ATTACHMENT 3

VIC-P17

W788

GIPPSLAND BASIN

OMEO NO.1

LOG ANALYSES - FORMATION EVALUATION

BY

J. BOWLER

AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.

OMEO NO. 1

WELLSITE FORMATION EVALUATION

BOWLER LOG CONSULTING SERVICES PTY. LTD.

JACK BOWLER
Telephone: (051) 56 6170

P.O. BOX 2,
PAYNESVILLE. 3880
VICTORIA,
AUSTRALIA

8th December, 1982

Mr. F. Brophy,
Australian Aquitaine Petroleum Pty. Ltd.,
Elf Aquitaine Centre,
14th Floor,
99 Mount Street,
SYDNEY. N.S.W. 2060.

Dear Frank,

Please find my evaluation of the logs run on Omeo No. 1 on 3rd December, 1982.

The shaly sands from 2845 to 2965 meters appear to have porosities up to 13 to 19 percent with water saturation down to around 50 percent but on an average of 70 percent. These sands need to be further evaluated by RFT sampling and pressure measurements. If this is not conclusive then they need to be production or drill stem tested to see what they will produce.

The sands above 2845 up to 2348 have porosities from 14 to 24 percent but are water wet with no likelihood of hydrocarbon production.

FORMATION EVALUATION

2965 - 2950

The better porosities of this interval range from ten to nineteen percent with water saturations from 64 to 92 percent. Both porosities and water saturations are shale corrected and Rw of 0.12 ohmm at 204 degrees F (20,000 PPM NaCl) was used. The Schulmberger CYBERLOOK using the same Rw found the better zones to have porosities up to 10-20 percent with water saturations from 50 to 100 percent. Results of calculations may be found on Table No. 1 and plots 1 and 3.

2950 - 2845

The better shale corrected porosities and water saturations ranged from 9 to 13 percent with water saturations from 47 to 74 percent using Rw of .07 ohmm at 204^{o} F (35,000 PPM NaCl). Those figures are supported by the CYBERLOOK using the same Rw. Another CYBERLOOK pass using Rw of .12 ohhm reduces the better water saturations to 60 percent. Calculations may also be found in Table 1 and data is plotted on plots 2 and 3.

2845 - 2348

Porosities, non-shale corrected, have been taken from the density-neutron and have been plotted against the laterolog deep on plot No. 4 from which a Rw of 0.75 has been derived. It is clear that these sands with good porosities from 14 to 24 percent are water wet. 2630 is a thin bed where resistivity is too high and 2461 looks as if the LLD may be reading too high due to shale effect. Water saturations have been calculated from the Archie relationship and may be found in Table 2. It would be worthwhile to check out the 2461 anomaly with a sidewall core at 2461 and 2462.

Yours very truly,

J Bowler

J. Bowler.

TABLE 1

LEVEL	DEPTH	PB	ØN	VSH	R	Rw	Ø	Sw
1	2965	2.4	15	16	7	.12	14.3	76
2	2963	2.46	13	25	15	.12	10.5	64
3	2958.5	2.36	21	18	6	.12	17.2	68
4	2856	2.55	21	100	20	-	0.	0
5	2953.5	2.35	15	0	3.2	.12	19.	92

VSH on above levels computed from GR. SP derived Rw = .12 at 204° F from + 10mv Sp at 2.953 (20,000 PPM NaCl). Sw from Indonesian Equation. RSH = 20 from 2956 shale. R from Chart Rint - 9. Porosity from density-neutron crossplot then shale corrected.

LEVEL	DEPTH	PB	ØN	VSH	R	Rw	Ø	Sw
6	2948.5	2.38	12	25	7	.07	12.	66
7	2945	2.45	15	27	15	.07	11.	48
8	2937	2.36	9	0	5	.07	15.	71
9	2931	2.50	12	25	10	.07	9.	71
10	2921.5	2.45	14	20	15	.07	11.2	49
11	2918	1.47	11	25	15	.07	10.4	51
12	2915	2.50	14	25	18	.07	10.	48
13	2910	2.45	15	12	8	.07	13.2	60
14	2905	2.48	15	18	11	.07	11.5	57
15	2900	2.50	11	12	9	.07	10.	74
16	2891	2.50	12	35	20	.07	9.	47
17	2885	2.52	13	20	15	.07	9.6	57
18	2879	2.52	11	16	10	.07	9.2	74
19	2854	2.40	6	0	7	.07	13.	69
20	2850	2.43	9	0	10	.07	13.	58

Levels 6 - 20 computed with same paramters and methods above but with Rw = .07 at 204° F (35,000 PPM NaCl).

TABLE 2

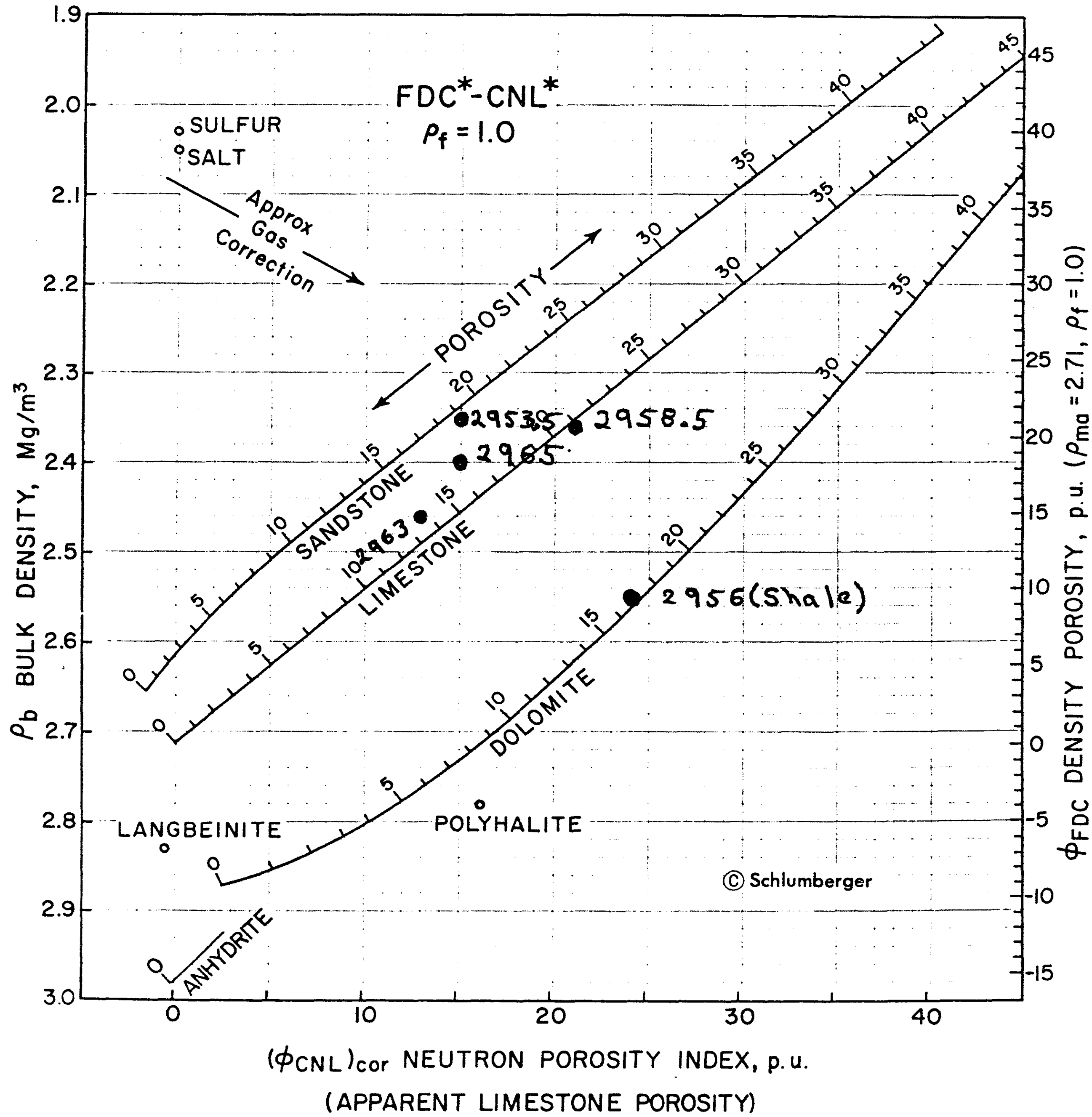
LEVEL	DEPTH	LLD	ØDN	Archie Sw	Rw
21	2840.5	3.0	15	95	.075
22	2835	3.0	14	102	"
23	2825	2.0	17	102	"
24	2805	2.5	18	87	"
25	2787	3.1	17	82	"
26	2769	3.0	17	84	"
27	2761	2.1	17	100	"
28	2749-2743	2.3	17	96	"
29	2726-2704	1.8	18	102	"
30	2694	2.0	20	87	"
31	2643	2.3	20	81	"
32	2630	3.0	22	65 Thin bed, R too high	"
33	2601	2.0	21	83	"
34	2590	2.0	21	83	"
35	2550.5	2.1	19	90	"
36	2500	1.3	22	98	"
37	2461	2.7?	22	68?	"
38	2437	1.9	21	85	"
39	2428	1.3	24	90	"
40	2411	1.3	24	90	"
41	2392-2386	1.5	20	100	"
42	2380.5	2.5	16	97	"
43	2371.5	1.0	25	99	"
44	2365	1.1	22	107	"
45	2349	1.2	22	102	"

Schlumberger

POROSITY AND LITHOLOGY DETERMINATION FROM FORMATION DENSITY LOG AND COMPENSATED NEUTRON LOG (CNL*)

FRESH WATER, LIQUID-FILLED HOLES

PLOT NO. 1



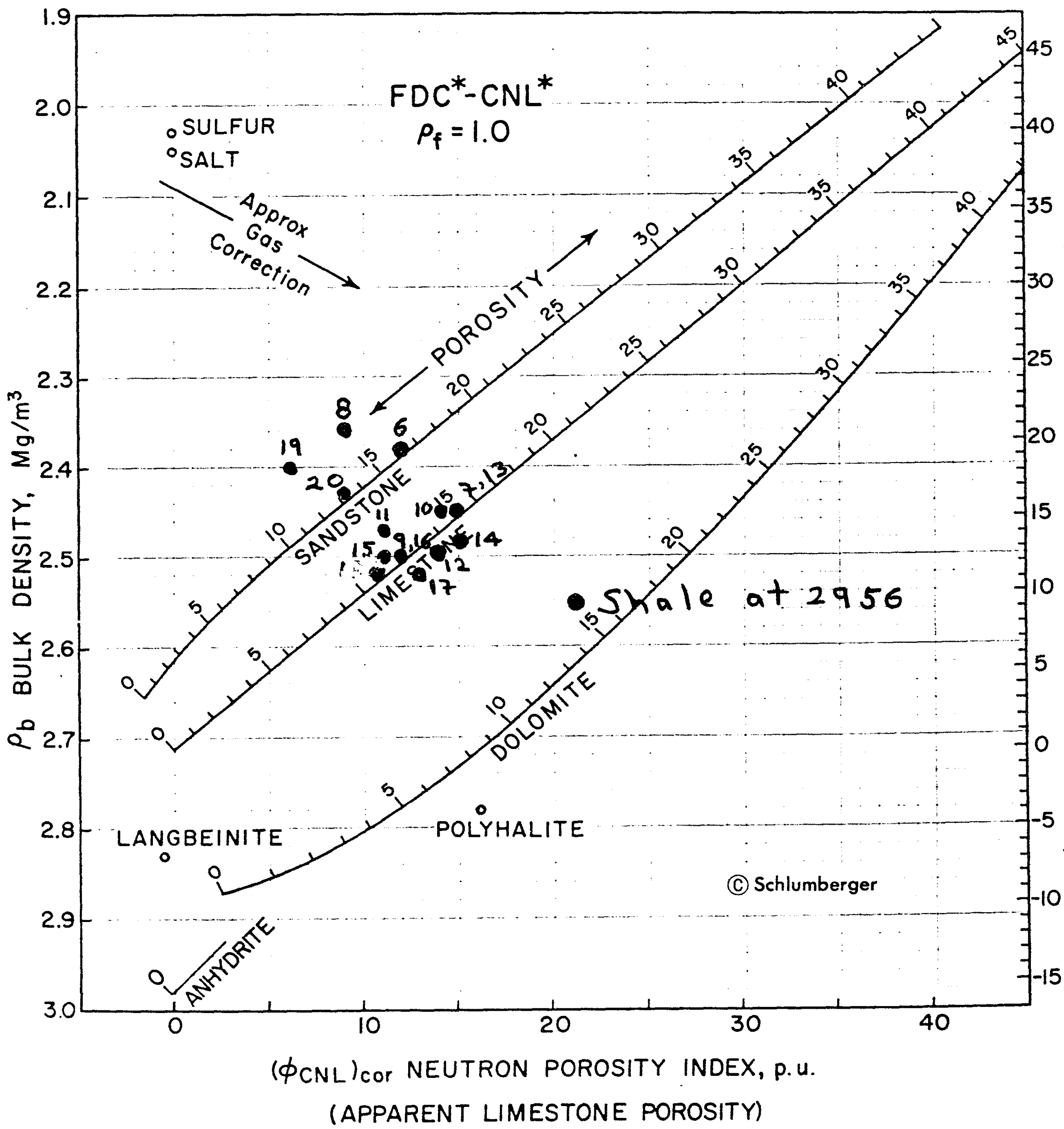
*Mark of Schlumberger

Schlumberger

POROSITY AND LITHOLOGY DETERMINATION FROM FORMATION DENSITY LOG AND COMPENSATED NEUTRON LOG (CNL*)

