# DIRECTIONAL DRILLING REPORT

ALL CALCULATIONS PERFORMED BY ELECTRONIC COMPUTER
USING THE RADIUS OF CURVATURE METHOD

DATE January 9, 1978

COMPANY GULF ENERGY & MINERALS

WELL CENTRAL DRINKARD UNIT 419

LOCATION LEA COUNTY, NEW MEXICO

MAGNETIC DECLINATION 10° EAST

WILSON™

DIRECTIONAL DRILLING
DIVISION

JOB # 55550

W-DC-1

GULF ENERGY + MINERALS
CENTRAL UNITHARD UNIT 419 — DATE OF SURVEY 11-18-77TO12-8-77
LEA COUNTY, NEW MEXICO — VERTICAL SECTION COMPUTED ALONG CLOSURE
JOB NO. 55550
COORDINATES AT 2637 ARE FROM SPERRY SUN SURVEY — MAGNETIC CORRECTION 10DEG EAST

WILSON DIRECTIONAL DRILLING
RECORD OF SURVEY

| MEASURED DEPTH | TRUE VERTICAL DEPTH | INCLINATION DEG | MIN | DIRECTION DEG | DOG-LEG SEVERITY DEG/100 | VERTICAL SECTION | RECTANGULAR COORDINATES NORTH | SOUTH | EAST | WEST |
|---|---|---|---|---|---|---|---|---|---|---|
| 2637 | 2636.02 | 2 | 0 | S 0 E | .00 | -57.61 | 42.43 | | 39.02 | |
| 2737 | 2735.96 | 2 | 0 | S 58 E | .00 | -61.01 | 44.28 | | 41.98 | |
| 2837 | 2835.90 | 2 | 0 | S 55 E | .10 | -64.42 | 46.20 | | 44.89 | |
| 2874 | 2872.85 | 2 | 0 | 75 E | 1.35 | -65.51 | 46.74 | | 46.04 | |
| 2935 | 2933.75 | 1 | 15 | S 25 E | 3.55 | -65.29 | 46.41 | | 47.35 | |
| 2967 | 2965.69 | 2 | 30 | S 42 W | 7.24 | -65.47 | 45.58 | | 47.03 | |
| 3030 | 3034.07 | 5 | 30 | S 45 W | 4.30 | -60.65 | 42.12 | | 43.64 | |
| 3063 | 3061.41 | 6 | 30 | S 50 W | 2.40 | -55.76 | 38.82 | | 40.05 | |
| 3155 | 3150.77 | 6 | 30 | S 49 W | .11 | -44.49 | 31.47 | | 31.45 | |
| 3245 | 3242.57 | 5 | 30 | S 47 W | .37 | -37.43 | 26.77 | | 26.25 | |
| 3345 | 3341.73 | 5 | 30 | S 49 W | .23 | -26.18 | 19.20 | | 17.82 | |
| 3445 | 3440.98 | 7 | 30 | S 46 W | 1.06 | -14.02 | 10.95 | | 8.65 | |
| 3545 | 3539.97 | 5 | 45 | S 44 W | 1.26 | .11 | .95 | | | 1.12 |
| 3645 | 3640.64 | 5 | 30 | S 45 W | .29 | 15.11 | | 9.75 | | 11.63 |
| 3745 | 3737.76 | 5 | 15 | S 46 W | .29 | 29.67 | | 20.16 | | 21.84 |
| 3845 | 3836.65 | 7 | 30 | S 44 W | .75 | 43.37 | | 29.99 | | 31.36 |
| 3945 | 3935.96 | 7 | 30 | S 47 W | .39 | 56.42 | | 39.14 | | 40.67 |
| 4045 | 4035.12 | 7 | 30 | S 47 W | .00 | 69.46 | | 48.04 | | 50.21 |
| 4145 | 4134.21 | 6 | 0 | S 48 W | .52 | 82.93 | | 57.15 | | 60.16 |
| 4245 | 4233.23 | 5 | 0 | S 48 W | .00 | 96.82 | | 66.46 | | 70.50 |
| 4345 | 4332.20 | 5 | 30 | S 46 W | .50 | 111.14 | | 76.06 | | 81.17 |
| 4445 | 4431.16 | 6 | 30 | S 48 W | .00 | 125.89 | | 85.95 | | 92.15 |
| 4545 | 4529.97 | 6 | 45 | S 50 W | .39 | 140.84 | | 95.79 | | 103.47 |
| 4645 | 4628.74 | 9 | 15 | S 60 W | 1.64 | 156.16 | | 104.70 | | 116.26 |
| 4745 | 4727.41 | 9 | 30 | S 58 W | .41 | 171.92 | | 113.09 | | 130.22 |

