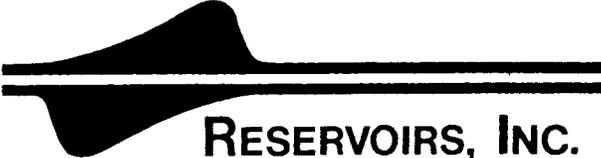


SPECIAL CORE ANALYSIS

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSB 3036

Basic Rock Properties

Formation Resistivity Factor At Confining Pressure  
Formation Resistivity Index At Confining Pressure  
Standard Mercury Injection Capillary Pressure  
High Pressure Mercury Injection Capillary Pressure



# RESERVOIRS, INC.

1151 BRITTMORE ROAD

HOUSTON, TEXAS 77043

GEOLOGICAL ANALYSIS • CLASTICS/CARBONATES

SINGLE WELL/FIELD/REGIONAL STUDIES

WELL COMPLETION/STIMULATION STUDIES

ROUTINE AND SPECIAL CORE ANALYSIS

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January 4, 1995

Mr. Todd Montgomery  
Anadarko Petroleum Corporation  
17001 Northchase Drive  
Houston, Texas 77060

Dear Mr. Montgomery:

Full diameter conventional core analysis was performed on well cores recovered from the Anadarko Petroleum Corporation, Youngren "J" 1-H Well located in Stevens County, Kansas. The test results were presented in a final report dated August 19, 1994. On the basis of the full diameter conventional core analysis data, Reservoirs, Inc. was requested and authorized to perform a special core analysis study for the above referenced well. Approximately one hundred (100) core plug samples, one and one half inches in diameter were drilled from the two-thirds (2/3) slabbed portion of the well cores from the depth interval of 2480 ft. to 2953 ft. Each sample was thoroughly cleaned using a hot soxhlet extraction process and the basic rock properties determined.

Samples were subsequently selected for special core analysis tests, a summary of the testing schedule is presented in Table 1. The following special core analyses were performed:

- Formation Resistivity Factor At Confining Pressure
- Formation Resistivity Index At Confining Pressure
- Standard Mercury Injection Capillary Pressure
- High Pressure Mercury Injection Capillary Pressure

A simulated formation brine based upon an analysis (Table 3) provided by Halliburton Services for the Anadarko Petroleum Corporation Tucker 3-19 Well, located in Morton County, Kansas was used during the electrical properties analyses. In addition, the confining pressure to be used during the analyses was derived from Nelson's Equation, using a reservoir pressure of 150 psig and a Poisson's Ratio ( $\nu$ ) of 0.30. Nelson's Equation is described separately in the section entitled "Laboratory Procedures".

Preliminary test results of the special core analyses were forwarded periodically to Mr. Todd Montgomery of the Anadarko Petroleum Corporation and to Mr. John T. Kulha of Loren & Associates as the data became available. This report presents the

basic rock properties, electrical properties and mercury injection capillary pressure test results in both tabular and graphical formats. These test results supersede all previously issued preliminary test results.

The basic rock properties test results are presented in Table 2 and Figures 1 and 2. Examination of Table 2 indicates the specific permeabilities to gas ranged from  $<0.001$  md to 144 md and the porosities ranged from 5.1 to 27.1 percent of the bulk volume. Figure 1 presents the relationship of specific permeability to gas-porosity. Grain densities and bulk densities ranged from 2.64 to 2.85 g/cc and from 1.96 to 2.60 g/cc, respectively. Figure 2 presents the relationship of bulk density-porosity.

The formation resistivity factor test results are presented in Table 4 and Figure 3. The formation resistivity factors ranged from 11.92 to 333.10 and the individual cementation exponent ( $m$ ) derived for each sample ranged from 1.77 to 3.45. Figure 3 presents the composite graphical presentation of formation resistivity factor-porosity and the composite cementation exponent was  $m = 2.02$

Tables 5 through 34 and Figures 4 through 33 present the individual formation resistivity index-saturation relationships. The saturation exponents ( $n$ ) ranged from 1.21 to 2.03 and Figure 34 presents the composite relationship of formation resistivity index-saturation for all of the samples analyzed. Several trends were apparent from the test results presented in Figure 34. The saturation exponents ( $n$ ) indicated by the dashed lines represent the minimum and maximum saturation exponents of  $n = 1.21$  and  $n = 2.03$ .

Standard mercury injection capillary pressure and derived pore size distribution data are presented in Tables 35 through 44 and Figures 35 through 64. Final wetting phase saturations attained at the maximum pressure of 2000 psia ranged from 5.8 to 24.5 percent of the pore volume. Examination of Figures 35 through 64 indicates several different pore geometrical systems were represented by the samples analyzed and are evident in the capillary pressure-saturation and pore size distribution profiles. In addition, high pressure mercury injection capillary pressure tests were performed on two (2) samples to a maximum injection pressure of approximately 60,000 psia. The results of these tests are presented in Tables 45 and 46 and Figures 65 through 70.

Mr. Todd Montgomery  
Anadarko Petroleum Corporation  
Page 3

It has been a pleasure to be of service to you and the Anadarko Petroleum Corporation, and Reservoirs, Inc. looks forward to working together with you on future projects. If you should have any questions pertaining to the test results, the procedures used to obtain the test results or if I can be of any further service, please do not hesitate to contact me at (713) 932-9670.

Sincerely,

*Paul Delacoe*

Paul Delacoe  
Manager  
Special Core Analysis  
RESERVOIRS, INC.

## LABORATORY PROCEDURES

### Sample Preparation

One and one-half inch (1-1/2") diameter core plug samples were drilled from each of the selected two-thirds (2/3) slabbed portion of the core segments using water. The ends of the sample were trimmed to form a right cylinder using a diamond rimmed sawblade and water as the sawblade coolant and lubricant. Each sample was subsequently labeled with a Reservoirs' identification using indelible ink, and cleaned using a hot soxhlet extraction process. Toluene and methanol were the solvents used during the process. The samples were subsequently dried in a conventional oven prior to determination of the basic rock properties.

### Basic Rock Properties

The **bulk volume** of each core plug sample was determined by mercury immersion (Archimedes' principle) and confirmed by measuring the length and diameter of each sample with calipers and calculating the bulk volume.

The **porosity** and **grain density** of each core plug sample was determined using the Boyle's law method and helium as the gaseous phase. The sample was placed in a matrix cup (sealed chamber) of known volume. Another chamber of known volume containing helium at a preselected pressure was connected to the matrix cup. The helium expanded into the matrix cup, and an equilibrium pressure was recorded. Using Boyle's law, the grain volume of the sample being tested can be determined. The grain volume subtracted from the bulk volume of the sample results in the pore volume of the sample. Porosity is the pore volume expressed as a percent of the bulk volume.

The **grain density** is the weight of the core material per unit volume of the core material (grain volume). The weight of the core material is determined by weighing the clean and dry sample on a pan-balance at ambient conditions. The grain volume is obtained from the Boyle's law calculation.

The **specific permeability** to gas was determined by placing each sample in a Hassler-type core holder. A confining pressure of 400 psig was applied to the system to prevent bypassing of the gas around the sample. Nitrogen gas was injected into each sample at a constant pressure until a constant flow rate of gas through the sample was attained (steady-state conditions). The specific permeability to gas was calculated using the Darcy equation.

#### **Sample Saturation (Vacuum-Pressure Method)**

Each clean and dried core plug sample selected for special core analysis testing was weighed and placed in a vacuum-pressure saturation chamber. The system was evacuated to a pressure of fifty (50) microns for a period of twelve (12) hours. A simulated formation brine (Table 3) was injected into the chamber until the level of the fluid was above the samples. A pressure of 1200 psig was applied to the system for a minimum of six (6) hours. The chamber was depressured and each sample was removed from the fluid and weighed. The pore volume was calculated gravimetrically using the dry weight and the saturated weight of each sample and the corresponding density of the fluid. This pore volume was compared to the pore volume previously derived by the Boyle's Law helium porosity method, to ensure one hundred percent (100%) saturation.

#### **Formation Resistivity Factor At Confining Pressure**

Each saturated sample was weighed and individually mounted in a hydrostatic core holder with a silver electrode/distribution plate at the upstream of the sample and a silver electrode/ capillary pressure porous-plate at the downstream of the sample. A confining pressure of 400 psig was applied to the system to prevent bypassing of fluid around the sample.

Several pore volumes of simulated formation brine were injected through the sample to ensure the sample and system were completely saturated with the brine. The resistance of the saturated sample was determined at a frequency of 1000 Hz, using a GenRad® meter. The determinations performed at the confining pressure of 400 psig are for

the purpose of quality control.

A pipette was attached to the system, and the confining pressure was slowly increased to a confining pressure which was derived from Nelson's Equation:

$$\frac{\text{Average Depth} - \text{Reservoir Pressure}}{3} \bullet \frac{(1+v)}{(1-v)}$$

Where: Average depth is in feet  
Reservoir pressure is in psig  
 $v$  = Poisson's Ratio

Given Values: Average depth = 2564 ft. (2430 - 2648 ft.)  
Average depth = 2818 ft. (2682 - 2953 ft.)  
Reservoir pressure = 150 psig  
Poisson's Ratio  $v$  = 0.30

The sample and system were allowed to stabilize for several hours. The volume of brine produced into the pipette is equivalent to the reduction in the pore volume. The porosity at confining pressure was calculated from these test results.

The resistance of the equilibrated sample was determined over a period of several hours to ensure that the sample had stabilized (ionic equilibrium). A frequency of 1000 Hz was used to determine the resistance. The resistance and the porosity at confining pressure (previously determined) and the resistance of the simulated formation brine were used to calculate the formation resistivity factor and cementation exponent ( $m$ ) for each sample.

#### Formation Resistivity Index At Confining Pressure

Immediately following the formation resistivity factor at confining pressure test, the sample was injected with nitrogen gas. The nitrogen was injected into the sample to displace the simulated formation brine through the capillary pressure porous-plate mounted at the downstream end of the sample. The resistance of the sample was determined as a function of the corresponding volume of brine produced. The resistance was measured at a frequency of 1000 Hz. The formation resistivity indices ( $I$ ), saturation exponents ( $n$ ) and the corresponding water saturations were calculated from the test results.

At the conclusion of the test, the confining pressure was removed and the sample was unloaded from the core holder. The sample was weighed to gravimetrically determine the final water saturation present in the sample. This saturation was compared to the final saturation determined volumetrically at the conclusion of the test to verify the test results.

#### Standard Mercury Injection Capillary Pressure

Each sample selected for testing was placed in the pycnometer (injection chamber) of the mercury injection apparatus, and evacuated to 50 microns of pressure. Mercury was injected at a predetermined pressure and maintained at that pressure until capillary equilibrium was achieved (mercury intrusion into the sample ceased). The pressure and the volume of mercury injected into the sample were recorded. The pressure was then increased and the procedure repeated. The range of injection pressure utilized during the standard mercury injection test was 0-2000 psia.

#### High Pressure Mercury Injection Capillary Pressure

Each sample selected for testing was placed in the chamber of Micromeritics' Auto Pore II and evacuated to 50 microns of pressure. The mercury was injected into the sample at a constant rate and the pressure was continuously monitored until  $\approx 60,000$  psia had been attained. The test results are presented in tabular and graphical formats.

#### Pore Size Distribution

The pore size distribution was derived from the mercury injection capillary pressure data using the following equation:

$$R_i = \frac{2 \gamma \cos \theta}{P_c} C$$

Where:  $R_i$  = Pore Radii (microns)  
 $P_c$  = Capillary Pressure in laboratory (psia)  
 $\gamma$  = Interfacial Tension (dynes/cm)  
 $\theta$  = Contact Angle (degrees)  
 $C$  = Conversion Constant equal to  $145 \times 10^{-3}$

Leverett's J-Function was derived from the mercury injection capillary pressure data using the following equation:

$$J(S_w) = \frac{P_c}{\gamma \cos \theta} \left( \frac{k}{\phi} \right)^{\frac{1}{2}}$$

Where:  $P_c$  = Capillary pressure in laboratory (dynes/cm<sup>2</sup>)  
 $\gamma$  = Interfacial tension (dynes/cm)  
 $\theta$  = Contact angle (degrees)  
 $k$  = Permeability (cm<sup>2</sup>)  
 $\phi$  = Fractional porosity

For Air-Mercury System:

$\gamma$  air-mercury = 480 dynes/cm  
Contact angle  $\theta$  air-mercury = 140°  
Cosine 140° = 0.766

Table 1

TEST SCHEDULE SUMMARY

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft.)</u> | <u>Basic Rock<br/>Properties</u> | <u>Formation<br/>Resistivity<br/>Factor</u> | <u>Formation<br/>Resistivity<br/>Index</u> | <u>Mercury<br/>Injection</u> |
|---------------|------------------------|----------------------------------|---|--|------------------------------|
| C 632         | 2480.4                 | X                                | -   | -  | -                            |
| C 633         | 2481.8                 | X                                | X   | X  | -                            |
| D 140         | 2483.3                 | X                                | -   | -  | -                            |
| D 141         | 2483.5                 | X                                | -   | -  | -                            |
| D 459         | 2507.2                 | X                                | -   | -  | -                            |
| D 460         | 2507.7                 | X                                | -   | -  | X                            |
| C 634         | 2514.9                 | X                                | -   | -  | -                            |
| C 635         | 2515.3                 | X                                | X   | X  | -                            |
| C 636         | 2518.2                 | X                                | X   | X  | -                            |
| C 637         | 2518.4                 | X                                | -   | -  | -                            |
| C 638         | 2525.8                 | X                                | -   | -  | -                            |
| C 639         | 2526.4                 | X                                | X   | X  | X                            |
| D 456         | 2530.3                 | X                                | -   | -  | X                            |
| D 457         | 2530.9                 | X                                | -   | -  | -                            |
| D 458         | 2531.5                 | X                                | -   | -  | -                            |
| C 640         | 2531.9                 | X                                | -   | -  | -                            |
| C 641         | 2532.3                 | X                                | X   | X  | -                            |
| D 142         | 2532.7                 | X                                | -   | -  | -                            |
| D 143         | 2532.8                 | X                                | -   | -  | X                            |
| C 622#        | 2542.7                 | X                                | X   | -  | -                            |
| C 623#        | 2543.1                 | X                                | -   | -  | -                            |
| C 624#        | 2543.5                 | X                                | -   | -  | -                            |
| C 625#        | 2543.9                 | X                                | -   | -  | -                            |
| D 144         | 2544.1                 | X                                | -   | -  | -                            |
| C 626#        | 2544.2                 | X                                | X   | -  | -                            |

# Denotes "red bed" sample.

Table 1 (Continued)

TEST SCHEDULE SUMMARY

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft.)</u> | <u>Basic Rock<br/>Properties</u> | <u>Formation<br/>Resistivity<br/>Factor</u> | <u>Formation<br/>Resistivity<br/>Index</u> | <u>Mercury<br/>Injection</u> |
|---------------|------------------------|----------------------------------|---|--|------------------------------|
| D 145A        | 2544.4                 | X                                | -   | -  | X                            |
| D 145B        | 2544.4                 | X                                | -   | -  | -                            |
| C 627#        | 2544.8                 | X                                | -   | -  | -                            |
| C 628#        | 2545.2                 | X                                | -   | -  | -                            |
| C 629#        | 2545.9                 | X                                | -   | -  | -                            |
| C 630#        | 2548.0                 | X                                | -   | -  | -                            |
| C 642         | 2552.9                 | X                                | X   | X  | -                            |
| C 643         | 2553.1                 | X                                | -   | -  | -                            |
| D 146         | 2570.4                 | X                                | -   | -  | -                            |
| D 147         | 2570.6                 | X                                | -   | -  | X                            |
| C 644         | 2573.2                 | X                                | -   | -  | -                            |
| C 645         | 2573.5                 | X                                | X   | X  | -                            |
| C 646         | 2578.4                 | X                                | -   | -  | -                            |
| C 647         | 2578.7                 | X                                | X   | X  | -                            |
| D 148         | 2612.5                 | X                                | -   | -  | -                            |
| D 149         | 2612.5                 | X                                | -   | -  | X                            |
| C 648         | 2612.9                 | X                                | -   | -  | -                            |
| C 649         | 2613.2                 | X                                | X   | X  | -                            |
| C 650         | 2625.3                 | X                                | -   | -  | -                            |
| C 651         | 2625.9                 | X                                | X   | X  | -                            |
| C 652         | 2637.8                 | X                                | X   | X  | -                            |
| C 653         | 2638.2                 | X                                | X   | X  | -                            |
| D 150         | 2643.8                 | X                                | -   | -  | X                            |
| D 151         | 2644.0                 | X                                | -   | -  | -                            |

# Denotes "red bed" sample.

Table 1 (Continued)

TEST SCHEDULE SUMMARY

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft.)</u> | <u>Basic Rock<br/>Properties</u> | <u>Formation<br/>Resistivity<br/>Factor</u> | <u>Formation<br/>Resistivity<br/>Index</u> | <u>Mercury<br/>Injection</u> |
|---------------|------------------------|----------------------------------|---|--|------------------------------|
| C 654         | 2647.3                 | X                                | -   | -  | -                            |
| C 655         | 2647.6                 | X                                | X   | X  | -                            |
| C 683         | 2682.6                 | X                                | X   | X  | -                            |
| C 684         | 2683.2                 | X                                | -   | -  | -                            |
| D 152         | 2683.4                 | X                                | -   | -  | X                            |
| D 153         | 2683.8                 | X                                | -   | -  | -                            |
| D 154         | 2694.6                 | X                                | -   | -  | X                            |
| D 155         | 2694.8                 | X                                | -   | -  | -                            |
| C 685         | 2704.7                 | X                                | X   | X  | -                            |
| C 686         | 2705.1                 | X                                | -   | -  | -                            |
| D 156         | 2739.7                 | X                                | -   | -  | -                            |
| D 157         | 2739.8                 | X                                | -   | -  | X                            |
| C 687         | 2740.1                 | X                                | X   | X  | -                            |
| C 688         | 2740.3                 | X                                | -   | -  | -                            |
| C 689         | 2743.1                 | X                                | X   | -  | -                            |
| C 690         | 2743.4                 | X                                | -   | -  | -                            |
| D 158         | 2758.1                 | X                                | -   | -  | -                            |
| D 159         | 2758.3                 | X                                | -   | -  | -                            |
| D 160         | 2766.7                 | X                                | -   | -  | X                            |
| D 161         | 2766.8                 | X                                | -   | -  | -                            |
| C 691         | 2768.8                 | X                                | X   | X  | -                            |
| C 692         | 2769.1                 | X                                | -   | -  | -                            |
| C 713#        | 2793.5                 | X                                | X   | X  | -                            |
| C 714#        | 2793.7                 | X                                | -   | -  | -                            |
| C 693         | 2793.9                 | X                                | X   | X  | -                            |
| C 694         | 2794.5                 | X                                | -   | -  | -                            |

# Denotes "red bed" sample.

Table 1 (Continued)

TEST SCHEDULE SUMMARY

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth<br/>(ft.)</u> | <u>Basic Rock<br/>Properties</u> | <u>Formation<br/>Resistivity<br/>Factor</u> | <u>Formation<br/>Resistivity<br/>Index</u> | <u>Mercury<br/>Injection</u> |
|---------------|------------------------|----------------------------------|---|--|------------------------------|
| C 715#        | 2802.3                 | X                                | -   | -  | -                            |
| C 716#        | 2802.6                 | X                                | X   | X  | -                            |
| C 717#        | 2804.9                 | X                                | -   | -  | -                            |
| C 718#        | 2805.2                 | X                                | X   | -  | -                            |
| C 695         | 2869.8                 | X                                | -   | -  | -                            |
| C 696         | 2870.3                 | X                                | X   | X  | -                            |
| C 697         | 2878.6                 | X                                | -   | -  | -                            |
| C 698         | 2878.9                 | X                                | X   | X  | -                            |
| C 699         | 2896.0                 | X                                | -   | -  | -                            |
| C 700         | 2896.3                 | X                                | X   | X  | -                            |
| C 701         | 2897.4                 | X                                | -   | -  | -                            |
| C 702         | 2897.6                 | X                                | X   | X  | -                            |
| C 703         | 2916.7                 | X                                | -   | -  | -                            |
| C 704         | 2917.3                 | X                                | X   | X  | -                            |
| C 705         | 2917.6                 | X                                | -   | -  | -                            |
| C 706         | 2918.1                 | X                                | X   | X  | -                            |
| C 719#        | 2925.5                 | X                                | X   | X  | -                            |
| C 720#        | 2925.7                 | X                                | -   | -  | -                            |
| C 707         | 2932.3                 | X                                | X   | X  | -                            |
| C 708         | 2932.5                 | X                                | -   | -  | -                            |
| C 709         | 2951.5                 | X                                | X   | X  | -                            |
| C 710         | 2951.7                 | X                                | -   | -  | -                            |
| C 711         | 2952.2                 | X                                | X   | X  | -                            |
| C 712         | 2952.6                 | X                                | -   | -  | -                            |

# Denotes "red bed" sample.

Table 2

BASIC ROCK PROPERTIES

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth<br/>(ft.)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Grain<br/>Density<br/>(g/cc)</u> | <u>Bulk<br/>Density<br/>(g/cc)</u> |
|---------------|------------------------|-------------------------------------|----------------------------|-------------------------------------|------------------------------------|
| C 632         | 2480.4                 | 3.05                                | 14.6                       | 2.73                                | 2.33                               |
| C 633         | 2481.8                 | 10.1                                | 17.6                       | 2.71                                | 2.23                               |
| D 140         | 2483.3                 | 3.12                                | 14.2                       | 2.69                                | 2.31                               |
| D 141         | 2483.5                 | 2.33                                | 13.5                       | 2.70                                | 2.34                               |
| D 459         | 2507.2                 | 0.406                               | 11.8                       | 2.84                                | 2.50                               |
| D 460         | 2507.7                 | 0.526                               | 12.1                       | 2.84                                | 2.50                               |
| C 634         | 2514.9                 | 1.36                                | 12.8                       | 2.84                                | 2.48                               |
| C 635         | 2515.3                 | 1.61                                | 11.4                       | 2.83                                | 2.51                               |
| C 636         | 2518.2                 | 31.4                                | 15.1                       | 2.85                                | 2.42                               |
| C 637         | 2518.4                 | 24.4                                | 14.4                       | 2.84                                | 2.44                               |
| C 638         | 2525.8                 | 0.022                               | 11.0                       | 2.84                                | 2.53                               |
| C 639         | 2526.4                 | 63.0                                | 19.3                       | 2.83                                | 2.29                               |
| D 456         | 2530.3                 | 25.1                                | 16.0                       | 2.84                                | 2.39                               |
| D 457         | 2530.9                 | 39.6                                | 19.8                       | 2.83                                | 2.27                               |
| D 458         | 2531.5                 | 11.9                                | 13.9                       | 2.84                                | 2.45                               |
| C 640         | 2531.9                 | 1.84                                | 12.5                       | 2.84                                | 2.48                               |
| C 641         | 2532.3                 | 8.74                                | 14.0                       | 2.84                                | 2.45                               |
| D 142         | 2532.7                 | 3.87                                | 14.9                       | 2.79                                | 2.38                               |
| D 143         | 2532.8                 | 6.71                                | 15.4                       | 2.79                                | 2.36                               |
| C 622#        | 2542.7                 | 0.010                               | 11.0                       | 2.76                                | 2.46                               |
| C 623#        | 2543.1                 | 0.078                               | 9.8                        | 2.79                                | 2.51                               |
| C 624#        | 2543.5                 | 0.017                               | 8.2                        | 2.76                                | 2.53                               |
| C 625#        | 2543.9                 | 8.66*                               | 9.3                        | 2.74                                | 2.49                               |
| D 144         | 2544.1                 | 0.005                               | 8.9                        | 2.77                                | 2.52                               |
| C 626#        | 2544.2                 | 0.004                               | 8.7                        | 2.78                                | 2.54                               |

\* Denotes sample contains fracture(s). Permeability to gas may be anomalously high.

# Denotes "red bed" sample.

Table 2 (Continued)

BASIC ROCK PROPERTIES

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth<br/>(ft.)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Grain<br/>Density<br/>(g/cc)</u> | <u>Bulk<br/>Density<br/>(g/cc)</u> |
|---------------|------------------------|-------------------------------------|----------------------------|-------------------------------------|------------------------------------|
| D 145A        | 2544.4                 | 0.006                               | 8.1                        | 2.80                                | 2.57                               |
| D 145B        | 2544.4                 | 0.006                               | 8.8                        | 2.76                                | 2.51                               |
| C 627#        | 2544.8                 | <0.001                              | 9.2                        | 2.77                                | 2.51                               |
| C 628#        | 2545.2                 | 13.1*                               | 10.4                       | 2.79                                | 2.50                               |
| C 629#        | 2545.9                 | 0.073*                              | 10.6                       | 2.78                                | 2.49                               |
| C 630#        | 2548.0                 | <0.001                              | 10.6                       | 2.76                                | 2.47                               |
| C 642         | 2552.9                 | 144                                 | 26.0                       | 2.65                                | 1.96                               |
| C 643         | 2553.1                 | 139                                 | 24.5                       | 2.64                                | 2.00                               |
| D 146         | 2570.4                 | 0.832                               | 13.0                       | 2.73                                | 2.37                               |
| D 147         | 2570.6                 | 1.01                                | 13.5                       | 2.73                                | 2.36                               |
| C 644         | 2573.2                 | 8.86                                | 18.8                       | 2.83                                | 2.30                               |
| C 645         | 2573.5                 | 7.64                                | 19.1                       | 2.83                                | 2.29                               |
| C 646         | 2578.4                 | 0.616                               | 12.6                       | 2.70                                | 2.36                               |
| C 647         | 2578.7                 | 0.779                               | 12.6                       | 2.71                                | 2.37                               |
| D 148         | 2612.5                 | 33.3                                | 19.2                       | 2.68                                | 2.17                               |
| D 149         | 2612.5                 | 34.8                                | 19.5                       | 2.69                                | 2.16                               |
| C 648         | 2612.9                 | 36.6                                | 20.2                       | 2.69                                | 2.15                               |
| C 649         | 2613.2                 | 35.7                                | 20.7                       | 2.68                                | 2.13                               |
| C 650         | 2625.3                 | 1.35                                | 13.9                       | 2.70                                | 2.33                               |
| C 651         | 2625.9                 | 1.69                                | 14.4                       | 2.71                                | 2.32                               |
| C 652         | 2637.8                 | 0.856                               | 27.1                       | 2.71                                | 1.97                               |
| C 653         | 2638.2                 | 4.52                                | 22.9                       | 2.70                                | 2.08                               |
| D 150         | 2643.8                 | 5.91                                | 17.6                       | 2.72                                | 2.24                               |
| D 151         | 2644.0                 | 5.82                                | 17.7                       | 2.73                                | 2.24                               |

\* Denotes sample contains fracture(s). Permeability to gas may be anomalously high.

# Denotes "red bed" sample.

Table 2 (Continued)

BASIC ROCK PROPERTIES

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSR 3036

| <u>Sample</u> | <u>Depth<br/>(ft.)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Grain<br/>Density<br/>(g/cc)</u> | <u>Bulk<br/>Density<br/>(g/cc)</u> |
|---------------|------------------------|-------------------------------------|----------------------------|-------------------------------------|------------------------------------|
| C 654         | 2647.3                 | 2.44                                | 17.1                       | 2.74                                | 2.27                               |
| C 655         | 2647.6                 | 3.39                                | 17.5                       | 2.74                                | 2.26                               |
| C 683         | 2682.6                 | 0.532                               | 15.9                       | 2.75                                | 2.31                               |
| C 684         | 2683.2                 | 0.441                               | 13.4                       | 2.73                                | 2.37                               |
| D 152         | 2683.4                 | 0.698                               | 12.1                       | 2.73                                | 2.40                               |
| D 153         | 2683.8                 | 0.650                               | 13.1                       | 2.72                                | 2.36                               |
| D 154         | 2694.6                 | 0.338                               | 12.7                       | 2.74                                | 2.40                               |
| D 155         | 2694.8                 | 0.301                               | 13.0                       | 2.74                                | 2.39                               |
| C 685         | 2704.7                 | 0.159                               | 10.5                       | 2.72                                | 2.44                               |
| C 686         | 2705.1                 | 0.231                               | 12.0                       | 2.73                                | 2.40                               |
| D 156         | 2739.7                 | 0.120                               | 9.2                        | 2.68                                | 2.43                               |
| D 157         | 2739.8                 | 0.130                               | 9.7                        | 2.68                                | 2.42                               |
| C 687         | 2740.1                 | 0.126                               | 10.1                       | 2.68                                | 2.41                               |
| C 688         | 2740.3                 | 0.147                               | 10.4                       | 2.68                                | 2.40                               |
| C 689         | 2743.1                 | 0.020                               | 9.0                        | 2.68                                | 2.43                               |
| C 690         | 2743.4                 | 0.021                               | 9.0                        | 2.67                                | 2.43                               |
| D 158         | 2758.1                 | 0.005                               | 6.4                        | 2.74                                | 2.56                               |
| D 159         | 2758.3                 | 0.007                               | 10.0                       | 2.76                                | 2.48                               |
| D 160         | 2766.7                 | 0.046                               | 8.5                        | 2.71                                | 2.48                               |
| D 161         | 2766.8                 | 0.035                               | 8.5                        | 2.71                                | 2.48                               |
| C 691         | 2768.8                 | 0.014                               | 7.0                        | 2.70                                | 2.51                               |
| C 692         | 2769.1                 | 0.014                               | 7.1                        | 2.71                                | 2.52                               |
| C 713#        | 2793.5                 | 4.73                                | 9.5                        | 2.74                                | 2.48                               |
| C 714#        | 2793.7                 | 2.32                                | 7.8                        | 2.71                                | 2.50                               |
| C 693         | 2793.9                 | 1.68                                | 8.3                        | 2.72                                | 2.49                               |
| C 694         | 2794.5                 | 1.39                                | 8.1                        | 2.73                                | 2.51                               |

\* Denotes sample contains fracture(s). Permeability to gas may be anomalously high.

# Denotes "red bed" sample.

Table 2 (Continued)

BASIC ROCK PROPERTIES

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSR 3036

| <u>Sample</u> | <u>Depth<br/>(ft.)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Grain<br/>Density<br/>(g/cc)</u> | <u>Bulk<br/>Density<br/>(g/cc)</u> |
|---------------|------------------------|-------------------------------------|----------------------------|-------------------------------------|------------------------------------|
| C 715#        | 2802.3                 | 0.012                               | 9.1                        | 2.69                                | 2.45                               |
| C 716#        | 2802.6                 | 0.010                               | 8.8                        | 2.68                                | 2.45                               |
| C 717#        | 2804.9                 | 0.017                               | 9.6                        | 2.75                                | 2.49                               |
| C 718#        | 2805.2                 | 0.012                               | 9.3                        | 2.73                                | 2.47                               |
| C 695         | 2869.8                 | 0.846                               | 7.7                        | 2.70                                | 2.49                               |
| C 696         | 2870.3                 | 10.6                                | 11.9                       | 2.70                                | 2.38                               |
| C 697         | 2878.6                 | 0.398                               | 6.3                        | 2.70                                | 2.53                               |
| C 698         | 2878.9                 | 0.291                               | 6.5                        | 2.71                                | 2.53                               |
| C 699         | 2896.0                 | 0.009                               | 5.2                        | 2.72                                | 2.58                               |
| C 700         | 2896.3                 | 0.014                               | 6.9                        | 2.71                                | 2.52                               |
| C 701         | 2897.4                 | 0.048                               | 7.8                        | 2.71                                | 2.50                               |
| C 702         | 2897.6                 | 0.065                               | 9.2                        | 2.71                                | 2.46                               |
| C 703         | 2916.7                 | 5.40                                | 13.3                       | 2.70                                | 2.34                               |
| C 704         | 2917.3                 | 9.30                                | 14.2                       | 2.70                                | 2.32                               |
| C 705         | 2917.6                 | 13.4                                | 14.0                       | 2.70                                | 2.32                               |
| C 706         | 2918.1                 | 0.576                               | 13.1                       | 2.70                                | 2.35                               |
| C 719#        | 2925.5                 | 0.035                               | 13.2                       | 2.72                                | 2.36                               |
| C 720#        | 2925.7                 | 0.008                               | 9.6                        | 2.72                                | 2.46                               |
| C 707         | 2932.3                 | 0.142                               | 6.6                        | 2.71                                | 2.53                               |
| C 708         | 2932.5                 | 0.049                               | 5.1                        | 2.74                                | 2.60                               |
| C 709         | 2951.5                 | 0.122                               | 9.7                        | 2.74                                | 2.47                               |
| C 710         | 2951.7                 | 0.571                               | 13.6                       | 2.82                                | 2.44                               |
| C 711         | 2952.2                 | 1.84                                | 13.7                       | 2.73                                | 2.36                               |
| C 712         | 2952.6                 | 1.73                                | 13.9                       | 2.77                                | 2.38                               |

\* Denotes sample contains fracture(s). Permeability to gas may be anomalously high.

# Denotes "red bed" sample.

Figure 1  
SPECIFIC PERMEABILITY TO GAS - POROSITY RELATIONSHIP

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSB 3036

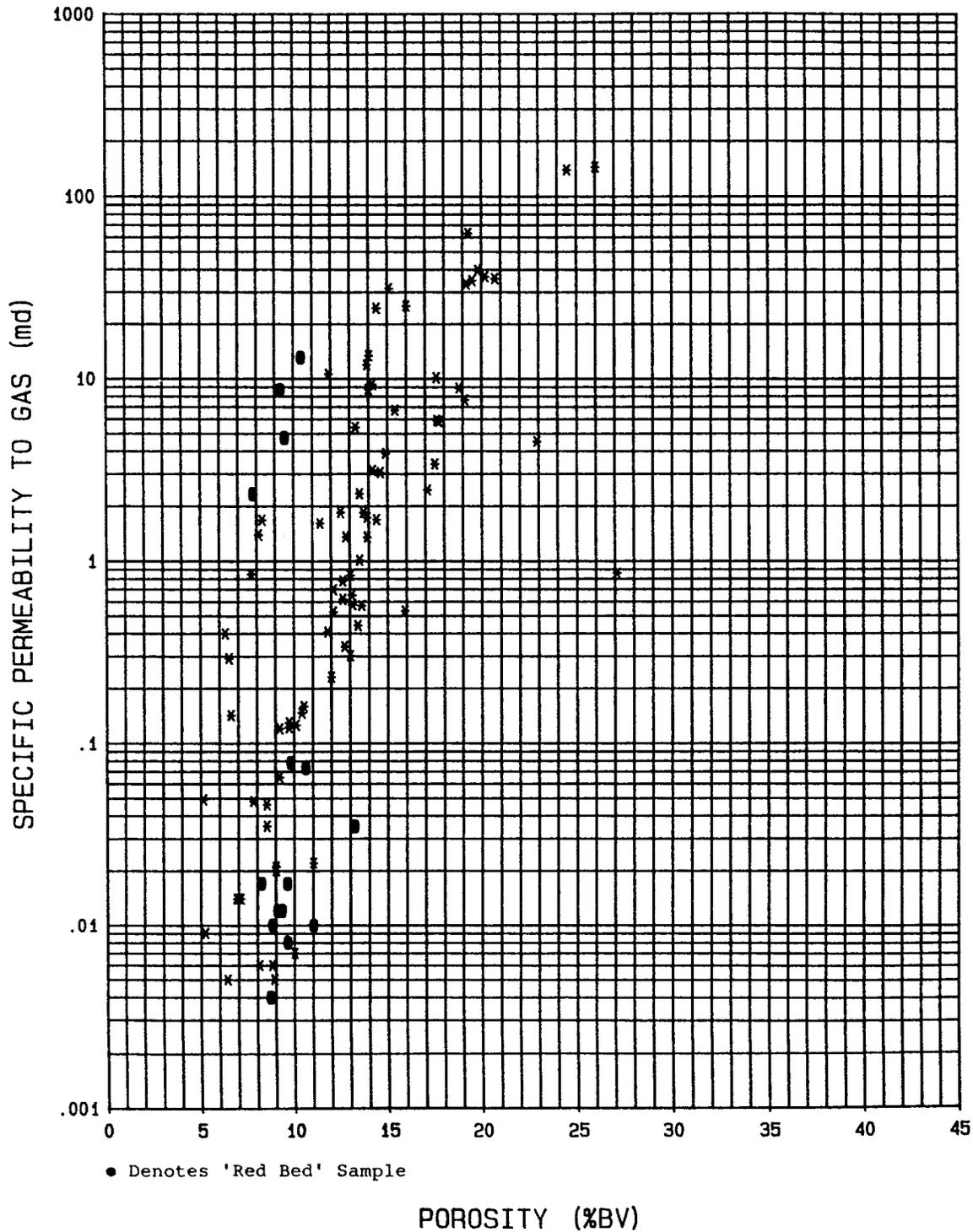


Figure 2  
BULK DENSITY - POROSITY RELATIONSHIP

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

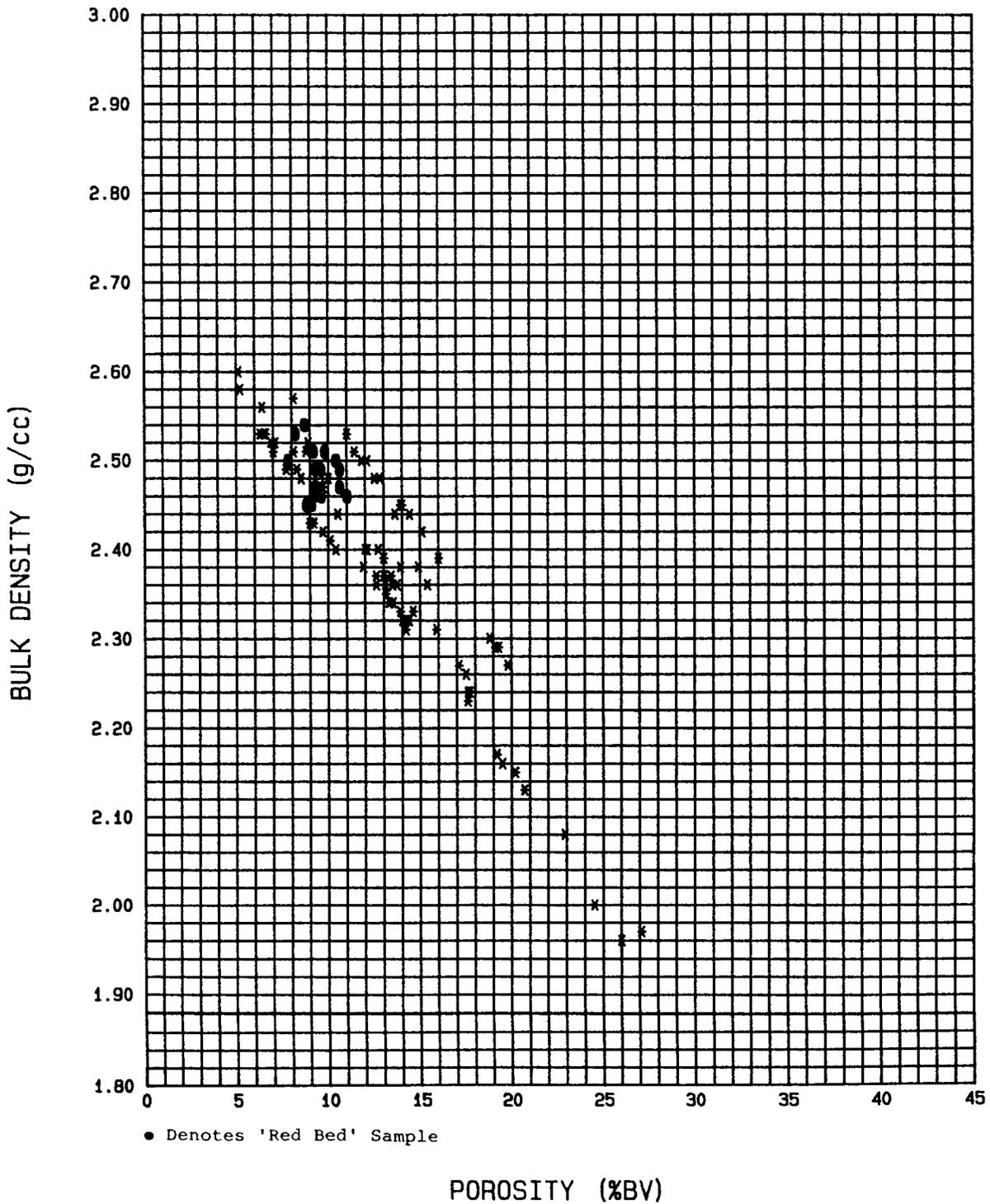


Table 3

SIMULATED FORMATION BRINE ANALYSIS\*

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSB 3036

| <u>Constituent(s)</u>   | <u>g/L</u>    |
|-------------------------|---------------|
| Sodium Bicarbonate      | 0.50          |
| Sodium Sulfate          | 1.18          |
| Magnesium Chloride      | 17.54         |
| Calcium Chloride        | 16.26         |
| Potassium Chloride      | 1.10          |
| Sodium Chloride         | <u>198.20</u> |
| Total Dissolved Solids: | 234.78        |

\* Denotes simulated formation brine was based upon an analysis performed by Halliburton Services in Liberal, Kansas on March 13, 1992 for the Anadarko Petroleum Corporation, Tucker 3-19 Well, located in Morton County, Kansas,

Table 4

FORMATION RESISTIVITY FACTOR - POROSITY RELATIONSHIP  
AT CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth (ft.)</u> | <u>Confining Pressure (psig)</u> | <u>Formation Resistivity Factor (F)</u> | <u>Porosity (% BV)</u> | <u>Cementation Exponent (m)</u> |
|---------------|--------------------|----------------------------------|---|------------------------|---------------------------------|
| C 633         | 2481.8             | 1500                             | 29.15                                   | 17.3                   | 1.92                            |
| C 635         | 2515.3             | 1500                             | 84.74                                   | 10.9                   | 2.00                            |
| C 636         | 2518.2             | 1500                             | 69.00                                   | 14.6                   | 2.20                            |
| C 639         | 2526.4             | 1500                             | 33.28                                   | 18.8                   | 2.10                            |
| C 641         | 2532.3             | 1500                             | 61.28                                   | 13.4                   | 2.05                            |
| C 622#        | 2542.7             | 1500                             | 81.57                                   | 10.9                   | 1.99                            |
| C 626#        | 2544.2             | 1500                             | 161.20                                  | 7.5                    | 1.96                            |
| C 642         | 2552.9             | 1500                             | 11.92                                   | 25.0                   | 1.79                            |
| C 645         | 2573.5             | 1500                             | 33.87                                   | 18.5                   | 2.09                            |
| C 647         | 2578.7             | 1500                             | 70.22                                   | 12.0                   | 2.01                            |
| C 649         | 2613.2             | 1500                             | 20.47                                   | 20.2                   | 1.89                            |
| C 651         | 2625.9             | 1500                             | 69.32                                   | 14.0                   | 2.15                            |
| C 652         | 2637.8             | 1500                             | 96.51                                   | 26.6                   | 3.45                            |
| C 653         | 2638.2             | 1500                             | 57.51                                   | 22.6                   | 2.72                            |
| C 655         | 2647.6             | 1500                             | 38.13                                   | 16.8                   | 2.04                            |
| C 683         | 2682.6             | 1650                             | 34.00                                   | 15.6                   | 1.90                            |
| C 685         | 2704.7             | 1650                             | 71.47                                   | 10.3                   | 1.88                            |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

