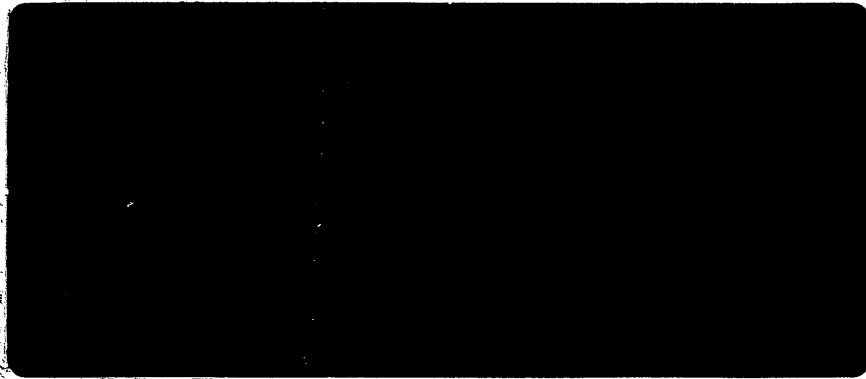


W736

DEPT. NAT. RES & ENV



PE906815



WCR

NORTH PAARATTE-2

**BEACH PETROLEUM**

W736

BEACH PETROLEUM N.L.

NORTH PAARATTE NO.2

WELL COMPLETION REPORT

2 8 APR 1981

**OIL and GAS DIVISION**

Prepared by D.M. Harrison and S.S. Derrington

February, 1981

Distribution: Beach 2  
Department of Minerals and Energy 1

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CORE DESCRIPTIONS AND ANALYSIS

Note: The depths on the core description sheets are drillers depths. These have been shown to be 2 metres shallow when compared with the wireline logs. The mistie is assumed to have arisen due to the neglect of part of the BHA in the drill string tally whilst drilling. The solution to the mistie is best achieved by matching the coal bed within the Flaxmans Formation in the core with the log character of coal on the Sonic Log.

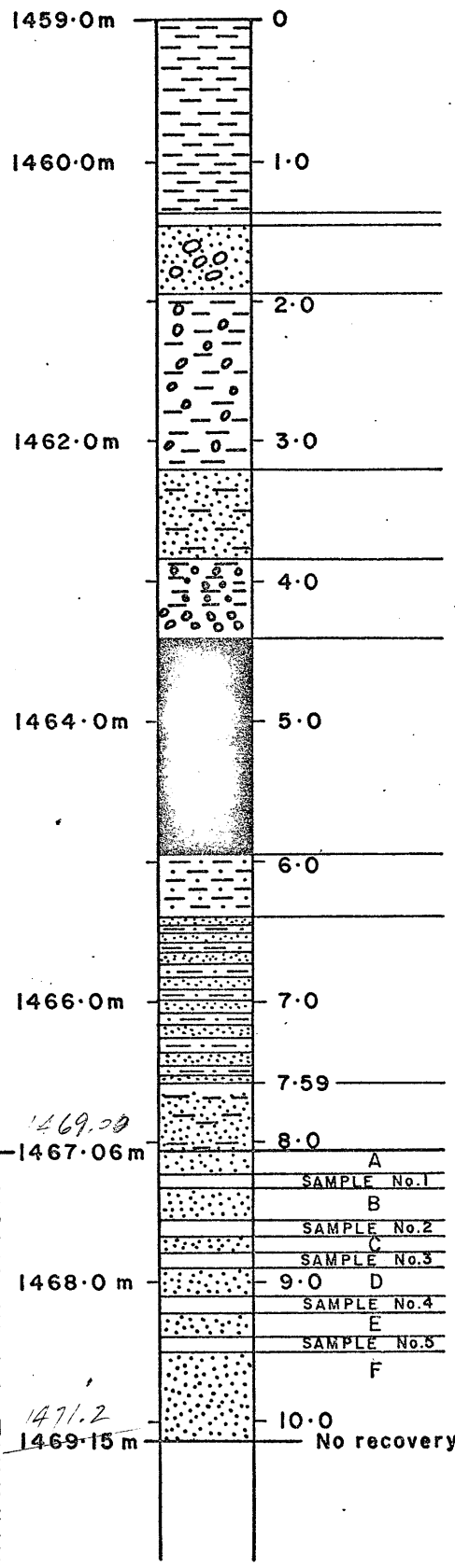
BEACH PETROLEUM N.L.  
NORTH PAARATTE No.2

CORE No.1 1459.0m - 1469.15m

CUT INTERVAL : 10.15m % age RECOVERY : 99.8 %  
RECOVERY : 10.13m LOGGING GEOLOGIST : D.M.HARRISON

FLAXMANS FORMATION

WAARRE FORMATION



CLAYSTONE, MEDIUM TO DARK GREY, HARD, INDURATED, MASSIVE BEDDING. MINOR LARGE SHELL FRAGMENTS ( LAMELLIBRANCHS ) AND MINOR SIDERITE NODULES. MINOR SLICKENSIDES .

CLAYSTONE, DARK GREY AND GREEN WITH MINOR FINE GRAINED SAND AGGREGATES.  
SANDSTONE, LIGHT GREY-GREEN, LIGHT BROWN, HARD FINE GRAINED, CALCAREOUS, STRUCTURAL ASPECT OF A CONGLOMERATE, NODULAR WITH CLAYSTONE AS ABOVE INTERMIXED.