GULF ENERGY + MINERALS
CENTRAL OPERATING UNIT 419
LEA COUNTY, NEW MEXICO
JOB NO. 55550
COORDINATES AT 2637 ARE FROM SPERRY SUN SURVEY MAGNETIC CORRECTION 10DEG EAST

DATE OF SURVEY 11-18-77TO12-8-77
VERTICAL SECTION COMPUTED ALONG CLOSURE

WILSON DOWNHOLE DIRECTIONAL DRILLING
RECORD OF SURVEY

| MEASURED DEPTH | TRUE VERTICAL DEPTH | INCLINATION DEG | INCLINATION MIN | DIRECTION DEG | DOG-LEG SEVERITY DEG/100 | VERTICAL SECTION | RECTANGULAR COORDINATES NORTH | SOUTH | EAST | WEST |
|---|---|---|---|---|---|---|---|---|---|---|
| 4945 | 4926.00 | 4 | 45 | S 58 W | .25 | 188.18 | | 121.95 | | 144.39 |
| 4945 | 4924.54 | 4 | 30 | S 60 W | .42 | 204.36 | | 130.56 | | 158.72 |
| 5045 | 5023.22 | 4 | 30 | S 60 W | .00 | 220.27 | | 138.81 | | 173.02 |
| 5145 | 5121.65 | 4 | 30 | S 60 W | .00 | 236.17 | | 147.07 | | 187.31 |
| 5245 | 5220.54 | 5 | 45 | S 65 W | 1.09 | 251.24 | | 154.41 | | 201.35 |
| 5345 | 5319.42 | 5 | 45 | S 65 W | .00 | 265.49 | | 160.84 | | 215.14 |
| 5417 | 5390.50 | 5 | 0 | S 67 W | .55 | 275.82 | | 165.35 | | 225.26 |
| 5489 | 5461.85 | 7 | 15 | S 45 W | 4.91 | 285.57 | | 170.76 | | 233.68 |
| 5541 | 5513.46 | 6 | 45 | S 47 W | 1.07 | 291.90 | | 175.17 | | 238.24 |
| 5641 | 5612.95 | 5 | 0 | S 48 W | .78 | 302.94 | | 182.67 | | 246.43 |
| 5741 | 5712.34 | 5 | 30 | S 48 W | .50 | 312.99 | | 189.38 | | 253.87 |
| 5788 | 5759.11 | 5 | 0 | S 45 W | 1.24 | 317.70 | | 192.62 | | 257.28 |
| 5801 | 5772.00 | 5 | 45 | S 24 W | 16.55 | 318.99 | | 193.70 | | 258.02 |
| 5901 | 5871.52 | 5 | 0 | S 11 W | 1.35 | 328.04 | | 203.40 | | 261.06 |
| 5997 | 5966.99 | 6 | 0 | S 14 W | .33 | 336.55 | | 213.20 | | 263.23 |
| 6097 | 6066.53 | 5 | 0 | S 16 W | 1.02 | 344.88 | | 222.46 | | 265.69 |
| 6159 | 6128.32 | 4 | 30 | S 12 W | .97 | 349.31 | | 227.44 | | 266.94 |
| 6243 | 6212.03 | 5 | 0 | S 14 W | .63 | 355.24 | | 234.21 | | 268.52 |
| 6343 | 6311.63 | 5 | 15 | S 12 W | .31 | 362.86 | | 242.91 | | 270.52 |
| 6443 | 6411.19 | 5 | 30 | S 10 W | .31 | 370.67 | | 252.11 | | 272.30 |
| 6543 | 6510.73 | 5 | 30 | S 6 W | .19 | 378.47 | | 261.57 | | 273.80 |
| 6643 | 6610.27 | 5 | 30 | S 2 W | .57 | 385.86 | | 271.11 | | 274.64 |
| 6734 | 6700.63 | 5 | 45 | S 2 W | .27 | 392.44 | | 280.02 | | 274.95 |

THE CALCULATION PROCEDURES ARE BASED ON THE USE OF THE RADIUS OF CURVATURE METHOD

ALL CALCULATIONS PERFORMED BY A UNIVAC 1108 COMPUTER

HORIZONTAL DISPLACEMENT = 392.44 FEET AT SOUTH 44 DEG. 28 MIN. WEST (TRUE)

DIRECTIONAL WILSON DRILLING DEPT.

COMPANY GULF ENERGY & MINERALS

WELL CENTRAL DRINKARD UNIT 419

LOCATION LEA COUNTY, NEW MEXICO

DATE 1/09/78



| | MEASURED DEPTH | COURSE LENGTH | DRIFT ANGLE | TRUE VERTICAL DEPTH | COURSE DEVIATION | DIRECTION OF DEVIATION | TOTAL COORDINATES | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | NORTH | SOUTH | EAST | WEST |
| | | | | | | | | | | |

CLOSURE: Distance 392.44' Direction S 44° 28' W

WILSON SUPERVISOR: David L. Nash

WE CERTIFY THAT THIS IS A TRUE AND CORRECT REPORT OF OUR SURVEY AND THAT IT AFFORDS A TRUE AND CORRECT REPRESENTATION OF OUR FINDINGS AS TO THE NATURE AND CONDITIONS OF THE WELL AT THE TIME THE SURVEY WAS MADE.

