Report No. DOE/ET/00026-8

GRUY FEDERAL, INC.

ASSESSMENT OF POTENTIAL INCREASED OIL PRODUCTION BY POLYMER-WATERFLOOD IN NORTHERN AND SOUTHERN MID-CONTINENT OIL FIELDS

PROGRESS REPORT
FOR THE QUARTER ENDING DECEMBER 31, 1978

Contract No. EW-78-C-19-0026

Submitted to

U. S. Department of Energy
Division of Energy Technology
Bartlesville Energy Technology Center
Bartlesville, Oklahoma

FEB 27 1979

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February 5, 1979

Mr. John McGhee
Department of Energy
Bartlesville Energy Research Center
Post Office Box 1398
Bartlesville, Oklahoma 74003

Re: BETC-Mid-Continent Polymer/
Water Study
Contract No. EW-78-C-19-0026

Dear Mr. McGhee:

The enclosed quarterly report summarizes the progress made toward each contract objective.

As can be drawn from the following report the first five tasks have been completed with work now centering on task six.

The format of this quarterly report is the same as the preceding quarterly and monthly reports with the finding of each task summarized in numerical order.

We are pleased with the results of our study to date and hope you will find this report useful and informative.

Sincerely,

GRUY FEDERAL, INC.

Rodney W. Pease
Senior Geologist

RWP:bc
Enclosure

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SECOND QUARTERLY TECHNICAL PROGRESS REPORT

ASSESSMENT OF POTENTIAL INCREASED OIL PRODUCTION BY POLYMER-WATERFLOOD IN NORTHERN AND SOUTHERN MID-CONTINENT OIL FIELDS

CONTRACT NO. EW-78-C-19-0026

Task I. Detailed geological and engineering study of the DOE-Kewanee polymer-augmented waterflood.

The Kewanee North Stanley polymer-augmented waterflood project is now in the final producing stage, the final phase of polymer injection having been completed in June, 1977. Details of the project have been documented in annual publications. The heterogeneity of the reservoir has posed major problems for the project, since fluid movement in the reservoir is controlled largely by two sets of high conductivity patterns. One set is a high permeability zone parallel to the axis of the reservoir and is a result of the depositional processes. A second set of high fluid conductivity is a post-depositional fracture system normal to the axis of the reservoir. The potential negative effects of these reservoir complexities were recognized early in the project and appropriate remedial operations were performed. Production response in the project has been affected not only by the basic flow geometry, but also by the remedial operations.

This section reviews available geologic data on the field and attempts to relate certain aspects of project performance to the geological and geophysical parameters.

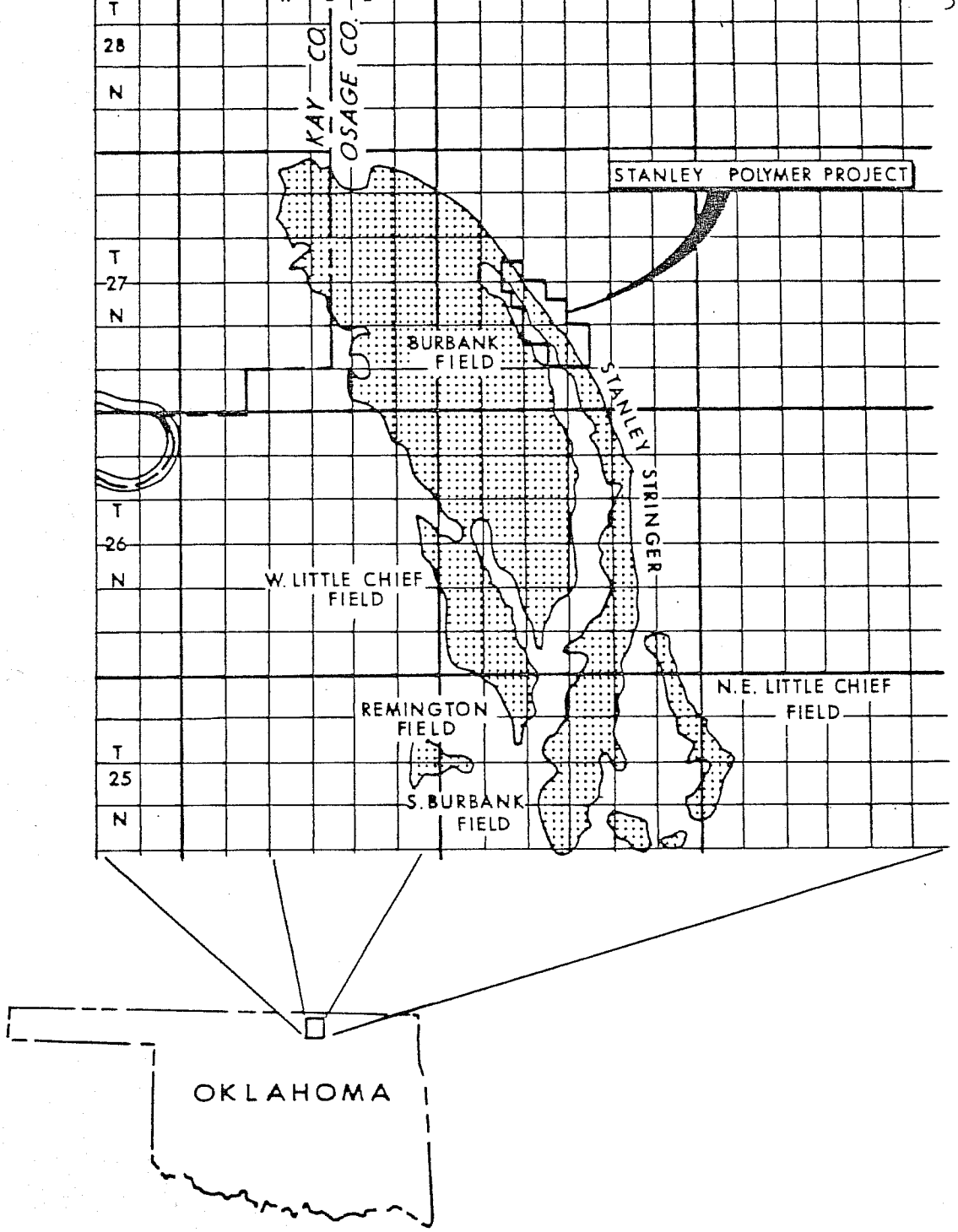
Area Geology

The North Stanley Stringer Field, located in Township 27 North, Range 6 East, Osage County, Oklahoma (Figure 1), projects southeasterly from the northern portion of the Burbank Field. It produces from the middle Pennsylvanian Burbank sandstone member of the Cherokee shale. Both fields produce from the same horizon and have similar depositional histories. Regional dip in the area is southwest at 30-40 feet per mile, as measured on the Oswego lime (150-200 feet above the Burbank sandstone).

The Stanley Stringer Field, 1/2 to 3/4 mile wide and 15 miles long, has been interpreted as an offshore bar deposit (Sands, 1927; Bass, Leatherock, Dillard, and Kennedy, 1937; Bass, Goodrich, and Dillard, 1952; Cruz, 1966). Bass et al (1937) postulated bar development along the western margin of the Cherokee Sea during Pennsylvanian time, with the Stanley Stringer representing a stage of development subsequent to the deposition of sands in the Burbank Field. Hudson (1970) provided evidence of a fluvial origin for the sands, and Phillips Petroleum Company (1976) suggested a fluvial origin for the Burbank sands in the Burbank Field, based on petrographic studies of cores.

Reservoir characteristics are compatible with either interpretation. Evidence, however, favors the offshore bar interpretation, and geomorphic terminology reflective of this type of deposition is used in the report.

The sand body in the northern portion of the Stanley Stringer Field (the area of study) is 32-84 feet thick. The axis of maximum sand development is positioned toward the seaward side of the sand body. The facies change from sand to shale is abrupt on the seaward side, but less so on the lagoonal side. The producing horizons lie at depths of 2850-2950 feet. The sand is composed of three zones, with shale or fine sand laminae separating the individual sands on the backbar or lagoonal side. In some areas the thin layers extend entirely across the field (Figures 2 and 3).



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INDEX MAP

KEWANEE NORTH STANLEY

POLYMER AUGMENT FLOOD

OSAGE COUNTY, OKLAHOMA

SCALE

660' 0 1320' 2640'

FIGURE 1

Petrographic studies by Leatherock (1937) show the Burbank sands to be predominantly fine grained, ranging in size from 1/8 to 1/4 mm in diameter. Clay content is most commonly 10 percent, but can be as high as 40 percent.

Reservoir Heterogeneity

Figures 2 and 3 are panel diagrams showing the sand development in the field. Logs used in constructing the diagrams include SP, gamma ray, acoustic, density and various lateral devices. The SP and velocity surveys are used in combination to delineate zonation within the sands. The logs are hung on a common datum, which allows subsurface structures to be visualized. As shown on the panel diagrams, sand development is essentially continuous through the pay interval. In general, the upper zone shows maximum SP deflection and maximum porosity/permeability development. The rapid decrease in porosity development from forebar to backbar is exemplified by wells on the Big Eagle and Art leases (Figure 2).

Analysis of a series of cores in the North Stanley Stringer points up the significant horizontal and vertical heterogeneity of the reservoir. Eleven cores, representing approximately 500 feet, show an arithmetic mean permeability of 307 md. The geometric mean permeability of all measurements is 54 md. Figure 4 shows the areal distribution of high permeability regions in the two upper zones. The uppermost zone includes the majority of wells on the east side of the field. The axis of the high permeability region is coincident with the axis of maximum initial daily yield (Figure 5). Figures 4 and 5 reflect the general decrease in permeability and productive capacity of wells on the west side of the field.

The distribution of high permeabilities within the middle zone, shown on Figure 4, is limited to a small area in the northern part of the field, oriented along the axis of maximum initial yield (Figure 5).

The lower zone has low permeabilities throughout the field. None of the logs examined shows porosity development approaching that of the upper

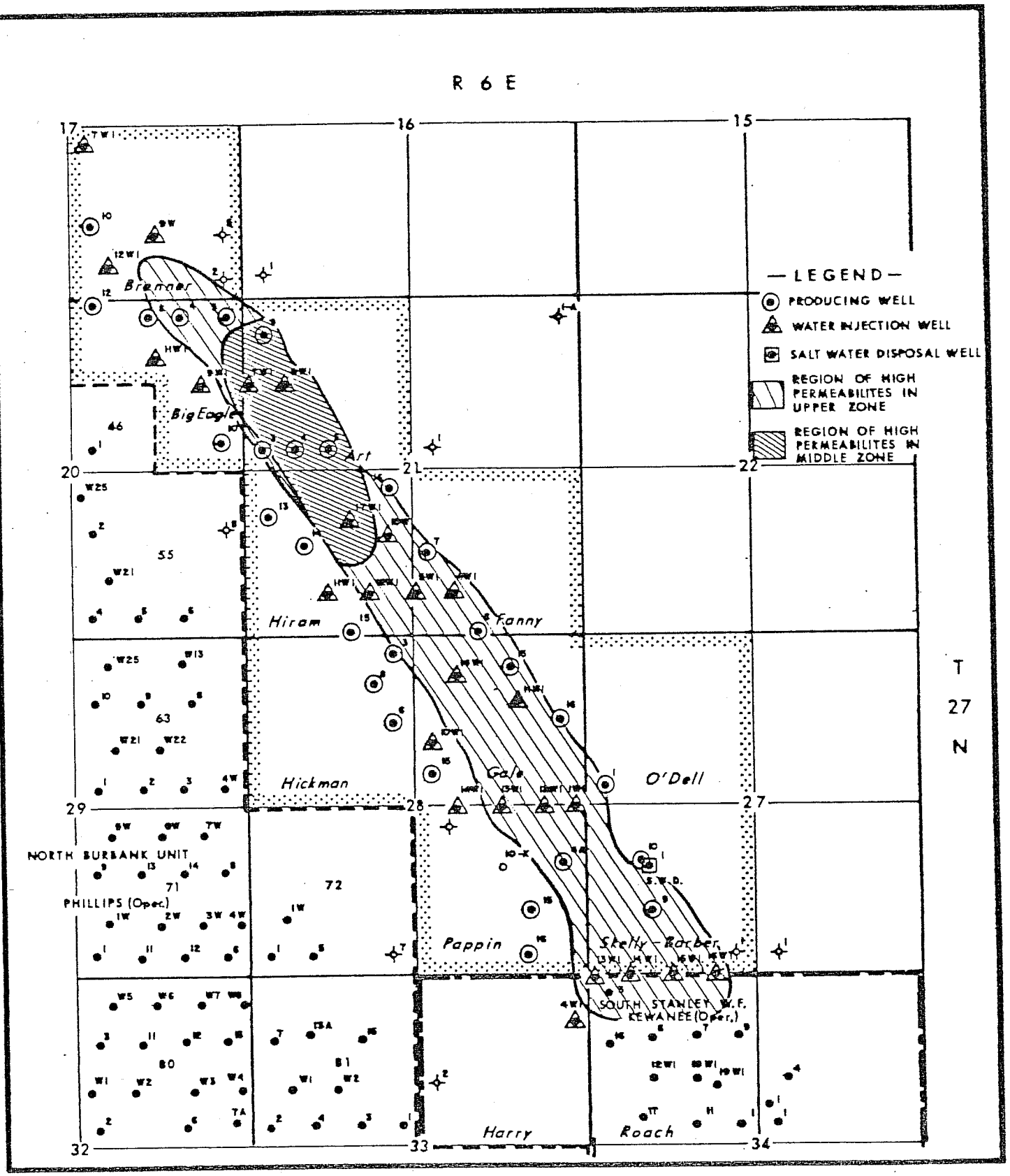

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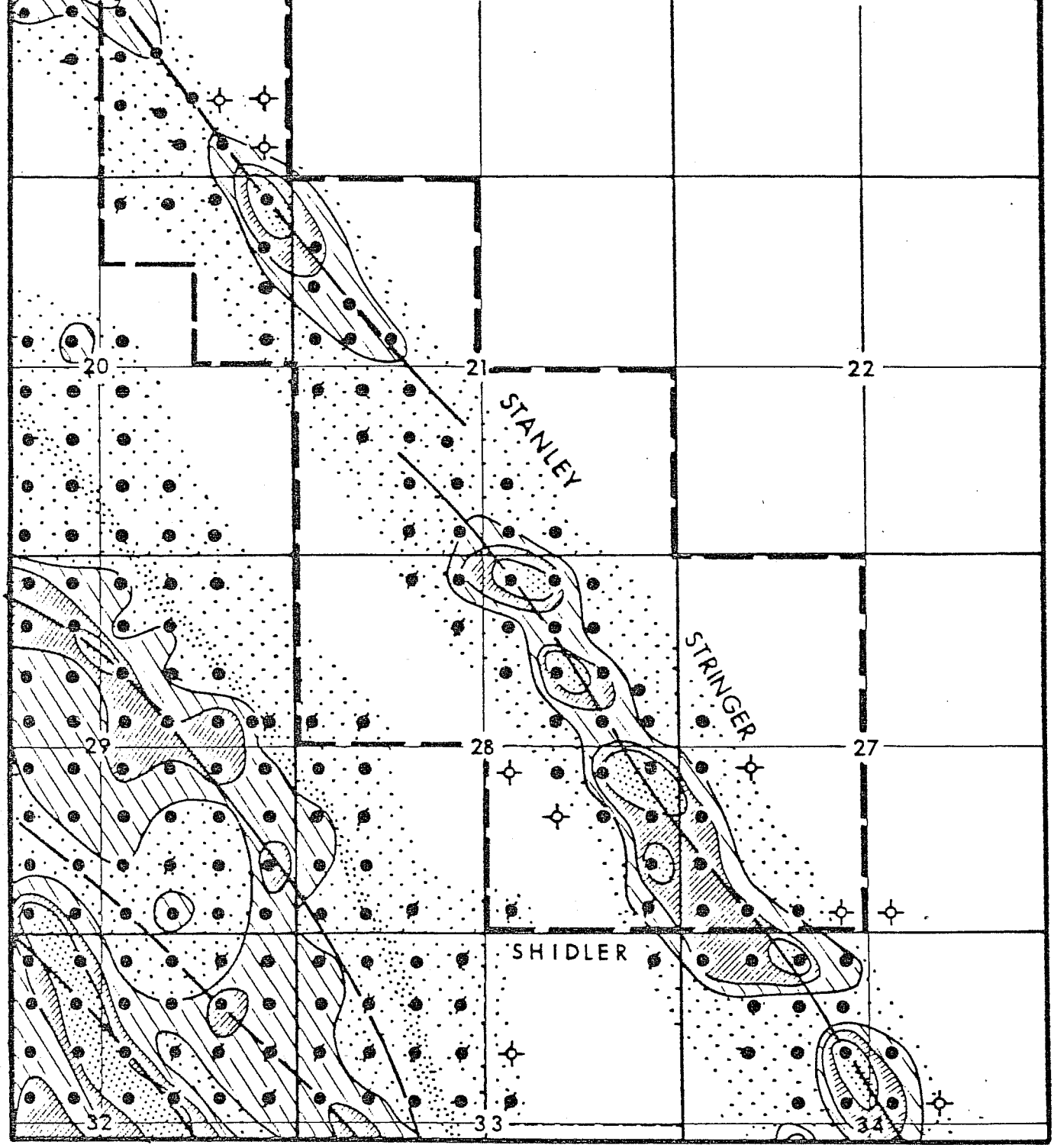
FIGURE 4 AREAL DISTRIBUTION OF HIGH PERMEABILITIES IN UPPER AND MIDDLE ZONES



INITIAL DAILY YIELDS LESS THAN 500 BARRELS

INITIAL DAILY YIELDS FROM 500-1000 BARRELS

INITIAL DAILY YIELDS FROM 1000-1500 BARRELS

INITIAL DAILY YIELDS EXCEEDED 1500 BARRELS

DELINEATE BELTS OF WELLS THAT HAVE HAD LARGE INITIAL DAILY YIELDS

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FIGURE 5 NORTH STANLEY STRINGER FIELD INITIAL DAILY PRODUCTION RATES

zones, and core analyses in the lower zone generally show low porosities and permeabilities.

Plots of permeability variation for the above reservoir conditions are shown in Figures 6-11. Table 1 summarizes the arithmetic and geometric means of permeability measurements in the high and low permeability regions of all three zones.

Porosity/permeability plots for the sand in the reservoir are shown in Figures 12-16. Figures 12 and 13 show porosity/permeability relationships for the regions of high permeabilities in the upper and middle zones, respectively. The plots are similar and indicative of high energy environments, with limited accumulation of clay-sized particles. In contrast, Figures 14 and 15, plots of the low permeability regions in the upper and middle zones, show porosity/permeability relationships shifted toward lower porosities, indicating tight sands. This lack of porosity/permeability may be the result of a lower energy environment and an increase in clay-sized particles, which cause a decrease in pore space. Alternatively, post-depositional mineralization through action of ground water or percolation from overlying waters may be the primary factor in the decreased porosity/permeability on the southwest section of the field.

Figure 16 is a plot of porosity/permeability for the lower zone, which is similar to the low permeability regions of the two upper zones.

Overall, then, the field can be divided into regions of high and lower permeabilities within the two upper zones, with the lower zone having low permeabilities throughout the area.

Fracture Systems

Prior to the polymer-augmented waterflood program, there was evidence for communication between wells. In the initial stages of the program, tracer

TABLE 1

PERMEABILITY VARIATION IN

BURBANK SANDS, NORTH STANLEY STRINGER FIELD

	REGION OF HIGH PERMEABILITY			REGION OF LOW PERMEABILITY		
	No. Of Readings	Arithmetic Mean	Geometric Mean	No. of Readings	Arithmetic Mean	Geometric Mean
Upper Zone	67	774	544	44	33	12
Middle Zone	26	231	104	50	71	11
Lower Zone	-	-	-	73	54	19

Total Reservoir: 260 readings; arithmetic mean 307 md; geometric mean 57 md

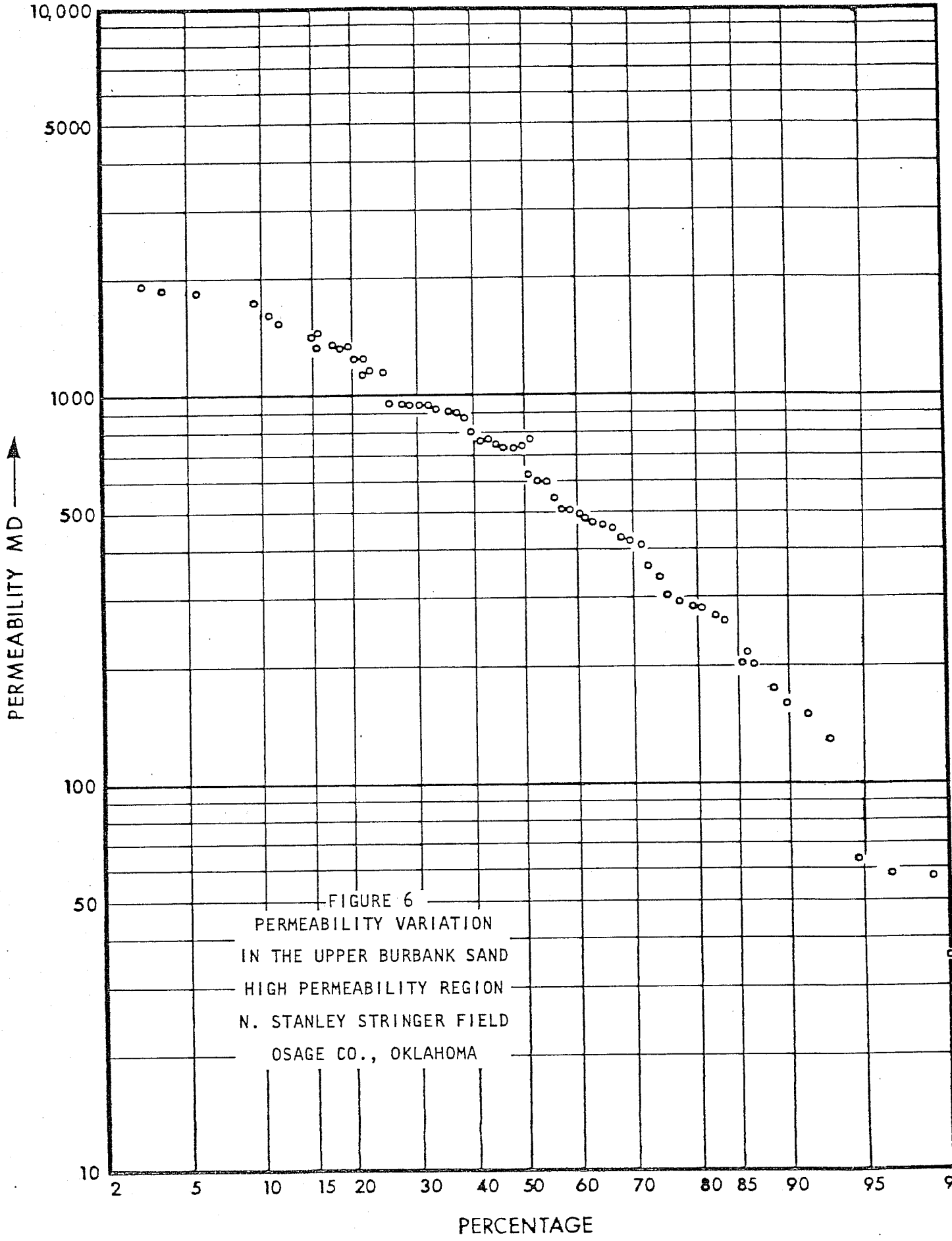

FIGURE 6
PERMEABILITY VARIATION
IN THE UPPER BURBANK SAND
HIGH PERMEABILITY REGION
N. STANLEY STRINGER FIELD
OSAGE CO., OKLAHOMA