SANDY CLAYSTONE, DARK GREY & MINOR WHITE, HARD. 50% GRAINS AND 50% CLAY MATRIX. QUARTZ IS MEDIUM GRAINED TO VERY COARSE TO MINOR GRANULE, DOMINANTLY VERY COARSE GRAINED AND ANGULAR. TRACE PYRITE AND FOSSIL WOOD. MASSIVE BEDDING.

SANDSTONE, LIGHT GREY-LIGHT GREEN, HARD, FINE GRAINED TO VERY FINE GRAINED, MODERATELY SORTED, QUARTZOSE WITH INTERLAMINATED SILTSTONE, DARK GREY-GREEN.

SANDY CLAYSTONE, AS ABOVE AT TOP GRADING INTO PEBBLE CONGLOMERATE, DARK GREY WHITE, HARD, 80% PEBBLE SIZE, ANGULAR QUARTZ WITH 20% DARK GREY CLAY MATRIX.

COAL, BLACK, DULL, LOW GRADE, PYRITIC, MINOR RESIN AND AMBER. COMMON SLICKENSIDES. BECOMING ARGILLACEOUS TOWARDS BASE.

SILTY CLAYSTONE, DARK GREY, HARD, CARBONACEOUS WITH COMMON ASSOCIATED PYRITE.

SANDSTONE/SILTSTONE, THINLY INTERLAMINATED.  
SANDSTONE, WHITE TO LIGHT GREY, HARD, FINE TO VERY FINE GRAINED, MODERATELY SORTED, QUARTZOSE, TRACE PYRITE.

SILTSTONE, MEDIUM TO DARK GREY, HARD.

SANDSTONE/SILTSTONE, THINLY INTERLAMINATED.  
SANDSTONE, LIGHT GREY-WHITE, SOFT-FIRM, FINE GRAINED TO MEDIUM GRAINED, DOMINANTLY M.G., WELL SORTED, QTZOSE, GOOD VIS Ø, PETROLIFEROUS ODOUR  
SILTSTONE, BLACK TO D.GREY, FIRM, CARBONACEOUS.

A/SANDSTONE, LT GY-WH, SOFT F.G.-C.G, DOM M.G, SUB-ROUNDED TO SUB-ANGULAR, MODERATELY SORTED, QTZOSE, TR DISSEMINATED CARBONACEOUS MATERIAL WITH MINOR CARBONACEOUS LAMINAE. EXCELLENT VISIBLE Ø, STRONG PETROLIFEROUS ODOUR.

B/SANDSTONE, LT GY, SOFT, WEAKLY CEMENTED TO LOOSELY CONSOLIDATED, M.G. TO V.C.G., DOM C.G., SUB-ROUNDED TO SUB-ANGULAR, MODERATE TO WELL SORTED, QTZOSE, MINOR CARBONACEOUS STREAKS AND INTERLAMINAE EXCELLENT VISIBLE Ø, STRONG PETROLIFEROUS ODOUR.

C/SANDSTONE, LT GY-WH, FINE GRAINED TO COARSE GRAINED, DOMINANTLY MEDIUM GRAINED, WEAKLY CEMENTED TO LOOSELY CONSOLIDATED, QUARTZOSE, SUBROUNDED, WELL SORTED, TRACE DISSEMINATED CARBONACEOUS MATTER AND MINOR STREAKS CARBONACEOUS MATTER. EXCELLENT VISIBLE Ø, STRONG PETROLIFEROUS ODOUR.

D/SANDSTONE, LT GY-WH, FIRM, F.G.-M.G, DOMINANTLY M.G., WELL SORTED, SUB-ROUNDED, QUARTZOSE, TRACE CARBONACEOUS MATTER AND MINOR CARBONACEOUS STREAKS. EXCELLENT VISIBLE POROSITY, STRONG PETROLIFEROUS ODOUR

E/ 'AS FOR D'

F/ 'AS FOR D'