# Denotes "red bed" sample

Table 4 (Continued)

FORMATION RESISTIVITY FACTOR - POROSITY RELATIONSHIP  
AT CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth (ft.)</u> | <u>Confining Pressure (psig)</u> | <u>Formation Resistivity Factor (F)</u> | <u>Porosity (% BV)</u> | <u>Cementation Exponent (m)</u> |
|---------------|--------------------|----------------------------------|---|------------------------|---------------------------------|
| C 687         | 2740.1             | 1650                             | 68.38                                   | 9.9                    | 1.83                            |
| C 689         | 2743.1             | 1650                             | 95.04                                   | 8.8                    | 1.88                            |
| C 691         | 2768.8             | 1650                             | 142.30                                  | 6.8                    | 1.84                            |
| C 713#        | 2793.5             | 1650                             | 73.15                                   | 9.3                    | 1.81                            |
| C 693         | 2793.9             | 1650                             | 97.78                                   | 8.1                    | 1.82                            |
| C 716#        | 2802.6             | 1650                             | 76.34                                   | 8.7                    | 1.78                            |
| C 718#        | 2805.2             | 1650                             | 72.98                                   | 8.8                    | 1.77                            |
| C 696         | 2870.3             | 1650                             | 115.60                                  | 11.8                   | 2.22                            |
| C 698         | 2878.9             | 1650                             | 333.10                                  | 6.4                    | 2.11                            |
| C 700         | 2896.3             | 1650                             | 134.50                                  | 6.7                    | 1.81                            |
| C 702         | 2897.6             | 1650                             | 93.47                                   | 8.8                    | 1.87                            |
| C 704         | 2917.3             | 1650                             | 62.83                                   | 14.1                   | 2.11                            |
| C 706         | 2918.1             | 1650                             | 58.62                                   | 13.0                   | 2.00                            |
| C 719#        | 2925.5             | 1650                             | 47.23                                   | 13.0                   | 1.89                            |
| C 707         | 2932.3             | 1650                             | 244.40                                  | 6.3                    | 1.99                            |
| C 709         | 2951.5             | 1650                             | 74.98                                   | 9.5                    | 1.83                            |
| C 711         | 2952.3             | 1650                             | 55.98                                   | 13.5                   | 2.01                            |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

# Denotes "red bed" sample

Figure 3  
 FORMATION RESISTIVITY FACTOR - POROSITY RELATIONSHIP  
 AT CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887/RSR 3036

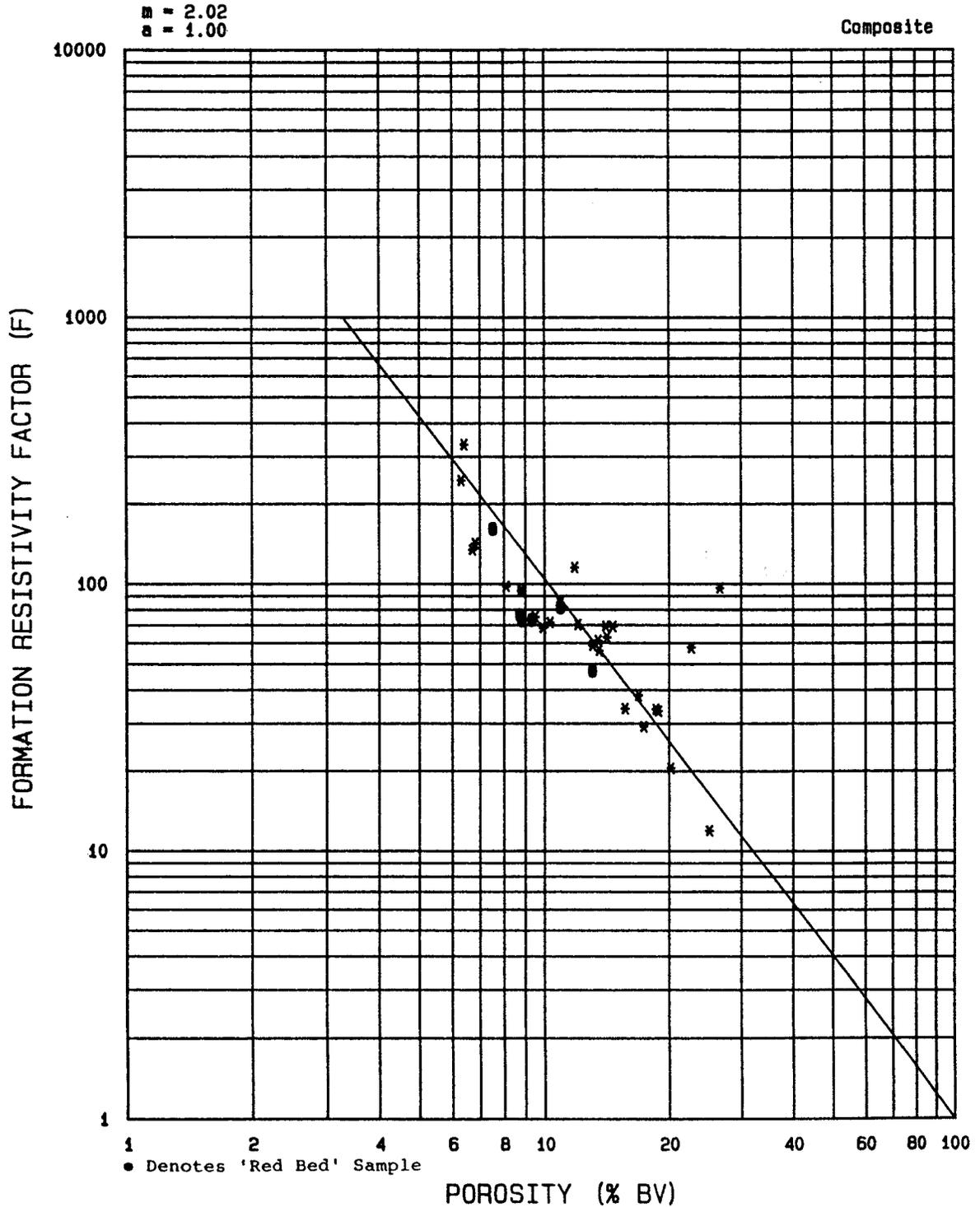


Table 5

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 633         | 2481.8                | 10.1*                               | 17.3                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.11   | 94.1                                   |
|               |                       |                                     |                            | 1.20   | 90.0                                   |
|               |                       |                                     |                            | 1.35   | 84.2                                   |
|               |                       |                                     |                            | 1.53   | 78.0                                   |
|               |                       |                                     |                            | 1.77   | 71.8                                   |
|               |                       |                                     |                            | 2.32   | 61.0                                   |
|               |                       |                                     |                            | 2.80   | 54.2                                   |
|               |                       |                                     |                            | 3.44   | 47.0                                   |
|               |                       |                                     |                            | 4.87   | 38.6                                   |
|               |                       |                                     |                            | 6.09   | 34.0                                   |
|               |                       |                                     |                            | 9.44   | 25.9                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 4

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 633  
Depth, ft : 2481.8

n = 1.69

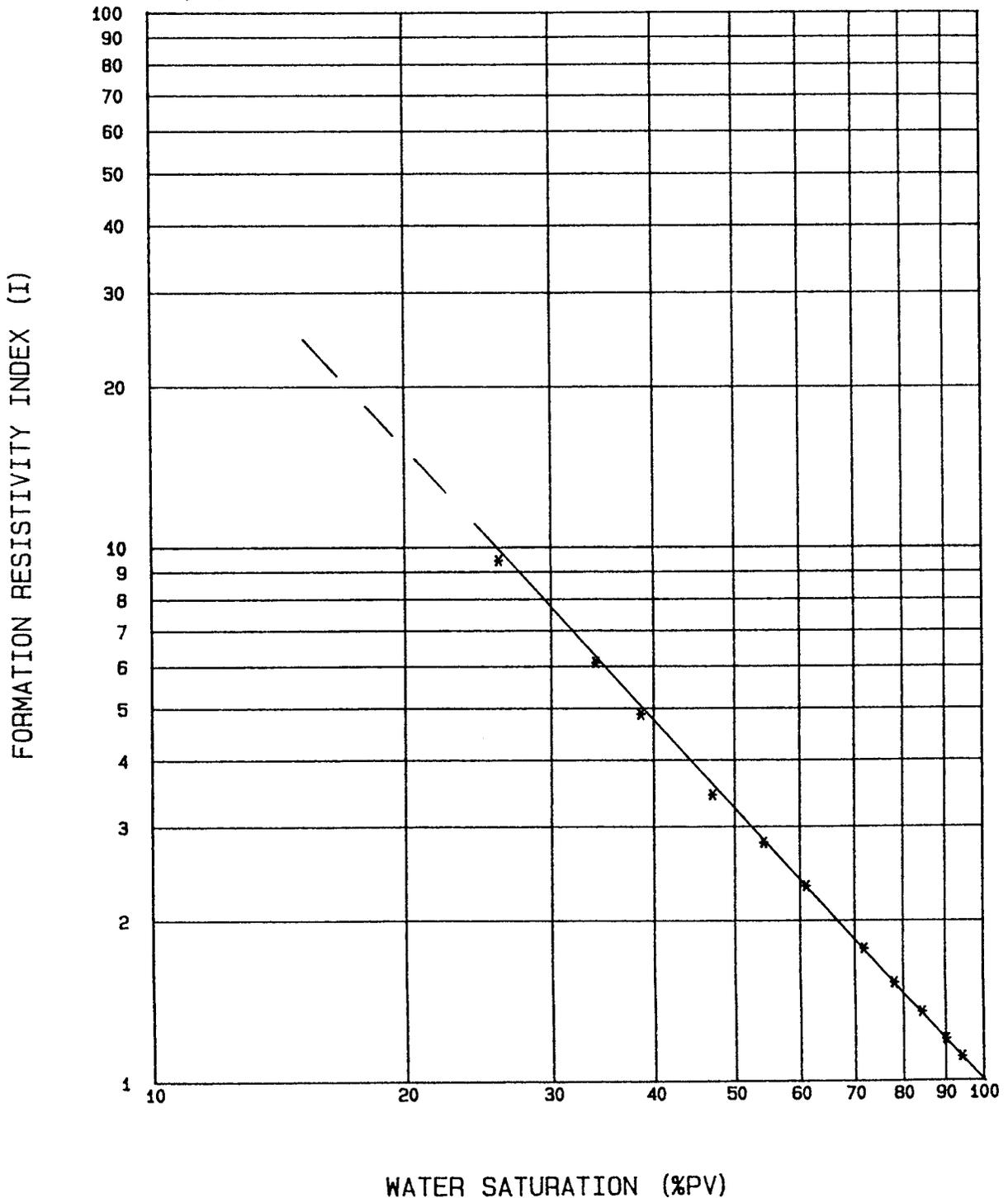


Table 6

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 635         | 2515.3                | 1.61*                               | 10.9                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.10   | 95.0                                   |
|               |                       |                                     |                            | 1.27   | 88.2                                   |
|               |                       |                                     |                            | 1.48   | 81.1                                   |
|               |                       |                                     |                            | 1.90   | 71.3                                   |
|               |                       |                                     |                            | 2.28   | 64.7                                   |
|               |                       |                                     |                            | 2.76   | 58.6                                   |
|               |                       |                                     |                            | 3.58   | 50.7                                   |
|               |                       |                                     |                            | 4.13   | 46.7                                   |
|               |                       |                                     |                            | 5.16   | 41.9                                   |
|               |                       |                                     |                            | 5.70   | 39.2                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 5

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 635  
Depth, ft : 2515.3

n = 1.88

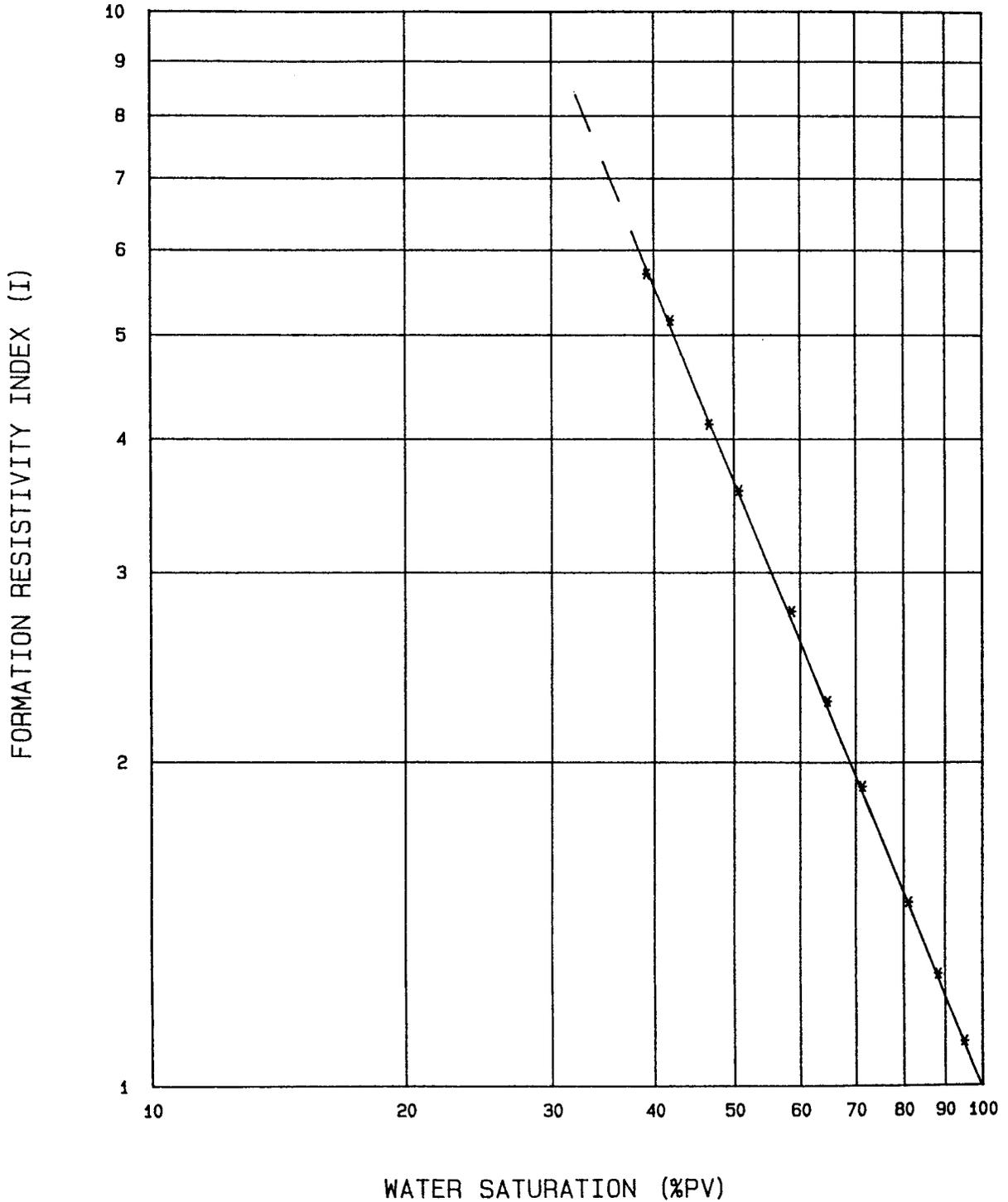


Table 7

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 636         | 2518.2                | 31.4*                               | 14.6                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.23   | 89.1                                   |
|               |                       |                                     |                            | 1.47   | 80.9                                   |
|               |                       |                                     |                            | 2.46   | 61.0                                   |
|               |                       |                                     |                            | 3.15   | 52.9                                   |
|               |                       |                                     |                            | 3.56   | 49.4                                   |
|               |                       |                                     |                            | 4.42   | 44.4                                   |
|               |                       |                                     |                            | 5.54   | 39.0                                   |
|               |                       |                                     |                            | 6.74   | 34.9                                   |
|               |                       |                                     |                            | 8.25   | 30.4                                   |
|               |                       |                                     |                            | 9.84   | 26.9                                   |
|               |                       |                                     |                            | 11.47  | 23.6                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 6

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 636  
Depth, ft : 2518.2

n = 1.78

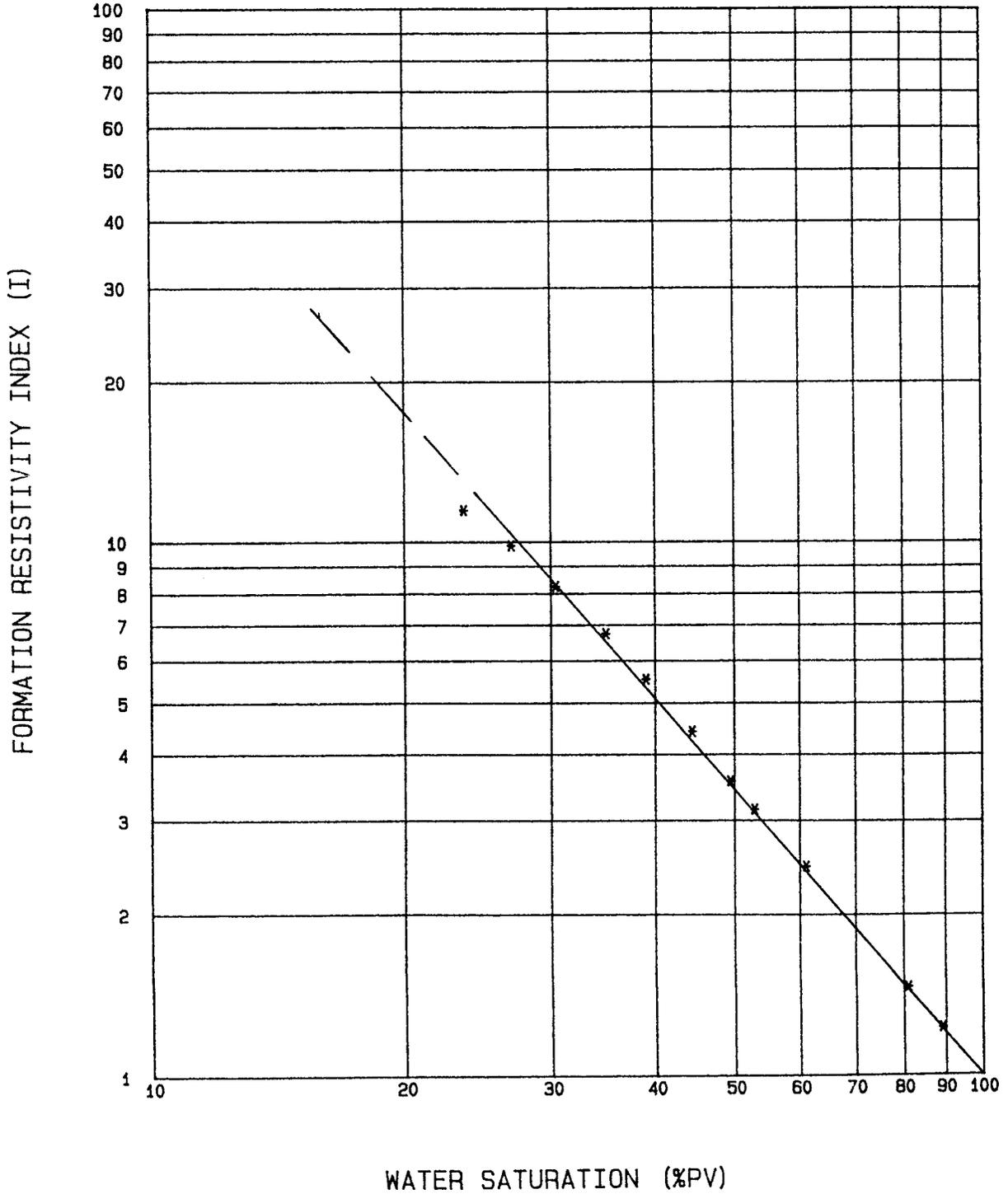


Table 8

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 639         | 2526.4                | 63.0*                               | 18.8                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.19   | 90.0                                   |
|               |                       |                                     |                            | 1.37   | 82.7                                   |
|               |                       |                                     |                            | 1.52   | 77.7                                   |
|               |                       |                                     |                            | 1.71   | 72.2                                   |
|               |                       |                                     |                            | 2.17   | 62.4                                   |
|               |                       |                                     |                            | 2.46   | 57.7                                   |
|               |                       |                                     |                            | 3.98   | 42.9                                   |
|               |                       |                                     |                            | 4.64   | 39.5                                   |
|               |                       |                                     |                            | 5.69   | 34.0                                   |
|               |                       |                                     |                            | 10.84  | 22.7                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 7

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 639  
Depth, ft : 2526.4

n = 1.64

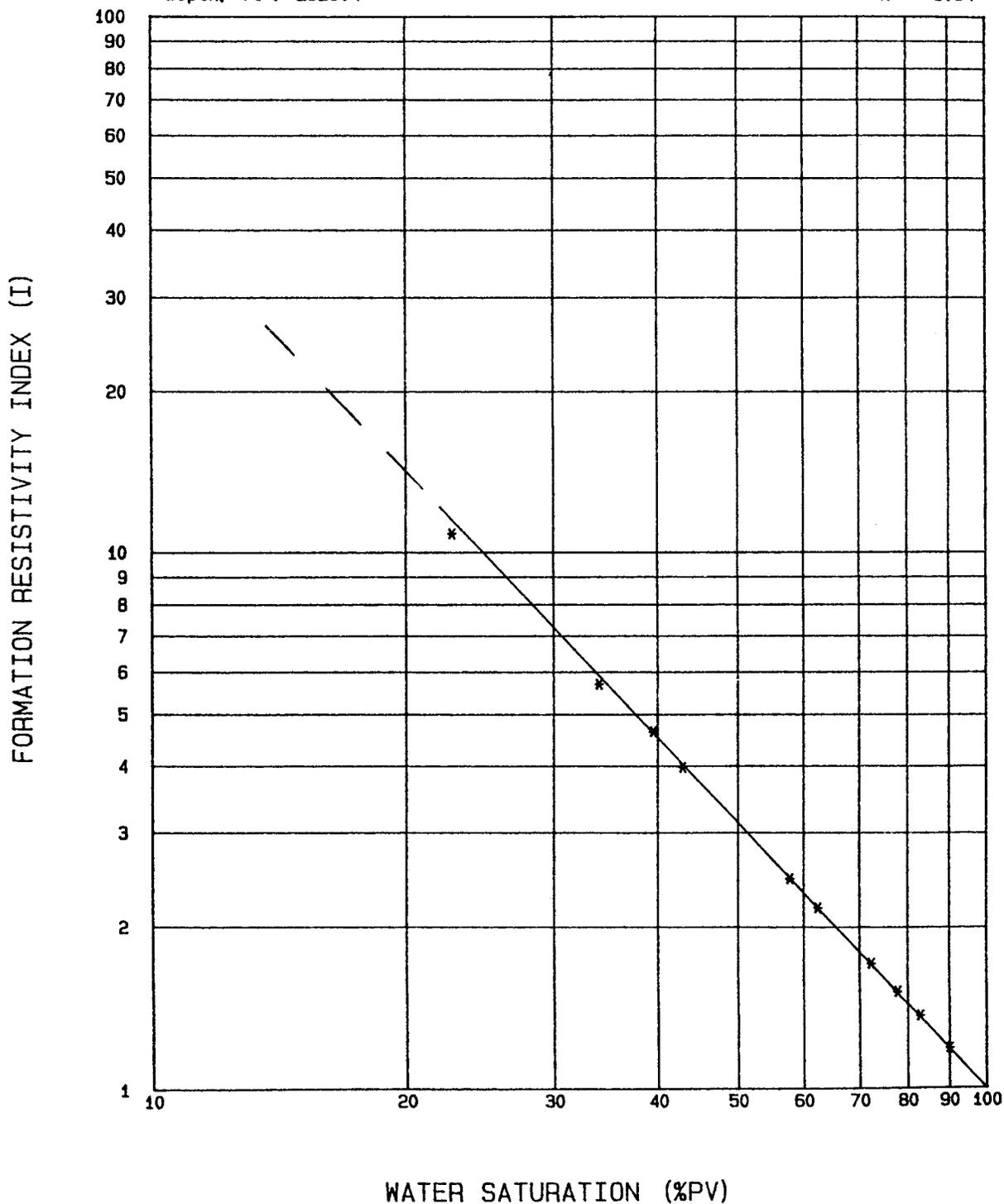


Table 9

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 641         | 2532.3                | 8.74*                               | 13.4                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.13   | 91.3                                   |
|               |                       |                                     |                            | 1.28   | 82.9                                   |
|               |                       |                                     |                            | 1.79   | 64.1                                   |
|               |                       |                                     |                            | 2.24   | 55.0                                   |
|               |                       |                                     |                            | 3.06   | 42.7                                   |
|               |                       |                                     |                            | 3.92   | 35.2                                   |
|               |                       |                                     |                            | 4.62   | 31.1                                   |
|               |                       |                                     |                            | 5.99   | 24.8                                   |
|               |                       |                                     |                            | 7.04   | 23.1                                   |
|               |                       |                                     |                            | 7.70   | 21.2                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 8

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

Sample : C 641  
Depth, ft : 2532.3

n = 1.32

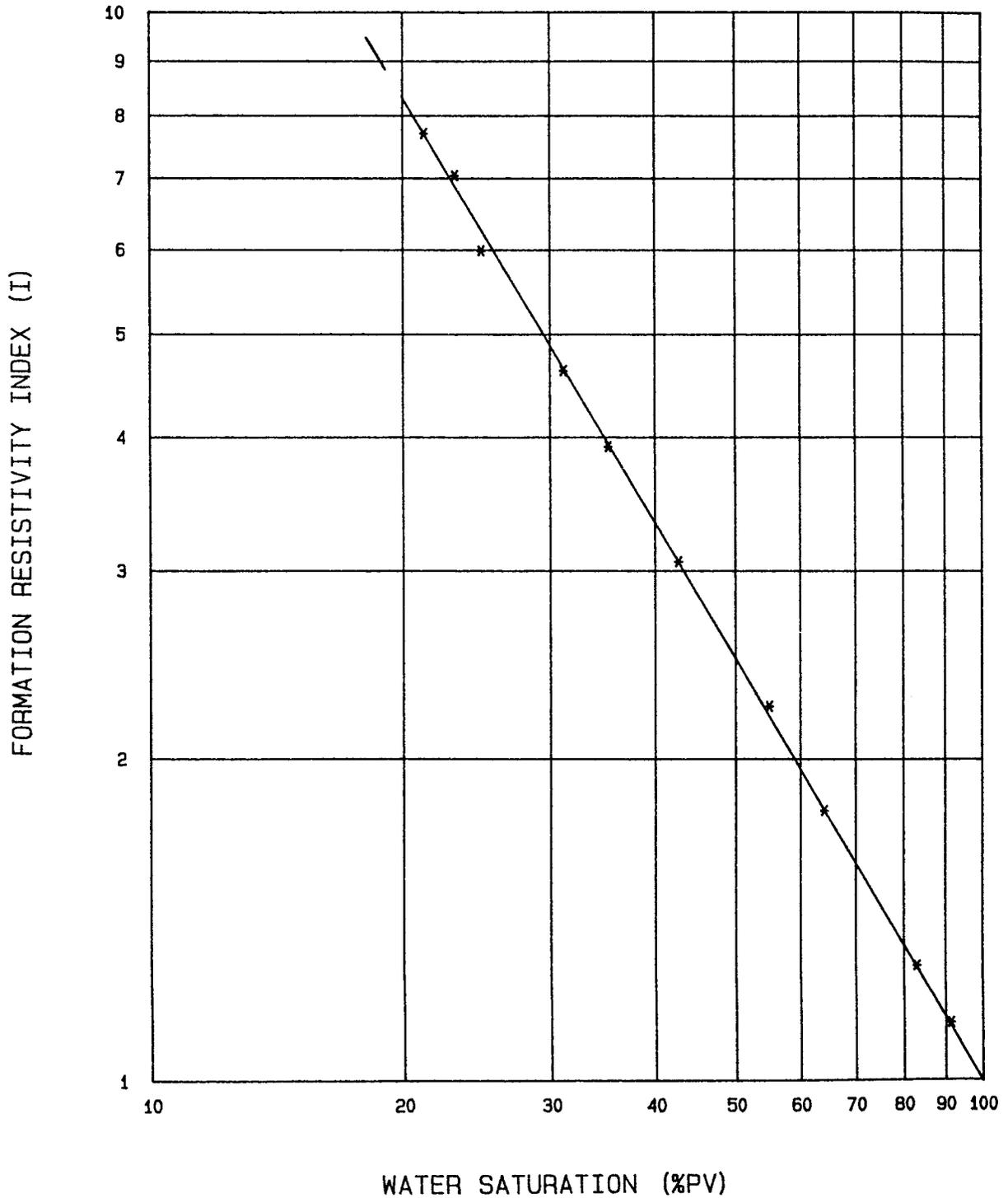


Table 10

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 642         | 2552.9                | 144*                                | 25.0                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.12   | 93.6                                   |
|               |                       |                                     |                            | 1.36   | 83.4                                   |
|               |                       |                                     |                            | 1.90   | 68.7                                   |
|               |                       |                                     |                            | 2.65   | 56.3                                   |
|               |                       |                                     |                            | 3.70   | 46.5                                   |
|               |                       |                                     |                            | 4.44   | 41.6                                   |
|               |                       |                                     |                            | 5.86   | 34.9                                   |
|               |                       |                                     |                            | 7.03   | 31.7                                   |
|               |                       |                                     |                            | 8.35   | 28.3                                   |
|               |                       |                                     |                            | 10.19  | 24.2                                   |
|               |                       |                                     |                            | 11.32  | 22.5                                   |
|               |                       |                                     |                            | 13.50  | 19.7                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 9

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 642  
Depth, ft : 2552.9

n = 1.68

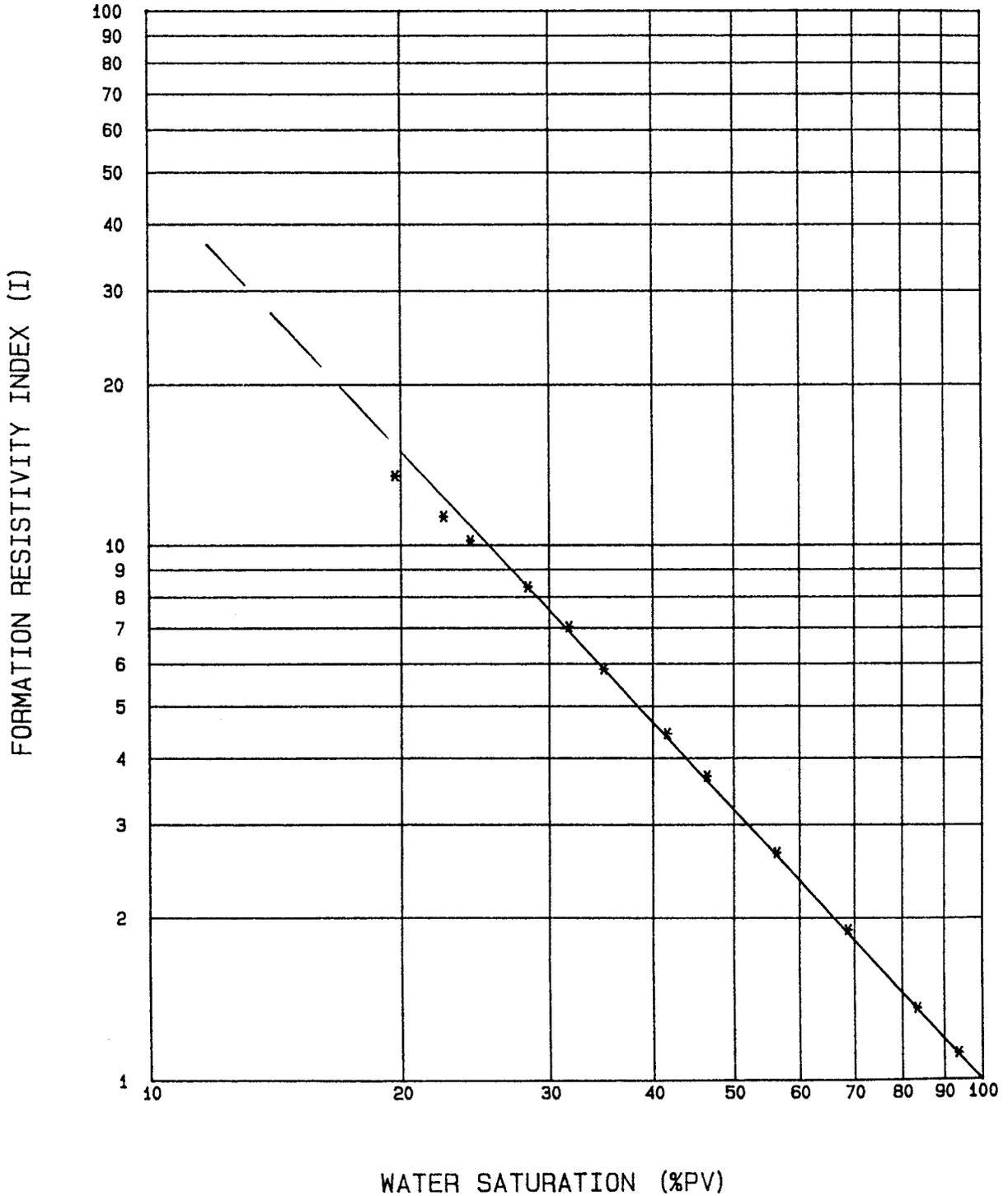


Table 11

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 645         | 2573.5                | 7.64*                               | 18.5                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.17   | 89.9                                   |
|               |                       |                                     |                            | 1.60   | 73.1                                   |
|               |                       |                                     |                            | 2.07   | 62.2                                   |
|               |                       |                                     |                            | 2.80   | 51.5                                   |
|               |                       |                                     |                            | 3.50   | 43.4                                   |
|               |                       |                                     |                            | 3.99   | 40.0                                   |
|               |                       |                                     |                            | 5.20   | 33.3                                   |
|               |                       |                                     |                            | 6.30   | 29.2                                   |
|               |                       |                                     |                            | 6.71   | 27.9                                   |
|               |                       |                                     |                            | 7.10   | 26.1                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 10

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

Sample : C 645  
Depth, ft : 2573.5

n = 1.50

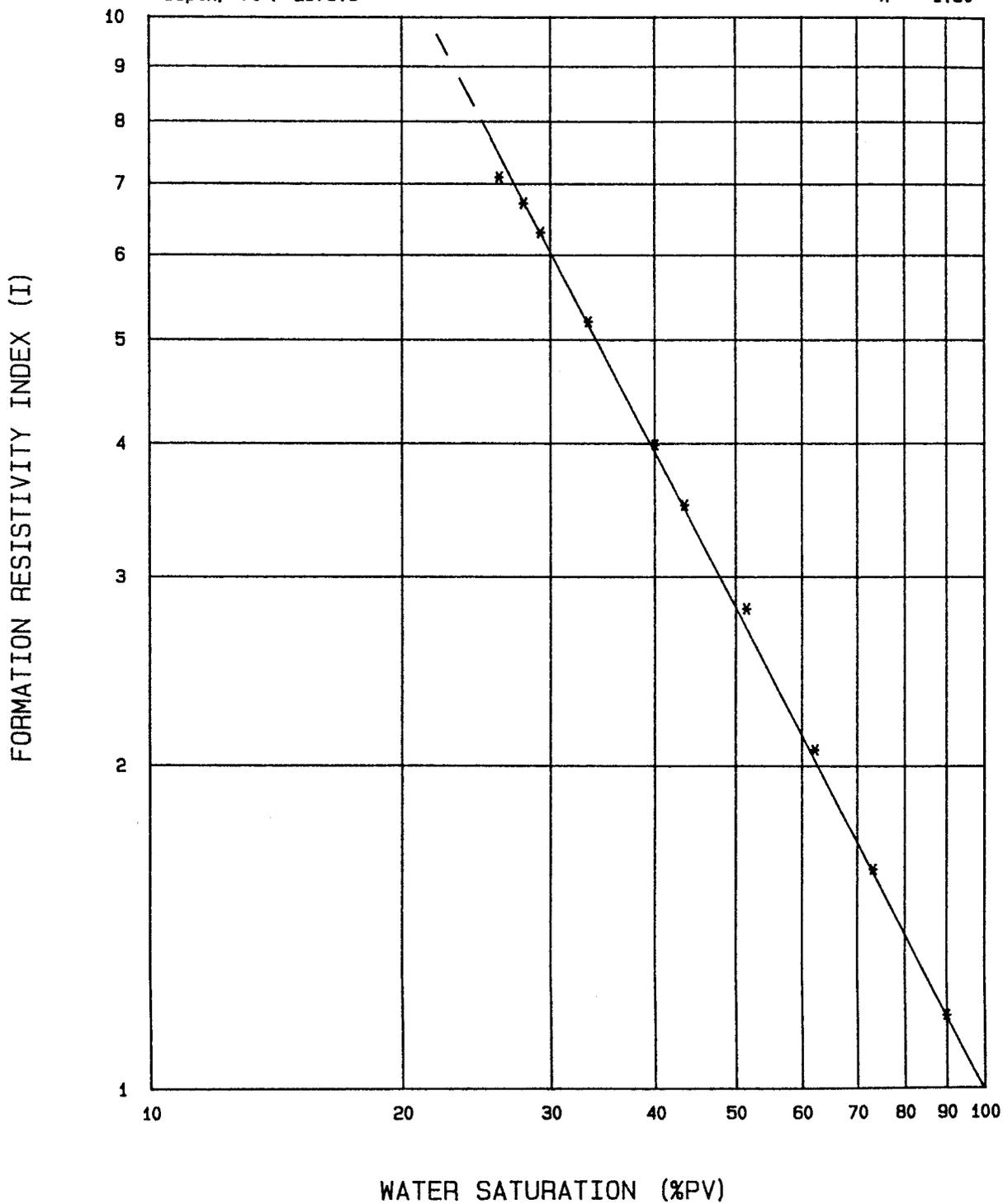


Table 12

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 647         | 2578.7                | 0.779*                              | 12.0                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.08   | 96.2                                   |
|               |                       |                                     |                            | 1.30   | 88.0                                   |
|               |                       |                                     |                            | 1.72   | 76.9                                   |
|               |                       |                                     |                            | 2.21   | 67.7                                   |
|               |                       |                                     |                            | 3.50   | 53.9                                   |
|               |                       |                                     |                            | 4.43   | 48.1                                   |
|               |                       |                                     |                            | 5.13   | 44.2                                   |
|               |                       |                                     |                            | 6.14   | 40.9                                   |
|               |                       |                                     |                            | 7.50   | 36.9                                   |
|               |                       |                                     |                            | 9.74   | 31.8                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 11

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

Sample : C 647  
Depth, ft : 2578.7

n = 2.03

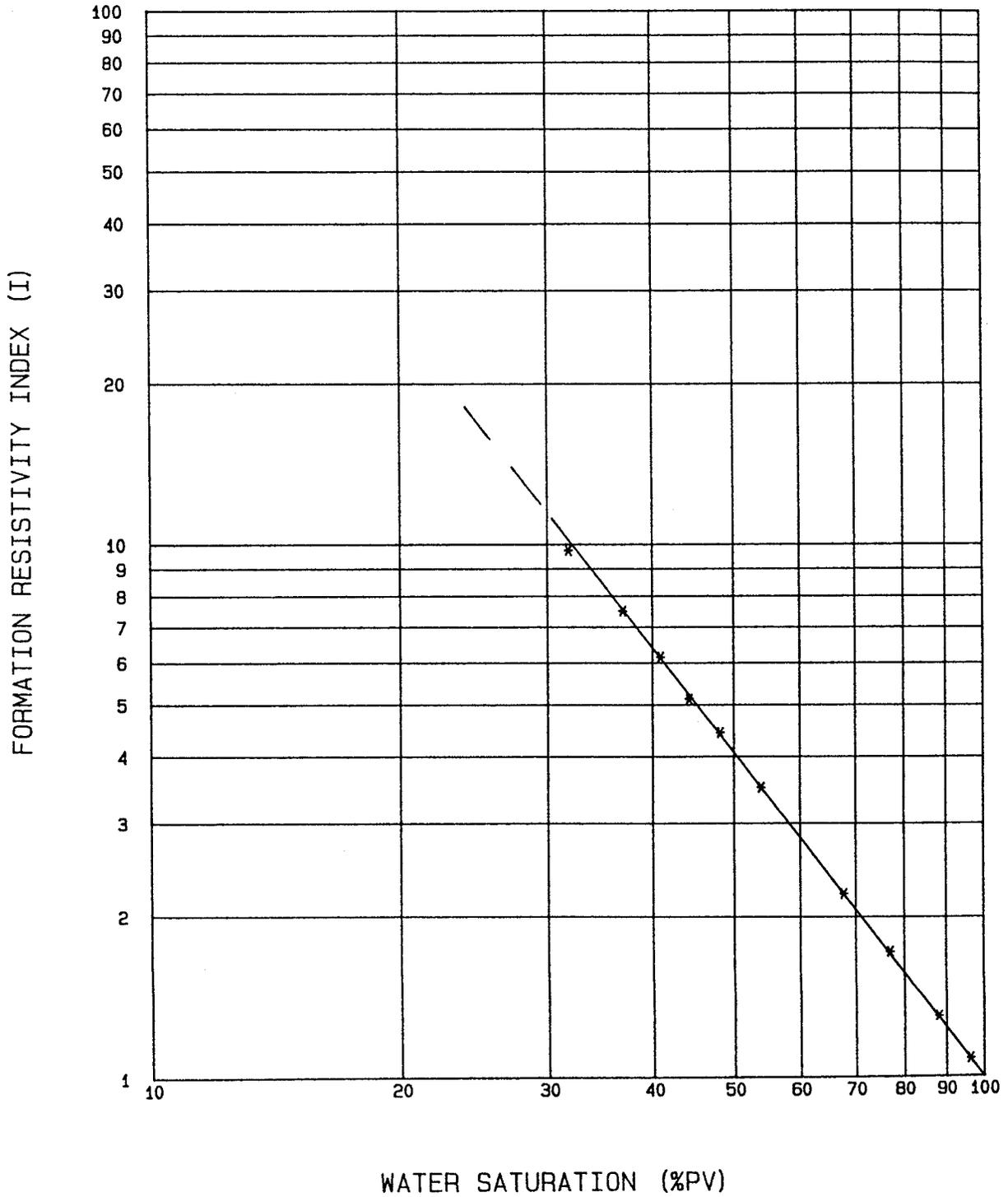


Table 13

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 649         | 2613.2                | 35.7*                               | 20.2                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.11   | 93.7                                   |
|               |                       |                                     |                            | 1.20   | 89.0                                   |
|               |                       |                                     |                            | 1.44   | 79.2                                   |
|               |                       |                                     |                            | 2.10   | 62.0                                   |
|               |                       |                                     |                            | 2.73   | 52.9                                   |
|               |                       |                                     |                            | 3.23   | 46.5                                   |
|               |                       |                                     |                            | 3.81   | 41.7                                   |
|               |                       |                                     |                            | 5.13   | 34.5                                   |
|               |                       |                                     |                            | 5.95   | 30.6                                   |
|               |                       |                                     |                            | 7.03   | 27.2                                   |
|               |                       |                                     |                            | 8.86   | 23.5                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 12

