me on this Fifteenth day of April, 19 77.

  
Notary Public in and for the county of  
Midland, Texas