CONVENTIONAL CORE ANALYSIS

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

Natural Core Gamma Radiation
Specific Permeability to Gas (Steady-State Method)
Porosity and Grain Density (Boyle's Law Method)
Fluid Saturations (Dean-Stark Method)
Lithological Description

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

(713) 932-7183 FAX (713) 932-0520

December 10, 1997

Mr. P.K. Pande
Anadarko Petroleum Corporation
17001 Northchase Drive
Houston, Texas 77060

Dear Mr. Pande:

On November 16, 1997, Reservoirs, Inc. received two (2) well cores at the Special Core Analysis Laboratory in Houston, Texas which had been obtained from the following well:

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas

Approximately sixty two (62) feet of full diameter core material was recovered from the cored interval of 2458.0-2518.4 ft. (Core 1) and also forty eight (48) feet of full diameter core material from the cored interval of 2598.0-2646.0 ft. (Core 2.) Upon arrival at the Special Core Analysis Laboratory, each segment was oriented, marked with respect to depth and the natural core gamma radiation measured. Conventional core analysis was initiated by obtaining one and one half inch (1.5") diameter core plug samples on the basis of one horizontally oriented core plug sample per one foot of recovered core material.

On November 20, 1997 Core 3 which was recovered from the depth interval of 2646.0-2696.0 ft. of the previously referenced well was received at the Special Core Analysis Laboratory of Reservoirs, Inc. and similar analyses were performed.

The full diameter well core was subsequently cut longitudinally into a one-third (1/3) portion and a two-thirds (2/3) portion. The two-thirds portion was immediately packaged in standard size, three feet (3') long cardboard core boxes. The one-third portion was placed in cardboard slab boxes for the purpose of photography, and geological description.

Preliminary test results were electronically transmitted to Mr. Pande and Mr. Steve Ruhl of the Anadarko Petroleum Corporation on November 19, 20 and 26, 1997 by Mr. Paul Delacoe of Reservoirs, Inc. via facsimile.

This report presents the conventional core analysis test results in both tabular and graphical formats together with the core gamma log. A section entitled "Laboratory Procedures" which describes the methods used to obtain the test results is also included in the report. The core gamma log which includes the conventional core analysis and the natural gamma radiation of the core is presented at the back of this report.

The conventional core analysis is presented in Tables 1 through 3 and Figures 1 through 8. Examination of the test results indicates the specific permeabilities to gas ranged from 0.002 md to 331 md and the porosities ranged from 3.9 to 28.6 percent of the bulk volume. The saturation data indicates the water saturations ranged from 27.6 to 84.2 percent of the pore volume. Grain densities varied from 2.67 g/cc to 2.86 g/cc.

In order to determine the accuracy and reproducibility of the permeability to gas and porosity test results, a series of Quality Assurance check plugs were tested prior to and following the sets of core plug samples. The data obtained for these Quality Assurance check plugs are presented in Table 4.

It has been a pleasure to be of service to you and the Anadarko Petroleum Corporation with this study and Reservoirs, Inc. looks forward to working 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 Reservoirs, Inc. can be of any further service to you, please do not hesitate to contact Mr. Steve Alexander at (713)935-4206 or me at (713)932-9670.

Sincerely,

Paul Delacoe

Paul Delacoe
Manager, Special Core Analysis
RESERVOIRS, INC.

LABORATORY PROCEDURES

Natural Core Gamma Radiation Log

The full-diameter well core was passed over a gamma radiation detection unit which was shielded from the natural background radiation. The relative magnitude of the radiation was recorded as a function of depth for comparison with the downhole logs. Five inches (5") of recorded log is equivalent to one hundred feet (100') of measured gamma response.

Sample Preparation

A total of one hundred fifty two (152), one and one half inch (1.5") in diameter, horizontally oriented core plug samples were drilled from the well core. Each core plug sample was obtained using a diamond core drill and water as the coolant and lubricant. The core plug samples were trimmed to form right cylinders using a diamond rimmed sawblade and water. Each core plug sample was marked with an identification number, weighed and immediately placed in a Dean-Stark distillation extraction apparatus to determine the fluid saturations, present.

Dean-Stark Distillation/Extraction

Each core plug sample was weighed and placed in an individual Dean-Stark apparatus after the toluene had been pre-boiled to remove any absorbed water. The temperature in the boiling flask was increased to begin the distillation process. The vapors flow upward around the core plug sample and into the condenser. The condensed liquid flows over the core plug sample and returns to the boiling flask. Toluene boils at a temperature higher than water. Thus, the water in the core plug sample was distilled and the vapors flow upward into the condenser. The condensed water was trapped in a graduated receiving tube and the water volumes were read to nearest 0.01 ml. In addition to distilling the water from the pore spaces, the toluene is a solvent and removes any hydrocarbons present from the pore spaces. When no further production of water was evident, the toluene was replaced with methanol to remove any residual salts present in the core plug sample.

The core plug sample was subsequently removed from the Dean-Stark apparatus and placed in a conventional chamber and dried. The core plug sample was allowed to cool to room temperature in a desiccator containing silica-gel and weighed, prior to determination of the basic rock properties of the sample. The fluid saturations were determined from the gravimetric measurements obtained before and after cleaning of the samples and the volumes of water produced during the Dean-Stark distillation/extractions.

Basic Rock Properties

The **bulk volume** of each 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 core plug 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 core plug sample being tested can be determined. The grain volume subtracted from the bulk volume of the core plug sample results in the pore volume of the core plug 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 core plug 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 core plug 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 core plug sample. Nitrogen gas was injected into each core plug sample at a constant pressure until a constant flow rate of gas through the core plug sample was attained (steady-state conditions). The specific permeability to gas was calculated using the Darcy Equation.

E Log Depth = CD - 12'

Table 1

CONVENTIONAL CORE ANALYSIS

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

Core Number: 1
Depth Interval: 2,458.0 - 2,518.4 ft

Sample	Depth (ft)	Porosity (%BV)	Permeability to Gas (md)	Grain Density (g/cc)	Saturation (%PV) Water	Oil	Gas	Lithological Description
W 060	2458.6	5.6	0.005	2.85	39.6	0.0	60.4	Dol tn v wl consol slty tr pyr
W 061	2459.3	7.8	0.103	2.85	46.2	0.0	53.8	Dol tn wl consol slty abd sh incls thn sh lams
W 062	2460.4	6.8	0.005	2.80	70.5	0.0	29.5	Dol tn v wl consol slty thn sh lams sml calc incls
W 063	2461.6	15.6	8.41	2.81	55.7	0.0	44.3	Dol lt tn wl consol slty lge calc incls tr pyr
W 064	2462.8	13.1	0.757	2.80	61.3	0.0	38.7	Dol lt gry wl consol slty thn sh lam sml sh incls
W 065	2463.7	15.5	1.40	2.70	67.6	0.0	32.4	Sltst lt gry wl consol sdy thn sh lam sml sh incls
W 066	2464.3	11.2	0.297	2.73	70.0	0.0	30.0	Sltst lt gry wl consol sdy sml sh incls sml calc incls
W 067	2465.4	10.2	0.306	2.74	66.9	0.0	33.1	Sltst lt gry wl consol sdy sml sh incls sml calc incls
W 068	2467.9	25.4	84.1	2.68	70.1	0.0	29.9	Sltst lt gry wl consol sdy sml sh incls tr pyr
W 069	2468.7	26.2	76.5	2.68	63.0	0.0	37.0	Sltst lt yel gry wl consol sdy thn sh lams abd sml pyr incls i.p.
W 070	2469.4	22.4	73.7	2.70	69.5	0.0	30.5	Sltst lt yel gry wl consol sdy thn sh lams abd sml pyr incls i.p.
W 071	2470.6	21.8	37.3	2.68	64.7	0.0	35.3	Sltst strk gry crm wl consol sdy thn sh lams abd sml pyr incls
W 072	2471.4	16.2	3.89	2.74	71.3	0.0	28.7	Sltst strk gry crm wl consol sdy thn sh lams abd sml pyr incls
W 073	2472.8	24.9	23.4 *	2.67	72.3	0.0	27.7	Sltst strk gry crm wl consol sdy abd thn sh lams sh lam frac
W 074	2473.5	12.2	0.023	2.74	84.2	0.0	15.8	Sltst strk gry crm wl consol dol abd thn sh lams
W 075	2474.2	11.8	0.034	2.76	81.1	0.0	18.9	Sltst strk gry crm wl consol dol abd thn sh lams
W 076	2475.3	11.7	0.009*	2.82	82.9	0.0	17.1	Sltst yel gry wl consol dol abd sh incls
W 077	2477.9	9.4	0.025	2.81	71.7	0.0	28.3	Sltst lt yel gry wl consol dol thn sh incls lge anhy incls
W 078	2478.3	7.7	0.168*	2.81	76.0	0.0	24.0	Sltst lt yel gry wl consol dol thn sh incls lge anhy incls
W 079	2479.4	11.1	0.045	2.82	64.9	0.0	35.1	Sltst lt yel gry wl consol dol thn sh incls lge anhy incls
W 080	2480.7	12.5	0.257	2.84	44.8	0.0	55.2	Dol lt yel gry wl consol slty abd sml sh incls lge anhy incl
W 081	2481.3	17.5	2.76	2.85	44.2	0.0	55.8	Dol lt tn gry wl consol slty sml sh incls calc incls p.p. vugs
W 082	2482.3	20.3	21.9	2.86	39.8	0.0	60.2	Dol lt tn gry wl consol slty sml sh incls calc incls p.p. vugs
W 083	2483.4	11.0	1.68	2.84	44.9	0.0	55.1	Dol mott crm gry wl consol slty sml sh incls p.p. vugs
W 084	2484.7	16.9	46.4	2.85	55.3	0.0	44.7	Dol mott crm gry wl consol slty sml sh incls p.p. vugs
W 085	2485.4	17.5	70.9	2.85	57.3	0.0	42.7	Dol mott crm gry wl consol slty sml calc incls p.p. vugs
W 086	2486.4	16.5	81.8	2.84	56.8	0.0	43.2	Dol mott crm gry wl consol slty sml calc incls p.p. vugs

* Sample contains fracture(s), permeability to gas may be anomalously high.
** Broken/non-cylindrical sample, permeability to gas indeterminable.