NOTE :- WAARRE SAND SECTION HAS EXCELLENT VISIBLE POROSITY WITH STRONG PETROLIFEROUS ODOUR

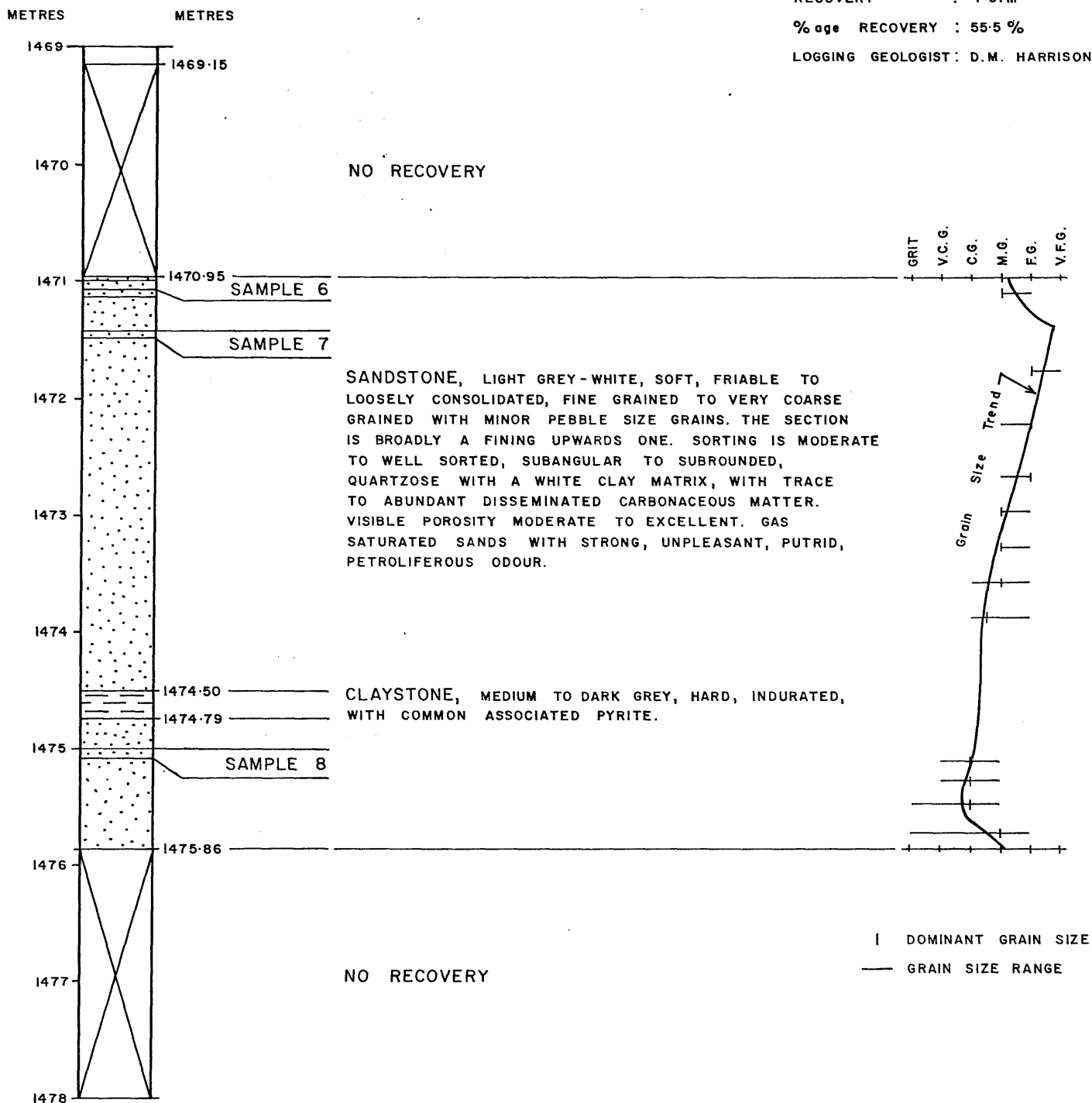
NOTE :- THE MAJOR PORTION OF SAND 'F' WAS LOOSELY CONSOLIDATED TO UNCONSOLIDATED.

BEACH PETROLEUM N.L.  
NORTH PAARATTE No.2

CORE N° 2 1469.15m — 1478.00m

CUT INTERVAL : 8.85m  
RECOVERY : 4.91m  
% age RECOVERY : 55.5 %

LOGGING GEOLOGIST: D.M. HARRISON



NOTE : THE SECTION WAS BASICALLY LOOSELY CONSOLIDATED AND FELL OUT OF THE CORE BARREL MINOR SECTIONS REMAINED INTACT AND CONSOLIDATED AT SURFACE. THESE WERE 1470.95 - 1471.13 m, 1471.4 - 1471.47, 1474.99 - 1475.16m.  
THE CLAYSTONE BED AT 1474.50 TO 1474.74m WAS FIXED BY THE DRILLING RATE CURVE AND THE LOOSELY CONSOLIDATED SAND DISTRIBUTED EITHER SIDE OF THE CLAYSTONE. IT IS THEREFORE INFERRED THAT SECTION WAS LOST BOTH AT THE TOP AND THE BOTTOM OF THE CORE.  
THE UPPERMOST PART OF THE SECTION FLOWED AND BLEW OUT OF THE CORE BARREL DUE TO THE GAS SATURATED NATURE OF THE SECTION.

CORE ANALYSIS RESULTS *E 1 & 2 COMBINED*

Company BEACH PETROLEUM N.L. Formation \_\_\_\_\_ File WA-CA-127  
 Well NORTH PAARATTE NO 2 Core Type CONV. Date Report 5 MARCH 81  
 Field \_\_\_\_\_ Drilling Fluid \_\_\_\_\_ Analysts GK DS  
 County AUST State VIC. Elev. \_\_\_\_\_ Location OTWAY BASIN.