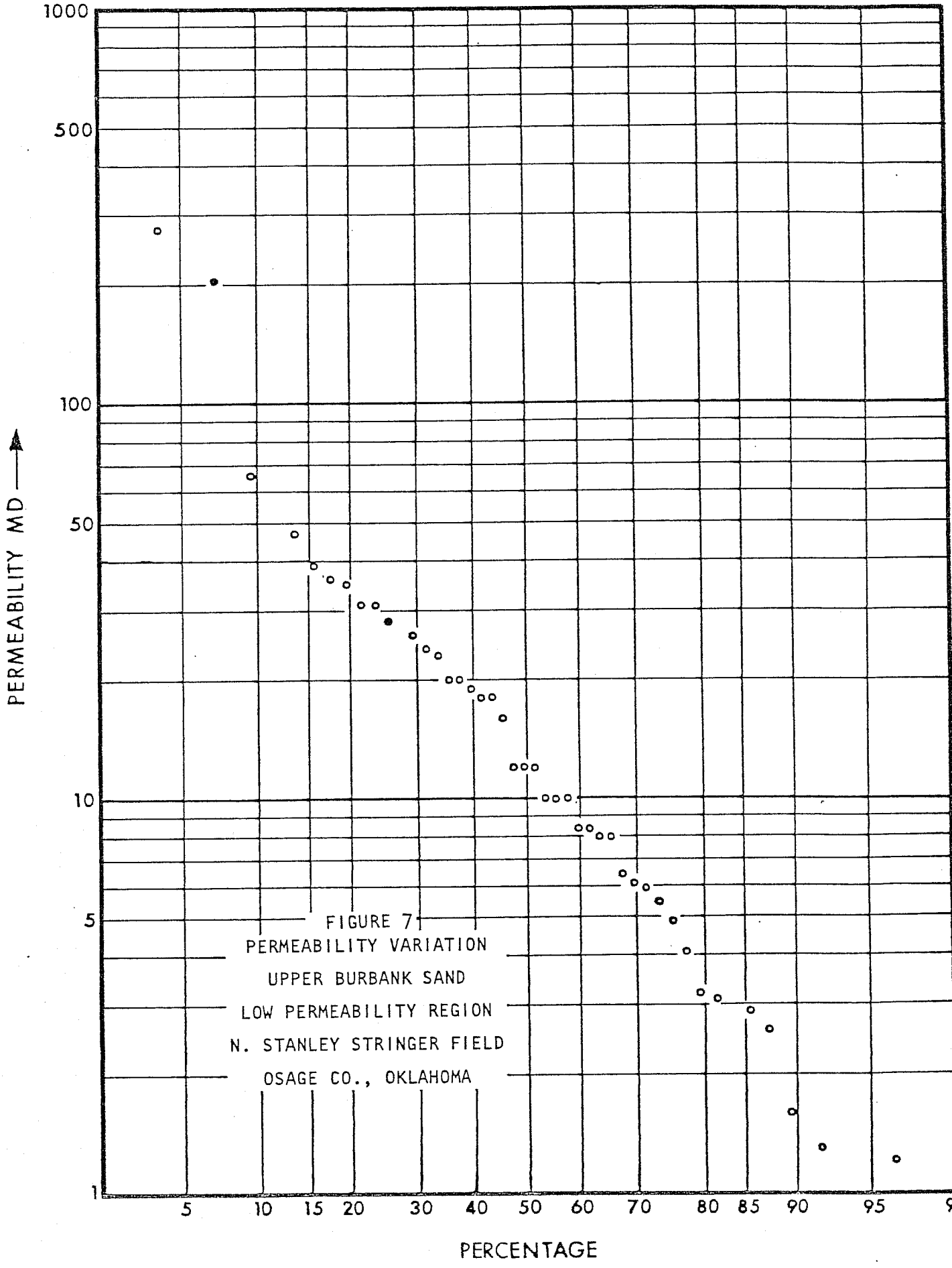

FIGURE 7
PERMEABILITY VARIATION
UPPER BURBANK SAND
LOW PERMEABILITY REGION
N. STANLEY STRINGER FIELD
OSAGE CO., OKLAHOMA

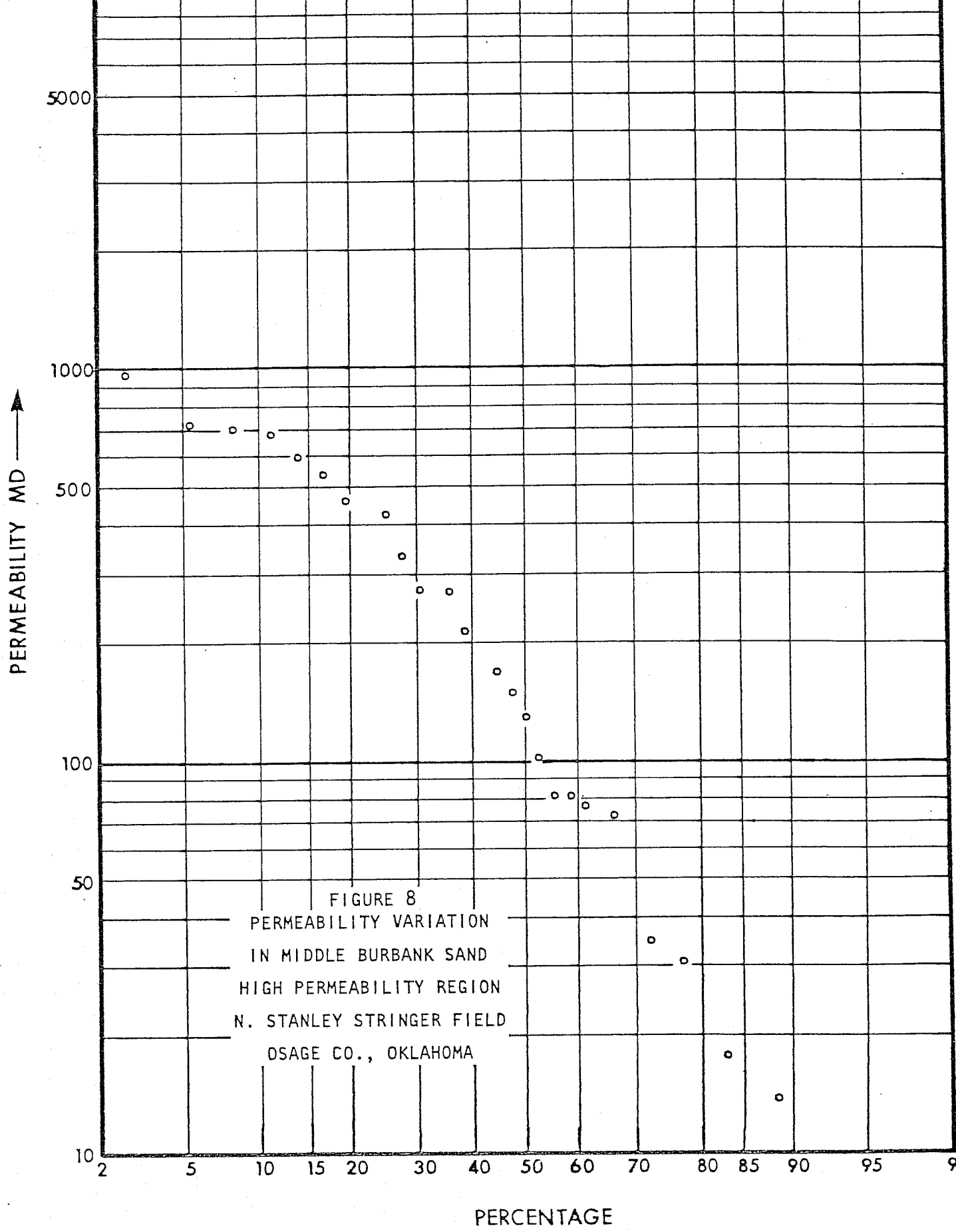

FIGURE 8
PERMEABILITY VARIATION
IN MIDDLE BURBANK SAND
HIGH PERMEABILITY REGION
N. STANLEY STRINGER FIELD
OSAGE CO., OKLAHOMA

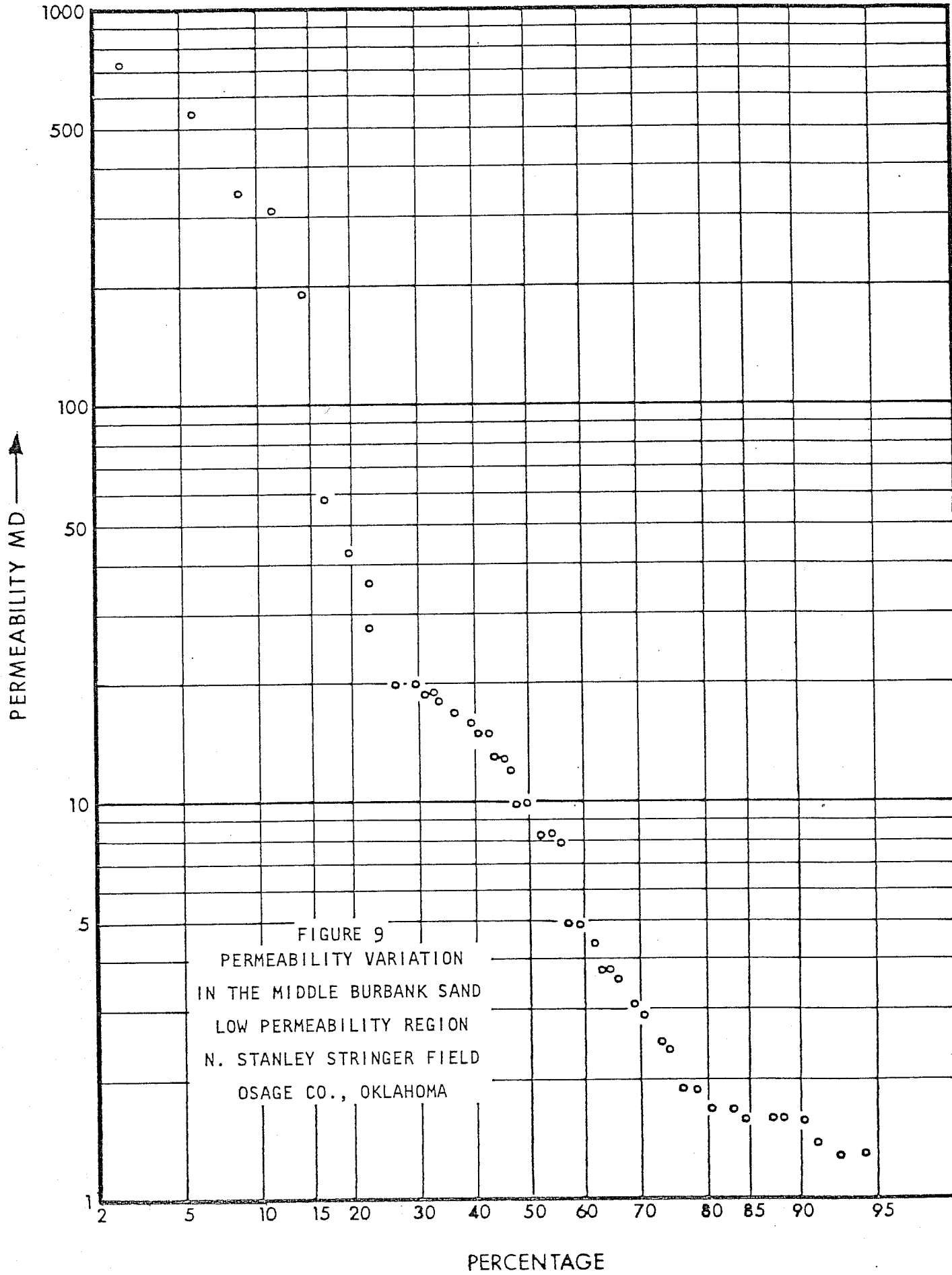

FIGURE 9
PERMEABILITY VARIATION
IN THE MIDDLE BURBANK SAND
LOW PERMEABILITY REGION
N. STANLEY STRINGER FIELD
OSAGE CO., OKLAHOMA

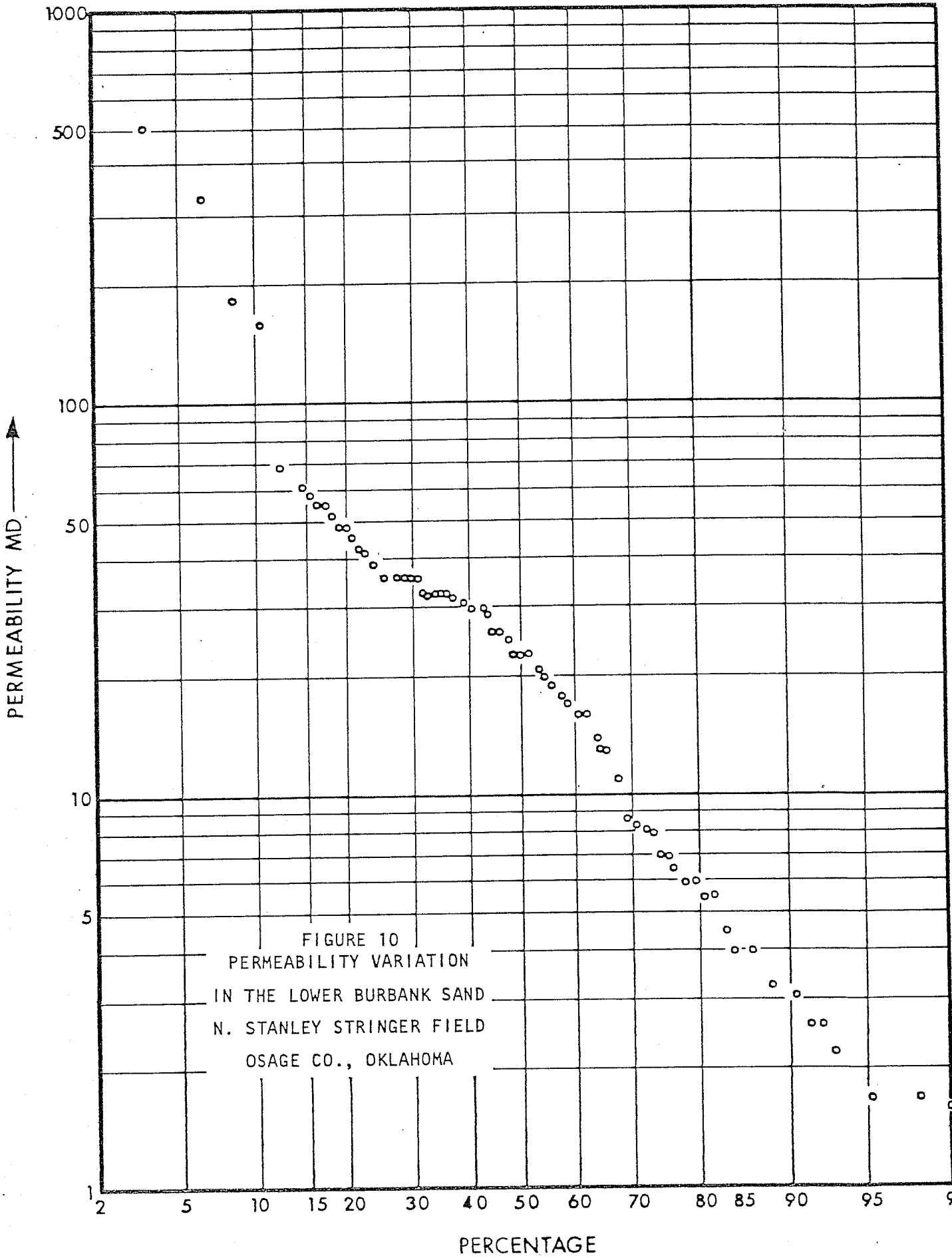

FIGURE 10
PERMEABILITY VARIATION
IN THE LOWER BURBANK SAND
N. STANLEY STRINGER FIELD
OSAGE CO., OKLAHOMA

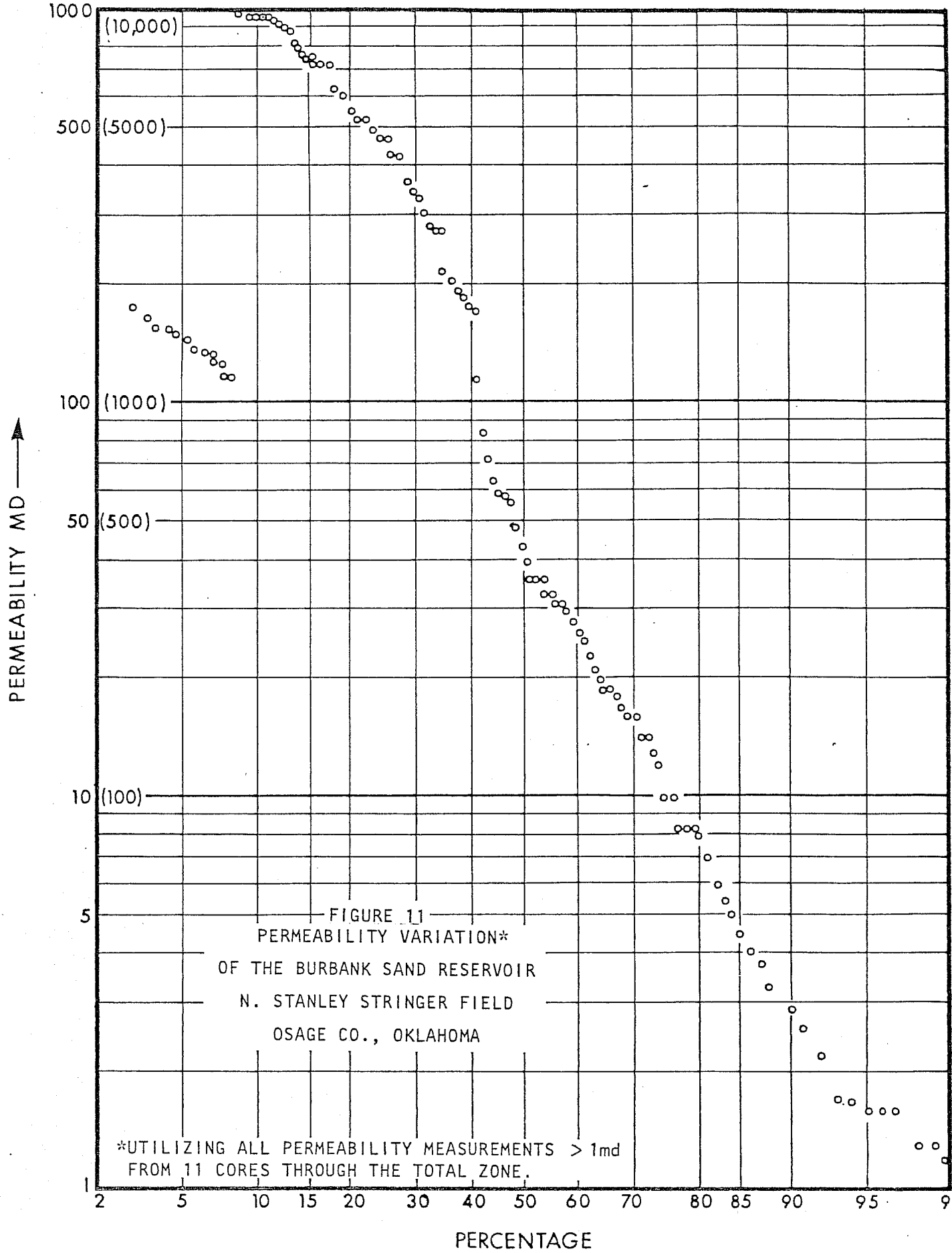

FIGURE 11
PERMEABILITY VARIATION*
OF THE BURBANK SAND RESERVOIR
N. STANLEY STRINGER FIELD
OSAGE CO., OKLAHOMA

*UTILIZING ALL PERMEABILITY MEASUREMENTS > 1md
FROM 11 CORES THROUGH THE TOTAL ZONE.

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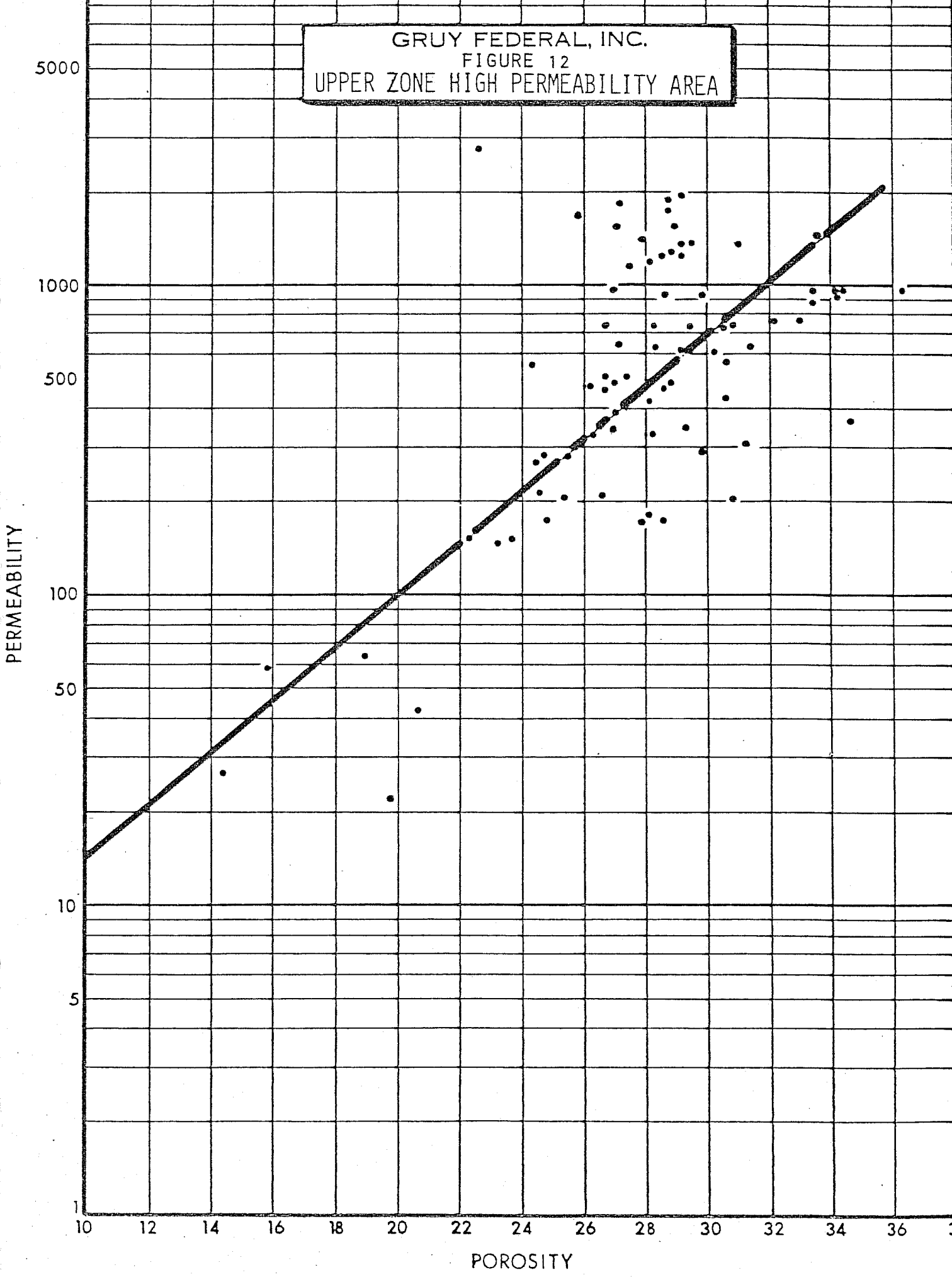
FIGURE 12