Table 1

CONVENTIONAL CORE ANALYSIS

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

Core Number: 1
Depth Interval: 2,458.0 - 2,518.4 ft

Sample	Depth (ft)	Porosity (%BV)	Permeability to Gas (md)	Grain Density (g/cc)	Saturation (%PV) Water	Oil	Gas	Lithological Description
W 087	2487.5	20.8	88.6	2.84	56.1	0.0	43.9	Dol mott crm gry wl consol slty sml calc incls p.p. vugs
W 088	2488.5	19.6	11.6	2.84	40.0	0.0	60.0	Dol mott crm gry wl consol slty abd p.p. vugs
W 089	2489.4	23.9	275. *	2.84	55.1	0.0	44.9	Dol mott crm gry wl consol slty abd p.p. vugs
W 090	2490.5	19.7	151.	2.84	51.7	0.0	48.3	Dol mott crm gry wl consol slty abd p.p. vugs
W 091	2491.4	20.9	167.	2.84	54.7	0.0	45.3	Dol mott crm gry wl consol slty abd p.p. vugs
W 092	2492.3	22.9	76.3	2.84	51.3	0.0	48.7	Dol mott crm gry wl consol slty abd p.p. vugs
W 093	2493.6	18.3	10.8	2.84	46.0	0.0	54.0	Dol mott crm gry wl consol slty abd p.p. vugs
W 094	2494.6	16.8	10.9	2.83	40.4	0.0	59.6	Dol mott gry crm wl consol slty sml sh incls sml vugs i.p.
W 095	2495.5	18.1	4.70	2.84	30.4	0.0	69.6	Dol mott gry crm wl consol slty sml sh incls sml vugs i.p.
W 096	2496.5	21.8	86.8	2.85	47.7	0.0	52.3	Dol mott gry crm wl consol slty sh incls calc incls sml vugs i.p.
W 097	2497.3	20.6	101.	2.84	54.3	0.0	45.7	Dol mott gry crm wl consol slty thn sh lams p.p. vugs i.p.
W 098	2498.3	19.7	55.8	2.84	41.8	0.0	58.2	Dol mott gry crm wl consol slty sml calc incls p.p. vugs
W 099	2499.5	23.2	60.3	2.84	42.5	0.0	57.5	Dol mott gry crm wl consol slty sml calc incls p.p. vugs
W 100	2500.4	22.8	126.	2.84	48.5	0.0	51.5	Dol mott gry crm wl consol slty sml calc incls p.p. vugs
W 101	2501.4	22.7	210.	2.86	56.3	0.0	43.7	Dol mott gry crm wl consol slty sml calc incls p.p. vugs
W 102	2502.6	21.3	118.	2.85	52.4	0.0	47.6	Dol mott gry crm wl consol slty sml calc incls p.p. vugs
W 103	2503.4	19.1	41.8	2.84	49.0	0.0	51.0	Dol mott gry crm wl consol slty sml calc incls p.p. vugs
W 104	2504.4	21.0	112.	2.84	51.5	0.0	48.5	Dol mott gry crm wl consol slty sml calc incls p.p. vugs
W 105	2505.6	16.7	18.6	2.85	38.3	0.0	61.7	Dol tn wl consol slty sml sh incls lge anhy incls p.p. vugs
W 106	2506.4	23.0	47.1	2.84	27.6	0.0	72.4	Dol tn wl consol slty sml sh incls p.p. vugs
W 107	2507.3	25.6	320.	2.85	49.4	0.0	50.6	Dol tn wl consol slty sml sh incls sml calc incls p.p. vugs
W 108	2508.3	27.2	275.	2.86	45.7	0.0	54.3	Dol tn wl consol slty sml sh incls sml calc incls p.p. vugs
W 109	2509.2	27.9	331.	2.85	49.8	0.0	50.2	Dol tn wl consol slty sh incls calc incls glauc incls p.p. vugs
W 110	2510.4	28.6	313.	2.85	68.5	0.0	31.5	Dol tn wl consol slty sml sh incls sml calc incls p.p. vugs
W 111	2511.3	27.9	157.	2.84	48.7	0.0	51.3	Dol tn wl consol slty sml sh incls lge anhy incls
W 112	2512.5	20.6	18.0	2.84	34.6	0.0	65.4	Dol tn wl consol slty sml sh incls lge anhy incls
W 113	2513.6	20.6	8.22	2.82	34.2	0.0	65.8	Dol tn wl consol slty sml sh incls lge anhy incls

* Sample contains fracture(s), permeability to gas may be anomalously high.
** Broken/non-cylindrical sample, permeability to gas indeterminable.

Table 1

CONVENTIONAL CORE ANALYSIS

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

Core Number: 1
Depth Interval: 2,458.0 - 2,518.4 ft

					Saturation (%PV)			
Sample	Depth (ft)	Porosity (%BV)	Permeability to Gas (md)	Grain Density (g/cc)	Water	Oil	Gas	Lithological Description
W 114	2514.3	14.3	162. *	2.76	46.0	0.0	54.0	Sltst gry tn wl consol shly sh lam fracs

* Sample contains fracture(s), permeability to gas may be anomalously high.
** Broken/non-cylindrical sample, permeability to gas indeterminable.