FRESH WATER, LIQUID-FILLED HOLES

PLOT NO. 2



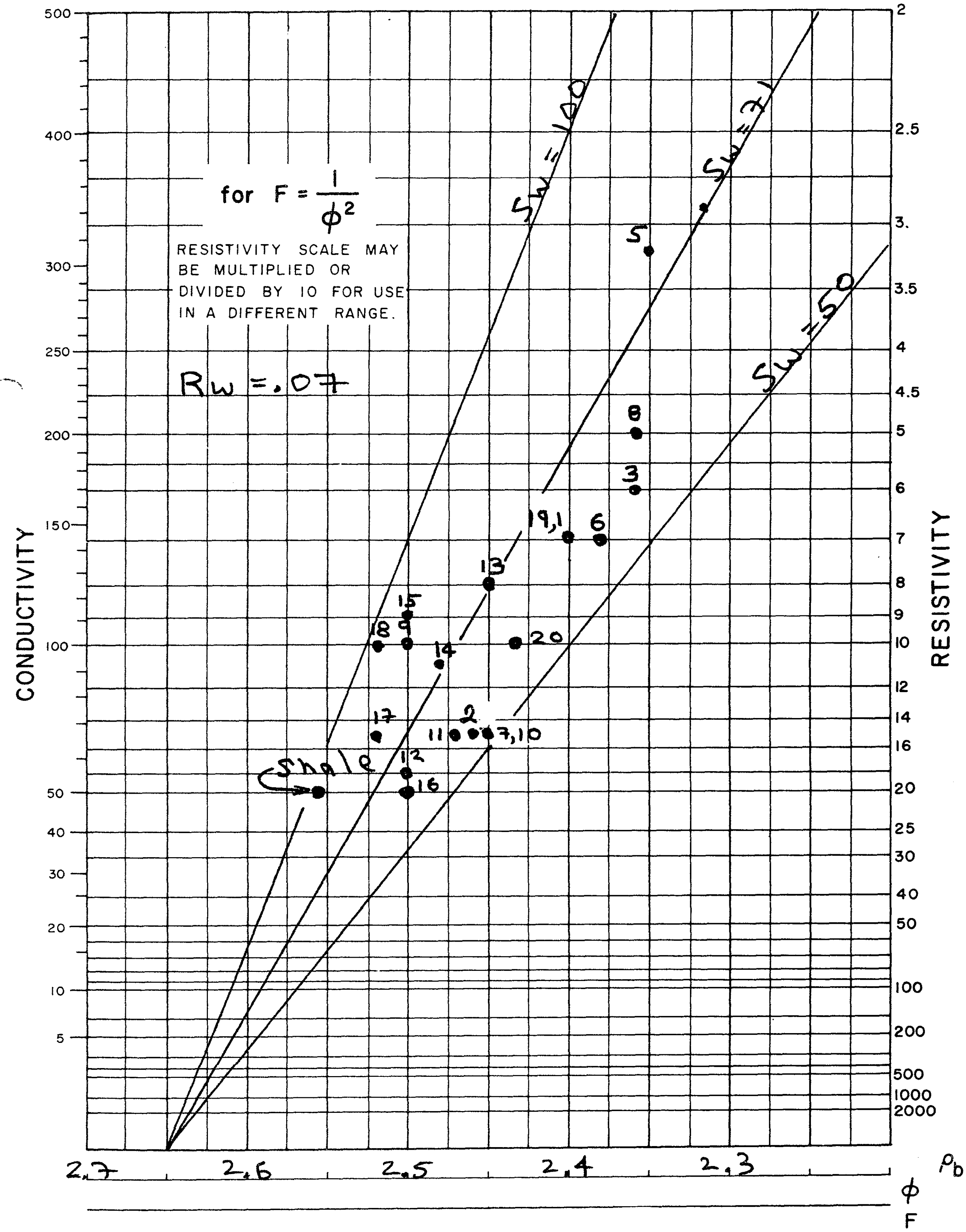
*Mark of Schlumberger

CP-1c

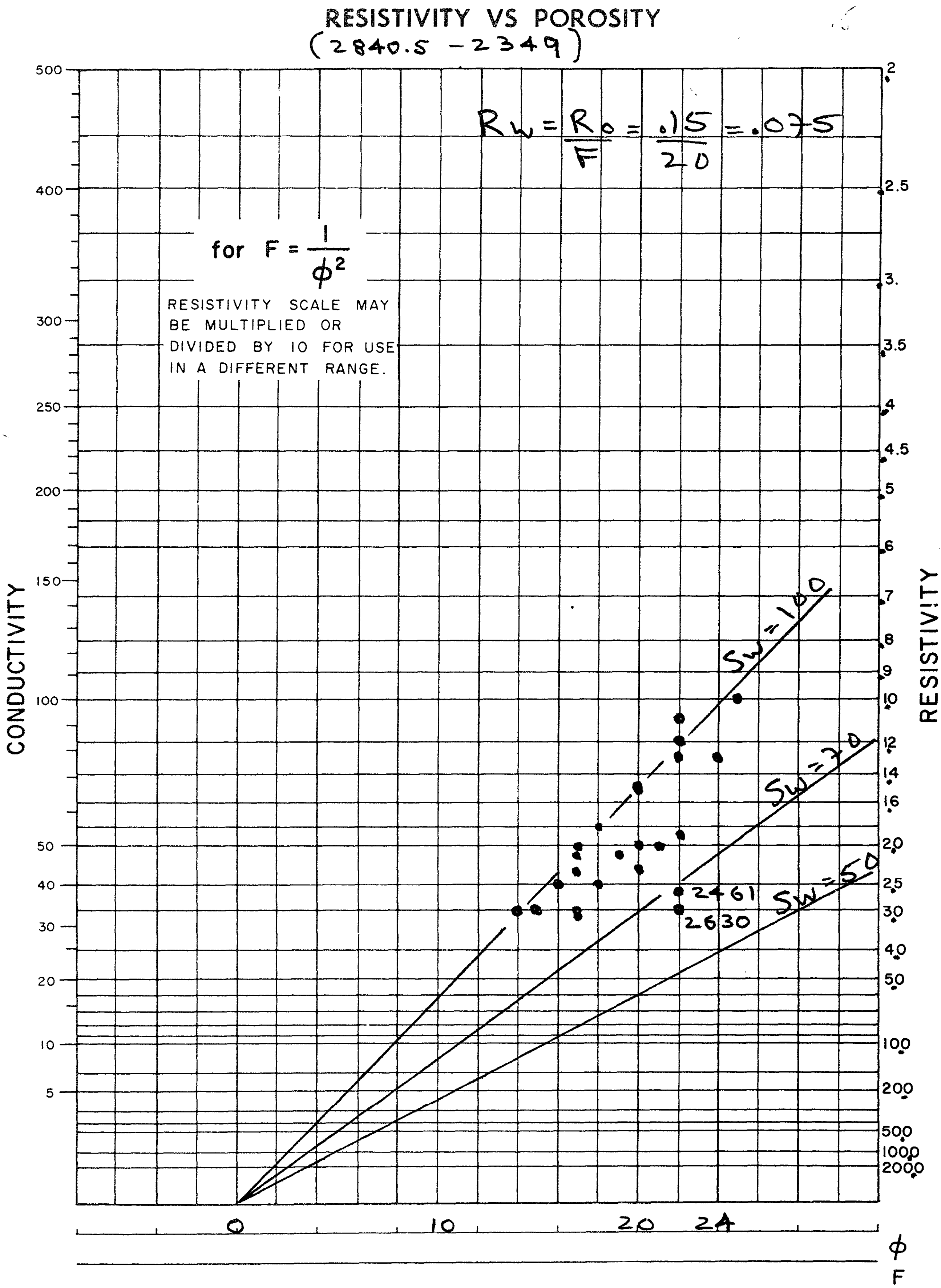
PLOT NO. 3

Schlumberger

RESISTIVITY VS POROSITY
(2965-2850)



PLOT NO. 4


RESISTIVITY VS POROSITY
(2840.5 - 2349)
Rw = Ro/F = .15/20 = .075
for F = 1/φ²
RESISTIVITY SCALE MAY BE MULTIPLIED OR DIVIDED BY 10 FOR USE IN A DIFFERENT RANGE.
CONDUCTIVITY
RESISTIVITY
500
400
300
250
200
150
100
50
40
30
20
10
5
2
2.5
3.
3.5
4
4.5
5
6
7
8
9
10
12
14
16
20
25
30
40
50
100
200
500
1000
2000
Sw=100
Sw=70
Sw=50
2461
2630
0
10
20
24
φ
F

DIVIDER PAGE

AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.

OMEO NO. 1

WELLSITE RFT EVALUATION

BOWLER LOG CONSULTING SERVICES PTY. LTD.

JACK BOWLER
Telephone: (051) 56 6170

P.O. BOX 2,
PAYNESVILLE. 3880
VICTORIA,
AUSTRALIA

7th December, 1982

Mr. Frank Brophy,
Australian Aquitaine Petroleum Pty. Ltd.,
Elf Aquitaine Centre,
14th Floor,
99 Mount Street,
SYDNEY. N.S.W. 2060

Dear Frank,

Please find my wellsite evaluation of the Omeo No. 1 RFT samples and pressures taken 4th December, 1982.

The pressures from 2805 to 2349 are valid and fall on a fresh water gradient of 0.433 psi per foot giving good reference pressures for the area.

The pressures below 2805 all fall above the 0.433 gradient. Because they do not fall on a clear gradient and because the formations are tight (as indicated by the pretest buildups) and the pressures may lie above the 0.433 gradient due to a component of pressure due to supercharging, it is not clear what the fluid content of the formations are.

The fluid recovery of water from 2952 indicates this level will produce water.

The fluid recovery of gas, condensate and water from 2849.8 indicates this level will produce gas, condensate and an unknown amount of water from zero to a large water cut. It is not possible to compute the per cent water recovered because the recovered water, the filtrate and the formation waters are all the same salinity within the accuracy of their measurements. A steady state hemispherical drawdown flow permeability estimate is 41 md for the first chamber and 45 md for the second. The chart FT-9 suggests this interval will flow hydrocarbons with a specific productivity index of .01 barrels per day per psi drawdown per foot of reservoir.

The Geoservices gas plots are attached and they indicate this zone will produce gas to condensate.

My guess is this zone will produce gas and condensate with little or no water.

The test at 2936.5 with a fill-up time of about 7 minutes for 22,700 cc suggests a drawdown permeability of 70 md. The long buildup time after the tool is full may be due to a compressible fluid such as gas.

Yours very truly,

J Bowler

J. Bowler.

OMEO NO. RFT

PRESSURES - 4.12.82
(PSIG)

Test	Depth	Formation Read	Formation Corrected	Qualitative Permeability From Pretest
		RUN NO. ONE		
1	2349	3321	3300	greater than 100 md
2	2371.5	3362	3341	about 10 md
3	2387	3373	3352	about 10 md
4	2427	3449	3428	about 10 md
5	2461	3490	3469	about 10 md
6	2590	3667	3646	about 10 md
7	2695	3824	3803	about 10 md
8	2705	3843	3822	about 10 md
9	2725	3874	3853	about 10 md
10	2805	3981	3960	about 10 md
11	2850	Seal Failure (SF)		
12	2849.8	4122	4101	less than 10 md
	Fill 10,400 cc Chamber in 10.7 minutes, 4102 FSIP.			
	Fill Upper 10,400 cc Chamber in 6.0 minutes, 4105 FSIP.			
13	2854	4149	4128	about 10 md
14	2858	4156	4135	about 10 md
15	2879	SF		
16	2878.5	SF		
17	2878	4411		less than 1 md Supercharged
18	2893	SF		less than 1 md
19	2893.5	SF		
20	2903	SF		
21	2902.5	SF		
22	2900			Tight
23	2899.5			Tight
24	2899			Tight
25	2906	SF		

Test	Depth	Formation Read	Formation Corrected	Qualitative Permeability From Pretest
		RUN NO. TWO		
26	2936.5	4320	4299	.1 md
27	2936.5	4320	4299	.1 md
28	2948	4370	4349	.1 md
29	2947.5	4380	4359	.1 md
30	2947			.1 md
31	2952	4350	4329	greater than 100 md
	Fill 10,400 cc Chamber in 9.9 minutes, 4300 FSIP.			
	Fill Upper 10,400 cc Chamber in 8.4 minutes, 4299 FSIP.			
32	2959	4350	4329	1 md
33	2899			Tight
34	2805	4047	4026	100 md

Suspect RFT Gage Drift to be so large that pressures are useless for Pressure Profile so P.O.O.H. to use HP Gage for further tests.

RUN NUMBER THREE HP
PRESSURES PSIG

Test	Cable Depth	Formation Pressure	Qualitative Permeability from Pretest
35	2936.5	SF	
36	2936.2	SF	
37	2935.9	SF	
38	2935.6	SF	
39	2936.8	SF	
40	2937.1	SF	
41	2937.4	SF	
42	2937.7	SF	
43	2938.0	SF	
44	2938.2	SF	
45	2938.4	SF	
46	2938.6	SF	
47	2938.8	SF	
48	2939	SF	
49	2939.2		1 md
50	2939.4	SF	
51	2939.6	SF	
52	2939.8	SF	
53	2939.3	SF	
54	2939.2	4351.5	1 md

Gamma Ray was not working at bottom of hole so we searched for the one meter sand at 2936.5 with the RFT Pretest, therefore 2939.2 Cable Depth is assumed to be 2936.5.
Fill 22,700 cc Lower Chamber in about seven minutes, 4344.5 FSIP.
Attempt to fill 10,400 cc Upper Chamber. Pressures appear unreliable. Fault in Cable. Unable to retract tool. Pull on Cable in attempt to shear safety pin in RFT. Cable breaks 20 feet above tool. The 22,700 cc Chamber is likely full of fluid.

2849.8 Meter RFT Fluid Recovery Results

Lower 10,400 cc Chamber was opened first and recovered :

- 5.6 cubic feet of gas
- 9,000 cc of water with resistivity of 0.24 at 60° F (33,000 PPM NaCl).
- Water measure by Baroid :
  21,500 PPM Cl
  300 PPM Ca
  0 PPM Nitrate
- zero surface pressure in Chamber.

The Upper 10,400 cc Chamber was opened second to the formation and recovered :
- 30 cubic geet of gas of which 2 samples were analysed by Geoservices :

	Sample No. 1	Sample No. 2
C-1	85%	88%
C-2	8.5	7.3
C-3	3	2.3
I-C-4	1.5	1.2
N-C-4	1.7	1.3
C-5	unmeasurable	.8 (estimated)

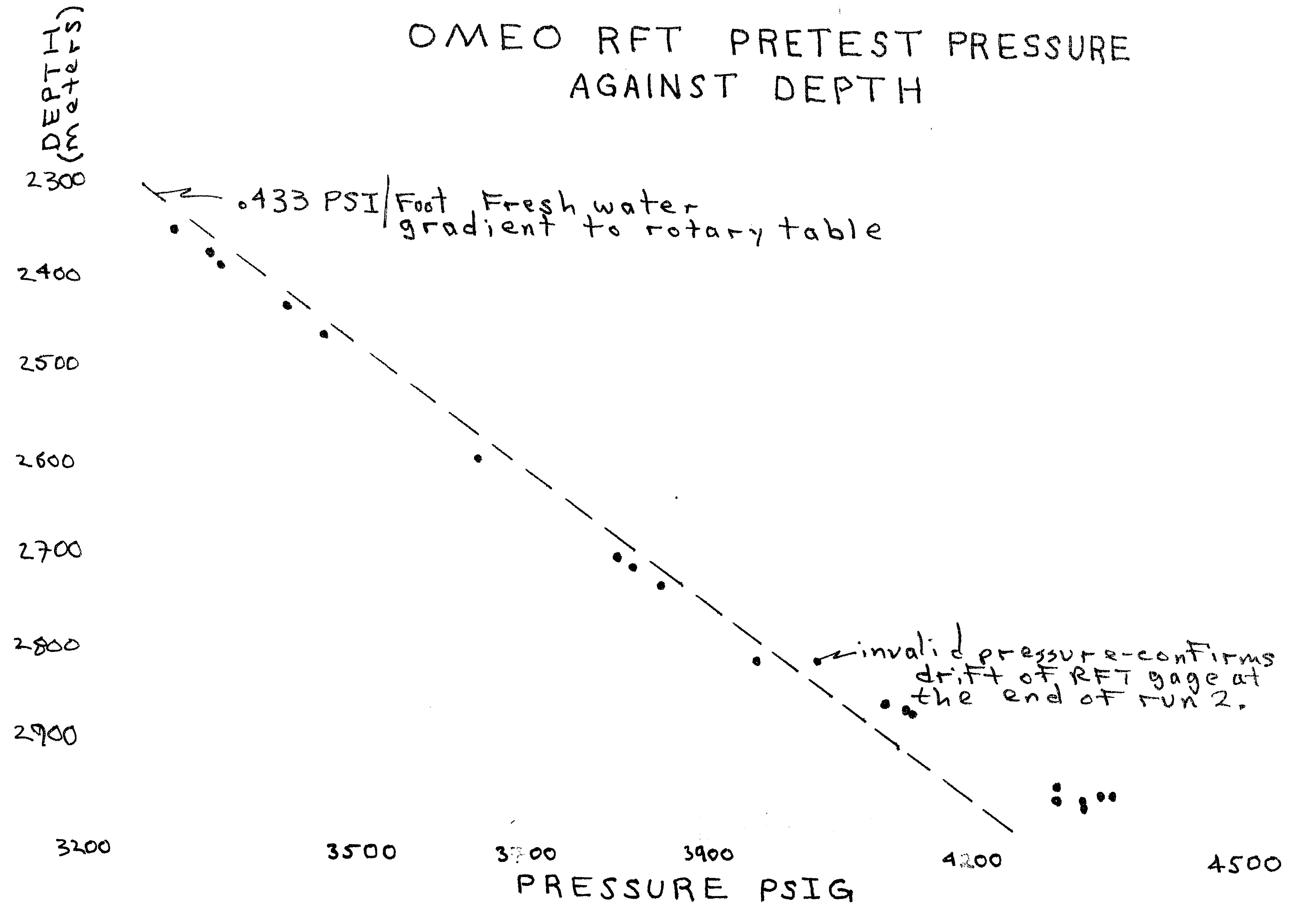
- 5,000 cc of water with resistivity of 0.23 at 60° F (35,000 PPM NaCl).
- Water measured by Baroid :
  20,000 PPM Cl
  320 PPM Ca
  0 PPM Nitrates
- There was a clear scum of oil or condensate present with a strong white flouresence
- 300 KPa (29 PSI) chamber surface pressure.

NOTE : Mud Filtrate resistivity is .26 at 60° F (30,000 PPM NaCl), Baroid report mud filtrate to contain 50 PPM Nitrates.
Rw = .12 at 204° F (20,000 PPM NaCl)
Rw = .07 at 204° F (35,000 PPM NaCl).