UPPER ZONE HIGH PERMEABILITY AREA



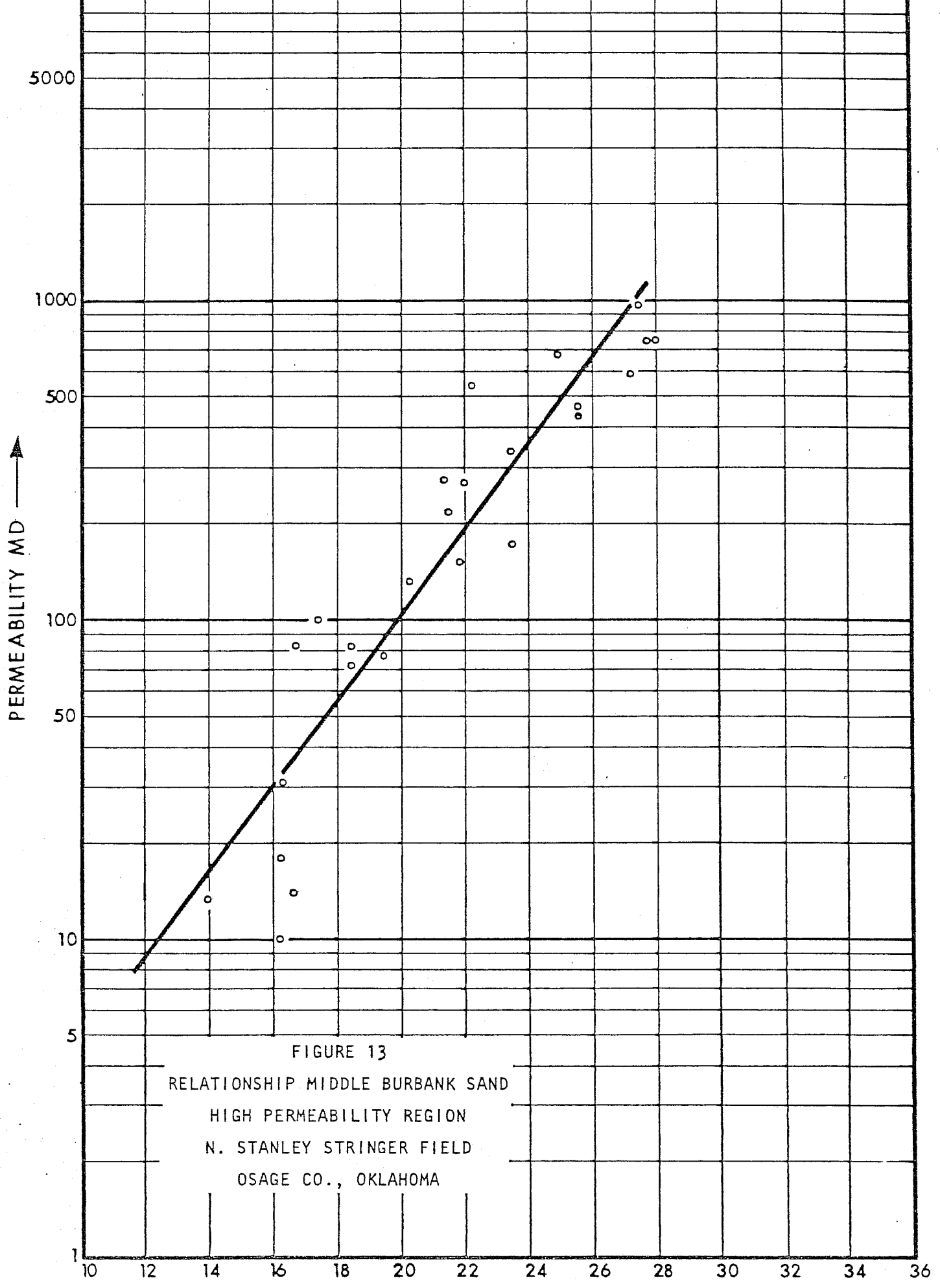


FIGURE 13

RELATIONSHIP MIDDLE BURBANK SAND

HIGH PERMEABILITY REGION

N. STANLEY STRINGER FIELD

OSAGE CO., OKLAHOMA

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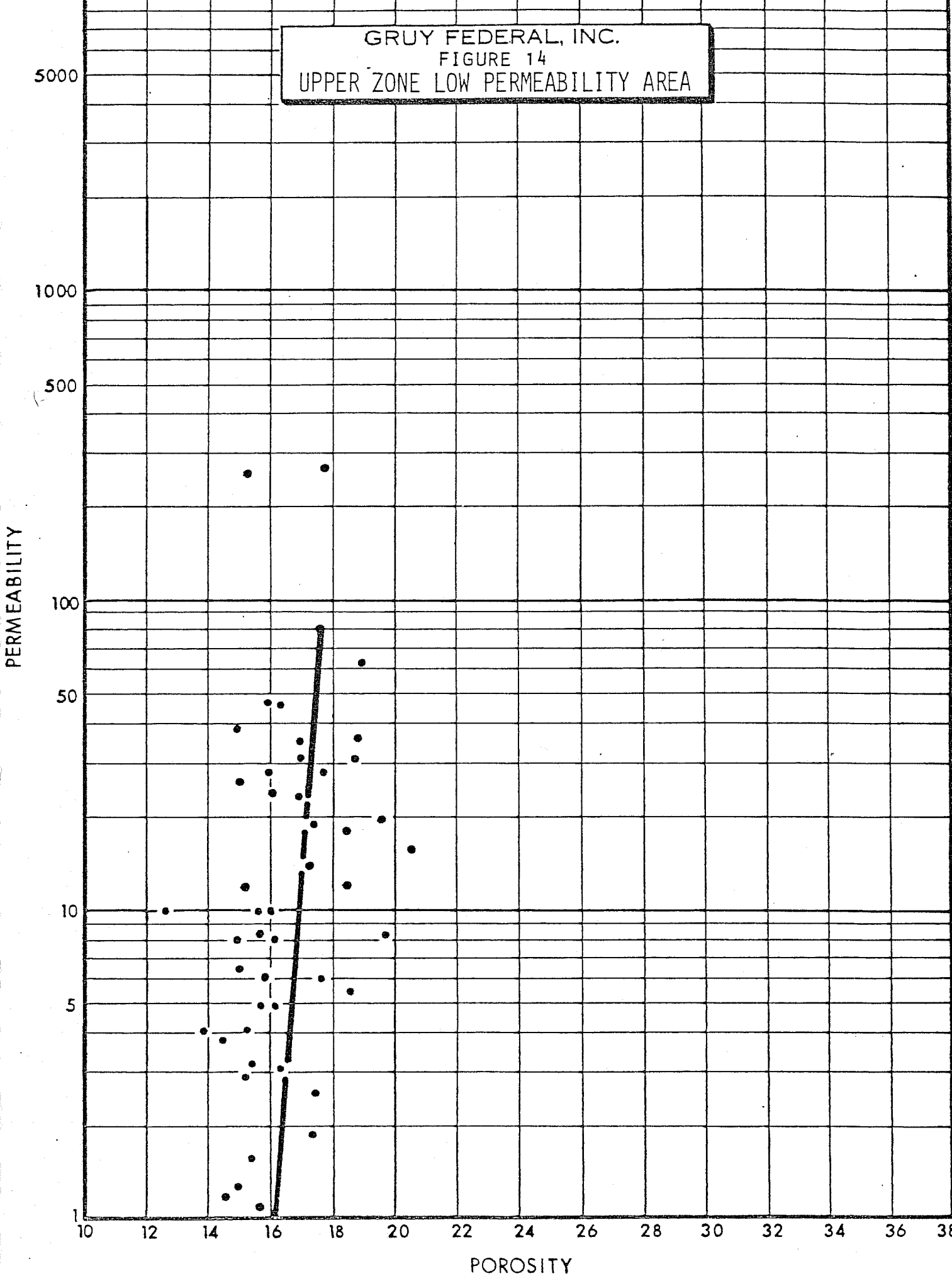
FIGURE 14

UPPER ZONE LOW PERMEABILITY AREA



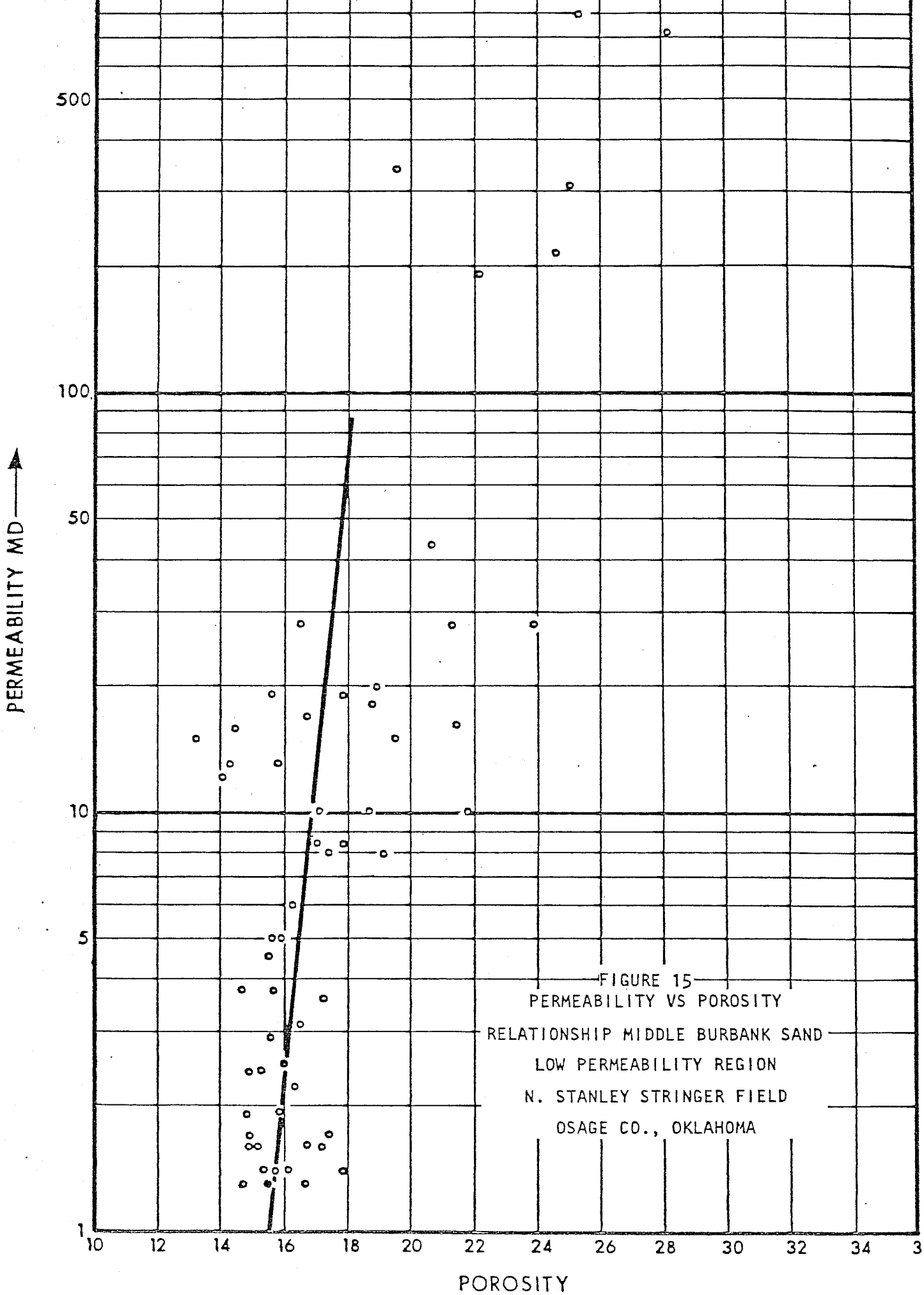


FIGURE 15
PERMEABILITY VS POROSITY
RELATIONSHIP MIDDLE BURBANK SAND
LOW PERMEABILITY REGION
N. STANLEY STRINGER FIELD
OSAGE CO., OKLAHOMA

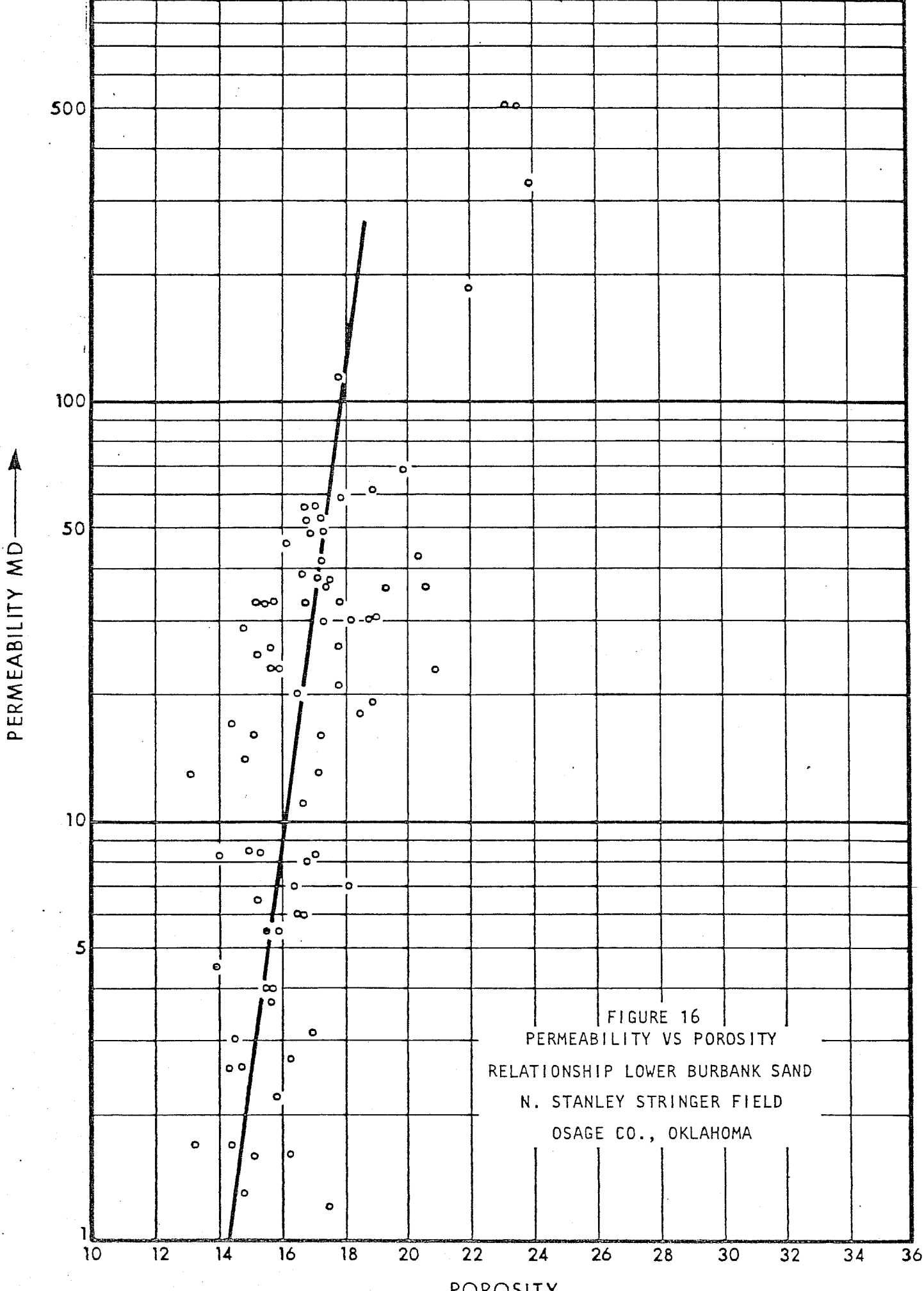


FIGURE 16
PERMEABILITY VS POROSITY
RELATIONSHIP LOWER BURBANK SAND
N. STANLEY STRINGER FIELD
OSAGE CO., OKLAHOMA

studies identified communication between Big Eagle 2 and Big Eagle 3, and communication between several other wells was suspected. As the program progressed, communication between Hiram 14, 17, and 16 was established, as well as between other pairs of wells, including Hiram 15 and Fanny 5, Gale 14 and 13, and Pappin 12 and O'Dell 1. In each case, the communication involved fluid movement in a northeast-southwest direction, normal to the axis of the field. Similar conditions existed in the Burbank Field, but communication was occasionally northwest-southeast (Hagen, 1972).

Hagen (1972) conducted a study of jointing in surface rocks using aerial photography and field mapping. The project centered on the Burbank Field and analyzed the waterflood project at Burbank in light of fracture patterns revealed on the surface and suspected to be present at reservoir depths. A system of parallel joints, principally oriented at N70°E, is present in the area studied, which included the North Stanley Stringer. Figure 17 shows the surface fracture pattern mapped by Hagen in the North Stanley Field along with those wells having communication problems. Problems have included early breakthrough of injected fluids in producing wells, and abnormally high injection rates in injection wells. The orientation of surface fractures corresponds quite closely with the known directions of communication.

Hagen was unable to determine whether the joints have dip, and no specific correlation between surface jointing and communication between wells is seen in Figure 17. It does seem certain, however, that the communication problems experienced in the reservoir result at least in large part from a fracture system having surface expression. Further, joints in the incipient fracture system can be opened under relatively low pressures. Phillips Petroleum Company (1976) conducted pressure parting tests in the Burbank Field and found formation breakdown at a bottomhole pressure of 1465 psia at a rate of 340 BWPD. This corresponds to a fracturing pressure depth gradient of 0.5 psi/foot of overburden, lower than the "normal" value (0.75 psi/foot of depth) for sandstone reservoirs.

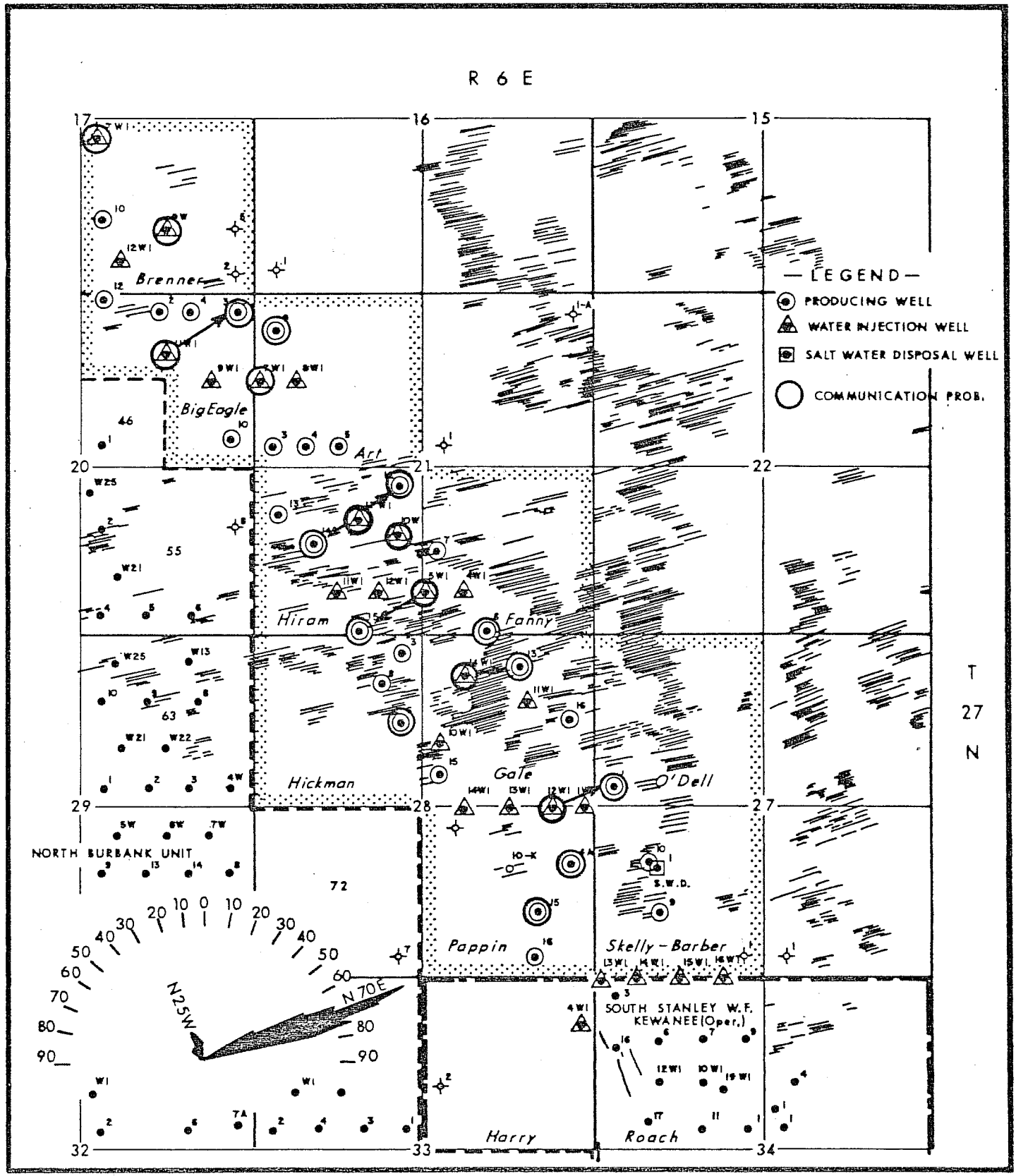


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FIGURE 17 NORTH STANLEY STRINGER FIELD WELLS WITH COMMUNICATION PROBLEMS. ALSO SHOWN IS SURFACE FRACTURE SYSTEM DELINEATED BY AERIAL PHOTOGRAPHY.

The fracture system can have significant areal continuity, as shown by Hunter (1966), who found evidence of water encroachment from the Burbank Field to the Stanley Stringer Field and concluded that a fracture system in the shale section immediately above the Burbank sand was the water loss zone, since the Burbank sand was missing in the interval between the two fields.

The exact mechanism responsible for the jointing system associated with the North Stanley Stringer Field is unknown. Jointing is commonly considered to be shear or tension fractures. Regional forces involving compression, tension, or torsion are thought to be the primary mechanisms generating joint systems.

Injectivity profiles run in all of the injection wells further emphasize the complexity of the reservoir. A variety of injection patterns was observed, divided into (1) injection exclusively into the upper or lower portion of the sand or (2) injection in varying degrees into both upper and lower portions of the sand. As noted by Kewanee Oil Company (1978), injection into the formation does not correlate with the high permeability portions of the sands. In some cases, injected fluid bypassed sections of pay having permeabilities greater than 1000 md. The fracture system is apparently a dominant factor in fluid acceptance, at least in the vicinity of the wellbore. Kewanee also noted that injection rates are closely correlated with permeability, those wells with high permeabilities having the highest injection rates. With high permeabilities occurring only in the upper zones of the sand, and injectivity profiles indicating significant input into the lower zone, it appears that the upper high-permeability zones are the primary paths of fluid travel. Where the fluids leave the wellbore in the lower section through fractures, they must migrate to the upper zones at some distance from the wellbore.

Of the 10 core analyses with core descriptions, 7 showed vertical fractures either in the reservoir rocks or in the shales immediately above or below them. This suggests that the reservoir is highly fractured.

Production Response

Figure 18 shows the distribution of tertiary oil attributed by Kewanee to the polymer-augmented waterflood project. For the most part, response has followed a pattern reflecting the reservoir characteristics. The largest responses in any given drive block have been primarily on the northeast side of the field, where maximum porosity/permeability is developed. Fanny 6, in the area of high porosity/permeability development, had produced almost half of all tertiary oil recovered as of June 1978. Three other wells in the same drive block have also been effective producers: Hickman 3 (8000 barrels), Hickman 6 (7700 barrels), and Hickman 8 (4600 barrels). The latter two wells are on the southwest side of the field where porosity/permeability development is limited. Three other drive blocks show similar responses but to lesser degrees. The lack of response in the southern portion of the field was expected because of the distance from the nearest injection wells and a field history of fluid migration northward. Occasional individual wells in some drive blocks have also shown poor response.