Figure 1

PERMEABILITY - POROSITY RELATIONSHIP

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

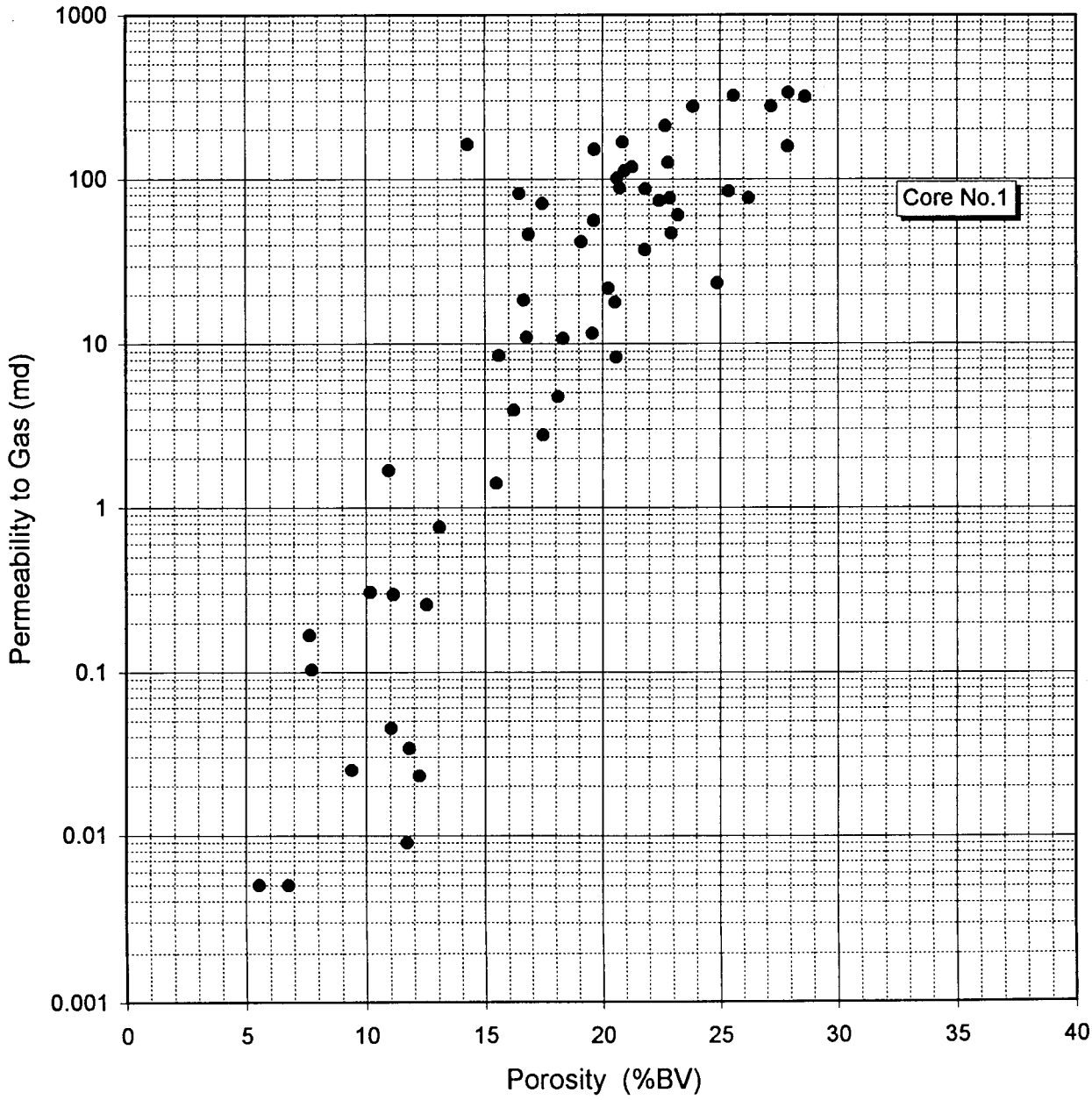


Figure 2

GRAIN DENSITY - POROSITY RELATIONSHIP

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

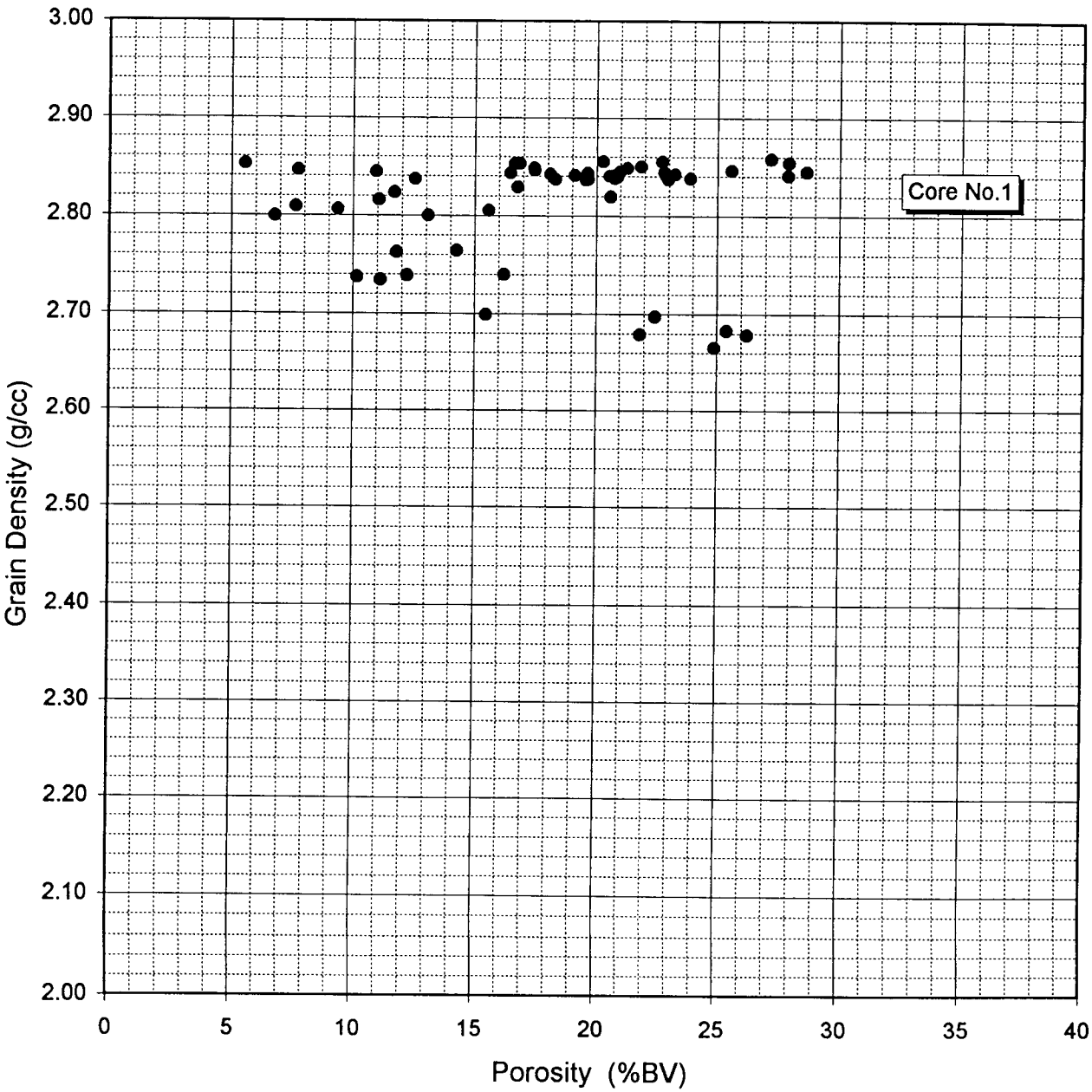


Table 2

CONVENTIONAL CORE ANALYSIS

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

Core Number: 2
Depth Interval: 2,598.0 - 2,646.0 ft

Sample	Depth (ft)	Porosity (%BV)	Permeability to Gas (md)	Grain Density (g/cc)	Saturation (%PV) Water	Oil	Gas	Lithological Description
W 012	2598.6	10.6	0.053	2.73	57.7	0.0	42.3	Sltst rdsh brn wl consol sdy thn sh lams tr pyr
W 013	2599.2	13.1	0.439*	2.71	69.2	0.0	30.8	Sltst gnsh gry rdsh brn i.p. wl consol sdy glauc lams
W 014	2600.7	15.8	0.024*	2.81	50.4	0.0	49.6	Dol lt tn wl consol abd calc incls sdy sh i.p.
W 015	2601.4	5.0	0.005	2.69	54.6	0.0	45.4	Sltst lt yel gry wl consol sdy thn sh lams sml calc incls
W 016	2602.6	5.1	0.005	2.68	62.5	0.0	37.5	Sltst lt yel gry wl consol sdy thn sh lams sli calc
W 017	2603.2	5.1	0.005	2.69	57.8	0.0	42.2	Sltst lt yel gry wl consol sdy thn sh lams sli calc
W 018	2604.7	3.9	0.002	2.71	52.5	0.0	47.5	Sltst lt yel gry wl consol mass calc incls sdy thn sh lams
W 019	2605.4	7.7	0.005	2.67	46.3	0.0	53.7	Sltst mott gry wh mass calc incls sdy thn sh lams pyr incls
W 020	2606.4	4.2	0.004	2.72	39.0	0.0	61.0	Ls mott wh gry wl consol mass calc incls sdy thn sh lams
W 021	2607.3	9.6	0.090	2.70	38.4	0.0	61.6	Ls spkld gry tn wl consol mass calc incls sdy
W 022	2608.2	11.6	0.426	2.70	49.0	0.0	51.0	Ls spkld gry tn wl consol mass calc incls sdy
W 023	2609.5	11.9	0.301	2.70	42.8	0.0	57.2	Ls spkld gry tn wl consol mass calc incls sdy
W 024	2610.4	11.5	0.242	2.70	41.9	0.0	58.1	Ls spkld gry tn wl consol mass calc incls sdy
W 025	2611.4	10.5	0.196	2.70	47.5	0.0	52.5	Ls spkld gry tn wl consol mass calc incls sdy
W 026	2612.6	9.0	0.536	2.70	51.9	0.0	48.1	Ls spkld gry tn wl consol mass calc incls sdy tr pyr
W 027	2613.3	10.0	0.456	2.70	55.3	0.0	44.7	Ls spkld gry tn wl consol mass calc incls sdy tr pyr
W 028	2614.3	15.9	20.7	2.70	58.1	0.0	41.9	Ls spkld gry tn wl consol mass calc incls sdy tr pyr
W 029	2615.5	18.6	51.3	2.71	52.6	0.0	47.4	Ls spkld gry tn wl consol mass calc incls p.p. vugs
W 030	2616.5	17.1	8.69	2.71	58.9	0.0	41.1	Ls spkld gry tn wl consol mass calc incls p.p. vugs
W 031	2617.6	17.0	5.44	2.70	61.5	0.0	38.5	Ls spkld wh tn wl consol mass calc incls p.p. vugs
W 032	2618.5	14.3	1.67	2.70	58.3	0.0	41.7	Ls lt tn wl consol mass calc incls
W 033	2619.6	14.3	1.15	2.70	55.3	0.0	44.7	Ls lt tn wl consol mass calc incls
W 034	2620.4	13.9	5.72	2.74	58.5	0.0	41.5	Ls mott gry tn wl consol mass calc incls
W 035	2621.5	13.8	4.06	2.72	62.7	0.0	37.3	Ls mott crm tn wl consol mass calc incls p.p. vugs i.p.
W 036	2622.5	14.5	3.64	2.74	58.0	0.0	42.0	Ls mott gry tn wl consol mass calc incls foss incls
W 037	2623.4	16.6	5.88	2.73	61.3	0.0	38.7	Ls mott gry tn wl consol mass calc incls sdy
W 038	2624.4	15.3	2.63	2.73	59.2	0.0	40.8	Ls mott gry tn wl consol mass calc incls sdy

* Sample contains fracture(s), permeability to gas may be anomalously high.
** Broken/non-cylindrical sample, permeability to gas indeterminable.