Lithological Abbreviations

SAND - SD      DOLOMITE - DOL      ANHYDRITE - ANHY      SANDY - SDY      FINE - FN      CRYSTALLINE - XLN      BROWN - BRN      FRACTURED - FRAC      SLIGHTLY - SL/  
 SHALE - SH      CHERT - CH      CONGLOMERATE - CONG      SHALY - SHY      MEDIUM - MED      GRAIN - GRN      GRAY - GY      LAMINATION - LAM      VERY - V/  
 LIME - LM      GYPSUM - GYP      FOSSILIFEROUS - FOSS      LIMY - LMY      COARSE - CSE      GRANULAR - GRNL      VUGGY - VGY      STYLOLITIC - STY      WITH - W/

SAMPLE NUMBER	DEPTH FEET M	PERMEABILITY MILLIDARCS KL	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		GRAIN DENS.	SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER		
							HORIZ. VERT.
1	<i>1469.1</i> ?	449	65	26.5		2.67	SST: lt-med gy, med-v crse, firm poor sort wht cly mtx, sub ang, minor argill carb lams
	<i>E 1</i> ?	1026	600	24.9		2.68	SST: A/A, med crse, mod sort, occ v. crse qtz grains.
	?	274	15	25.2		2.67	SST: lt gy, fn-v crse, firm, v poor sort, wht cly mtx, sub ang, minor argill carb lams
4	?	44	5.5	21.2		2.65	SST: A/A, fn med, hd, mod sort.
5	<i>1471.2</i> ?	539	35	25.6		2.65	SST: A/A med crse.
	<del>1469.2</del>	34	8.3	20.3		2.64	SST: A/A, abunt argill carb laminations.
	<i>E 2</i> <i>1471.0</i> <del>1469.03</del> ?	988	276	29.0		2.69	SST: A/A, med crse, firm, well sort.
	<i>1475.2</i> <del>1473.19</del>	847	481	25.6		2.76	SST: med gy, crse-v crse, fria, mod sort, argill mtx, sub ang sub rnd, abunt pyrite.
	<i>1476.1</i>						
							<i>270/3 = 525</i> <i>1536/3 = 512</i> <i>17.1/3 = 5.7</i>

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations, as to the productivity, proper operations, or profitability of any oil, gas or other material well or sand in connection with which such report is used or relied upon.



Received  
Jm  
2/4/81.

\*  
BEAPET AA36500  
TO MR D HARRISON - BEACH PETROLEUM  
CC D SISELY - CORELAB PERTH

FM T KENNAIRD - CORELAB SPORE

TLX 4433  
2 APR 81

YR REF: TLX NO. 2/4  
OUR REF: SNSCAL 81010

RE: N. PAARATTE NO. 2  
-----

FLWG POROPERM MEASUREMENTS, PLUGS WERE SATURATED N FF MEASURED ON SEVERAL CONSECUTIVE DAYS UNTIL RESULTS STABLE (INDICATING IONIC EQUILIBRIUM). SAMPLES ARE NOW IN CAP. PRESS. CELLS WHERE THEY MUST COME INTO CAPILLARY EQUILIBRIUM AT EACH OF SIX PRESSURE POINTS. THIS WILL TAKE APPROX 4 WKS. (R1 WILL BE MEASURED IN CONJUNCTION WITH CAP. PRESS. TESTS).  
HERE IS FF DATA:

SAMPLE NO.	POROSITY PERCENT	FF	M
2H	23.2	11.5	1.67
5H	25.1	9.9	1.66

INTERCEPT 'A' ASSUMED TO BE UNITY.

RGDS  
NNN  
CORELAB RS21423\*  
BEAPET AA36500  
VVVV

BEAPETDAMBBBDBON - BEACH PETROLEUM, MELBOURNE  
 FM T KEN

Received  
 9am  
 22/4/81.

BEAPET AA36500  
 TO MR D HARRISON - BEACH PETROLEUM, MELBOURNE  
 FM T KENNAIRD - CORELAB SPORE

TLX 4673  
 20 APR 81

RE: NORTH PAARATTE NO. 2  
 OUR REF: SNSCAL 81010

HERE ARE PRELIMINARY AIR-BRINE CAP. PRESS. N RESISTIVITY INDEX RESULTS:

SAMPLE NO.	KA(MD)	PRESSURE, PSI					
		1	2	4	8	15	35
		BRINE SATURATION PERCENT PORE SPACE					
2H	1170	69.3	51.2	39.5	32.9	30.9	29.7
5H	587	93.8	67.3	56.1	48.3	44.6	43.4

SAMPLE NO.	POROSITY PERCENT	FF	BRINE SATN. PERCENT PORE SPACE	RESISTIVITY	AVERAGE
				INDEX	'N'
2H	23.2	11.5	100.0	1.00	1.83
			69.3	1.97	
			51.2	3.40	
			39.5	5.42	
			30.9	8.50	
5H	25.1	9.9	100.0	1.00	1.73
			67.3	1.98	
			56.1	2.75	
			48.3	3.55	
			44.6	3.94	

RGDS  
 NNN  
 CORELAB RS21423\*  
 BEAPET AA36500  
 VVVV

SPECIAL CORE ANALYSIS REPORT  
FOR  
BEACH PETROLEUM N.L.

WELL: NORTH PAARATTE NO.2

OIL and GAS DIVISION

27 JUL 1981

Special Core Analysis



**CORE LABORATORIES**

Special Core Analysis



Beach Petroleum N.L.  
32nd Floor, 360 Collins Street  
Melbourne  
Victoria 3000  
Australia

Attention: Mr. D Harrison

April 1981

Subject: Special Core Analysis  
Well : North Paaratte No.2  
File : SNSCAL 81010

Gentlemen,

In Order No. 272, dated February 25, 1981, Mr. Ian McPhee of Beach Petroleum N.L. requested Core Laboratories to perform various special core analysis measurements on two samples from the subject well.