David L. Nash

WILSON INDUSTRIES INC.
Directional Drilling Division

BEFORE ME THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED David L. Nash, KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THIS INSTRUMENT, WHO AFTER BEING DULY SWORN ON OATH, STATES THAT THE SAME IS A TRUE AND CORRECT STATEMENT OF THE FACTS THEREIN RECITED.

SUBSCRIBED AND SWORN TO BEFORE ME THIS THE 9th DAY OF January 19 78

Ruby Albright

NOTARY PUBLIC IN AND FOR HARRIS COUNTY, TEXAS

RUBY ALBRIGHT
Notary Public in and for Harris County, Texas
My Commission Expires June 30, 1978
Bonded By John L. Wortham & Son Insurance

W-DD-5

GULF ENERGY AND MINERALS COMPANY
CDU NO. 419
DRINKARD
LEA COUNTY, NEW MEXICO
MAGNETIC MULTISHOT SURVEY



DATE OF SURVEY NOVEMBER 18, 1977
VERTICAL SECTION DIRECTION CLOSURE

MS-6930

SPERRY-SUN, INC.
RECORD OF SURVEY

| MEASURED DEPTH | TRUE VERTICAL DEPTH | SUB SEA TVD | COURSE INCLINATION DEG MIN | COURSE DIRECTION DEG | DOG-LEG SEV DEG/100 | TOTAL RECTANGULAR COORDINATES NORTH/SOUTH | EAST/WEST | VERTICAL SECTION |
|---|---|---|---|---|---|---|---|---|
| 378 | 378.00 | 378.00 | ASSUME VERTICAL TO 378 FT. | | | .00 N | .00 E | .00 |
| 395 | 395.00 | 395.00 | 0 55 | N 11 E | 5.39 | .13 N | .03 E | .12 |
| 426 | 425.99 | 425.99 | 1 5 | N 13 E | .55 | .66 N | .14 E | .59 |
| 519 | 518.98 | 518.98 | 1 0 | N 20 E | .16 | 2.28 N | .61 E | 2.11 |
| 612 | 611.96 | 611.96 | 1 0 | N 21 E | .02 | 3.80 N | 1.18 E | 3.63 |
| 705 | 704.95 | 704.95 | 1 0 | N 16 E | .09 | 5.34 N | 1.70 E | 5.12 |
| 798 | 797.94 | 797.94 | 0 50 | N 34 E | .36 | 6.63 N | 2.30 E | 6.52 |
| 891 | 890.93 | 890.93 | 0 45 | N 17 E | .27 | 7.82 N | 2.86 E | 7.75 |
| 984 | 983.92 | 983.92 | 0 45 | N 37 E | .28 | 8.89 N | 3.40 E | 8.91 |
| 1077 | 1076.91 | 1076.91 | 0 50 | N 17 E | .31 | 10.02 N | 3.96 E | 10.13 |
| 1170 | 1169.90 | 1169.90 | 0 50 | N 20 E | .05 | 11.31 N | 4.39 E | 11.37 |
| 1263 | 1262.89 | 1262.89 | 0 50 | N 11 E | .14 | 12.61 N | 4.75 E | 12.58 |
| 1356 | 1355.88 | 1355.88 | 1 0 | N 30 E | .37 | 13.97 N | 5.29 E | 13.99 |
| 1449 | 1448.87 | 1448.87 | 0 45 | N 21 E | .31 | 15.24 N | 5.91 E | 15.32 |
| 1542 | 1541.86 | 1541.86 | 1 0 | N 34 E | .34 | 16.48 N | 6.58 E | 16.70 |
| 1635 | 1634.84 | 1634.84 | 1 15 | N 46 E | .37 | 17.86 N | 7.77 E | 18.51 |
| 1728 | 1727.82 | 1727.82 | 1 20 | N 54 E | .21 | 19.20 N | 9.37 E | 20.58 |
| 1821 | 1820.78 | 1820.78 | 1 55 | N 52 E | .63 | 20.80 N | 11.47 E | 23.17 |
| 1914 | 1913.72 | 1913.72 | 2 5 | N 42 E | .42 | 23.01 N | 13.83 E | 26.39 |
| 2007 | 2006.64 | 2006.64 | 2 35 | N 42 E | .54 | 25.82 N | 16.36 E | 30.17 |
| 2100 | 2099.54 | 2099.54 | 2 45 | N 52 E | .53 | 28.75 N | 19.52 E | 34.46 |
| 2193 | 2192.44 | 2192.44 | 2 40 | N 51 E | .10 | 31.49 N | 22.96 E | 38.79 |
| 2286 | 2285.34 | 2285.34 | 2 40 | N 46 E | .25 | 34.35 N | 26.20 E | 43.08 |
| 2379 | 2378.23 | 2378.23 | 2 50 | N 57 E | .59 | 37.11 N | 29.68 E | 47.46 |
| 2472 | 2471.13 | 2471.13 | 2 30 | N 53 E | .41 | 39.58 N | 33.23 E | 51.66 |
| 2565 | 2564.06 | 2564.06 | 2 0 | N 56 E | .55 | 41.71 N | 36.20 E | 55.22 |
| 2596 | 2595.04 | 2595.04 | 2 0 | N 55 E | .12 | 42.32 N | 37.09 E | 56.27 |
| 2637 | 2636.01 | 2636.01 | 2 0 | N 58 E | .26 | 43.11 N | 38.28 E | 57.65 |