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

Sample : C 649  
Depth, ft : 2613.2

n = 1.54

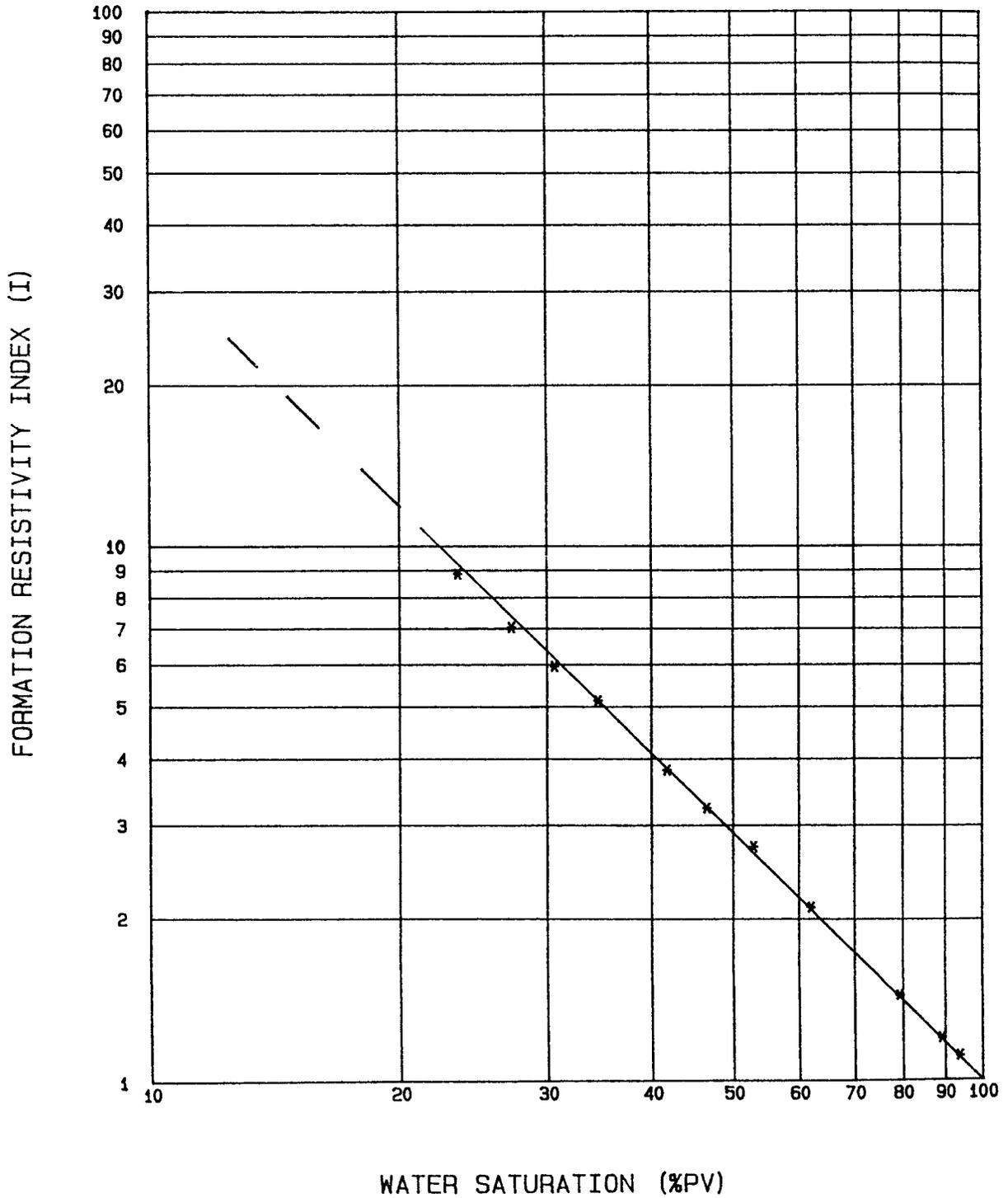


Table 14

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 651         | 2625.9                | 1.69*                               | 14.0                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.15   | 92.8                                   |
|               |                       |                                     |                            | 1.38   | 83.9                                   |
|               |                       |                                     |                            | 1.70   | 75.1                                   |
|               |                       |                                     |                            | 2.30   | 64.1                                   |
|               |                       |                                     |                            | 2.65   | 58.7                                   |
|               |                       |                                     |                            | 3.85   | 47.7                                   |
|               |                       |                                     |                            | 5.61   | 38.9                                   |
|               |                       |                                     |                            | 6.43   | 36.4                                   |
|               |                       |                                     |                            | 7.65   | 32.7                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 13

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSB 3036

Sample : C 651  
Depth, ft : 2625.9

n = 1.84

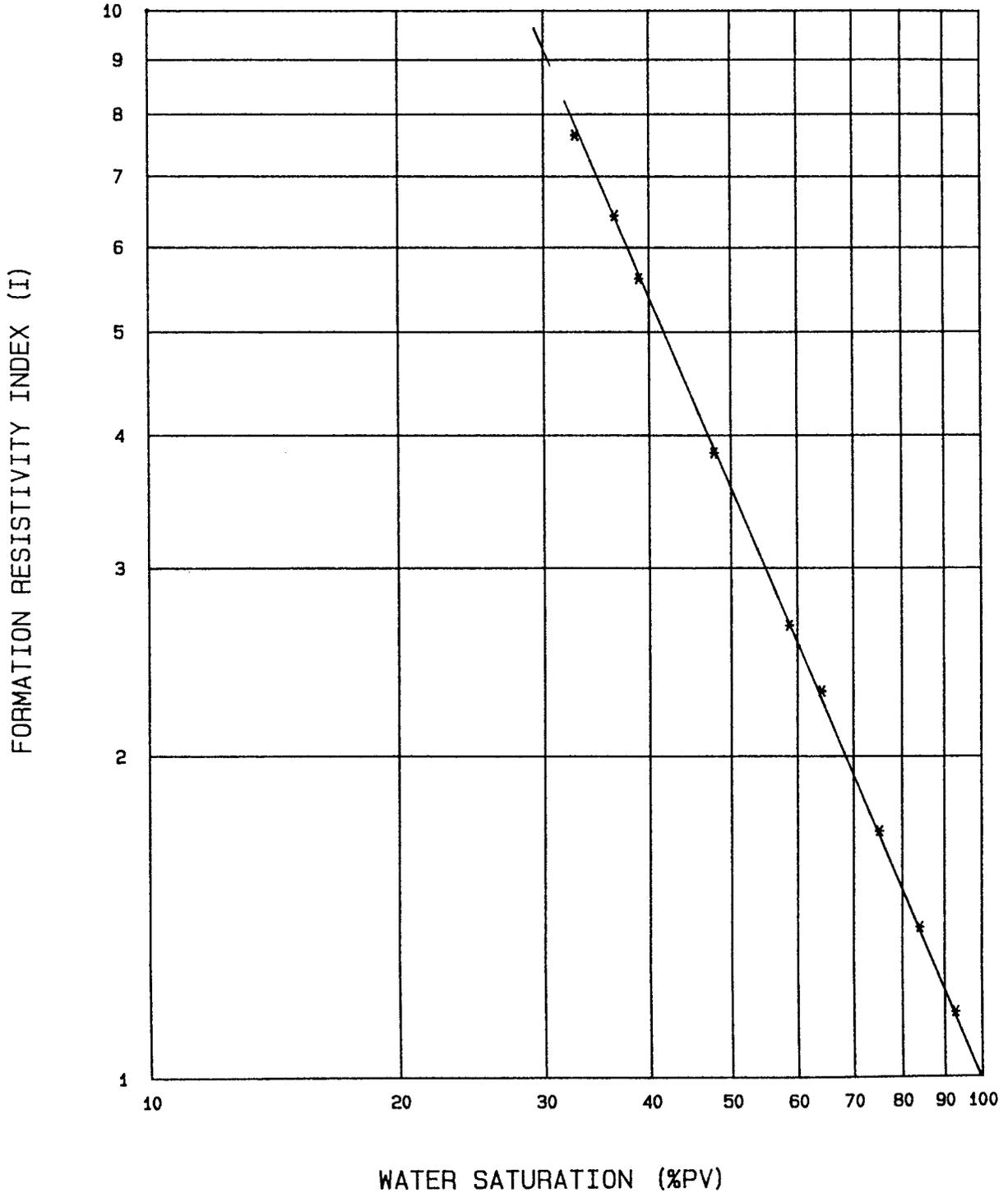


Table 15

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 652         | 2637.8                | 0.856*                              | 26.6                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.09   | 95.7                                   |
|               |                       |                                     |                            | 1.26   | 88.7                                   |
|               |                       |                                     |                            | 1.44   | 82.5                                   |
|               |                       |                                     |                            | 1.90   | 72.1                                   |
|               |                       |                                     |                            | 2.17   | 67.1                                   |
|               |                       |                                     |                            | 2.34   | 64.7                                   |
|               |                       |                                     |                            | 2.88   | 58.6                                   |
|               |                       |                                     |                            | 3.59   | 51.1                                   |
|               |                       |                                     |                            | 4.09   | 48.0                                   |
|               |                       |                                     |                            | 4.78   | 44.0                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 14

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 652  
Depth, ft : 2637.8

n = 1.94

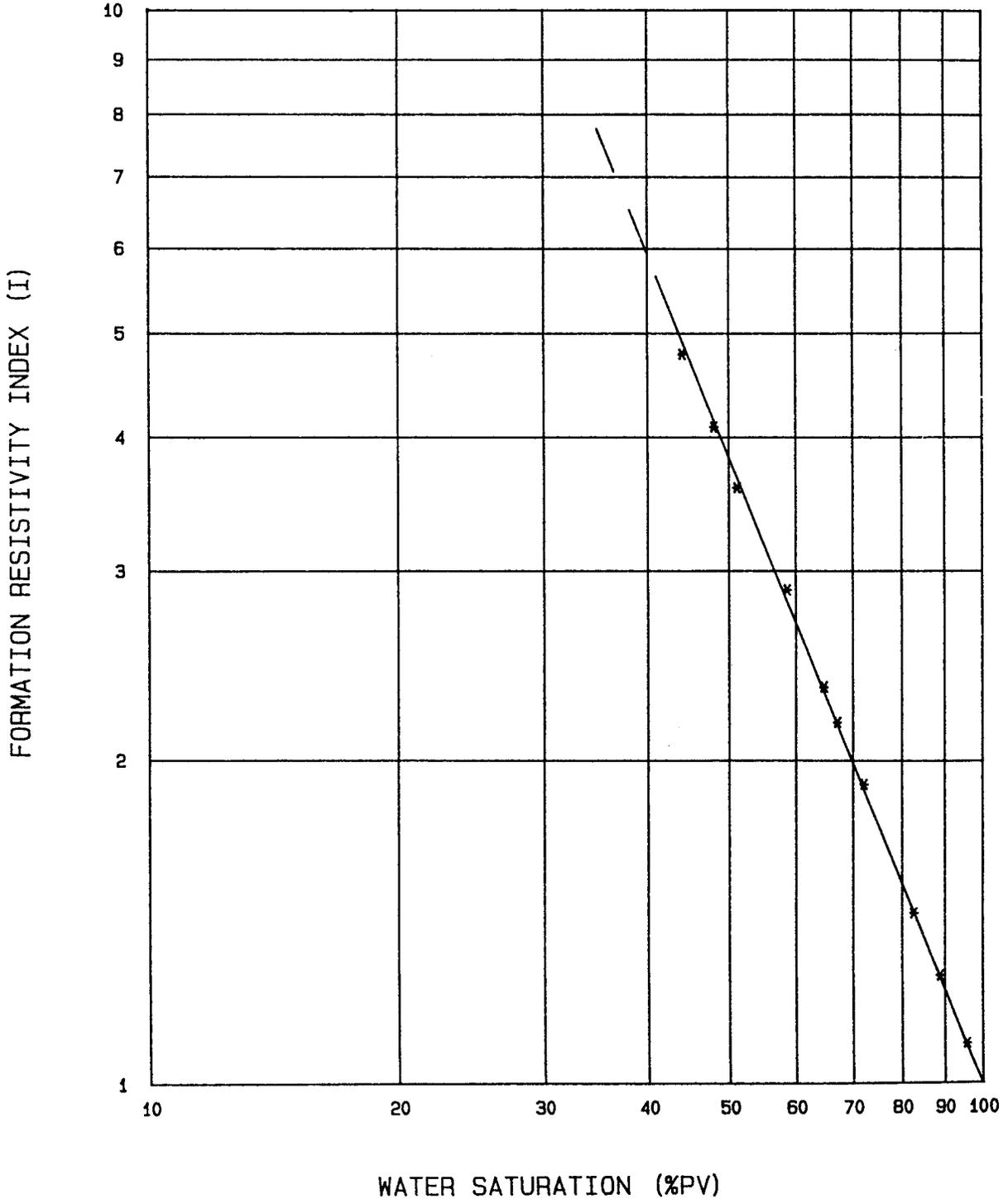


Table 16

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 653         | 2638.2                | 4.52*                               | 22.6                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.11   | 94.0                                   |
|               |                       |                                     |                            | 1.55   | 76.5                                   |
|               |                       |                                     |                            | 2.03   | 65.3                                   |
|               |                       |                                     |                            | 3.04   | 51.2                                   |
|               |                       |                                     |                            | 3.52   | 47.2                                   |
|               |                       |                                     |                            | 4.17   | 42.3                                   |
|               |                       |                                     |                            | 4.92   | 38.7                                   |
|               |                       |                                     |                            | 6.87   | 31.5                                   |
|               |                       |                                     |                            | 7.75   | 29.3                                   |
|               |                       |                                     |                            | 8.71   | 27.8                                   |
|               |                       |                                     |                            | 10.07  | 25.2                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 15

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 653  
Depth, ft : 2638.2

n = 1.67

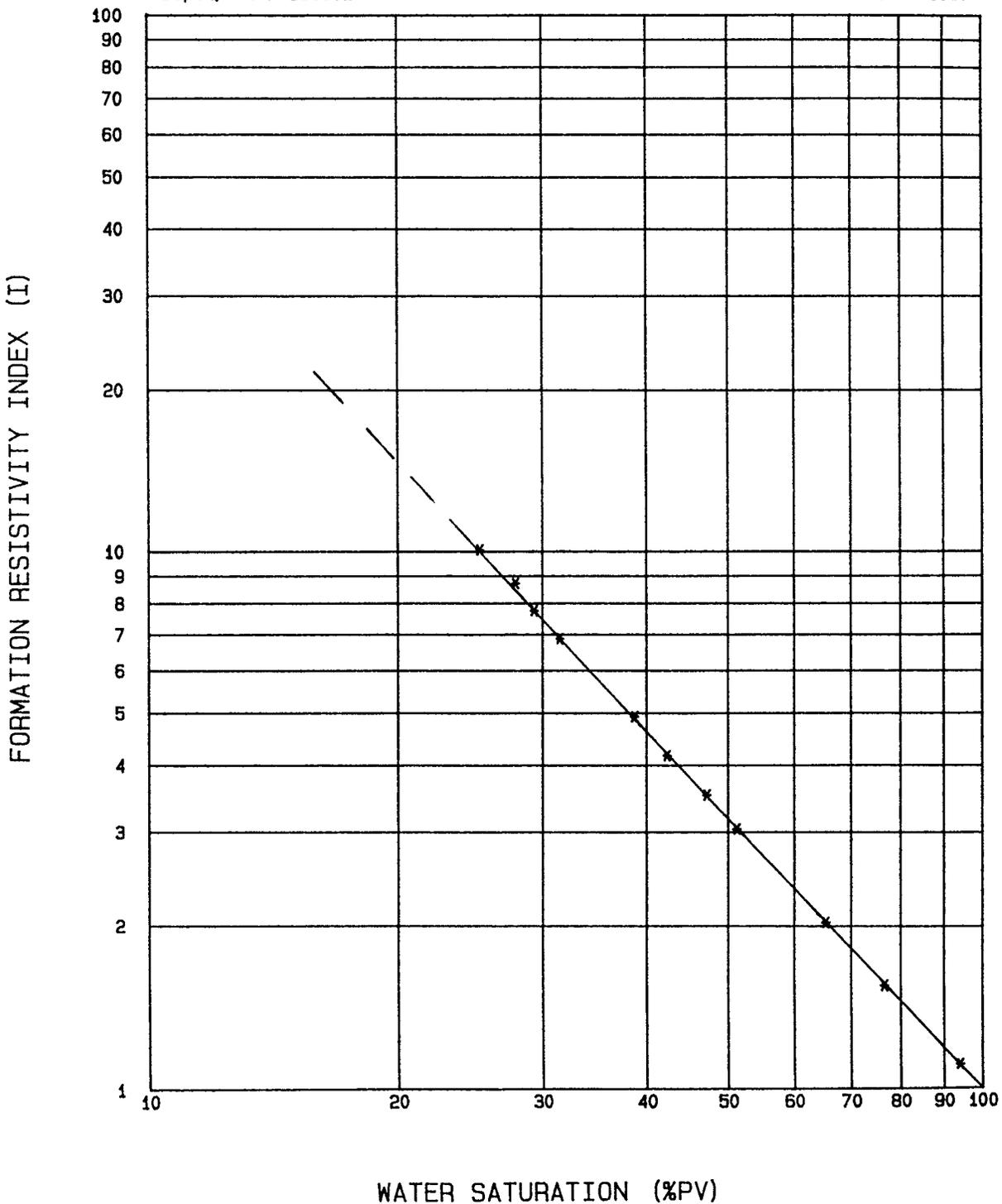


Table 17

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 655         | 2647.6                | 3.39*                               | 16.8                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.14   | 92.7                                   |
|               |                       |                                     |                            | 1.61   | 75.0                                   |
|               |                       |                                     |                            | 2.29   | 61.2                                   |
|               |                       |                                     |                            | 3.34   | 48.4                                   |
|               |                       |                                     |                            | 3.83   | 45.0                                   |
|               |                       |                                     |                            | 4.59   | 40.8                                   |
|               |                       |                                     |                            | 5.44   | 36.7                                   |
|               |                       |                                     |                            | 8.40   | 29.2                                   |
|               |                       |                                     |                            | 9.35   | 27.1                                   |
|               |                       |                                     |                            | 10.64  | 24.4                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 16

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1500 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

Sample : C 655  
Depth, ft : 2647.6

n = 1.69

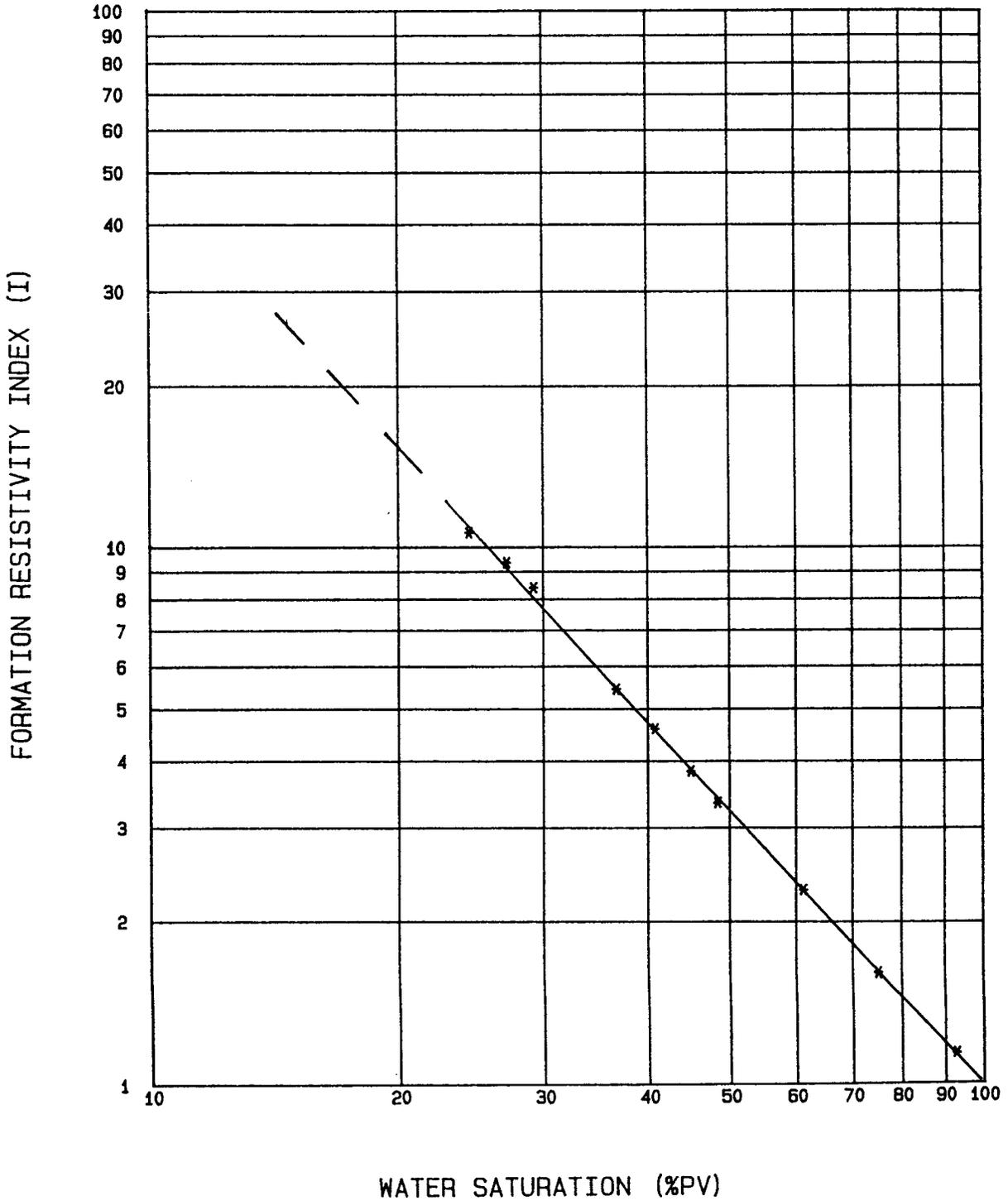


Figure 17

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 683  
Depth, ft : 2682.6

n = 1.61

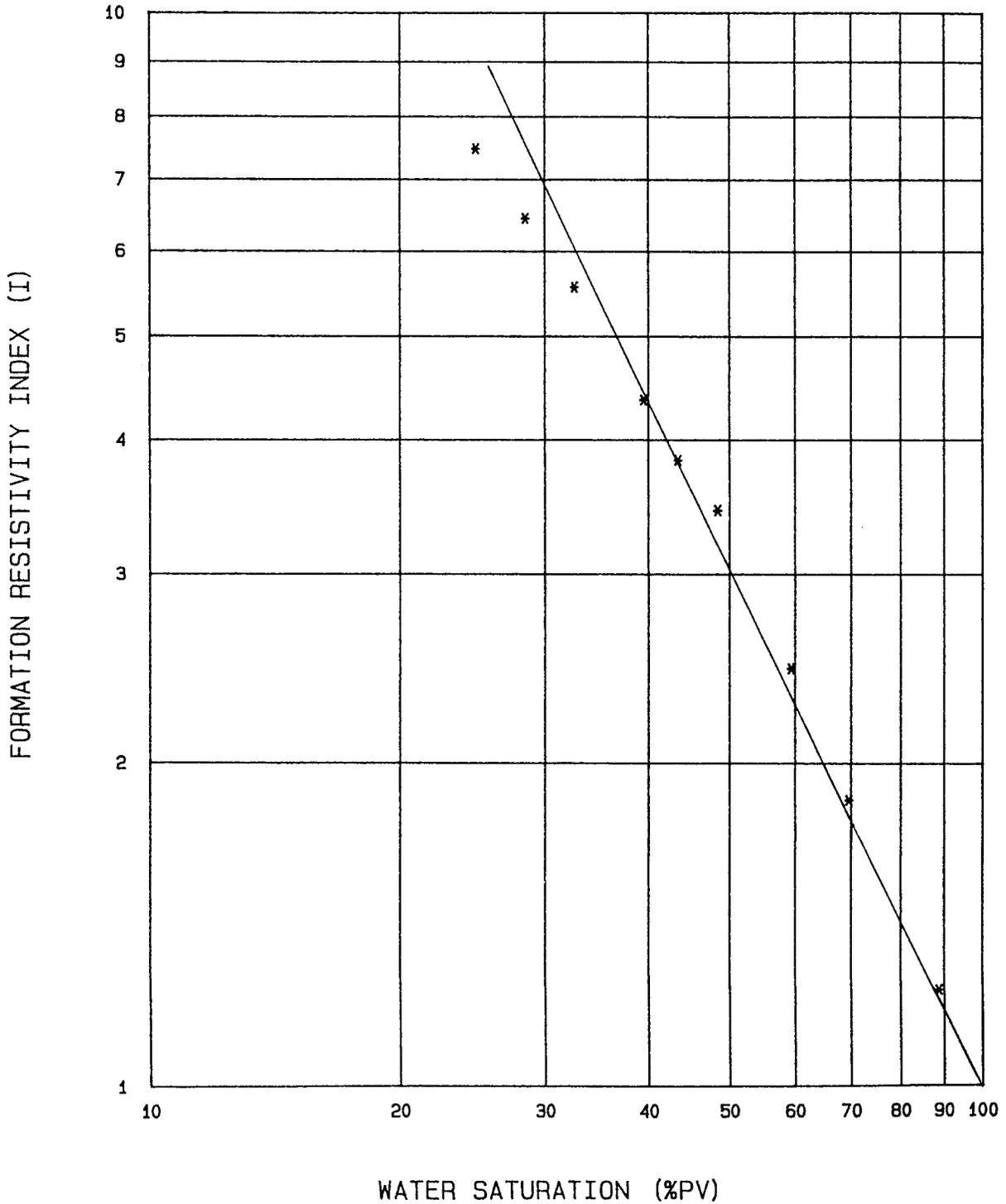


Table 18

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 683         | 2682.6                | 0.532*                              | 15.6                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.23   | 88.7                                   |
|               |                       |                                     |                            | 1.85   | 69.5                                   |
|               |                       |                                     |                            | 2.45   | 59.3                                   |
|               |                       |                                     |                            | 3.44   | 48.4                                   |
|               |                       |                                     |                            | 3.83   | 43.4                                   |
|               |                       |                                     |                            | 4.36   | 39.5                                   |
|               |                       |                                     |                            | 5.56   | 32.6                                   |
|               |                       |                                     |                            | 6.44   | 28.4                                   |
|               |                       |                                     |                            | 7.47   | 24.7                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Table 19

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 685         | 2704.7                | 0.159*                              | 10.3                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.04   | 97.3                                   |
|               |                       |                                     |                            | 1.37   | 80.5                                   |
|               |                       |                                     |                            | 1.45   | 77.2                                   |
|               |                       |                                     |                            | 1.67   | 69.6                                   |
|               |                       |                                     |                            | 2.43   | 52.8                                   |
|               |                       |                                     |                            | 3.06   | 44.2                                   |
|               |                       |                                     |                            | 3.78   | 37.0                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 18

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

Sample : C 685  
Depth, ft : 2704.7

n = 1.41

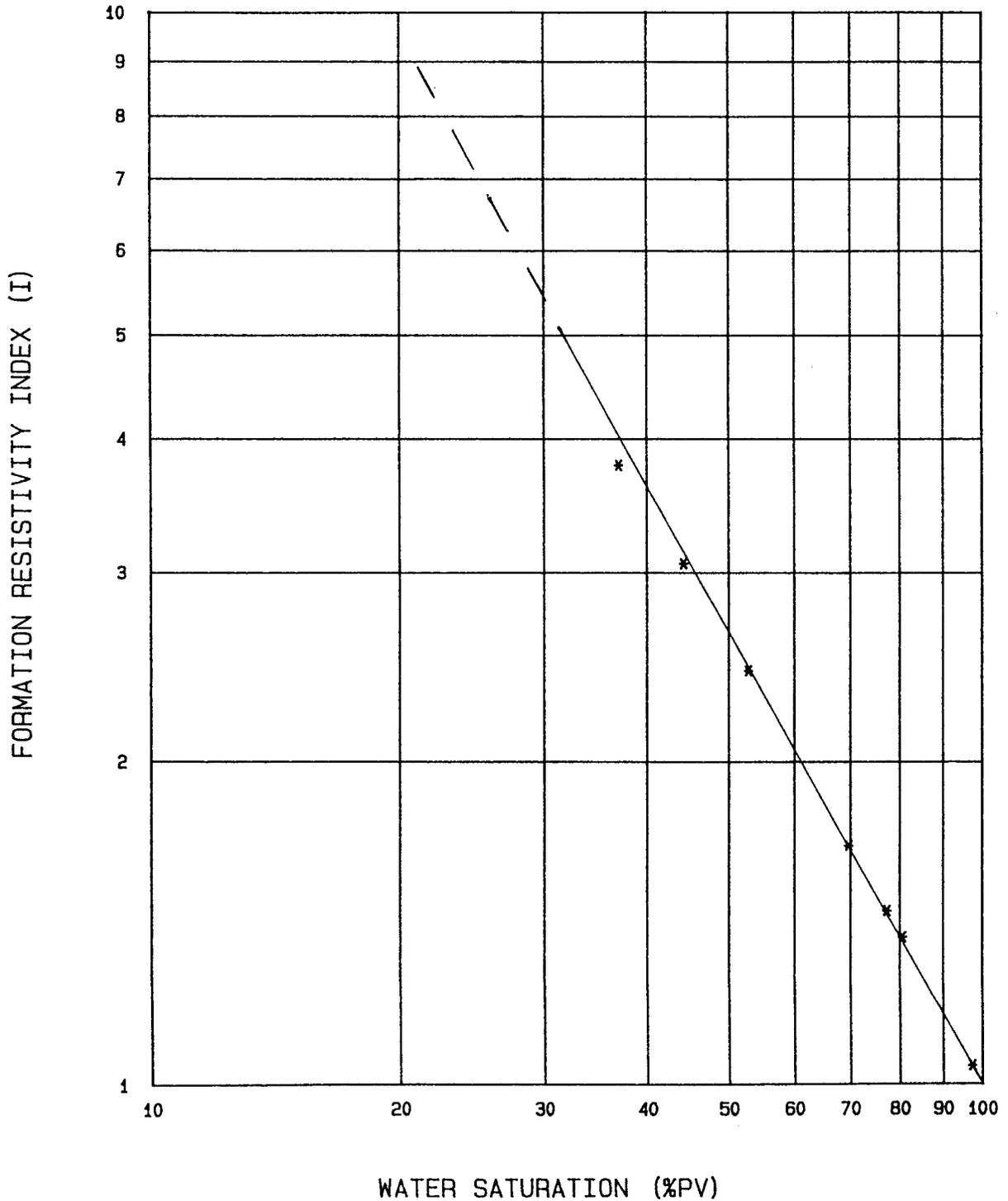


Table 20

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 687         | 2740.1                | 0.126*                              | 9.9                        | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.16   | 91.5                                   |
|               |                       |                                     |                            | 1.32   | 84.7                                   |
|               |                       |                                     |                            | 1.64   | 73.5                                   |
|               |                       |                                     |                            | 2.24   | 59.6                                   |
|               |                       |                                     |                            | 2.96   | 50.0                                   |
|               |                       |                                     |                            | 3.07   | 47.8                                   |
|               |                       |                                     |                            | 3.20   | 45.4                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 19

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

Sample : C 687  
Depth, ft : 2740.1

n = 1.57

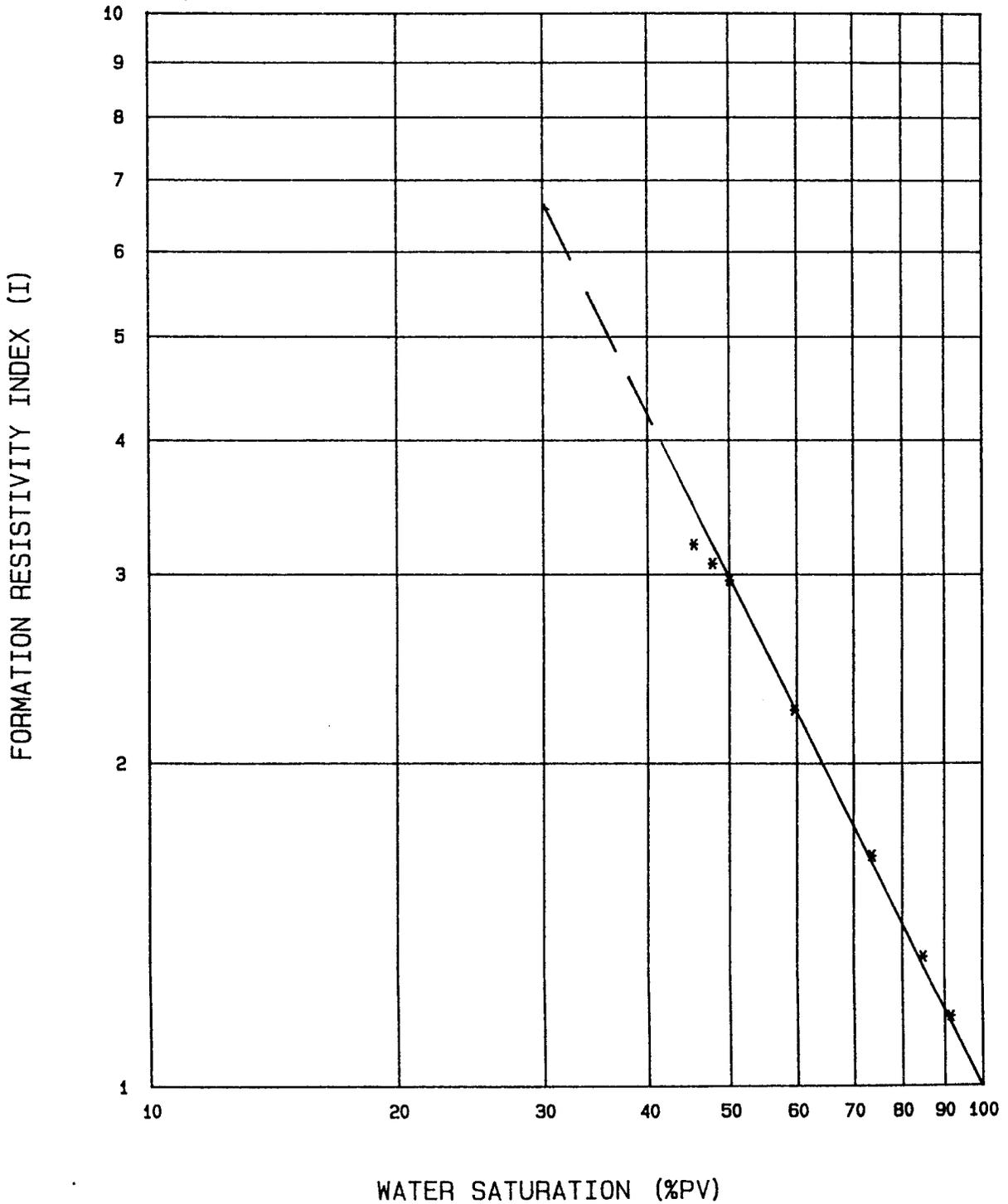


Table 21

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 691         | 2768.8                | 0.014*                              | 6.8                        | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.20   | 88.4                                   |
|               |                       |                                     |                            | 1.36   | 81.5                                   |
|               |                       |                                     |                            | 1.62   | 71.4                                   |
|               |                       |                                     |                            | 1.83   | 66.0                                   |
|               |                       |                                     |                            | 1.93   | 63.0                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 20

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSB 3036

Sample : C 691  
Depth, ft : 2768.8

n = 1.46

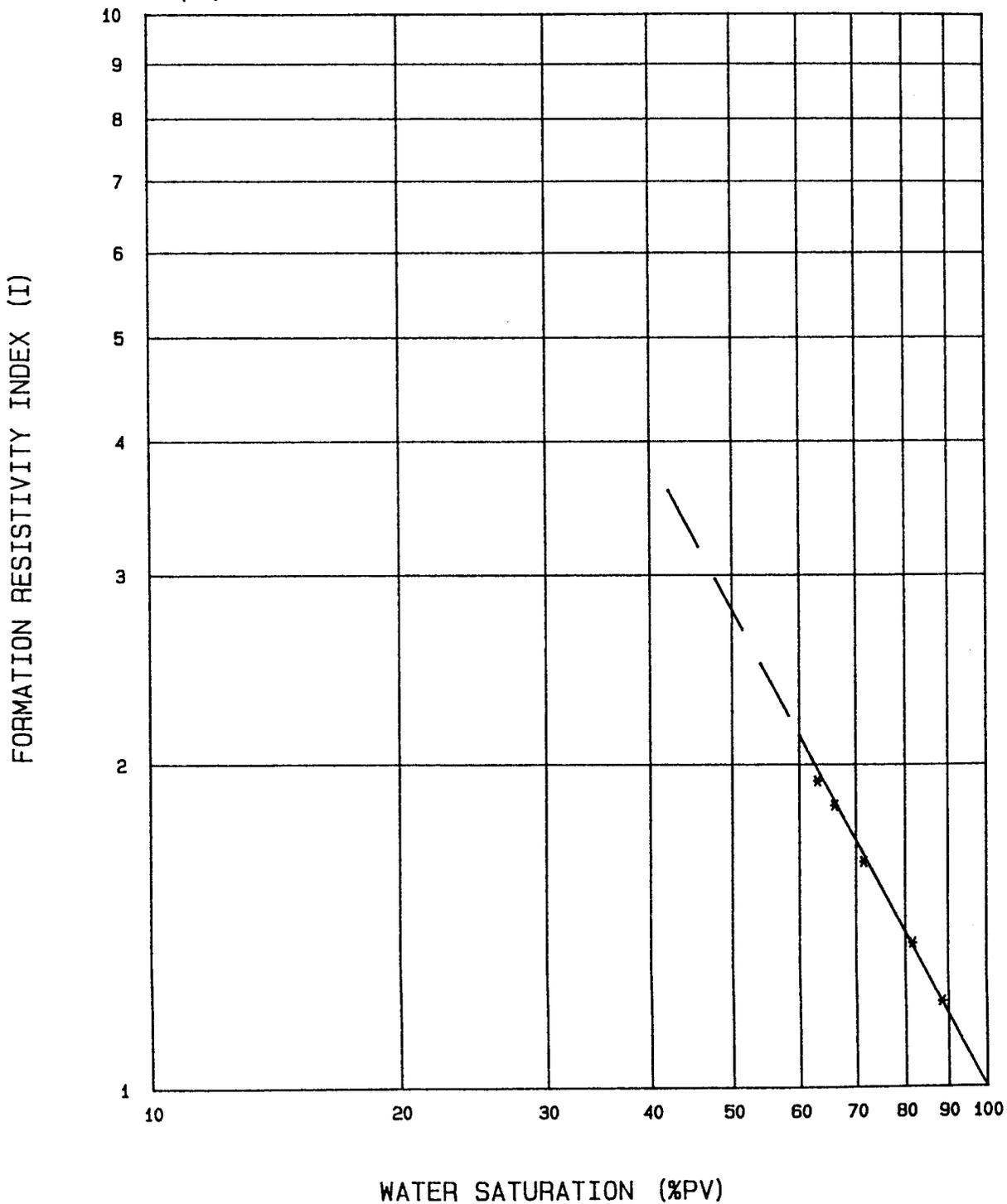


Table 22

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887A/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 713         | 2793.5                | 4.73*                               | 9.3                        | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.09   | 94.8                                   |
|               |                       |                                     |                            | 1.56   | 74.8                                   |
|               |                       |                                     |                            | 1.90   | 65.7                                   |
|               |                       |                                     |                            | 2.99   | 49.1                                   |
|               |                       |                                     |                            | 3.44   | 44.1                                   |
|               |                       |                                     |                            | 4.69   | 37.7                                   |
|               |                       |                                     |                            | 5.72   | 33.1                                   |
|               | 6.01                  | 31.3                                |                            |  |  |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 21