Two one-inch diameter plug-size samples were despatched from our Perth laboratory to our Singapore laboratory in preparation for this study. These samples are described with respect to lithology on page 1 of this report.

Air-Brine Capillary Pressure (Pages 2 through 4)

Both samples had been cleaned prior to analysis in Perth. Their cleanliness was verified by checking with ultra-violet light (to detect oil) and methanol (to detect salt). The samples were then dried in an oven maintained at 40-45% relative humidity.

The clean dry samples were evacuated and pressure saturated with a simulated formation brine having a concentration of approximately 24,000 mg/l. This brine was synthesised from an  $R_w$  value given by Beach Petroleum, and its salt content comprised 80% sodium chloride and 20% calcium chloride since a full brine analysis was not available.

After measurements of formation factor had been made, the samples were placed in a porous plate cell and humidified air introduced at increasing incremental pressures up to 35 psi. At equilibrium saturations the samples were removed from the cell and the brine saturations determined gravimetrically.

Cont'd....

Beach Petroleum N.L.  
Well: North Paaratte No.2  
April 1981

Page Two

The results of the measurements are presented in tabular form on page 2 and in graphical form on pages 3 and 4.

Considering the air permeabilities of these two samples, the irreducible water saturations appear rather high. It may be possible that the coarse grained lamination in sample number 2H, and the carbonaceous laminations in sample number 5H tend to channel air flow at conditions of low overburden pressure. At conditions of reservoir overburden pressure it might be found that both samples would exhibit lower air permeabilities.

Formation Factor and Resistivity Index (Pages 5 through 9)

Prior to performing capillary pressure measurements electrical resistivities of the brine saturated samples and the saturant brine were measured on consecutive days until the results stabilised indicating ionic equilibrium within the core samples.

Formation resistivity factors were calculated and the results are presented in tabular form on page 5 and graphical form on page 6. The resultant plot yields a value of unity for the intercept "a" and an average value of 1.67 for the cementation exponent "m".

Electrical resistivities of the partially saturated plugs were measured in conjunction with the capillary pressure measurements. Resistivity index values were calculated and the results are presented in tabular form on page 5 and in graphical form on pages 7 through 9. The resultant plots yield values for the saturation exponent "n" of 1.83 for sample number 2H and 1.73 for sample number 5H. The composite plot gives a value of 1.78 for "n".

It has been a pleasure to perform this study for Beach Petroleum and should you have any questions or require further assistance, please do not hesitate to contact us.

Yours faithfully  
CORE LABORATORIES INTERNATIONAL LTD

*Tony Kennaird*

TONY KENNAIRD  
Laboratory Manager  
Special Core Analysis

Enc

TK/sb

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COMPANY: BEACH PETROLEUM N.L.

FORMATION:

WELL: NORTH PAARATTE NO.2

COUNTRY: AUSTRALIA

FIELD:

IDENTIFICATION AND DESCRIPTION OF SAMPLES

<u>Sample Number</u>	<u>Depth, Feet</u>	<u>Lithological Description</u>
2H	N/A	SST:gy, f-mg, occ cg, cg lam, mod-p cmtd, mod-p std, subang-sub rdd.
5H	N/A	SST:gy, fg, mod cmtd, w std, subang-sub rdd, abd carb lams.