SPERRY-SUN, INC.
RECORD OF SURVEY

** THE CALCULATIONS ARE BASED ON THE MINIMUM RADIUS OF CURVATURE METHOD **

HORIZONTAL DISPLACEMENT = 57.66 FEET AT NORTH 41 DEG. 36 MIN. EAST (TRUE)

[illegible]

** [illegible]

[illegible]
[illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

GULF ENERGY AND MINERALS COMPANY
CDU NO. 419
DRINKARD
LEA COUNTY, NEW MEXICO
MAGNETIC MULTISHOT SURVEY


DATE OF SURVEY NOVEMBER 18, 1977
VERTICAL SECTION DIRECTION CLOSURE
MS-6930

SPERRY-SUN, INC.
RECORD OF SURVEY

| MEASURED DEPTH | TRUE VERTICAL DEPTH | SUB SEA TVD | COURSE INCLINATION DEG MIN | COURSE DIRECTION DEG | DOG-LEG SEV DEG/100 | TOTAL RECTANGULAR COORDINATES NORTH/SOUTH | EAST/WEST | VERTICAL SECTION |
|---|---|---|---|---|---|---|---|---|
| 378 | 378.00 | 378.00 | ASSUME VERTICAL TO 378 FT. | | | .00 N | .00 E | .00 |
| 395 | 395.00 | 395.00 | 0 55 | N 11 E | 5.39 | .13 N | .03 E | .12 |
| 425 | 425.99 | 425.99 | 1 5 | N 13 E | .55 | .66 N | .14 E | .59 |
| 519 | 518.98 | 518.98 | 1 0 | N 20 E | .16 | 2.28 N | .61 E | 2.11 |
| 612 | 611.96 | 611.96 | 1 0 | N 21 E | .02 | 3.80 N | 1.18 E | 3.63 |
| 705 | 704.95 | 704.95 | 1 0 | N 16 E | .09 | 5.34 N | 1.70 E | 5.12 |
| 798 | 797.94 | 797.94 | 0 50 | N 34 E | .36 | 6.68 N | 2.30 E | 6.52 |
| 891 | 890.93 | 890.93 | 0 45 | N 17 E | .27 | 7.82 N | 2.86 E | 7.75 |
| 984 | 983.92 | 983.92 | 0 45 | N 37 E | .28 | 8.89 N | 3.40 E | 8.91 |
| 1077 | 1076.91 | 1076.91 | 0 50 | N 17 E | .31 | 10.02 N | 3.96 E | 10.13 |
| 1170 | 1169.90 | 1169.90 | 0 50 | N 20 E | .05 | 11.31 N | 4.39 E | 11.37 |
| 1263 | 1262.89 | 1262.89 | 0 50 | N 11 E | .14 | 12.61 N | 4.75 E | 12.58 |
| 1356 | 1355.88 | 1355.88 | 1 0 | N 30 E | .37 | 13.97 N | 5.29 E | 13.96 |
| 1449 | 1448.87 | 1448.87 | 0 45 | N 21 E | .31 | 15.24 N | 5.91 E | 15.32 |
| 1542 | 1541.86 | 1541.86 | 1 0 | N 34 E | .34 | 16.48 N | 6.58 E | 16.70 |
| 1635 | 1634.84 | 1634.84 | 1 15 | N 46 E | .37 | 17.86 N | 7.77 E | 18.51 |
| 1728 | 1727.82 | 1727.82 | 1 20 | N 54 E | .21 | 19.20 N | 9.37 E | 20.58 |
| 1821 | 1820.78 | 1820.78 | 1 55 | N 52 E | .63 | 20.80 N | 11.47 E | 23.17 |
| 1914 | 1913.72 | 1913.72 | 2 5 | N 42 E | .42 | 23.01 N | 13.83 E | 26.39 |
| 2007 | 2006.64 | 2006.64 | 2 35 | N 42 E | .54 | 25.82 N | 16.36 E | 30.17 |
| 2100 | 2099.54 | 2099.54 | 2 45 | N 52 E | .53 | 28.75 N | 19.52 E | 34.46 |
| 2193 | 2192.44 | 2192.44 | 2 40 | N 51 E | .10 | 31.49 N | 22.96 E | 38.79 |
| 2286 | 2285.34 | 2285.34 | 2 40 | N 46 E | .25 | 34.35 N | 26.20 E | 43.08 |
| 2379 | 2378.23 | 2378.23 | 2 50 | N 57 E | .59 | 37.11 N | 29.68 E | 47.46 |
| 2472 | 2471.13 | 2471.13 | 2 30 | N 53 E | .41 | 39.58 N | 33.23 E | 51.66 |
| 2565 | 2564.06 | 2564.06 | 2 0 | N 56 E | .55 | 41.71 N | 36.20 E | 55.22 |
| 2596 | 2595.04 | 2595.04 | 2 0 | N 55 E | .12 | 42.32 N | 37.09 E | 56.27 |
| 2637 | 2636.01 | 2636.01 | 2 0 | N 58 E | .26 | 43.11 N | 38.28 E | 57.66 |

