

EARLOUGHER ENGINEERING  
CORE SUMMARY

Company M. W. Shriver Lease McCaslin Well No. E-4  
 Location 50 ft. south, 145 ft. west, of northeast corner  
 Section 5 Twp. 23-S Rge. 21-E County Anderson State Kansas  
 Formation Cored Bartlesville Sand Type Core No. 6 Baker Berrel  
 Date Cored 8-7-46 Date Shot \_\_\_\_\_ Date Completed \_\_\_\_\_

Depths:

|   |                 |
|---|-----------------|
| Started coring, sandy shale             | 724.5 ft.       |
| Top of oil sand                         | 734.6 "         |
| Bottom of oil sand                      | 747.7 "         |
| Net feet of oil sand                    | 11.3 "          |
| Probable black sand (747.7 - 748.7 ft.) | 1.0 "           |
| Coal                                    | 748.7 - 749.5 " |
| Bottom of core, probable shale          | 749.9 "         |
| Total cored                             | 25.4 "          |
| Feet analyzed                           | 12.3 "          |

Shot Record:

|                    |             |             |                                   |                 |               |
|--------------------|-------------|-------------|-----------------------------------|-----------------|---------------|
|                    |             |             | Set Packer <u>733.0</u> Feet      |                 |               |
|                    |             |             | Bottom of hole - <u>747.0</u> ft. |                 |               |
| <u>Depth, Feet</u> | <u>From</u> | <u>To</u>   | <u>Shell</u>                      | <u>Quarts</u>   | <u>Total</u>  |
|                    |             | <u>Feet</u> | <u>Diameter</u>                   | <u>Per Foot</u> | <u>Quarts</u> |
|                    | 736.        | 739.        | 3.                                | 4 "             | 2.5           |
|                    | 739.        | 747.        | 8.                                | 4 1/2 "         | 3.2           |
|                    |             |             |                                   |                 | 7.5           |
|                    |             |             |                                   |                 | 25.6          |
|                    |             |             |                                   |                 | 33.1          |

Completion Data:

Hrs. well stood after coring 40; Feet Fluid in Hole 150 (Oil 112 Water 38)  
 Clean-out time, hrs. 40; Initial production, bbls. day 23 (Oil 23 Water None)

Remarks: Net feet of oil sand is 11.3 feet. The top 2.0 feet occurs in relatively thin streaks in a sand and shale section, while the bottom 9.3 feet is relatively clean sand with a few minor shale breaks. Below the good oil sand occurs 1.0 foot of micaceous sand with some black sand characteristics and it is not included in net feet of oil pay.

(Continued following page.)

PERMEABILITY The average permeability of the 11.3 feet of oil sand is 77 millidarcys. Individual values range from 23 to 143 millidarcys. Permeability capacity is 865 foot millidarcys.

POROSITY The porosity is uniformly good and averages 22.0 percent.

PERCENT SATURATION The top 2.0 feet of sand has an average oil saturation of 25 percent, and average water saturation of 38 percent. The lower 9.3 feet has average oil saturation of 34 percent, and average water saturation of 34 percent. Over-all average oil saturation is 32.3 percent, and water saturation 35 percent. These relatively low values probably indicate that oil was lost from the core by gas expansion.

The 1.0 foot of sand at the base of the section is micaceous and black sand which is probably non-floodable. Average oil saturation is 35 percent, and average water saturation 31 percent.

OIL CONTENT Average oil content of the oil pay is 552 barrels per acre foot and values range from 400 to 740 barrels per acre foot.

LABORATORY FLOODING TESTS Flood pot tests yielded an average oil recovery of 90 barrels per acre foot. Average residual oil saturation was 28 percent which is about normal for this sand.

#### CONCLUSION

1. Net feet of oil sand is 11.3 feet.
2. Total average saturation is 67.3 percent, indicating that oil was lost from the core by gas expansion.
3. Estimated oil recovery by water flooding is approximately 3,300 barrels per

M. W. Shriver  
McCaslin Well No. E-4

- Page 3 -

acre from the area of which this core is representative.

Respectfully submitted

EARLOUGHER ENGINEERING

A handwritten signature in cursive script that reads "J. M. Robinson".