2952 Meter RFT Fluid Recovery Results

Lower 10,400 cc chamber was opened first and recovered :
- 0 gas
- 9,750 cc of water with resistivities of .242 at 62° F (32,000 PPM NaCl) and .237 at 67° F (30,000 PPM NaCl)
- 0 surface pressure in chamber.

The upper 10,400 cc chamber was opened second to the Formation and recovered :
- 0 gas
- 9,500 cc of water with a resistivity of .277 at 62° F (28,000 PPM NaCl).

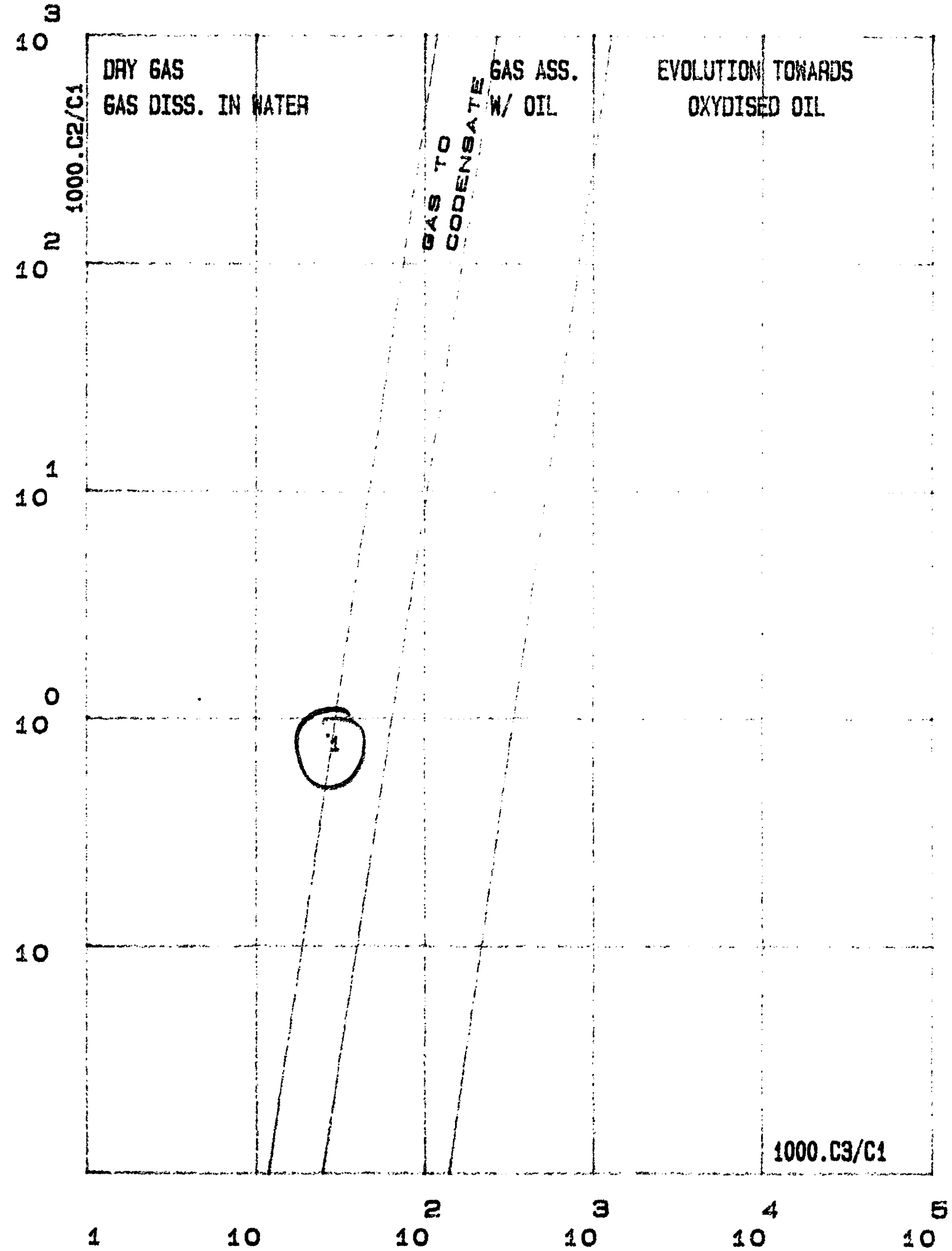


OMEO RFT PRETEST PRESSURE AGAINST DEPTH
DEPTH (meters)
2300
2400
2500
2600
2700
2800
2900
.433 PSI/Foot Fresh water gradient to rotary table
invalid pressure-confirms drift of RFT gage at the end of run 2.
3200
3500
3700
3900
4200
4500
PRESSURE PSIG

Sec15252452, mkjkknkiu

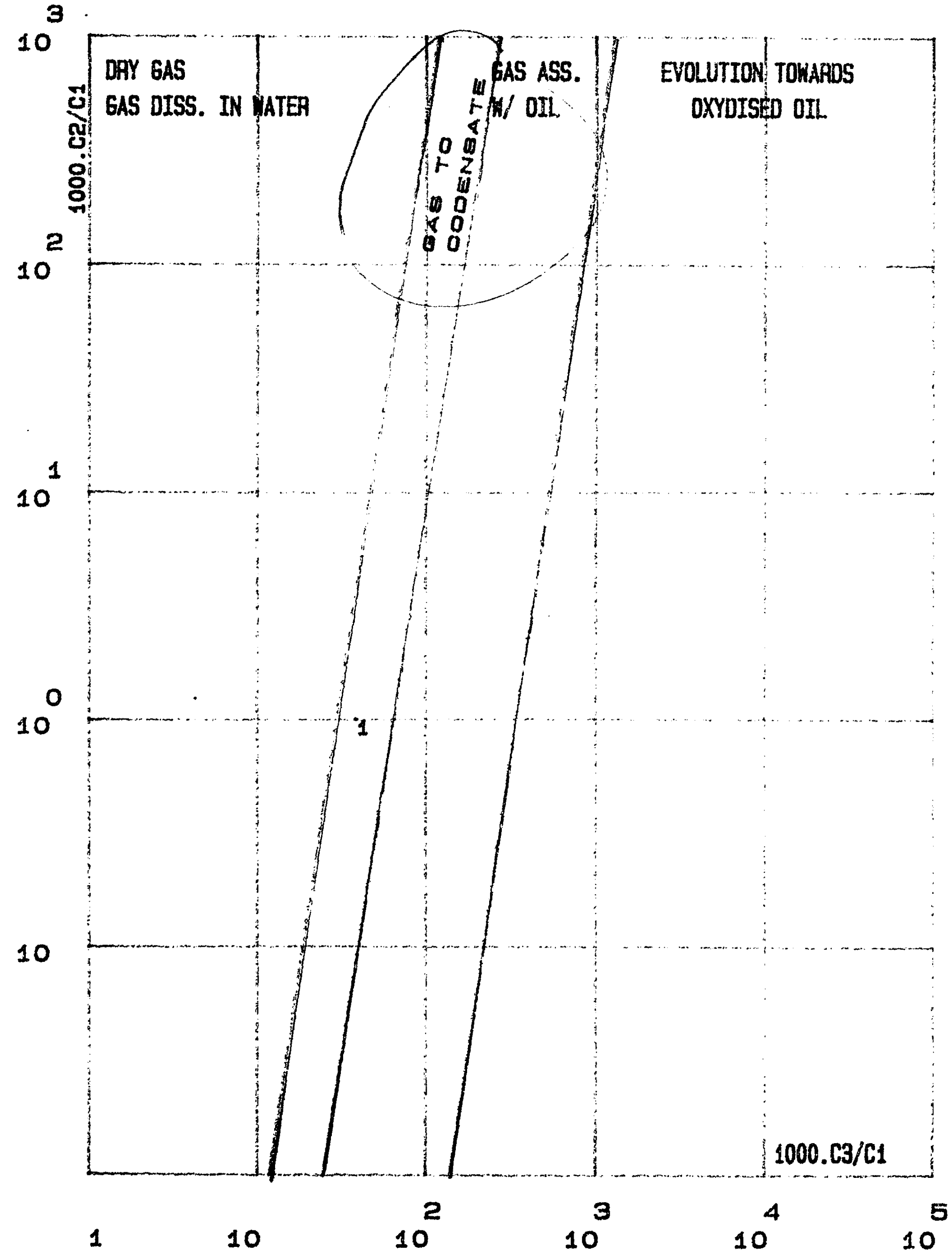
OMEO # 1 A.A.P.

Nb	Depth	C1	C2	C3
1	~~2850~~ 2849.8	87.8800	7.3200	2.3400



OMEO # 1 AUSTRALIAN AQUITAINE

Nb	Depth	C1	C2	C3
1	~~0~~ 2849.8	84.9800	8.5000	3.3100



PE906203

This is an enclosure indicator page.
The enclosure PE906203 is enclosed within the container PE906202 at this location in this document.

The enclosure PE906203 has the following characteristics:

ITEM_BARCODE =	PE906203
CONTAINER_BARCODE =	PE906202
NAME =	Gas Composition Diagram
BASIN =	GIPPSLAND
PERMIT =	VIC/P17
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Gas Composition Diagram (enclosure from attachment 3 to WCR) for Omeo-1
REMARKS =	
DATE_CREATED =	4/02/83
DATE_RECEIVED =	11/08/83
W_NO =	W788
WELL_NAME =	OMEO-1
CONTRACTOR =	GEOSERVICES
CLIENT_OP_CO =	AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)

DIVIDER PAGE

AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.

OMEO NO. 1

SUITE NO. 1 RFT PRESSURES EVALUATION

BOWLER LOG CONSULTING SERVICES PTY. LTD.

JACK BOWLER
Telephone: (051) 56 6170

P.O. BOX 2,
PAYNESVILLE. 3880
VICTORIA,
AUSTRALIA

4th January, 1983

Mr. Frank Brophy,
Australian Aquitaine Petroleum Pty. Ltd.,
Elf Aquitaine Centre,
14th Floor,
99 Mount Street,
SYDNEY. N.S.W. 2060

Dear Frank,

Please find my detailed evaluation of the Suite No. 1 Omeo No. 1 RFT pressures taken on 4th December, 1982.

The main references for this evaluation are the following Schlumberger publications :

A. RFT Essentials of Pressure Test Interpretation.
B. The Essentials of Wireline Formation Tester.

I. Drawdown Permeabilities

Table No. 1 lists the results of the computations of pretest and sample chamber drawdown permeabilities. These calculations are only valid when fluid flow (usually mudfiltrate) into the pretest chambers is determined by the rate of pretest piston displacement. As a result very low permeability formations do not fit the model and their permeabilities cannot be determined from the drawdown method. If gas is trapped in the flowline the drawdown technique cannot be used for permeability determination either. Those levels that may have gas trapped in the flowline are marked with an asterix * on Table No. 1. See page 30 Figure III h of reference 1 for an example of a RFT pretest pressure recording when gas is present in the flowline. Note that 50 per cent of the pressure drop occurs within 0.55 cm so the pretest drawdown permeability is very much a function of the formation very near the wellbore and will give a pessimistic permeability in the case of formation damage (which may be very shallow).

Drawdown permeabilities from the 10,400 cc and 22,700 cc chambers should be much more representative of the formation permeability.

The pretests at 2948 (File 35), 2947 (File 37), and 2899 (File 40) look similar to the example of a low permeability test in which the filtrate in the pretest chamber is at bubble point pressure (page 34 of reference No. 1).

II. Pressure-Depth Plots

Table No. 2 lists the various formation and hydrostatic mud pressures recorded prior to any corrections. Please note that Schlumberger have recomputed the Hewlett-Packard pressures with the correct temperature corrections and the corrected HP pressure at 2936.5 meters falls very close to the hydrostatic mud gradient of 9.99 pounds per gallon extrapolated to the bottom of the hole on Plot No. 1. Note also the Hewlett Packard pressures are recorded in PSIA or 14.7 PSI less than the RFT pressures of PSIG.

Table No. 3 is a list of formation pressures corrected by the hydrostatic shift method described by Phil Mitchell in the 17th December Operating Committee meeting.

Table No. 4 is a list of the final formation pressures with all corrections to read PSIG. Those levels with a range of pressures are due to a shift in hydrostatic pressure recorded before and after the formation pressure recording.

Plots No. 2, 3 and 3a are the final formation pressures PSIG against depth. Several interpretations may be made of the plots:

A. A 1.0 g/cc gradient line may be drawn through Files 17, 33, 34, 117 and 39, and a 0.77 g/cc line may be drawn through Files 15 and 17 or a 0.35 g/cc line through Files 16 and 17. This case would give 10 meters gross of hydrocarbons from 2849 to 2859 meters and a shift in aquifer pressures of 65 PSI somewhere between 2849 and 2805 meters. Esso advised that they would expect such a shift of 40 to 50 psi at Omeo No. 1 due to production from the Bass Strait Fields. This is the interpretation presented by Phil Mitchell.

B. A 0.81 g/cc gradient line can be drawn through Files 15, 16, 17, 73 and the low pressure data of File 38. Assuming no shift in aquifer gradient, this would put an oil-water contact at 3095 meters. For this interpretation to be valid all the other pressures below 2849.8 meters would have to be reading too high due to supercharging or inaccuracies in the pressure corrections. If the shift in aquiter gradient was only 32 psi this would put the oil-water contact around 2952 meters

III. Pressure Build-up Plots

Spherical and radial cylindrical pressure build-up plots were made on several pretests of interest as described in Chapter III of Reference 1. In addition Horner plots were made as described on Page 22 of Reference 2 (Pressures are not corrected for any of those plots).

A. Permeabilities

Permeabilities (build-up) were computed as follows where the data seemed to fit the models described in the references above :

Depth	File	Permeability (md)	Remarks
2805	12	0.55	radial cylindrical
2849.8	15	3.4	radial cylindrical
2854	16	.38	radial cylindrical. See Plot No. 15
2858	17	.67	spherical. See Plot No. 16
2936.5	122	.09 to 39	Horner depending on best guess for fill-up time. See Plot No. 12.
2952	38	147 to 414	Horner. See Plot No. 14.