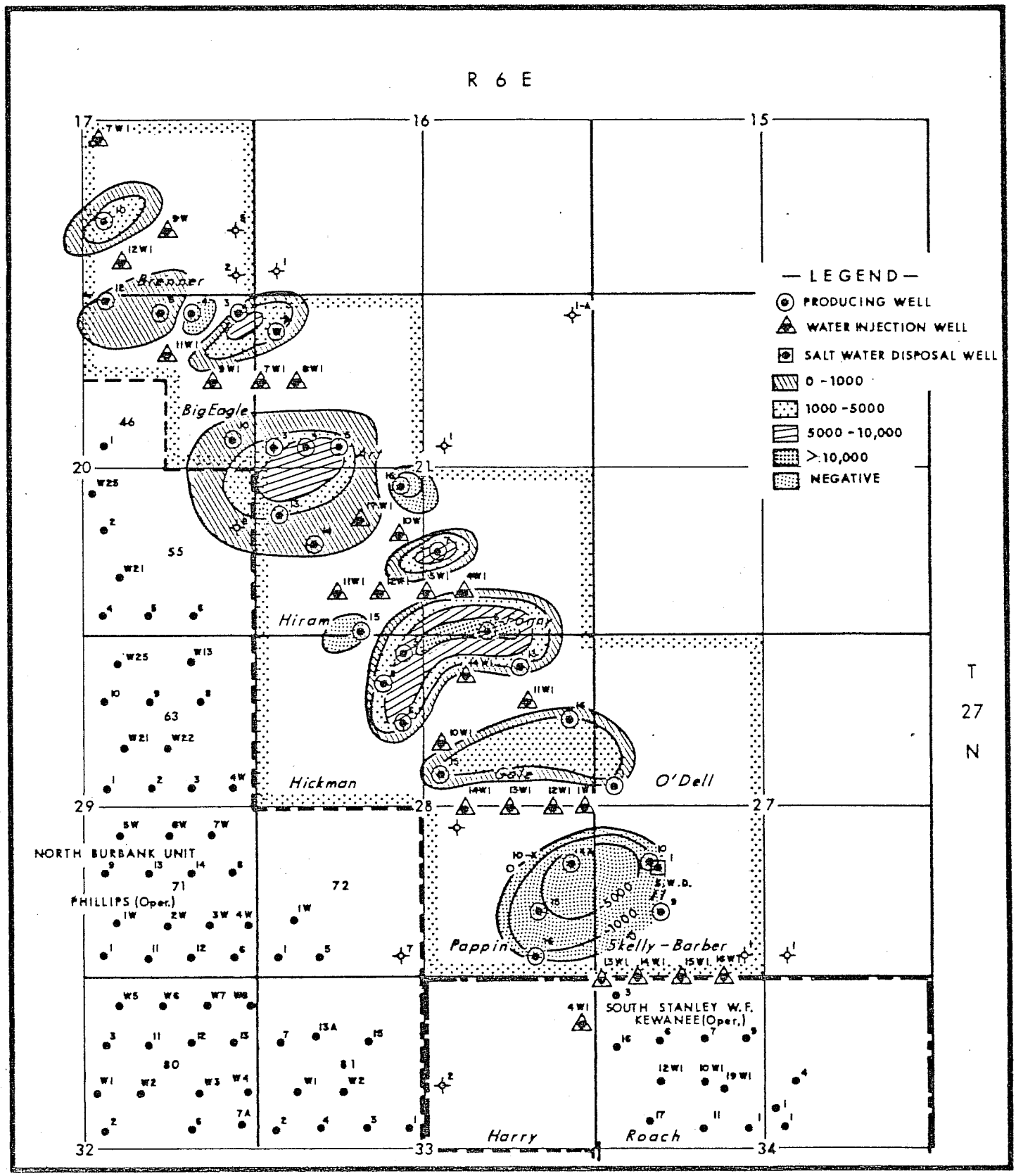

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FIGURE 18 TERTIARY OIL ATTRIBUTABLE TO POLYMER AUGMENT, NORTH STANLEY STRINGER FIELD.

Task II. Review of the polymer injection program in this field and

Task III. Evaluation of the results of the polymer-augmented waterflood in this field.

After reviewing the information reported by Kewanee, we have made the following observations.

It appears that the incremental addition to project ultimate recovery resulting from all operations performed subsequent to January 1, 1975, will amount to about 500,000 barrels of oil, or about 1.3% of the oil originally in place. This estimate is based largely on projected cumulative recovery versus water-oil ratio characteristics (see Figure 19).

Results reported by Kewanee of a reservoir simulation study of the field using a polymer-waterflood model are also shown on this graph. They provide the principal basis for predicting the relation of projected future cumulative oil to Water-Oil Ratio (W.O.R.). Actual performance to date suggests an incremental oil recovery from this project of approximately 50% of that projected by the model.

At a limiting W.O.R. of 105, the predicted incremental recovery represents a 10% improvement over the recovery anticipated from waterflood alone. This economic limit is consistent with the limiting production rate of approximately 400 barrels of oil per day used by Kewanee, and with a projected final daily water production rate under conventional waterflood operations of about 42,000 barrels.

Figure 20 shows the smoothed historical performance of the project, including the last three years of conventional waterflooding before field preparation for polymer injection began in 1975. The decline rate of 11% per year without polymer injection and 18% per year projected after December 1,

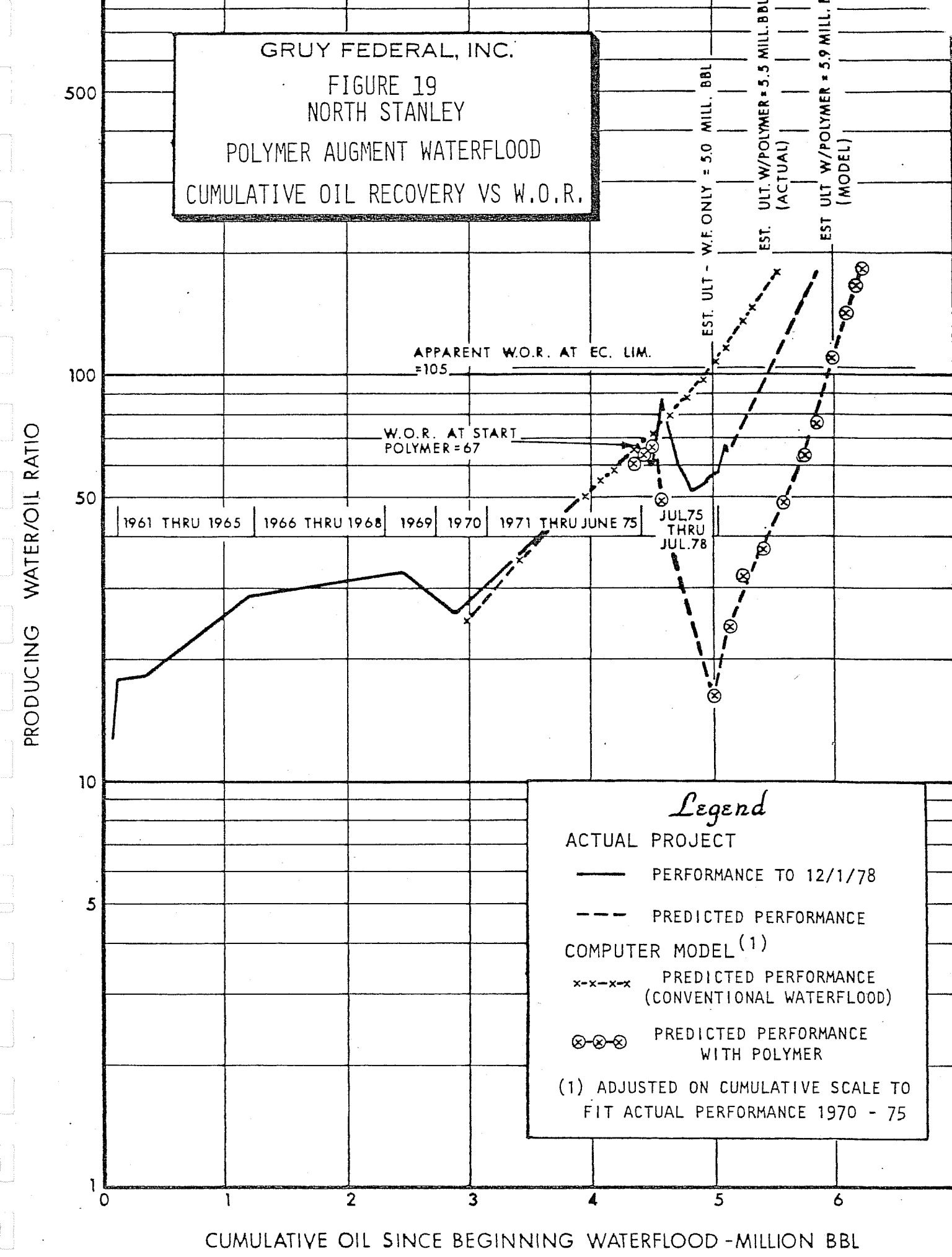
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FIGURE 19
NORTH STANLEY
POLYMER AUGMENT WATERFLOOD
CUMULATIVE OIL RECOVERY VS W.O.R.
PRODUCING WATER/OIL RATIO
CUMULATIVE OIL SINCE BEGINNING WATERFLOOD - MILLION BBL
500
100
50
10
5
1
0
1
2
3
4
5
6
APPARENT W.O.R. AT EC. LIM. =105
W.O.R. AT START POLYMER = 67
EST. ULT - W.F. ONLY = 5.0 MILL. BBL
EST. ULT. W/POLYMER = 5.5 MILL. BBL (ACTUAL)
EST ULT W/POLYMER = 5.9 MILL. (MODEL)
1961 THRU 1965
1966 THRU 1968
1969
1970
1971 THRU JUNE 75
JUL75 THRU JUL.78
Legend
ACTUAL PROJECT
PERFORMANCE TO 12/1/78
PREDICTED PERFORMANCE
COMPUTER MODEL (1)
PREDICTED PERFORMANCE (CONVENTIONAL WATERFLOOD)
PREDICTED PERFORMANCE WITH POLYMER
(1) ADJUSTED ON CUMULATIVE SCALE TO FIT ACTUAL PERFORMANCE 1970 - 75

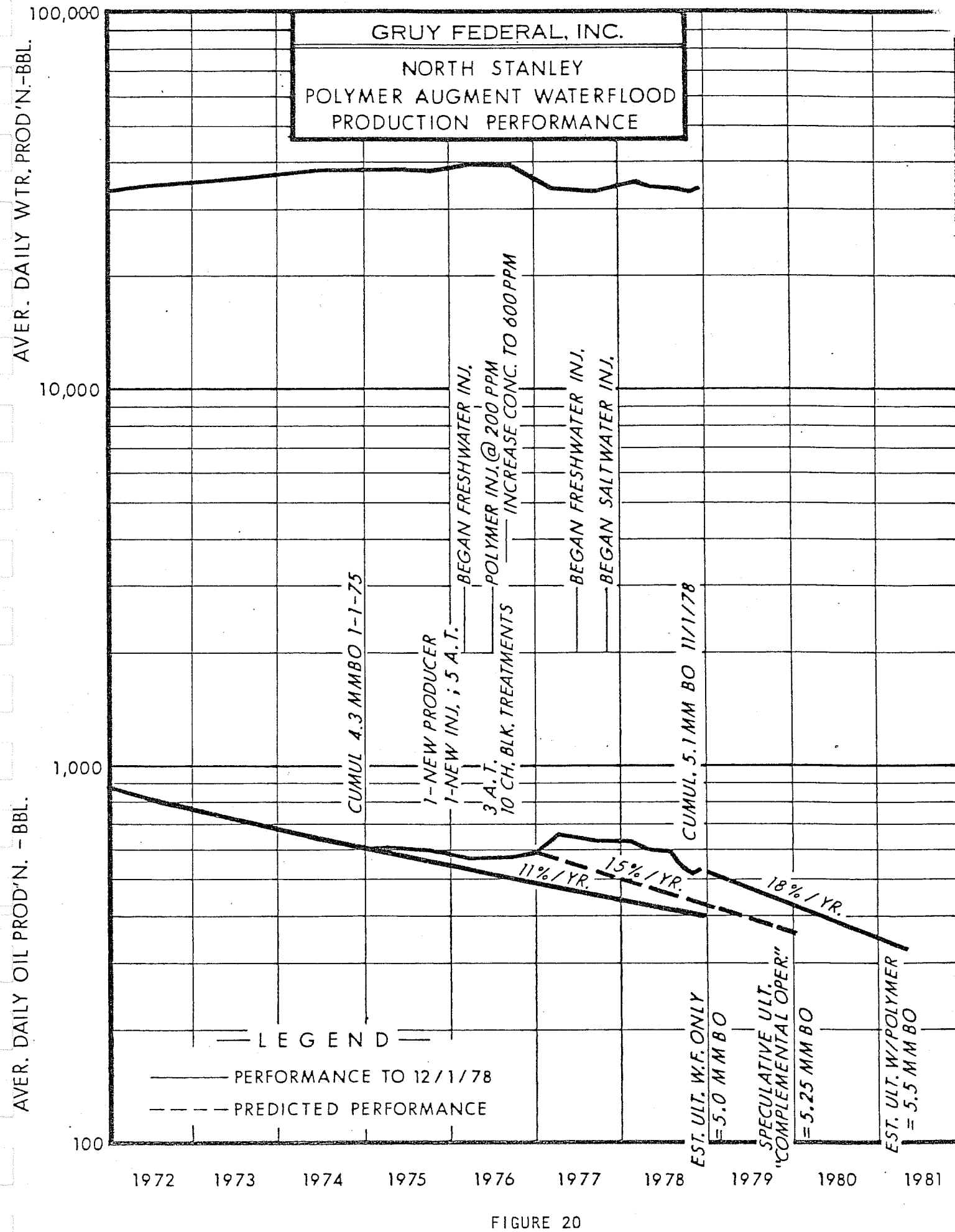

GRUY FEDERAL, INC.
NORTH STANLEY
POLYMER AUGMENT WATERFLOOD
PRODUCTION PERFORMANCE
AVER. DAILY WTR. PROD'N.-BBL.
AVER. DAILY OIL PROD'N. - BBL.
100,000
10,000
1,000
100
CUMUL 4.3 MMBO 1-1-75
1-NEW PRODUCER
1-NEW INJ. ; 5 A.T.
BEGAN FRESHWATER INJ.
3 A.T.
POLYMER INJ. @ 200 PPM
10 CH. BLK. TREATMENTS
INCREASE CONC. TO 600 PPM
BEGAN FRESHWATER INJ.
BEGAN SALTWATER INJ.
CUMUL. 5.1 MM BO 11/1/78
11%/YR.
15%/YR.
18%/YR.
EST. ULT. W.F. ONLY
= 5.0 MM BO
SPECULATIVE ULT.
"COMPLEMENTAL OPER."
= 5.25 MM BO
EST. ULT. W/POLYMER
= 5.5 MM BO
LEGEND
PERFORMANCE TO 12/1/78
PREDICTED PERFORMANCE
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981

FIGURE 20

1978, are the constant percentage decline rates which would produce the same relative ultimate recoveries predicted by Figure 20. We believe these are reasonable projections.

A number of complementary operations were performed at North Stanley preparatory to and in conjunction with the injection of the polymer slug. These operations (summarized in Table 2) included drilling one new well and conducting remedial workovers of both producers and injectors, the latter including several channel block treatments for selective control of the distribution of injected fluids. Any one of these operations could affect the flow patterns in the reservoir and consequently the production performance. Even though the end effect of any one particular operation may be small, the aggregate effect could certainly be substantial.

The conduct of such operations is essential to minimizing risk, particularly high chemical losses, and to ensuring maximum results from polymer injection. Therefore, it is not only proper but essential that the costs of these operations be taken into account in the economic considerations for any polymer project. Some of these operations, however, have the potential for increasing economic oil recovery and/or upgrading profits on their own merits. There could be situations, therefore, where complementary operations could be economically applied to extend life and increase oil recovery, but subsequent polymer flooding alone could not be justified on the basis of the increased recovery and profitability attributable strictly to the polymer injection.

The simultaneous timing of a number of important operations performed at North Stanley precludes precise quantitative evaluation of the results attributable exclusively to complementary operations. However, we believe that these operations could be responsible for as much as half of the presently indicated increase in ultimate recovery. This is primarily a judgmental observation; however, it is consistent, qualitatively at least, with the opinion expressed by Kewanee in their final reports.

TABLE 2

SUMMARY OF COMPLEMENTARY OPERATION

PERFORMED DURING 1976-77

KEWANEE'S NORTH STANLEY POLYMER DEMONSTRATION PROJECT

- General Mechanical Checkup and Repair of All Injectors Including:
  - Repaired casing leaks - 8 injections
  - Cleaned out and installed tubing with packers - all injectors.
- Perforated Additional Intervals - 3 Injectors
- Performed 8 Acid Treatments
- Plugged and Abandoned - 2 Injectors
- Drilled 1 Replacement Injector
- Drilled 1 New Producer
- Performed 10 Channel Block Treatments of Injectors
- Changed Level of Submersible Plumps in 4 Producers Including Change Pumps Size In 2

Further, oil production from the project did show significant improvement over the projected trend beginning in early 1975, prior to fresh water and polymer injection, with the largest increases occurring at the beginning of 1977, approximately 6 months following start of polymer. If all of the production increase prior to January 1977, which reached a maximum of about 100 barrels per day in December 1976, is arbitrarily attributed to complementary operations, and if the subsequent performance without polymer injections is projected at a rate of 15% per year, the increase in recovery indicated for these operations would be about 250,000 barrels. This projection is shown on Figure 20.

Table 3 shows North Stanley reservoir parameters compared to the latest published screening criteria (Chang, 1978). From our review to date, we believe the following are the most important features to be noted:

North Stanley parameters are comfortably within the preferred range, with the following exceptions:

a. Oil viscosity - This criterion has been suggested as a substitute for water-oil mobility ratio only where the latter is not available. In the North Stanley case, it is of secondary importance. However, based solely on North Stanley data, the lower limit of oil viscosity for a minimum water-oil mobility ratio of 1.0 would be approximately 2.0, rather than 5.0 as suggested.

b. The fraction of mobile oil in place at North Stanley (13% of pore volume, based on saturation values used in the model study) at the start of polymer injection is only slightly above the suggested limiting value of 10%. This tends to support the validity of using 10% as a minimum value for general screening purposes.

c. The water-oil mobility ratio at North Stanley (in the range 1.0 to 2.0) is also slightly above the suggested cutoff value (1.0). Therefore, the results from this test alone do not justify revising this screening criterion.

TABLE 3

COMPARISON OF NORTH STANLEY RESERVOIR PARAMETERS
WITH CURRENT SCREENING CRITERIA

PARAMETER DESCRIPTION	LATEST PUBLISHED SCREENING CRITERIA	NORTH STANLEY
Oil Viscosity, cp	<200 Preferred (5-125)	2.36
Temperature, ^{o}F	<200	105
Permeability, md	>20	Range <20 to >1500 Average 300 ±
Mobile oil saturation - % P.V.	>10	13*
Water-oil mobility ratio	>1	1-2
Beginning Water-oil ratio	<15	67
Perferred lithology	Sandstone	Sandstone
Channeling-fracturing	No "gross channeling or major natural fractures"	Evidence of channeling and natural fracture system in project area

* Based on average values used in computer model.

d. The beginning water-oil ratio at North Stanley was much higher than the suggested upper limit for screening purposes. Model runs, incorporating the marginal values of remaining mobile oil and the high beginning W.O.R., yield a predicted incremental oil recovery as high as 20% of estimated ultimate waterflood production. Present predictions of actual incremental oil production attributable to polymer are in the range 5 to 10% of estimated ultimate waterflood recovery. This is being achieved under actual field conditions, which include a relatively unfavorable flow system geometry. (This was partially described under Task I in this report and will be more fully developed when a drafted version of the panel diagram can be included with the report.) We believe that this unfavorable flow system geometry may be significant in accounting for the difference in predicted and actual results. Therefore, it would appear that a W.O.R. value of greater than 15 may be acceptable for screening purposes. Until data are further refined, we suggest a cutoff W.O.R. value of at least 25.

e. With regard to the qualitative reference in Table 3 to "channeling and fracturing," it is our observation that the general flow geometry characteristic is a function of the distribution of flow characteristics of the major pay subdivisions, the geometric relationship of these subdivisions, the extent of fracturing, and the injector-producer pattern relative to the naturally occurring patterns of preferential flow. At our present stage of analysis we are inclined to rate North Stanley low on a qualitative scale of overall flow geometry characteristics. Performance data tend to confirm the geophysical characterization of the flow system geometry as partially described thus far.

Results and analyses of injectivity index measurements, injectivity profile measurements, fall-off pressure tests, trace experiments,

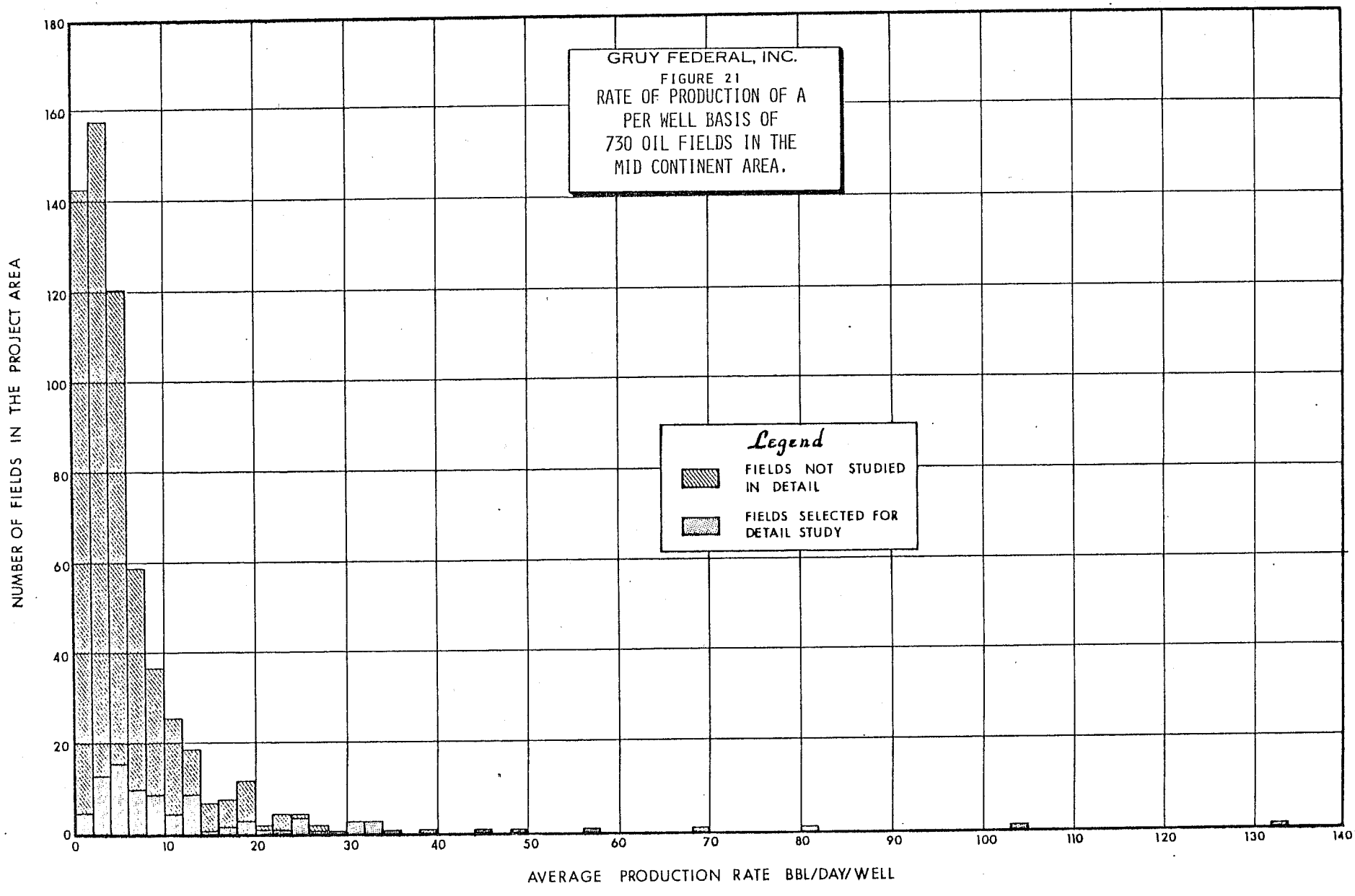
and fresh water, polymer, and brine breakthrough observations have been documented in considerable detail in Kewanee's progress reports. These results support their recommendation for acquiring "more information on fluid flow through the reservoir . . . before starting polymer injection."

Task IV. Review of geological and engineering characteristics of oil fields now in waterflood as candidates for polymer augmentation, and

Task V. Similarly review fields currently under primary production.

Appendix A contains selected information on 730 oil fields in the Mid-Continent region, and represents our expanded master list. These fields have a cumulative production of one million barrels or more with five or more currently producing wells. In addition, we have screened lithology to remove all fields where there is no production from sandstone reservoirs (there still is some doubt on Mississippian reservoirs in eastern Kansas), and oil gravity (limited to data available) to remove all fields where crude oil gravity for all pools was outside the 20° - 40° API range. Screening for thickness removes all fields with thickness less than 5 feet in all pools. Also removed from the list are fields which have at any time been dump flooded and, in some cases where smaller fields have been combined with a field being dump flooded, the smaller field was also removed from the lists. Screening on permeability, mobile oil saturation, producing water-oil ratio, or mobility ratio cannot be done on a large scale on this list of reservoirs since we lack adequate information.

We have therefore selected 88 of the 730 fields on this list for which we will gather the information necessary to continue the screening efforts. To select these reservoirs we chose all fields with an annual production of 200,000 barrels or more. This subset of the master list gives a sample containing all the fields with production rates greater than 28 BOPD per well, and a representative sample of those with lower daily per-well production rates (see Figure 21). The locations of the 730 fields with respect to geologic provinces in the area are shown in Figure 22. A similar map showing the locations of the 88-field subgroup is Figure 23. The specific data for each of these 88 fields and all the related pools have been recorded on data sheets (see Figure 24 for sample).