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887A/RSH 3036

Sample : C 713  
Depth, ft : 2793.5

n = 1.55

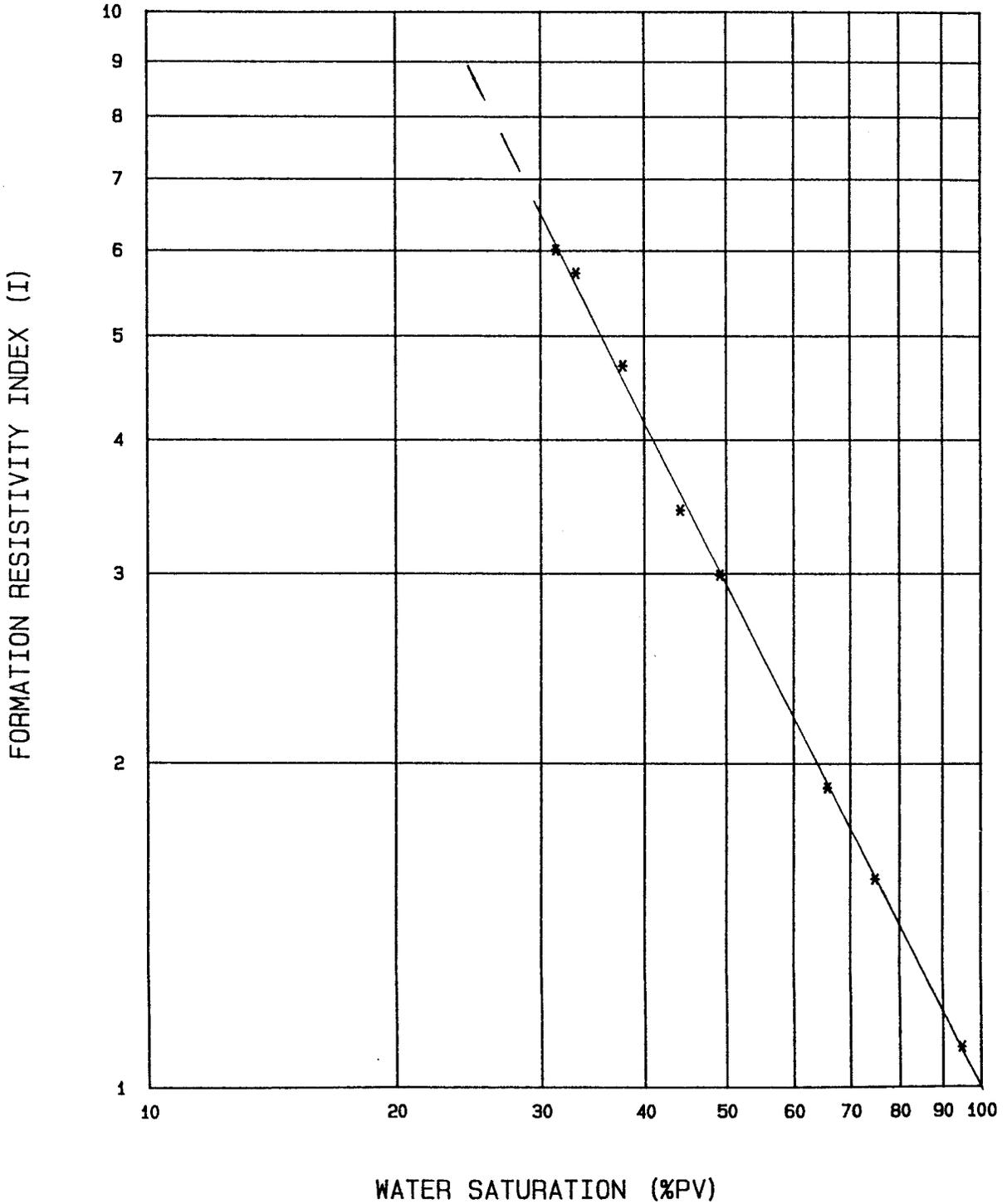


Table 23

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 693         | 2793.9                | 1.68*                               | 8.1                        | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.16   | 92.3                                   |
|               |                       |                                     |                            | 1.39   | 83.9                                   |
|               |                       |                                     |                            | 1.73   | 74.7                                   |
|               |                       |                                     |                            | 2.41   | 62.3                                   |
|               |                       |                                     |                            | 2.76   | 56.7                                   |
|               |                       |                                     |                            | 3.28   | 51.1                                   |
|               |                       |                                     |                            | 4.00   | 45.1                                   |
|               |                       |                                     |                            | 4.86   | 39.3                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 22

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 693  
Depth, ft : 2793.9

n = 1.81

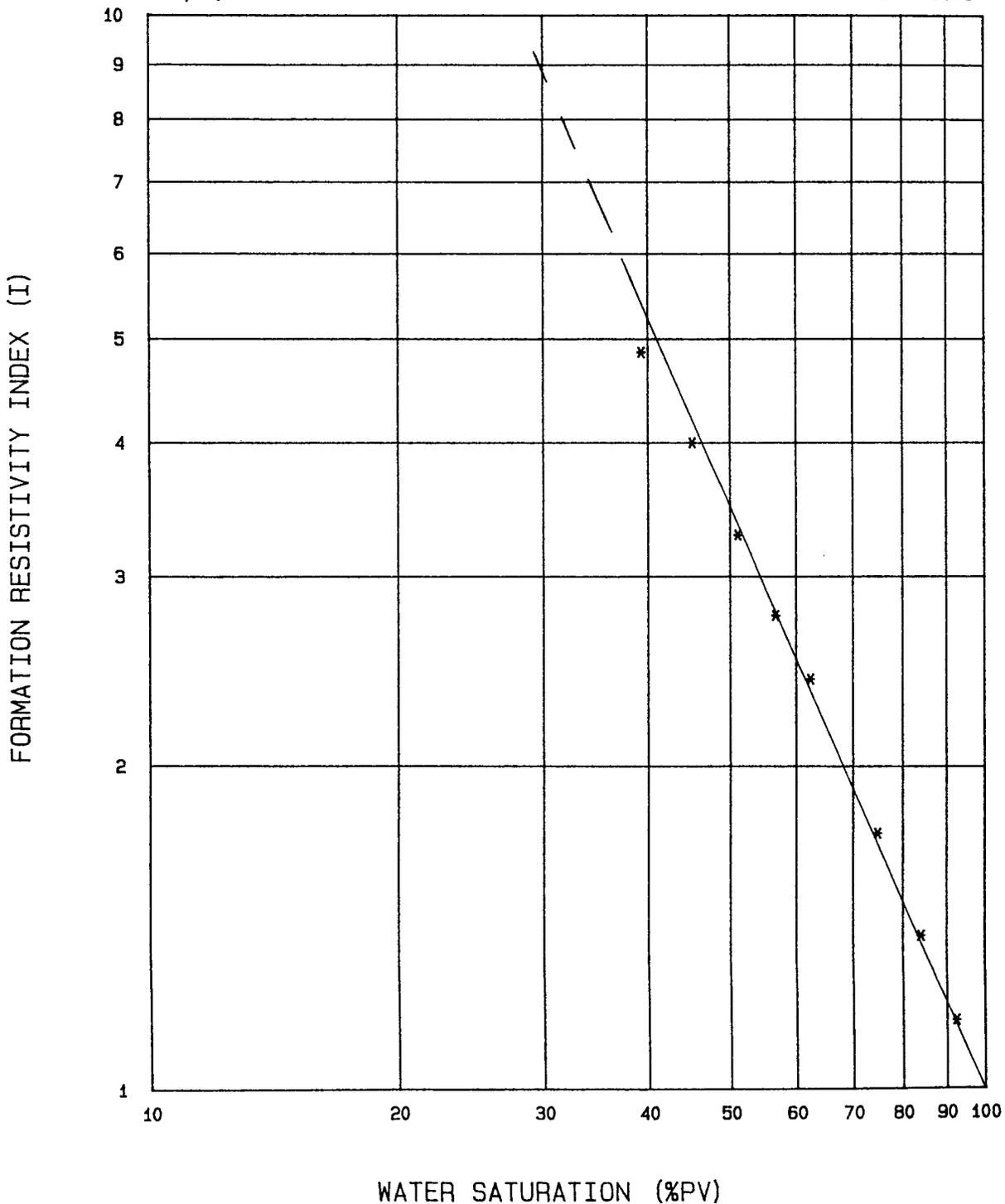


Table 24

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 716         | 2802.6                | 0.010*                              | 8.7                        | 1.00<br>1.10                                   | 100.0<br>92.4                          |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 23

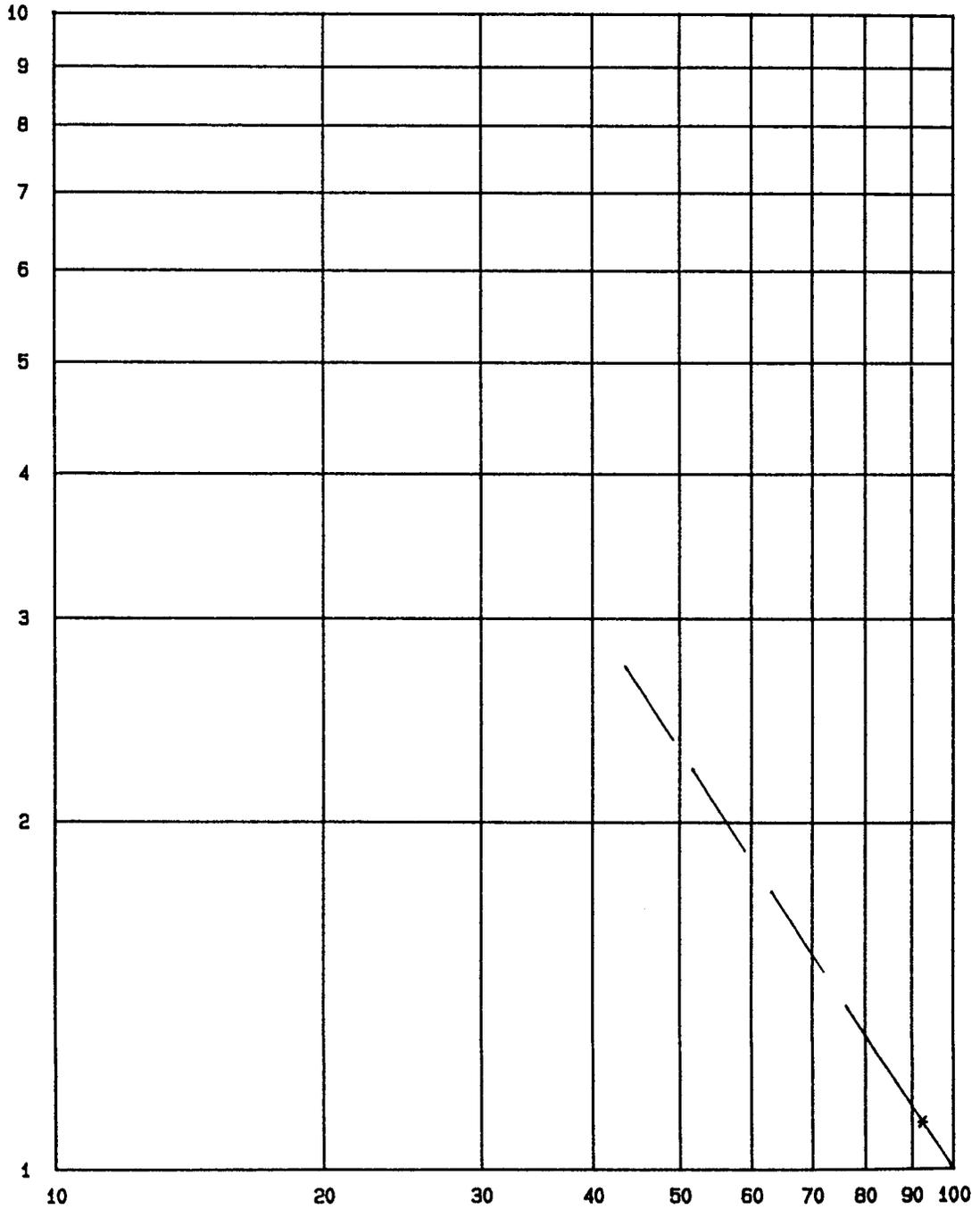
FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 716  
Depth, ft : 2802.6

n = 1.21

FORMATION RESISTIVITY INDEX (I)



WATER SATURATION (%PV)

Table 25

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 696         | 2870.3                | 10.6*                               | 11.8                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.20   | 91.3                                   |
|               |                       |                                     |                            | 1.74   | 76.1                                   |
|               |                       |                                     |                            | 2.23   | 66.8                                   |
|               |                       |                                     |                            | 2.63   | 61.7                                   |
|               |                       |                                     |                            | 3.06   | 57.8                                   |
|               |                       |                                     |                            | 5.54   | 43.0                                   |
|               |                       |                                     |                            | 7.93   | 36.0                                   |
|               |                       |                                     |                            | 12.33  | 29.4                                   |
|               |                       |                                     |                            | 15.07  | 27.2                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 24

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 696  
Depth, ft : 2870.3

n = 2.03

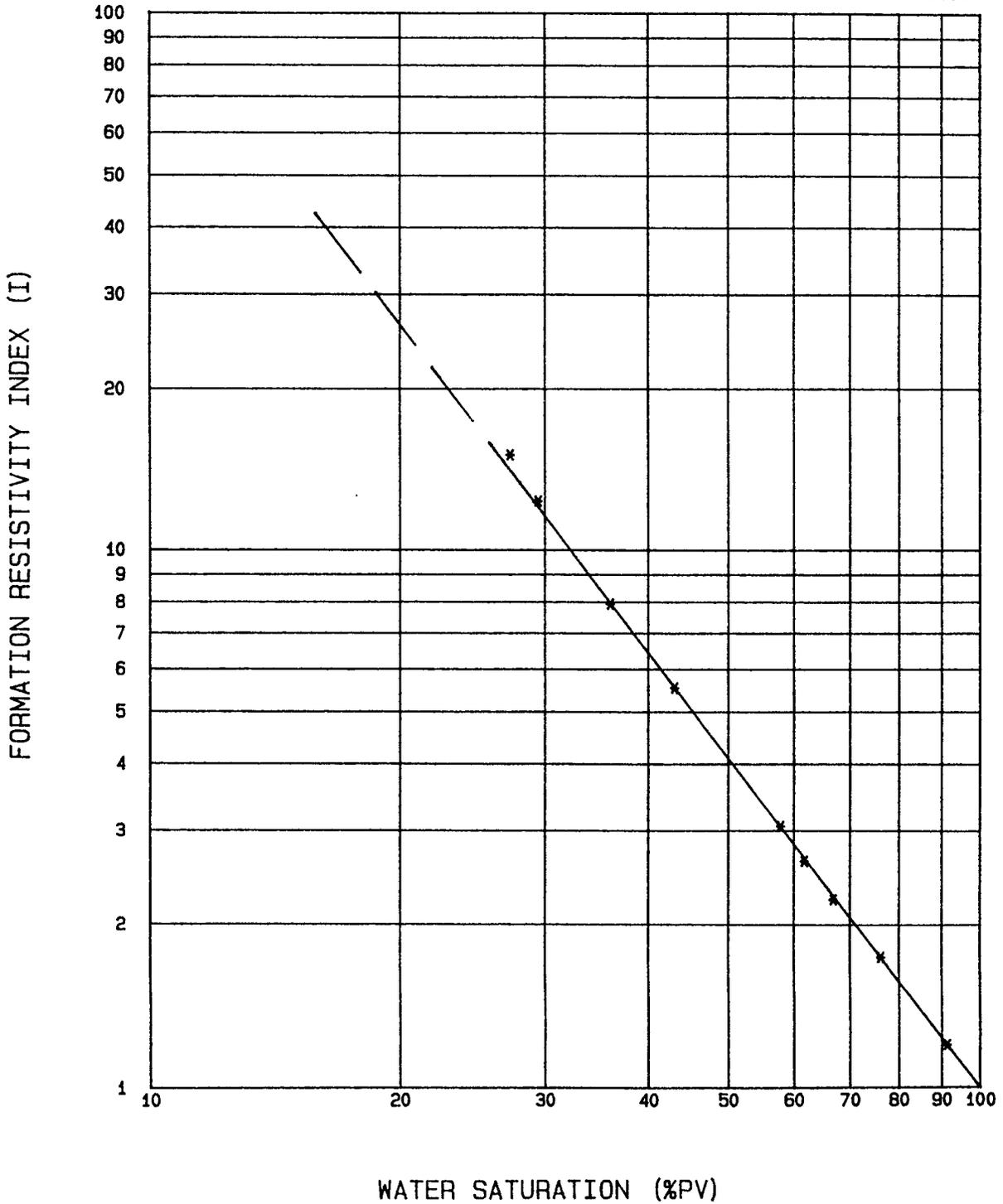


Table 26

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 698         | 2878.9                | 0.291*                              | 6.4                        | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.11   | 95.0                                   |
|               |                       |                                     |                            | 1.29   | 88.0                                   |
|               |                       |                                     |                            | 1.48   | 82.1                                   |
|               |                       |                                     |                            | 2.22   | 66.5                                   |
|               |                       |                                     |                            | 2.51   | 63.0                                   |
|               |                       |                                     |                            | 3.13   | 56.4                                   |
|               |                       |                                     |                            | 3.97   | 50.0                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 25

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

Sample : C 698  
Depth, ft : 2878.9

n = 1.99

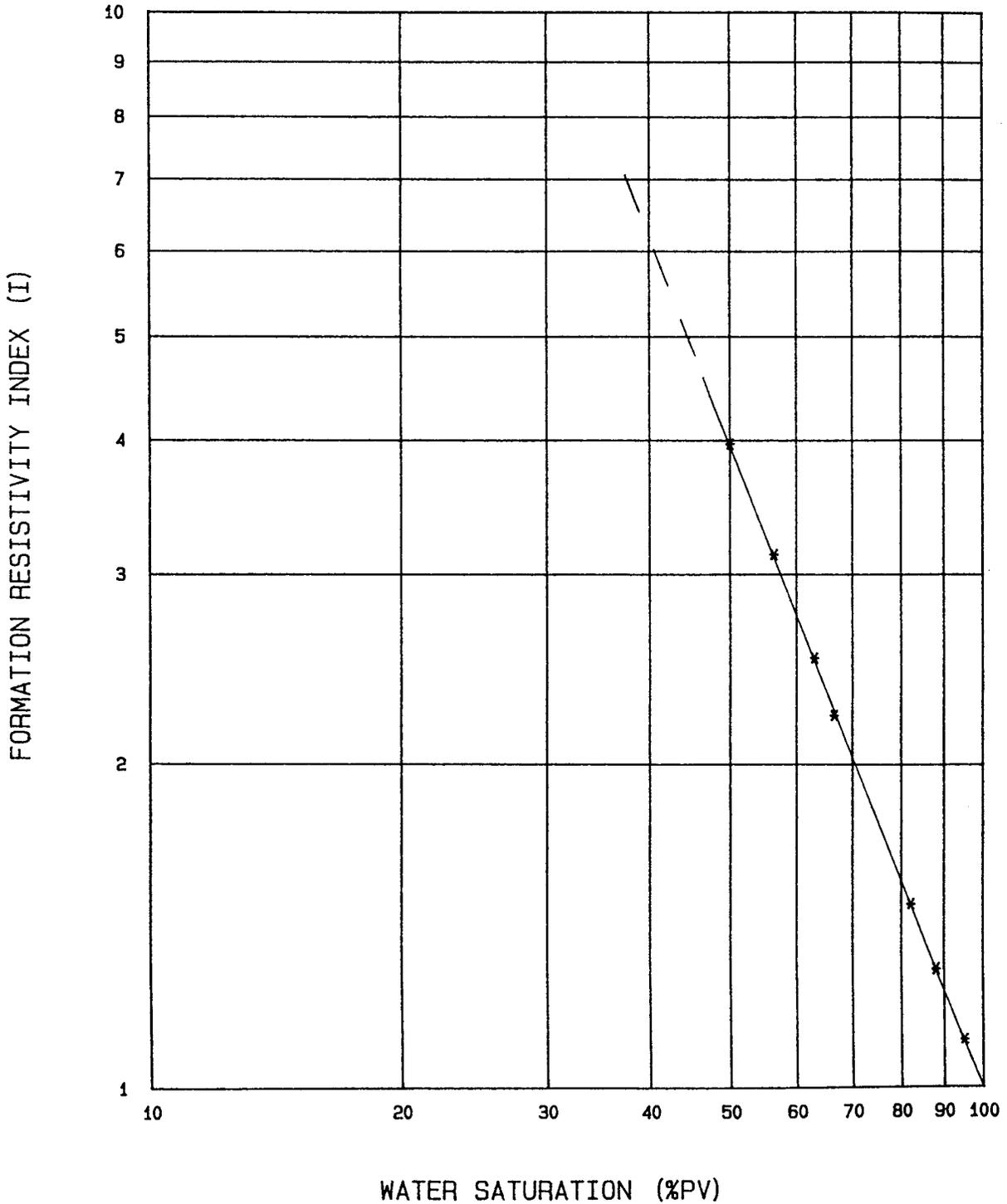


Table 27

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 700         | 2896.3                | 0.014*                              | 6.7                        | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.32   | 83.0                                   |
|               |                       |                                     |                            | 1.67   | 70.4                                   |
|               |                       |                                     |                            | 1.99   | 62.6                                   |
|               |                       |                                     |                            | 2.39   | 54.1                                   |
|               |                       |                                     |                            | 2.53   | 50.3                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 26

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSB 3036

Sample : C 700  
Depth, ft : 2896.3

n = 1.44

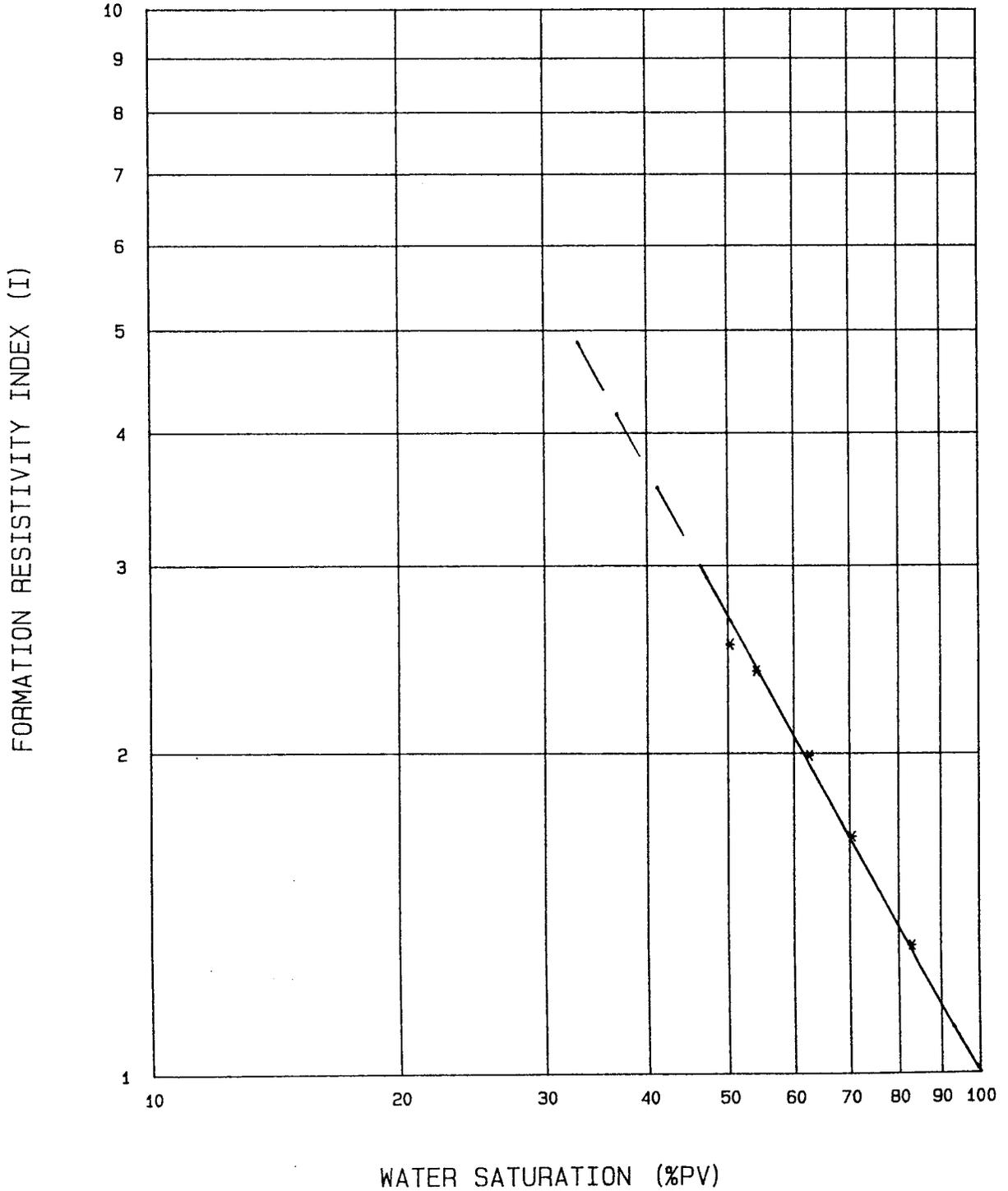


Table 28

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 702         | 2897.6                | 0.065*                              | 8.8                        | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.10   | 94.6                                   |
|               |                       |                                     |                            | 1.20   | 89.3                                   |
|               |                       |                                     |                            | 1.49   | 78.6                                   |
|               |                       |                                     |                            | 3.10   | 50.0                                   |
|               |                       |                                     |                            | 4.05   | 43.8                                   |
|               |                       |                                     |                            | 4.76   | 40.4                                   |
|               |                       |                                     |                            | 5.42   | 36.2                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 27

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 702  
Depth, ft : 2897.6

n = 1.67

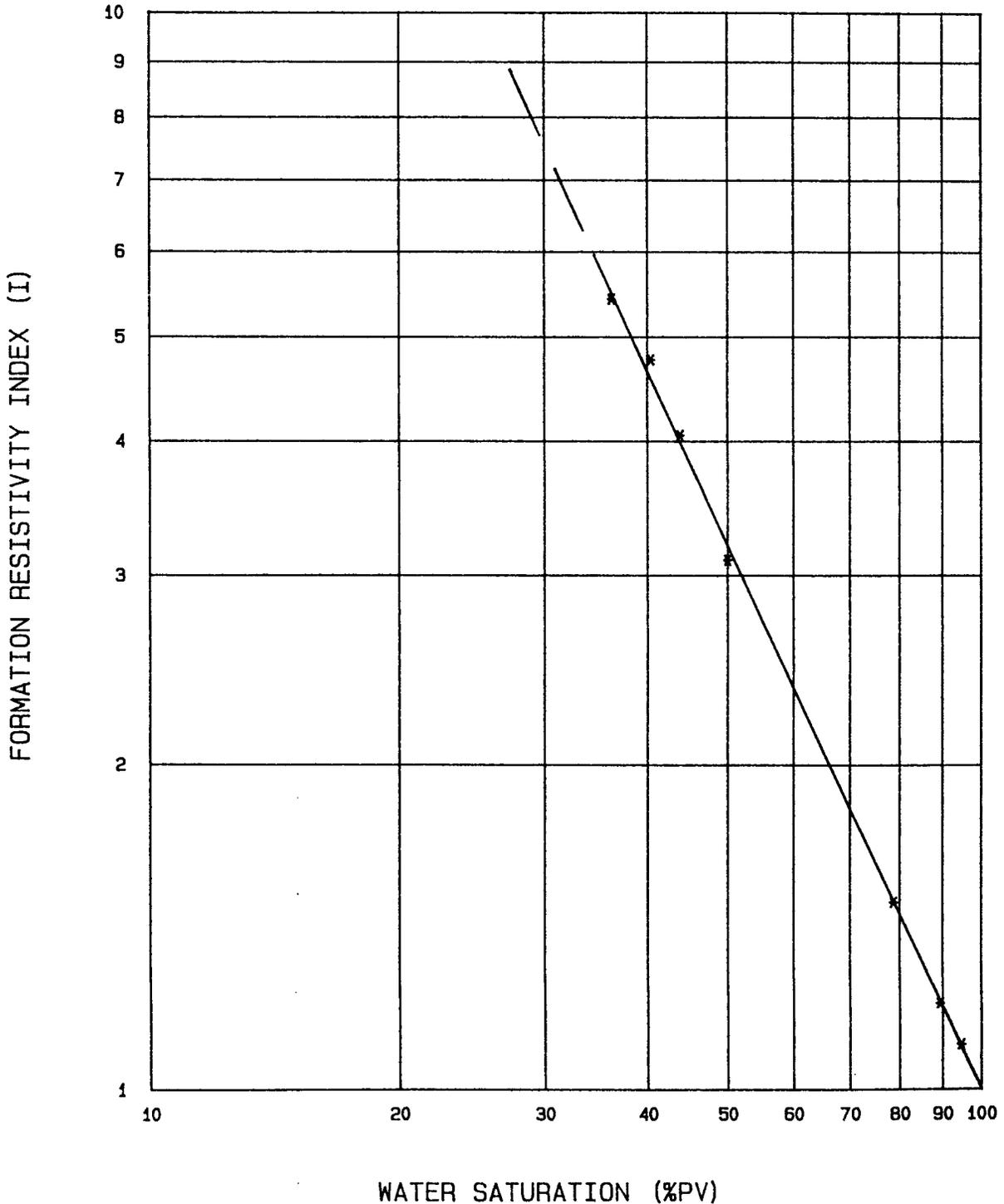


Table 29

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 704         | 2917.3                | 9.30*                               | 14.1                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.07   | 95.7                                   |
|               |                       |                                     |                            | 1.48   | 77.8                                   |
|               |                       |                                     |                            | 1.96   | 64.9                                   |
|               |                       |                                     |                            | 2.57   | 55.0                                   |
|               |                       |                                     |                            | 3.95   | 41.0                                   |
|               |                       |                                     |                            | 5.71   | 32.2                                   |
|               |                       |                                     |                            | 7.43   | 26.7                                   |
|               |                       |                                     | 12.67                      | 18.9   |  |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 28

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 704  
Depth, ft : 2917.3

n = 1.55

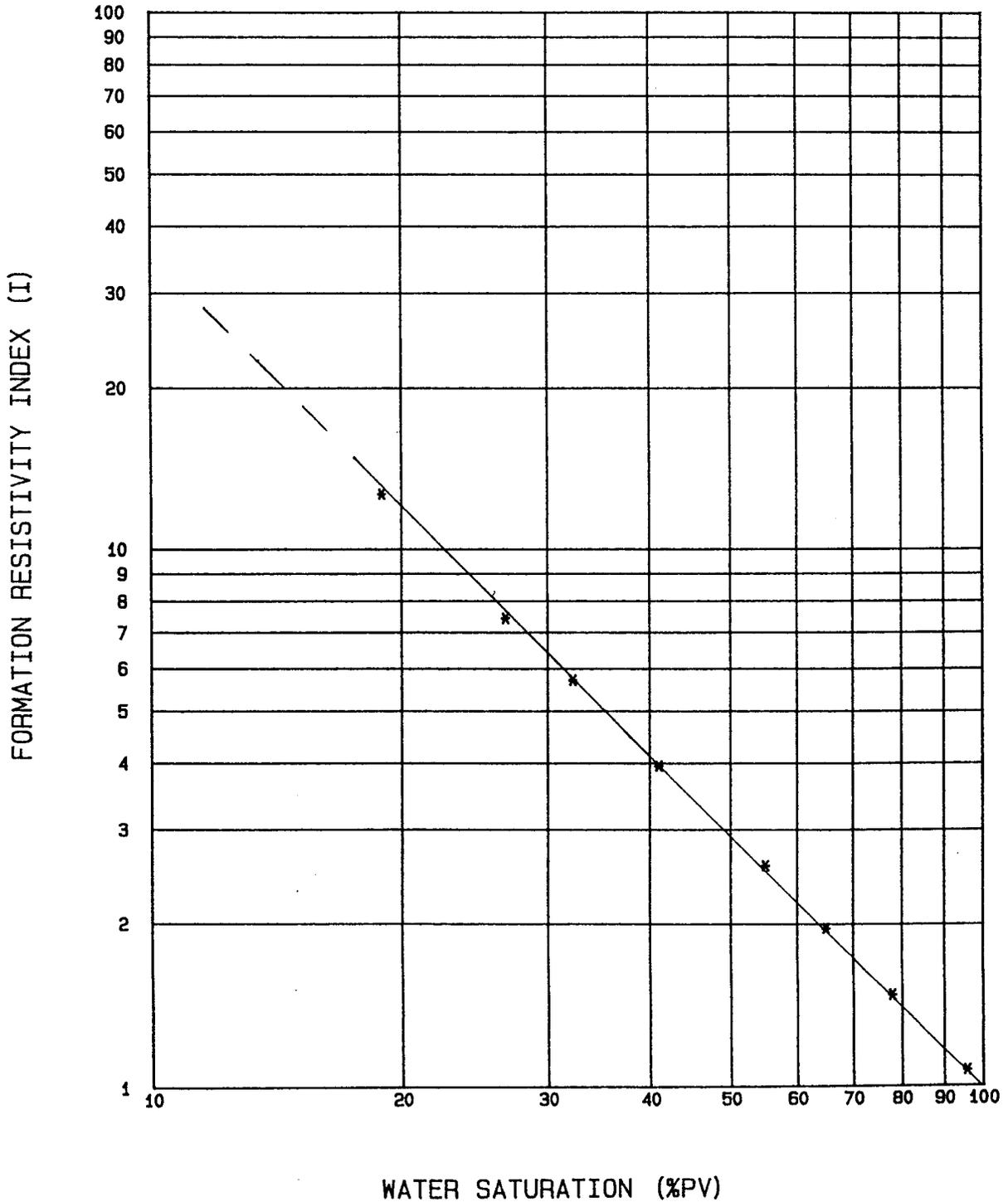


Table 30

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 706         | 2918.1                | 0.576*                              | 13.0                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.21   | 89.3                                   |
|               |                       |                                     |                            | 1.60   | 75.2                                   |
|               |                       |                                     |                            | 2.01   | 65.9                                   |
|               |                       |                                     |                            | 2.31   | 60.2                                   |
|               |                       |                                     |                            | 3.64   | 46.6                                   |
|               |                       |                                     |                            | 4.23   | 42.8                                   |
|               |                       |                                     |                            | 5.23   | 37.6                                   |
|               |                       |                                     |                            | 6.00   | 33.6                                   |
|               |                       |                                     |                            | 6.85   | 30.9                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 29

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 706  
Depth, ft : 2918.1

n = 1.67

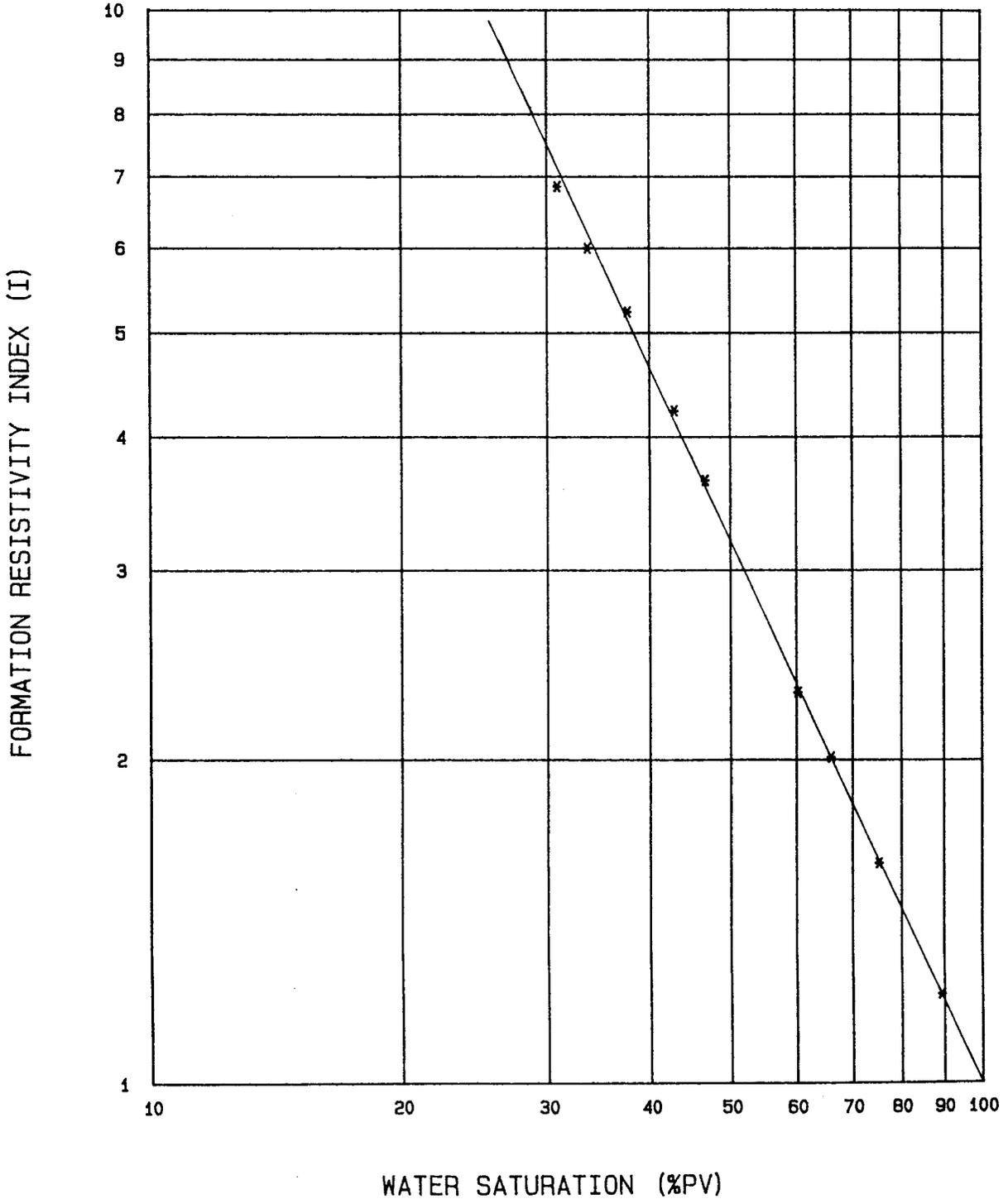


Table 31

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887A/RSB 3031

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 719         | 2925.5                | 0.035*                              | 13.0                       | 1.00<br>1.51                                   | 100.0<br>80.6                          |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 30

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887A/RSH 3031

Sample : C 719  
Depth, ft : 2925.5

n = 1.91

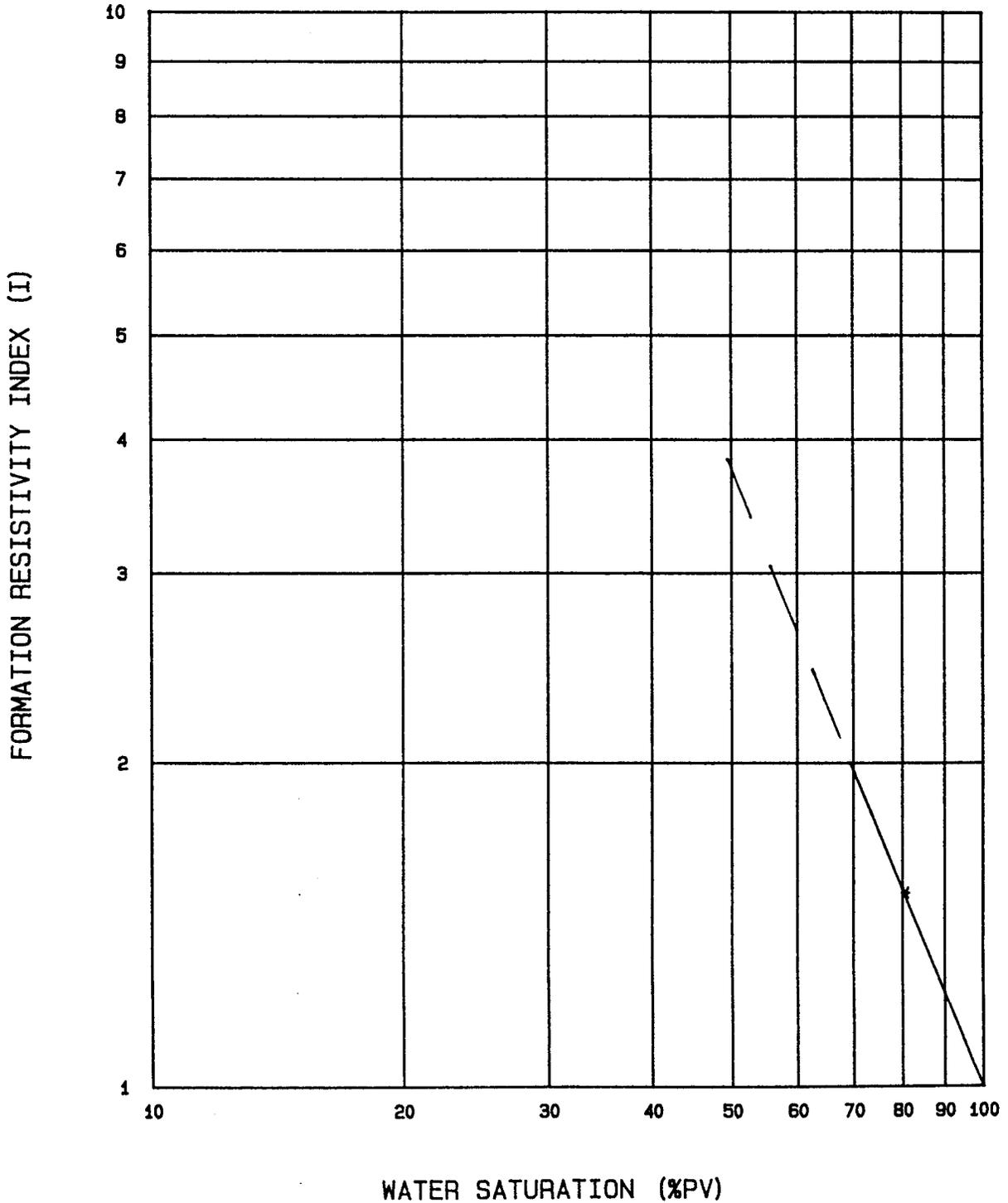


Table 32

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 707         | 2932.3                | 0.142*                              | 6.3                        | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.07   | 96.0                                   |
|               |                       |                                     |                            | 1.23   | 88.3                                   |
|               |                       |                                     |                            | 2.02   | 66.3                                   |
|               |                       |                                     |                            | 2.63   | 56.0                                   |
|               |                       |                                     |                            | 2.97   | 52.5                                   |
|               |                       |                                     |                            | 3.30   | 49.0                                   |
|               |                       |                                     |                            | 3.43   | 46.3                                   |
|               |                       |                                     |                            | 3.52   | 44.4                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 31