SPERRY-SUN, INC.
RECORD OF SURVEY

** THE CALCULATIONS ARE BASED ON THE MINIMUM RADIUS OF CURVATURE METHOD **

HORIZONTAL DISPLACEMENT = 57.66 FEET AT NORTH 41 DEG. 36 MIN. EAST (TRUE)

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

GULF ENERGY AND MINERALS COMPANY
CDU NO. 419
DRINKARD
LEA COUNTY, NEW MEXICO
MAGNETIC MULTISHOT SURVEY


DATE OF SURVEY NOVEMBER 18, 1977
VERTICAL SECTION DIRECTION CLOSURE
MS-6930

SPERRY-SUN, INC.
RECORD OF SURVEY

| MEASURED DEPTH | TRUE VERTICAL DEPTH | SUB SEA TVD | COURSE INCLINATION DEG MIN | COURSE DIRECTION DEG | DOG-LEG SEV DEG/100 | TOTAL RECTANGULAR COORDINATES NORTH/SOUTH | EAST/WEST | VERTICAL SECTION |
|---|---|---|---|---|---|---|---|---|
| 378 | 378.00 | 378.00 | ASSUME VERTICAL TO 378 FT. | | | .00 N | .00 E | .00 |
| 395 | 395.00 | 395.00 | 0 55 | N 11 E | 5.39 | .13 N | .03 E | .12 |
| 426 | 425.99 | 425.99 | 1 5 | N 13 E | .55 | .66 N | .14 E | .59 |
| 519 | 518.98 | 518.98 | 1 0 | N 20 E | .16 | 2.28 N | .61 E | 2.11 |
| 612 | 611.96 | 611.96 | 1 0 | N 21 E | .02 | 3.80 N | 1.18 E | 3.63 |
| 705 | 704.95 | 704.95 | 1 0 | N 16 E | .09 | 5.34 N | 1.70 E | 5.12 |
| 798 | 797.94 | 797.94 | 0 50 | N 34 E | .36 | 6.68 N | 2.30 E | 6.52 |
| 891 | 890.93 | 890.93 | 0 45 | N 17 E | .27 | 7.82 N | 2.86 E | 7.75 |
| 984 | 983.92 | 983.92 | 0 45 | N 37 E | .28 | 8.89 N | 3.40 E | 8.91 |
| 1077 | 1076.91 | 1076.91 | 0 50 | N 17 E | .31 | 10.02 N | 3.96 E | 10.13 |
| 1170 | 1169.90 | 1169.90 | 0 50 | N 20 E | .05 | 11.31 N | 4.39 E | 11.37 |
| 1263 | 1262.89 | 1262.89 | 0 50 | N 11 E | .14 | 12.61 N | 4.75 E | 12.58 |
| 1356 | 1355.88 | 1355.88 | 1 0 | N 30 E | .37 | 13.97 N | 5.29 E | 13.96 |
| 1449 | 1448.87 | 1448.87 | 0 45 | N 21 E | .31 | 15.24 N | 5.91 E | 15.32 |
| 1542 | 1541.86 | 1541.86 | 1 0 | N 34 E | .34 | 16.48 N | 6.58 E | 16.70 |
| 1635 | 1634.84 | 1634.84 | 1 15 | N 46 E | .37 | 17.86 N | 7.77 E | 18.51 |
| 1728 | 1727.82 | 1727.82 | 1 20 | N 54 E | .21 | 19.20 N | 9.37 E | 20.58 |
| 1821 | 1820.78 | 1820.78 | 1 55 | N 52 E | .63 | 20.80 N | 11.47 E | 23.17 |
| 1914 | 1913.72 | 1913.72 | 2 5 | N 42 E | .42 | 23.01 N | 13.83 E | 26.39 |
| 2007 | 2006.64 | 2006.64 | 2 35 | N 42 E | .54 | 25.82 N | 16.36 E | 30.17 |
| 2100 | 2099.54 | 2099.54 | 2 45 | N 52 E | .53 | 28.75 N | 19.52 E | 34.46 |
| 2193 | 2192.44 | 2192.44 | 2 40 | N 51 E | .10 | 31.49 N | 22.96 E | 38.79 |
| 2286 | 2285.34 | 2285.34 | 2 40 | N 46 E | .25 | 34.35 N | 26.20 E | 43.08 |
| 2379 | 2378.23 | 2378.23 | 2 50 | N 57 E | .59 | 37.11 N | 29.68 E | 47.46 |
| 2472 | 2471.13 | 2471.13 | 2 30 | N 53 E | .41 | 39.58 N | 33.23 E | 51.66 |
| 2565 | 2564.06 | 2564.06 | 2 0 | N 56 E | .55 | 41.71 N | 36.20 E | 55.22 |
| 2596 | 2595.04 | 2595.04 | 2 0 | N 55 E | .12 | 42.32 N | 37.09 E | 56.27 |
| 2637 | 2636.01 | 2636.01 | 2 0 | N 58 E | .26 | 43.11 N | 38.28 E | 57.66 |