J. M. Robinson, Engineer

JMR d

# EARLOUGHER ENGINEERING

## RESULTS OF SATURATION TESTS

COMPANY M. W. Shriver

WELL McCaslin No. E-4

| Sat. No. | Depth Feet | Porosity Per Cent | PER CENT SAT. |       |       | Avg. Oil Content Bbls./A. Ft. | FT. OF SAND |       | Total Oil Content Bbls./Acre |
|----------|------------|-------------------|---------------|-------|-------|-------------------------------|-------------|-------|------------------------------|
|          |            |                   | Oil           | Water | Total |                               | Ft.         | Cu.n. |                              |
| 1        | 734.9      | 20.5              | 29.           | 32.   | 61.   | 460.                          | 0.7         | 0.7   | 320.                         |
| 2        | 737.0      | 22.6              | 23.           | 43.   | 66.   | 400.                          | 1.3         | 2.0   | 520.                         |
| 3        | 738.3      | 22.9              | 42.           | 40.   | 82.   | 740.                          | 1.6         | 3.6   | 1180.                        |
| 4        | 739.8      | 22.8              | 30.           | 31.   | 61.   | 530.                          | 0.5         | 4.1   | 270.                         |
| 5        | 740.5      | 22.4              | 29.           | 33.   | 62.   | 510.                          | 0.4         | 4.5   | 200.                         |
| F-5      | 741.0      | 22.4              | 29.           | --    | --    | 510.                          | 0.5         | 5.0   | 260.                         |
| 6        | 742.0      | 20.3              | 39.           | 34.   | 73.   | 620.                          | 1.3         | 6.3   | 810.                         |
| F-7      | 743.5      | 20.6              | 37.           | --    | --    | 590.                          | 1.2         | 7.5   | 710.                         |
| 7        | 744.3      | 22.1              | 26.           | 28.   | 54.   | 440.                          | 0.9         | 8.4   | 400.                         |
| F-8      | 745.4      | 21.2              | 37.           | --    | --    | 600.                          | 1.0         | 9.4   | 600.                         |
| 8        | 746.1      | 24.0              | 26.           | 37.   | 63.   | 490.                          | 0.7         | 10.1  | 340.                         |
| F-9      | 746.8      | 22.4              | 32.           | --    | --    | 560.                          | 0.6         | 10.7  | 340.                         |
| 9        | 747.3      | 22.4              | 28.           | 36.   | 64.   | 490.                          | 0.6         | 11.3  | 290.                         |
| 10       | 747.9      | 20.9              | 22.           | 38.   | 60.   | 360.                          | 0.5         | 11.8  | 180.                         |
| 11       | 748.5      | 21.6              | 47.           | 24.   | 71.   | 790.                          | 0.5         | 12.3  | 400.                         |

### SUMMARY

| DEPTH FEET |       | FEET OF SAND | AVG. POROSITY | AVG. OIL SAT. | AVG. WATER SAT. | AVG. OIL CONTENT BBLs./A. FT. | TOTAL OIL CONTENT BBLs./ACRE |
|------------|-------|--------------|---------------|---------------|-----------------|-------------------------------|------------------------------|
| FROM       | TO    |              |               |               |                 |                               |                              |
| 734.6      | 737.3 | 2.0          | 21.9          | 25.           | 38.             | 420.                          | 840.                         |
| 737.6      | 747.7 | 9.3          | 22.0          | 34.           | 34.             | 581.                          | 5400.                        |
| 734.6      | 747.7 | 11.3         | 22.0          | 32.3          | 35.             | 552.                          | 6240.                        |
| 747.7      | 748.7 | 1.0          | 21.3          | 35.           | 31.             | 580.                          | 580.                         |