Table 2

CONVENTIONAL CORE ANALYSIS

ELog = CD-15'

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

Core Number: 2
Depth Interval: 2,598.0 - 2,646.0 ft

Sample	Depth (ft)	Porosity (%BV)	Permeability to Gas (md)	Grain Density (g/cc)	Saturation (%PV) Water	Oil	Gas	Lithological Description
W 039	2625.4	12.6	1.24	2.71	58.4	0.0	41.6	Ls mott gry tn wl consol mass calc incls sdy
W 040	2626.4	17.1	1.23	2.77	45.7	0.0	54.3	Ls mott gry tn wl consol mass calc incls sdy i.p. p.p. vugs
W 041	2627.6	11.3	0.261	2.73	47.2	0.0	52.8	Ls mott crm gry wl consol mass calc incls sdy
W 042	2628.6	11.1	0.246	2.73	52.3	0.0	47.7	Ls mott crm gry wl consol mass calc incls thn sh lams sdy
W 043	2629.3	14.5	0.502	2.76	44.1	0.0	55.9	Dol mott gry tn wl consol mass calc incls sdy
W 044	2630.6	13.3	0.505	2.79	46.9	0.0	53.1	Dol lt tn vfgr wl consol mass calc incls lge calc incls sdy v calc
W 045	2631.6	15.3	0.105	2.78	47.2	0.0	52.8	Dol tn gry wl consol abd calc incls thn sh lams v sdy i.p.
W 046	2632.3	10.4	0.042	2.75	48.9	0.0	51.1	Dol mott crm tn wl consol sdy mass calc incls
W 047	2633.3	15.8	0.897	2.73	51.8	0.0	48.2	Sltst lt yel tn wl consol sdy thn sh lams occ calc incls tr pyr
W 048	2635.4	15.0	0.578	2.72	59.8	0.0	40.2	Sltst lt yel tn wl consol sdy thn sh lams occ calc incls tr pyr
W 049	2635.4	15.9	1.73	2.70	58.5	0.0	41.5	Sltst lt gry wl consol sdy thn sh lams sml calc incls i.p.
W 050	2636.3	14.1	0.651	2.72	65.2	0.0	34.8	Sltst lt gry wl consol sdy thn sh lams sml calc incls i.p.
W 051	2637.8	14.6	2.07	2.69	69.3	0.0	30.7	Sltst strk dk gry gry wl consol sdy abd sh lams
W 052	2639.3	11.9	0.034	2.70	65.7	0.0	34.3	Sltst strk dk gry gry wl consol sdy abd sh lams
W 053	2639.3	10.5	0.036	2.70	63.8	0.0	36.2	Sltst strk dk gry gry wl consol sdy abd sh lams
W 054	2640.6	9.5	6.06 *	2.72	59.1	0.0	40.9	Sltst strk dk gry gry wl consol sdy abd sh lams sh lam frac
W 055	2641.4	6.2	0.006	2.72	56.6	0.0	43.4	Sltst mott wh gry wl consol sdy abd sh lams sml calc incls
W 056	2642.6	11.4	0.139	2.71	55.6	0.0	44.4	Sltst lt yel gry wl consol sdy thn sh lams
W 057	2643.6	12.4	0.184	2.70	51.1	0.0	48.9	Sltst lt gry wl consol sdy tr pyr
W 058	2644.6	11.5	0.078	2.70	67.0	0.0	33.0	Sltst lt yel gry wl consol sdy thn sh lams
W 059	2645.5	17.1	0.343	2.68	55.1	0.0	44.9	Sltst lt yel gry wl consol sdy thn sh lams

* Sample contains fracture(s), permeability to gas may be anomalously high.
** Broken/non-cylindrical sample, permeability to gas indeterminable.

Figure 3

PERMEABILITY - POROSITY RELATIONSHIP

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

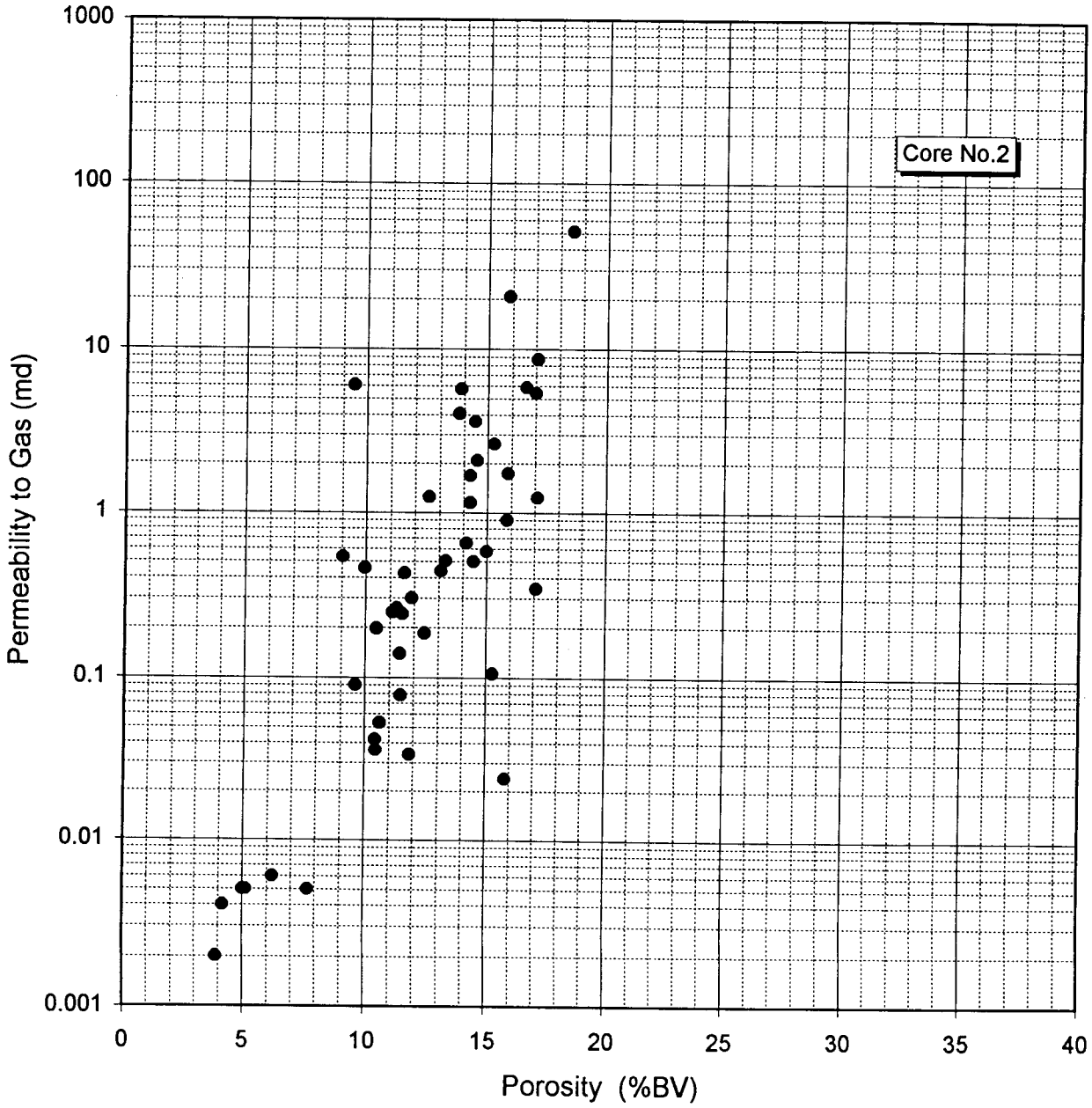
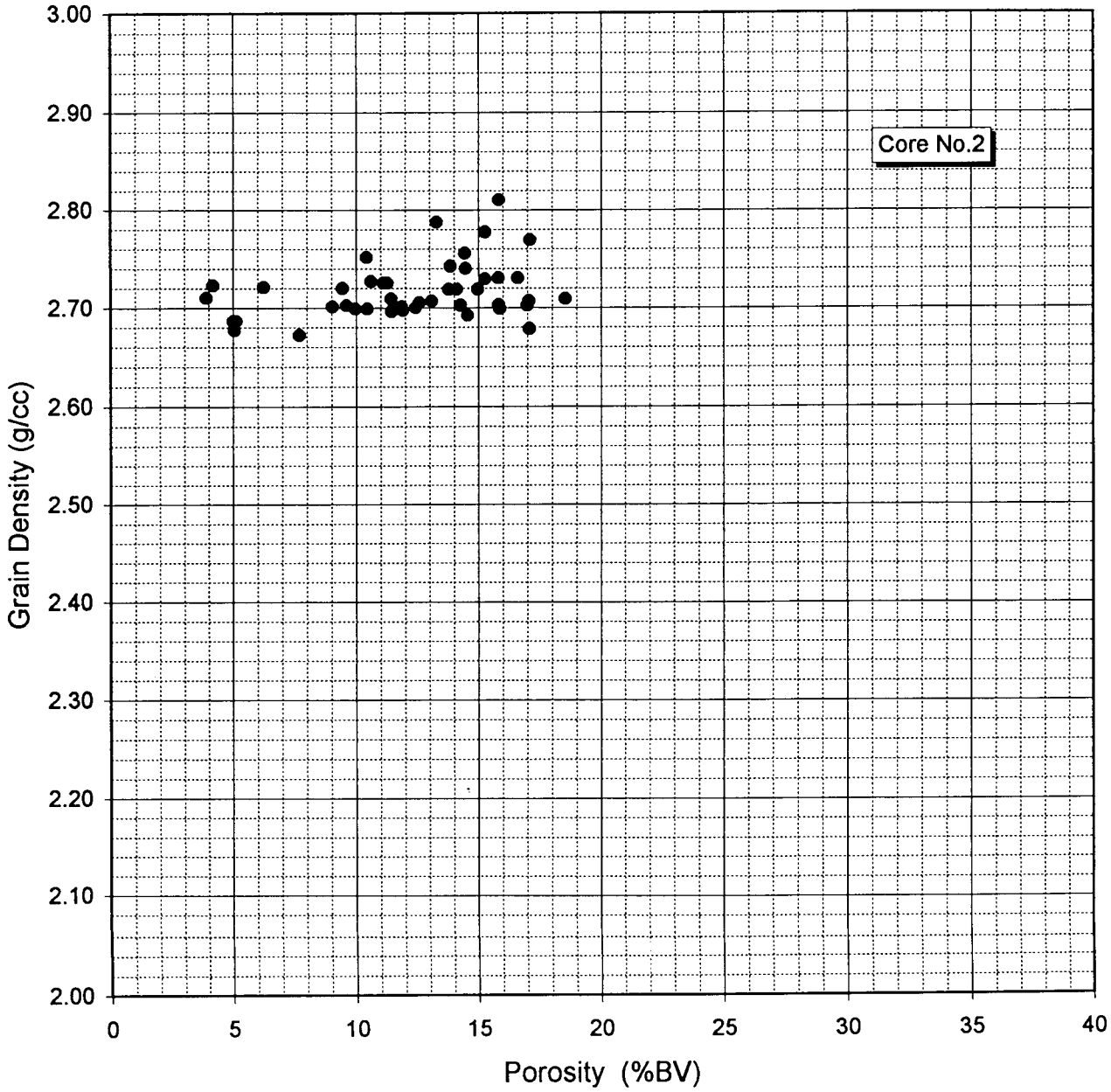