SPERRY-SUN, INC.
RECORD OF SURVEY

** THE CALCULATIONS ARE BASED ON THE MINIMUM RADIUS OF CURVATURE METHOD **

HORIZONTAL DISPLACEMENT = 57.66 FEET AT NORTH 41 DEG. 36 MIN. EAST (TRUE)

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

GULF ENERGY AND MINERALS COMPANY
CDU NO. 419
DRINKARD
LEA COUNTY, NEW MEXICO
MAGNETIC MULTISHOT SURVEY


DATE OF SURVEY NOVEMBER 18, 1977
VERTICAL SECTION DIRECTION CLOSURE
MS-6930

SPERRY-SUN, INC.
RECORD OF SURVEY

| MEASURED DEPTH | TRUE VERTICAL DEPTH | SUB SEA TVD | COURSE INCLINATION DEG MIN | COURSE DIRECTION DEG | DOG-LEG SEV DEG/100 | TOTAL RECTANGULAR COORDINATES NORTH/SOUTH | EAST/WEST | VERTICAL SECTION |
|---|---|---|---|---|---|---|---|---|
| 378 | 378.00 | 378.00 | ASSUME VERTICAL TO 378 FT. | | | .00 N | .00 E | .00 |
| 395 | 395.00 | 395.00 | 0 55 | N 11 E | 5.39 | .13 N | .03 E | .12 |
| 426 | 425.99 | 425.99 | 1 5 | N 13 E | .55 | .66 N | .14 E | .59 |
| 519 | 518.98 | 518.98 | 1 0 | N 20 E | .16 | 2.23 N | .61 E | 2.11 |
| 612 | 611.96 | 611.96 | 1 0 | N 21 E | .02 | 3.80 N | 1.18 E | 3.63 |
| 705 | 704.95 | 704.95 | 1 0 | N 16 E | .09 | 5.34 N | 1.70 E | 5.12 |
| 798 | 797.94 | 797.94 | 0 50 | N 34 E | .36 | 6.68 N | 2.30 E | 6.52 |
| 891 | 890.93 | 890.93 | 0 45 | N 17 E | .27 | 7.82 N | 2.86 E | 7.75 |
| 984 | 983.92 | 983.92 | 0 45 | N 37 E | .28 | 8.80 N | 3.40 E | 8.91 |
| 1077 | 1076.91 | 1076.91 | 0 50 | N 17 E | .31 | 10.02 N | 3.96 E | 10.13 |
| 1170 | 1169.90 | 1169.90 | 0 50 | N 20 E | .05 | 11.31 N | 4.39 E | 11.37 |
| 1263 | 1262.89 | 1262.89 | 0 50 | N 11 E | .14 | 12.61 N | 4.75 E | 12.58 |
| 1356 | 1355.88 | 1355.88 | 1 0 | N 30 E | .37 | 13.97 N | 5.29 E | 13.96 |
| 1449 | 1448.87 | 1448.87 | 0 45 | N 21 E | .31 | 15.24 N | 5.91 E | 15.32 |
| 1542 | 1541.86 | 1541.86 | 1 0 | N 34 E | .34 | 16.48 N | 6.58 E | 16.70 |
| 1635 | 1634.84 | 1634.84 | 1 15 | N 46 E | .37 | 17.86 N | 7.77 E | 18.51 |
| 1728 | 1727.82 | 1727.82 | 1 20 | N 54 E | .21 | 19.20 N | 9.37 E | 20.58 |
| 1821 | 1820.78 | 1820.78 | 1 55 | N 52 E | .63 | 20.80 N | 11.47 E | 23.17 |
| 1914 | 1913.72 | 1913.72 | 2 5 | N 42 E | .42 | 23.01 N | 13.83 E | 26.39 |
| 2007 | 2006.64 | 2006.64 | 2 35 | N 42 E | .54 | 25.82 N | 16.36 E | 30.17 |
| 2100 | 2099.54 | 2099.54 | 2 45 | N 52 E | .53 | 28.75 N | 19.52 E | 34.46 |
| 2193 | 2192.44 | 2192.44 | 2 40 | N 51 E | .10 | 31.49 N | 22.96 E | 38.79 |
| 2286 | 2285.34 | 2285.34 | 2 40 | N 46 E | .25 | 34.35 N | 26.20 E | 43.08 |
| 2379 | 2378.23 | 2378.23 | 2 50 | N 57 E | .59 | 37.11 N | 29.68 E | 47.46 |
| 2472 | 2471.13 | 2471.13 | 2 30 | N 53 E | .41 | 39.58 N | 33.23 E | 51.66 |
| 2565 | 2564.06 | 2564.06 | 2 0 | N 56 E | .55 | 41.71 N | 36.20 E | 55.22 |
| 2596 | 2595.04 | 2595.04 | 2 0 | N 55 E | .12 | 42.32 N | 37.09 E | 56.27 |
| 2637 | 2636.01 | 2636.01 | 2 0 | N 58 E | .26 | 43.11 N | 38.28 E | 57.66 |