# GEOLOGIC STANDARDS COMPANY

## RESULTS OF PERMEABILITY TESTS

COMPANY M. W. Shriver

WELL McCaslin No. E-4

| Sample No. | Depth Feet | Permeability Millidarcys | FEET OF SAND |          | Capacity Ft. X Md. | Sample No. | Depth Feet | Permeability Millidarcys | FEET OF SAND |          | Capacity Ft. X Md. |
|------------|------------|--------------------------|--------------|----------|--------------------|------------|------------|--------------------------|--------------|----------|--------------------|
|            |            |                          | Ft.          | Cum. Ft. |                    |            |            |                          | Ft.          | Cum. Ft. |                    |
| 1          | 735.0      | 45.                      | 0.7          | 0.7      | 32.                | 16         | 742.3      | 43.                      | 0.6          | 6.3      | 26.                |
| 2          | 735.6      | 37.                      | 0.2          | 0.9      | 7.4                | 17         | 742.8      | 130.                     | 0.5          | 6.8      | 65.                |
| 3          | 736.3      | 70.                      | 0.3          | 1.2      | 21.                | 18         | 743.2      | 77.                      | 0.5          | 7.3      | 38.                |
| 4          | 736.9      | 100.                     | 0.8          | 2.0      | 80.                | 19         | 743.7      | 48.                      | 0.2          | 7.5      | 9.6                |
| 5          | 737.8      | 95.                      | 0.4          | 2.4      | 38.                | 20         | 744.1      | 97.                      | 0.7          | 8.2      | 68.                |
| 6          | 738.1      | 108.                     | 0.5          | 2.9      | 54.                | 21         | 744.6      | 43.                      | 0.2          | 8.4      | 8.6                |
| 7          | 738.7      | 133.                     | 0.5          | 3.4      | 66.                | 22         | 745.1      | 42.                      | 0.5          | 8.9      | 21.                |
| 8          | 739.1      | 143.                     | 0.2          | 3.6      | 27.                | 23         | 745.6      | 37.                      | 0.5          | 9.4      | 18.                |
| 9          | 739.6      | 0.1                      | 0.1*         |          |                    | 24         | 745.9      | 71.                      | 0.4          | 9.8      | 28.                |
| 10         | 740.1      | 80.                      | 0.5          | 4.1      | 40.                | 25         | 746.4      | 102.                     | 0.3          | 10.1     | 31.                |
| 11         | 740.3      | 69.                      | 0.4          | 4.5      | 28.                | 26         | 746.7      | 91.                      | 0.3          | 10.4     | 27.                |
| 12         | 740.8      | 73.                      | 0.3          | 4.8      | 22.                | 27         | 747.0      | 89.                      | 0.3          | 10.7     | 27.                |
| 13         | No sample. |                          |              |          |                    | 28         | 747.5      | 23.                      | 0.6          | 11.3     | 14.                |
| 14         | 741.1      | 31.                      | 0.2          | 5.0      | 6.2                | 29         | 747.8      | 54.                      | 0.5          | 11.8     | 27.                |
| 15         | 741.6      | 88.                      | 0.7          | 5.7      | 62.                | 30         | 748.3      | 76.                      | 0.5          | 12.3     | 38.                |

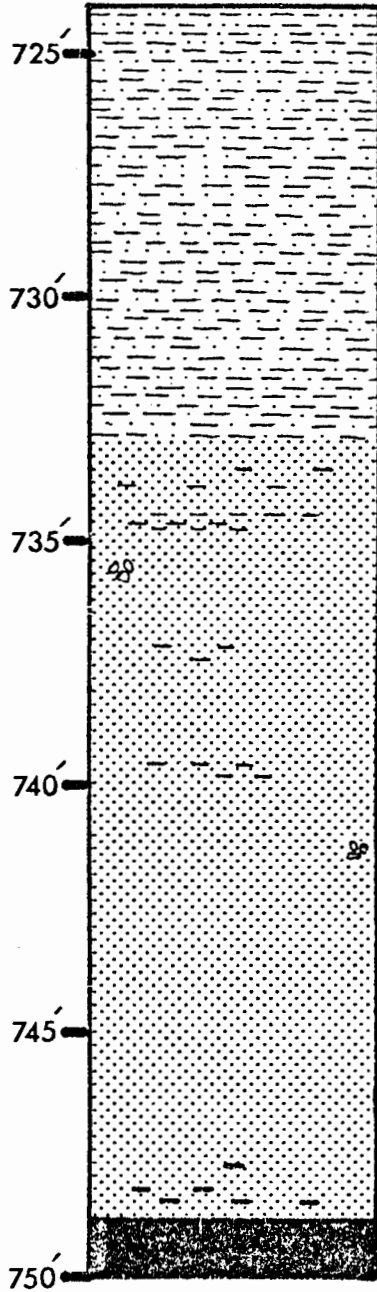
\*- Not included in cumulative feet of sand.