GRUY FEDERAL, INC.
FIGURE 21
RATE OF PRODUCTION OF A
PER WELL BASIS OF
730 OIL FIELDS IN THE
MID CONTINENT AREA.
Legend
FIELDS NOT STUDIED IN DETAIL
FIELDS SELECTED FOR DETAIL STUDY
NUMBER OF FIELDS IN THE PROJECT AREA
AVERAGE PRODUCTION RATE BBL/DAY/WELL
0
20
40
60
80
100
120
140
160
180
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140

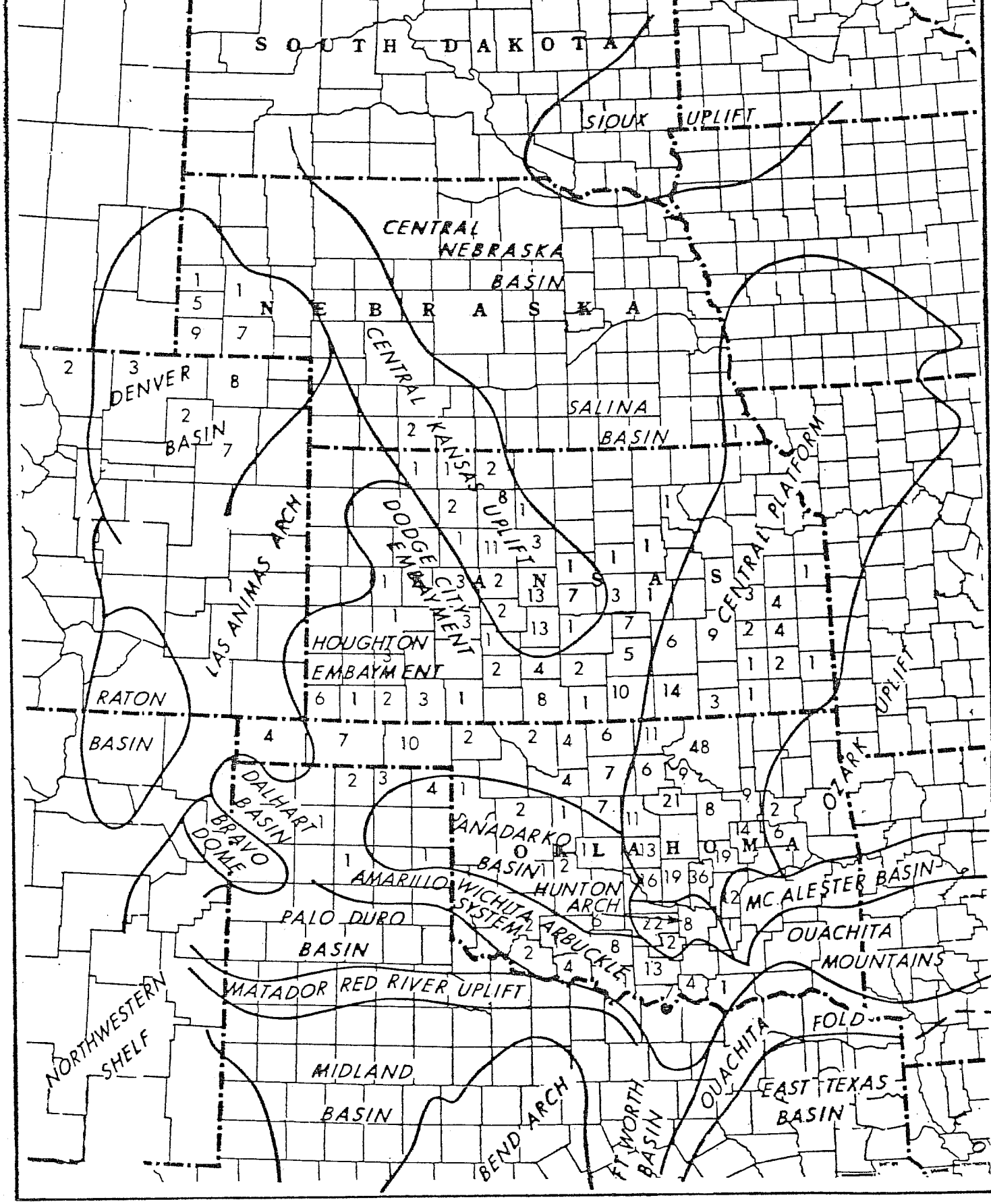


FIGURE 22 LOCATION OF 730 POTENTIAL CANDIDATE FIELDS BY COUNTY IN THE MID-CONTINENT REGION.

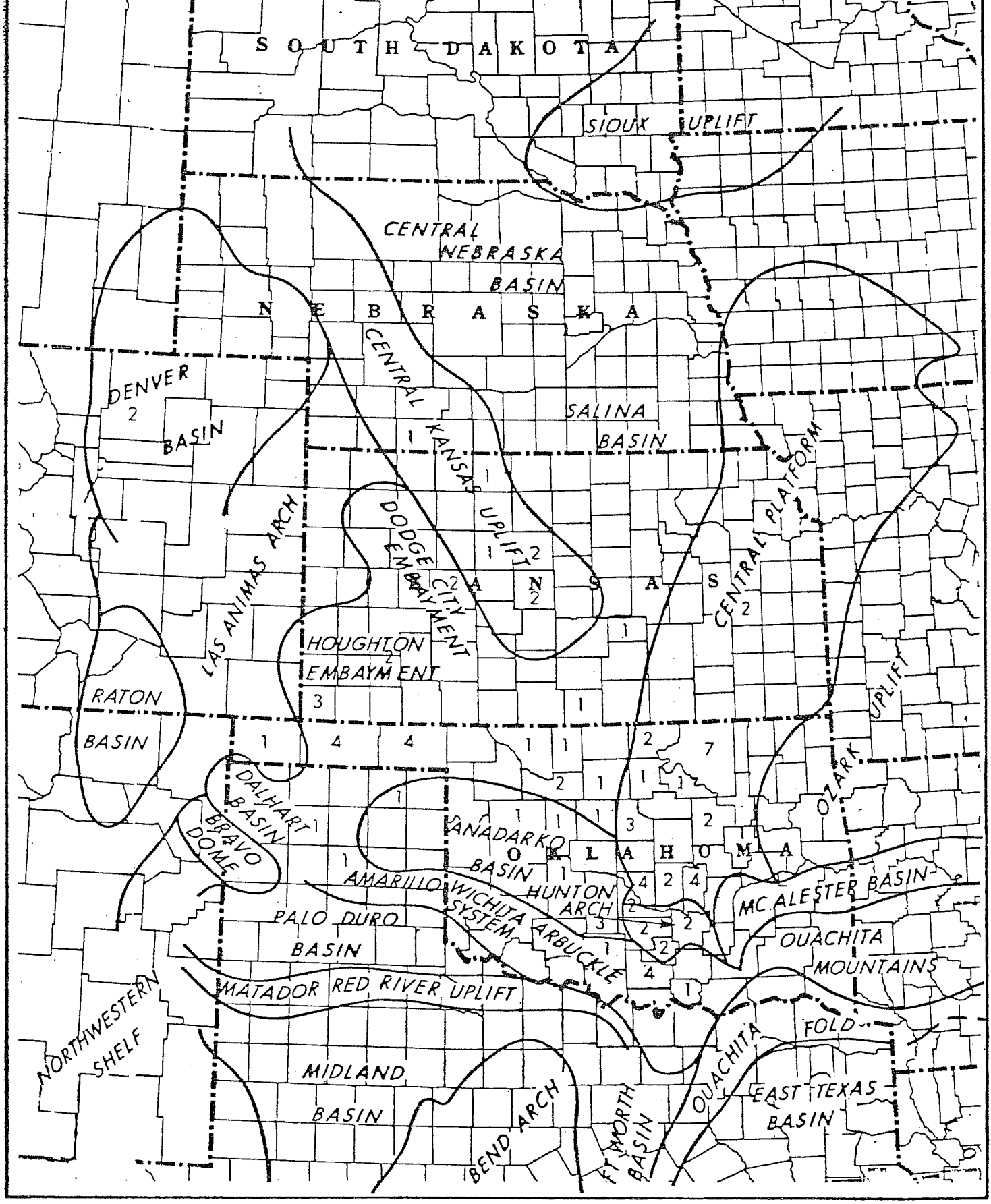


FIGURE 23 LOCATION OF 88 FIELDS SELECTED AS A SUB GROUP BY COUNTY IN THE MID-CONTINENT REGION.

FIELD _____ COUNTY _____ STATE _____ REG. DIST. _____

CUMULATIVE PRODUCTION _____ ANNUAL PRODUCTION _____ PROVED ACREAGE _____

NUMBER WELLS _____ DAILY PROD/WELL _____ DISC. DATE _____

WATERFLOOD DATE _____ WATER INJECTION/ _____ WATER PRODUCTION/ _____

NUMBER OPERATORS _____ NUMBER LEASES _____ WELL SPACING _____

GEOLOGIC PROVINCE AND TYPE OF TRAP _____

_____

COMPLETION TECHNIQUES _____

_____

POOL INFORMATION:

DEPTH								
THICKNESS								
LITHOLOGY								
API/VISCOSITY								
DISC. DATE								
AVG. POROSITY								
AVG. PERMEABILITY								
FORM. VOL. FACTOR								
TYPE OF DRIVE								
POOL ACREAGE								
INITIAL WATERFLOOD								
WATERFLOOD ACREAGE								
RESERVOIR TEMP. °F.								
SATURATION								
POOL PRODUCTION								
INITIAL PRESSURE								
EARLY GOR								
WOR								
ORIGINAL B.O.								

REFERENCES: _____

REMARKS: _____

_____

_____

_____

_____

Figure 24: Sample Data Sheet

After an exhaustive search of the technical literature, including the use of two computerized bibliographic geologic data bases and the PDS files, we obtained the following information on the 88 fields. These fields contain a total of 618 reservoirs, 332 of which can be identified as sandstone reservoirs. Of these, detailed reservoir information (such as permeability, porosity, oil gravity, viscosity, and waterflood acreage) can be assembled on about 53 reservoirs. There are many properties of this group which can be analyzed. Water-oil ratio of a waterflood project can be used as a guide in estimating the state of depletion of the project. A current W.O.R. versus cumulative percentage of production for 119 different waterflood units in 64 fields curve is given in Figure 25. Permeability and porosity versus percentage of readings unweighted to production is given in Figure 26.

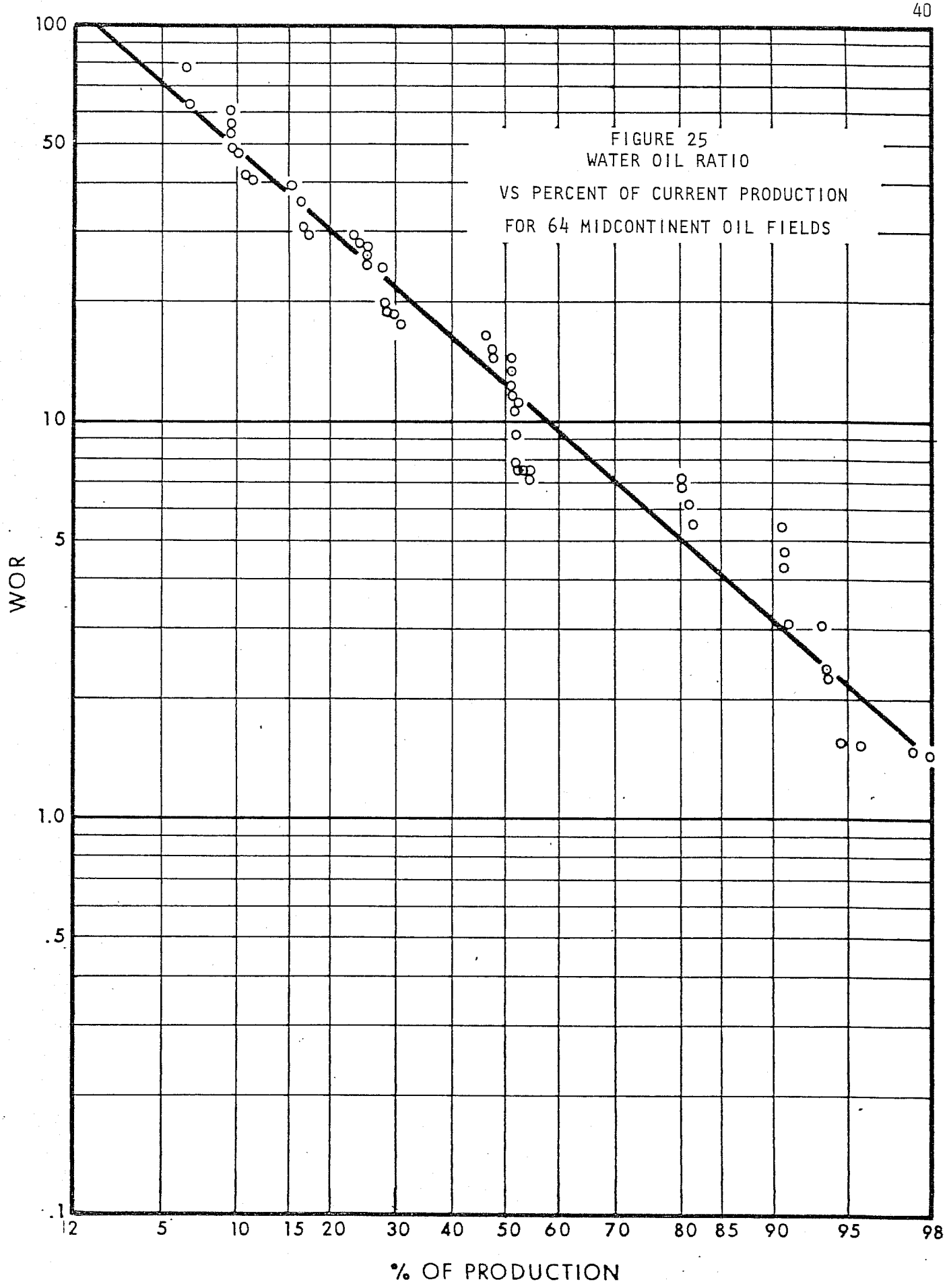


FIGURE 25
WATER OIL RATIO
VS PERCENT OF CURRENT PRODUCTION
FOR 64 MIDCONTINENT OIL FIELDS

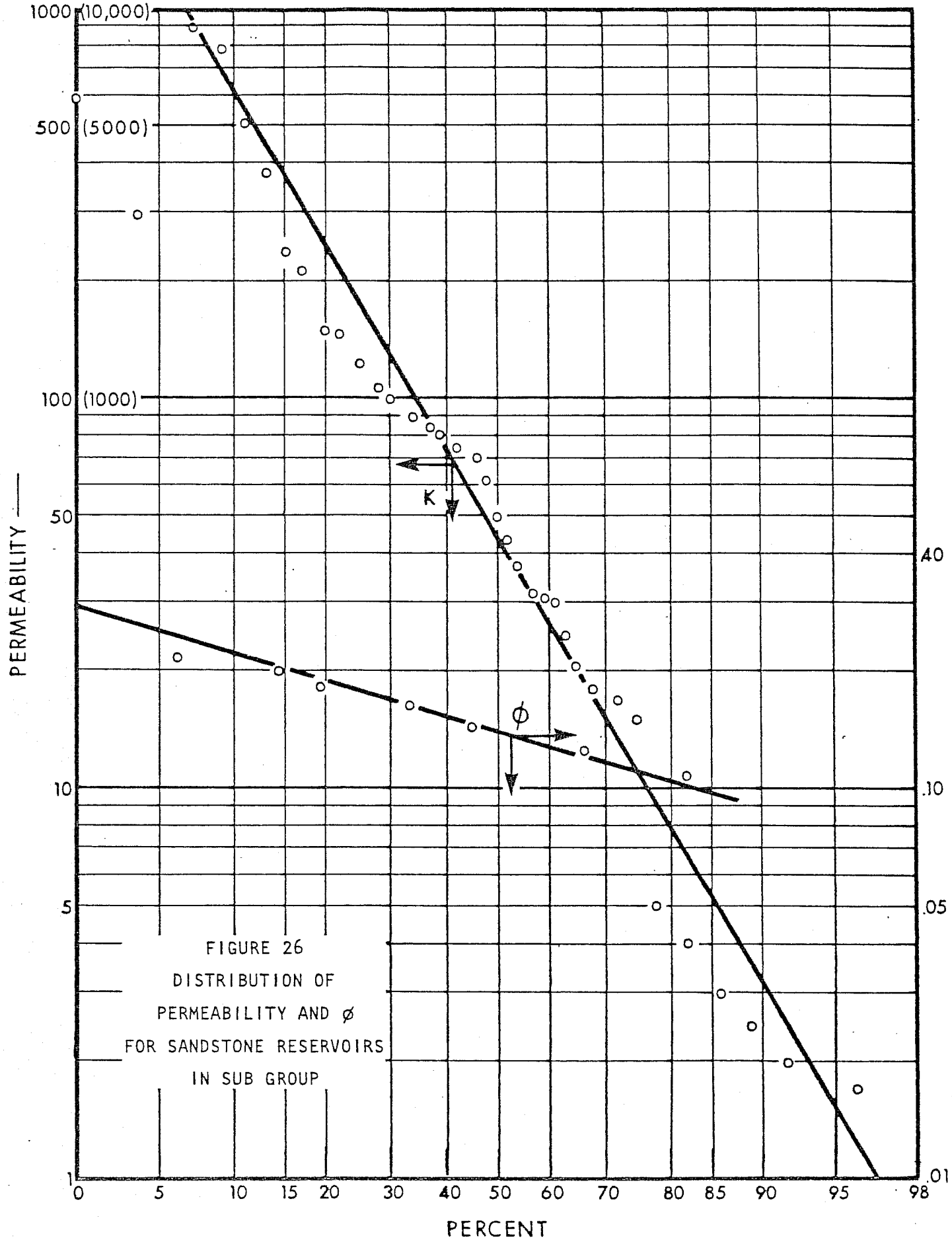


FIGURE 26
DISTRIBUTION OF
PERMEABILITY AND ø
FOR SANDSTONE RESERVOIRS
IN SUB GROUP

Task VI. Determine ranges of future increased oil production from the polymer-water process in the project area

We are currently assessing the potential of the polymer-augmented waterflood process in the Mid-Continent region. At present we envision three possible methods of making this assessment. Limitations of time and money will probably dictate the choice of methods.

1. "Top Down" Method

From the total oil in place for the region, the amount of oil remaining in applicable reservoirs will be estimated. Water-oil ratio vs. current and remaining production, developed on the subgroup of fields (as discussed under Tasks IV and V), will be assumed to hold for the entire group. An estimated total potential will be calculated, using a W.O.R. vs. recovery factor curve to obtain a multiplier for use on the remaining production on a composite basis. Effect of technology and price can be assessed by altering the range of W.O.R. considered and by creating a second curve of remaining production vs. W.O.R. where a lower production rate is allowed.

2. "Bottom Up" Method

An estimate of increased recovery under various scenarios can be made on those fields for which good information is available, i.e., limiting oil production, W.O.R.'s, etc. (At this point it appears that this would be about 20 fields.) This estimate could then be applied to the total oil in place, assuming that the fields used are representative of the sandstone reservoirs in the region.

3. "Detail Approach"

This method is similar to 2, except that detailed studies will be done on one or two reservoirs. Ideally, these studies would include reservoir simulation with a polymer-waterflood model. The results of such detailed studies would serve as a guide for extrapolation to the Mid-Continent area.

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SELECTED INFORMATION ON 730 OIL FIELDS IN THE PROJECT AREA

FIELD	COUNTY	NO. WELLS	DISC DATE	ANNUAL PROD.	CUM. PROD.	WTRFL DATE	NO. PLS	ID	ID NO.	STATE	AVERAGE PROD.
DA E	PONTOTOC	57.	28.	42841.	7181707.	57	6	A	0	0	2.06
DAMS	HUGHES	11.	35.	34429.	3265195.	0	4	A	0	0	3.50
GRA W	LINCOLN	54.	42.	29752.	2911277.	63	3	A	0	0	1.51
LABAMA SW	HUGHES	8.	48.	4008.	1075253.	0	2	A	0	0	1.67
LDEN NE	CADDO	24.	56.	100069.	2869879.	74	3	A	0	0	11.42
LEMEDA	OSAGE	28.	18.	13970.	2484070.	0	2	A	0	0	1.37
NORITA S	ALFALFA	9.	59.	10088.	1479912.	0	1	A	0	0	3.07
NTELOPE NW	GARFIELD	25.	56.	12931.	1081759.	0	2	A	0	0	1.42
NTIOCH E	GARVIN	11.	45.	90192.	3120019.	0	5	A	0	0	22.46
NTIOCH SW	GARVIN	0.	46.	0.	25499754.	0	2	GOLDTR	1	0	0.00
PACHE	CADDO	44.	41.	1325135.	57733441.	65	2	A	0	0	82.51
RCADIA NE	OKLAHOMA	0.	44.	0.	2335050.	0	1	CONCRK	1	0	0.00
ROMORE	CARTER	9.	42.	11853.	1337736.	0	2	A	0	0	3.61
RLINGTON W	LINCOLN	16.	58.	35036.	1249327.	65	3	A	0	0	6.00
SHER	POTTAWATOM	9.	29.	9447.	4380532.	0	2	A	0	0	2.88
TLANTIC	OSAGE	391.	24.	654785.	30497864.	56	9	A	0	0	4.5
VANT	OSAGE	390.	4.	165378.	105955901.	58	2	A	0	0	1.1
VOCA	POTTAWATOM	0.	38.	0.	2121721.	0	3	STLOU	1	0	0.0
AYLESWORTH	MARSHALL	89.	42.	171079.	9820391.	62	8	A	0	0	5.2
AYLESWORTH SE	BRYAN	20.	45.	72333.	1016815.	0	7	A	0	0	9.9
AZTEC	OKMULGEE	0.	19.	0.	2535973.	0	5	HENRYT	1	0	0.0
BALD HILL	OKMULGEE	685.	6.	270196.	64551958.	53	6	B	0	0	1.0
BALKO S	BEAVER	108.	57.	289172.	13175414.	67	8	BALK S	0.	0	7.3
BANDWHEEL	OSAGE	139.	21.	131450.	4064034.	65	2	B	0	0	2.5
								B	0	0	2.6

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BARNSDALL	OSAGE	229.	16.	134064.	6761110.	60	4	B	0	0	1.60
BARNSDALL W	OSAGE	99.	22.	41934.	31987459.	59	2	B	0	0	1.16
BEARDEN NW	OKFUSKEE	13.	41.	9700.	2680441.	55	3	B	0	0	2.04
BEAVER	STEPHENS	0.	51.	0.	1084828.	0	1	MARLOW	1	0	0.00
BEBEE KONOWA SW	PONTOTOC	349.	23.	440798.	28799124.	62	6	BEBKON	0	0	3.46
BEGGS	OKMULGEE	84.	10.	65499.	14361501.	57	6	BEGGS	0	0	2.14
BEGGS N	OKMULGEE	0.	9.	0.	4202000.	0	2	BEGGS	1	0	0.00
BEGGS S	OKMULGEE	0.	11.	0.	9439000.	0	4	BEGGS	2	0	0.00
BENJAMIN	HUGHES	14.	24.	30020.	2875790.	0	2	BENJM	0	0	5.87
BETHEL	SEMINOLE	20.	24.	14048.	5338825.	58	6	BETHL	0	0	1.92
BETHEL N	SEMINOLE	6.	36.	8410.	5895051.	55	2	B	0	0	3.84
BETHEL W	SEMINOLE	0.	41.	0.	1921192.	0	3	BETHL	1	0	0.00
BILLINGS	NOBLE	19.	17.	32992.	27850978.	99	5	B	0	0	4.76
BILLINGS E	NOBLE	19.	56.	85089.	1993986.	65	2	B	0	0	12.27
BIRCH CREEK	OSAGE	63.	20.	10641.	2185765.	45	6	B	0	0	.46
BIXBY	TULSA	0.	14.	0.	2118115.	0	5	BIXBYJ	1	0	0.00
BIXBY-JENKS	TULSA	161.	1.	120359.	34226708.	57	11	BIXBYJ	0	0	2.05
BLACKLAND	OSAGE	36.	37.	71887.	2537977.	0	1	B	0	0	5.47
BLACKWELL	KAY	89.	4.	108797.	11900007.	69	3	B	0	0	3.35
BLACKWELL E	KAY	42.	50.	48834.	2571682.	67	3	B	0	0	3.19
BOSTON	OSAGE	24.	12.	92698.	0.	59	4	B	0	0	10.58
BOYNTON	MUSKOGEE	82.	14.	56214.	3499277.	64	2	B	0	0	1.88
BRADLEY	GRADY	0.	53.	0.	25157641.	0	9	GOLDTR	2	0	0.00
BRADLEY E	MCCLAIN	0.	47.	0.	1938860.	0	4	GOLDTR	3	0	0.00
BRADLEY N	GRADY	0.	54.	0.	1258257.	0	3	GOLDTR	4	0	0.00