SPERRY-SUN, INC.
RECORD OF SURVEY

** THE CALCULATIONS ARE BASED ON THE MINIMUM RADIUS OF CURVATURE METHOD **

HORIZONTAL DISPLACEMENT = 57.66 FEET AT NORTH 41 DEG. 36 MIN. EAST (TRUE)

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

GULF ENERGY AND MINERALS COMPANY
CDU NO. 419
DRINKARD
LEA COUNTY, NEW MEXICO
MAGNETIC MULTISHOT SURVEY


DATE OF SURVEY NOVEMBER 18, 1977
VERTICAL SECTION DIRECTION CLOSURE
MS-6930

SPERRY-SUN, INC.
RECORD OF SURVEY

| MEASURED DEPTH | TRUE VERTICAL DEPTH | SUB SEA TVD | COURSE INCLINATION DEG MIN | COURSE DIRECTION DEG | DOG-LEG SEV DEG/100 | TOTAL RECTANGULAR COORDINATES NORTH/SOUTH | EAST/WEST | VERTICAL SECTION |
|---|---|---|---|---|---|---|---|---|
| 378 | 378.00 | 378.00 | ASSUME VERTICAL TO 378 FT. | | | .00 N | .00 E | .00 |
| 395 | 395.00 | 395.00 | 0 55 | N 11 E | 5.39 | .13 N | .03 E | .12 |
| 426 | 425.99 | 425.99 | 1 5 | N 13 E | .55 | .66 N | .14 E | .59 |
| 519 | 518.98 | 518.98 | 1 0 | N 20 E | .16 | 2.28 N | .61 E | 2.11 |
| 612 | 611.96 | 611.96 | 1 0 | N 21 E | .02 | 3.80 N | 1.18 E | 3.63 |
| 705 | 704.95 | 704.95 | 1 0 | N 16 E | .09 | 5.34 N | 1.70 E | 5.12 |
| 798 | 797.94 | 797.94 | 0 50 | N 34 E | .36 | 6.68 N | 2.30 E | 6.52 |
| 891 | 890.93 | 890.93 | 0 45 | N 17 E | .27 | 7.82 N | 2.86 E | 7.75 |
| 984 | 983.92 | 983.92 | 0 45 | N 37 E | .28 | 8.89 N | 3.40 E | 8.91 |
| 1077 | 1076.91 | 1076.91 | 0 50 | N 17 E | .31 | 10.02 N | 3.96 E | 10.13 |
| 1170 | 1169.90 | 1169.90 | 0 50 | N 20 E | .05 | 11.31 N | 4.39 E | 11.37 |
| 1263 | 1262.89 | 1262.89 | 0 50 | N 11 E | .14 | 12.61 N | 4.75 E | 12.58 |
| 1356 | 1355.88 | 1355.88 | 1 0 | N 30 E | .37 | 13.97 N | 5.29 E | 13.96 |
| 1449 | 1448.87 | 1448.87 | 0 45 | N 21 E | .31 | 15.24 N | 5.91 E | 15.32 |
| 1542 | 1541.86 | 1541.86 | 1 0 | N 34 E | .34 | 16.48 N | 6.58 E | 16.70 |
| 1635 | 1634.84 | 1634.84 | 1 15 | N 46 E | .37 | 17.86 N | 7.77 E | 18.51 |
| 1728 | 1727.82 | 1727.82 | 1 20 | N 54 E | .21 | 19.20 N | 9.37 E | 20.58 |
| 1821 | 1820.78 | 1820.78 | 1 55 | N 52 E | .63 | 20.80 N | 11.47 E | 23.17 |
| 1914 | 1913.72 | 1913.72 | 2 5 | N 42 E | .42 | 23.01 N | 13.83 E | 26.39 |
| 2007 | 2006.64 | 2006.64 | 2 35 | N 42 E | .54 | 25.82 N | 16.36 E | 30.17 |
| 2100 | 2099.54 | 2099.54 | 2 45 | N 52 E | .53 | 28.75 N | 19.52 E | 34.46 |
| 2193 | 2192.44 | 2192.44 | 2 40 | N 51 E | .10 | 31.49 N | 22.96 E | 38.79 |
| 2286 | 2285.34 | 2285.34 | 2 40 | N 46 E | .25 | 34.35 N | 26.20 E | 43.08 |
| 2379 | 2378.23 | 2378.23 | 2 50 | N 57 E | .59 | 37.11 N | 29.68 E | 47.46 |
| 2472 | 2471.13 | 2471.13 | 2 30 | N 53 E | .41 | 39.58 N | 33.23 E | 51.66 |
| 2565 | 2564.06 | 2564.06 | 2 0 | N 56 E | .55 | 41.71 N | 36.20 E | 55.22 |
| 2596 | 2595.04 | 2595.04 | 2 0 | N 55 E | .12 | 42.32 N | 37.09 E | 56.27 |
| 2637 | 2636.01 | 2636.01 | 2 0 | N 58 E | .26 | 43.11 N | 38.28 E | 57.66 |