AIR-BRINE CAPILLARY PRESSURE DATA

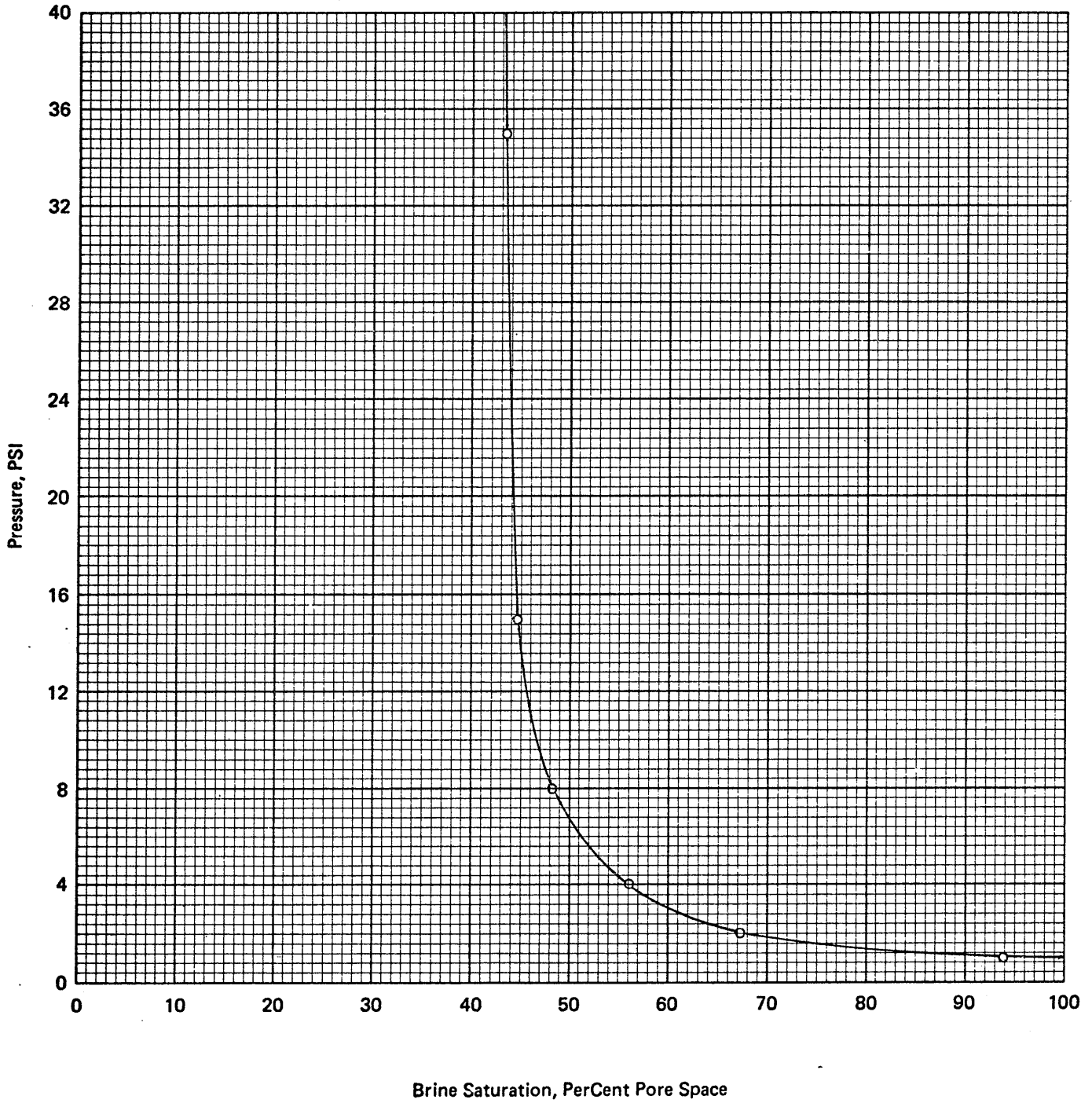
<u>Sample Number</u>	<u>Permeability Millidarcys</u>	<u>Porosity Per Cent</u>	<u>Pressure, Psi:</u>					
			<u>1</u>	<u>2</u>	<u>4</u>	<u>8</u>	<u>15</u>	<u>35</u>
			<u>Brine Saturation, Per Cent Pore Space</u>					
2H	1170	23.2	69.3	51.2	39.5	32.9	30.9	29.7
5H	587	25.1	93.8	67.3	56.1	48.3	44.6	43.4





Company BEACH PETROLEUM N.L. Formation \_\_\_\_\_  
Well NORTH PAARATTE NO.2 Country AUSTRALIA  
Field \_\_\_\_\_