B. Build-up Curve Shape

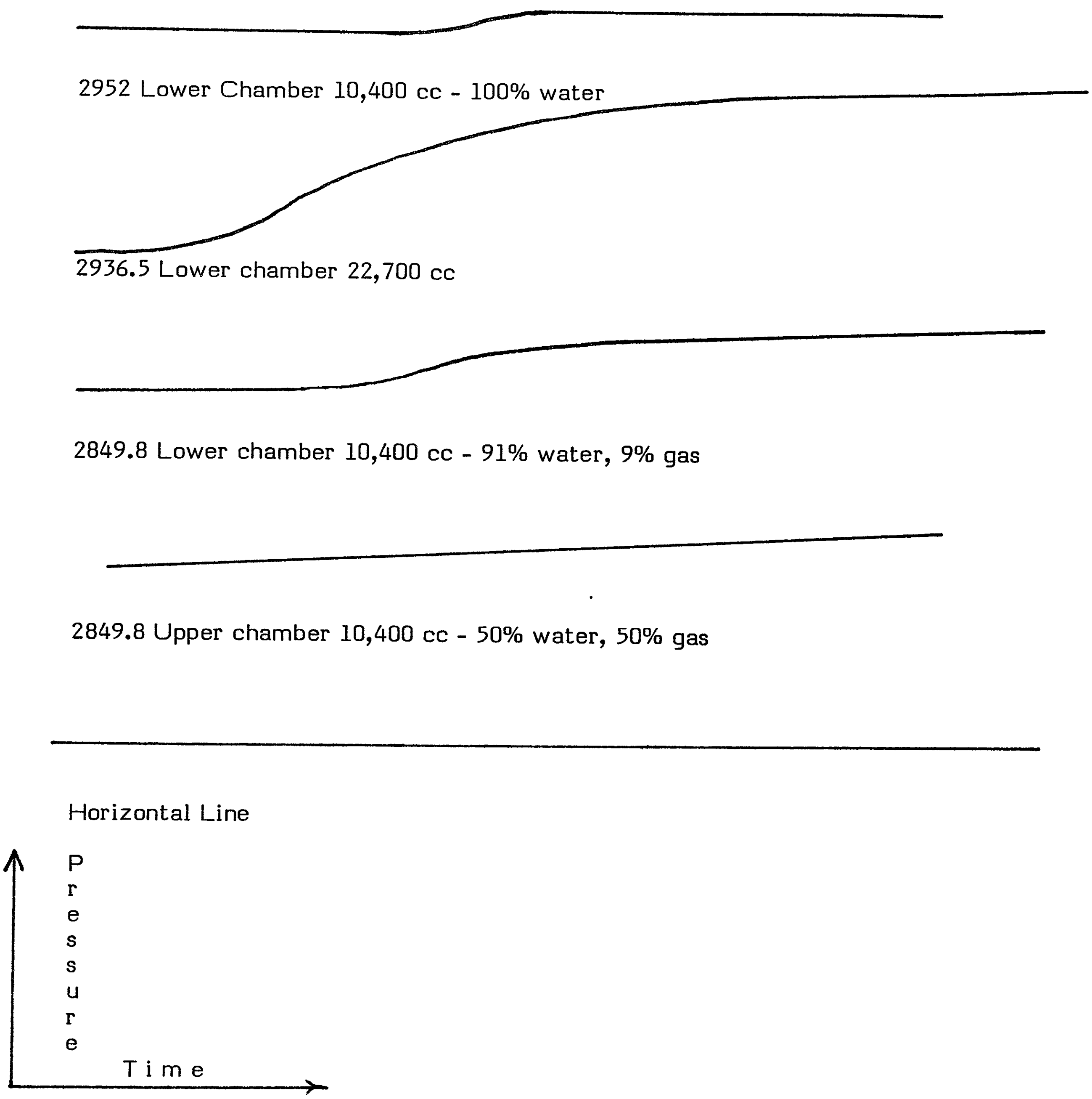
1. Pretest

The pretest build-up at 2805 meters (Plot No. 4) seems to exhibit radial cylindrical flow (a water zone) while the pretest build-up at 2952 meters (Plot No. 13) in a zone of water recovery doesn't seem to fit either spherical or radial cylindrical flow. Plot No. 5 for the 2849.8 meter pretest seems to fit radial cylindrical flow. This may mean that only mud filtrate was in the flowline during the pretest. None of the 2936.5 meter pretest build-up plots No. 7, 8, 9, 10 or 11 seem to fit either spherical or radial cylindrical models. Possibly due to gas in the flowline or partial plugging? The pretest curves can be made to better approximate the radial cylindrical and spherical models by extending the Fill-up time as in Plot No. 11a for File 122. The selection of the Fill-up time is rather subjective so I cannot place much confidence in the 2936.5 meter plots.

2. Sample Chamber

The recorded sample chamber build-up curves have been traced on the same pressure against time scale for the sample chambers at 2948.9, 2936.5 and 2952. There does seem to be a small resemblance between the 2936.5 and 2849.8 meter lower chamber recordings, particularly the slow build-up at late time. Possibly this is due to the present of gas in both chambers. It might be worthwhile to have a reservoir engineer express an opinion on the sample chamber pressure build-ups which are shown on the next page.

RECORDED SAMPLE CHAMBER PRESSURE BUILD-UP



3. Horner build-up on Sample Chamber

The 2849.8 meter upper chamber (which was half full of gas) Horner Plot No. 6 in late time looks very similar to the short fill-up time curve (due to plugging?) on Plot No. 12 for late time Horner build-up at 2936.5 meters.

The 2952 Horner Plot No. 14 seems to go into the straight line portion for both the upper and lower chambers. Recovery was all water in each chamber.

IV. Conclusions

At the minimum there is a gross hydrocarbon section from 2849 to 2859 meters. At the maximum there may be a gross hydrocarbon section from 2849 to 3095, probably oil but the uncertainties associated with this interpretation are very high due to the lack of reliable pressure readings. If this case were true it means the water recovered at 2952 meters was all filtrate and invasion is very deep. Permeabilities are low (a few md) from 2849 to 2975 except for the clean sands as at 2952 where permeabilities are a few hundred millidarcies.

It is difficult to draw definite conclusions about 2936.5 meters. If the lost 22,700 cc lower chamber did not fill up then permeability is low. The shape of recorded sample chamber pressure build-up suggests gas is present.

Because of the uncertainties in the pressure data and because of the log interpretations based on an Rw of 0.07 ohmm it is necessary to take a good representative Formation Fluid sample through casing midway between 2849 and 2952 meters to obtain a definitve evaluation of this interval.

TABLE NO. 1
DRAWDOWN PERMEABILITY FROM
K = 5660 q u/Pi - P

where: K = drawdown permeability in md
q = flow rate in cc/sec
u = viscosity in cp of flowing fluid
Pi = reservoir pressure
P = sampling pressure

Depth	File	K	q	u	Pi	P	Remarks
Run No. 1							
2705	10	10.0	.96	.3	3843	3680	Pretest No. 1
2705	10	6.4	1.67	.3	3843	3400	Pretest No. 2
2725	11	11.4	.83	.3	3874	3750	Pretest No. 1
2725	11	16.0	1.92	.3	3874	3670	Pretest No. 2
2805	12	7.5	.93	.3	3981	3770	Pretest No. 1
2805	12	5.1	1.92	.3	3981	3340	Pretest No. 2
**2849.8	15	.84	1.0	.3	4123	2100	Pretest No. 1
**2849.8	15	3.0	1.67	.3	4123	3175	Pretest No. 2
2849.8	15	22.9	16.2	.28	4121	3000	Lower Chamber
2849.8	15	7.5	15.1	.16	4115	2300	Upper Chamber
*2854	16	5.3	.78	.3	4149	3900	Pretest No. 1
2854	16	14.3	2.1	.3	4149	3900	Pretest No. 2
*2858	17	-	.83	.3	4156	----	Pretest No. 1
2858	17	11.1	1.67	.3	4156	3900	Pretest No. 2
*2878	20				4411		Supercharged
*2900	28						Tight
*2899.5	29						Tight
*2899	30						Tight
Run No. 2							
*2936.5	33	.8	.86	.3	4320	2500	Pretest No. 1
*2936.5	33	1.1	2.17	.3	4320	1000	Pretest No. 2
*2936.5	34	.72	.78	.3	4320	2500	Pretest No. 1
*2936.5	34	.85	1.78	.3	4320	800	Pretest No. 2
*2948	35	.07	.17	.3	4370	500	Pretest No. 2
*2947.5	36	.1	.19	.3	4380	1000	Pretest No. 2
2952	38	18.3	1.0	.3	4353	4260	Pretest No. 1
2952	38	25.7	1.92	.3	4353	4226	Pretest No. 2
2952	38	51.8	17.16	.3	4322	3760	Lower Chamber
2952	38	93.2	20.31	.3	4320	3950	Upper Chamber
**2959	39	1.04	.83	.3	4350	3000	Pretest No. 1
*2959	39	1.50	2.08	.3	4350	2000	Pretest No. 2
2805	41	12.9	.89	.3	4047	3930	Pretest No. 1
2805	41	22.5	2.08	.3	4047	3890	Pretest No. 2
2805	42	14.3	1.09	.3	4064	3935	Pretest No. 1
2805	42	11.2	2.08	.3	4064	3750	Pretest No. 2
Run No. 3							
*2936.5	117	2.0	.83	.3	4205	3500	Pretest No. 1
*2936.5	117	0.91	1.78	.3	4205	900	Pretest No. 2
*2936.5	122	2.0	.83	.3	4209	3500	Pretest No. 1
*2936.5	122	0.91	.178	.3	4209	900	Pretest No. 2

NOTE: The pretest drawdown permeabilities are a function of the permeability of the formation very close to the borehole and may represent the 'worst case' permeability due to formation damage. As more fluid is drawn from the formation as at 2952 meters the formation cleans up and the permeability becomes more representative of the true formation permeability. The same trend of increasing permeability with increased flow of fluid is seen at 2849.8. Initially the fluid in the pretest is mud filtrate and when the upper 10,400 cc chamber is opened about half the fluid has become gas. Difficulties in determining the flowrate and fluid viscosity due to the gas may make the drawdown permeability determined for the upper chamber questionable. The 2948.8 pretest permeability accuracy suffers from the effects of probe plugging.

** denotes probe plugging

TABLE NO. 2

RFT PRESSURES (NO CORRECTION)
(PSIG)
HYDROSTATIC MUD

File	Depth	Before Pretest	After Pretest	Pretest Formation
Suite No. 1 - Run No. 1				
3	2349	3886	3886	3321
4	2371.5	3935	3935	3362
5	2387	3946	3947	3373
6	2427	4032	4033	3449
7	2461	4084	4083	3490
8	2590	4285	4289	3667
9	2695	4466	4468	3824
10	2705	4490	4490	3843
11	2725	4525	4527	3874
12	2805	4650	4653	3981
15	2849.8	4736	4739	4123
	Lower Chamber Fill-up Pressure = 4121			
	Lower Chamber Shut-in Pressure = 4123			
	Upper Chamber Fill-up Pressure = 4115			
	Upper Chamber Shut-in Pressure = 4126			
16	2854	4773	4774	4149
17	2858	4784	4785	4156
20	2878	4828	4828	4411
Suite No. 1 - Run No. 2				
33	2936.5	4969	4969	4320
34	2936.5	4969	4969	4320
35	2948	4976	4975	4370
36	2947.5	4975	4975	4380
38	2952	4983	4998	4353
	Lower Chamber Fill-up Pressure = 4321			
	Lower Chamber Shut-in Pressure = 4322			
	Upper Chamber Fill-up Pressure = 4320			
	Upper Chamber Shut-in Pressure = 4320			
39	2959	5003	5008	4350
40	2899	4884	4884	Tight
41	2805	4730	4731	4047
42	2805	4749	4752	4064
Suite No. 1 - Run No. 3				
67	2936.5	4994	4994	4341
73	2936.5	5112	----	4442
Suite No. 1 - Run No. 3, Hewlett-Packard Pressures				
117	2936.5	4840	4841	4205
122	2936.5	4842	Tool failed	4209

PLOT NO. 1

Hydrostatic Mud
(no correction)

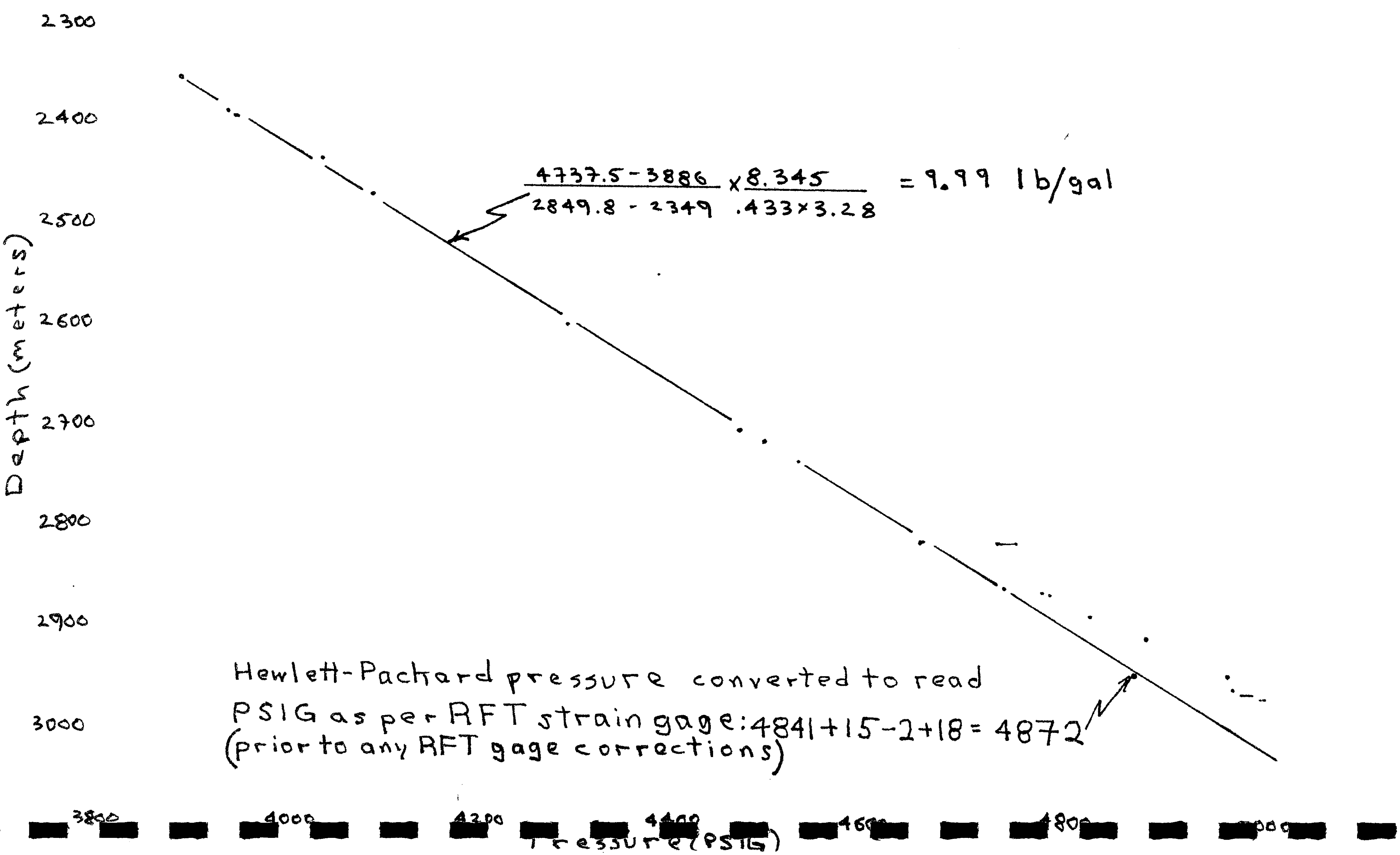


TABLE NO. 3

Corrected Formation Pressures after subtracting recorded hydrostatic less calculated hydrostatic assuming correct hydrostatic at 2725 is 4526 PSI and the hydrostatic mud gradient is 1.7003 PSI/Meter (9.99 lb./gal.) as from Plot No. 1. (No correction made for temperature pressure).