SPERRY-SUN, INC.
RECORD OF SURVEY

** THE CALCULATIONS ARE BASED ON THE MINIMUM RADIUS OF CURVATURE METHOD **

HORIZONTAL DISPLACEMENT = 57.66 FEET AT NORTH 41 DEG. 36 MIN. EAST (TRUE)

Petroleum Information.

COUNTY LEA POOL Drinkard STATE NM

OPR GULF OIL CORP. API 30-02[illegible]-25694

419 LEASE Central Drinkard Unit MAP

Sec 28, T21S, R37E COORD

1631' FSL, 260' FWL of Sec 2-3-[illegible]

Eunice Townsite SPD 11-14-77 CMP 1-19-7[illegible]

WELL CLASS D INIT D FIN DO ELEV

| FORMATION | DATUM | FORMATION | DATUM |
|---|---|---|---|
| | | | |

13 3/8" at 378' w/400 sx
8 5/8" at 2637' w/700 sx
5 1/2" at 6734' w/1000 sx

TD 6734' DRKD PBD

IP (Drinkard) Perfs 6501-6618' P 9 BO + 200 BW. Pot based on 24 hr test. GOR 7667; gtv 38.8

LOSE MGF #10 DRSTEP 3462' GL PD 6700' [illegible]

F.R. 10-31-77
(Drinkard)
(BHL: 1351' FSL, 13' FEL of Sec 29, T21S, R37E)

| | |
|---|---|
| 11-15-77 | TD 396'; Rng Csg |
| 11-28-77 | Drlg 4215' lm |
| 12-5-77 | Drlg 6036' lm |
| 12-13-77 | TD 6734'; WOC |
| 12-19-77 | TD 6734'; Rng Tbg<br>Perf (DRKD) 6501-03', 6530-32', 6573-75'<br>6616-18' w/2 SPF<br>Acid (6501-6618') 3000 gals |
| 1-3-78 | TD 6734'; TOP<br>Ppd 36 BO + 247 BW in 24 hrs (6501-6618') |
| 1-9-78 | TD 6734'; TOP |
| 1-16-78 | TD 6734'; TOP |
| 1-20-78 | TD 6734'; WOSP<br>Ppd 9 BO + 200 BW in 24 hrs (6501-6618') |

2-3-20 NM

LEA
GULF OIL CORP.

Drinkard
419 Central Drinkard Unit
Sec 28, T21S, R37E

NM
Page #2

2-13-78 TD 6734'; Complete
LOG TOPS: Rustler 1170', Base Salt 2402', Yates 2592', Seven Rivers 2824', Queen 3353', Grayburg 3629', San Andres 3842', Glorieta 5064', Blinebry 5472', Tubb 6062', Drinkard 6393'
LOG TOPS: DENL,GRL
2-13-78 COMPLETION ISSUED

2-3-20 MDS
IC 30-025-70285-77