SAMPLE NUMBER: 5H  
AIR PERMEABILITY, MD: 587

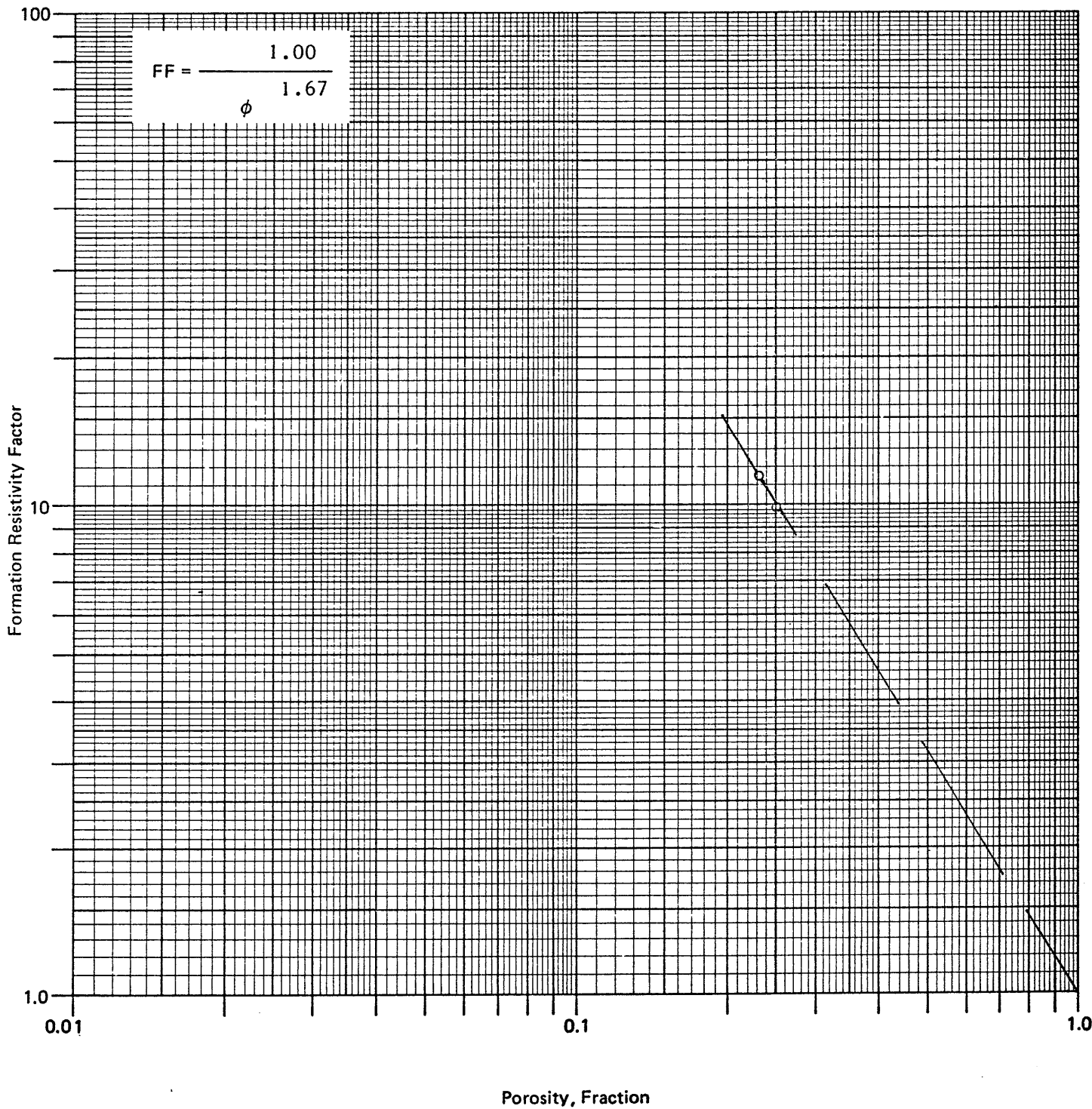


FORMATION FACTOR AND RESISTIVITY INDEX DATA

Resistivity of Saturant Brine, Ohm-Metres: 0.334 @ 60°F

<u>Sample Number</u>	<u>Air Permeability Millidarcys</u>	<u>Porosity Per Cent</u>	<u>Formation Factor</u>	<u>Brine Saturation Per Cent Pore Space</u>	<u>Resistivity Index</u>
2H	1170	23.2	11.5	100	1.00
				69.3	1.97
				51.2	3.40
				39.5	5.42
				30.9	8.50
5H	587	25.1	9.9	100	1.00
				67.3	1.98
				56.1	2.75
				48.3	3.55
				44.6	3.94

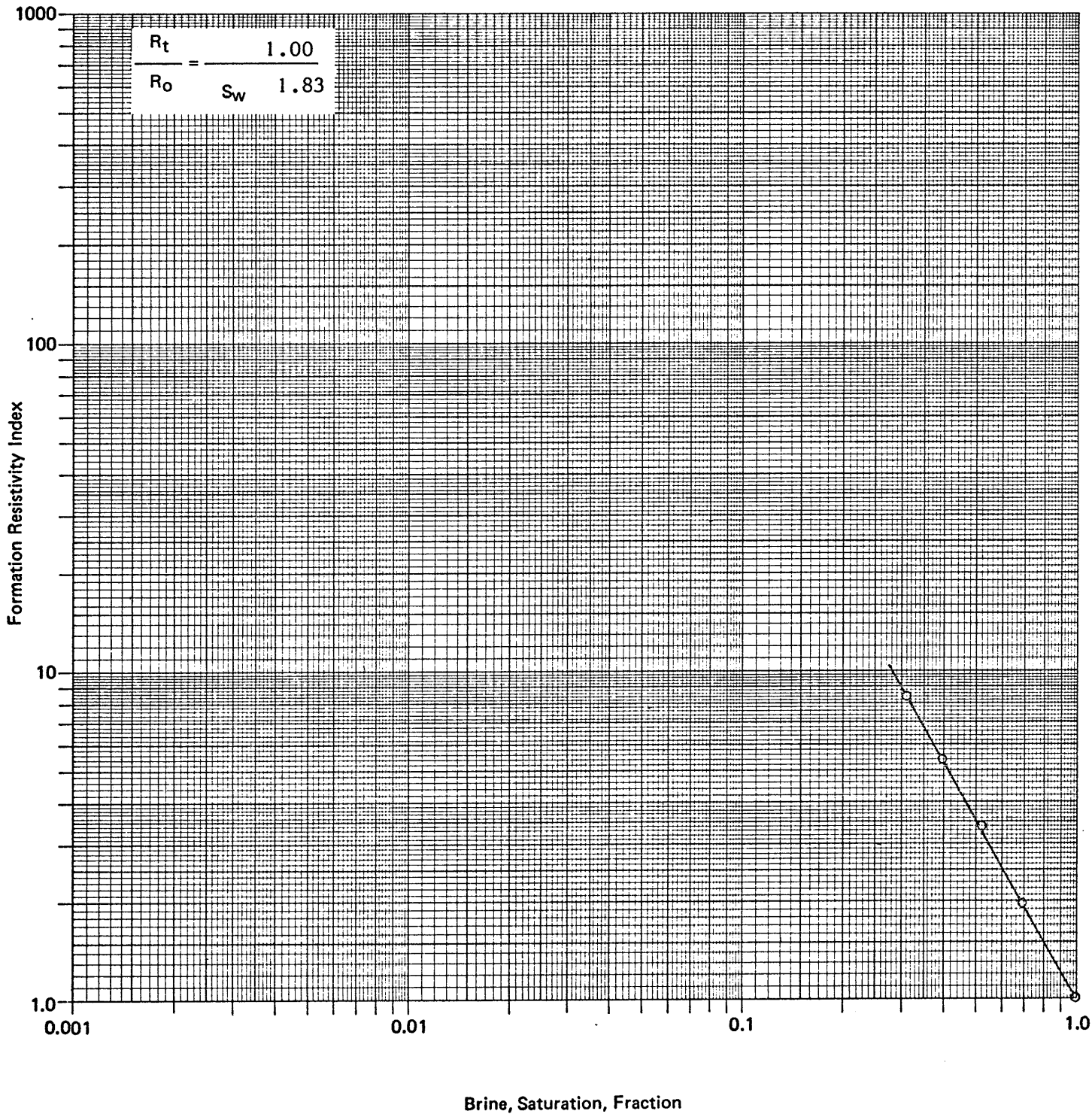
Company BEACH PETROLEUM N.L. Formation \_\_\_\_\_  
Well NORTH PAARATTE NO.2 Country AUSTRALIA  
Field \_\_\_\_\_