Figure 4

GRAIN DENSITY - POROSITY RELATIONSHIP

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835



EL = CD-15'

Table 3

CONVENTIONAL CORE ANALYSIS

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

Core Number: 3
Depth Interval: 2,646.0 - 2,696.0 ft

Sample	Depth (ft)	Porosity (%BV)	Permeability to Gas (md)	Grain Density (g/cc)	Saturation (%PV) Water	Oil	Gas	Lithological Description
W 115	2646.7	10.3	27.6 *	2.73	79.5	0.0	20.5	Sltst gnsh vfgr i.p. wl consol thn sh lams abd anhy incls
W 116	2647.3	13.3	42.8 *	2.72	69.5	0.0	30.5	Sltst rdsh gry vfgr i.p. wl consol sml anhy incls
W 117	2648.7	13.3	0.860*	2.72	60.9	0.0	39.1	Sltst yel gry vfgr i.p. wl consol shly i.p.
W 118	2649.8	13.1	4.07 *	2.72	66.0	0.0	34.0	Sltst yel gry vfgr i.p. wl consol abd thn sh lams
W 119	2650.6	13.6	11.5 *	2.76	75.6	0.0	24.4	Sltst rdsh gry vfgr i.p. wl consol thn sh lams
W 120	2651.7	13.9	0.150	2.72	59.3	0.0	40.7	Sltst yel gry vfgr i.p. wl consol thn sh lams
W 121	2652.2	13.7	0.209*	2.71	67.4	0.0	32.6	Sltst yel gry vfgr i.p. wl consol thn sh lams
W 122	2653.9	14.5	**	2.69	76.2	0.0	23.8	Sltst yel gry vfgr i.p. wl consol thn sh lams
W 123	2655.7	8.6	0.014	2.72	57.4	0.0	42.6	Sltst lt yel gry wl consol lmy thn sh lams
W 124	2656.3	11.8	0.045	2.76	60.3	0.0	39.7	Ls lt gry pred wl consol sdy thn sh lams
W 125	2657.6	12.6	1.65	2.73	57.6	0.0	42.4	Ls lt yel gry wl consol sdy lge anhy incls
W 126	2658.4	12.8	0.689	2.72	59.0	0.0	41.0	Ls lt yel gry wl consol sdy lge anhy incls
W 127	2659.7	14.2	1.32	2.70	59.0	0.0	41.0	Ls lt yel gry wl consol sdy lge anhy incls
W 128	2660.5	11.5	0.243	2.74	58.2	0.0	41.8	Ls lt yel gry wl consol sdy sml anhy incls
W 129	2661.6	11.3	0.115	2.72	58.9	0.0	41.1	Ls lt yel gry wl consol sdy thn sh lams
W 130	2662.5	14.4	1.08	2.70	54.2	0.0	45.8	Ls lt yel gry wl consol sdy thn sh lam
W 131	2663.7	10.6	0.550	2.72	59.7	0.0	40.3	Ls lt yel gry wl consol sdy thn sh lam
W 132	2664.6	13.7	0.714	2.70	54.3	0.0	45.7	Ls lt yel gry wl consol sdy thn sh lam
W 133	2665.6	14.8	0.745	2.71	53.5	0.0	46.5	Ls lt yel gry wl consol sdy sml sh incls
W 134	2666.7	14.4	0.526	2.71	55.3	0.0	44.7	Ls lt yel gry wl consol sdy sml sh incls
W 135	2667.6	13.7	0.609	2.77	56.1	0.0	43.9	Ls lt yel gry wl consol sdy lge anhy incls
W 136	2668.5	15.7	2.25	2.72	61.8	0.0	38.2	Ls lt yel gry wl consol sdy i.p. sml sh incls
W 137	2669.5	17.3	5.05	2.73	60.0	0.0	40.0	Ls lt yel gry wl consol sdy i.p. sml sh incls
W 138	2670.5	15.7	2.19	2.72	63.5	0.0	36.5	Ls lt yel gry wl consol sdy i.p. sml sh incls
W 139	2671.5	15.1	2.17	2.72	59.5	0.0	40.5	Ls lt gry wl consol sdy
W 140	2672.3	13.3	0.493	2.72	56.2	0.0	43.8	Ls lt gry wl consol sdy
W 141	2673.4	12.7	0.274	2.71	50.0	0.0	50.0	Ls lt gry wl consol sdy i.p.

* Sample contains fracture(s), permeability to gas may be anomalously high.
** Broken/non-cylindrical sample, permeability to gas indeterminable.

Table 3

CONVENTIONAL CORE ANALYSIS

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

Log Depth = Core Depth - 15'

Core Number: 3
Depth Interval: 2,646.0 - 2,696.0 ft

Sample	Depth (ft)	Porosity (%BV)	Permeability to Gas (md)	Grain Density (g/cc)	Saturation (%PV) Water	Oil	Gas	Lithological Description
W 142	2674.5	12.3	0.231	2.75	52.5	0.0	47.5	Ls lt gry wl consol sdy i.p.
W 143	2675.4	14.1	0.659	2.70	51.4	0.0	48.6	Ls lt yel gry wl consol sdy
W 144	2676.5	13.0	0.387	2.70	59.6	0.0	40.4	Ls lt yel gry wl consol sdy
W 145	2677.4	13.5	0.564	2.71	53.5	0.0	46.5	Ls lt yel gry wl consol sdy
W 146	2678.3	13.1	0.323	2.72	58.4	0.0	41.6	Ls lt yel gry wl consol sdy
W 147	2679.5	12.8	0.411	2.71	61.2	0.0	38.8	Ls lt yel gry wl consol sdy
W 148	2680.3	13.7	0.639	2.71	57.9	0.0	42.1	Ls lt yel gry wl consol sdy
W 149	2681.3	10.7	0.111	2.71	56.4	0.0	43.6	Ls lt yel gry wl consol sdy
W 150	2682.2	11.0	0.140	2.70	53.1	0.0	46.9	Ls lt yel gry wl consol sdy
W 151	2683.5	11.6	0.164	2.72	56.8	0.0	43.2	Ls lt yel gry wl consol sdy
W 152	2684.4	9.9	0.059	2.71	61.0	0.0	39.0	Ls lt yel gry wl consol sdy
W 153	2685.4	10.3	0.068	2.73	62.2	0.0	37.8	Ls lt yel gry wl consol sdy
W 154	2686.6	12.1	0.028	2.76	69.3	0.0	30.7	Sltst brn-gry wl consol sml anhy incls
W 155	2687.5	10.4	0.015	2.78	69.8	0.0	30.2	Sltst mott wh gry wl consol anhy incls foss incls
W 156	2688.6	10.9	0.006	2.76	67.3	0.0	32.7	Sltst mott wh gry wl consol anhy incls foss incls
W 157	2689.4	10.1	0.012	2.77	65.4	0.0	34.6	Sltst mott wh gry wl consol anhy incls foss incls
W 158	2690.3	11.4	0.044*	2.77	60.8	0.0	39.2	Sltst mott wh gry wl consol anhy incls foss incls
W 159	2691.5	13.5	0.153*	2.73	81.1	0.0	18.9	Sltst mott wh gry wl consol anhy incls foss incls
W 160	2692.6	10.9	0.004	2.72	62.1	0.0	37.9	Sltst brn gry wl consol abd sh lams anhy incls
W 161	2693.5	9.9	0.011	2.72	53.8	0.0	46.2	Sltst brn gry wl consol abd sh lams anhy incls
W 162	2694.7	10.9	0.059*	2.68	60.7	0.0	39.3	Sltst lt gry vfgr i.p. wl consol shly i.p.
W 163	2695.8	8.4	0.005*	2.70	53.5	0.0	46.5	Sltst lt gry vfgr i.p. wl consol shly i.p.

* Sample contains fracture(s), permeability to gas may be anomalously high.
** Broken/non-cylindrical sample, permeability to gas indeterminable.