### SUMMARY

| DEPTH FEET |       | FEET OF SAND | AVERAGE PERMEABILITY | CAPACITY FT. X MD. |
|------------|-------|--------------|----------------------|--------------------|
| FROM       | TO    |              |                      |                    |
| 734.6      | 737.3 | 2.0          | 70.2                 | 140.4              |
| 737.6      | 747.7 | 9.3          | 78.                  | 724.4              |
| 734.6      | 747.7 | 11.3         | 77.                  | 865.               |
| 747.7      | 748.7 | 1.0          | 65.                  | 65.                |

Richard Eng. E-4-McCaslin  
NE NE NE 5-23-21 E  
elev. 1048' (est.)

Depths:



Gy. to brn. par.-bed. siltst. w/thin sh. & sid. layers

Brn. v. fn.-gr. ss. w/sh. & sid. ptgs. & sid. nod's.

Ss. becomes v. oily & blk.

Coal

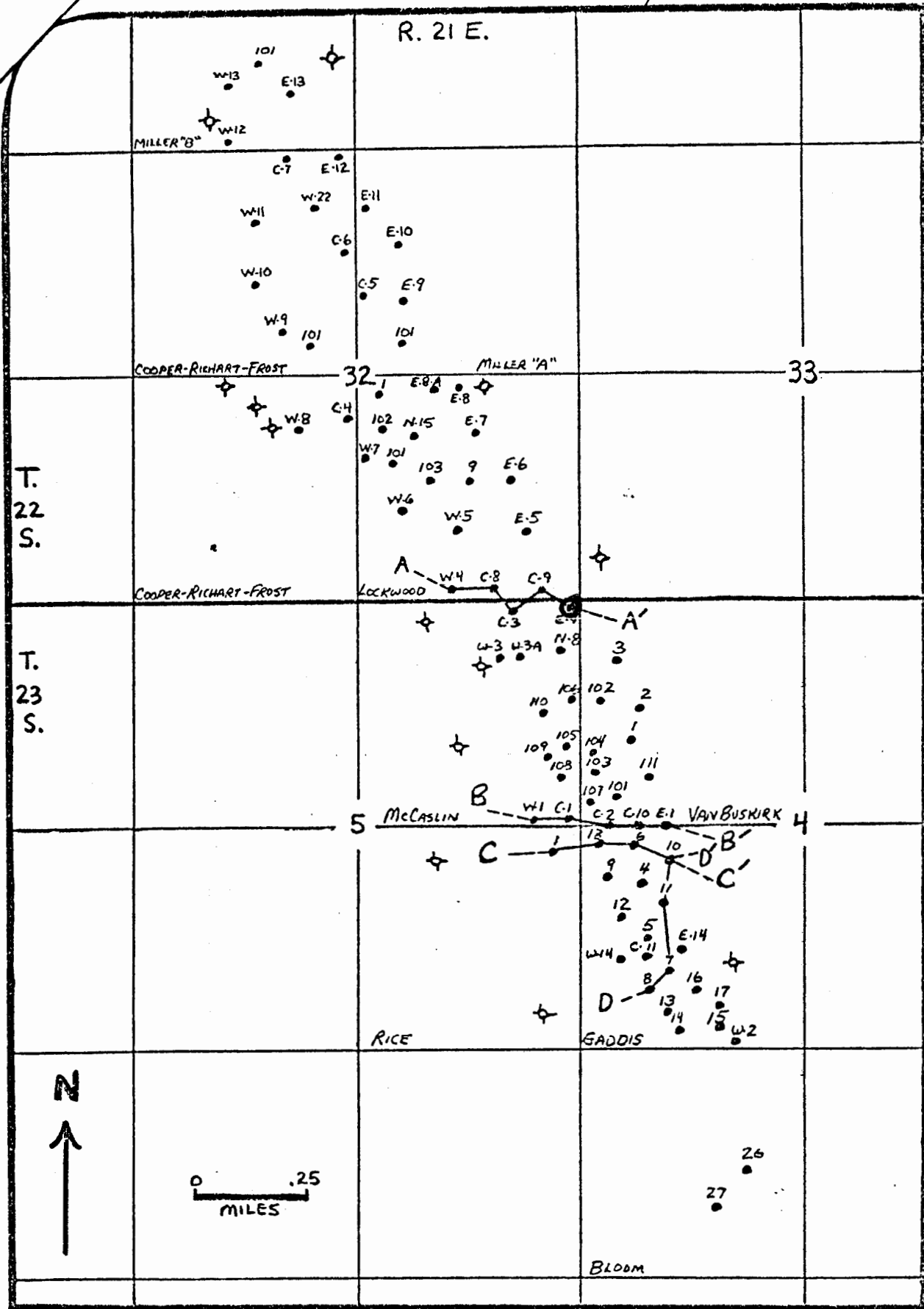


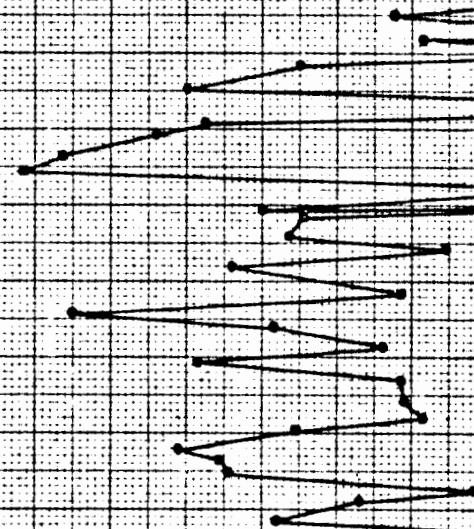
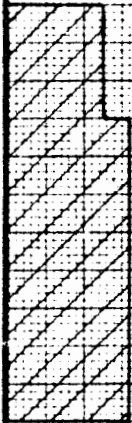
Figure 6. - Map of the Kincaid Oil Field showing leases, locations of wells, and lines of cross sections.

Recommended  
Shot, Qts. Ft.