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 707  
Depth, ft : 2932.3

n = 1.65

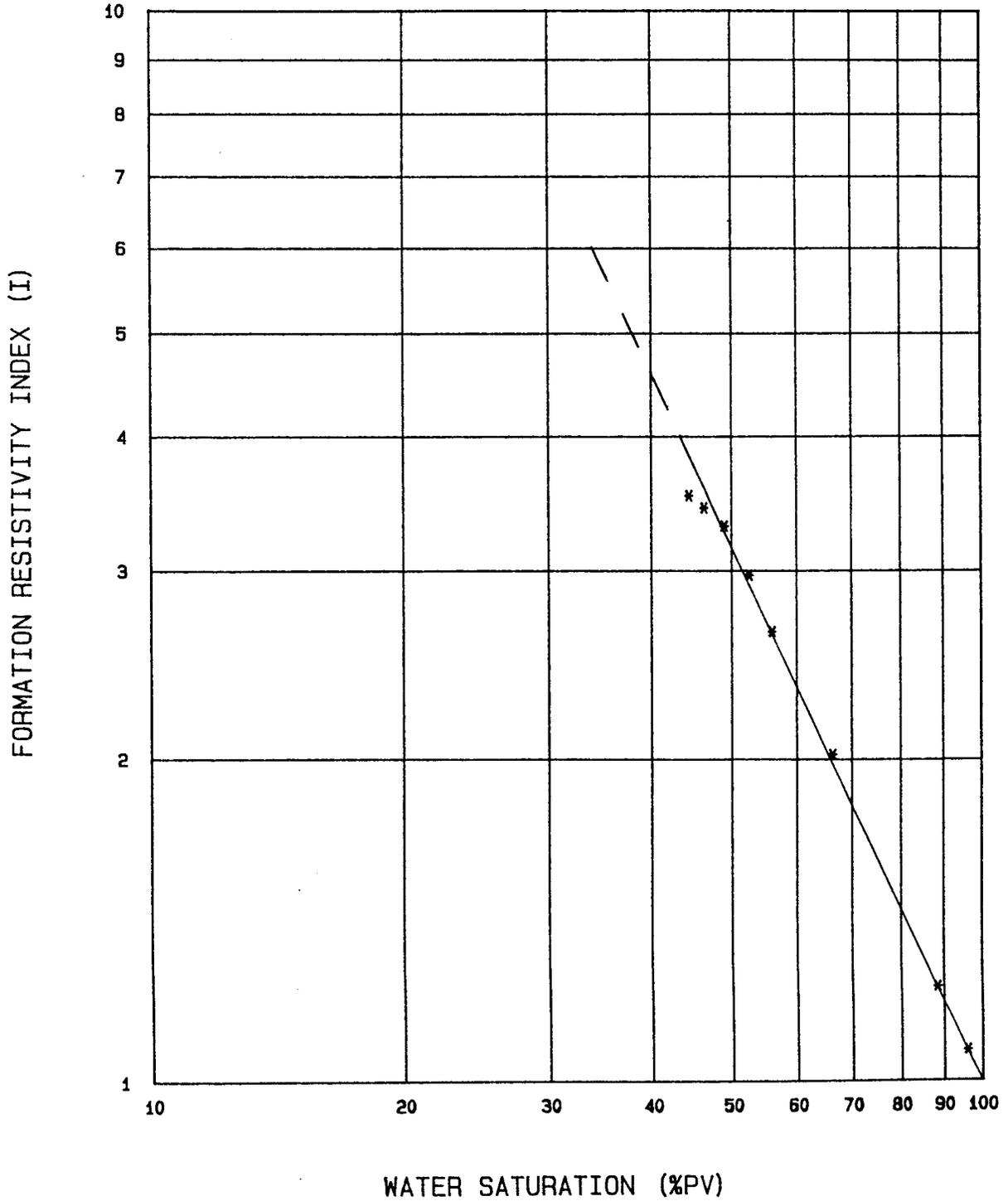


Table 33

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 709         | 2951.5                | 0.122*                              | 9.5                        | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.06   | 96.3                                   |
|               |                       |                                     |                            | 1.26   | 86.2                                   |
|               |                       |                                     |                            | 1.59   | 74.4                                   |
|               |                       |                                     |                            | 1.87   | 67.8                                   |
|               |                       |                                     |                            | 3.08   | 48.9                                   |
|               |                       |                                     |                            | 3.36   | 45.0                                   |
|               |                       |                                     |                            | 4.14   | 37.5                                   |
|               |                       |                                     |                            | 4.87   | 32.3                                   |
|               |                       |                                     |                            | 5.69   | 27.9                                   |
|               |                       |                                     |                            | 6.39   | 24.5                                   |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 32

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample : C 709  
Depth, ft : 2951.5

n = 1.49

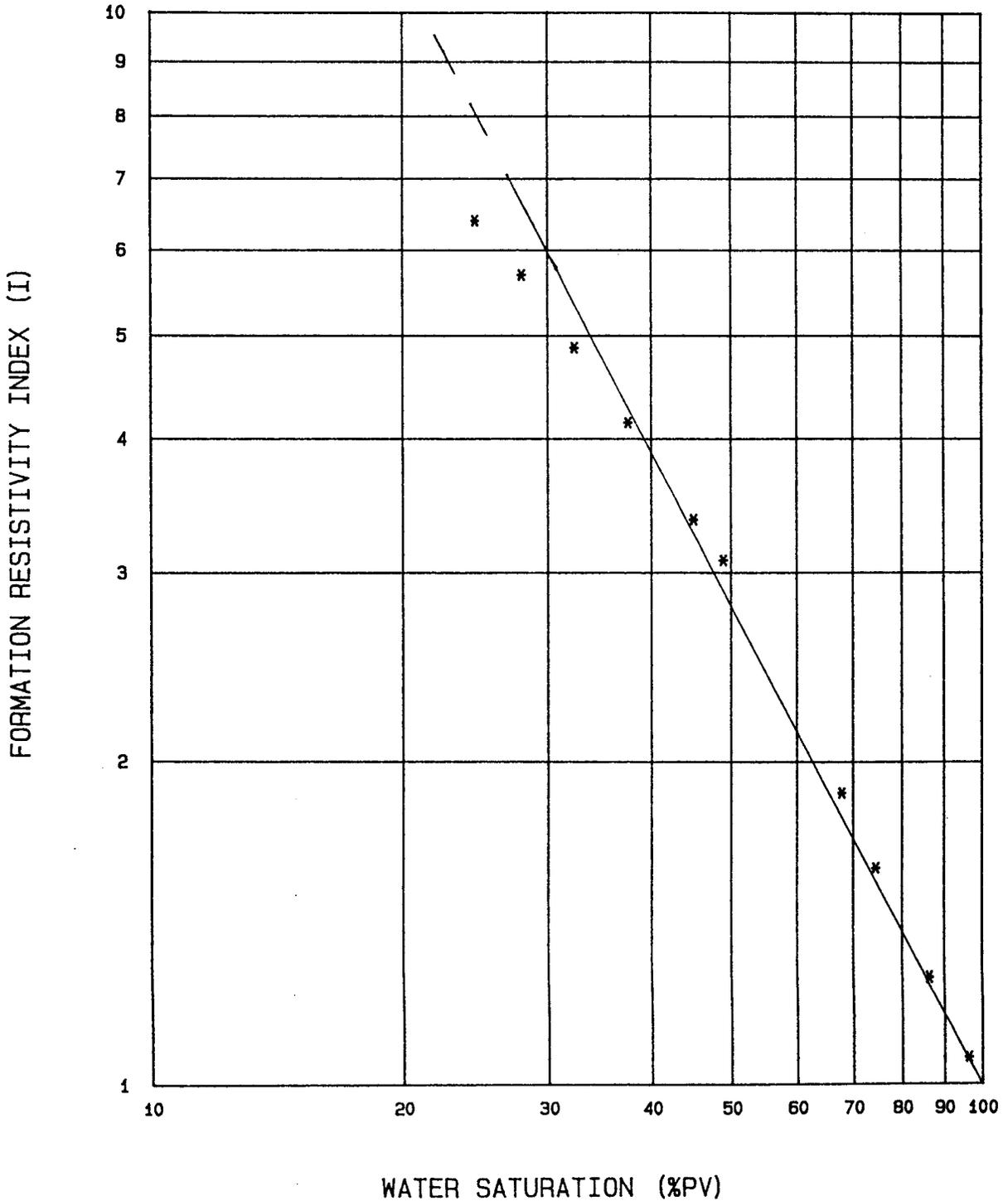


Table 34

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP

AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

| <u>Sample</u> | <u>Depth<br/>(ft)</u> | <u>Permeability<br/>To Gas (md)</u> | <u>Porosity<br/>(% BV)</u> | <u>Formation<br/>Resistivity<br/>Index (I)</u> | <u>Water<br/>Saturation<br/>(% PV)</u> |
|---------------|-----------------------|-------------------------------------|----------------------------|--|--|
| C 711         | 2952.2                | 1.84                                | 13.5                       | 1.00   | 100.0                                  |
|               |                       |                                     |                            | 1.22   | 90.3                                   |
|               |                       |                                     |                            | 1.57   | 79.4                                   |
|               |                       |                                     |                            | 2.11   | 68.2                                   |
|               |                       |                                     |                            | 3.48   | 52.5                                   |
|               |                       |                                     |                            | 4.28   | 47.1                                   |
|               |                       |                                     |                            | 5.44   | 41.3                                   |
|               |                       |                                     |                            | 6.46   | 36.7                                   |
|               |                       |                                     | 7.82                       | 32.7   |  |

Rw = 0.047 ohm-meters @ 73 degrees Fahrenheit

\* Permeability to gas measured at 400 psig confining pressure.

Figure 33

FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
AT 1650 psig CONFINING PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

Sample : C 711  
Depth, ft : 2952.2

$n = 1.92$

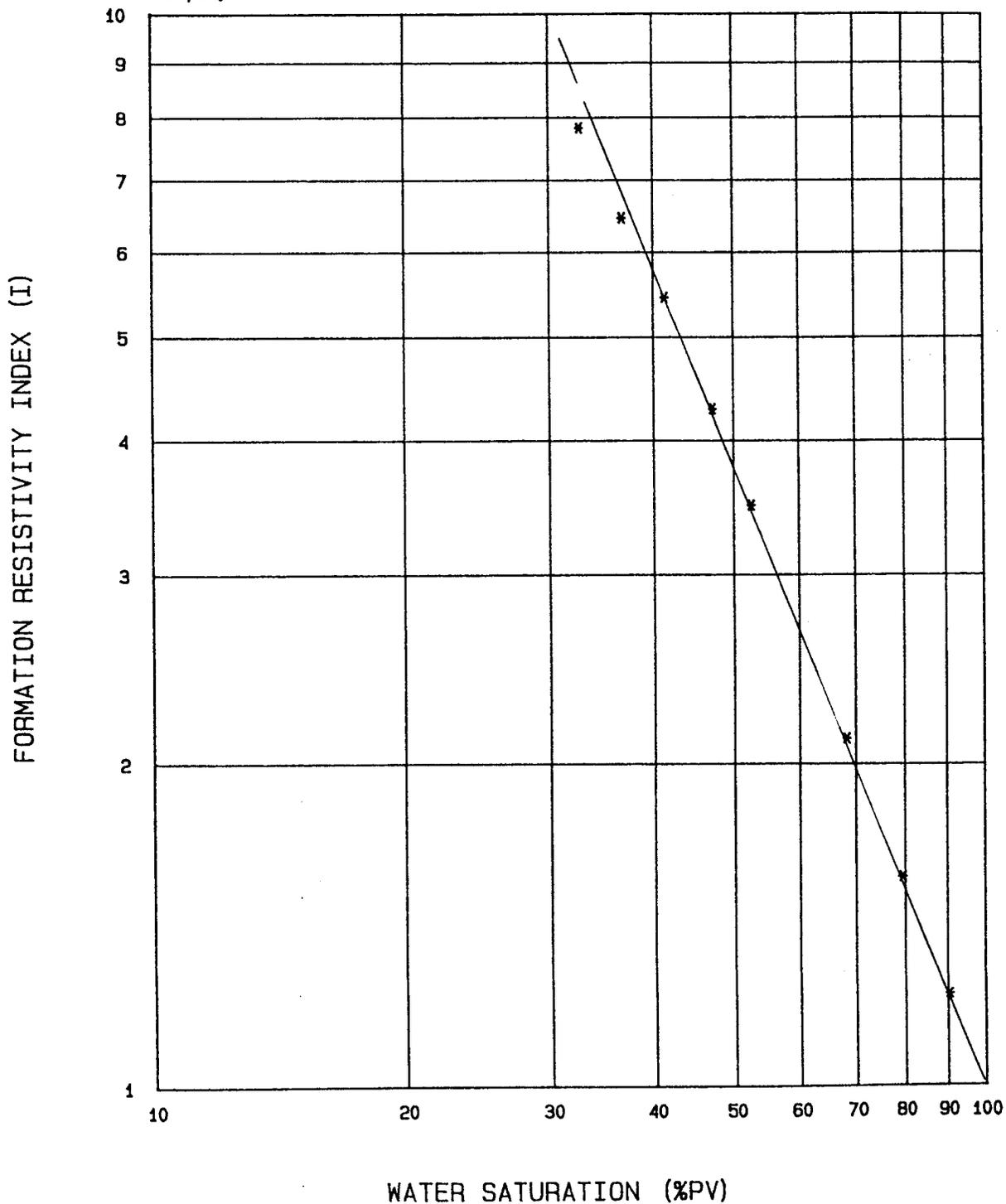


Figure 34  
 FORMATION RESISTIVITY INDEX - SATURATION RELATIONSHIP  
 AT CONFINING PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

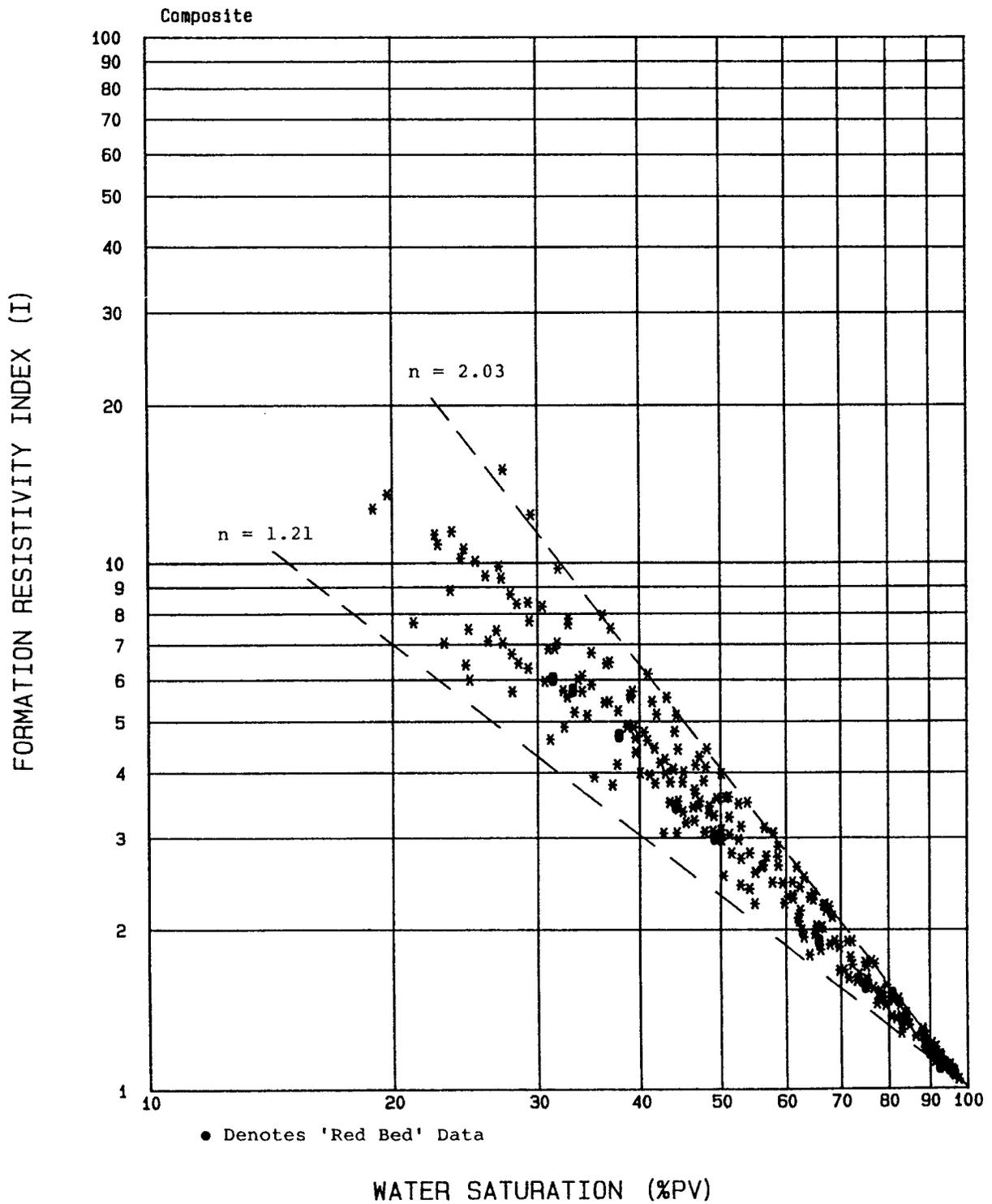


Figure 35

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

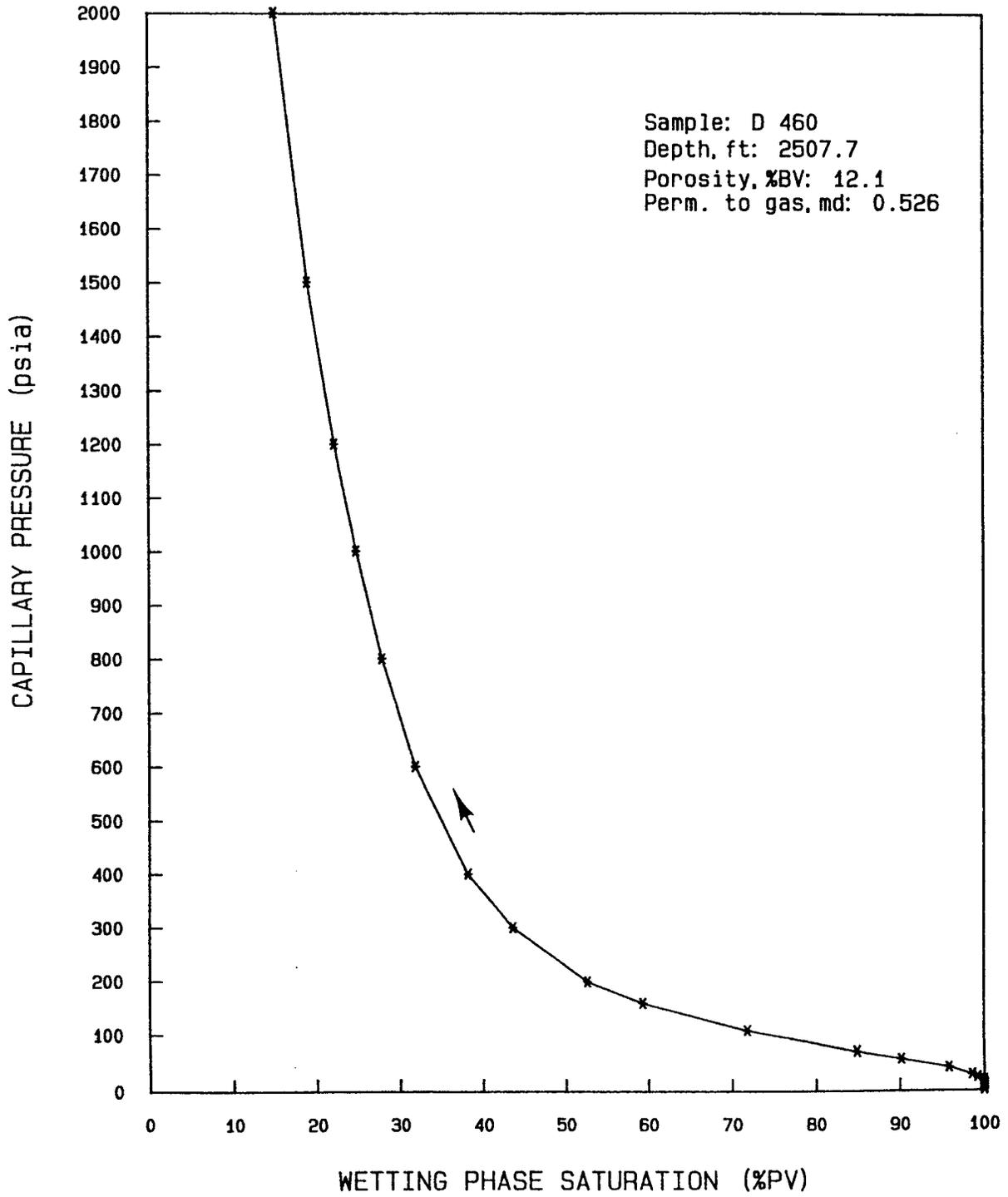


Figure 36  
MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample: D 460  
Depth, ft: 2507.7

Porosity, %BV: 12.1  
Permeability, md: 0.526

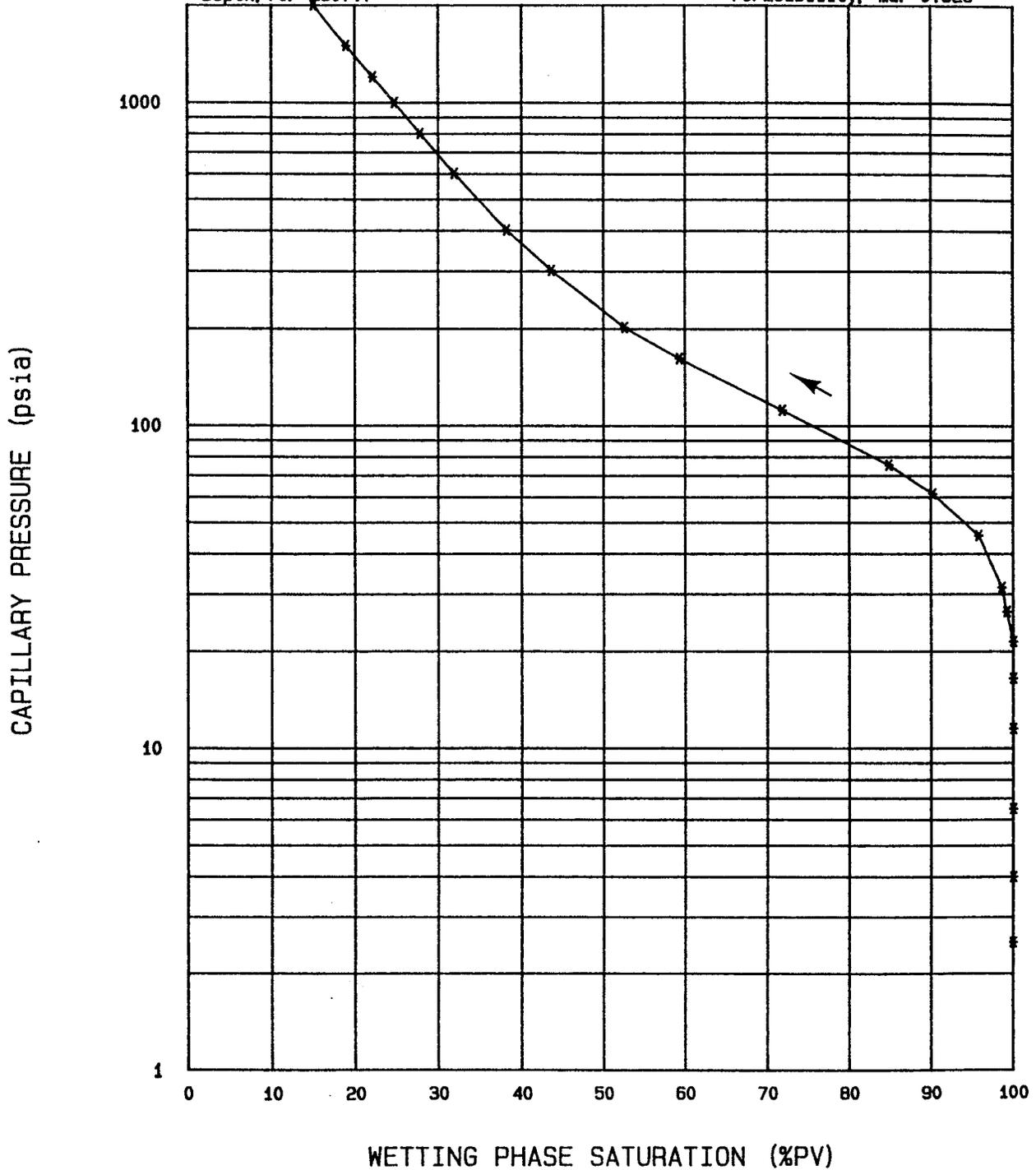


Figure 37

PORE SIZE DISTRIBUTION  
Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

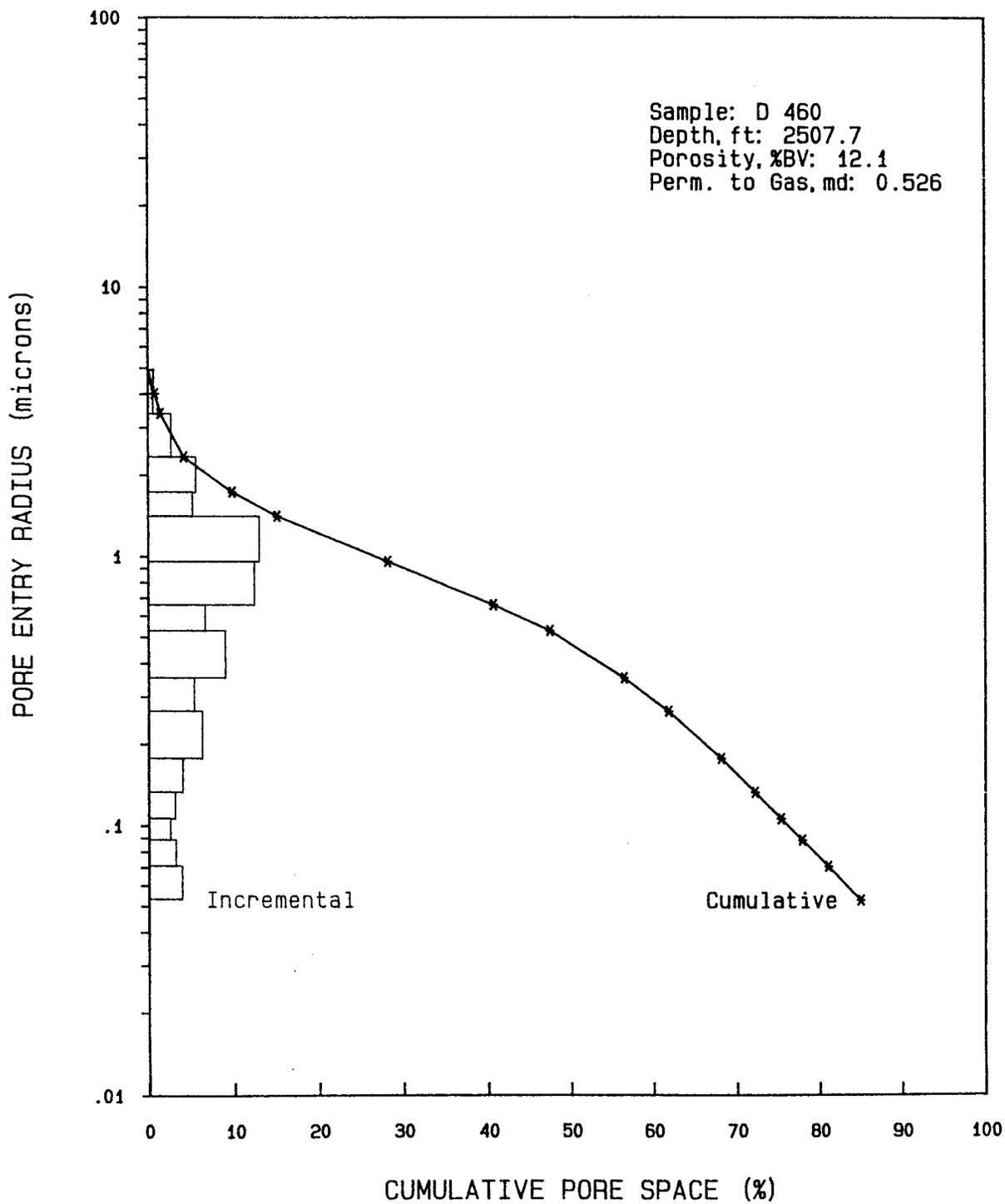


Table 36

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

Sample: C 639 Porosity, % BV: 19.3  
 Depth, ft: 2526.4 Perm. to Gas, md: 63.0

| <u>CAPILLARY PRESSURE (psia)</u> | <u>WETTING PHASE SATURATION (%PV)</u> | <u>PORE ENTRY RADIUS (microns)</u> | <u>LEVERETT'S J-FUNCTION</u> |
|----------------------------------|---------------------------------------|------------------------------------|------------------------------|
| 2.52                             | 100.0                                 | -                                  | -                            |
| 4.02                             | 100.0                                 | -                                  | -                            |
| 6.52                             | 99.1                                  | 16.34                              | 0.067                        |
| 11.5                             | 87.2                                  | 9.25                               | 0.117                        |
| 16.5                             | 68.3                                  | 6.45                               | 0.168                        |
| 21.5                             | 56.3                                  | 4.95                               | 0.219                        |
| 26.5                             | 48.8                                  | 4.02                               | 0.270                        |
| 31.5                             | 43.5                                  | 3.38                               | 0.321                        |
| 45.5                             | 35.5                                  | 2.34                               | 0.464                        |
| 61.5                             | 30.6                                  | 1.73                               | 0.627                        |
| 75.5                             | 28.0                                  | 1.41                               | 0.770                        |
| 112                              | 24.0                                  | 0.96                               | 1.14                         |
| 162                              | 21.2                                  | 0.66                               | 1.65                         |
| 202                              | 19.8                                  | 0.53                               | 2.05                         |
| 302                              | 17.6                                  | 0.35                               | 3.07                         |
| 402                              | 16.2                                  | 0.27                               | 4.09                         |
| 602                              | 14.1                                  | 0.18                               | 6.13                         |
| 802                              | 12.6                                  | 0.13                               | 8.17                         |
| 1001                             | 11.4                                  | 0.11                               | 10.21                        |
| 1201                             | 10.4                                  | 0.09                               | 12.25                        |
| 1501                             | 9.2                                   | 0.07                               | 15.31                        |
| 2001                             | 7.8                                   | 0.05                               | 20.41                        |

Figure 38

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

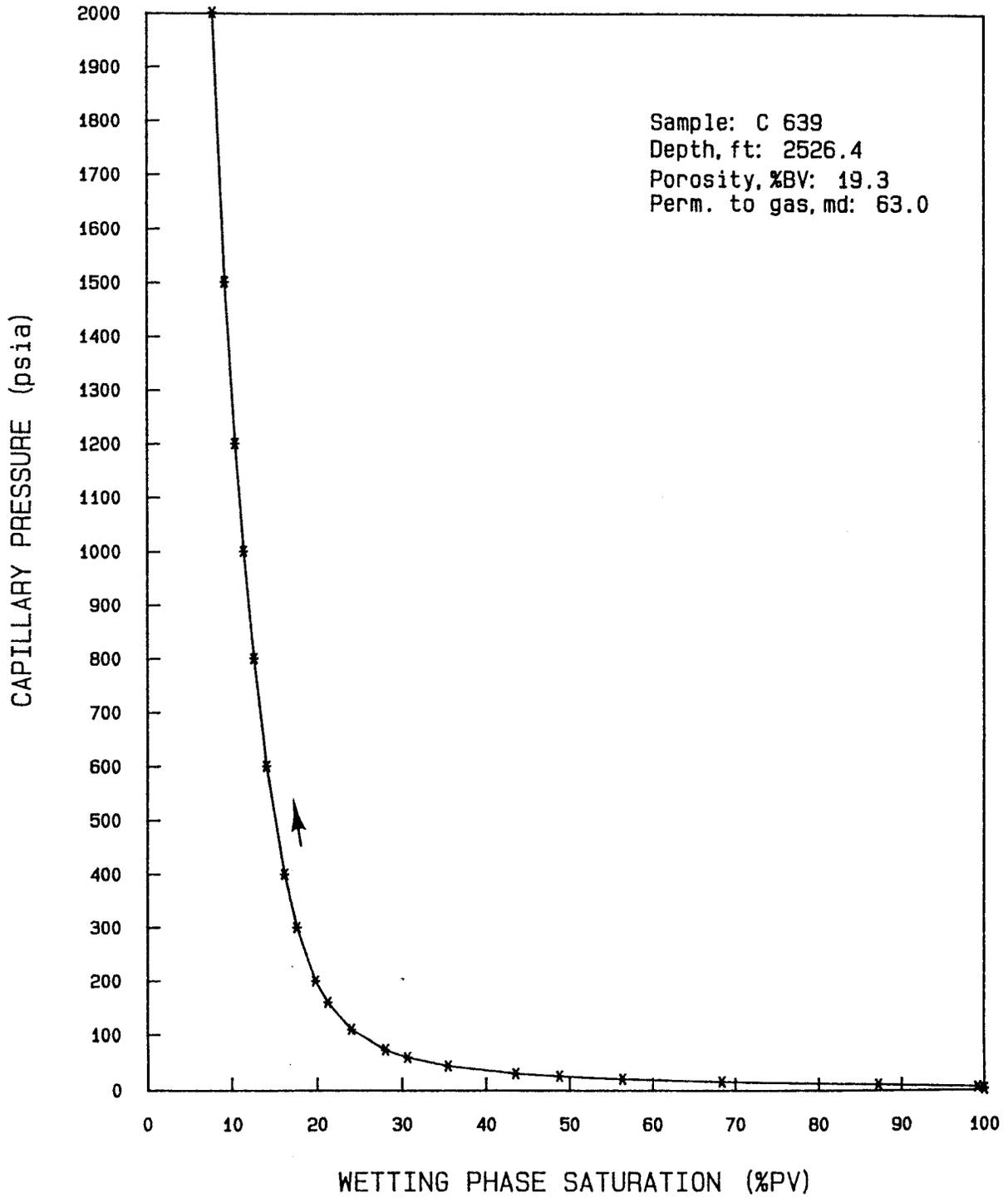


Figure 39  
MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample: C 639  
Depth, ft: 2526.4

Porosity, %BV: 19.3  
Permeability, md: 63.0

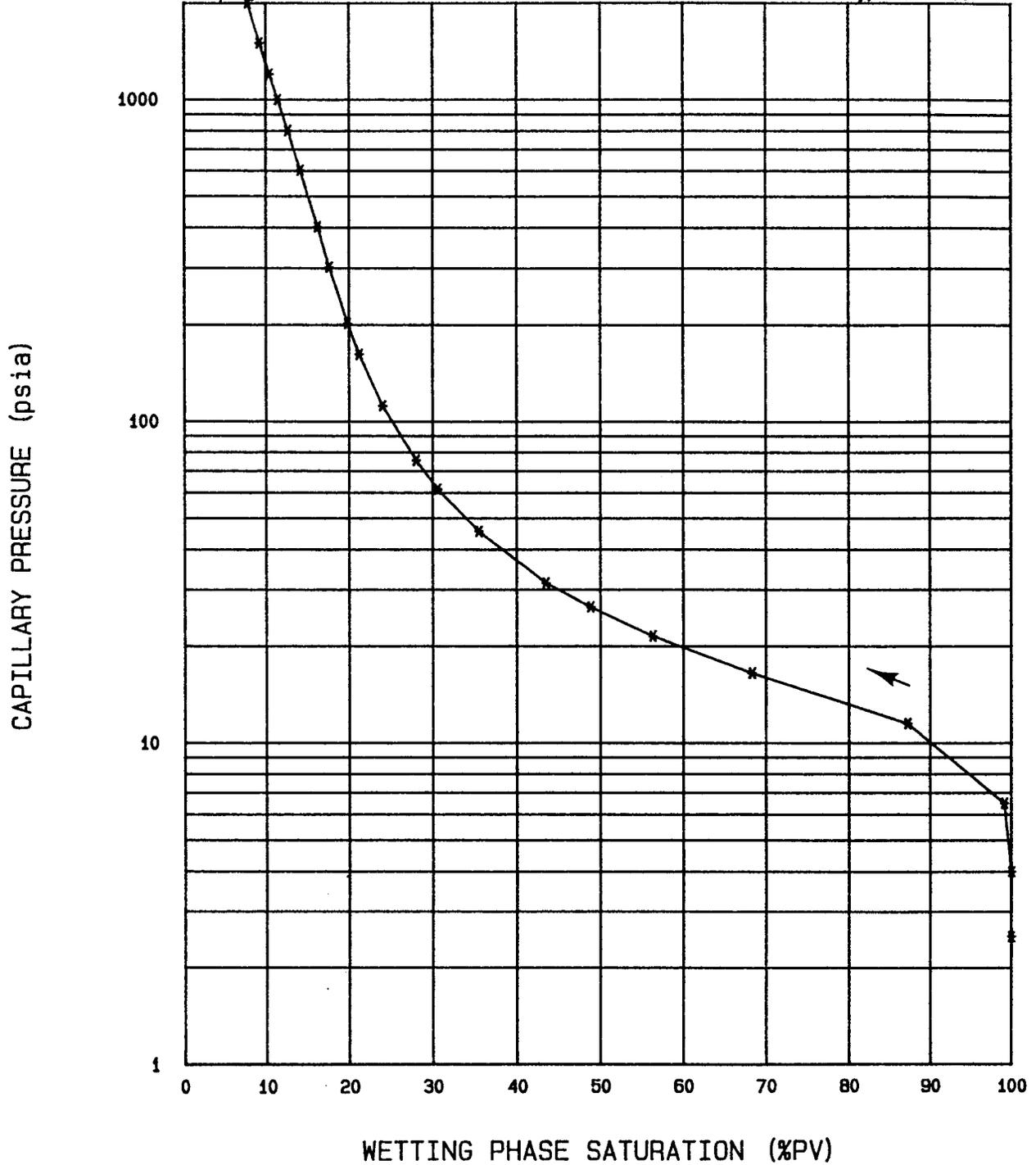


Figure 40  
 PORE SIZE DISTRIBUTION  
 Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

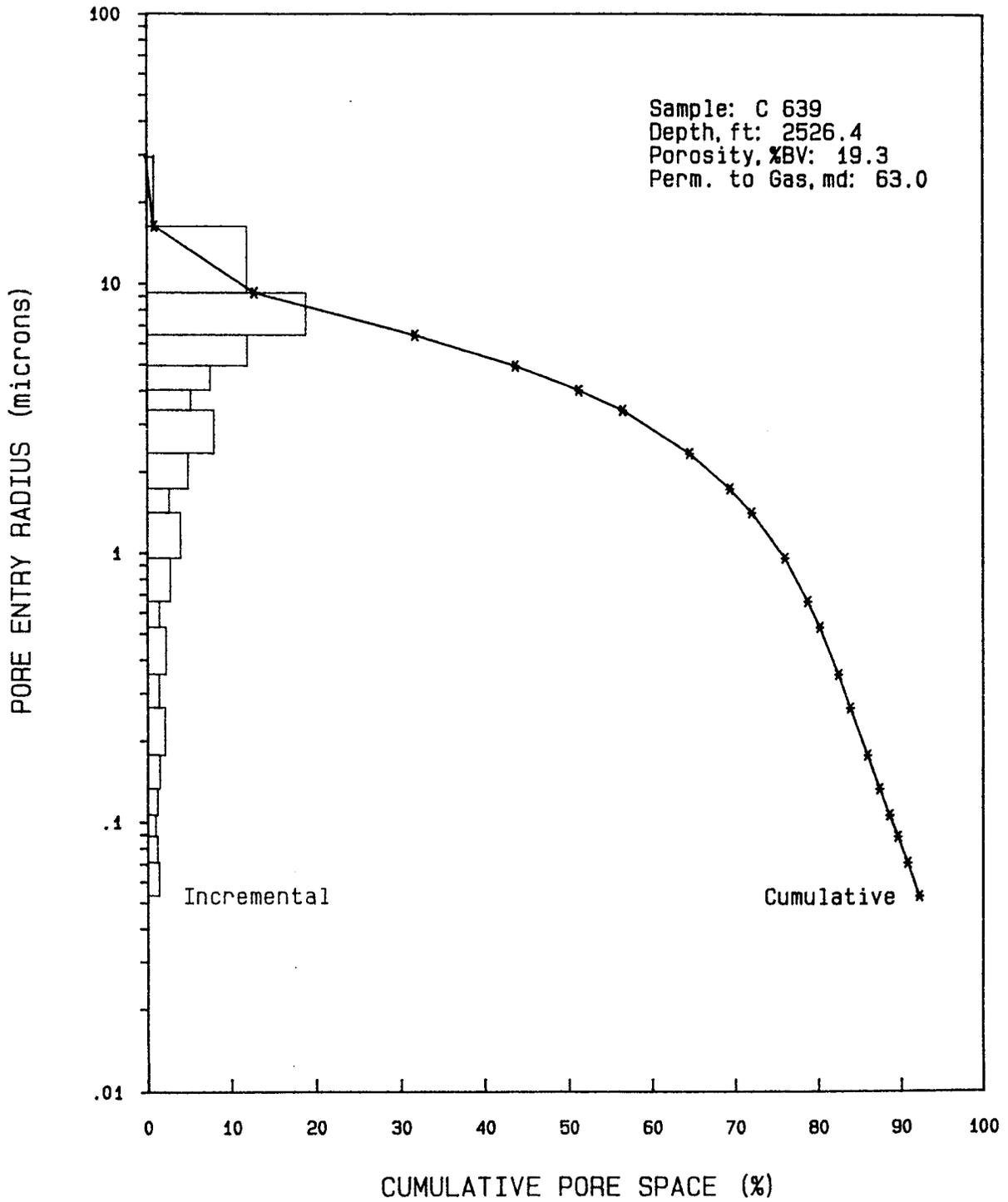


Table 37

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

Sample: D 456 Porosity, % BV: 16.0  
 Depth, ft: 2530.3 Perm. to Gas, md: 25.1

| <u>CAPILLARY PRESSURE (psia)</u> | <u>WETTING PHASE SATURATION (%PV)</u> | <u>PORE ENTRY RADIUS (microns)</u> | <u>LEVERETT'S J-FUNCTION</u> |
|----------------------------------|---------------------------------------|------------------------------------|------------------------------|
| 2.52                             | 100.0                                 | -                                  | -                            |
| 4.02                             | 100.0                                 | -                                  | -                            |
| 6.52                             | 100.0                                 | -                                  | -                            |
| 11.5                             | 99.0                                  | 9.26                               | 0.085                        |
| 16.5                             | 92.2                                  | 6.45                               | 0.122                        |
| 21.5                             | 77.2                                  | 4.95                               | 0.159                        |
| 26.5                             | 63.5                                  | 4.02                               | 0.196                        |
| 31.5                             | 54.1                                  | 3.38                               | 0.233                        |
| 45.5                             | 39.0                                  | 2.34                               | 0.336                        |
| 61.5                             | 30.8                                  | 1.73                               | 0.454                        |
| 75.5                             | 26.7                                  | 1.41                               | 0.557                        |
| 112                              | 21.3                                  | 0.96                               | 0.823                        |
| 162                              | 17.8                                  | 0.66                               | 1.19                         |
| 202                              | 16.2                                  | 0.53                               | 1.49                         |
| 302                              | 13.8                                  | 0.35                               | 2.23                         |
| 402                              | 12.4                                  | 0.27                               | 2.96                         |
| 602                              | 10.6                                  | 0.18                               | 4.44                         |
| 802                              | 9.6                                   | 0.13                               | 5.92                         |
| 1001                             | 8.7                                   | 0.11                               | 7.39                         |
| 1201                             | 8.1                                   | 0.09                               | 8.87                         |
| 1501                             | 7.3                                   | 0.07                               | 11.08                        |
| 2001                             | 6.2                                   | 0.05                               | 14.77                        |