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RADLEY SW	GRADY	0.	48.	0.	1192886.	0	3	GOLDTR	5	0	0.00
RAMAN N	KAY	23.	24.	39096.	21564924.	0	2	B	0	0	4.66
RITTON	OKLAHOMA	12.	35.	37976.	4280673.	0	2	B	0	0	8.67
ROCK	CARTER	227.	22.	148841.	9767381.	51	4	BROCK	0	0	1.80
ROCK W	CARTER	0.	47.	0.	5958558.	0	2	BROCK	1	0	0.00
ROKEN ARROW	TULSA	25.	13.	10737.	10201332.	99	3	B	0	0	1.18
ROYLES	PAYNE	25.	18.	40248.	1560517.	63	9	B	0	0	4.41
RUNER-VERN	TULSA	23.	23.	13370.	1417561.	0	3	B	0	0	1.59
UCHNER	HUGHES	0.	24.	0.	1085866.	0	1	BENJM	1	0	0.00
UFFALO N	HARPER	17.	58.	64585.	2204550.	0	5	B	0	0	10.41
ULLDOG	OSAGE	26.	20.	16705.	1964879.	58	4	B	0	0	1.76
URBANK	OSAGE	1029.	20.	2895114.	507334674.	50	6	BURBK	0	0	7.71
URTON SE	CIMARRON	21.	59.	25811.	1516704.	0	1	B	0	0	3.37
UTLER	MUSKOGEE	0.	18.	0.	1953886.	0	1	COLE	1	0	0.00
ACHE CREEK	COTTON	210.	46.	89104.	25163083.	56	1	C	0	0	1.16
ADDO	CARTER	50.	39.	28324.	4069004.	68	6	C	0	0	1.55
AMRICK	TEXAS	359.	54.	1272307.	27228658.	67	8	C	0	0	9.71
ANDY CREEK	OSAGE	34.	20.	3665.	1751491.	65	2	C	0	0	.30
ANYON CREEK	OSAGE	44.	23.	41943.	4758991.	64	3	C	0	0	2.61
ARLETON NE	BLAINE	33.	65.	297411.	4583512.	0	1	C	0	0	24.69
ARR CITY	SEMINOLE	42.	27.	61180.	40768054.	57	2	C	0	0	3.99
ARTHAGE NE	TEXAS	98.	58.	1284843.	11752239.	70	2	C	0	0	35.92
ARY	OKFUSKEE	0.	23.	0.	2193196.	0	2	OKEM N	1	0	0.00
ASTLE E	OKFUSKEE	10.	44.	15947.	3472615.	62	4	C	0	0	4.37
ENTERPOINT	POTTAWATOM	13.	42.	11311.	1456418.	65	2	C	0	0	2.38

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CENTRAHOMA	COAL	27.	37.	76319.	3133210.	0	4	C	0	0	7.74
CENTRAL SCHOOL S	LOGAN	0.	52.	0.	1008116.	0	4	COYL S	1	0	0.00
CENTRAL SCHOOL W	LOGAN	0.	51.	0.	2368618.	0	2	COYL S	2	0	0.00
CHANDLER	LINCOLN	104.	24.	265206.	22410464.	63	9	CHANDR	0	0	6.99
CHEROKEE NE	ALFALFA	0.	57.	0.	2496859.	0	3	CHTRD	1	0	0.00
CHEROKITA TREND	ALFALFA	140.	57.	364626.	10512362.	63	4	CHRTRD	0	0	7.14
CHEYENNE VALLEY	MAJOR	91.	58.	346677.	4794754.	67	3	C	0	0	10.44
CHEYENNE VALLEY E	MAJOR	54.	67.	195510.	4135953.	71	5	C	0	0	9.92
CHICKASHA NW	GRADY	96.	69.	3681279.	10264560.	74	2	C	0	0	105.06
CHITWOOD NW	GRADY	36.	53.	386082.	8311447.	0	2	C	0	0	29.38
CIVIT NE	GARVIN	19.	62.	49481.	1464521.	0	2	C	0	0	7.14
CLEAR BROOK SW	CLEVELAND	0.	53.	0.	1786398.	0	6	NORM N	3	0	0.00
CLEARVIEW	OKFUSKEE	12.	21.	5796.	2074731.	59	5	C	0	0	1.32
CLEVELAND	PAWNEE	135.	4.	179275.	45699081.	59	6	C	0	0	3.64
CLOTHIER SW	CLEVELAND	0.	50.	0.	4174421.	0	5	NORM N	1	0	0.00
COLE	MUSKOGEE	38.	14.	12678.	3645003.	0	1	COLE	0	0	.91
COLUMBIA E	KINGFISHER	0.	56.	0.	1245122.	0	3	SONTRD	1	0	0.00
COMO	BEAVER	58.	59.	35908.	4903059.	70	2	C	0	0	1.70
COMO SE	BEAVER	91.	60.	227564.	10191213.	0	3	C	0	0	6.85
COMO SW	BEAVER	17.	59.	106078.	3189061.	0	2	C	0	0	17.10
COON CREEK	LOGAN	13.	46.	22545.	15575255.	0	2	CONCRK	0	0	4.75
COOPER E	KINGFISHER	61.	70.	49434.	1175854.	0	4	C	0	0	2.22
CORN S	CLEVELAND	4.	60.	35404.	2074052.	0	1	C	0	0	24.25
COUNCIL HILL	MUSKOGEE	33.	19.	12050.	2243933.	0	2	C	0	0	1.00
COUNTRY CLUB	OSAGE	23.	22.	32851.	1167191.	62	4	C	0	0	3.91

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COWETA	WAGONER	36.	14.	8187.	2084221.	63	2	C	0	0	.62
COYLE	PAYNE	14.	38.	40006.	12434089.	59	4	C	0	0	7.83
COYLE S	LOGAN	20.	51.	38719.	5659161.	0	6	COYL S	0	0	5.30
CRESCENT	LOGAN	0.	33.	0.	23602233.	0	2	CRSLOV	2	0	0.00
CRESCENT-LOVELL	LOGAN	103.	26.	353139.	32289647.	58	11	CRSLOV	0	0	9.39
CRINER E	MCCLAIN	0.	56.	0.	3289294.	0	3	PAYNE	1	0	0.00
CRINER NE	MCCLAIN	6.	58.	18029.	1099935.	0	2	C	0	0	8.23
CROMWELL	OKFUSKEE	67.	23.	123159.	72044396.	53	3	C	0	0	5.04
CROMWELL E	OKFUSKEE	16.	38.	30303.	9412212.	50	2	C	0	0	5.19
CROMWELL S	SEMINOLE	27.	37.	28155.	3105894.	57	7	C	0	0	2.86
CUMBERLAND	MARSHALL	133.	40.	301871.	70276004.	64	4	C	0	0	5.22
DAVENPORT	LINCOLN	0.	24.	0.	27349000.	0	3	STROUD	1	0	0.00
DAVENPORT S	LINCOLN	0.	26.	0.	3768319.	0	3	STROUD	2	0	0.00
DAVIS	MURRAY	35.	59.	351948.	5258947.	0	10	D	0	0	27.55
DAVIS NE	MURRAY	32.	61.	682874.	5238915.	70	2	D	0	0	58.47
DENVER SE	CLEVELAND	17.	48.	82075.	1957902.	69	1	D	0	0	13.23
DEWEY	OSAGE	37.	5.	54516.	3053920.	61	3	D	0	0	4.04
DILL	OKFUSKEE	20.	43.	30014.	9050353.	53	3	D	0	0	4.11
DILL NE	OKFUSKEE	8.	43.	4099.	1437152.	62	3	D	0	0	1.40
DOMES-POND CREEK	OSAGE	987.	17.	619691.	10146520.	55	13	DPCREK	0	0	1.72
DORA	SEMINOLE	0.	35.	0.	12439846.	0	4	KONDOR	1	0	0.00
DOVER & HENNESSEY	KINGFISHER	0.	58.	0.	35366223.	0	8	SONTRD	2	0	0.00
DOVER SW	KINGFISHER	0.	48.	0.	1240143.	0	5	SONTRD	3	0	0.00
DUNCAN W	STEPHENS	192.	19.	145921.	4053844.	67	2	D	0	0	2.08
EARLSBORO	POTTAWATOM	168.	26.	423668.	199685244.	62	4	EARBOR	0	0	5.91

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EARLSBORO E	SEMINOLE	0.	29.	0.	44907939.	0	3	EARBOR	1	0	0.00
EARLSBORO N	SEMINOLE	17.	36.	29777.	11398719.	0	2	E	0	0	4.80
EARLSBORO N	SEMINOLE	10.	36.	20574.	11398719.	0	2	E	0	0	5.64
EARLSBORO S	SEMINOLE	0.	30.	0.	11386999.	0	3	EARBOR	2	0	0.00
EDMOND	OKLAHOMA	0.	30.	0.	27597001.	0	2	EDM W	1	0	0.00
EDMOND E NON-UNIT	OKLAHOMA	0.	45.	0.	2230481.	0	3	EDM NE	1	0	0.00
EDMOND E SOUTH UNIT	OKLAHOMA	0.	44.	0.	1279667.	0	1	EDM NE	2	0	0.00
EDMOND NE	OKLAHOMA	154.	42.	139773.	18859871.	65	4	EDM NE	0	0	2.49
EDMOND W	OKLAHOMA	438.	33.	580036.	155589603.	47	10	EDM W	0	0	3.63
ELGIN S	OSAGE	43.	15.	4648.	3094132.	0	4	E	0	0	.30
ELMORE NE	GARVIN	0.	47.	0.	9091984.	0	2	GOLDTR	6	0	0.00
ELMWOOD SW	BEAVER	0.	56.	0.	4991190.	0	2	BALK S	1	0	0.00
EMPIRE COMANCHE	STEPHENS	304.	18.	214959.	3724719.	58	2	E	0	0	1.94
ENID NE	GARFIELD	281.	40.	397545.	15960144.	0	7	E	0	0	3.88
ENVILLE SW	LOVE	32.	50.	114483.	12080466.	0	5	ENVLSW	0	0	9.80
EOLA	GARVIN	0.	47.	0.	19429921.	0	4	EOLROB	1	0	0.00
EOLA ROBBERSON	GARVIN	482.	20.	2206638.	111169860.	59	10	EOLROB	0	0	12.54
ESSAQUANAHDALE	COTTON	50.	46.	27559.	2844573.	54	1	E	0	0	1.51
FALLS NE	CLEVELAND	32.	55.	224515.	8235567.	0	4	F	0	0	13.22
FITTS	PONTOTOC	621.	34.	3153509.	150711976.	54	12	FITTS	0	0	13.91
FITTS S	PONTOTOC	0.	37.	0.	1021686.	0	4	FITTS	1	0	0.00
FITTS W	PONTOTOC	19.	37.	9251.	1763787.	59	1	F	0	0	1.33
FLATS NW	TEXAS	17.	61.	65406.	2392595.	0	1	F	0	0	10.54
FLINT CREEK	MCCLAIN	0.	52.	0.	2982607.	0	2	WAY SW	1	0	0.00
FLINT CREEK W	MCCLAIN	8.	59.	60480.	1833911.	67	3	F	0	0	20.71

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FORAKER	OSAGE	53.	22.	32661.	1638769.	0	4	E	0	0	1.69
FORT SILL	COMANCHE	138.	42.	48684.	2185306.	0	6	F	0	0	.97
FORTY-FIVE	OSAGE	41.	16.	39039.	2350796.	0	3	E	0	0	2.61
FOURDEE	NOBLE	0.	46.	0.	5014000.	0	4	POLO	1	0	0.00
FREDERICK	TILLMAN	40.	37.	38318.	2201633.	0	4	F	0	0	2.62
FREDERICK S	TILLMAN	58.	45.	36417.	3563855.	.63	5	F	0	0	1.72
FUHRMAN	HUGHES	7.	25.	4752.	2009713.	0	5	F	0	0	1.86
GARBER E	GARFIELD	36.	47.	15660.	1013316.	60	2	G	0	0	1.19
GARCREEK	SEMINOLE	6.	46.	6672.	2003435.	0	2	G	0	0	3.05
GARR	PAYNE	75.	20.	135293.	6824093.	68	4	G	0	0	4.94
GARRETT NW	KAY	87.	46.	128039.	5768320.	0	4	G	0	0	4.03
GILLILAND	OSAGE	114.	19.	389382.	5221417.	72	10	G	0	0	9.36
GLENNPOOL	CREEK	1043.	5.	1543725.	311186340.	54	8	G	0	0	4.06
GOLDEN TREND	GARVIN	994.	45.	4962968.	407689819.	48	27	GOLDTR	0	0	13.68
GRAND VALLEY E	BEAVER	81.	57.	164640.	6473797.	66	1	G	0	0	5.57
GRANT POND CREEK E	GRANT	14.	51.	20711.	1302708.	0	3	G	0	0	4.05
GRAY	POTTAWATOM	18.	33.	58242.	9578420.	0	2	G	0	0	8.86
GRAYSON	SEMINOLE	0.	35.	0.	5430140.	0	4	KONDOR	2	0	0.00
GREASY CREEK	HUGHES	41.	36.	60964.	4319394.	58	8	GRYCRK	0	0	4.07
GREENVILLE	LOVE	0.	50.	0.	1764062.	0	5	OVBK S	1	0	0.00
GREENVILLE NE	LOVE	0.	54.	0.	1239183.	0	3	OVBK S	2	0	0.00
GRIGGS SE	CIMARRON	91.	58.	52670.	1846715.	74	4	G	0	0	1.59
GUTHRIE	LOGAN	26.	41.	321805.	4753748.	63	5	G	0	0	33.91
GUTHRIE LAKE E	LOGAN	15.	52.	51825.	3444041.	62	4	G	0	0	9.47
GUYMON SOUTH	TEXAS	76.	59.	42643.	1566804.	0	4	G	0	0	1.54

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HALLETT	PAWNEE	8.	22.	5266.	3232537.	99	5	H	0	0	1.80
HAMILTON SWITCH	OKMULGEE	127.	9.	59601.	5857061.	59	6	H	0	0	1.29
HANEY E	SEMINOLE	0.	27.	0.	1807169.	0	2	SEMINO	1	0	0.00
HAPPY HILL E	LINCOLN	14.	57.	22322.	1001571.	61	3	H	0	0	4.37
HAPPY HOLLOW	OSAGE	0.	19.	0.	1982354.	0	5	TIDOSG	1	0	0.00
HARDESTY NE	TEXAS	43.	58.	386214.	5532249.	71	1	H	0	0	24.61
HARDY	OSAGE	42.	34.	106207.	2865811.	63	3	H	0	0	6.93
HARMON E	ELLIS	24.	59.	33907.	1594759.	0	2	H	0	0	3.87
HASKELL	MUSKOGEE	66.	9.	24619.	6012645.	0	1	H	0	0	1.02
HAWLEY	GRANT	44.	63.	91903.	2081840.	74	2	H	0	0	5.72
HAYDENVILLE DIST	OKFUSKEE	35.	38.	28783.	3509949.	58	9	H	0	0	2.25
HAZEL	SEMINOLE	0.	38.	0.	2282024.	0	5	STLOU	2	0	0.00
HEALDTON	CARTER	1388.	13.	3764410.	300952093.	56	15	HLDTN	0	0	7.43
HELSEL W	CLEVELAND	7.	54.	12751.	1286209.	0	3	H	0	0	4.99
HENRYETTA	OKFUSKEE	117.	10.	58239.	6514534.	57	4	HENRYT	0	0	1.36
HERD NW	OSAGE	0.	53.	0.	1157209.	0	1	DPCREK	1	0	0.00
HEWITT	CARTER	1181.	19.	4430710.	224697430.	60	6	HEWITT	0	0	10.28
HEWITT E	CARTER	32.	52.	242172.	3116280.	69	8	H	0	0	20.73
HEWITT NW	CARTER	0.	48.	0.	1857765.	0	4	HLTTN	1	0	0.00
HICKORY CREEK	OSAGE	0.	14.	0.	3700040.	0	4	DPCREK	2	0	0.00
HICKORY CREEK S	OSAGE	0.	39.	0.	1160443.	0	1	DPCREK	3	0	0.00
HOBART NE	KIOWA	33.	45.	5734.	2001773.	0	1	H	0	0	.48
HOOKER SW	TEXAS	46.	61.	36391.	1280966.	0	1	H	0	0	2.17
HOOVER	GARVIN	288.	44.	159665.	25359680.	61	4	H	0	0	1.52
HORNS CORNER	HUGHES	7.	43.	9399.	2529820.	0	1	H	0	0	3.68

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HOYT	LINCOLN	0.	35.	0.	2301579.	0	3	CHANDR	1	0	0.00
HUBBARD	KAY	35.	25.	56749.	12167449.	0	2	H	0	0	4.44
HUCMAC N	DEWEY	15.	70.	39288.	1086432.	0	1	H	0	0	7.18
HUNTER S	GARFIELD	67.	52.	68456.	4669786.	64	6	HUNT S	0	0	2.80
HUNTER SW	GARFIELD	0.	45.	0.	1876779.	0	4	HUNT S	1	0	0.00
INGALLS	PAYNE	8.	14.	18372.	9171593.	60	9	I	0	0	6.29
INGALLS E	PAYNE	27.	47.	34364.	2084826.	55	5	I	0	0	3.49
INGALLS NE	PAYNE	11.	43.	11423.	1462455.	0	3	I	0	0	2.85
JACKSON	SEMINOLE	0.	25.	0.	1701064.	0	1	WEWOK	1	0	0.00
JENKS	TULSA	0.	1.	0.	28496710.	0	6	BIXBYJ	2	0	0.00
JENNINGS SE	CREEK	14.	56.	20702.	1095694.	60	1	J	0	0	4.05
JESSE	PONTOTOC	0.	35.	0.	10944190.	0	4	FITTS	2	0	0.00
JOINER CITY	CARTER	113.	53.	157668.	12147808.	65	7	J	0	0	3.82
JOINER CITY SE	CARTER	30.	60.	256296.	4164863.	0	6	J	0	0	23.41
JONES	OKLAHOMA	11.	39.	20434.	10894567.	59	2	J	0	0	5.09
JOSEY	OKFUSKEE	0.	23.	0.	6040810.	0	2	HENRYT	2	0	0.00
KATIE	GARVIN	0.	46.	0.	6303072.	0	2	GOLDTR	7	0	0.00
KAW S	OSAGE	44.	47.	204726.	4463280.	63	2	K	0	0	12.75
KENDRICK	LINCOLN	21.	53.	17349.	3457895.	60	3	K	0	0	2.26
KEOKUK	POTTAWATOM	64.	33.	100134.	20232690.	64	5	K	0	0	4.29
KEYES	CIMARRON	93.	45.	62212.	1231099.	0	4	K	0	0	1.83
KEYSTONE	PAWNEE	85.	19.	66070.	11774046.	50	6	K	0	0	2.13
KNOX	GRADY	360.	16.	554785.	58987293.	62	7	K	0	0	4.22
KOMALTY	KIOWA	114.	59.	35967.	2166202.	0	4	K	0	0	.86
KONAWA	SEMINOLE	0.	29.	0.	21112423.	0	4	KONDOR	3	0	0.00

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KONAWA DORA	SEMINOLE	275.	29.	303348.	54932759.	53	9	KONDOR	0	0	3.02
KONAWA W	SEMINOLE	0.	38.	0.	1465739.	0	2	BEBKON	1	0	0.00
LACEY SW	KINGFISHER	0.	56.	0.	4653300.	0	6	SONTRD	4	0	0.00
LAFFOON	LINCOLN	24.	35.	96580.	7001322.	0	4	L	0	0	11.03
LAFFOON SE	OKFUSKEE	70.	56.	62782.	5183291.	66	8	L	0	0	2.46
LAUDERDALE	PAWNEE	230.	15.	92802.	22898316.	48	6	L	0	0	1.11
LEONARD	TULSA	20.	16.	12060.	1519763.	66	4	L	0	0	1.65
LEWIS	GARVIN	44.	44.	26206.	1700893.	60	6	L	0	0	1.63
LINCOLN SE	KINGFISHER	0.	58.	0.	3577657.	0	5	SONTRD	5	0	0.00
LINDSAY E	MCCLAIN	0.	47.	0.	12728634.	0	3	GOLDTR	8	0	0.00
LINDSAY NE	MCCLAIN	0.	47.	0.	5228506.	0	2	GOLDTR	9	0	0.00
LINDSAY NW	MCCLAIN	0.	50.	0.	2972670.	0	2	GOLDTR	10	0	0.00
LITTLE CHIEF NE	OSAGE	0.	52.	0.	1183919.	0	3	BURBK	1	0	0.00
LITTLE RIVER	SEMINOLE	97.	27.	187602.	134831805.	65	6	L	0	0	5.30
LITTLE RIVER E	SEMINOLE	36.	27.	88363.	23964054.	64	4	LTRV E	0	0	6.72
LITTLE RIVER N	SEMINOLE	0.	40.	0.	1165030.	0	2	LTRV E	1	0	0.00
LOGAN S	BEAVER	54.	56.	45498.	4521791.	0	4	L	0	0	2.31
LONE ELM S	NOBLE	64.	52.	96452.	4421783.	60	2	L	0	0	4.13
LONE GROVE S	CARTER	16.	54.	22930.	1019729.	0	3	L	0	0	3.93
LONE GROVE SW	CARTER	0.	44.	0.	9774689.	0	1	HEWITT	1	0	0.00
LOVEDALE NW	HARPER	37.	61.	46001.	1297574.	0	3	L	0	0	3.41
LOVELL	LOGAN	0.	28.	0.	5043000.	0	3	CRSLOV	1	0	0.00
LUCIEN	NOBLE	188.	32.	382385.	51981926.	59	5	L	0	0	5.57
LUCIEN N	GARFIELD	14.	36.	26576.	3402010.	0	4	L	0	0	5.20
LUTHER	OKLAHOMA	6.	53.	18482.	1496353.	55	4	L	0	0	8.44

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LYONS-QUINN	OKFUSKEE	142.	21.	74415.	23644194.	56	8	L	0	0	1.44
MACOMB S	POTTAWATOM	16.	43.	24281.	3598794.	62	3	M	0	0	4.16
MADILL	MARSHALL	156.	6.	154773.	5171858.	0	10	MADILL	0	0	2.72
MADILL N	MARSHALL	0.	55.	0.	9259209.	0	3	MADILL	1	0	0.00
MAMMOTH NE	LINCOLN	11.	51.	5258.	2528833.	62	2	M	0	0	1.31
MANION	OSAGE	66.	18.	18968.	2670814.	68	5	M	0	0	.79
MARAMEC	PAWNEE	125.	20.	231454.	12721172.	57	8	M	0	0	5.07
MARCH	PAYNE	58.	22.	124898.	3975024.	64	4	M	0	0	5.90
MARCH N	PAYNE	37.	38.	72602.	4203081.	59	6	M	0	0	5.38
MARIETTA SE	LOVE	0.	57.	0.	5312904.	0	3	ENVLSW	1	0	0.00
MARLOW	STEPHENS	35.	52.	69996.	4819112.	0	15	MARLOW	0	0	5.48
MARLOW W	STEPHENS	41.	37.	38872.	5179231.	66	6	M	0	0	2.60
MARSHALL	LOGAN	59.	27.	204733.	16179299.	56	4	M	0	0	9.51
MASHAM	PAWNEE	5.	24.	9087.	1137261.	60	2	M	0	0	4.98
MAUD	POTTAWATAM	65.	29.	101082.	21909317.	63	4	M	0	0	4.26
MAYSVILLE	GARVIN	1.	76.	3807.	1153376.	0	2	M	0	0	10.43
MAYSVILLE E	GARVIN	8.	54.	58724.	82290764.	0	2	M	0	0	20.11
MAYSVILLE S	GARVIN	0.	47.	0.	1744246.	0	2	GOLDTR	11	0	0.00
MAYSVILLE SW	GARVIN	0.	46.	0.	7659692.	0	5	GOLDTR	12	0	0.00
MEHAN	PAYNE	20.	25.	35124.	5494503.	0	6	MEHAN	0	0	4.81
MEHAN NE	PAYNE	0.	41.	0.	1623152.	0	4	MEHAN	1	0	0.00
MERVINE	KAY	16.	13.	26664.	2423626.	0	7	M	0	0	4.57
MIDWELL	CIMARRON	58.	62.	522620.	7418917.	77	1	M	0	0	24.69
MILFAY	CREEK	28.	41.	41333.	4158363.	55	4	M	0	0	4.04
MISSION	SEMINOLE	20.	28.	51404.	29492898.	0	3	M	0	0	7.04