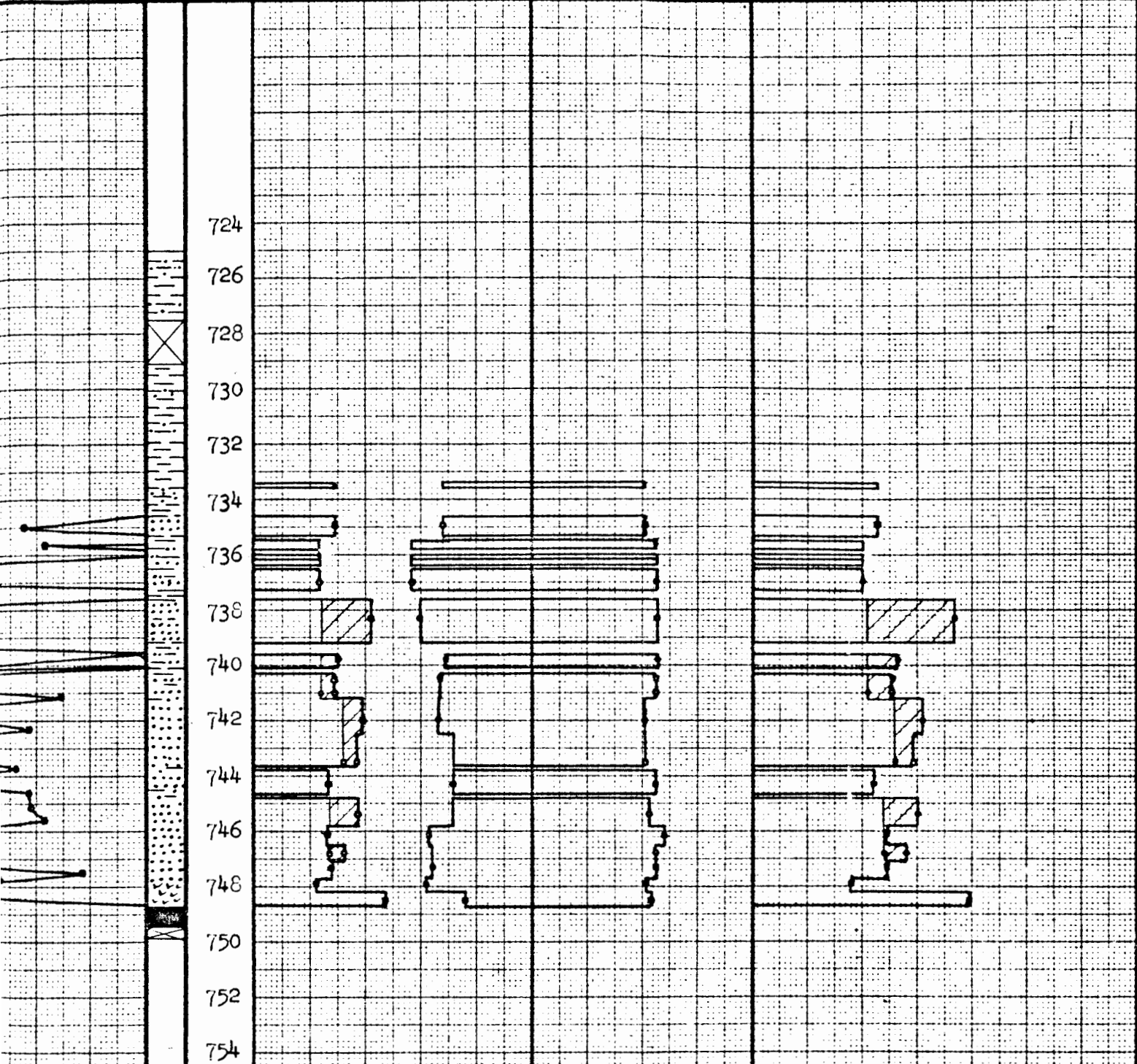
Permeability, Millidarcys

0 2 4 340 320 300 280 260 240 220 200 180 160 140 120 100 80 60 40

Set Packer - 733.0 ft.  
Bottom of hole - 748.0 ft.  
Total Shot - 33.1 qts.



| Sec | Sand         | Depth, Feet |       | Net Ft. of Sand | Avg. Por. | Average Core Sat. |       | Core Oil Content |                | Perme. Avg. Mds. |
|-----|--------------|-------------|-------|-----------------|-----------|-------------------|-------|------------------|----------------|------------------|
|     |              | From        | To    |                 |           | Oil               | Water | Avg. B./A Ft.    | Total Bbl /Ac. |                  |
| 1   | Bartlesville | 734.6       | 737.3 | 2.0             | 21.9      | 25.               | 38.   | 420.             | 840.           | 70.2             |
| 2   | Bartlesville | 737.6       | 747.7 | 9.3             | 22.0      | 34.               | 34.   | 581.             | 5,400.         | 78.              |
| 1&2 | Bartlesville | 734.6       | 747.7 | 11.3            | 22.0      | 32.3              | 35.   | 552.             | 6,240.         | 77.              |



Shaded Area - Recoverable oil from laboratory flooding tests.

| Permeability |                    | Flood Pot Residuals |       |             |          |
|--------------|--------------------|---------------------|-------|-------------|----------|
| Avg. Mds.    | Capacity Ft. x Md. | Saturation          |       | Oil Content |          |
|              |                    | Oil                 | Water | B / A Ft.   | Bbl / Ac |
| 70.2         | 140.4              |                     |       |             |          |
| 78.          | 724.4              | 28.                 | 59.   | 478.        | 4,450.   |
| 77.          | 865.               |                     |       |             |          |
| 65.          | 65.                |                     |       |             |          |

COMPANY M. W. SHRIVER  
 LEASE MC CASLIN WELL NO. E-4  
 LOCATION 50' S., 145' W., of NE Corner  
 SEC 5 T 23S R 21E COUNTY Anderson  
 STATE Kansas DATE 8-20-46  
 EARLOUGHER ENGINEERING TULSA, OKLAHOMA