Figure 5

PERMEABILITY - POROSITY RELATIONSHIP

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

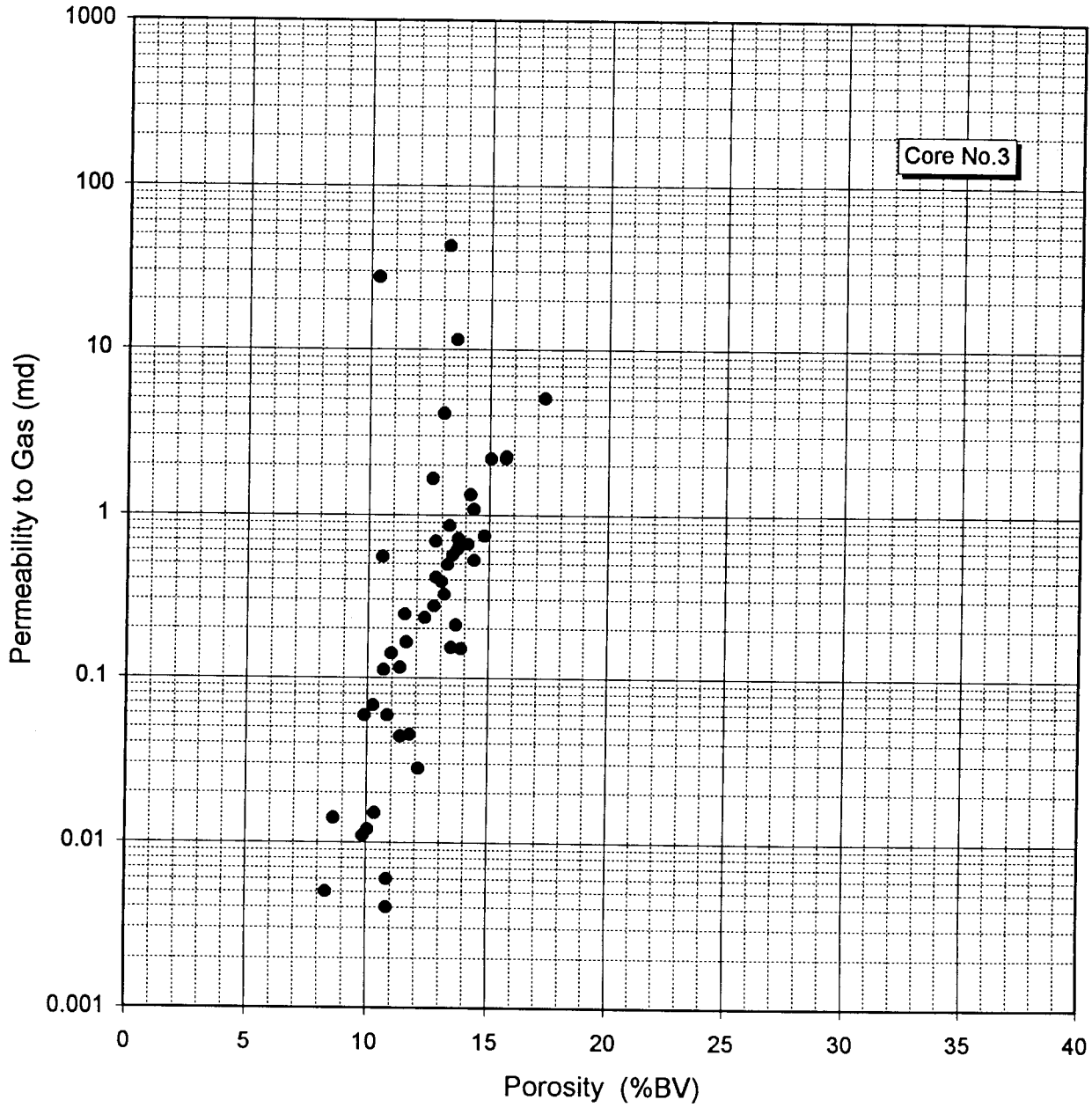


Figure 6

GRAIN DENSITY - POROSITY RELATIONSHIP

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

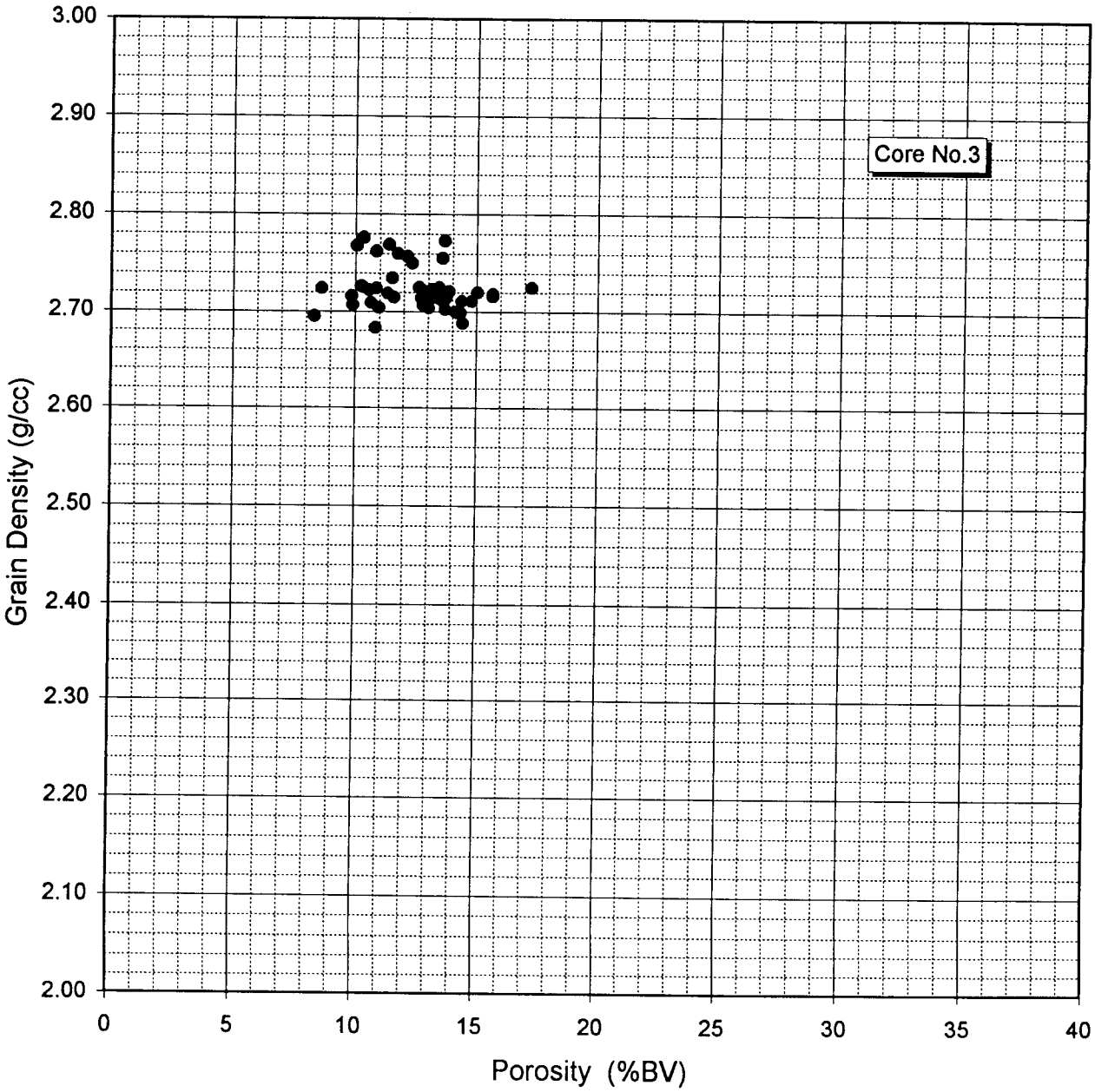


Figure 7

PERMEABILITY - POROSITY RELATIONSHIP

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

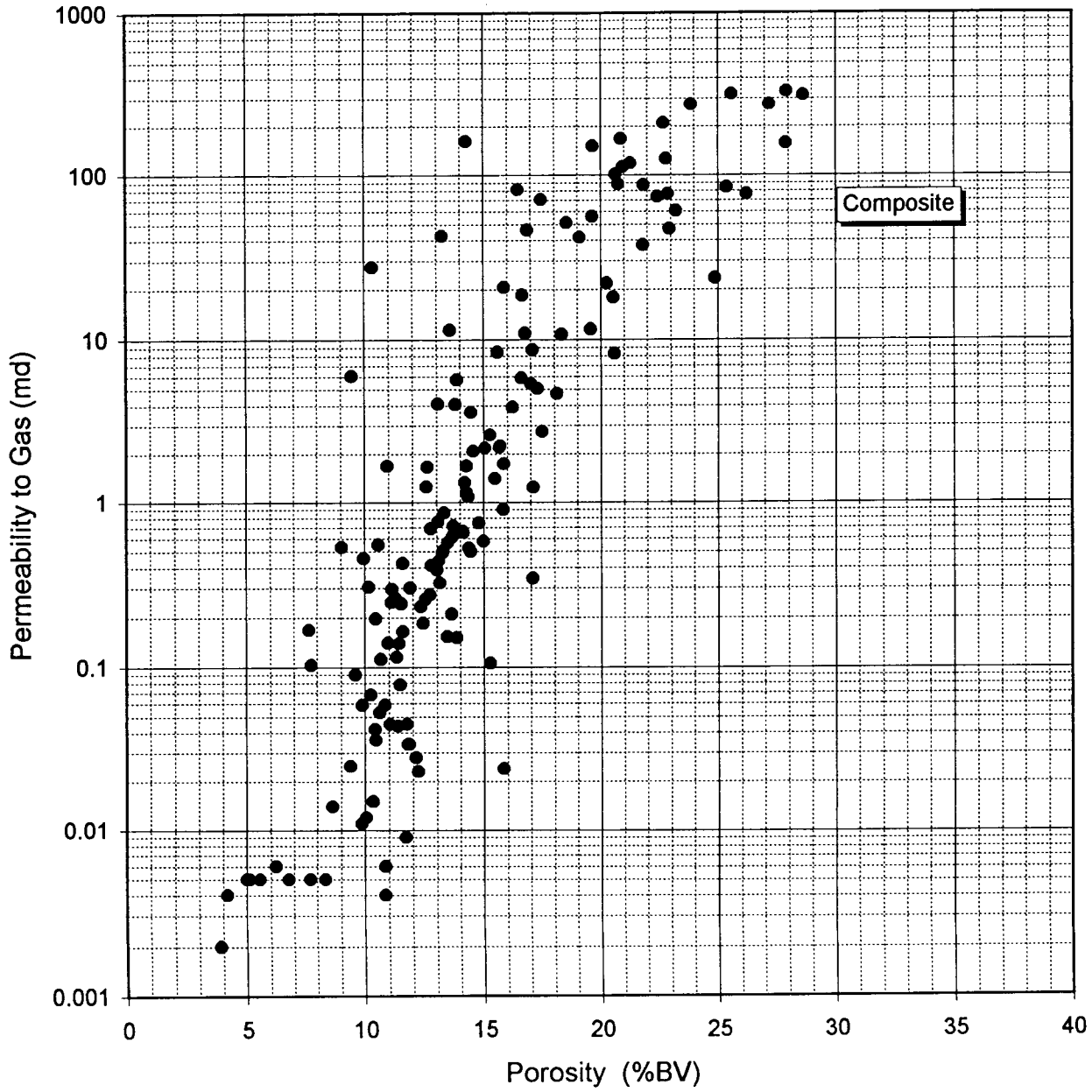


Figure 8

GRAIN DENSITY - POROSITY RELATIONSHIP

Anadarko Petroleum Corporation
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

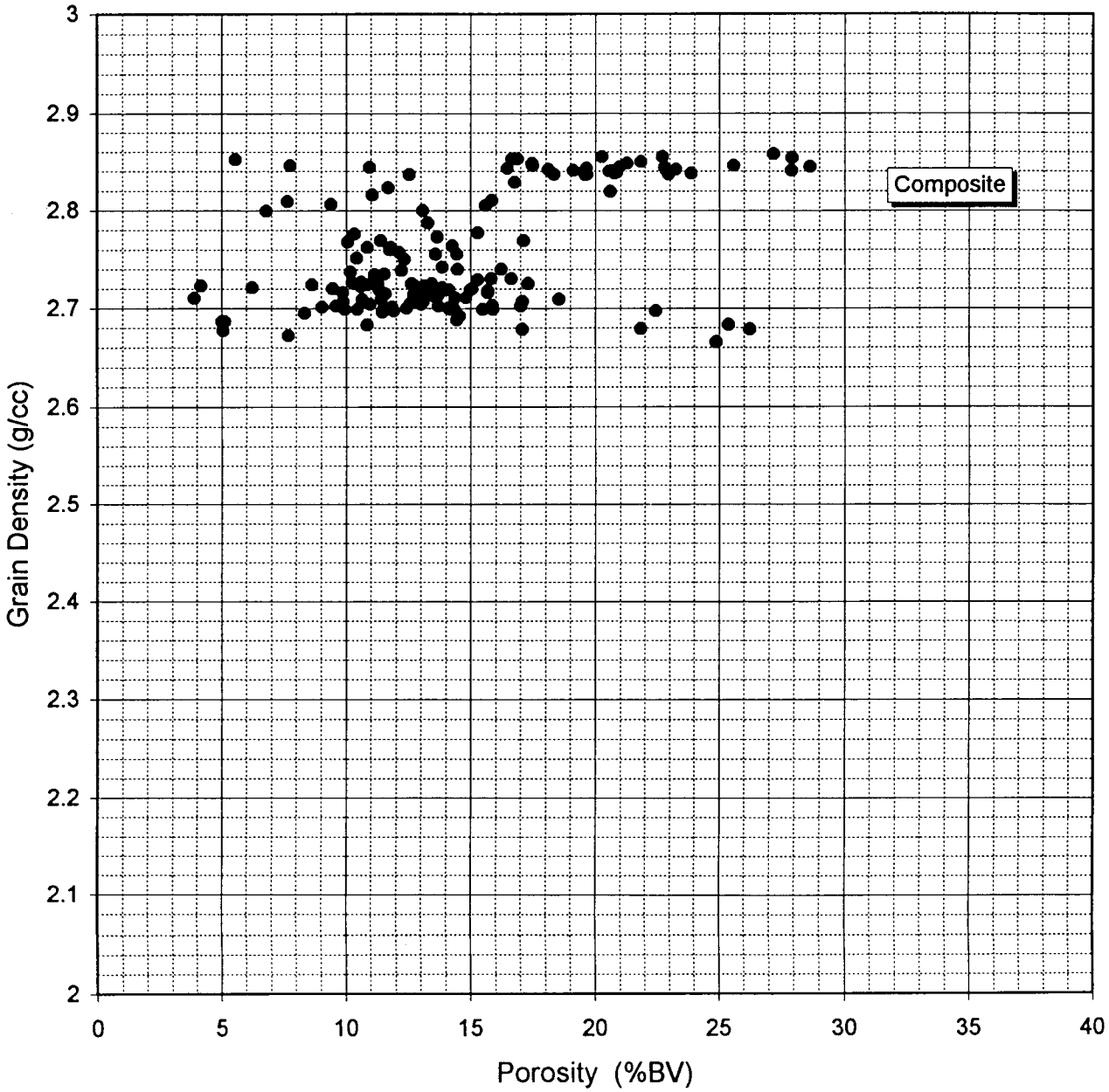


Table 4

PERMEABILITY, POROSITY & GRAIN DENSITY QUALITY ASSURANCE CHECK PLUGS