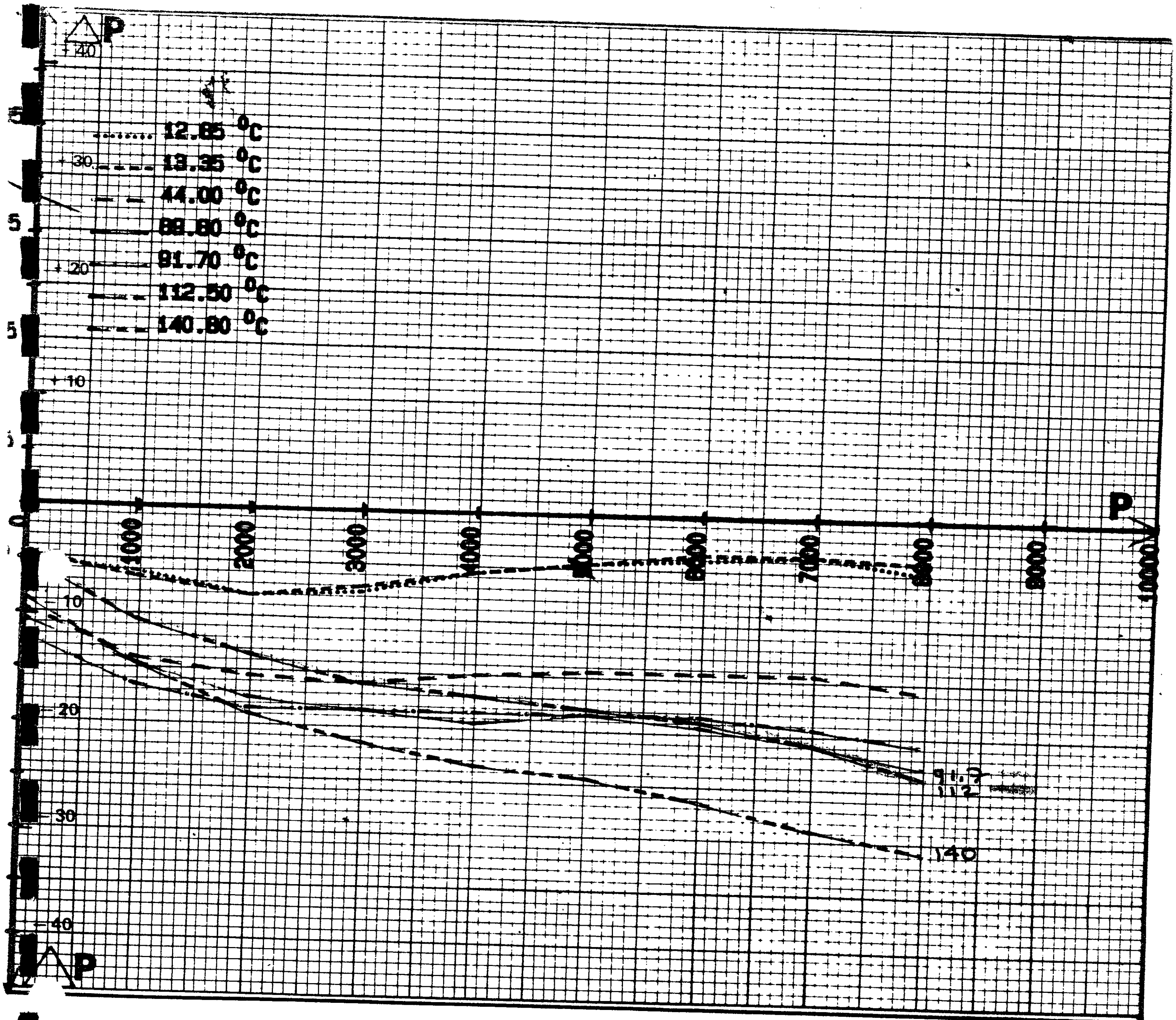
File	Depth	Correction (PSI)	Corrected Formation Pressure (PSIG)
15	2849.8	Nil	4115 to 4126
16	2854	-28	4121
17	2858	-32	4124
20	2878	-42	4369
33	2936.5	-83	4237
34	2936.5	-83	4237
35	2948	-70	4300
36	2947.5	-71	4309
38	2952	-71 to -86	4282 to 4234
39	2959	-79 to -84	4271 to 4266
41	2805	-68	3979
42	2805	-89	3975
67	2936.5	-108	4233
73	2936.5	-226	4216

TABLE NO. 4

Final corrected Formation Pressures. RFT Pressures are corrected for hydrostatic normalization as in Table No. 3 minus 18 PSI for temperature-pressure correction as per master calibration chart dated 11.8.82. Hewlett-Packard pressures have 14.7 PSI added to bring them to PSIG, minus 2 PSI for difference in RFT strain gage and HP gage measure points in the tool string.

File	Depth	Pressure (PSIG)	
10	2705	3825	
11	2725	3856	
12	2805	3963	
15	2849.8	4097 to 4108	
16	2854	* 4103 + 1 = 4104	
17	2858	4106	
20	2878	4351	
33	2936.5	4219	
34	2936.5	4219	
35	2948	4282	
36	2947.5	4291	
38	2952	4264 to 4216	
39	2959	4253 to 4248	
41	2805	3961	
42	2805	3957	
67	2936.5	4215	
73	2936.5	4198	
117	2936.5	~~4218~~	4188
122	2936.5	4222	4192

* 1 PSI added for extrapulation to final reservoir pressure from Plot No. 16.



PRESSURE READ PSIG

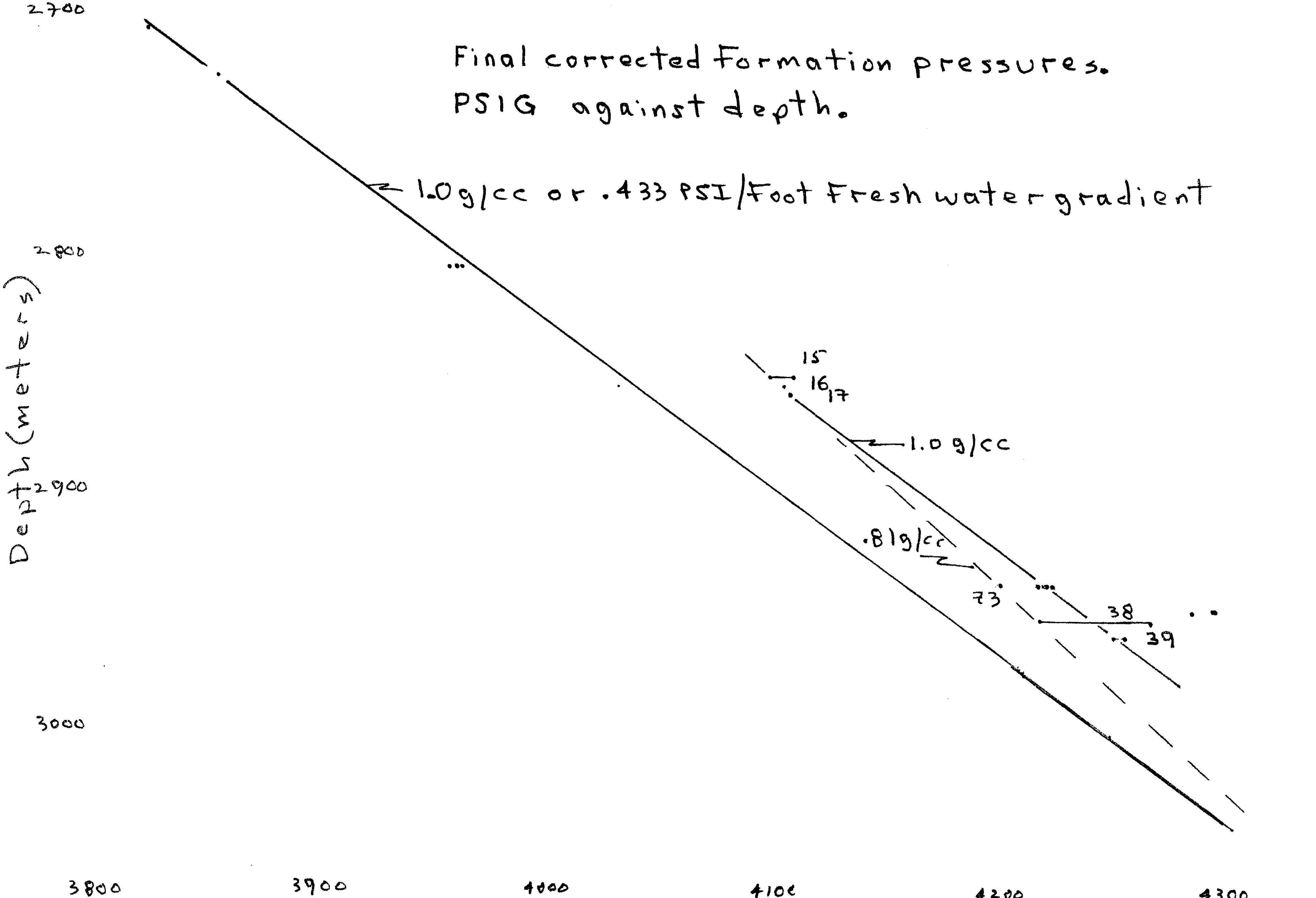
DATE	11-08-82
OFFSET	5.28 at 12 °C
F.T. Engineer	
F.T. Operator	R. MEREDITH
Location	SEA.

EQUIPMENT DATA

GAUGE No.	50186	DWT No.	[illegible]
RFP No.	AD 348	GRAVITY FACTOR	.9[illegible]
RPP No.	AB 401		
RVP No.	AB 388	TEMP-SENSOR	A[illegible]
RFM No.	ABB 428		
RFC No.	AB 426		

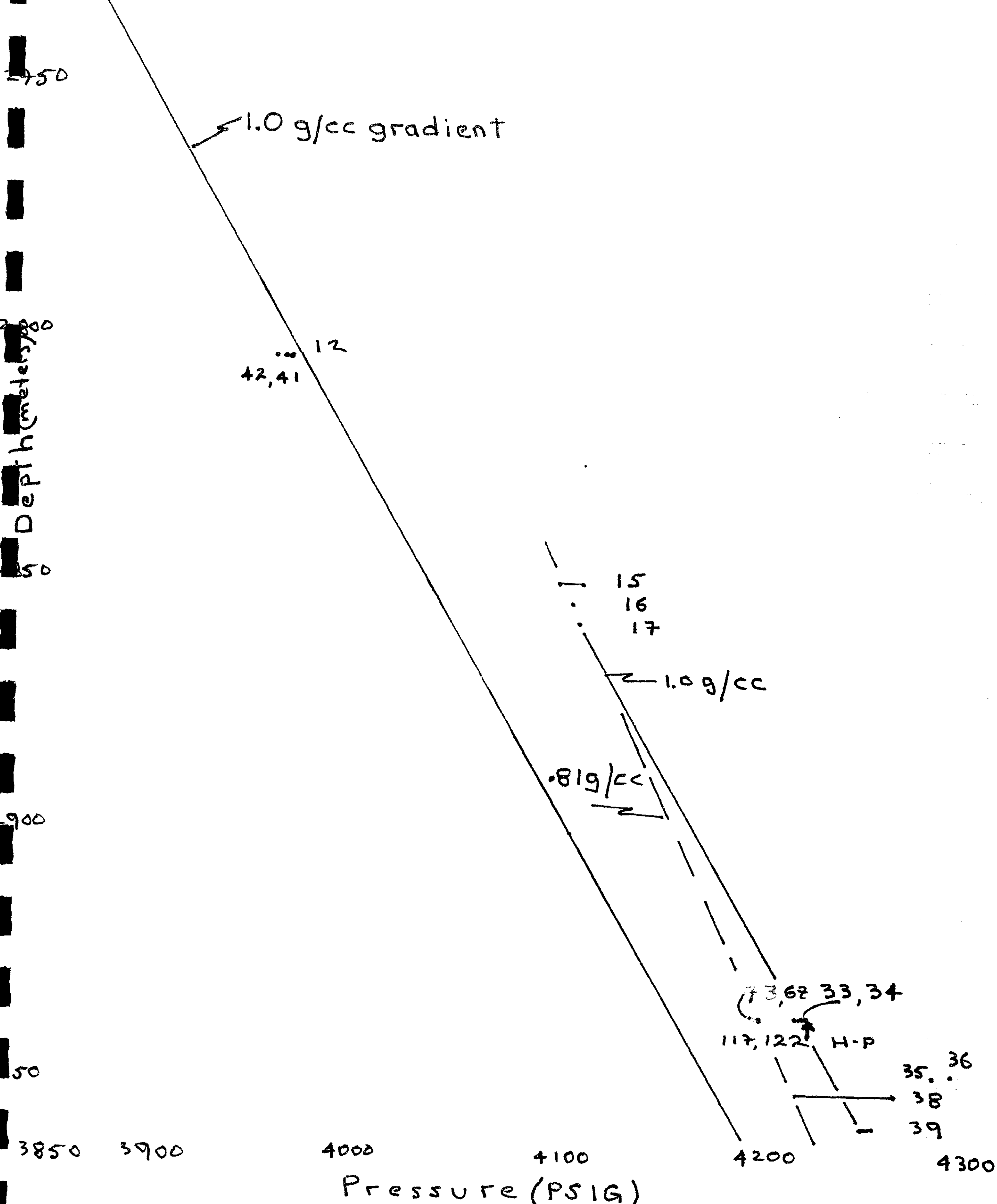
REMARKS : CORRECTED PRESSURE = PRESSURE READ + Δ P IN PSI G

PLOT NO. 2


Final corrected Formation pressures.
PSIG against depth.
1.0g/cc or .433 PSI/Foot Fresh water gradient
1.0 g/cc
.81g/cc
15
16
17
73
38
39
2700
2800
2900
3000
Depth (meters)
3800
3900
4000
4100
4200
4300

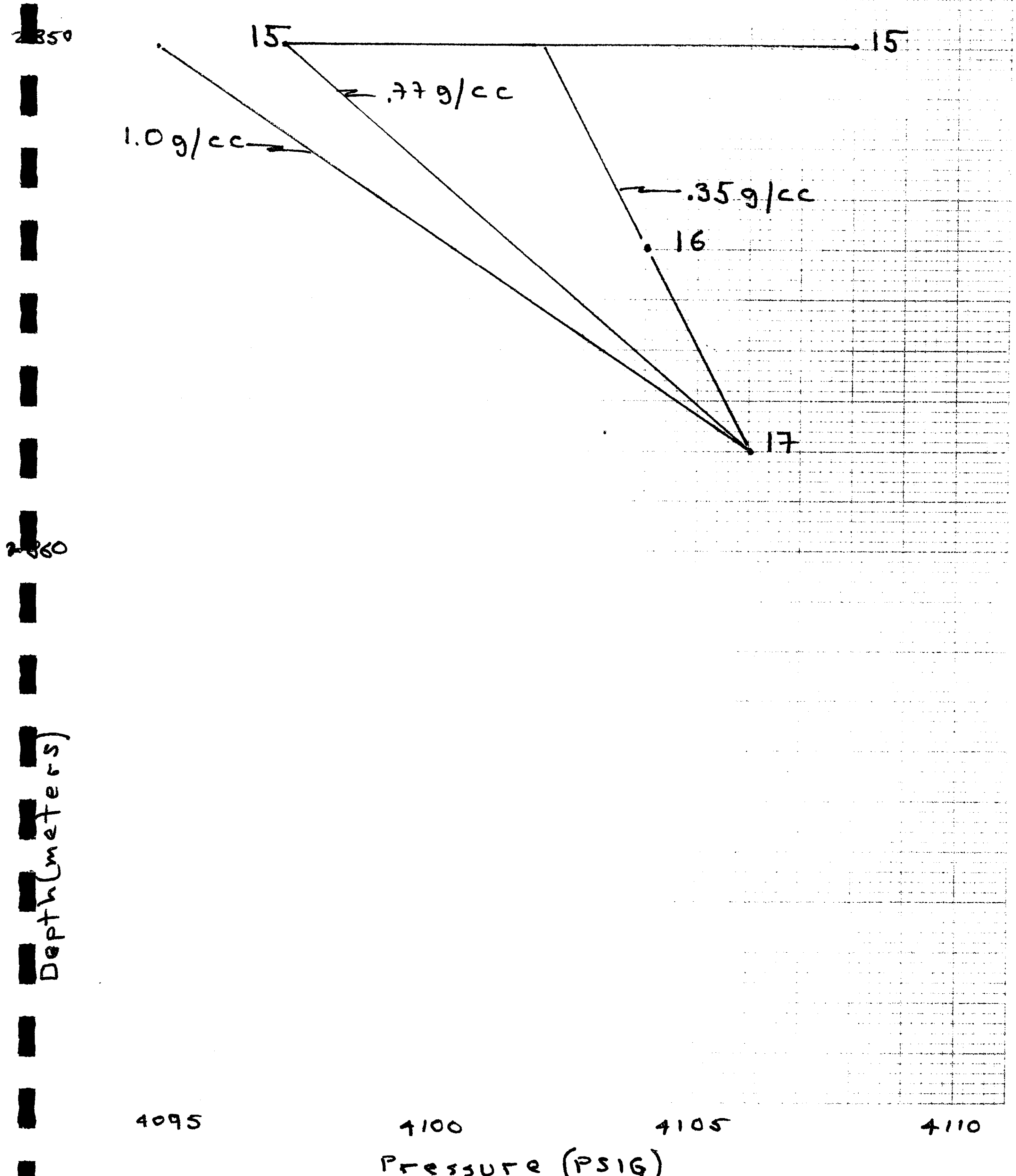
PLOT NO. 3

Final corrected formation pressures.
PSIG against depth.



PLOT NO. 3 a.