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MOCANE NW	BEAVER	47.	55.	328273.	8385684.	0	7	M	0	0	19.14
MOCANE-LAVERNE	BEAVER	1114.	39.	497534.	13169805.	0	13	M	0	0	1.22
MOORE	CLEVELAND	0.	35.	0.	13241000.	0	3	NORM N	2	0	0.00
MOORE NE	CLEVELAND	0.	55.	0.	1370000.	0	3	MOOR W	1	0	0.00
MOORE S	CLEVELAND	0.	44.	0.	3831000.	0	3	MOOR W	2	0	0.00
MOORE SE	CLEVELAND	13.	47.	46207.	1072922.	69	2	M	0	0	9.74
MOORE W	CLEVELAND	265.	43.	326449.	34206051.	65	17	MOOR W	0	0	3.38
MORAVIA E	BECKHAM	58.	55.	31417.	1953592.	0	3	M	0	0	1.48
MORRIS	OKMULGEE	143.	6.	37154.	28289808.	59	7	M	0	0	.71
MORSE	OKFUSKEE	24.	44.	18074.	1873133.	60	6	M	0	0	2.06
MT HOPE NW	PAYNE	16.	49.	10828.	2099376.	62	4	M	0	0	1.85
MT VERNON	LINCOLN	42.	52.	26111.	9362409.	57	4	M	0	0	1.70
MT VERNON SW	LINCOLN	10.	54.	126900.	7887193.	62	4	M	0	0	34.77
MUSKOGEE	MUSKOGEE	141.	4.	75640.	22902788.	56	1	M	0	0	1.47
MUSTANG N	CANADIAN	34.	56.	86697.	5418159.	0	3	M	0	0	6.99
NATURA	OKMULGEE	47.	14.	16845.	2110375.	66	5	N	0	0	.98
NAVAL RESERVE	OSAGE	313.	28.	423749.	54677512.	52	4	NAVRES	0	0	3.71
NAVAL RESERVE NW	OSAGE	0.	51.	0.	2103193.	0	1	NAVRES	1	0	0.00
NAVAL RESERVE S	OSAGE	6.	38.	12578.	1136102.	0	3	N	0	0	5.74
NELLIE SW	STEPHENS	8.	56.	12272.	1510734.	0	2	N	0	0	4.20
NEW HOPE SE	GARVIN	0.	47.	0.	11843513.	0	2	GOLDTR	13	0	0.00
NEWBY NE	CREEK	35.	44.	7324.	1535852.	64	3	N	0	0	.57
NOBLE	CLEVELAND	14.	56.	107322.	4498260.	0	3	N	0	0	21.00
NOBLE E	CLEVELAND	12.	53.	67748.	3889960.	0	2	N	0	0	15.47
NOBLE NW	CLEVELAND	32.	58.	295328.	11286895.	0	5	N	0	0	25.28

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NORFOLK	PAYNE	102.	68.	51794.	6176056.	60	6	N	0	0	1.39
NORFOLK W	PAYNE	6.	29.	3428.	3490450.	0	4	N	0	0	1.57
NORMAN N	CLEVELAND	69.	35.	209146.	23116353.	65	8	NORM N	0	0	8.30
NUMA	GRANT	54.	56.	43052.	2075652.	70	3	N	0	0	2.18
NUYAKA	OKMULGEE	11.	21.	13258.	1535379.	0	2	N	0	0	3.30
OAKDALE	WOODS	137.	55.	283622.	7663912.	0	1	O	0	0	5.67
OAKMAN	PONTOTOC	45.	37.	33196.	1043859.	0	3	O	0	0	2.02
OCHELATA N	OSAGE	159.	10.	46212.	2042090.	56	6	O	0	0	.80
OKEMAH	OKFUSKEE	63.	40.	29041.	3072161.	59	2	O	0	0	1.26
OKEMAH N	OKFUSKEE	83.	40.	60939.	5899277.	66	7	OKEM N	0	0	2.01
OKESA	OSAGE	0.	4.	0.	1017115.	0	3	DPCREK	4	0	0.00
OKLAHOMA CITY	OKLAHOMA	220.	29.	1510261.	735712538.	55	7	O	0	0	19.81
OKLAHOMA CITY S	CLEVELAND	10.	58.	21728.	1697973.	0	3	O	0	0	5.95
OKMULGEE	OKMULGEE	80.	6.	46372.	15127851.	55	5	O	0	0	1.59
OLYMPIC	HUGHES	5.	35.	5502.	38585068.	0	2	O	0	0	3.01
ONETA	WAGONER	24.	16.	4865.	1991631.	64	3	O	0	0	.56
ORCHARD CITY	OKLAHOMA	8.	54.	5866.	1488212.	66	2	O	0	0	2.01
ORLANDO	PAYNE	27.	29.	148160.	5353143.	59	3	O	0	0	15.03
OVERBROOK S	LOVE	62.	49.	73087.	4099684.	65	8	OVBK S	0	0	3.23
PANTHER CREEK SW	GARVIN	0.	48.	0.	6913963.	0	1	GOLDTR	14	0	0.00
PAPOOSE	HUGHES	13.	24.	4551.	24083802.	0	6	P	0	0	.96
PAULS VALLEY	GARVIN	59.	42.	88358.	28208549.	71	5	P	0	0	4.10
PAULS VALLEY E	GARVIN	48.	44.	91169.	9696939.	58	3	P	0	0	5.20
PAULS VALLEY SE	GARVIN	14.	57.	98808.	1502863.	0	1	P	0	0	19.34
PAWHUSKA	OSAGE	107.	19.	75278.	2430371.	0	4	P	0	0	1.93

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PAYNE	MCCLAIN	167.	56.	1139658.	35284554.	65	11	PAYNE	0	0	19.70
PAYSON	LINCOLN	6.	40.	17518.	15285595.	61	1	PAYSON	0	0	8.00
PAYSON E	LINCOLN	0.	52.	0.	2963216.	0	1	PAYSON	1	0	0.00
PEARSONIA	OSAGE	54.	19.	42854.	5466561.	53	4	P	0	0	2.17
PEAVINE	OKLAHOMA	0.	50.	0.	1895392.	0	2	EDM NE	3	0	0.00
PECK	LINCOLN	34.	47.	32628.	4325501.	57	4	P	0	0	2.63
PETTIT	OSAGE	22.	19.	85330.	4325673.	59	9	P	0	0	10.63
POLLYANNA	OKMULGEE	149.	21.	72629.	6277799.	0	6	P	0	0	1.34
POLO	NOBLE	78.	46.	174434.	15148708.	61	8	POLO	0	0	6.13
PONCA CITY	KAY	87.	17.	302396.	12265976.	57	3	P	0	0	9.52
PONCA CITY SW	KAY	5.	40.	5779.	1597800.	0	1	P	0	0	3.17
POND CREEK	OSAGE	0.	12.	0.	2251686.	0	2	DPCREK	5	0	0.00
POSTLE	TEXAS	306.	58.	3851429.	76664830.	65	4	P	0	0	34.48
PRAGUE	LINCOLN	8.	40.	10717.	2606552.	0	1	P	0	0	3.67
PURDY SE	GARVIN	0.	53.	0.	4431017.	0	1	GOLDTR	15	0	0.00
PUTNAM	DEWEY	404.	59.	950110.	42570627.	68	7	P	0	0	6.44
QUAPAW	OSAGE	140.	14.	79425.	11024034.	50	3	Q	0	0	1.55
RALSTON	PAWNEE	9.	9.	7727.	1145403.	0	5	R	0	0	2.35
RAMONA	OSAGE	85.	11.	62520.	7803039.	52	3	R	0	0	2.02
RAMSEY	PAYNE	45.	38.	113780.	19966693.	69	5	R	0	0	6.93
RANDLETT SW	COTTON	20.	47.	5070.	1249033.	59	1	R	0	0	.69
RED FORK	CREEK	16.	1.	6025.	8165591.	62	3	R	0	0	1.03
REMINGTON	OSAGE	32.	49.	119134.	1800143.	66	3	R	0	0	10.20
REMUS	POTTAWATOM	0.	47.	0.	1536970.	0	4	STLOU	3	0	0.00
RICH VALLEY SE	GRANT	0.	51.	0.	1130076.	0	2	RCHVAL	1	0	0.00

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RINGLING N	JEFFERSON	16.	48.	36781.	2398452.	64	1	R	0	0	6.30
RINGWOOD	MAJOR	1248.	46.	2441632.	61359495.	63	19	RNGWOD	0	0	5.36
RINGWOOD N	MAJOR	0.	64.	0.	3605468.	0	8	RNGWOD	1	0	0.00
RIPLEY N	PAYNE	7.	14.	9634.	2766272.	0	4	R	0	0	3.77
ROBBERSON	GARVIN	0.	21.	0.	21707525.	0	4	EOLROB	2	0	0.00
ROSANNA	SEMINOLE	0.	24.	0.	2438810.	0	1	WEWOK	2	0	0.00
ROVER	POTTAWATOM	17.	45.	21323.	3261756.	62	4	R	0	0	3.44
ROYAL	GARVIN	0.	52.	0.	1233270.	0	3	EOLROB	3	0	0.00
SACRED HEART	POTTAWATOM	22.	35.	16195.	2652360.	64	7	S	0	0	2.02
SALT FORK SE	GRANT	38.	56.	47201.	1272337.	72	2	S	0	0	3.40
SAND SPRINGS	TULSA	23.	16.	14541.	2715387.	73	5	S	0	0	1.73
SCHLEGEL N	PAYNE	27.	26.	45961.	1086796.	72	6	S	0	0	4.66
SCHULTER	OKMULGEE	31.	7.	13337.	2350105.	69	6	S	0	0	1.18
SEARIGHT	SEMINOLE	66.	26.	336148.	42720393.	64	3	S	0	0	13.95
SEARIGHT N	SEMINOLE	17.	34.	48486.	7392148.	64	2	S	0	0	7.81
SEMINOLE	SEMINOLE	230.	26.	790039.	182756699.	0	8	SEMINO	0	0	9.41
SENTINEL W	WASHITA	1.	76.	1618.	1307168.	0	1	S	0	0	4.43
SHAWNEE	POTTAWATOM	27.	34.	24159.	7351815.	57	3	S	0	0	2.45
SHAWNEE NE	POTTAWATOM	6.	42.	39913.	4941313.	66	3	S	0	0	18.23
SHELDON	OKFUSKEE	8.	16.	2920.	2055419.	0	2	S	0	0	1.00
SILVER CITY NE	CREEK	19.	56.	15484.	1117917.	62	1	S	0	0	2.23
SIVELS BEND	LOVE	10.	46.	23157.	2086449.	52	2	S	0	0	5.34
SIX MILE S	BEAVER	18.	59.	19253.	1723666.	0	2	S	0	0	2.93
SKELLYVILLE	LINCOLN	26.	24.	43809.	4228616.	59	4	S	0	0	4.62
SOLDIER CREEK	COTTON	240.	46.	67223.	14417907.	62	1	S	0	0	.77

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SOONER TREND	KINGFISHER	3266.	53.	8549815.	207973510.	63	30	SONTRD	0	0	7.17
SPARKS E	LINCOLN	35.	50.	37648.	7528759.	59	2	S	0	0	2.95
SPENCER	OKMULGEE	54.	17.	17993.	1623585.	60	4	S	0	0	.91
ST LOUIS	POTTAWATOM	527.	26.	1063196.	215714927.	59	13	STLOU	0	0	5.53
ST LOUIS N	POTTAWATOM	0.	41.	0.	1535517.	0	2	STLOU	4	0	0.00
STEEDMAN N	PONOTOC	2.	52.	549.	3910000.	57	2	S	0	0	.75
STILLWATER	PAYNE	19.	54.	78010.	3631501.	62	1	S	0	0	11.25
STILLWATER W	PAYNE	17.	40.	50176.	966657.	69	5	S	0	0	9.09
STONE BLUFF	TULSA	94.	15.	43641.	7636848.	0	2	S	0	0	1.27
STROUD	CREEK	297.	23.	564655.	67912017.	0	6	STROUD	0	0	5.21
STROUD E	CREEK	17.	40.	30440.	1968785.	64	2	S	0	0	4.91
SYLVIAN	SEMINOLE	1.	41.	2154.	3098343.	0	1	S	0	0	5.90
TATUMS NE	CARTER	14.	53.	10017.	1029479.	0	1	T	0	0	1.96
TERLTON	PAWNEE	41.	12.	8339.	2222394.	58	8	T	0	0	.56
THACKERVILLE N	LOVE	45.	61.	91980.	4261808.	0	8	T	0	0	5.60
THOMAS	KAY	52.	25.	75750.	10588609.	56	7	T	0	0	3.99
TIDAL-OSAGE	OSAGE	209.	16.	323724.	9919880.	52	8	TIDOSG	0	0	4.24
TIGER FLATS	OKFUSKEE	56.	8.	25515.	5053928.	60	9	T	0	0	1.25
TONKAWA	KAY	201.	21.	292286.	135525758.	67	9	TONK	0	0	3.98
TONKAWA E	KAY	0.	55.	0.	3344479.	0	2	TONK	1	0	0.00
TRANSCO NW	SEMINOLE	9.	40.	7137.	1718860.	0	4	T	0	0	2.17
TRAUGH DEEP	SEMINOLE	0.	37.	0.	3484228.	0	6	KONDOR	4	0	0.00
TROUSDALE	POTTAWATOM	10.	51.	29062.	1045421.	62	1	T	0	0	7.96
TUCKER NE	STEPHENS	10.	56.	21628.	1175674.	62	2	T	0	0	5.93
TURLEY	OSAGE	131.	14.	35056.	7868386.	52	2	T	0	0	.73

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TYROLA NE	SEMINOLE	62.	53.	48244.	3350704.	55	5	T	0	0	2.13
VASSAR SE	PAYNE	21.	66.	129498.	1180473.	74	2	V	0	0	16.89
VELMA W	STEPHENS	60.	46.	136930.	9194876.	61	4	V	0	0	6.25
VICTORY HILL	POTTAWATOM	13.	46.	8690.	1028966.	67	1	V	0	0	1.83
WAKITA TREND	ALFALFA	109.	54.	145399.	7096202.	67	4	W	0	0	3.65
WANETTE	POTTAWATOM	19.	49.	8831.	4957710.	55	3	W	0	0	1.27
WANETTE W	POTTAWATOM	25.	43.	130854.	1005085.	0	4	W	0	0	14.34
WASHINGTON	MCCLAIN	90.	44.	329868.	20658196.	0	12	W	0	0	10.04
WATCHORN	PAWNEE	18.	18.	22621.	8715487.	0	2	W	0	0	3.44
WATCHORN E	OSAGE	48.	42.	87536.	13549749.	53	4	W	0	0	5.00
WATERLOO N	LOGAN	7.	62.	16572.	1909350.	0	7	W	0	0	6.49
WAUKOMIS	GARFIELD	0.	61.	0.	3816880.	0	4	SONTRD	6	0	0.00
WAYNE SW	MCCLAIN	86.	46.	154977.	13742889.	63	6	WAY SW	0	0	4.94
WAYNOKA NE	WOODS	72.	57.	27731.	1265865.	0	3	W	0	0	1.06
WEBB	GRANT	5.	25.	27760.	1970598.	0	4	W	0	0	15.21
WELEETKA W	OKFUSKEE	11.	20.	17193.	2015764.	0	2	W	0	0	4.28
WELLSTON N	LINCOLN	14.	37.	16157.	5137882.	0	6	W	0	0	3.16
WELLSTON W	LINCOLN	28.	51.	38230.	3245311.	59	6	W	0	0	3.74
WESTPOINT S	PAYNE	10.	45.	13199.	1194387.	59	1	W	0	0	3.62
WETUMKA	HUGHES	7.	19.	10649.	1702883.	56	7	W	0	0	4.17
WETUMKA S	HUGHES	0.	26.	0.	1317875.	0	5	GRYCRK	1	0	0.00
WEWOKA	SEMINOLE	183.	24.	248007.	62495514.	50	12	WEWOK	0	0	3.71
WEWOKA E	SEMINOLE	5.	24.	14774.	2363968.	0	4	W	0	0	8.10
WEWOKA LAKE	SEMINOLE	0.	43.	0.	6059184.	0	4	WEWOK	3	0	0.00
WEWOKA N	SEMINOLE	7.	40.	1647.	1205393.	64	2	W	0	0	.64

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WEWOKA NE	SEMINOLE	27.	26.	15798.	3667575.	64	6	W	0	0	1.60
WEWOKA TOWNSITE	SEMINOLE	0.	24.	0.	7396462.	0	3	WEWOK	4	0	0.00
WHITETAIL	OSAGE	82.	19.	37712.	2778540.	57	6	W	0	0	1.26
WICEY	TULSA	53.	15.	27866.	4460560.	59	3	W	0	0	1.44
WILDHORSE	OSAGE	268.	12.	182357.	8986046.	67	7	W	0	0	1.86
WILZETTA	LINCOLN	7.	34.	9247.	3880545.	0	4	W	0	0	3.62
WILZETTA S	LINCOLN	3.	36.	5024.	1933303.	0	5	W	0	0	4.59
WITCHER	OKLAHOMA	29.	47.	114431.	19649773.	61	4	W	0	0	10.81
WOOLAROC	OSAGE	133.	17.	40942.	6701140.	0	2	W	0	0	.84
WYNONA	OSAGE	128.	17.	183356.	19083928.	62	9	W	0	0	3.92
YEAGER	HUGHES	3.	35.	11821.	2680678.	0	4	Y	0	0	10.80
YOUNGSTOWN	OKMULGEE	25.	54.	55927.	3734370.	60	6	Y	0	0	5.13
AIRBASE	ELLIS	32.	53.	59866.	2338674.	67	4	A	0	1	5.13
ALBRIGHT	COWLEY	47.	56.	67437.	1402101.	63	1	A	0	1	3.93
ALTOONA	WILSON	88.	0.	29878.	1494734.	99	1	A	0	1	.93
ANSON SE	SUMNER	30.	58.	134029.	3235281.	64	2	A	0	1	12.24
ASH CREEK	BARTON	8.	47.	10827.	1367366.	0	2	A	0	1	3.71
ATYEO-PIXLEE	CHASE	92.	23.	75961.	12687300.	60	2	A	0	1	2.26
AUGUSTA	BUTLER	133.	14.	132259.	44398811.	62	5	A	0	1	2.72
BARRY	ROOKS	68.	42.	165115.	15352496.	68	3	B	0	1	5.65
BART-STAFF	BARTON	13.	51.	22458.	1976606.	63	3	B	0	1	4.73
BAYER	STAFFORD	12.	51.	25784.	1029949.	70	4	B	0	1	5.89
BEAUMONT	GREENWOOD	33.	19.	32855.	1635129.	73	4	B	0	1	2.73
BEAVER	BARTON	29.	34.	36127.	5521780.	68	5	B	0	1	3.41
BEAVER S	BARTON	22.	45.	38008.	2712832.	0	3	B	0	1	4.73

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BERNDSEN	BUTLER	14.	58.	13198.	1279103.	70	1	B	0	1	2.58
BERRYMAN	MORTON	32.	59.	91654.	1436033.	0	1	B	0	1	7.85
BIDDLE	COWLEY	37.	21.	26288.	1929413.	61	4	B	0	1	1.95
BIG SANDY	WOODSON	62.	26.	24920.	1227013.	57	1	B	0	1	1.10
BLANKENSHIP	BUTLER	44.	21.	90083.	5176145.	71	2	B	0	1	5.61
BLUE HILL	ELLIS	37.	37.	50730.	4076786.	0	4	B	0	1	3.76
BLUE HILL NW	ELLIS	36.	58.	75953.	1859064.	0	3	B	0	1	5.78
BOGGS	BARBER	0.	46.	0.	2744576.	0	2	MEDLOG	1	1	0.00
BOYD	BARTON	86.	42.	85414.	12134882.	0	4	BOYD	0	1	2.72
BREHM	PRATT	14.	61.	53976.	1223618.	0	2	B	0	1	10.56
BRONSON-XENIA	ALLEN	183.	19.	36940.	3978053.	51	1	B	0	1	.55
BRUNGARDT	ELLIS	11.	52.	29511.	1128479.	0	1	B	0	1	7.35
BUHLER	RENO	9.	38.	9092.	1717277.	0	2	B	0	1	2.77
BULL CREEK	RICE	27.	61.	19585.	1114622.	67	1	B	0	1	1.99
BURDEN	COWLEY	36.	28.	38240.	2635626.	63	3	B	0	1	2.91
BURKETT	GREENWOOD	96.	23.	33825.	7238979.	0	1	B	0	1	.97
BURRTON	HARVEY	419.	31.	722054.	66181726.	67	3	B	0	1	4.72
BUSH CITY SHOESTRING	ANDERSON	641.	21.	118158.	7370550.	44	99	B	0	1	.51
CABIN VALLEY	COWLEY	9.	52.	4030.	1795092.	0	1	C	0	1	1.23
CANTON N	MCPHERSON	15.	36.	15953.	1097803.	0	1	C	0	1	2.91
CATHARINE S	ELLIS	56.	46.	100484.	5659653.	64	3	C	0	1	4.92
CENTERVILLE	ANDERSON	32.	20.	7470.	1291300.	0	2	C	0	1	.64
CHANCE	PRATT	19.	46.	4988.	4403033.	0	6	C	0	1	.72
CHASE-SILICA	BARTON	1005.	30.	1424937.	251464315.	66	6	CHSSIL	0	1	3.88
CHEYENNE	BARTON	14.	59.	31454.	1218267.	69	2	CHYNE	0	1	6.16

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CHEYENNE VIEW	BARTON	94.	49.	110612.	7092464.	60	3	C	0	1	3.22
CHITWOOD	PRATT	6.	43.	11974.	11988248.	55	6	C	0	1	5.47
CHURCHILL	COWLEY	11.	26.	13353.	20448953.	0	99	C	0	1	3.33
CIMARRON VALLEY SW	MORTON	8.	65.	203627.	1883439.	0	2	C	0	1	69.74
COLONY W	ALLEN	114.	22.	40784.	1668857.	55	1	C	0	1	.98
COLONY-WELDA	ANDERSON	117.	16.	58543.	1754679.	48	2	C	0	1	1.37
COMBS	BUTLER	13.	47.	17916.	1338379.	0	1	C	0	1	3.78
CUNNINGHAM	KINGMAN	48.	31.	55103.	6440069.	61	4	C	0	1	3.15
CUTTER	STEVENS	15.	61.	142285.	4949111.	0	2	C	0	1	25.99
DAVID	COWLEY	37.	35.	27231.	6793089.	60	2	D	0	1	2.02
DAVIDSON	BARTON	26.	30.	26669.	1852955.	0	4	D	0	1	2.81
DEERHEAD	BARBER	9.	42.	2907.	1411395.	0	4	D	0	1	.88
DELL E	STAFFORD	12.	51.	14817.	1151334.	70	3	D	0	1	3.38
DILLWIN	STAFFORD	10.	55.	10927.	1421885.	0	3	D	0	1	2.99
DONALD	BARBER	11.	46.	18690.	1209880.	0	2	D	0	1	4.66
DOPITA	ROOKS	96.	34.	170036.	7399010.	65	3	D	0	1	4.85
DORR	ROOKS	50.	42.	67590.	3532065.	62	2	D	0	1	3.70
DUBOIS	HARVEY	45.	57.	37915.	3816447.	0	1	D	0	1	2.31
DUNAWAY	COFFEY	70.	22.	117828.	2664315.	0	3	D	0	1	4.61
EASTMAN	COWLEY	17.	23.	22139.	3527646.	99	3	E	0	1	3.57
ELLIS	ELLIS	60.	43.	83415.	5380370.	0	3	E	0	1	3.81
ELRICK	GRAHAM	74.	55.	160307.	7170551.	69	3	E	0	1	5.94
ERIE	NEOSHO	219.	3.	67201.	2281014.	60	1	E	0	1	.84
EUBANK	HASKELL	71.	58.	278444.	8633077.	75	4	E	0	1	10.74
EUBANK N	HASKELL	8.	59.	55438.	1246161.	0	1	E	0	1	18.99