Figure 41

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

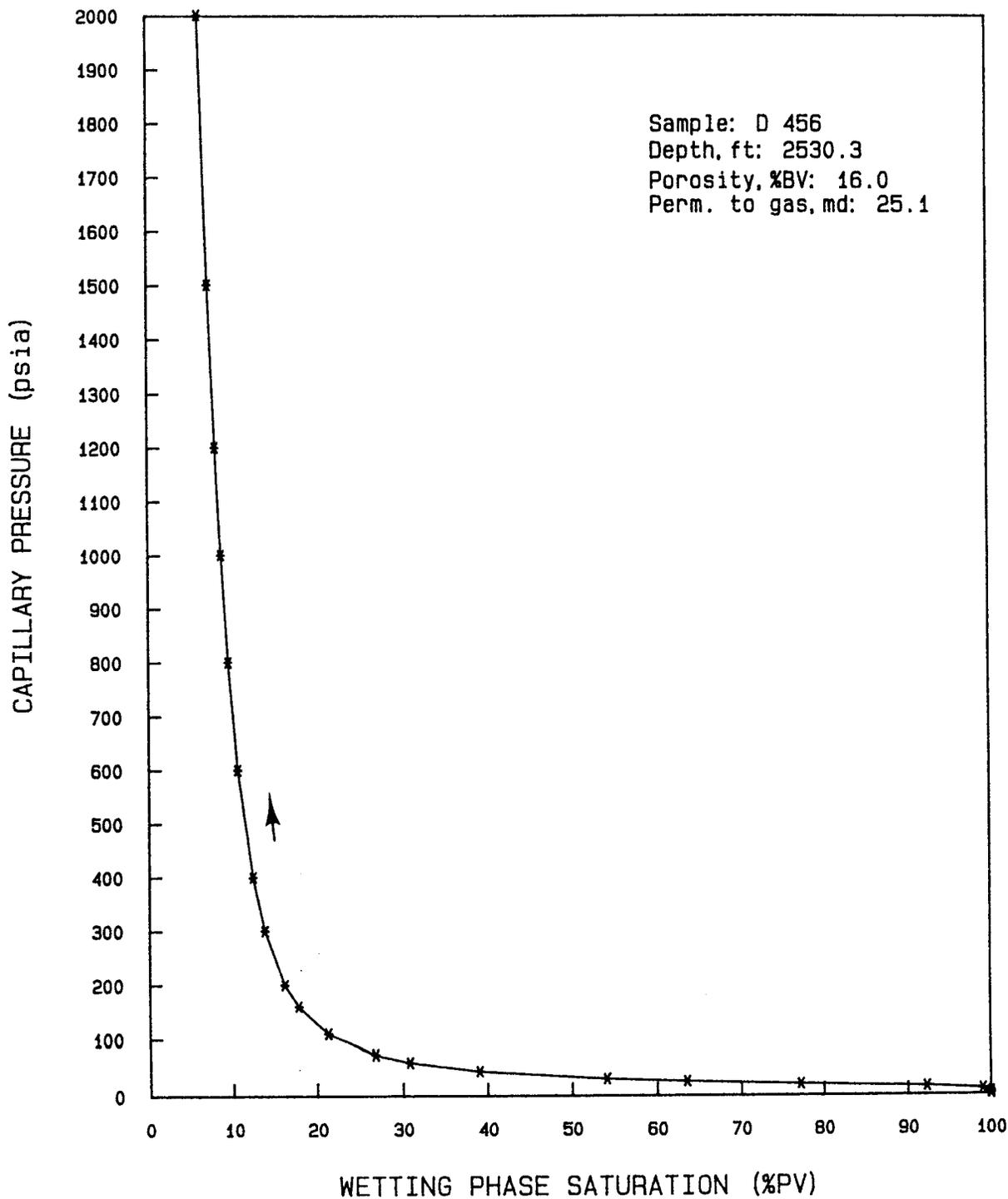


Figure 42  
MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample: D 456  
Depth, ft: 2530.3

Porosity, %V: 16.0  
Permeability, md: 25.1

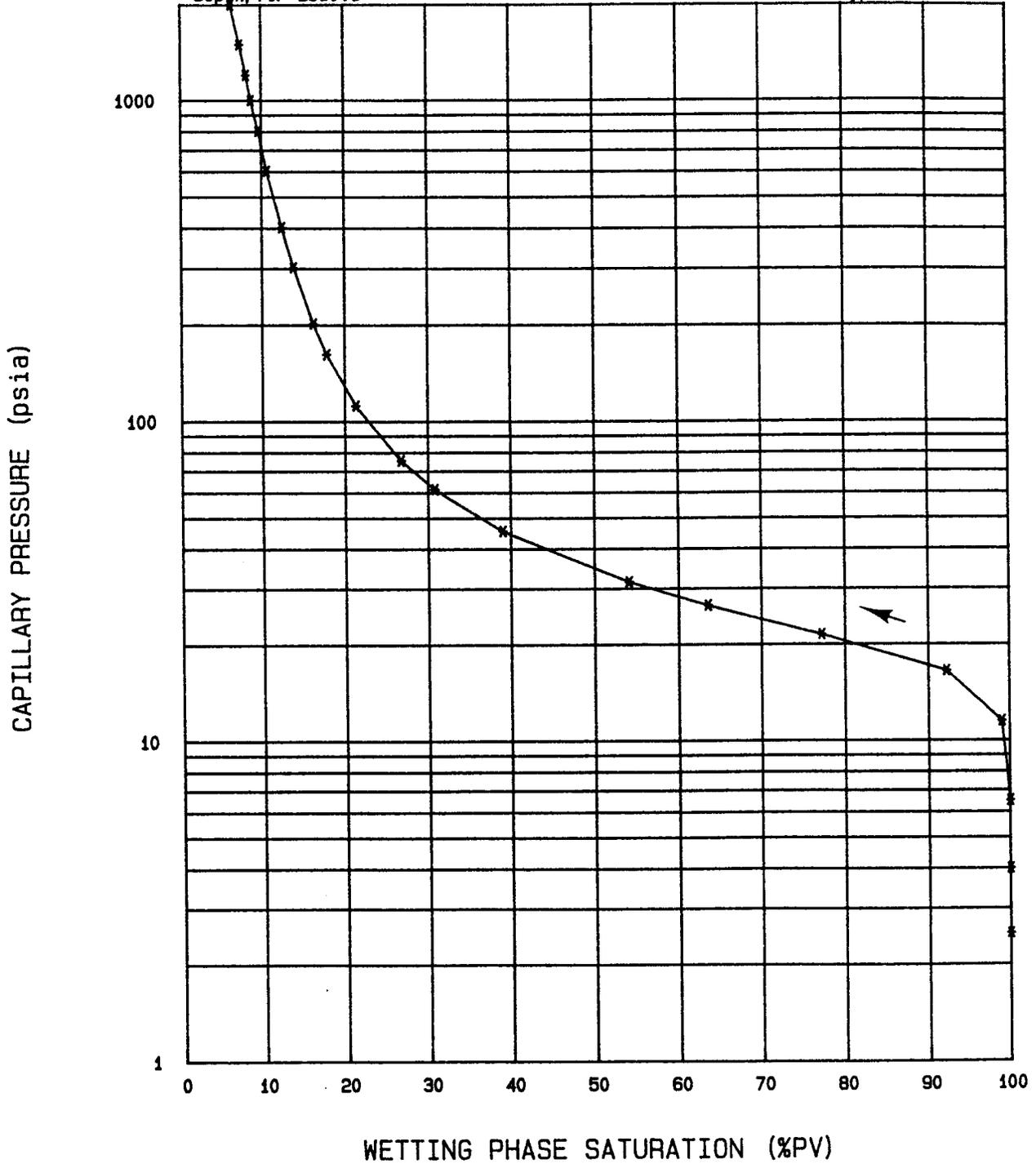


Figure 43

PORE SIZE DISTRIBUTION  
Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSB 3036

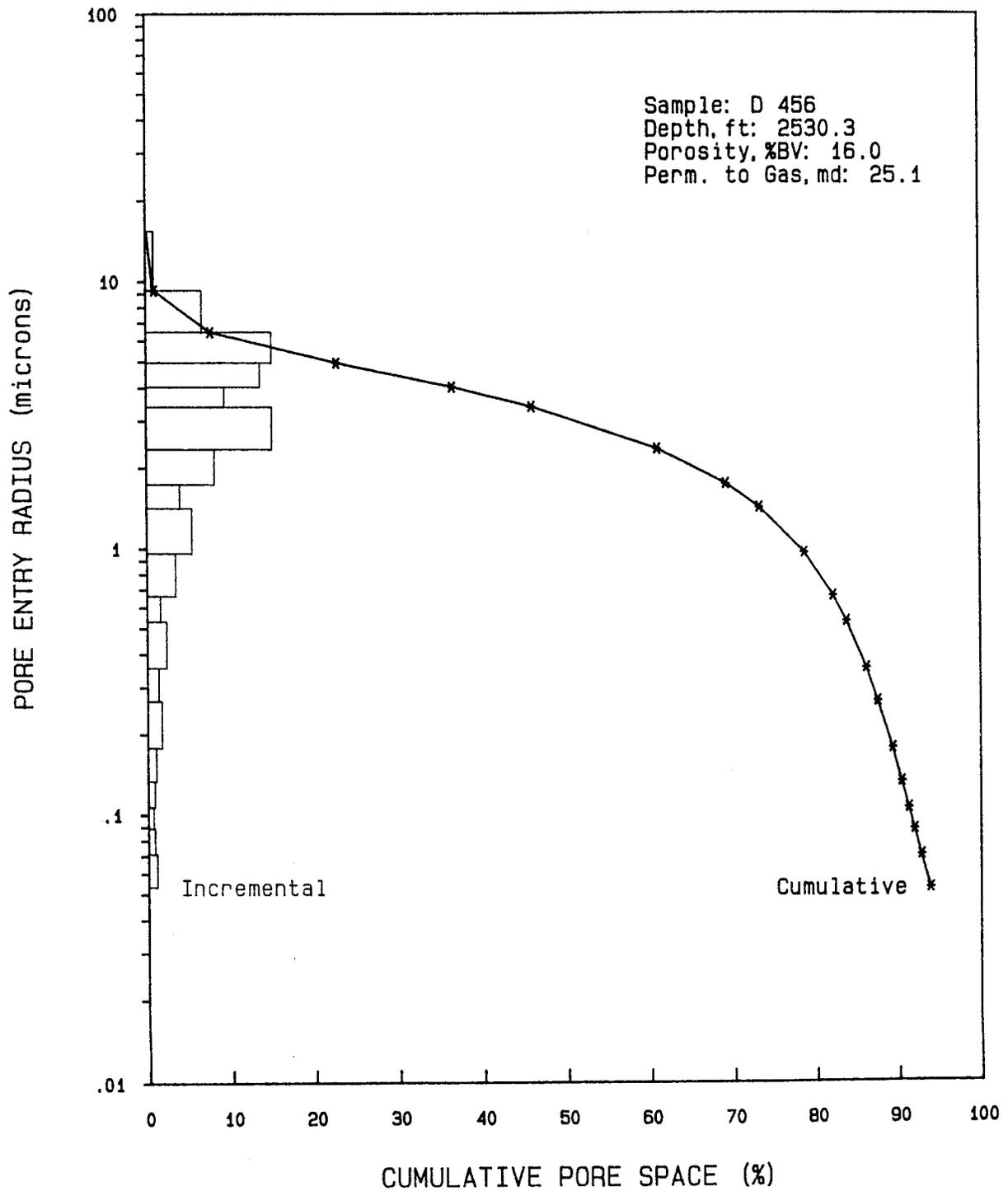


Table 38

## MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

Sample: D 143 Porosity, % BV: 15.4  
 Depth, ft: 2532.8 Perm. to Gas, md: 6.71

| <u>CAPILLARY<br/>PRESSURE<br/>(psia)</u> | <u>WETTING PHASE<br/>SATURATION<br/>(%PV)</u> | <u>PORE ENTRY<br/>RADIUS<br/>(microns)</u> | <u>LEVERETT'S<br/>J-FUNCTION</u> |
|--|---|--|----------------------------------|
| 2.70                                     | 100.0   | -  | -                                |
| 4.20                                     | 100.0   | -  | -                                |
| 6.70                                     | 100.0   | -  | -                                |
| 11.7                                     | 98.8  | 9.11                                       | 0.045                            |
| 16.7                                     | 86.8  | 6.38                                       | 0.064                            |
| 21.7                                     | 81.2  | 4.91                                       | 0.083                            |
| 26.7                                     | 72.6  | 3.99                                       | 0.103                            |
| 31.7                                     | 65.8  | 3.36                                       | 0.122                            |
| 45.7                                     | 54.0  | 2.33                                       | 0.176                            |
| 61.7                                     | 46.4  | 1.73                                       | 0.237                            |
| 75.7                                     | 42.7  | 1.41                                       | 0.291                            |
| 112                                      | 37.3  | 0.95                                       | 0.430                            |
| 162                                      | 33.6  | 0.66                                       | 0.622                            |
| 202                                      | 32.0  | 0.53                                       | 0.776                            |
| 302                                      | 29.6  | 0.35                                       | 1.16                             |
| 402                                      | 28.2  | 0.27                                       | 1.55                             |
| 602                                      | 26.4  | 0.18                                       | 2.31                             |
| 802                                      | 25.0  | 0.13                                       | 3.08                             |
| 1001                                     | 23.9  | 0.11                                       | 3.85                             |
| 1201                                     | 22.6  | 0.09                                       | 4.62                             |
| 1501                                     | 19.8  | 0.07                                       | 5.78                             |
| 2001                                     | 16.7  | 0.05                                       | 7.70                             |

Figure 44

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

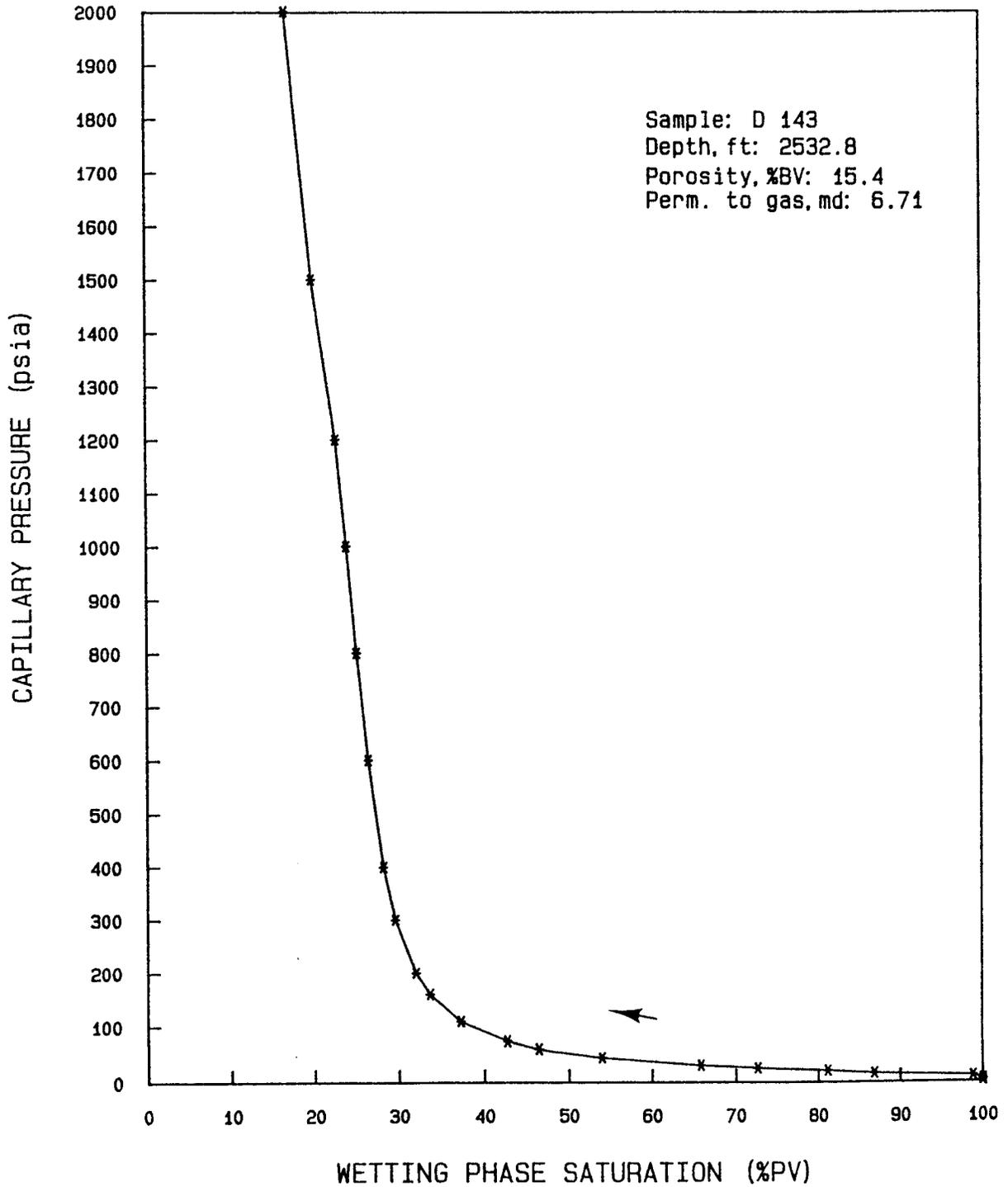


Figure 45  
 MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

Sample: D 143  
 Depth, ft: 2532.8

Porosity, %BV: 15.4  
 Permeability, md: 6.71

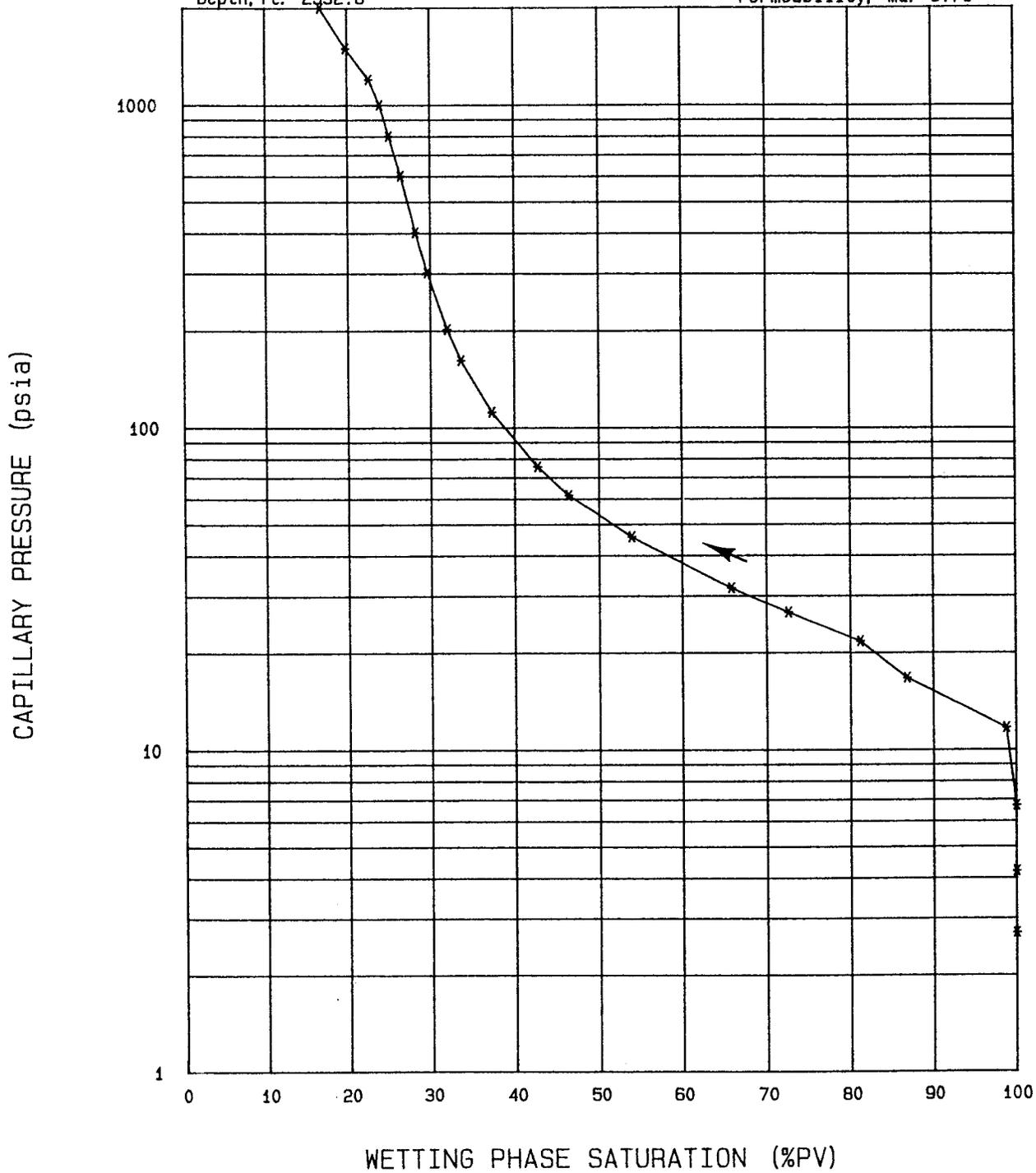


Figure 46

PORE SIZE DISTRIBUTION  
Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

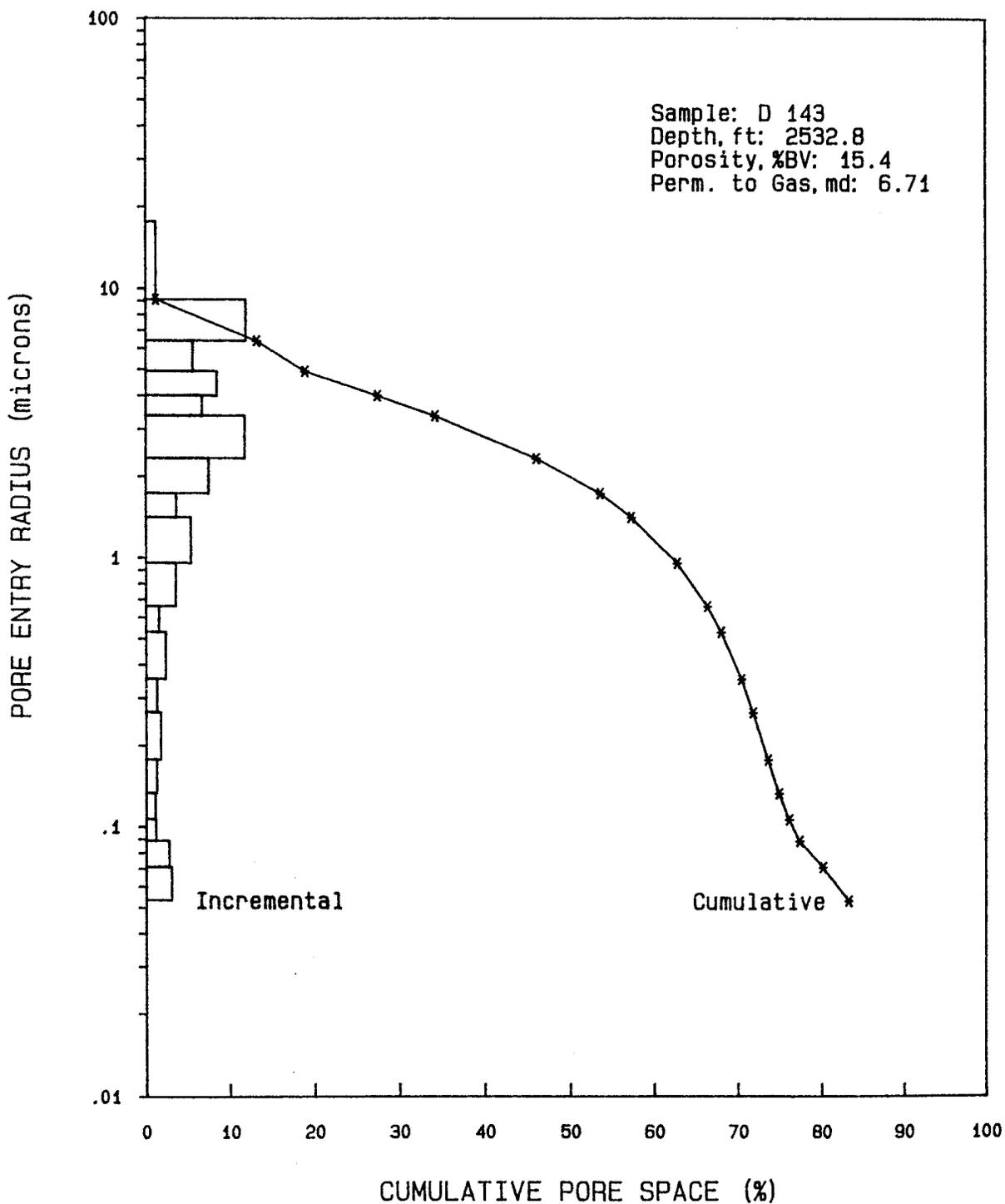


Table 39

## MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

Sample: D 147 Porosity, % BV: 13.5  
 Depth, ft: 2570.6 Perm. to Gas, md: 1.01

| <u>CAPILLARY<br/>PRESSURE<br/>(psia)</u> | <u>WETTING PHASE<br/>SATURATION<br/>(%PV)</u> | <u>PORE ENTRY<br/>RADIUS<br/>(microns)</u> | <u>LEVERETT'S<br/>J-FUNCTION</u> |
|--|---|--|----------------------------------|
| 2.71                                     | 100.0   | -  | -                                |
| 4.21                                     | 100.0   | -  | -                                |
| 6.71                                     | 100.0   | -  | -                                |
| 11.7                                     | 100.0   | -  | -                                |
| 16.7                                     | 100.0   | -  | -                                |
| 21.7                                     | 100.0   | -  | -                                |
| 26.7                                     | 100.0   | -  | -                                |
| 31.7                                     | 100.0   | -  | -                                |
| 45.7                                     | 100.0   | -  | -                                |
| 61.7                                     | 99.5  | 1.73                                       | 0.099                            |
| 75.7                                     | 96.4  | 1.41                                       | 0.121                            |
| 112                                      | 75.9  | 0.95                                       | 0.179                            |
| 162                                      | 57.4  | 0.66                                       | 0.259                            |
| 202                                      | 49.7  | 0.53                                       | 0.323                            |
| 302                                      | 38.6  | 0.35                                       | 0.483                            |
| 402                                      | 32.0  | 0.27                                       | 0.642                            |
| 602                                      | 24.5  | 0.18                                       | 0.962                            |
| 802                                      | 20.6  | 0.13                                       | 1.28                             |
| 1001                                     | 18.1  | 0.11                                       | 1.60                             |
| 1201                                     | 16.3  | 0.09                                       | 1.92                             |
| 1501                                     | 14.3  | 0.07                                       | 2.40                             |
| 2001                                     | 11.9  | 0.05                                       | 3.20                             |

Figure 47

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

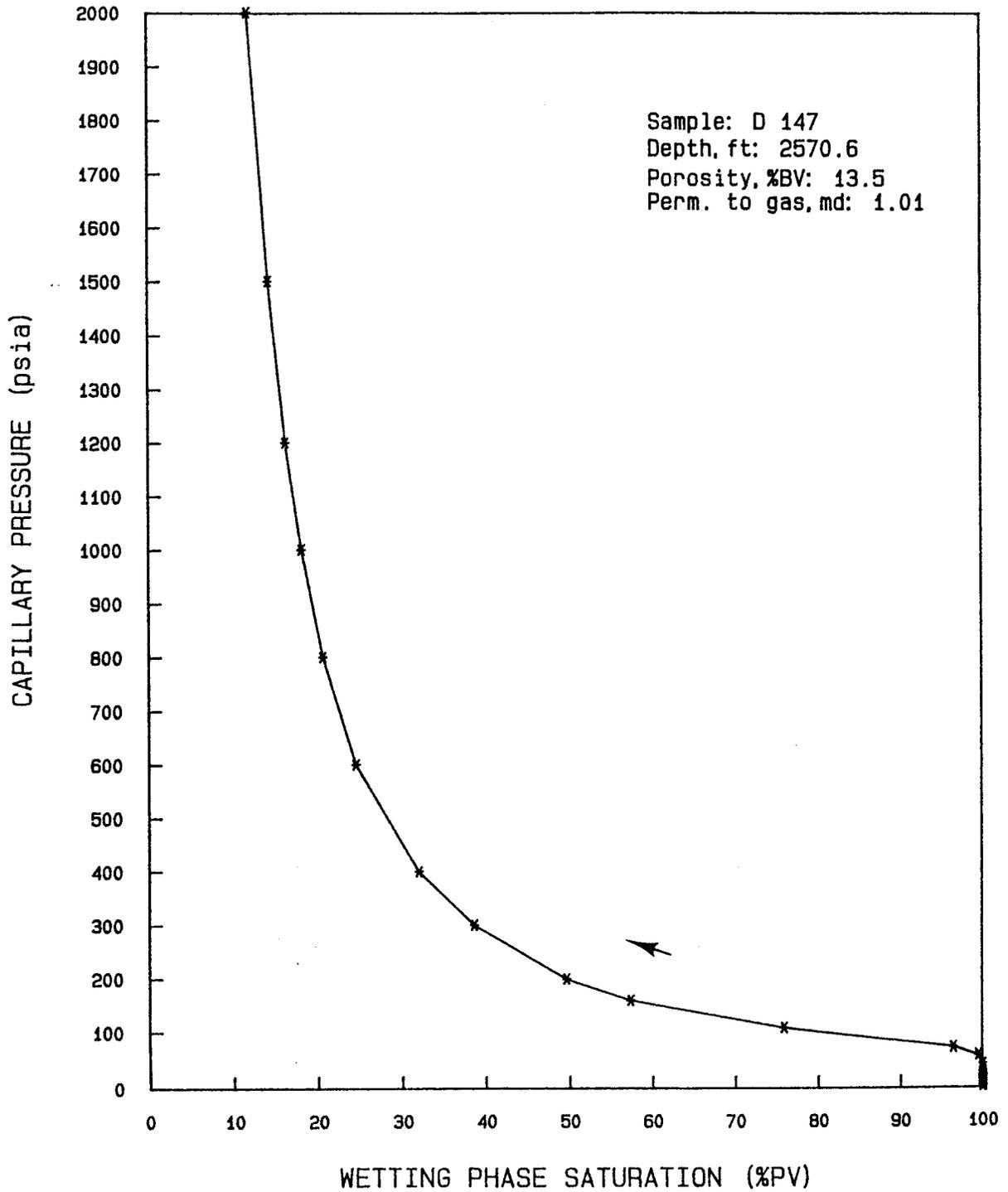


Figure 48  
MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation

Youngren "J" 1-H Well

Stevens County, Kansas

SRS 1887B/RSH 3036

Sample: D 147  
Depth, ft: 2570.6

Porosity, %BV: 13.5  
Permeability, md: 1.01

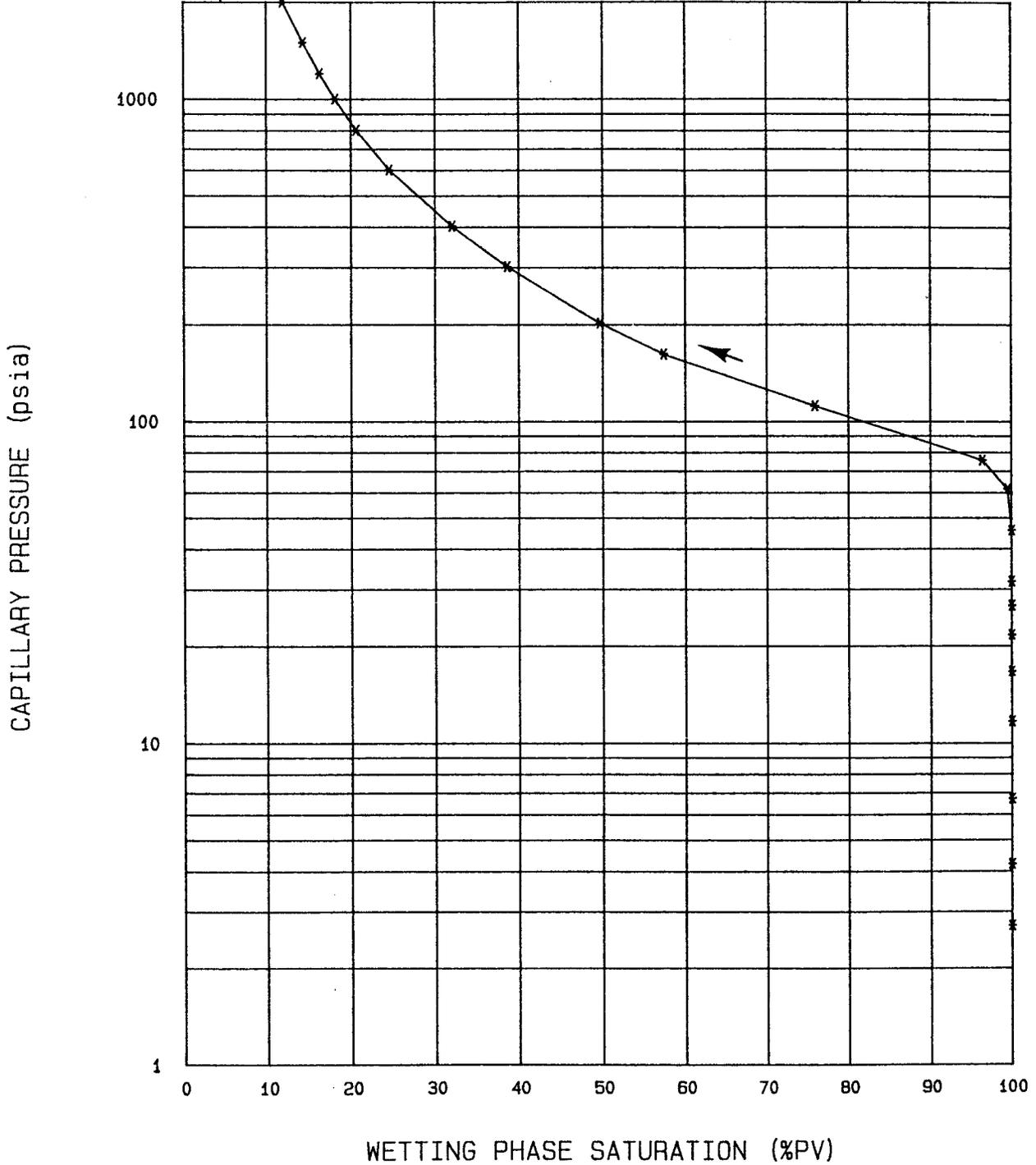


Figure 49

PORE SIZE DISTRIBUTION  
Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

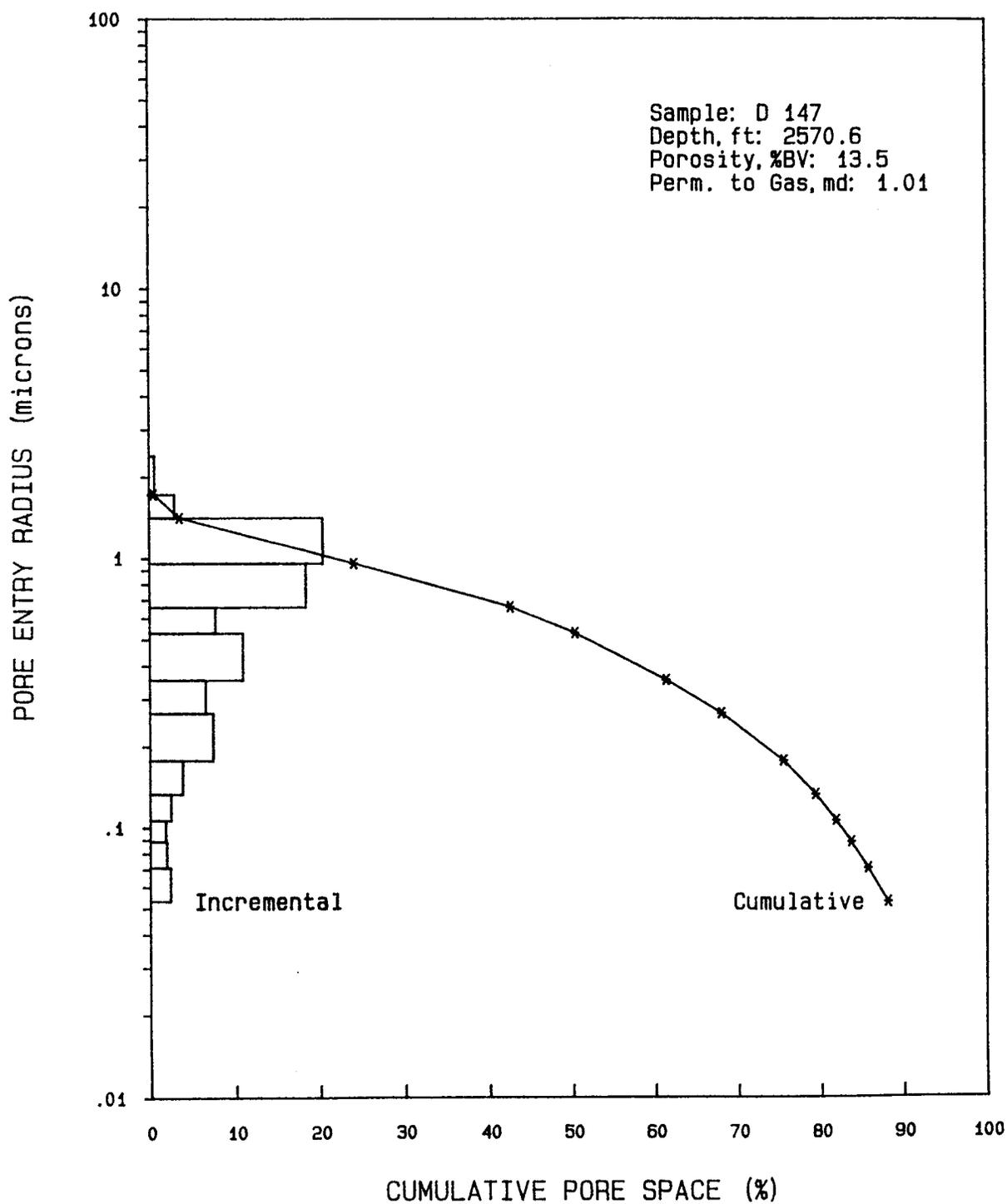


Table 40

## MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSH 3036

Sample: D 149 Porosity, % BV: 19.5  
 Depth, ft: 2612.5 Perm. to Gas, md: 34.8

| <u>CAPILLARY<br/>PRESSURE<br/>(psia)</u> | <u>WETTING PHASE<br/>SATURATION<br/>(%PV)</u> | <u>PORE ENTRY<br/>RADIUS<br/>(microns)</u> | <u>LEVERETT'S<br/>J-FUNCTION</u> |
|--|---|--|----------------------------------|
| 2.41                                     | 100.0   | -  | -                                |
| 3.91                                     | 100.0   | -  | -                                |
| 6.41                                     | 100.0   | -  | -                                |
| 11.4                                     | 100.0   | -  | -                                |
| 16.4                                     | 100.0   | -  | -                                |
| 21.4                                     | 100.0   | -  | -                                |
| 26.4                                     | 100.0   | -  | -                                |
| 31.4                                     | 98.6  | 3.39                                       | 0.243                            |
| 45.4                                     | 41.9  | 2.35                                       | 0.351                            |
| 61.4                                     | 28.6  | 1.74                                       | 0.475                            |
| 75.4                                     | 24.1  | 1.41                                       | 0.583                            |
| 111                                      | 19.4  | 0.96                                       | 0.862                            |
| 161                                      | 16.7  | 0.66                                       | 1.25                             |
| 201                                      | 15.7  | 0.53                                       | 1.56                             |
| 301                                      | 14.1  | 0.35                                       | 2.33                             |
| 401                                      | 13.2  | 0.27                                       | 3.11                             |
| 601                                      | 12.2  | 0.18                                       | 4.65                             |
| 801                                      | 11.3  | 0.13                                       | 6.20                             |
| 1000                                     | 10.7  | 0.11                                       | 7.75                             |
| 1200                                     | 10.0  | 0.09                                       | 9.29                             |
| 1500                                     | 9.3   | 0.07                                       | 11.61                            |
| 2000                                     | 8.2   | 0.05                                       | 15.48                            |