Sample Number	Permeability (md) Res. Inc. *	Permeability (md) Measured	Deviation %	Porosity (%BV) Res.Inc. *	Porosity (%BV) Measured	Deviation Porosity %	Grain Density (g/cc) Res. Inc.*	Grain Density (g/cc) Measured	Deviation g/cc
B-179	33.6	33.6	+0.0	7.4	7.2	-0.2	2.63	2.63	-0.00
737-A	4.13	4.12	-0.2	22.9	22.7	-0.2	2.64	2.63	-0.01
B-179	33.6	33.9	+0.9	7.4	7.2	-0.2	2.63	2.63	-0.00
737-A	4.13	4.20	+1.7	22.9	23.1	+0.2	2.64	2.64	-0.00
B-179	33.6	33.5	-0.3	7.4	7.5	+0.1	2.63	2.64	+0.01
737-A	4.13	4.08	-1.2	22.9	22.9	-0.0	2.64	2.64	-0.00
B-179	33.6	33.9	+0.9	7.4	7.5	+0.1	2.63	2.64	+0.01
737-A	4.13	4.16	+0.7	22.9	22.7	-0.2	2.64	2.63	-0.01

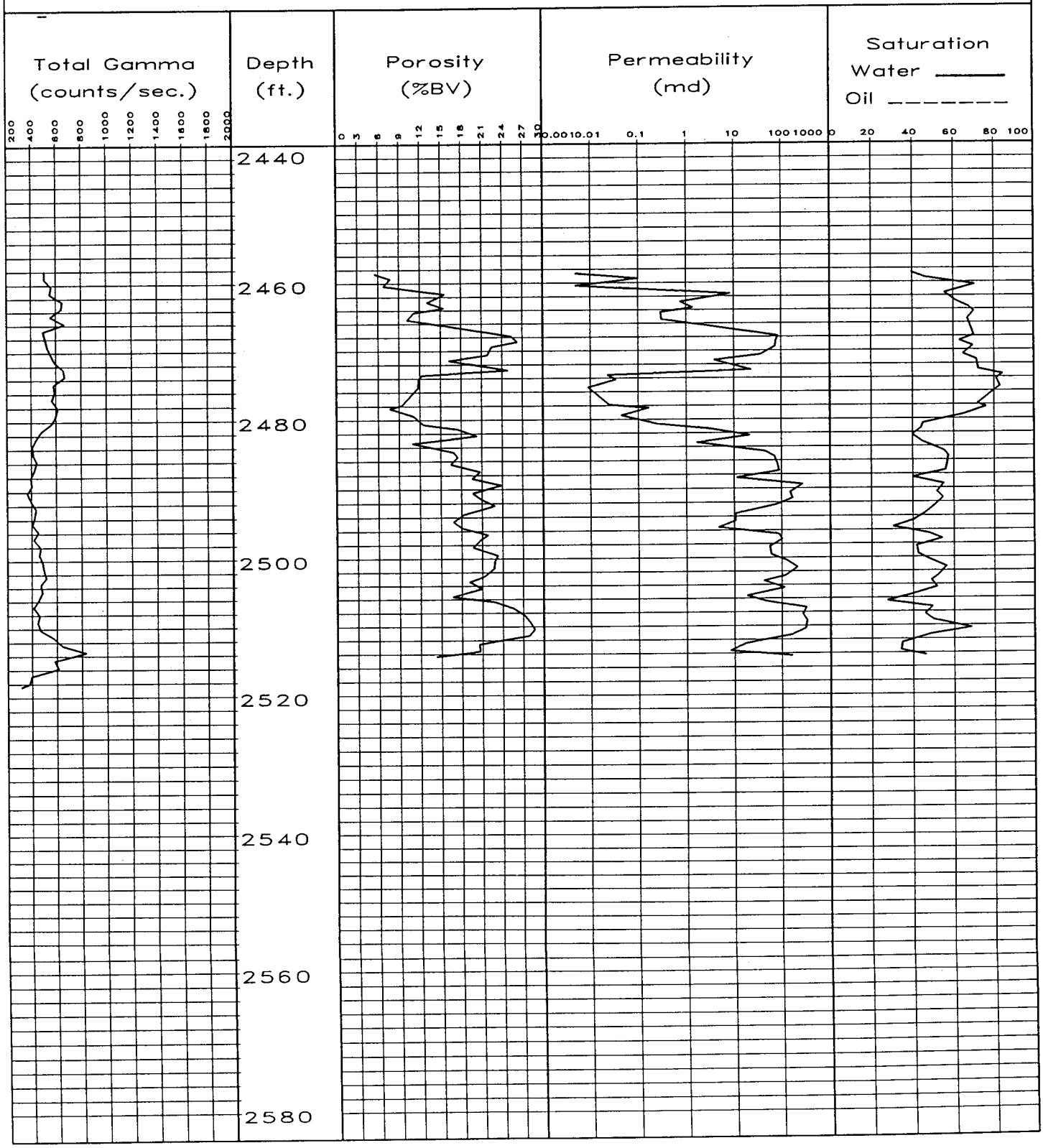
* Denotes historical value, the average of numerous runs.