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EVALYN-CONDIT	SEWARD	52.	60.	116560.	2470316.	0	4	E	0	1	6.14
EVELEIGH	BARTON	0.	43.	0.	1235577.	0	1	BOYD	1	1	0.00
FAIRPORT	ELLIS	347.	23.	728676.	46306517.	57	1	F	0	1	5.75
FALL CREEK	SUMNER	7.	50.	5684.	3217308.	69	3	F	0	1	2.22
FARMINGTON	STAFFORD	9.	43.	19215.	1611678.	0	6	F	0	1	5.85
FRALICK W	KIOWA	19.	61.	130034.	2510767.	0	1	F	0	1	19.75
FREDERICK	RICE	17.	51.	22756.	2035217.	63	2	F	0	1	3.67
GARNETT SHOESTRING	ANDERSON	20.	4.	9896.	1084199.	59	1	G	0	1	1.36
GATES	STAFFORD	126.	0.	187587.	19070236.	66	5	GATES	0	1	4.08
GIBSON	COWLEY	49.	41.	23581.	4361314.	59	5	G	0	1	1.32
GILLIAN	SEDGWICK	16.	61.	72088.	2204322.	0	1	G	0	1	12.34
GOODRICH	SEDGWICK	29.	28.	31528.	6204829.	66	4	G	0	1	2.98
GRA-ROOK	ROOKS	28.	48.	52119.	3807994.	0	3	G	0	1	5.10
GRABER	HARVEY	81.	34.	74065.	16212463.	0	3	G	0	1	2.51
GRAHAM	COWLEY	66.	24.	78384.	5612004.	59	3	G	0	1	3.25
GROFF	TREGO	19.	52.	49913.	1760678.	67	3	G	0	1	7.20
GUELPH	SUMNER	22.	51.	54484.	3474334.	73	3	G	0	1	5.79
HALL-GURNEY	RUSSELL	1128.	31.	1650939.	128846554.	0	8	H	0	1	4.01
HALLET	HODGEMAN	18.	56.	42321.	1965344.	60	1	H	0	1	6.44
HALSTEAD	HARVEY	19.	29.	22534.	2646210.	75	2	H	0	1	3.25
HALSTEAD W	HARVEY	12.	60.	21707.	1063112.	0	3	H	0	1	4.96
HARDTNER	BARBER	68.	54.	77707.	1279670.	0	4	H	0	1	3.13
HARPER RANCH	CLARK	59.	53.	10984.	3143627.	59	2	H	0	1	.51
HEIKEN	ELLSWORTH	10.	30.	4876.	1217911.	0	3	H	0	1	1.34
HICKMAN	STAFFORD	16.	51.	55604.	1724591.	75	2	H	0	1	9.52

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HILLTOP	SUMNER	0.	53.	0.	3494001.	0	3	MURPY	1	1	0.00
HITTLE	COWLEY	14.	25.	21696.	10238985.	0	2	H	0	1	4.25
HOLLOW-NIKKEL	HARVEY	68.	31.	150499.	26753409.	64	4	H	0	1	6.06
HUNTER	SALINE	21.	43.	12100.	1752810.	0	2	H	0	1	1.58
INTERSTATE	MORTON	77.	53.	876041.	19401639.	65	3	I	0	1	31.17
JENNINGS	DECATUR	39.	51.	76427.	1609999.	61	4	J	0	1	5.37
JORDAN	STAFFORD	12.	36.	21970.	1543934.	56	3	J	0	1	5.02
KERSCHEN	SUMNER	11.	55.	2814.	1026474.	0	3	K	0	1	.70
KISMET	MEADE	53.	48.	152340.	7306291.	0	7	K	0	1	7.87
KRAUS	ELLIS	37.	36.	46296.	2929003.	0	4	K	0	1	3.43
LAMONT	GREENWOOD	37.	26.	21720.	3319401.	99	1	L	0	1	1.61
LANDON-FLOYD	CHAUTAUQUA	29.	36.	36783.	1442025.	62	1	L	0	1	3.48
LATTA	SUMNER	18.	27.	37259.	2312269.	69	2	L	0	1	5.67
LAW	GRAHAM	22.	51.	41863.	1769520.	99	2	L	0	1	5.21
LEESBURG	STAFFORD	18.	38.	64916.	4460333.	64	3	L	0	1	9.88
LEIKER	ELLIS	17.	43.	48896.	2858709.	0	3	L	0	1	7.88
LENITON	CHAUTAUQUA	59.	0.	18249.	1028853.	99	2	L	0	1	.85
LINDSBORG	MCPHERSON	103.	38.	137738.	13951106.	71	2	L	0	1	3.66
LOST SPRINGS	DICKINSON	397.	27.	173552.	23891124.	69	3	L	0	1	1.20
LOUISBURG	MIAMI	65.	27.	17879.	1017518.	58	3	L	0	1	.75
LYONS W	RICE	100.	63.	127254.	6621406.	68	4	L	0	1	3.49
MCCANDLESS	STAFFORD	20.	0.	25908.	2594222.	99	2	M	0	1	3.55
MEDICINE LODGE N	BARBER	36.	54.	54983.	1274666.	69	1	MEDLOG	1	1	4.18
MEDICINE LODGE-BOGGS	BARBER	56.	27.	68191.	6466422.	69	8	MEDLOG	0	1	3.34
MINER	NESS	44.	70.	240844.	1548500.	0	2	M	0	1	15.00

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MORAN	ALLEN	223.	3.	153370.	2951502.	53	1	M	0	1	1.88
MUDDY CREEK	BUTLER	19.	50.	9460.	1174212.	62	1	M	0	1	1.36
MURPHY	COWLEY	102.	33.	59006.	9987047.	74	10	MURPY	0	1	1.58
NEODESHA	MONTGOMERY	343.	1900.	48070.	2613337.	73	1	N	0	1	.38
NEOSHO FALLS-LEROY	ALLEN	186.	5.	77465.	2312318.	0	2	N	0	1	1.14
NETTIE	ROOKS	81.	48.	147906.	4290543.	65	5	N	0	1	5.00
NICHOLS	KIOWA	14.	55.	11898.	5560857.	0	1	N	0	1	2.33
NORTON	NORTON	110.	53.	152769.	9793097.	0	2	N	0	1	3.81
NUNN	FINNEY	29.	38.	40344.	3588270.	58	4	N	0	1	3.81
ORO	PAWNEE	8.	53.	5970.	1247517.	66	1	O	0	1	2.04
OTIS-ALBERT	RUSH	54.	30.	40772.	14672585.	0	4	O	0	1	2.07
OXFORD	SUMNER	23.	27.	58742.	17333235.	0	4	O	0	1	7.00
OXFORD W	SUMNER	8.	26.	7920.	1059427.	0	2	O	0	1	2.71
PADGETT	SUMNER	69.	25.	119127.	4798771.	0	7	P	0	1	4.73
PEABODY	MARION	23.	19.	21571.	1504728.	0	3	P	0	1	2.57
PLAINVILLE	ROOKS	50.	48.	83749.	1377082.	65	3	P	0	1	4.59
PLEASANT PRAIRIE	HASKELL	93.	54.	623604.	19592373.	66	5	P	0	1	18.37
POLHAMUS	GREENWOOD	22.	22.	7806.	3270941.	0	3	P	0	1	.97
POTTER	ELLIS	16.	56.	43151.	1783517.	0	4	P	0	1	7.39
QUINCY	GREENWOOD	135.	26.	104923.	5001016.	50	2	Q	0	1	2.13
RADIUM TOWNSITE	STAFFORD	45.	53.	132615.	2640794.	73	4	R	0	1	8.07
RAY	PHILLIPS	159.	40.	750700.	40388460.	0	5	R	0	1	12.94
RICHFIELD	MORTON	14.	48.	45605.	1500034.	0	3	R	0	1	8.92
RINGWALD	RICE	12.	49.	31487.	1654510.	61	2	R	0	1	7.19
RIVERSIDE	NESS	18.	65.	48142.	1245666.	0	2	R	0	1	7.33

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ROBBINS	SEDGWICK	18.	29.	14978.	6519134.	47	1	R	0	1	2.28
ROLINGSON	PRATT	19.	58.	47066.	1831664.	68	3	R	0	1	6.79
ROXBURY	MCPHERSON	20.	38.	31500.	4013000.	0	2	R	0	1	4.32
RUGGLES	OSBORNE	13.	52.	19653.	1173235.	0	3	R	0	1	4.14
SAND HILLS	STAFFORD	15.	44.	30968.	1052431.	73	4	S	0	1	5.66
SCHABEN	NESS	57.	63.	257905.	5596836.	0	2	S	0	1	12.40
SCHAOEL S	PAWNEE	18.	67.	94366.	1413600.	0	1	S	0	1	14.36
SCHOOL CREEK N	COWLEY	41.	53.	48215.	2203818.	63	3	S	0	1	3.22
SCOTT	GREENWOOD	15.	25.	0.	1580862.	45	1	S	0	1	0.00
SHAEFFER ROTHGARN	BARTON	57.	41.	111088.	4415461.	67	4	S	0	1	5.34
SHALLOW WATER	SCOTT	6.	34.	5101.	2147951.	68	3	S	0	1	2.33
SHARON	BARBER	33.	55.	20493.	1305791.	0	1	S	0	1	1.70
SINGLEY	MEADE	17.	55.	10299.	1077602.	0	2	S	0	1	1.66
SLICK CARSON	COWLEY	8.	24.	7618.	15985698.	0	4	S	0	1	2.61
SLINKER	PHILLIPS	25.	51.	50568.	1351617.	67	2	S	0	1	5.54
SMYRES	RICE	0.	42.	0.	2447643.	0	1	WLSHBN	2	1	0.00
SNIDER S	STAFFORD	32.	38.	76900.	4032827.	0	3	S	0	1	6.58
SPERLING	HARVEY	6.	35.	8505.	1090083.	0	2	S	0	1	3.88
SPIVEY GRABS BASIL	HARPER	705.	49.	1184599.	51026914.	0	7	SPIVY	0	1	4.60
SPIVEY-GRABS	KINGMAN	0.	56.	0.	12280891.	0	3	SPIVY	1	1	0.00
ST PAUL WALNUT	CRAWFORD	181.	0.	26802.	1248543.	58	1	S	0	1	.41
ST PETER	BARTON	38.	44.	51912.	4131296.	62	4	S	0	1	3.74
STAIRETT	HODGEMAN	12.	62.	50832.	1017909.	0	1	S	0	1	11.61
STEVENS	MEADE	21.	52.	13694.	2887348.	0	2	S	0	1	1.79
STOLTENBERG	BARTON	204.	31.	275280.	48687444.	0	5	S	0	1	3.70

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TALOGA	MORTON	48.	55.	184497.	4411548.	69	5	T	0	1	10.53
TEICHGRABER	GREENWOOD	118.	27.	85253.	2335947.	65	1	T	0	1	1.98
THRALL AGAARD	GREENWOOD	214.	21.	89530.	18558517.	48	1	T	0	1	1.15
TOULON	ELLIS	57.	35.	121222.	3959153.	67	2	T	0	1	5.83
TOWANDA	BUTLER	27.	48.	32964.	4320581.	54	1	T	0	1	3.34
TRAPP	RUSSELL	900.	29.	1335985.	208418071.	57	5	TRAPP	0	1	4.07
TRAPP E	RUSSELL	0.	49.	0.	0.	0	2	TRAPP	5	1	0.00
TRENT	NEOSHO	126.	0.	12952.	1014574.	68	1	T	0	1	.28
VALLEY CENTER	SEDGWICK	24.	28.	43345.	23128171.	65	3	V	0	1	4.95
VERNON	WOODSON	159.	38.	71636.	2433964.	63	99	V	0	1	1.23
VIRGIL N	COFFEY	443.	20.	373530.	10747016.	61	5	V	0	1	2.31
VOHS	ROOKS	25.	45.	59207.	4173581.	66	3	V	0	1	6.49
WAYSIDE-HAVANA	CHAUTAUQUA	593.	4.	132921.	4440172.	0	4	W	0	1	.61
WEATHERED	COWLEY	12.	35.	11728.	3259246.	0	5	W	0	1	2.68
WEBS	RUSH	5.	54.	15719.	1120001.	0	1	W	0	1	8.61
WEBSTER	ROOKS	30.	30.	25200.	3926538.	68	2	W	0	1	2.30
WELCH	RICE	0.	24.	0.	6248595.	0	1	WLSHBN	3	1	0.00
WELCH-BORNHOLDT	RICE	229.	24.	121031.	38612010.	0	1	WLSHBN	0	1	1.45
WELLINGTON	SUMNER	116.	29.	168635.	17340016.	53	2	W	0	1	3.98
WHELAN	BARBER	11.	34.	7566.	3726950.	0	2	W	0	1	1.88
WICHITA	SEDGWICK	24.	57.	28521.	2827345.	0	2	W	0	1	3.26
WIDE AWAKE	SEWARD	26.	54.	26842.	1011702.	0	3	W	0	1	2.83
WIELAND N	HODGEMAN	8.	59.	35508.	1345207.	0	2	W	0	1	12.16
WIGGINS	GREENWOOD	13.	25.	9035.	1793325.	66	2	W	0	1	1.90
WIL	EDWARDS	73.	42.	68671.	4619274.	0	5	W	0	1	2.58

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WILBURTON	MORTON	29.	59.	339238.	7969271.	66	1	W	0	1	32.05
WINTERSCHIED	COFFEY	351.	0.	288153.	9995399.	55	4	W	0	1	2.25
YAEGE	RILEY	38.	59.	86669.	2337094.	0	3	Y	0	1	6.25
ZENITH-PEACE CREEK	STAFFORD	67.	37.	104433.	42945700.	51	4	ZENPCE	0	1	4.27
BECHTHOLD	LIPSCOMB	19.	59.	49497.	1712155.	0	1	B	0	2	7.14
BRADFORD T	LIPSCOMB	34.	58.	72818.	2597076.	66	1	B	0	2	5.87
FARNSWORTH	OCHILTREE	93.	55.	1724045.	26241410.	55	1	F	0	2	50.79
FOLLETT W	LIPSCOMB	25.	61.	26982.	2385371.	0	1	F	0	2	2.96
HANSFORD N	HANSFORD	7.	56.	14761.	1808534.	64	1	H	0	2	5.78
KIOWA CREEK	LIPSCOMB	9.	63.	23105.	1827864.	0	1	K	0	2	7.03
PANHANDLE CRSN PENN	CARSON	1792.	21.	1574002.	129945420.	48	1	P	0	2	2.41
PANHANDLE MOOR RDCV	MOORE	251.	60.	835472.	2558533.	0	3	P	0	2	9.12
PANHANDLE WHLR OSB	WHEELER	81.	10.	45309.	5560084.	62	2	P	0	2	1.53
RHF	OCHILTREE	36.	56.	403004.	15564684.	64	1	R	0	2	30.67
SHARE SE	OCHILTREE	12.	59.	21717.	1899813.	0	1	S	0	2	4.96
TWIN	HANSFORD	12.	54.	11636.	2628936.	68	1	T	0	2	2.66
BODCAW	NEVADA	14.	0.	14587.	1062405.	74	3	B	0	3	2.85
BUCKNER	LAFAYETTE	19.	46.	85789.	5800000.	0	5	B	0	3	12.37
CATESVILLE	UNION	8.	50.	13576.	1069820.	56	3	C	0	3	4.65
CHAMPAGNOLLE B	UNION	234.	0.	341328.	27461555.	0	2	C	0	3	4.00
CHAMPAGNOLLE CV	UNION	26.	70.	65617.	1614363.	0	7	C	0	3	5.91
DORCHEAT MACEDONIACV	COLUMBIA	5.	56.	7671.	1109490.	66	1	D	0	3	4.20
EL DORADO E CV	UNION	16.	51.	80627.	1029091.	0	1	E	0	3	13.81
EL DORADO E OLD	UNION	28.	21.	23348.	11831875.	0	1	E	0	3	2.28
EL DORADO S NACATOCH	UNION	93.	20.	76591.	54667328.	0	1	E	0	3	2.26

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FOUKE N PALUXY	MILLER	10.	51.	16911.	1381138.	63	1	F	0	3	4.63
FOUKE N TUSCALOOSA	MILLER	37.	58.	59496.	2878616.	0	1	F	0	3	4.41
FOUKE TOKIO	MILLER	19.	52.	33506.	1115465.	0	1	F	0	3	4.83
GARLAND CITY OLD	MILLER	6.	32.	2461.	2518589.	0	1	G	0	3	1.12
GENOA PALUXY	MILLER	39.	57.	832.	1412891.	62	1	G	0	3	.06
HIBANK NACATOCH	UNION	154.	42.	30749.	2375085.	0	1	H	0	3	.55
HILLSBORO NACATOCH	UNION	36.	30.	16546.	1610975.	0	1	H	0	3	1.26
IRMA TOKIO	NEVADA	17.	63.	68179.	3022301.	0	1	I	0	3	10.99
LEWISVILLE OLDTN PXY	LAFAYETTE	9.	58.	10845.	1688931.	0	1	L	0	3	3.30
LISBON NW	UNION	38.	57.	49037.	1726078.	64	1	L	0	3	3.54
LISBON OLD	UNION	44.	25.	15313.	8168890.	0	1	L	0	3	.95
MCKINNEY BAYOU PXY	MILLER	15.	55.	29538.	1585184.	0	1	M	0	3	5.40
NEW LONDON	UNION	10.	42.	39620.	4211932.	0	1	N	0	3	10.85
NICK SPRINGS W MKN	UNION	6.	50.	15088.	1505005.	0	1	N	0	3	6.89
PACE CITY GLN ROSE	QUACHITA	12.	47.	15734.	1060076.	0	1	P	0	3	3.59
SCHULER E CTN VALY	UNION	13.	51.	25011.	1170447.	0	1	S	0	3	5.27
SCHULER JONES	UNION	76.	37.	372098.	75790307.	41	1	S	0	3	13.41
SMACKOVER TRVS PEK	QUACHITA	15.	61.	10576.	3959692.	0	1	S	0	3	1.93
SNOW HILL CTN VALY	QUACHITA	20.	55.	21691.	3826289.	0	1	S	0	3	2.97
SPIRIT LAKE PALUXY	LAFAYETTE	15.	61.	16055.	2385121.	72	1	S	0	3	2.93
STAMPS PALUXY	LAFAYETTE	16.	58.	57318.	1481962.	0	1	S	0	3	9.81
STEPHENS BUCKRANGE	QUACHITA	815.	22.	221917.	21208809.	69	1	S	0	3	.75
STEPHENS HOGG	COLUMBAI	14.	49.	91505.	5722614.	50	1	S	0	3	17.91
URBANA CRAIN	UNION	5.	40.	2913.	2491387.	0	1	U	0	3	1.60
URBANA GREG-URBANA	UNION	27.	29.	31413.	9594537.	0	2	U	0	3	3.19

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URBANA TRAVIS PEAK	UNION	30.	51.	45324.	2318717.	58	1	U	0	3	4.14
WESSON BLSM-BKRANGE	QUACHITA	79.	47.	44676.	2537656.	68	1	W	0	3	1.55
WESSON HOGG	QUACHITA	78.	46.	311200.	36041091.	48	1	W	0	3	10.93
WESSON TRAVIS PEAK	QUACHITA	9.	46.	32712.	3697288.	0	1	W	0	3	9.96
WOODLEY W	UNION	121.	54.	60251.	2666641.	0	1	W	0	3	1.36
BIG BEAVER J	WASHINGTON	15.	54.	146144.	11393143.	0	1	B	0	4	26.69
BISON J	WASHINGTON	15.	60.	138458.	4353096.	0	1	B	0	4	25.29
BLACK HOLLOW LYONS	WELD	6.	53.	95599.	9820326.	58	1	B	0	4	43.65
BOBCAT D	WASHINGTON	8.	54.	18276.	6983422.	68	1	B	0	4	5.26
BOXER D	MORGAN	15.	65.	65834.	2105940.	72	1	B	0	4	12.02
BRANDON MISS	KIOWA	37.	59.	434241.	7295683.	0	1	B	0	4	32.15
CLIFF D	LOGAN	8.	55.	25837.	5642939.	0	1	C	0	4	8.85
DIVIDE D	LOGAN	7.	52.	15427.	3726531.	60	1	D	0	4	6.04
FORT COLLINS MUDDY	LARIMER	9.	24.	17279.	3500663.	0	1	F	0	4	5.26
GRAYLIN NW D	LOGAN	12.	51.	78434.	11170895.	60	1	G	0	4	17.91
GRAYLIN NW J	LOGAN	7.	51.	47802.	1254477.	69	1	G	0	4	18.71
HYDE D	WASHINGTON	10.	55.	41426.	1754573.	0	1	H	0	4	11.35
LITTLE BEAVER D	WASHINGTON	17.	51.	34773.	13399188.	58	1	L	0	4	5.60
MERINO J	LOGAN	7.	50.	23301.	3951822.	0	1	M	0	4	9.12
MOUNT HOPE D	LOGAN	14.	50.	34707.	6641205.	63	1	M	0	4	6.79
MOUNT HOPE E D	LOGAN	6.	54.	27471.	1916033.	0	1	M	0	4	12.54
PIERCE LYONS	WELD	8.	55.	393674.	8734300.	66	1	P	0	4	134.82
RODERICK J	WASHINGTON	6.	56.	25443.	1740489.	0	1	R	0	4	11.62
RUSH WILLADEL J	WASHINGTON	9.	61.	172019.	3862733.	0	1	R	0	4	52.37
SAND RIVER D	MORGAN	11.	54.	21174.	3623162.	0	1	S	0	4	5.27

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SINGLETREE	WELD	43.	72.	716783.	1111233.	0	1	S	0	4	45.67
THIRD CREEK J	ADAMS	48.	71.	66662.	2739994.	0	1	T	0	4	3.80
WELLINGTON	LARIMER	11.	23.	19753.	7313707.	0	2	W	0	4	4.92
YENTER J	LOGAN	11.	50.	62002.	9774322.	0	1	Y	0	4	15.44
AUE-GRIFFITH	KIMBALL	6.	56.	36869.	3744185.	61	1	A	0	5	16.84
BALTENSPERGER	KIMBALL	8.	53.	13882.	1607164.	0	2	B	0	5	4.75
DORMAN	CHEYENNE	10.	50.	32816.	4453300.	0	3	D	0	5	8.99
ENDERS	KIMBALL	13.	52.	52960.	8736168.	56	1	E	0	5	11.16
FALLS CITY	RICHARDSON	9.	39.	35056.	5277208.	0	1	F	0	5	10.67
HARRISBURG	BANNER	16.	51.	19949.	5877691.	61	3	H	0	5	3.42
HUNTSMAN	CHEYENNE	9.	50.	36420.	3711636.	0	2	H	0	5	11.09
ITTNER	CHEYENNE	6.	54.	5584.	1275639.	0	1	I	0	5	2.55
JOHNSON	CHEYENNE	9.	51.	64083.	3566461.	0	2	J	0	5	19.51
KIMBALL	KIMBALL	8.	54.	29878.	6430552.	59	1	K	0	5	10.23
LONG	KIMBALL	10.	52.	24965.	5431833.	61	2	L	0	5	6.84
MIDWAY	RED WILLOW	13.	61.	79690.	1216449.	0	1	M	0	5	16.79
MINATARE	SCOTTS BLU	6.	64.	52830.	1260918.	0	1	M	0	5	24.12
OLSEN	MORRILL	8.	55.	25851.	5674920.	0	1	O	0	5	3.85
POTTER SW	CHEYENNE	11.	51.	30485.	6986973.	59	2	P	0	5	7.59
PREBLE	CHEYENNE	8.	52.	23798.	2795367.	0	1	P	0	5	8.15
RIGGS	KIMBALL	5.	56.	13053.	1847944.	0	1	R	0	5	7.15
SIMPSON	KIMBALL	7.	58.	21470.	1889133.	0	1	S	0	5	8.40
SINGLETON	BANNER	16.	58.	107355.	9997956.	0	1	S	0	5	19.38
SLEEPY HOLLOW	RED WILLOW	91.	60.	1313104.	36904428.	0	2	S	0	5	39.53
SLOSS	KIMBALL	8.	54.	75724.	16538371.	58	1	S	0	5	25.93

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SPEAROW	CHEYENNE	9.	52.	44597.	2626024.	0	1	S	0	5	13.58
STAGE HILL	BANNER	8.	64.	99655.	1372975.	0	1	S	0	5	34.13
TORGESON	KIMBALL	10.	51.	36112.	3956306.	0	1	T	0	5	9.89
VEDENE	BANNER	6.	56.	14961.	3587345.	59	3	V	0	5	6.83
WILLSON RANCH	BANNER	8.	57.	33554.	8048415.	61	1	W	0	5	11.49