Figure 50

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

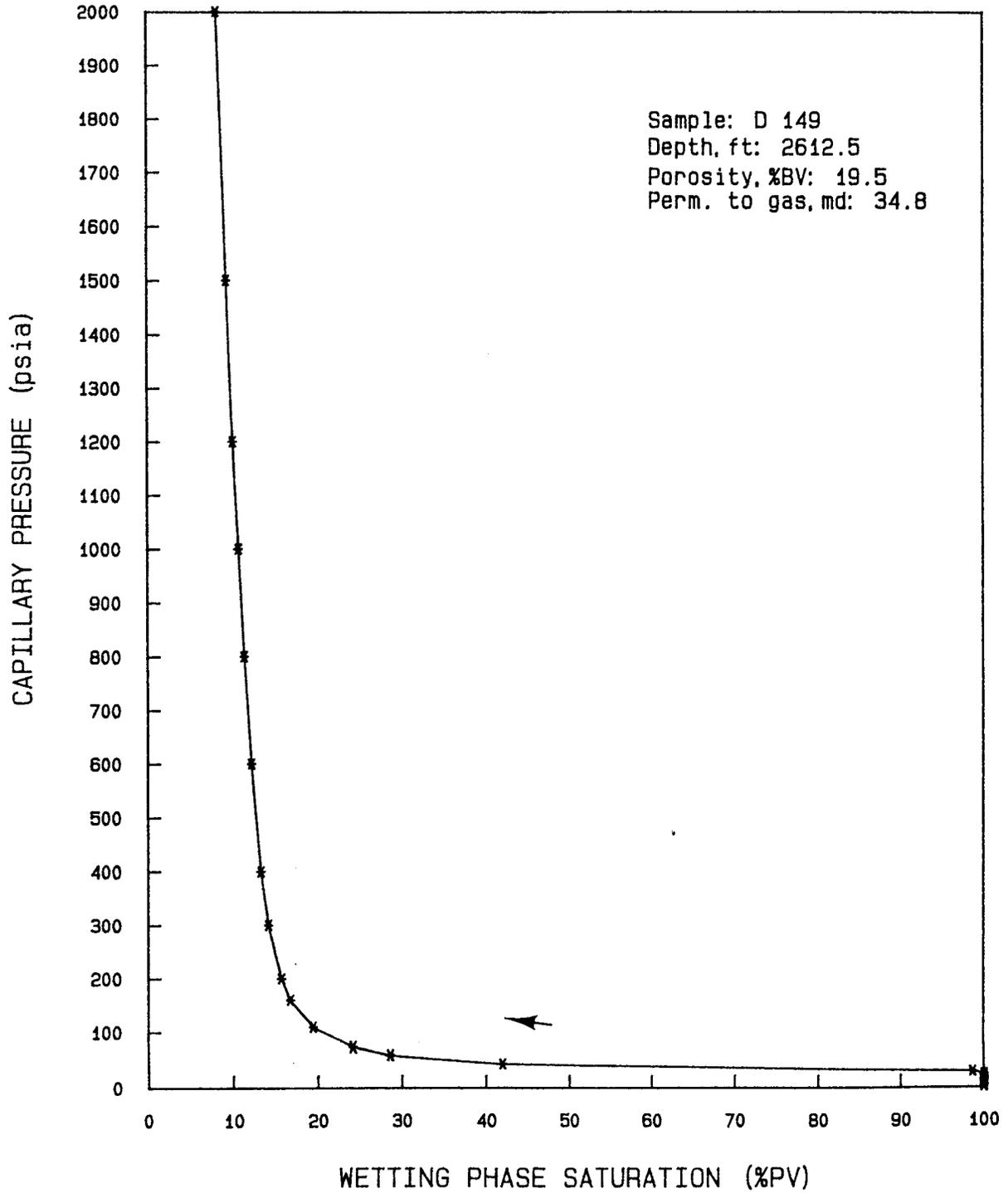


Figure 51  
MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation

Youngren "J" 1-H Well

Stevens County, Kansas

SRS 1887B/RSR 3036

Sample: D 149  
Depth, ft: 2612.5

Porosity, %BV: 19.5  
Permeability, md: 34.8

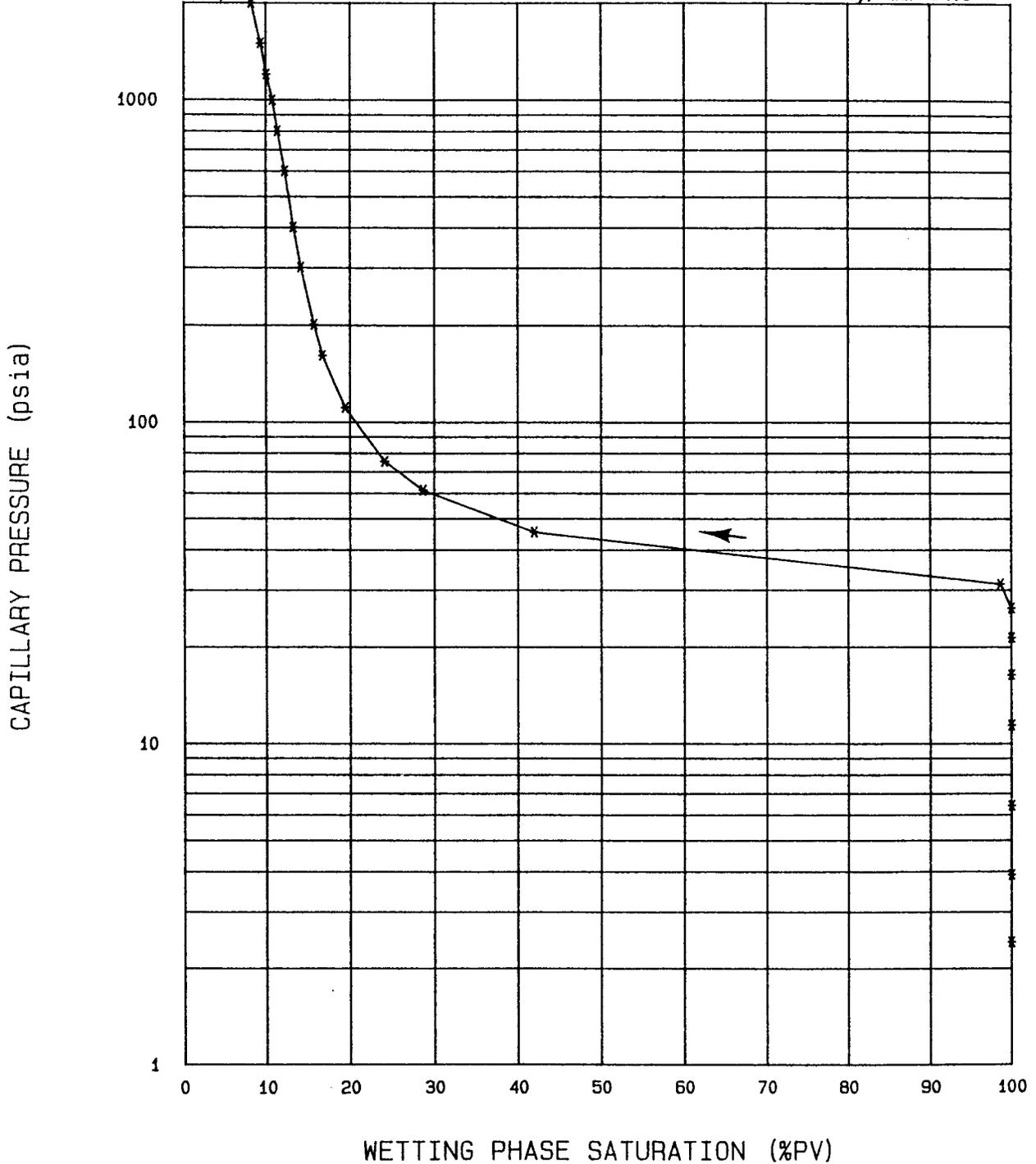


Figure 52

PORE SIZE DISTRIBUTION  
Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

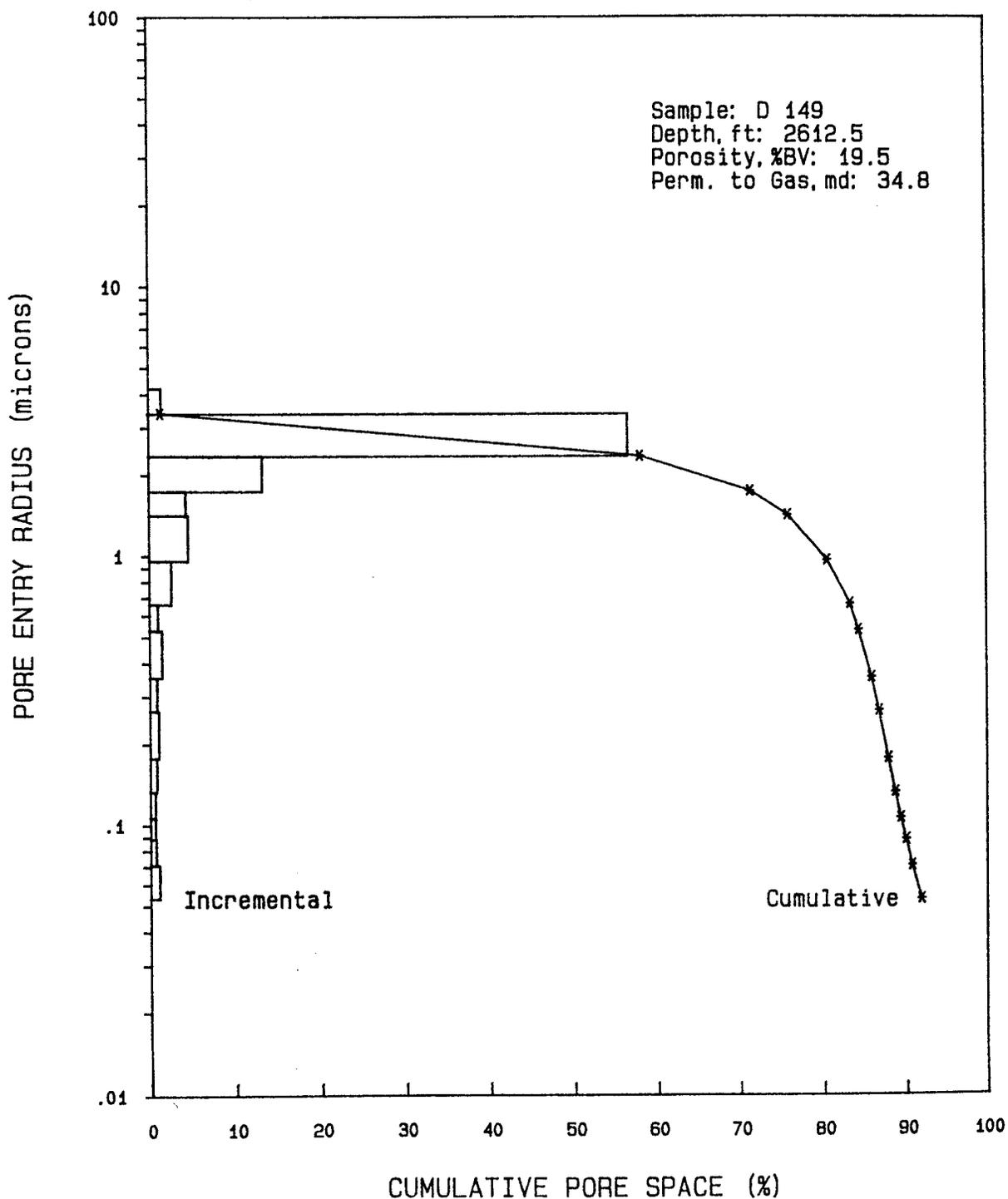


Table 41

## MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

Sample: D 150 Porosity, % BV: 17.6  
 Depth, ft: 2643.8 Perm. to Gas, md: 5.91

| <u>CAPILLARY<br/>PRESSURE<br/>(psia)</u> | <u>WETTING PHASE<br/>SATURATION<br/>(%PV)</u> | <u>PORE ENTRY<br/>RADIUS<br/>(microns)</u> | <u>LEVERETT'S<br/>J-FUNCTION</u> |
|--|---|--|----------------------------------|
| 2.62                                     | 100.0   | -  | -                                |
| 4.12                                     | 100.0   | -  | -                                |
| 6.62                                     | 100.0   | -  | -                                |
| 11.6                                     | 100.0   | -  | -                                |
| 16.6                                     | 100.0   | -  | -                                |
| 21.6                                     | 100.0   | -  | -                                |
| 26.6                                     | 99.8  | 4.00                                       | 0.089                            |
| 31.6                                     | 99.3  | 3.37                                       | 0.106                            |
| 45.6                                     | 87.5  | 2.34                                       | 0.153                            |
| 61.6                                     | 67.2  | 1.73                                       | 0.207                            |
| 75.6                                     | 58.1  | 1.41                                       | 0.254                            |
| 112                                      | 45.4  | 0.96                                       | 0.375                            |
| 162                                      | 36.0  | 0.66                                       | 0.543                            |
| 202                                      | 31.1  | 0.53                                       | 0.677                            |
| 302                                      | 23.5  | 0.35                                       | 1.01                             |
| 402                                      | 19.3  | 0.27                                       | 1.35                             |
| 602                                      | 14.4  | 0.18                                       | 2.02                             |
| 802                                      | 11.9  | 0.13                                       | 2.69                             |
| 1001                                     | 10.2  | 0.11                                       | 3.36                             |
| 1201                                     | 8.8   | 0.09                                       | 4.03                             |
| 1501                                     | 7.4   | 0.07                                       | 5.04                             |
| 2001                                     | 5.8   | 0.05                                       | 6.72                             |

Figure 53

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

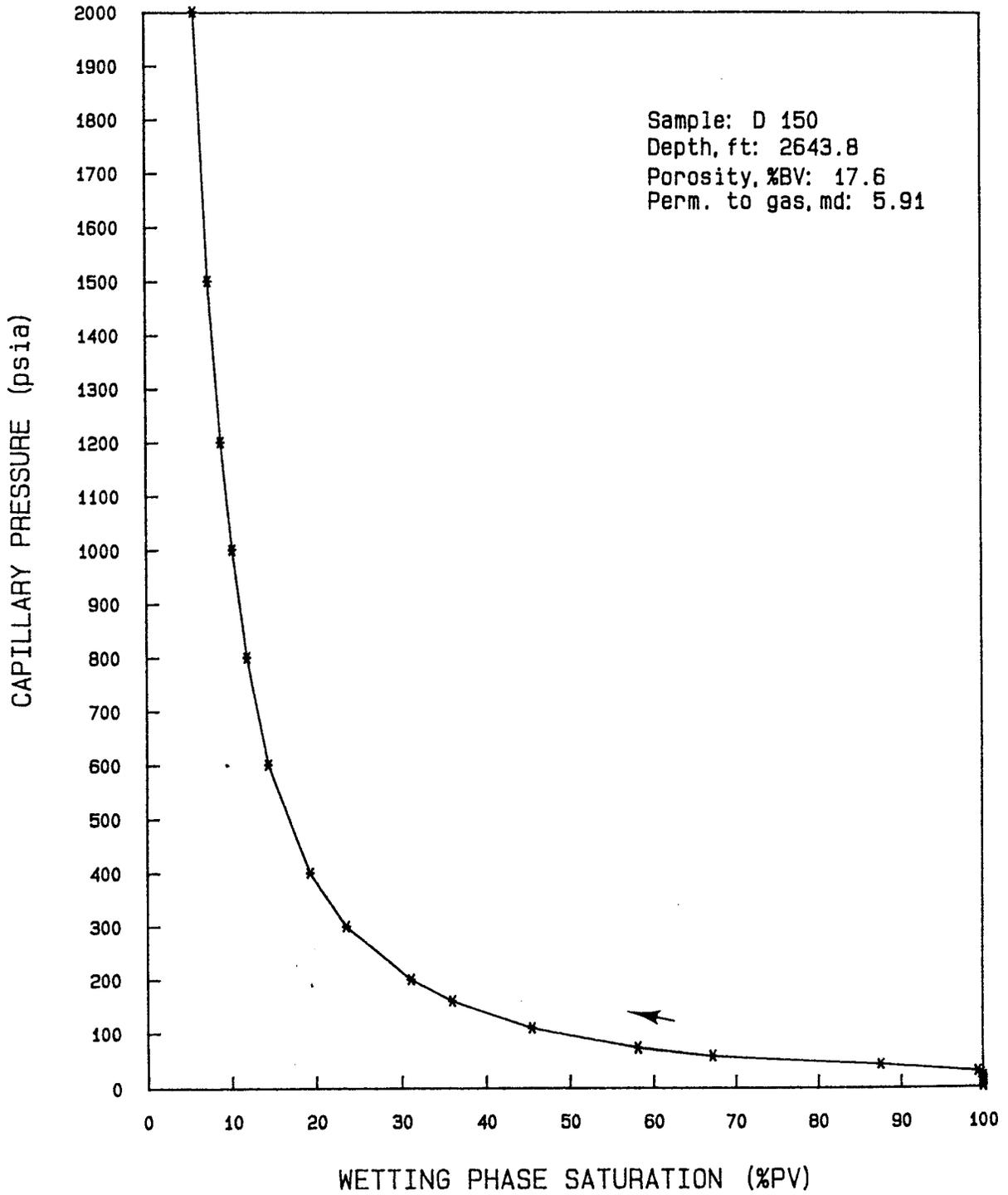


Figure 54  
MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

Sample: D 150  
Depth, ft: 2643.8

Porosity, %BV: 17.6  
Permeability, md: 5.91

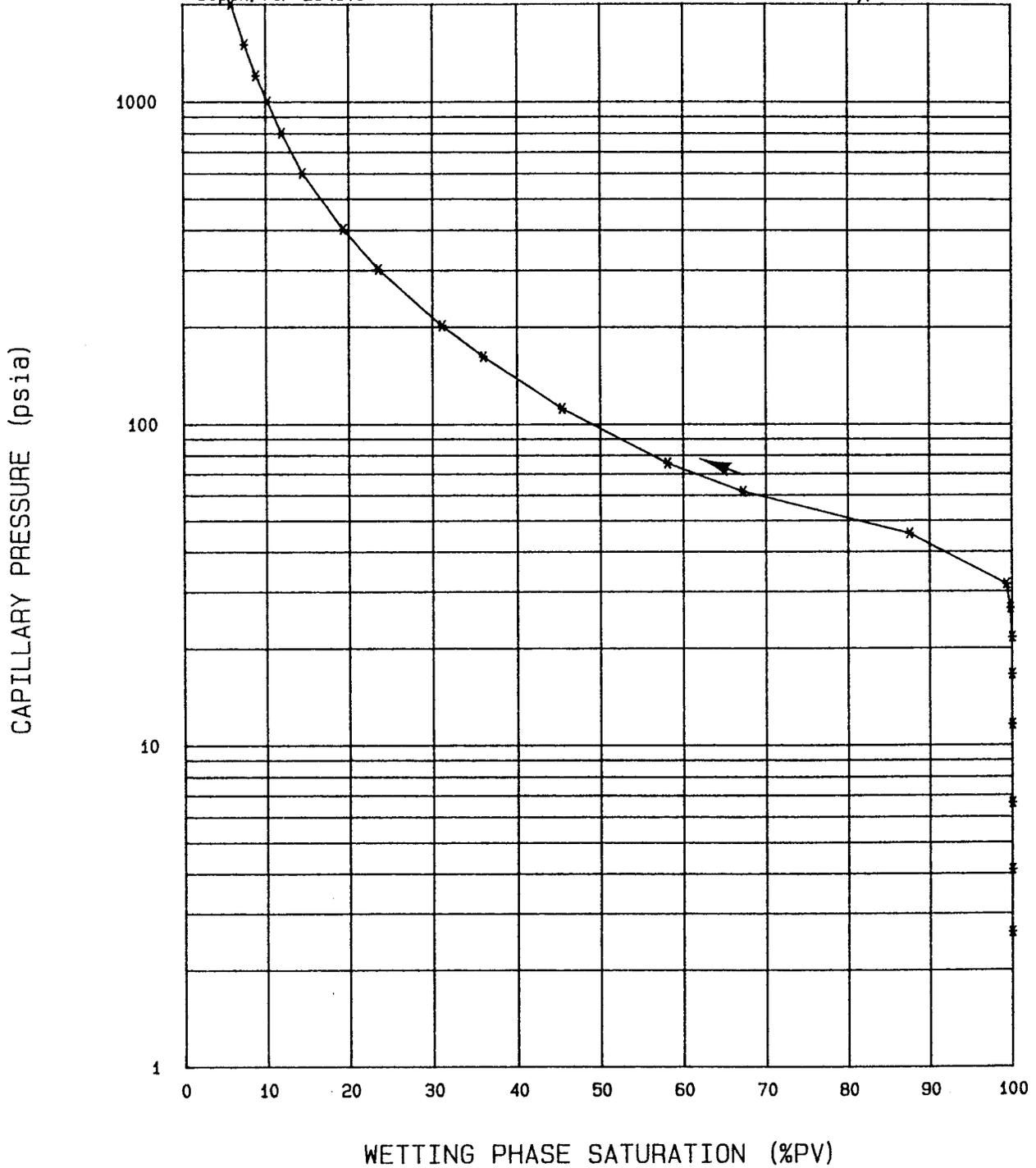


Figure 55

PORE SIZE DISTRIBUTION  
Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

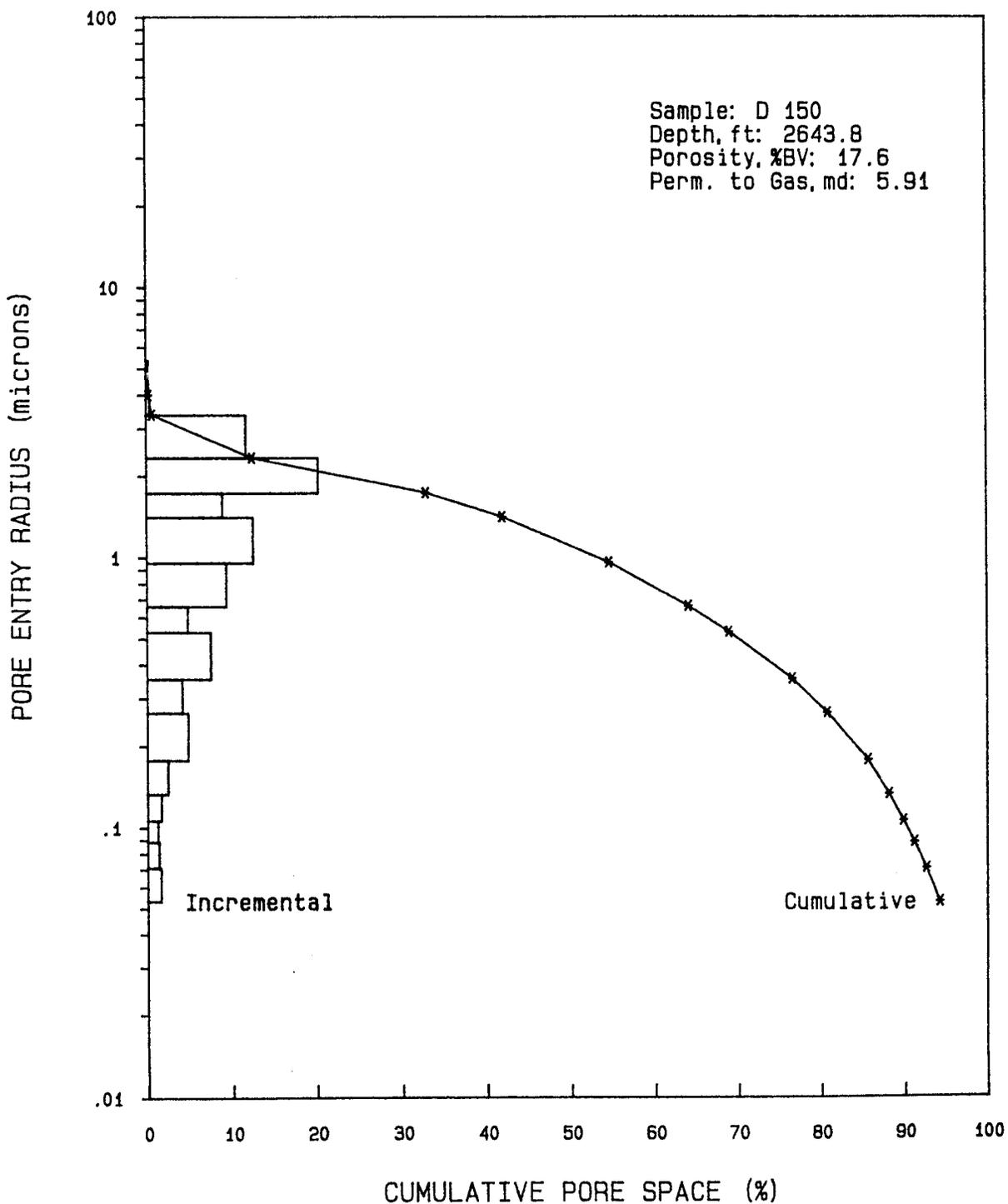


Table 42

## MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSR 3036

Sample: D 152 Porosity, % BV: 12.1  
 Depth, ft: 2683.4 Perm. to Gas, md: 0.698

| <u>CAPILLARY<br/>PRESSURE<br/>(psia)</u> | <u>WETTING PHASE<br/>SATURATION<br/>(%PV)</u> | <u>PORE ENTRY<br/>RADIUS<br/>(microns)</u> | <u>LEVERETT'S<br/>J-FUNCTION</u> |
|--|---|--|----------------------------------|
| 2.51                                     | 100.0   | -  | -                                |
| 4.01                                     | 100.0   | -  | -                                |
| 6.51                                     | 100.0   | -  | -                                |
| 11.5                                     | 100.0   | -  | -                                |
| 16.5                                     | 100.0   | -  | -                                |
| 21.5                                     | 100.0   | -  | -                                |
| 26.5                                     | 100.0   | -  | -                                |
| 31.5                                     | 100.0   | -  | -                                |
| 45.5                                     | 98.3  | 2.34                                       | 0.063                            |
| 61.5                                     | 93.4  | 1.73                                       | 0.086                            |
| 75.5                                     | 89.2  | 1.41                                       | 0.105                            |
| 112                                      | 77.5  | 0.96                                       | 0.155                            |
| 162                                      | 60.6  | 0.66                                       | 0.225                            |
| 202                                      | 50.6  | 0.53                                       | 0.280                            |
| 302                                      | 37.0  | 0.35                                       | 0.419                            |
| 402                                      | 29.6  | 0.27                                       | 0.559                            |
| 602                                      | 22.1  | 0.18                                       | 0.837                            |
| 802                                      | 17.9  | 0.13                                       | 1.11                             |
| 1001                                     | 15.2  | 0.11                                       | 1.39                             |
| 1201                                     | 13.2  | 0.09                                       | 1.67                             |
| 1501                                     | 11.0  | 0.07                                       | 2.09                             |
| 2001                                     | 8.6   | 0.05                                       | 2.78                             |

Figure 56

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

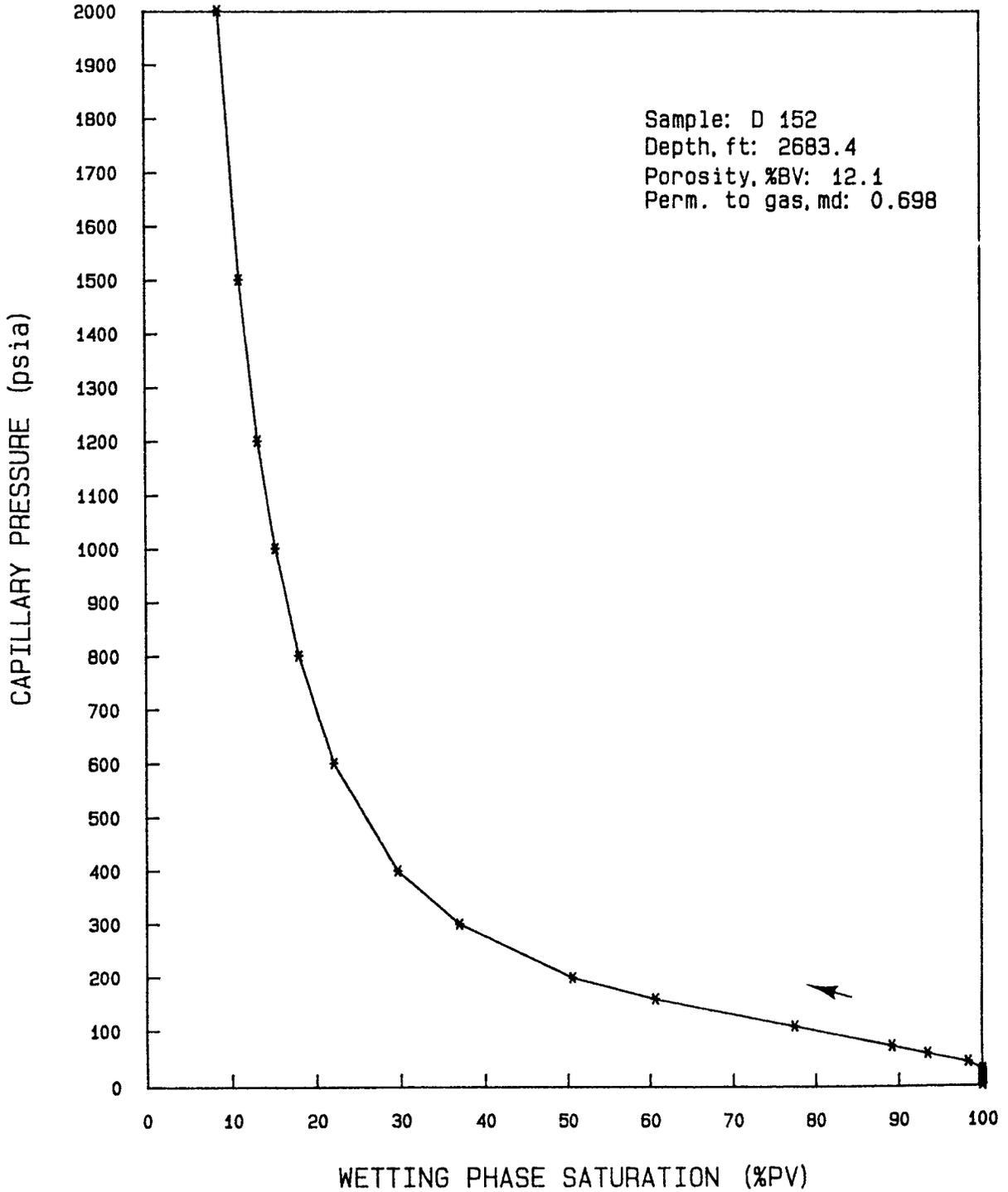


Figure 57  
MERCURY INJECTION CAPILLARY PRESSURE  
Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample: D 152  
Depth, ft: 2683.4

Porosity, %BV: 12.1  
Permeability, md: 0.698

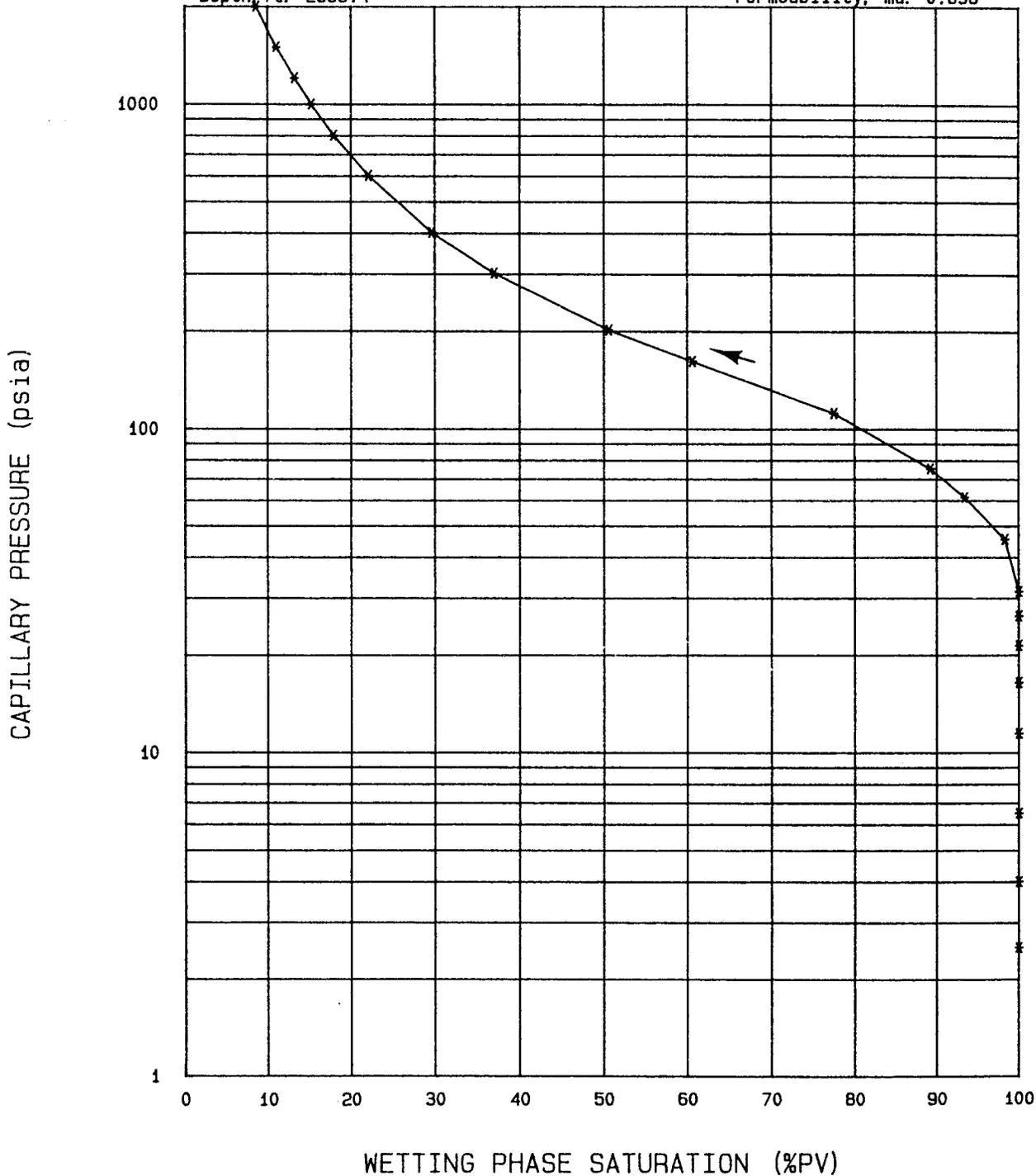


Figure 58

PORE SIZE DISTRIBUTION  
Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

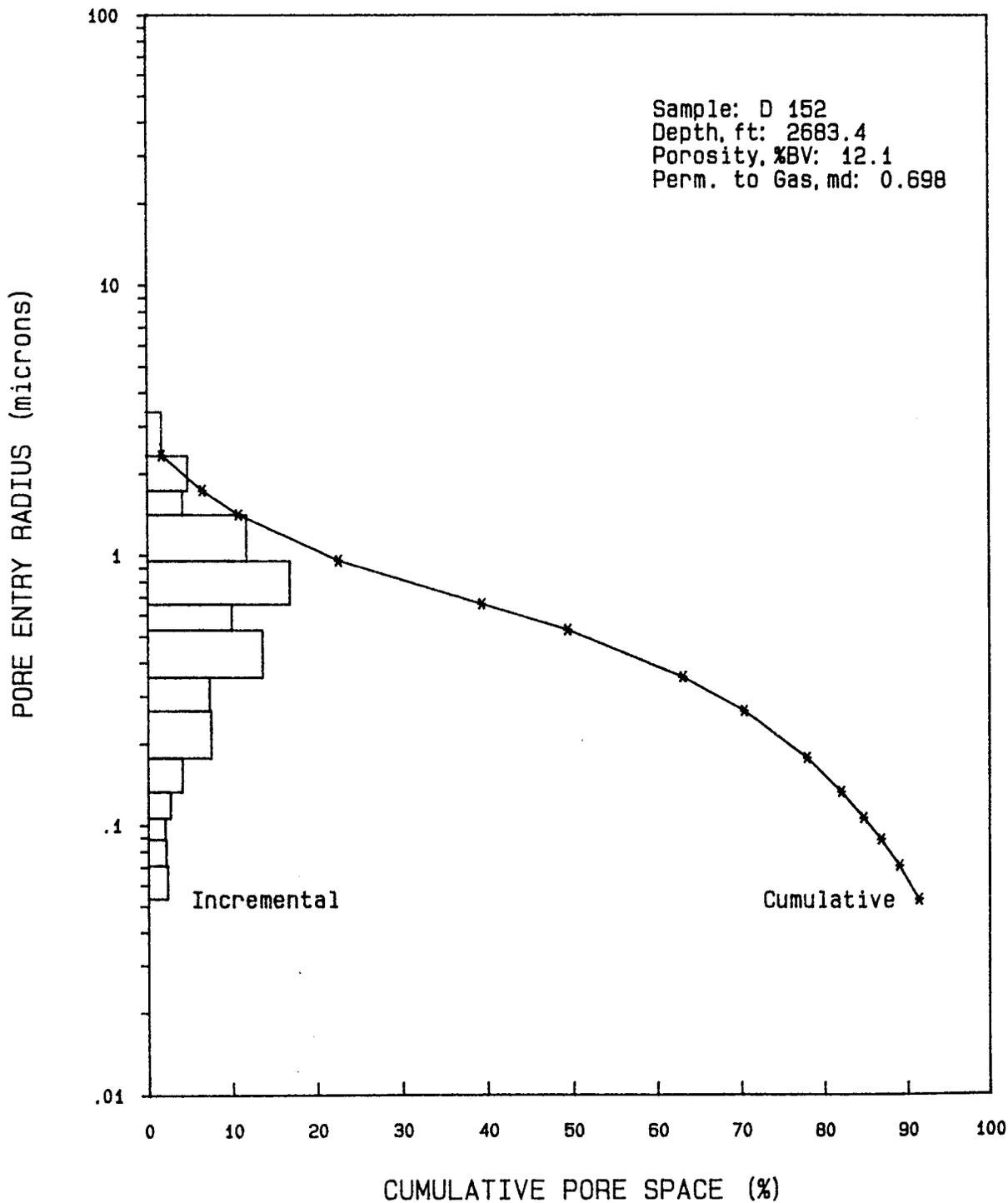


Table 43

## MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

Sample: D 154 Porosity, % BV: 12.7  
 Depth, ft: 2694.6 Perm. to Gas, md: 0.338

| <u>CAPILLARY PRESSURE (psia)</u> | <u>WETTING PHASE SATURATION (%PV)</u> | <u>PORE ENTRY RADIUS (microns)</u> | <u>LEVERETT'S J-FUNCTION</u> |
|----------------------------------|---------------------------------------|------------------------------------|------------------------------|
| 2.70                             | 100.0                                 | -                                  | -                            |
| 4.20                             | 100.0                                 | -                                  | -                            |
| 6.70                             | 100.0                                 | -                                  | -                            |
| 11.7                             | 100.0                                 | -                                  | -                            |
| 16.7                             | 100.0                                 | -                                  | -                            |
| 21.7                             | 100.0                                 | -                                  | -                            |
| 26.7                             | 100.0                                 | -                                  | -                            |
| 31.7                             | 100.0                                 | -                                  | -                            |
| 45.7                             | 100.0                                 | -                                  | -                            |
| 61.7                             | 100.0                                 | -                                  | -                            |
| 75.7                             | 100.0                                 | -                                  | -                            |
| 112                              | 98.7                                  | 0.95                               | 0.107                        |
| 162                              | 81.8                                  | 0.66                               | 0.155                        |
| 202                              | 67.1                                  | 0.53                               | 0.193                        |
| 302                              | 45.3                                  | 0.35                               | 0.289                        |
| 402                              | 35.1                                  | 0.27                               | 0.384                        |
| 602                              | 25.3                                  | 0.18                               | 0.576                        |
| 802                              | 20.2                                  | 0.13                               | 0.767                        |
| 1001                             | 16.9                                  | 0.11                               | 0.959                        |
| 1201                             | 14.8                                  | 0.09                               | 1.15                         |
| 1501                             | 12.6                                  | 0.07                               | 1.44                         |
| 2001                             | 10.1                                  | 0.05                               | 1.92                         |

Figure 60  
MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

Sample: D 154  
Depth, ft: 2694.6

Porosity, %BV: 12.7  
Permeability, md: 0.338

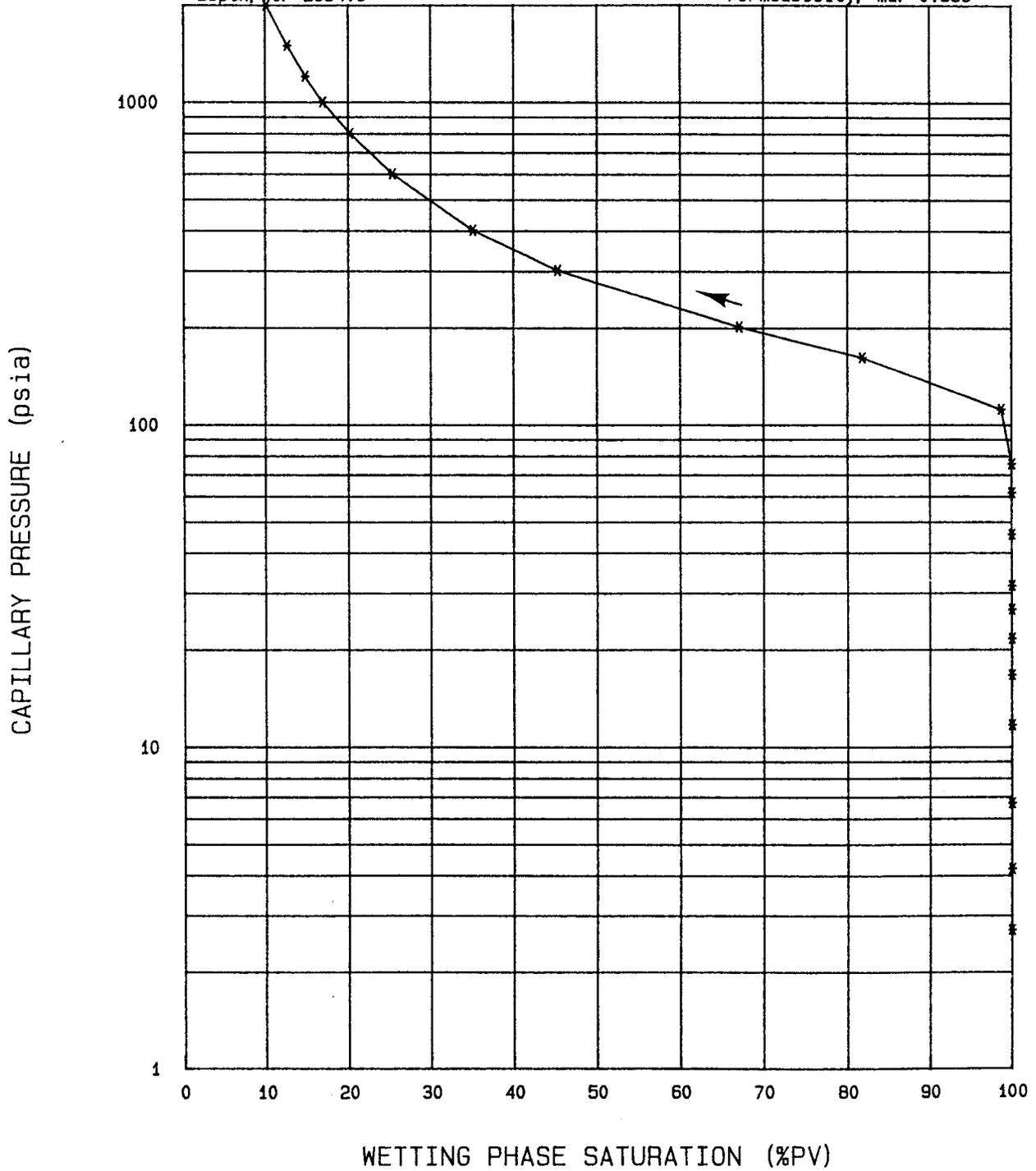


Figure 61

PORE SIZE DISTRIBUTION  
Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SAS 1887B/RSH 3036