Expanded scale of Plot No. 3



RFT SUITE NO. 1 - RUN NO. 1

2805 Meters - File 12

Pretest Spherical and Radial Cylindrical Build-up

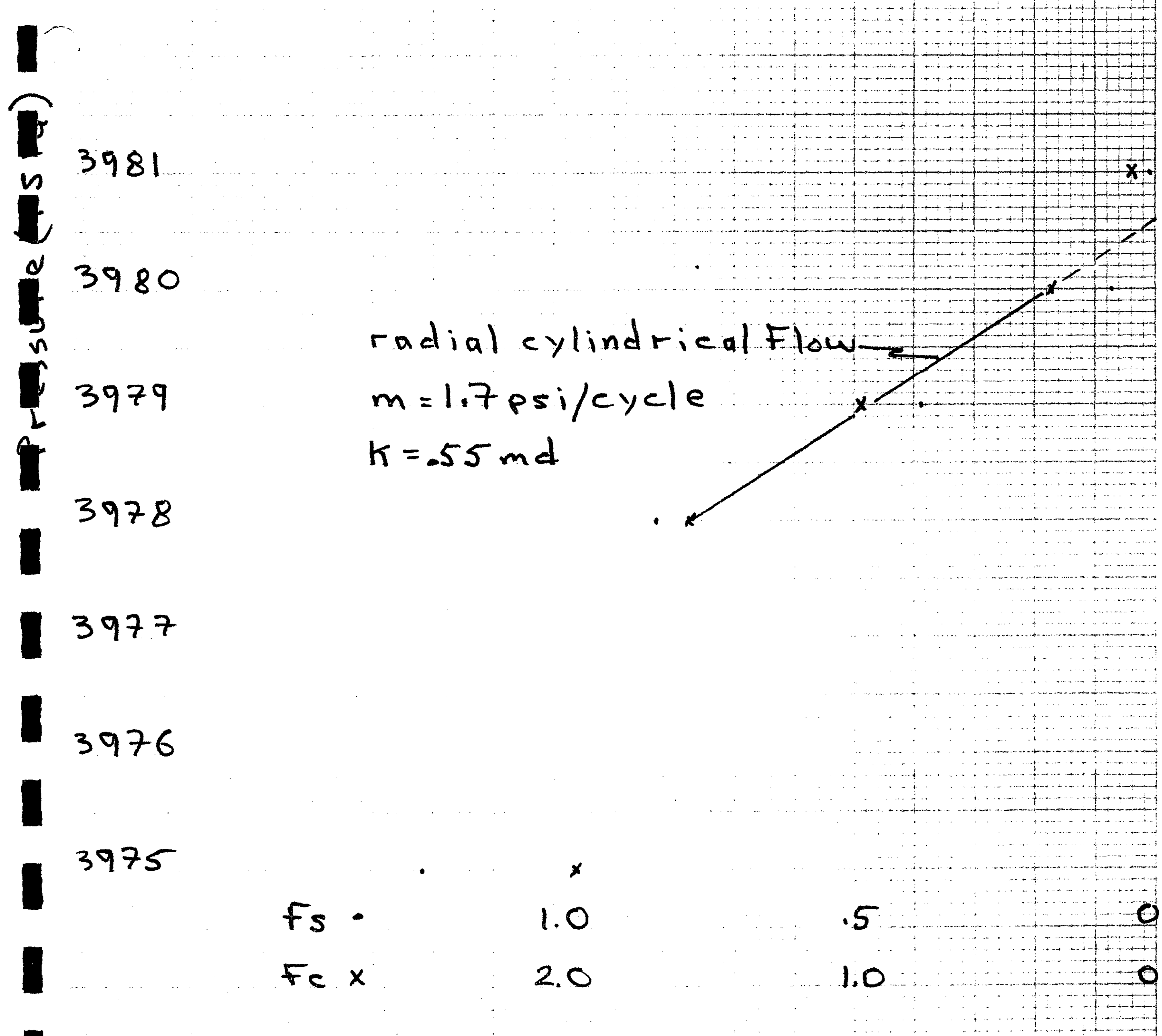
T_1 = 10.8 sec. T_2 = 5.2 sec. q_1 = .93 cc/sec.

q_2 = 1.92 cc/sec.   u = .3 cp   h = 800 cm

Pressure (PSIG)	DT (sec)	Fs (DT)	Fc (DT)
3975	1.2	1.22	1.93
3978	2.0	.83	1.55
3979	4.8	.39	.98
3980	21.0	.078	.35
3981	112.0	.0084	.079

PLOT NO. 4

2805 meter pretest build-up
File 12



RFT SUITE NO. 1 - RUN NO. 1

2849.8 meters - File 15

Pretest Spherical and Radial Cylindrical Build-up

T_1 = 10 sec. T_2 = 6 sec. q_1 = 1 cc/sec. q_2 = 1.67 cc/sec.
u = .3 cp. Porosity = 0.15 $C_t = 3 \times 10^{-6}$ psi^{-1}

Pressure (PSIG)	DT (sec)	Fs (DT)	Fc (DT)
4120	02	.7083	1.3576
4121	04	.3995	.9656
4122	10	.1645	.5517
4123	262	.0023	.0323

An examination of Plot No. 5 shows the pretest build-up regime most likely to be radial cylindrical with a slope m of 2.5 psi/cycle for a radial cylindrical permeability of 3.4 md assuming a bed thickness of 100 cm from the CYBERLOOK. Probe plugging through most of the pretest is probably effecting the build-up plot shape.

ower Sample Chamber Horner Plot Pressure Build-up at 2849.8 meters

T - 642 sec.

Pressure (PSIG)	DT (sec)	$\frac{DT}{T + DT}$
2560	30	.0446
3000	108	.1440
3600	120	.1575
3900	156	.1955
4000	186	.2246
4050	210	.2465
4080	234	.2671
4100	276	.3007
4110	324	.3354
4117	416	.3932
4119	474	.4247
4120	528	.4513
4121	594	.4677
4121	732	.5328

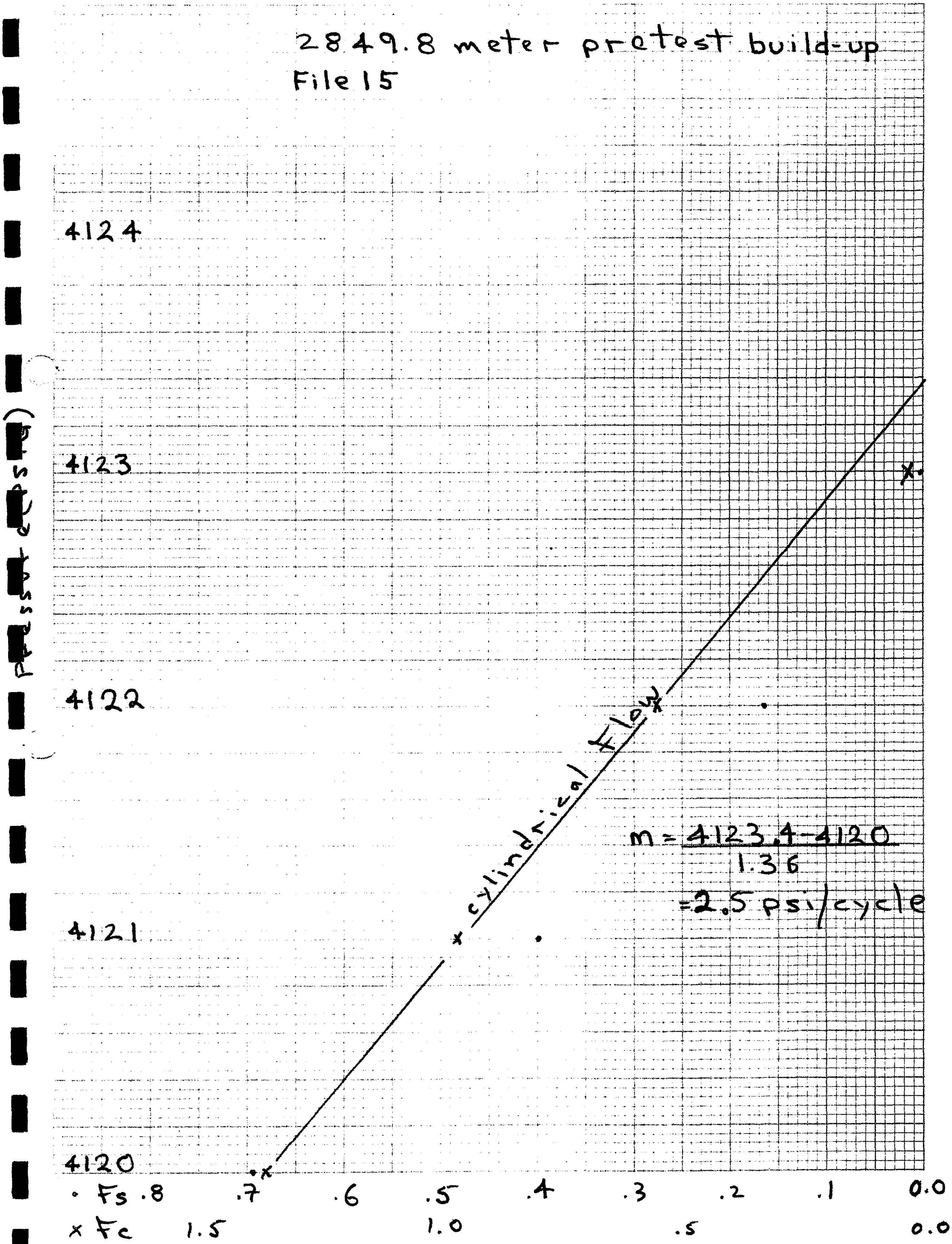
Upper Sample Chamber Horner Plot Pressure Build-up at 2849.8 meters

T = 690 sec.

3000	168	.1958
3600	381	.3557
3900	594	.4626
4000	774	.5287
4050	960	.5818
4070	1092	.6128
4090	1320	.6567
4100	1554	.6925
4105	1716	.7132
4110	1926	.7362
4111	2004	.7439
4112	2052	.7484
4113	2100	.7527
4114	2160	.7579

The Horner Plot of the build-up pressures of the lower and upper chambers is presented on Plot No. 6. It is not clear where to pick the straight line Horner slope from the build-up on the expanded scale. This may be due to the presence of gas. Gas may also explain the inability to reach a final reservoir pressure in late time in the upper sample chamber.

PLOT NO. 5


2849.8 meter pretest build-up
File 15
Pressure (psi)
4124
4123
4122
4121
4120
cylindrical flow
m = 4123.4-4120 / 1.36
=2.5 psi/cycle
• Fs .8 .7 .6 .5 .4 .3 .2 .1 0.0
× Fc 1.5 1.0 .5 0.0

PE906204

This is an enclosure indicator page.
The enclosure PE906204 is enclosed within the container PE906202 at this location in this document.

The enclosure PE906204 has the following characteristics:

```
     ITEM_BARCODE = PE906204
CONTAINER_BARCODE = PE906202
             NAME = Horner Plot (No.6)
            BASIN = GIPPSLAND
           PERMIT = VIC/P17
             TYPE = WELL
          SUBTYPE = DIAGRAM
      DESCRIPTION = Horner Plot No.6 (enclosure from
                    attachment 3 to WCR) for Omeo-1
          REMARKS =
     DATE_CREATED = 4/02/83
    DATE_RECEIVED = 11/08/83
             W_NO = W788
        WELL_NAME = OMEO-1
       CONTRACTOR =
     CLIENT_OP_CO = AUSTRALIAN AQUITAINE PETROLEUM
```

(Inserted by DNRE - Vic Govt Mines Dept)

RFT SUITE NO. 1 - RUN NO. 2

2936.5 Meters - File 33

Pretest Spherical and Radial Cylindrical Build-up

T_1 = 11.6 sec. T_2 = 4.6 sec. q_1 = .86 cc/sec.
q_2 = 2.17 cc/sec. u = .3 cp Porosity = .15
$C_t = 3 \times 10^{-6}$ psi^{-1} h = 100 cm

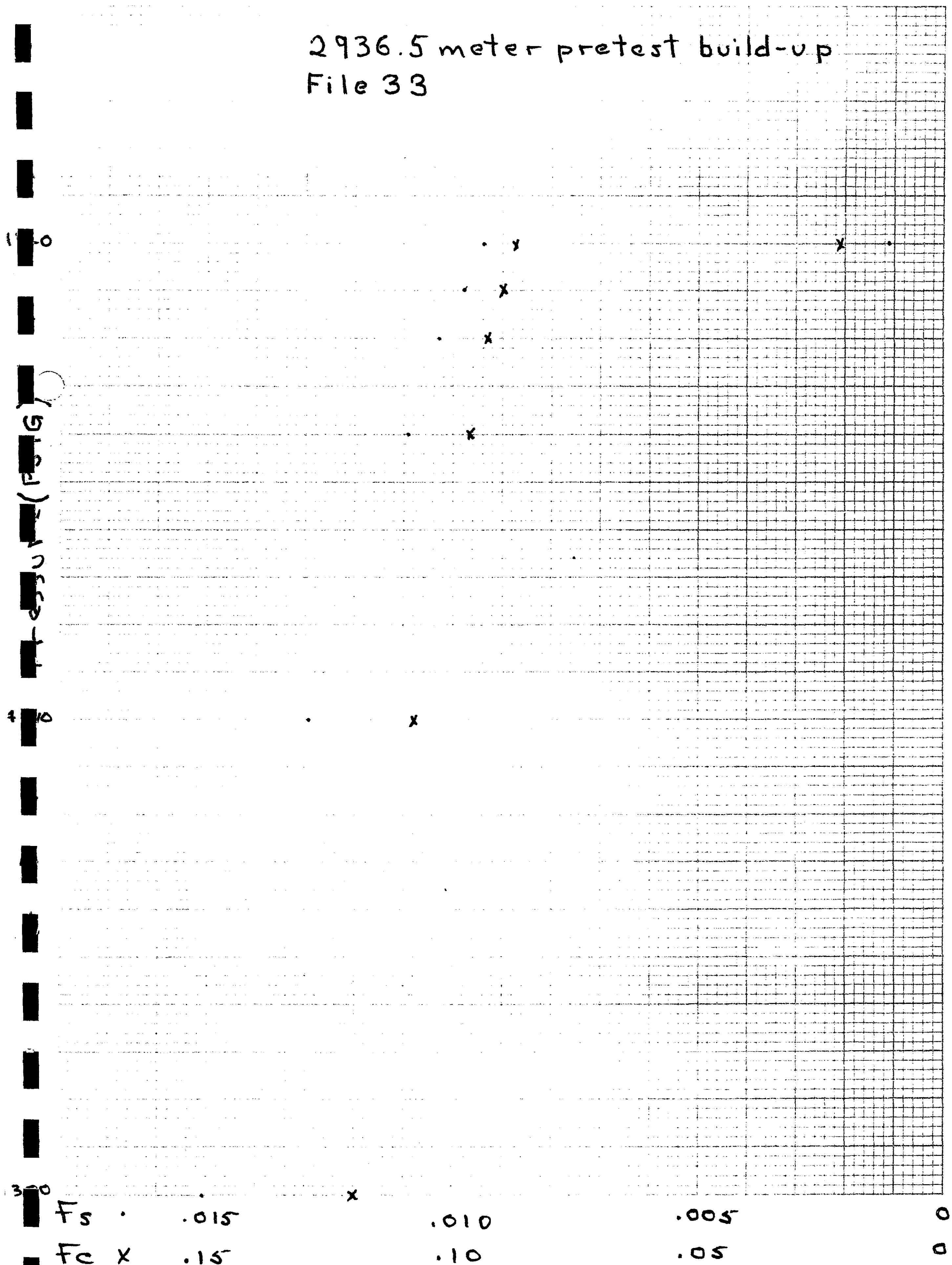
Pressure (PSIG)	DT (sec)	Fs (DT)	Fc (DT)
4300	78	.01507	.1199
4310	87	.01293	.1082
4316	98	.01093	.0968
4318	102	.01033	.0932
4319	106	.00978	.0899
4320	109	.00940	.0875
4320	469	.00112	.0212

2936.5 meters - File 34

T_1 = 12.8 sec. T_2 = 5.6 sec. q_1 = .78 cc/sec.
q_2 = 1.78 cc/sec. u = .3 cp Porosity = .15
$C_t = 3 \times 10^{-6}$ psi^{-1} h = 100 cm

4300	64	.02142	.1564
4310	71	.01858	.1424
4316	83	.01498	.1233
4317	90	.01338	.1144
4318	94	.01259	.1099
4319	105	.01078	.0991
4320	151	.00643	.0702
4320	181	.00495	.0590