Total Gamma Log

Anadarko Petroleum Corp.
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

Core No. 1

Scale 1:240

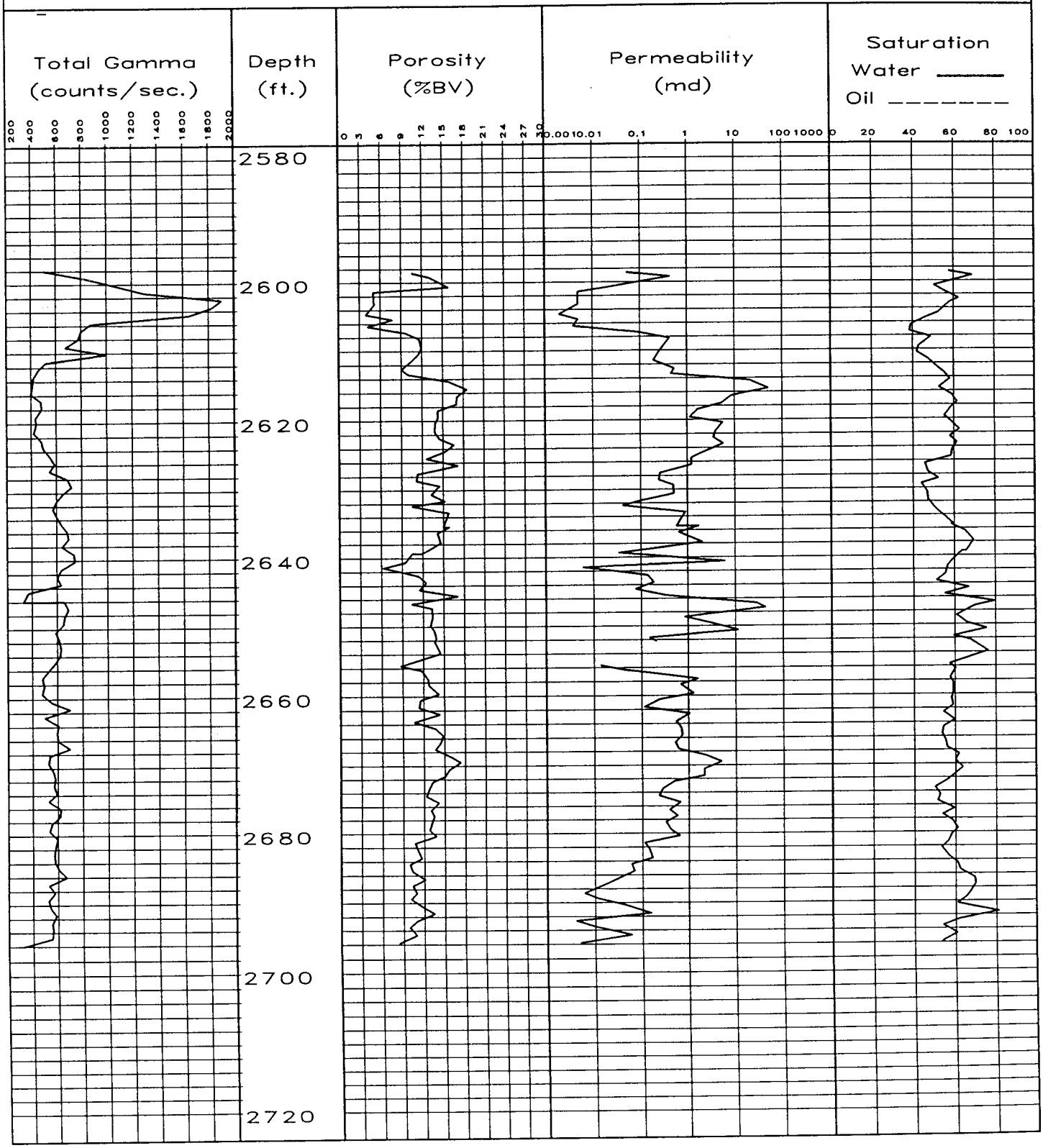


Total Gamma Log

Anadarko Petroleum Corp.
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

Cores No. 2 and 3

Scale 1:240

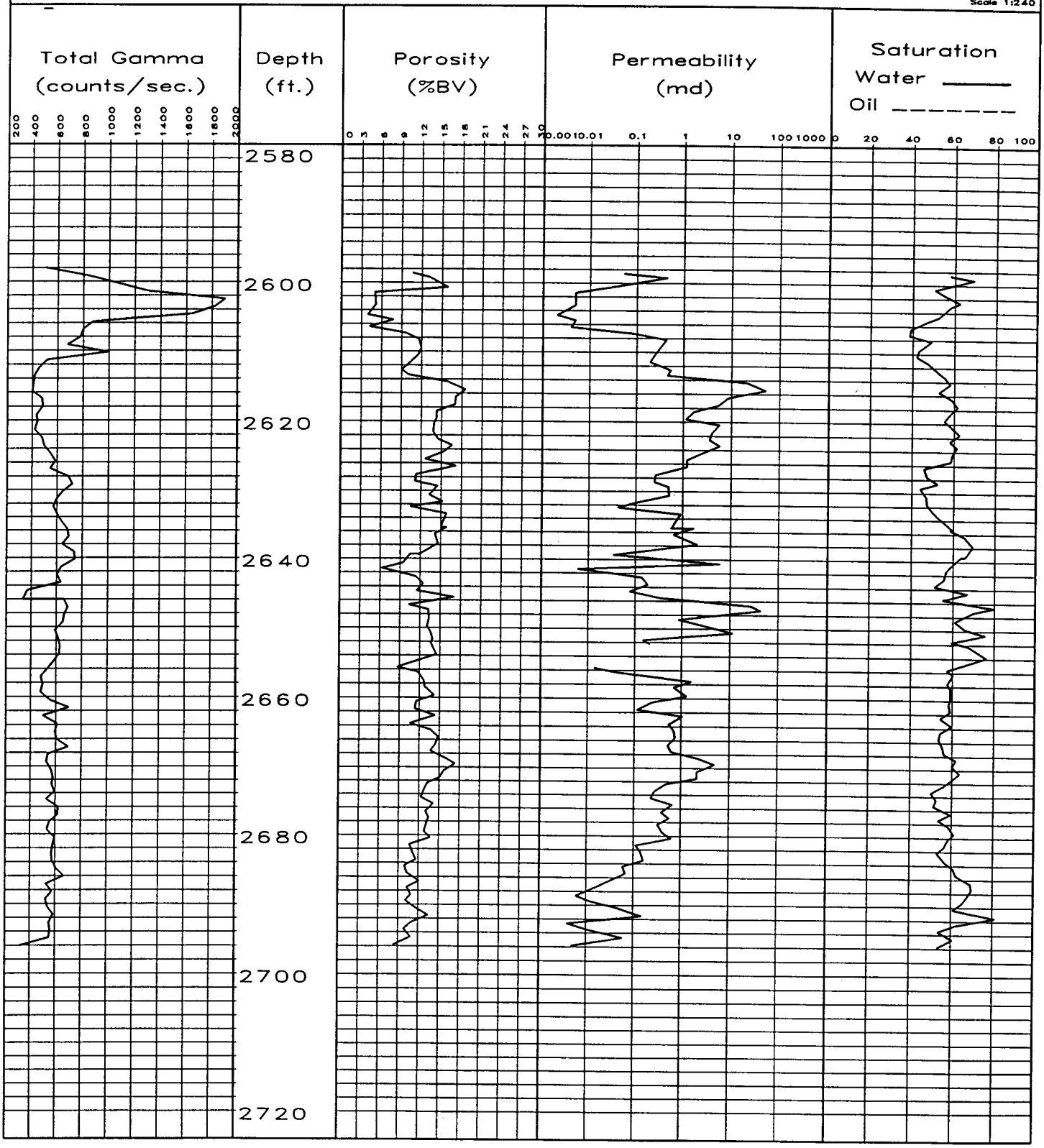


Total Gamma Log

Anadarko Petroleum Corp.
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

Cores No. 2 and 3

Scale 1:240



Total Gamma Log

Anadarko Petroleum Corp.
Youngren H-2H Well
Stevens County, Kansas
SRS 2459/RSH 3835

Cores No. 2 and 3

Scale 1:240