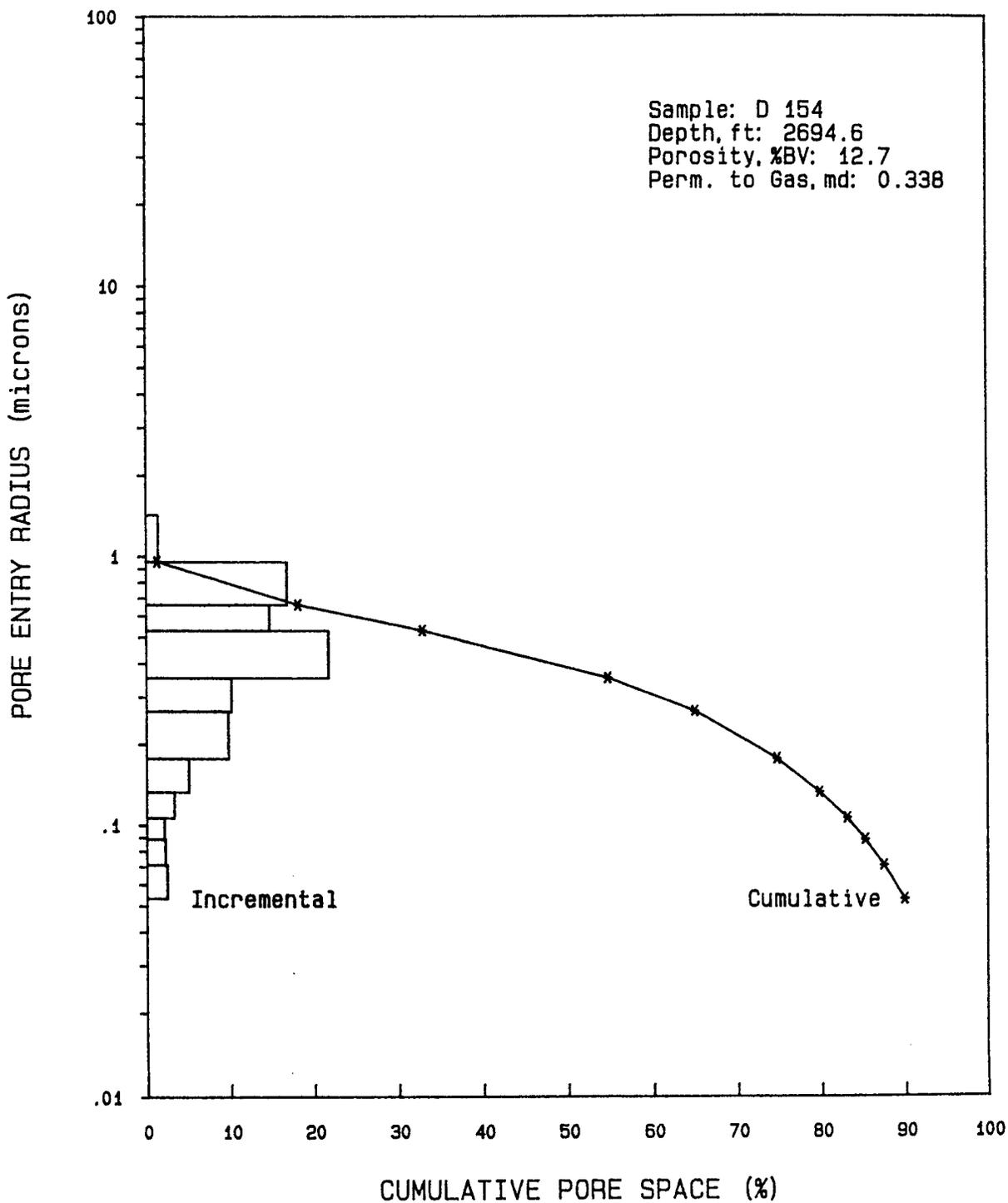


Table 44

## MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSR 3036

Sample: D 157

Porosity, % BV: 9.7

Depth, ft: 2739.8

Perm. to Gas, md: 0.130

| <u>CAPILLARY<br/>PRESSURE<br/>(psia)</u> | <u>WETTING PHASE<br/>SATURATION<br/>(%PV)</u> | <u>PORE ENTRY<br/>RADIUS<br/>(microns)</u> | <u>LEVERETT'S<br/>J-FUNCTION</u> |
|--|---|--|----------------------------------|
| 2.70                                     | 100.0   | -  | -                                |
| 4.20                                     | 100.0   | -  | -                                |
| 6.70                                     | 100.0   | -  | -                                |
| 11.7                                     | 100.0   | -  | -                                |
| 16.7                                     | 100.0   | -  | -                                |
| 21.7                                     | 100.0   | -  | -                                |
| 26.7                                     | 100.0   | -  | -                                |
| 31.7                                     | 100.0   | -  | -                                |
| 45.7                                     | 100.0   | -  | -                                |
| 61.7                                     | 100.0   | -  | -                                |
| 75.7                                     | 100.0   | -  | -                                |
| 112                                      | 100.0   | -  | -                                |
| 162                                      | 96.3  | 0.66                                       | 0.123                            |
| 202                                      | 89.4  | 0.53                                       | 0.153                            |
| 302                                      | 74.7  | 0.35                                       | 0.229                            |
| 402                                      | 64.0  | 0.27                                       | 0.305                            |
| 602                                      | 50.7  | 0.18                                       | 0.456                            |
| 802                                      | 42.7  | 0.13                                       | 0.608                            |
| 1001                                     | 37.4  | 0.11                                       | 0.759                            |
| 1201                                     | 33.3  | 0.09                                       | 0.911                            |
| 1501                                     | 29.3  | 0.07                                       | 1.14                             |
| 2001                                     | 24.5  | 0.05                                       | 1.52                             |

Figure 62

MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

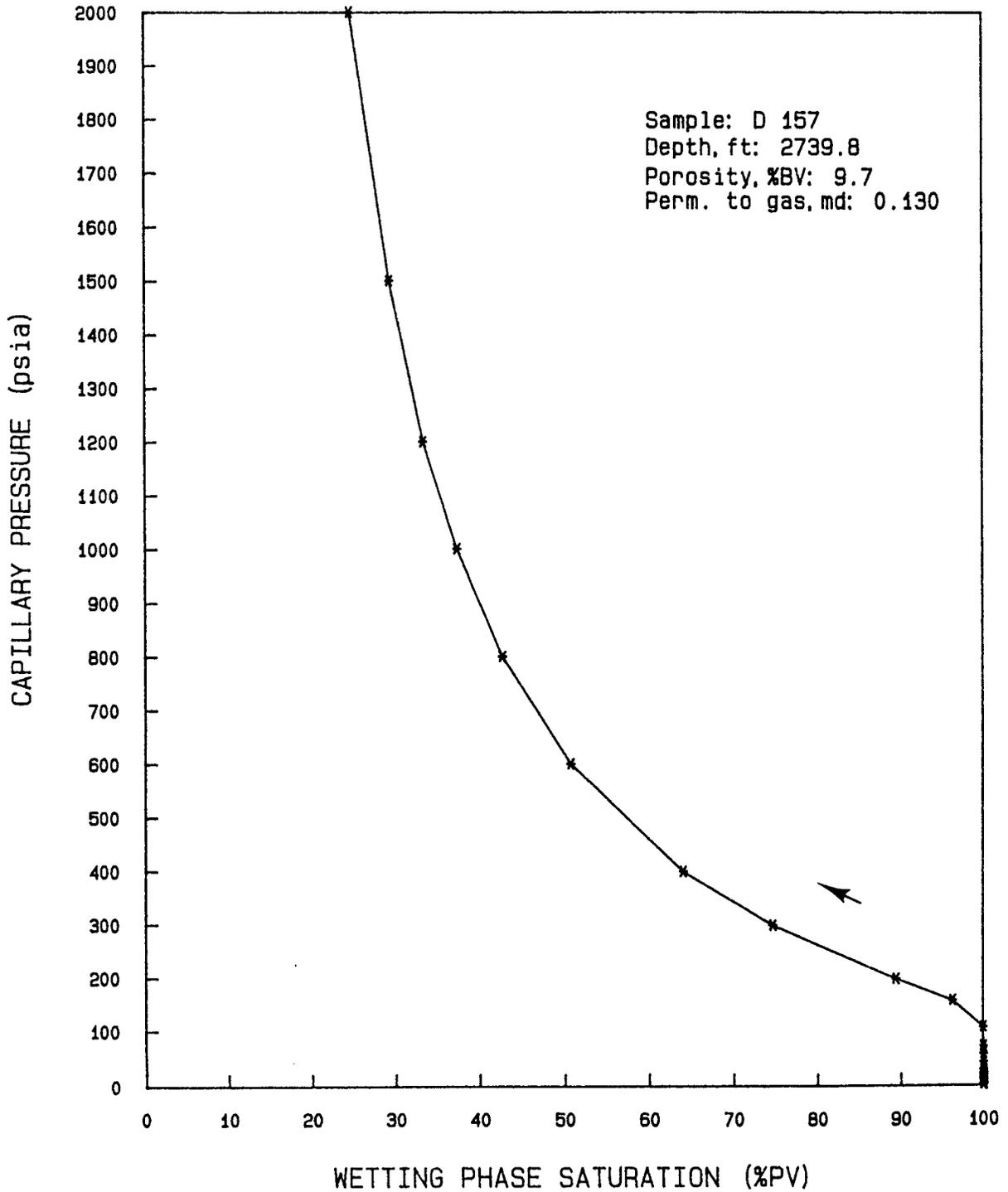


Figure 63  
MERCURY INJECTION CAPILLARY PRESSURE

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/ASH 3036

Sample: D 157  
Depth, ft: 2739.8

Porosity, %BV: 9.7  
Permeability, md: 0.130

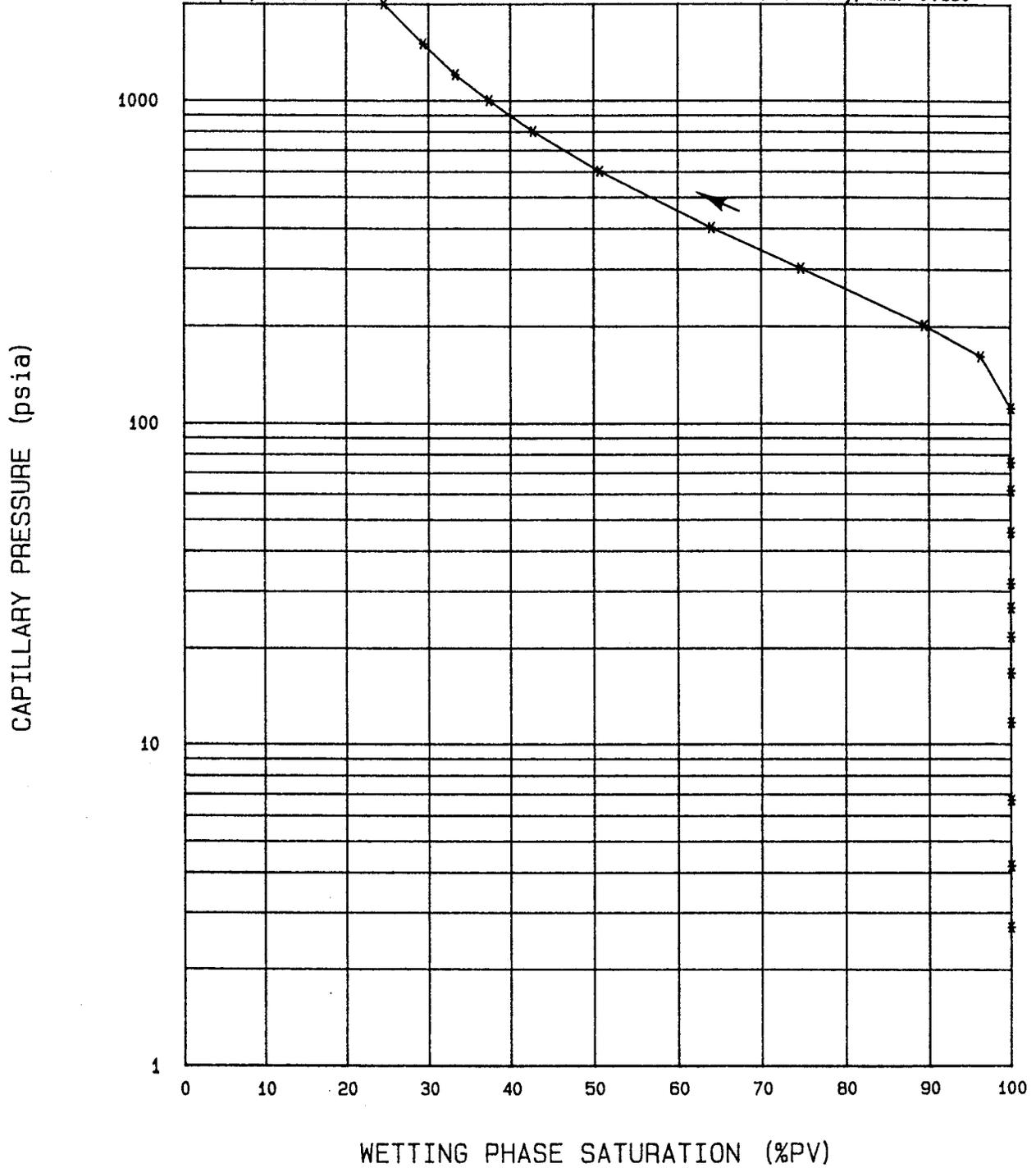


Figure 64

PORE SIZE DISTRIBUTION  
Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

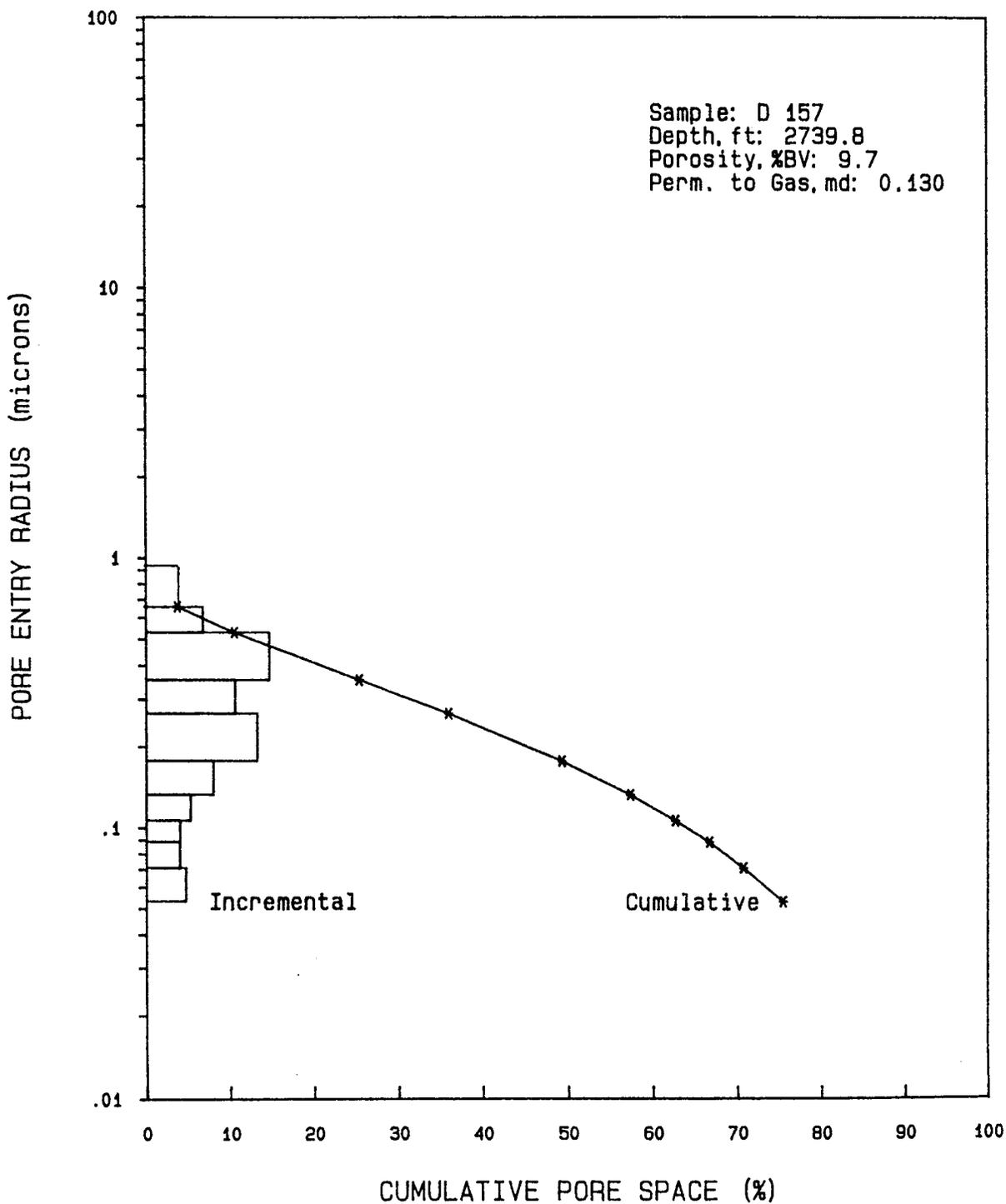


Table 45

HIGH PRESSURE MERCURY INJECTION

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSB 3036

SAMPLE: D 145A  
 DEPTH, ft: 2544.4

POROSITY, %BV: 8.1  
 PERM TO GAS, md: 0.006

| INJECTION<br>PRESSURE<br>(psia) | WETTING<br>SATURATION<br>(% inj vol) | PORE THROAT<br>RADIUS<br>(Microns) | LEVERETT<br>J<br>FUNCTION |
|---------------------------------|--------------------------------------|------------------------------------|---------------------------|
| 1.47                            | 100.0                                | -                                  | -                         |
| 2.11                            | 100.0                                | -                                  | -                         |
| 3.10                            | 100.0                                | -                                  | -                         |
| 4.11                            | 100.0                                | -                                  | -                         |
| 5.60                            | 100.0                                | -                                  | -                         |
| 7.10                            | 100.0                                | -                                  | -                         |
| 10.6                            | 100.0                                | -                                  | -                         |
| 16.1                            | 100.0                                | -                                  | -                         |
| 20.0                            | 100.0                                | -                                  | -                         |
| 25.0                            | 100.0                                | -                                  | -                         |
| 30.4                            | 100.0                                | -                                  | -                         |
| 40.1                            | 100.0                                | -                                  | -                         |
| 50.8                            | 100.0                                | -                                  | -                         |
| 74.7                            | 100.0                                | -                                  | -                         |
| 115                             | 100.0                                | -                                  | -                         |
| 219                             | 100.0                                | -                                  | -                         |
| 517                             | 100.0                                | -                                  | -                         |
| 987                             | 100.0                                | -                                  | -                         |
| 2044                            | 98.7                                 | 0.052                              | 0.33                      |
| 2985                            | 94.4                                 | 0.036                              | 0.48                      |
| 4978                            | 71.1                                 | 0.021                              | 0.80                      |
| 7969                            | 35.9                                 | 0.013                              | 1.28                      |
| 11969                           | 27.0                                 | 0.0089                             | 1.92                      |
| 14959                           | 22.4                                 | 0.0071                             | 2.40                      |
| 19782                           | 17.4                                 | 0.0054                             | 3.17                      |
| 25009                           | 13.5                                 | 0.0043                             | 4.01                      |
| 32344                           | 9.2                                  | 0.0033                             | 5.19                      |
| 40044                           | 5.9                                  | 0.0027                             | 6.42                      |
| 50209                           | 2.6                                  | 0.0021                             | 8.05                      |
| 55895                           | 1.0                                  | 0.0019                             | 8.96                      |
| 59843                           | 0.0                                  | -                                  | -                         |

Figure 65  
HIGH PRESSURE MERCURY INJECTION

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSB 3036

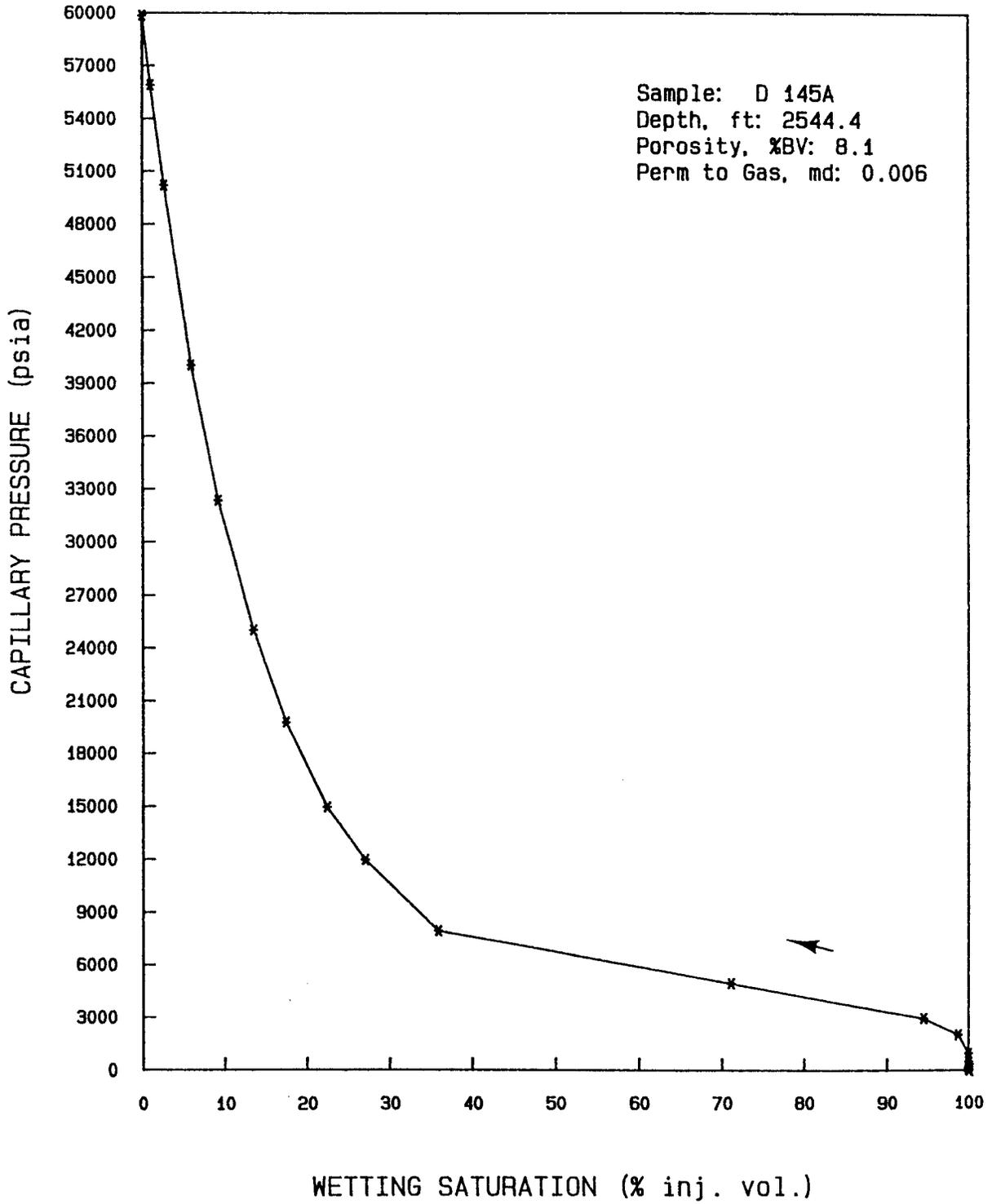


Figure 66  
HIGH PRESSURE MERCURY INJECTION

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas

Sample: D 145A

SRS 1887B/RSH 3036

Depth, ft: 2544.4

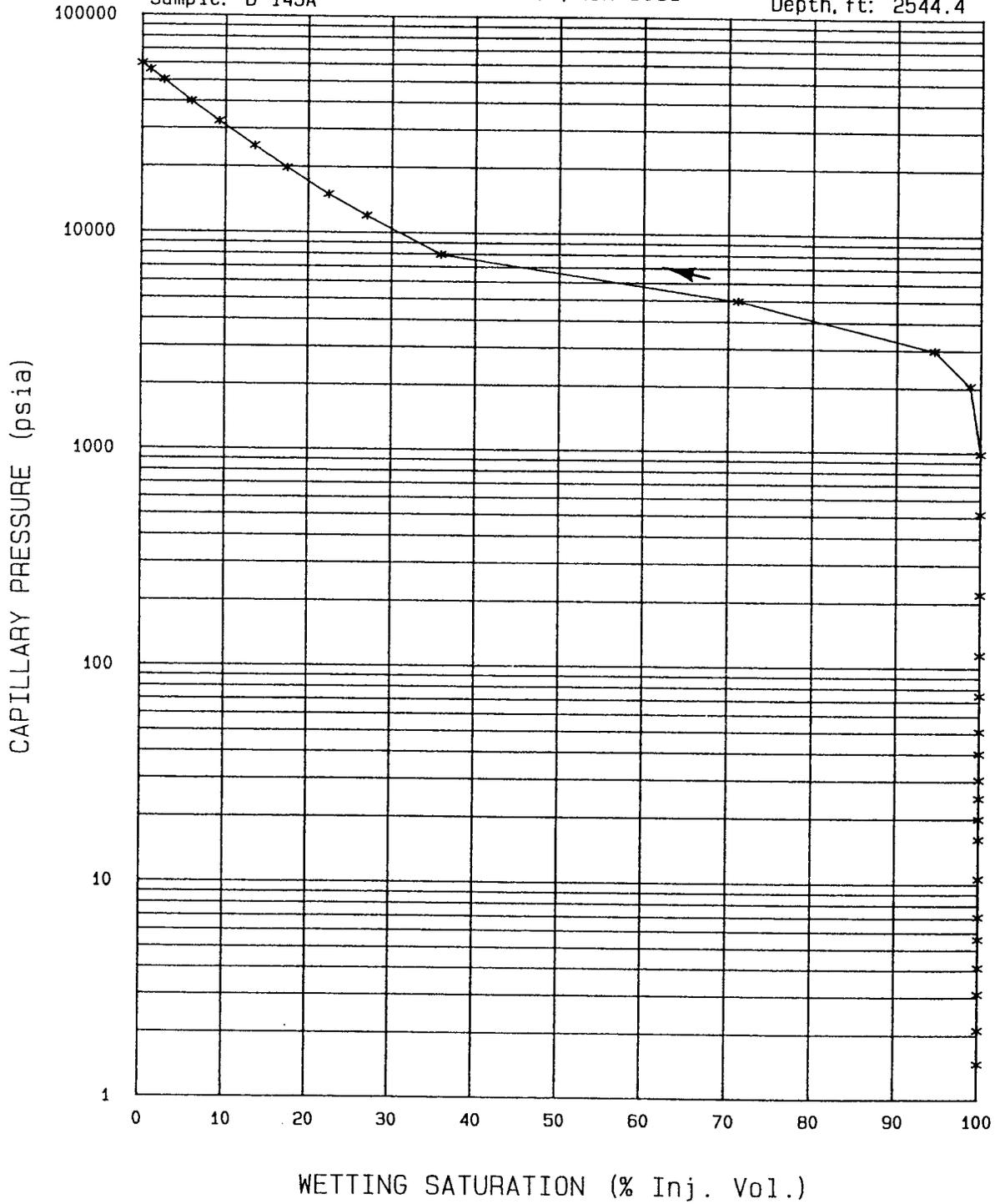


Figure 67  
PORE THROAT SIZE DISTRIBUTION

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSH 3036

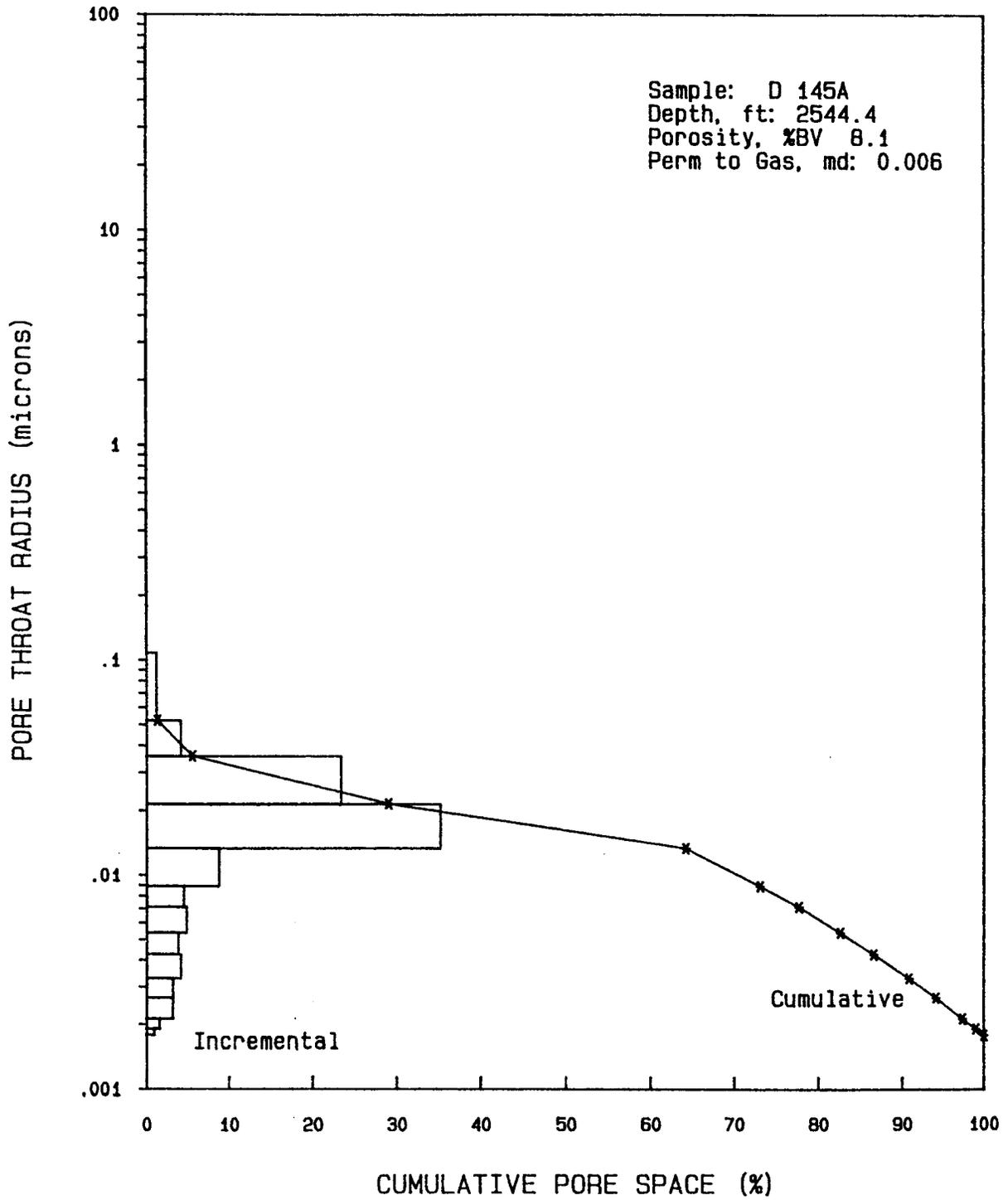


Table 46

HIGH PRESSURE MERCURY INJECTION

Anadarko Petroleum Corporation  
 Youngren "J" 1-H Well  
 Stevens County, Kansas  
 SRS 1887B/RSR 3036

SAMPLE: D 160  
 DEPTH, ft: 2766.7

POROSITY, %BV: 8.5  
 PERM TO GAS, md: 0.046

| CAPILLARY<br>PRESSURE<br>(psia) | WETTING<br>SATURATION<br>(% inj. vol) | PORE THROAT<br>RADIUS<br>(Microns) | LEVERETT<br>J<br>FUNCTION |
|---------------------------------|---------------------------------------|------------------------------------|---------------------------|
| 1.47                            | 100.0                                 | -                                  | -                         |
| 2.11                            | 100.0                                 | -                                  | -                         |
| 3.10                            | 100.0                                 | -                                  | -                         |
| 4.11                            | 100.0                                 | -                                  | -                         |
| 5.60                            | 100.0                                 | -                                  | -                         |
| 7.10                            | 100.0                                 | -                                  | -                         |
| 10.6                            | 100.0                                 | -                                  | -                         |
| 16.1                            | 100.0                                 | -                                  | -                         |
| 20.0                            | 100.0                                 | -                                  | -                         |
| 25.0                            | 100.0                                 | -                                  | -                         |
| 30.4                            | 100.0                                 | -                                  | -                         |
| 40.1                            | 100.0                                 | -                                  | -                         |
| 50.8                            | 100.0                                 | -                                  | -                         |
| 74.7                            | 100.0                                 | -                                  | -                         |
| 115                             | 100.0                                 | -                                  | -                         |
| 219                             | 100.0                                 | -                                  | -                         |
| 517                             | 66.0                                  | 0.206                              | 0.224                     |
| 985                             | 38.3                                  | 0.108                              | 0.427                     |
| 2042                            | 21.8                                  | 0.0522                             | 0.885                     |
| 2983                            | 16.4                                  | 0.0357                             | 1.29                      |
| 4976                            | 11.3                                  | 0.0214                             | 2.16                      |
| 7967                            | 8.1                                   | 0.0134                             | 3.45                      |
| 11968                           | 6.2                                   | 0.0089                             | 5.19                      |
| 14958                           | 5.1                                   | 0.0071                             | 6.48                      |
| 19781                           | 4.0                                   | 0.0054                             | 8.57                      |
| 25008                           | 3.2                                   | 0.0043                             | 10.84                     |
| 31793                           | 2.4                                   | 0.0034                             | 13.78                     |
| 40043                           | 1.6                                   | 0.0027                             | 17.35                     |
| 50209                           | 0.8                                   | 0.0021                             | 21.76                     |
| 55894                           | 0.3                                   | 0.0019                             | 24.22                     |
| 59841                           | 0.0                                   | 0.0018                             | 25.93                     |

Figure 68

HIGH PRESSURE MERCURY INJECTION

Anadarko Petroleum Corporation

Youngren "J" 1-H Well

Stevens County, Kansas

SRS 1887B/RSH 3036

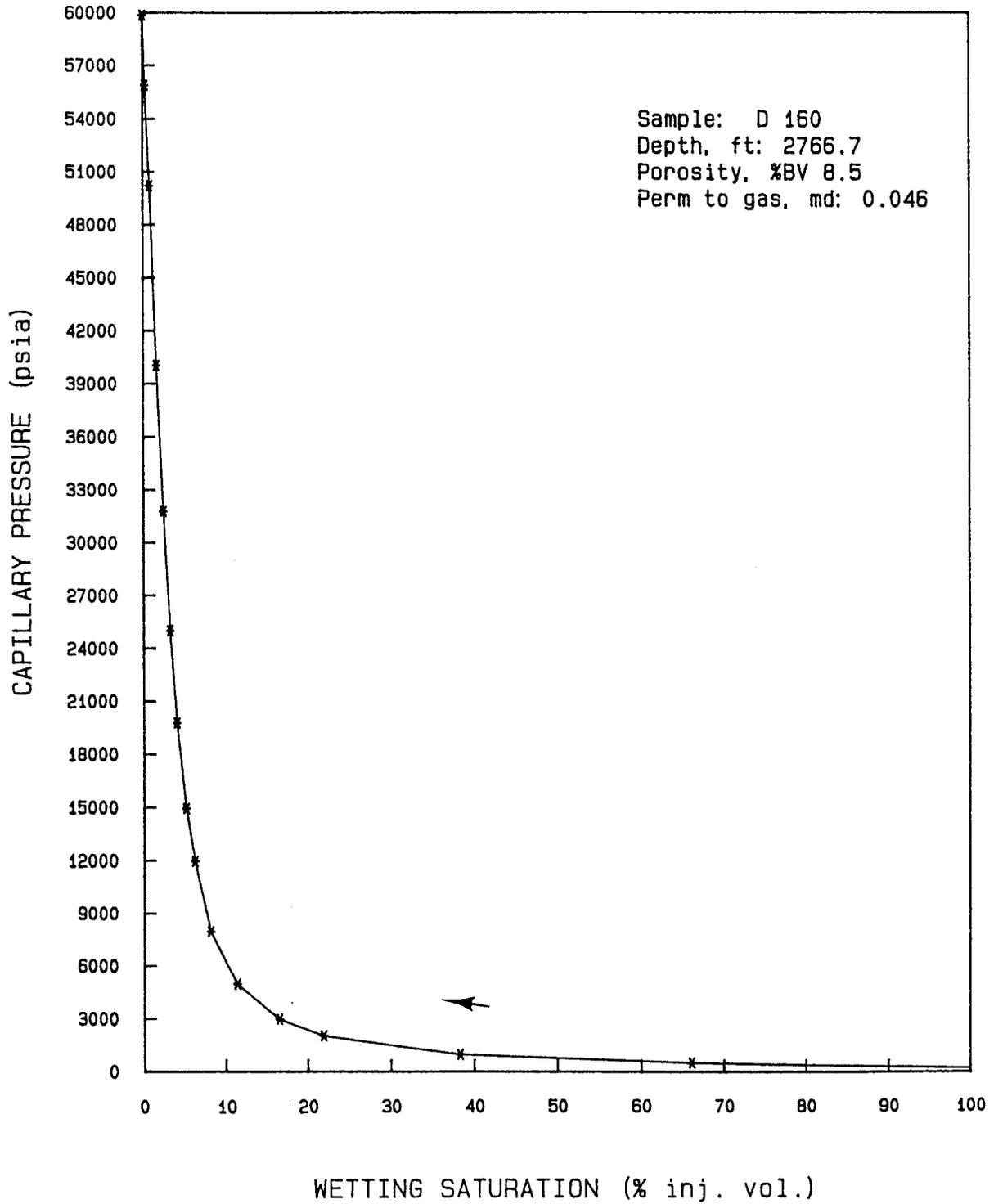


Figure 69  
HIGH PRESSURE MERCURY INJECTION

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas

Sample: D 160

SRS 1887B/RSR 3036

Depth, ft: 2766.7

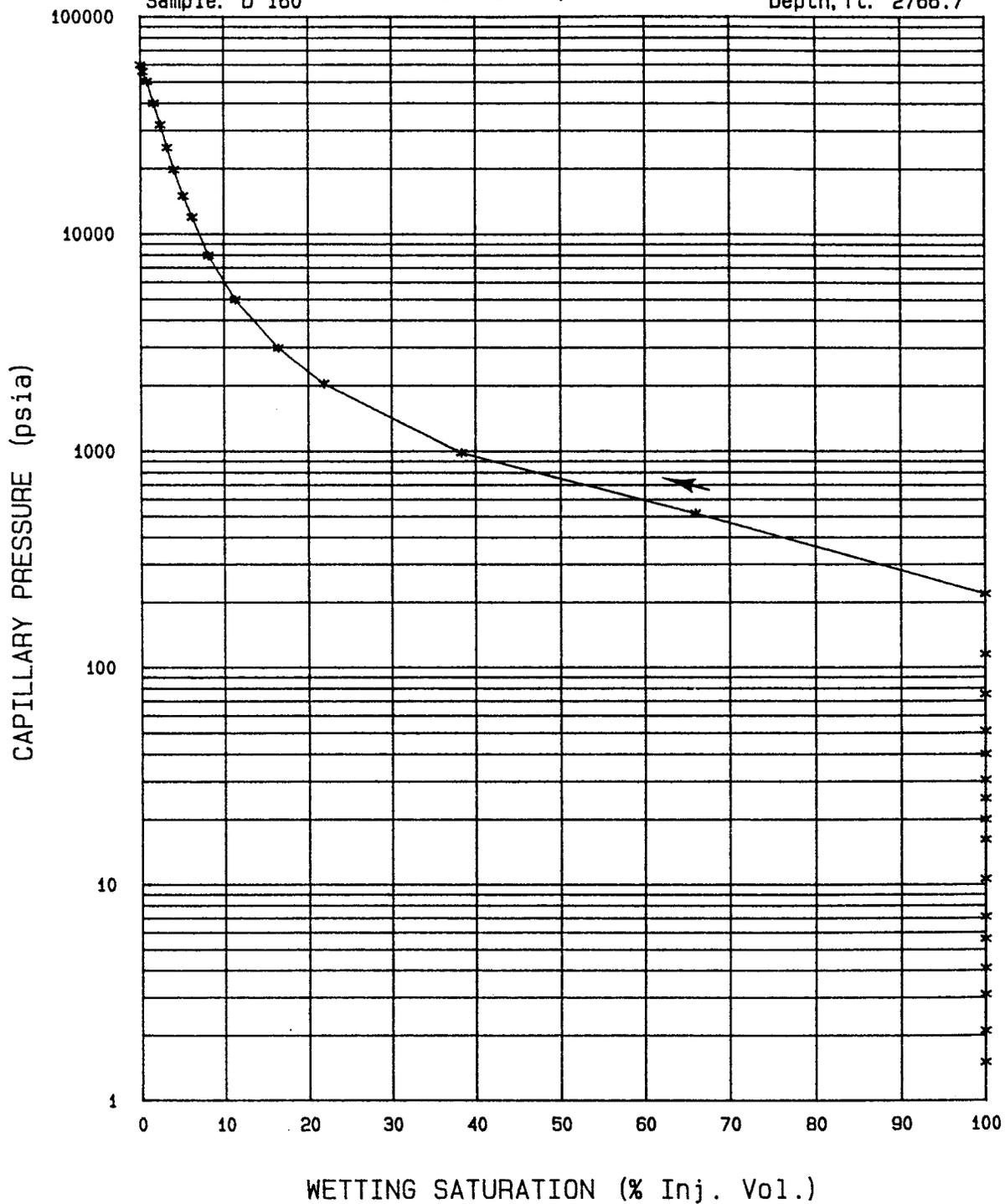


Figure 70  
PORE THROAT SIZE DISTRIBUTION

Anadarko Petroleum Corporation  
Youngren "J" 1-H Well  
Stevens County, Kansas  
SRS 1887B/RSR 3036