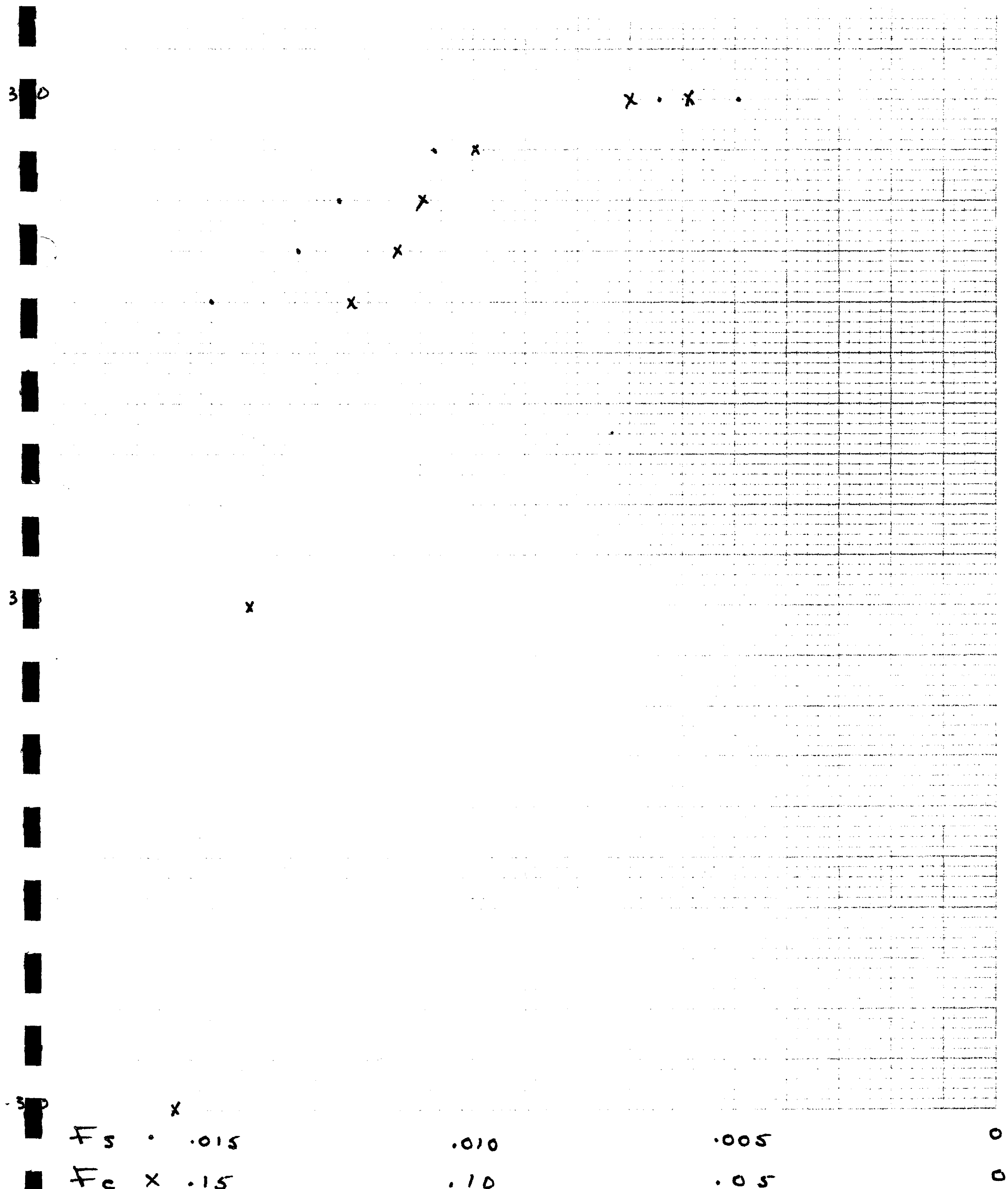
PLOT NO. 7



2936.5 meter pretest build-up
File 33
(PSIG)
Fs · .015 .010 .005 0
Fc x .15 .10 .05 0

PLOT NO. 8

2936.5 meter pretest build-up
File 34



RFT SUITE NO. 1 - RUN NO. 2

2936.5 Meters - File No. 33

Pretest Spherical and Radial Cylindrical Build-up

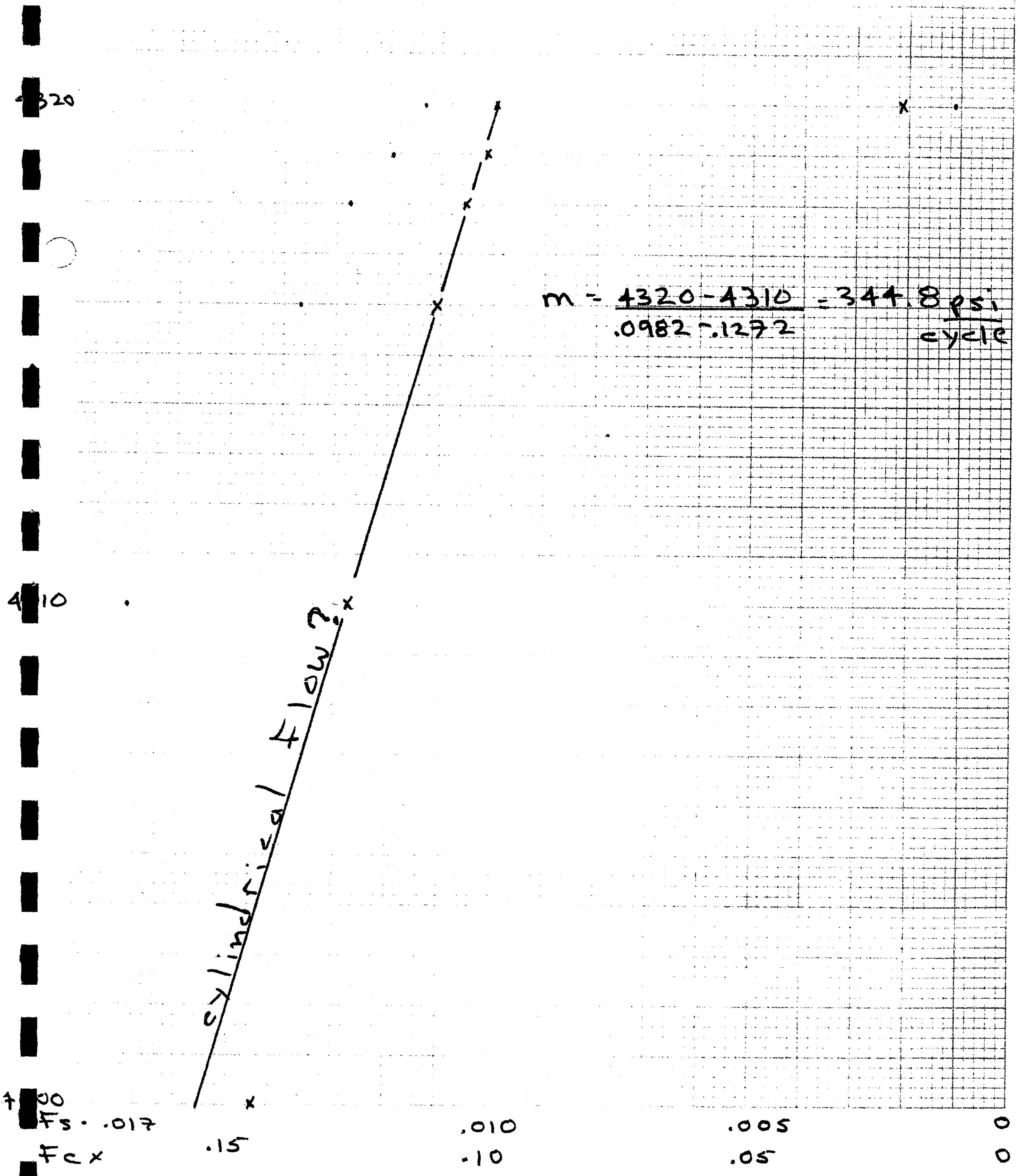
T_1 = 11.6 sec. T_2 = 46.6 sec. q_1 = .86 cc/sec.
q_2 = .21 cc/sec. u = .3 cp Porosity = .15
$C_t = 3 \times 10^{-6}$ psi^{-1} h = 100 cm

Pressure (PSIG)	DT (sec)	Fs (DT)	Fc (DT)
4300	36	.02083	.1451
4310	45	.01693	.1272
4316	56	.01367	.1107
4318	60	.01275	.1058
4319	64	.01193	.1013
4320	67	.01137	.0982
4320	427	.00115	.0215

Here a long fill-up time has been interpreted for the second pretest chamber. The radial cylindrical slope from Plot No. 7a is 345 psi per cycle for a radial cylindrical permeability of .02 md. If this were correct the extrapolated reservoir pressure would be considerably higher yet at late time it is still 4320 PSIG. This must mean that the pressure regime does not fit the cylindrical flow model.

PLOT NO. 7 a.

2936.5 meter pretest build-up
File 33



RFT SUITE NO. 1 - RUN NO. 3

2936.5 Meters - File 73

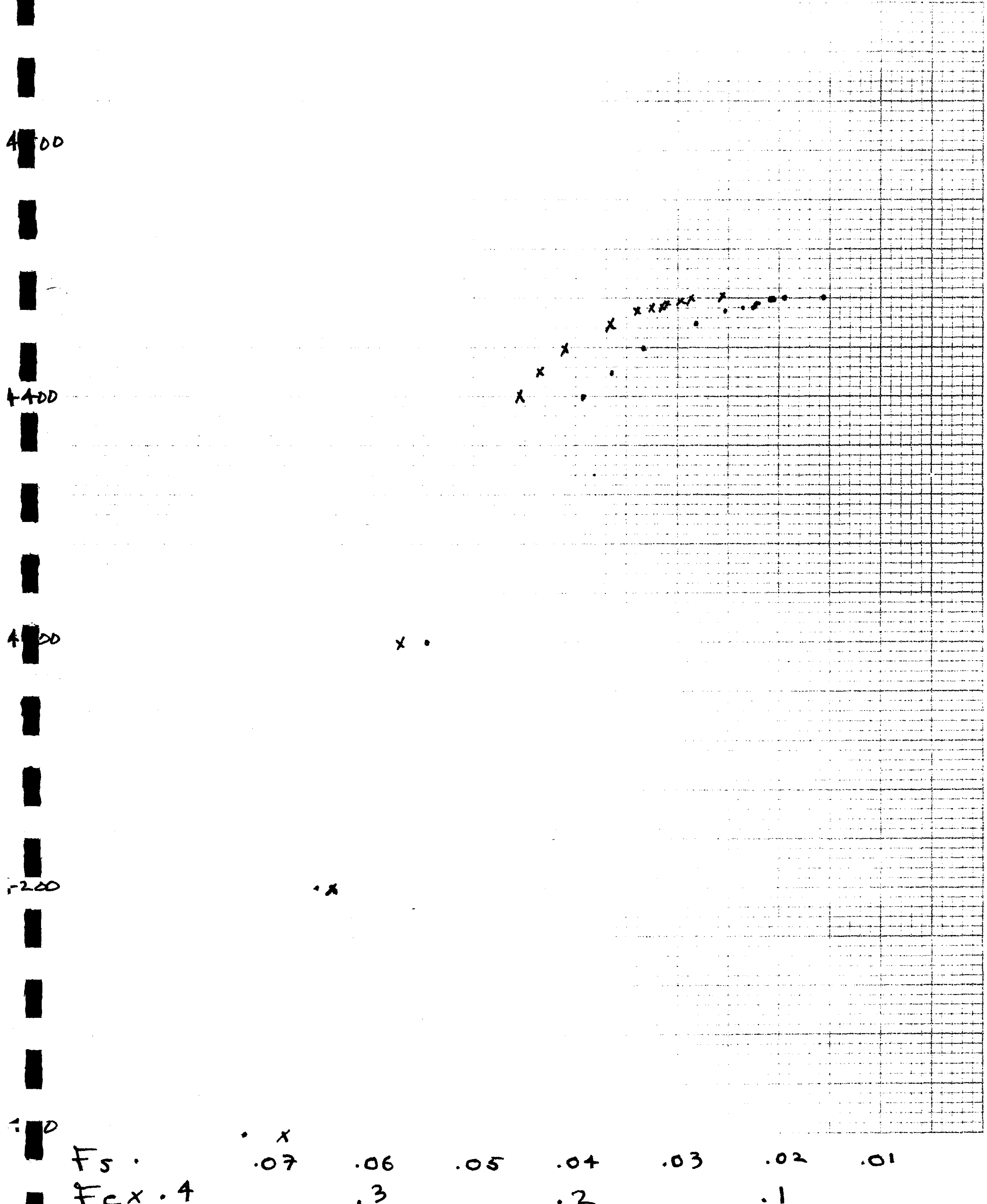
Pretest Spherical and Radial Cylindrical Build-up

T_1 = 12 sec. T_2 = 5.6 sec. q_1 = .83 cc/sec.
q_2 = 1.78 cc/sec. u = .3 cp Porosity = .15
$C_t = 3 \times 10^{-6}$ psi^{-1} h = 100 cm

Pressure (PSIG)	DT (sec)	Fs (DT)	Fc (DT)
4100	24	.07234	.3431
4200	26	.06553	.3215
4300	30	.05477	.2856
4400	39	.03910	.2285
4410	41	.03663	.2188
4420	44	.03338	.2057
4430	50	.02816	.1838
4435	54	.02540	.1716
4436	57	.02361	.1635
4437	59	.02254	.1585
4438	60	.02203	.1561
4439	63	.02061	.1493
4440	66	.01934	.1432
4441	78	.01537	.1228

PLOT NO. 9

2936.5 meter pretest build-up
File 73



RFT SUITE NO. 1 - RUN NO. 3

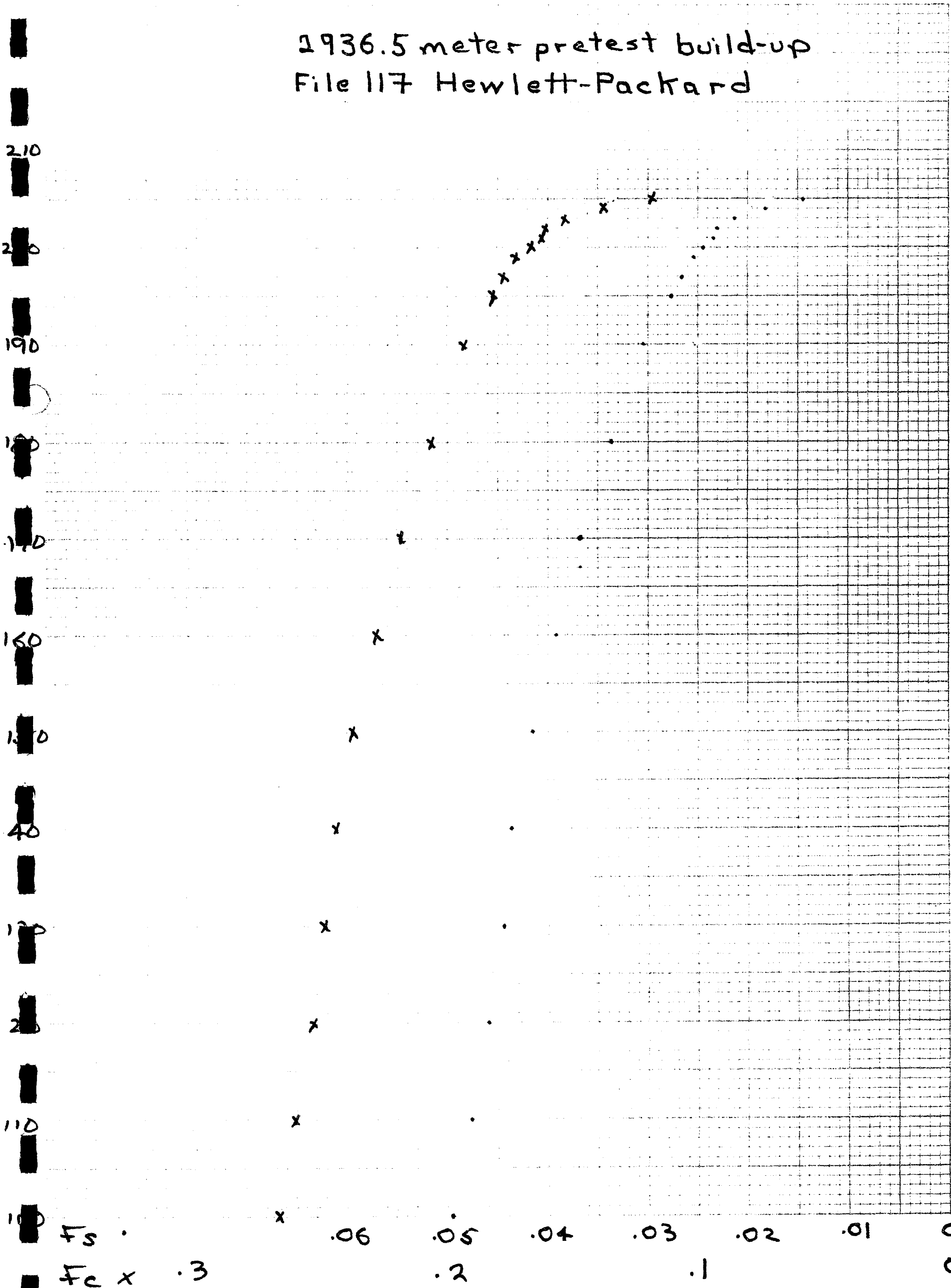
2936.5 Meters - File 117

Hewlett-Packard Pretest Spherical and Radial Cylindrical Build-up

T_1 = 12 sec. T_2 = 5.6 sec. q_1 = .83 cc/sec.
q_2 = 1.78 cc/sec. u = .3 cp Porosity = .15
$C_t = 3 \times 10^{-6}$ psi^{-1} h = 100 cm