Formation Resistivity Factor

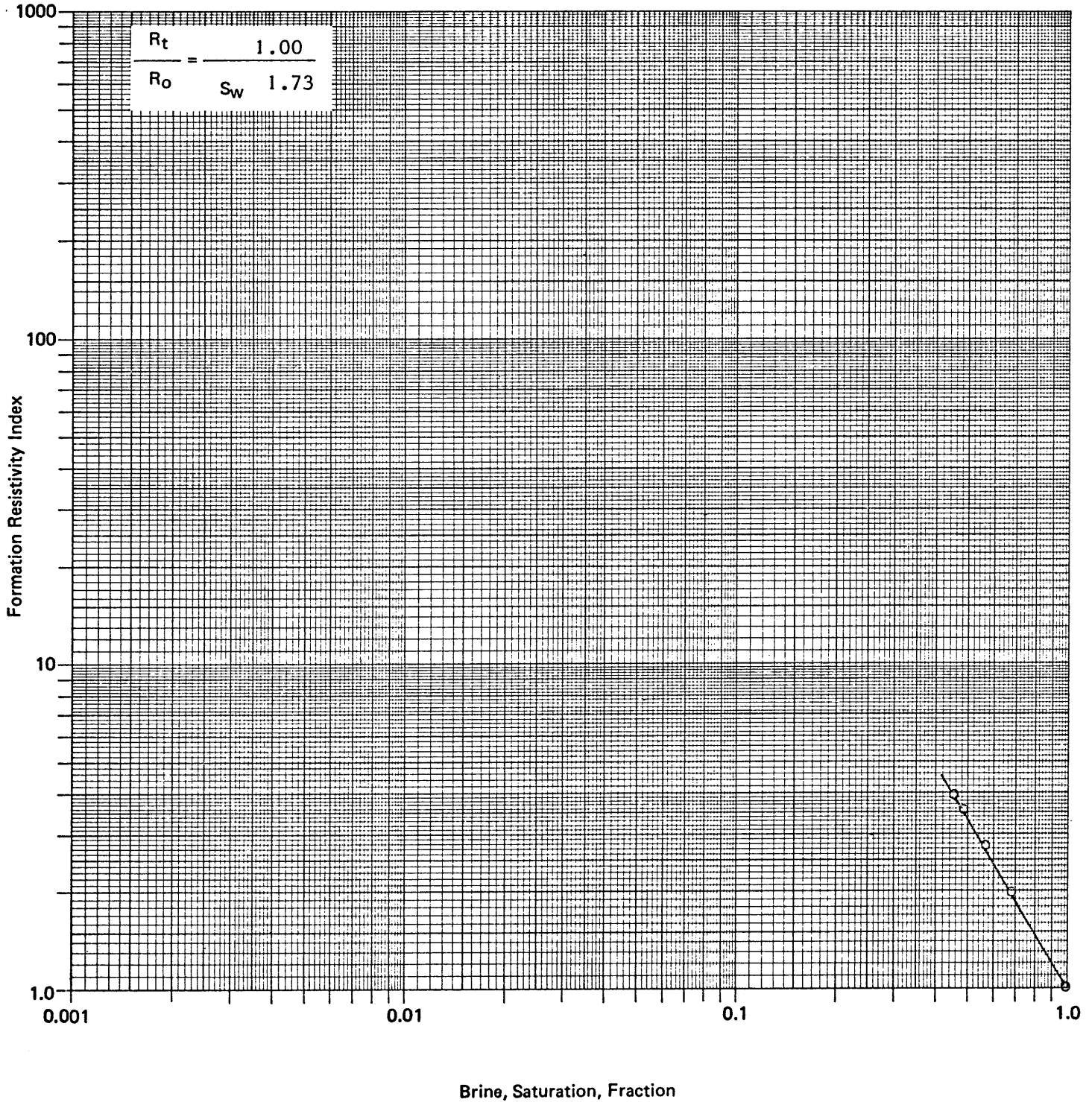
Company BEACH PETROLEUM N.L. Formation \_\_\_\_\_  
Well NORTH PAARATTE NO.2 Country AUSTRALIA  
Field \_\_\_\_\_

SAMPLE NUMBER: 2H



Company BEACH PETROLEUM N.L. Formation \_\_\_\_\_  
Well NORTH PAARATTE NO.2 Country AUSTRALIA  
Field \_\_\_\_\_

SAMPLE NUMBER: 5H



Company BEACH PETROLEUM N.L. Formation \_\_\_\_\_  
Well NORTH PAARATTE NO.2 Country AUSTRALIA  
Field \_\_\_\_\_