Pressure (PSIA)	DT (sec)	Fs (DT)	Fc (DT)
4100	32.4	.04967	.2677
4110	33.4	.04777	.2609
4120	34.4	.04600	.2544
4130	35.2	.04466	.2495
4140	36.0	.04338	.2447
4150	37.2	.04158	.2379
4160	39.0	.03910	.2285
4170	40.8	.03690	.2197
4180	43.6	.03378	.2073
4190	47.2	.03041	.1934
4195	50.4	.02786	.1824
4197	52.0	.02672	.1774
4199	54.0	.02540	.1716
4200	55.6	.02442	.1671
4201	57.2	.02350	.1629
4202	57.6	.02328	.1619
4203	61.6	.02125	.1524
4204	68.6	.01835	.1382
4205	80.6	.01468	.1192

PLOT NO. 10


1936.5 meter pretest build-up
File 117 Hewlett-Packard
210
190
160
110
Fs ·
Fc x
.06
.05
.04
.03
.02
.01
0
.3
.2
.1
0

RFT SUITE NO.1 - RUN NO. 3

2936.5 Meters - File 122

Hewlett-Packard Pretest Spherical and Radial Cylindrical Build-up

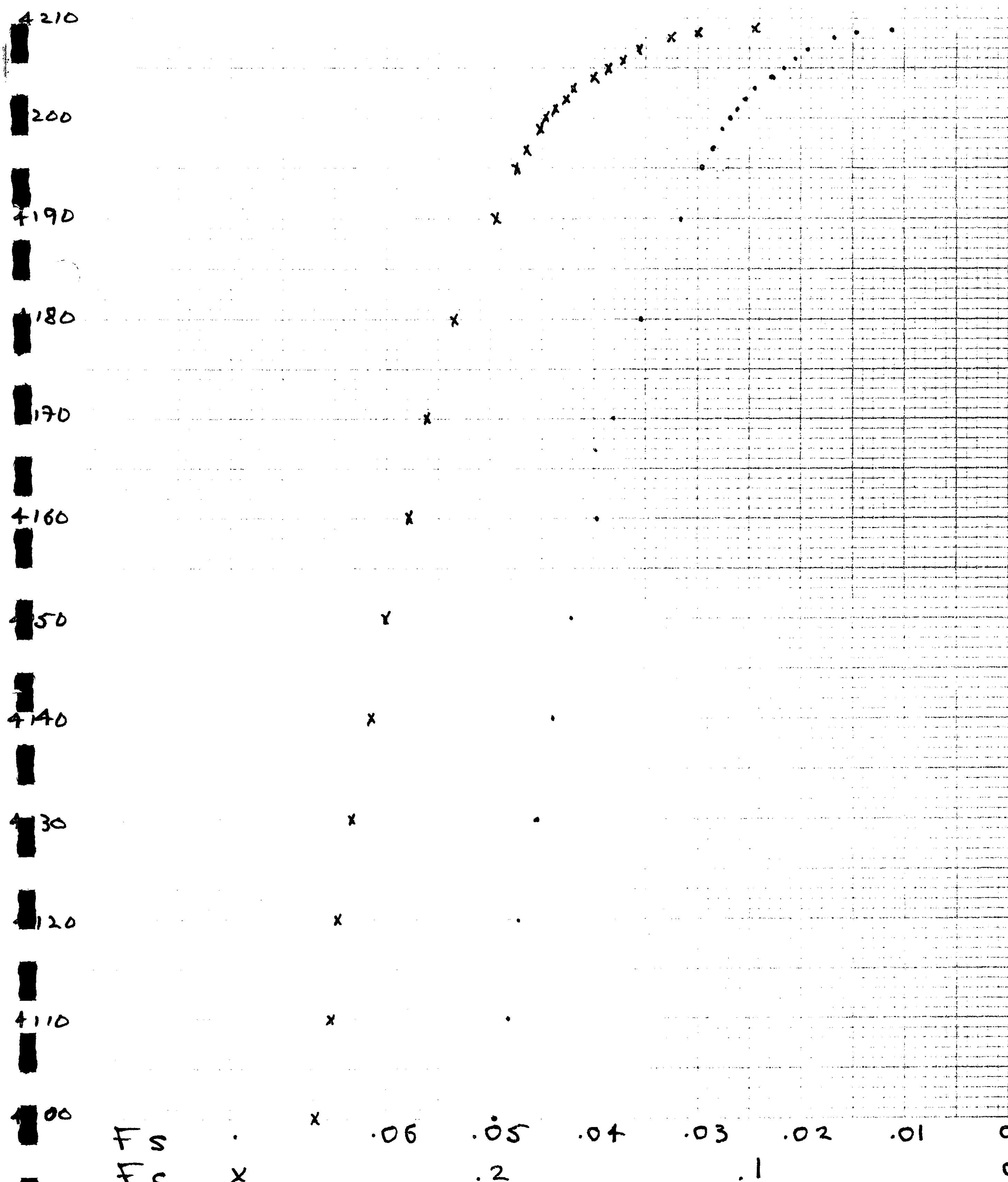
T_1 = 12 sec. T_2 = 5.6 sec. q_1 = .83 cc/sec.
q_2 = 1.78 cc/sec. u = .3 cp Porosity = .15
$C_t = 3 \times 10^{-6}$ psi^{-1} h = 100 cm

Pressure (PSIA)	DT (sec)	Fs (DT)	Fc (DT)
4100	32.4	.04967	.2677
4110	33.2	.04814	.2622
4120	33.6	.04741	.2596
4130	34.6	.04566	.2532
4140	35.6	.04401	.2471
4150	36.8	.04216	.2402
4160	38.4	.03990	.2315
4170	39.8	.03808	.2245
4180	42.0	.03549	.2142
4190	45.6	.03184	.1993
4195	48.0	.02974	.1905
4197	49.2	.02878	.1854
4199	50.8	.02757	.1812
4200	51.6	.02700	.1787
4201	52.8	.02618	.1750
4202	54.0	.02540	.1716
4203	55.2	.02466	.1682
4204	58.4	.02285	.1599
4205	60.4	.02183	.1551
4206	63.2	.02052	.1489
4207	65.8	.01942	.1435
4208	72.4	.01703	.1315
4208.5	79.6	.01494	.1206
4208.98	98.8	.01105	.0986

PLOT NO. 11

2936.5 meter pretest build-up

File 122 Hewlett-Packard



RFT SUITE NO. 1 - RUN NO. 3

2936.5 Meters - File 122

Hewlett-Packard Pretest Spherical and Radial Cylindrical Build-Up

The assumption made here is that gas is in the flowline and the fill-up time for the second pretest chamber is 45.6 seconds instead of 5.6 seconds.

T_1 = 12 sec. T_2 = 45.6 sec. q_1 = .83 cc/sec.
q_2 = .22 cc/sec. u = .3 cp Porosity = .15
$C_t = 3 \times 10^{-6}$ psi^{-1} h = 100 cm

Pressure	DT (sec)	Fs (DT)	Fc (DT)
4195	2.4	.1481	.4418
4197	3.6	.1166	.3958
4199	5.2	.0932	.3545
4200	6.0	.0851	.3385
4201	7.2	.0757	.3183
4202	8.4	.0684	.3014
4203	9.6	.0625	.2868
4204	12.8	.0511	.2559
4205	14.8	.0459	.2406
4206	17.6	.0403	.2227
4207	20.2	.0362	.2087
4208	26.8	.0287	.1810
4208.5	34.0	.0233	.1589
4208.98	53.2	.0153	.1210

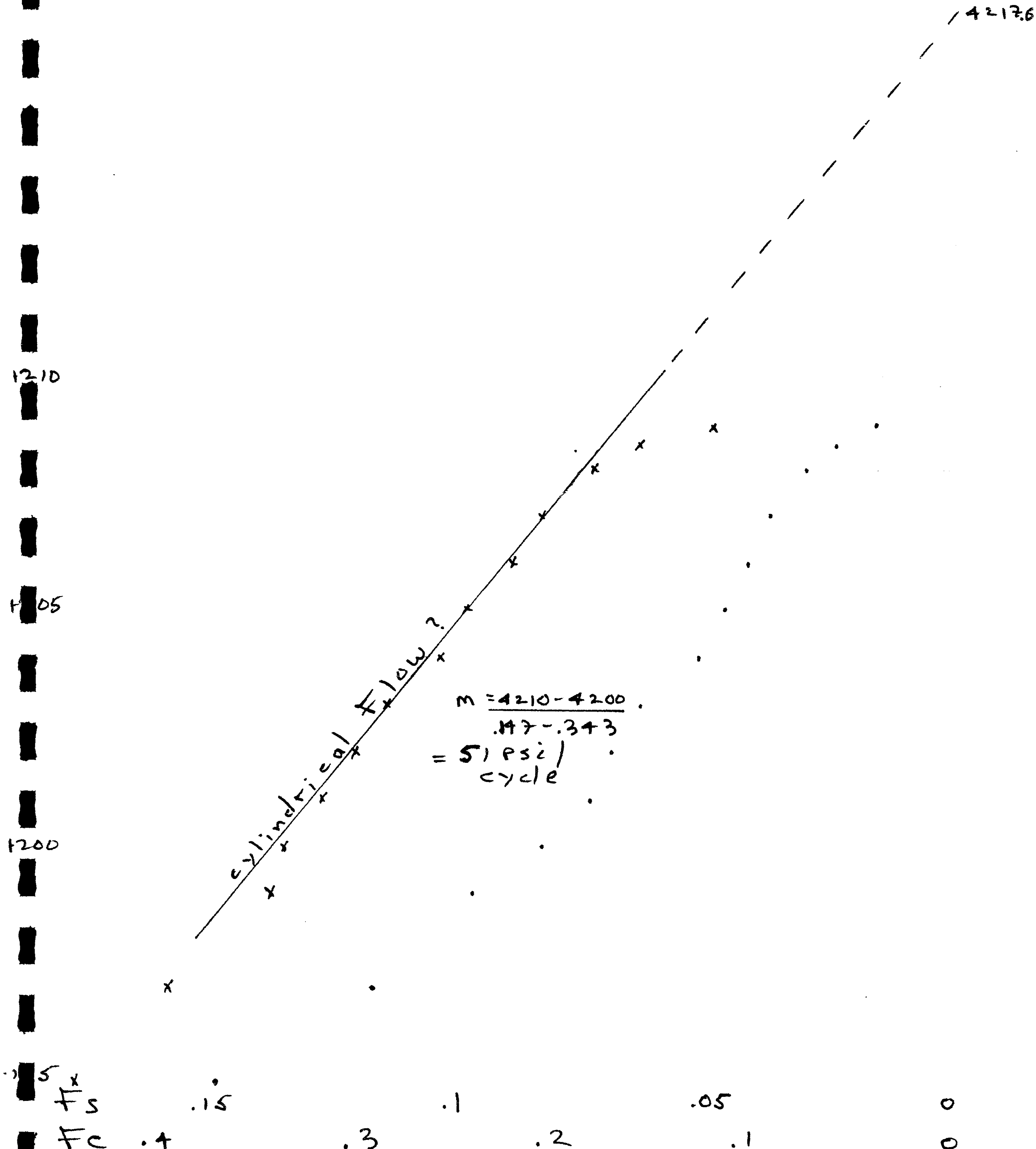
It the Plot No. 11a does go into radial cylindrical flow with a straight line slope of 51 psi per cycle then radial cylindrical permeability is 0.13 md.

The reservoir pressure would then be extrapolated to an increase of 9 PSI.

With a permeability of only 0.13 md it is unlikely that the 22,700 cc lower chamber filled up.

PLOT No. 11 a.

2936.5 meter pretest build-up
File 122 Hewlett-Packard



RFT SUITE NO. 1 - RUN NO. 3

2936.5 Meters - File 122

Hewlett-Packard Lower Sample Chamber Build-up Horner Plot

T = 435 sec.   q = 20,700 cc.

Pressure (PSIA)	DT	$\frac{DT}{T + DT}$
4190	34	.07249
4191	46	.09563
4192	53	.01086
4193	69	.13690
4194	78	.15205
4195	90	.17143
4196	106	.19593
4197	117	.21196
4198	141	.24479
4199	204	.31925
4200	290	.4000
4201	440	.50286
4202	626	.59001
4202.2	698	.61606

T = 30 sec. assuming plugged tool or sample chamber not opened.

4190	439	.93603
4191	451	.93763
4192	458	.93852
4193	474	.94048
4194	483	.94152
4195	495	.94286
4196	511	.94455
4197	522	.94565
4198	546	.94792
4199	609	.95305
4200	695	.95862
4201	845	.96571
4202	1031	.97172
4202.2	1103	.97352

PE906205

This is an enclosure indicator page.
The enclosure PE906205 is enclosed within the container PE906202 at this location in this document.

The enclosure PE906205 has the following characteristics:

ITEM_BARCODE =	PE906205
CONTAINER_BARCODE =	PE906202
NAME =	Horner Plot (No.12)
BASIN =	GIPPSLAND
PERMIT =	VIC/P17
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Horner Plot No.12 (enclosure from attachment 3 to WCR) for Omeo-1
REMARKS =	
DATE_CREATED =	4/02/83
DATE_RECEIVED =	11/08/83
W_NO =	W788
WELL_NAME =	OMEO-1
CONTRACTOR =	
CLIENT_OP_CO =	AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)

RFT SUITE NO. 1 - RUN NO. 2

2952 Meters - File 38

Pretest Spherical and Radial Cylindrical Build-up

T_1 = 10 sec. T_2 = 5.2 sec. q_1 = 1.0 cc/sec.
q_2 = 1.92 cc/sec. u = .3 cp Porosity = .17
$C_t = 3 \times 10^{-6}$ psi^{-1} h = 100 cm

Pressure (PSIG)	DT (sec)	Fs (DT)	Fc (DT)
4328	32	0.04302	0.2290
4329	62	0.0178	0.1274
4330	86	0.0113	0.0941
4335	212	0.0031	0.0398
4336	242	0.0026	0.0350
4337	278	0.0021	0.0305
4338	302	0.0018	0.0281
4340	362	0.0014	0.0236
4345	488	0.0009	0.0176
4350	572	0.0007	0.0150
4353	611	0.00065	0.0141
4340	660	0.0006	0.0130
4350	842	0.0004	0.0102

A Plot of both spherical and radial cylindrical data on Plot No. 13 does not fall on a straight line. In addition there is a 13 psi drop and then a 13 psi build-up back to 4353 psi which may be due to drift or a shift in the pressure measuring system. This shift of 13 psi is fairly close to the 16 psi difference in hydrostatic pressure before and after the test at this level.

Lower Sample Chamber Horner Plot Pressure Build-up at 2952 Meters

T = 606 sec.

Pressure (PSIG)	DT (sec)	$\frac{DT}{T + DT}$
3800	36	0.0561
4000	54	0.0818
4300	72	0.1062
4320	90	0.1293
4321	152	0.2005
4322	216	0.2628

Upper Sample Chamber Horner Plot Pressure Build-up at 2952 Meters

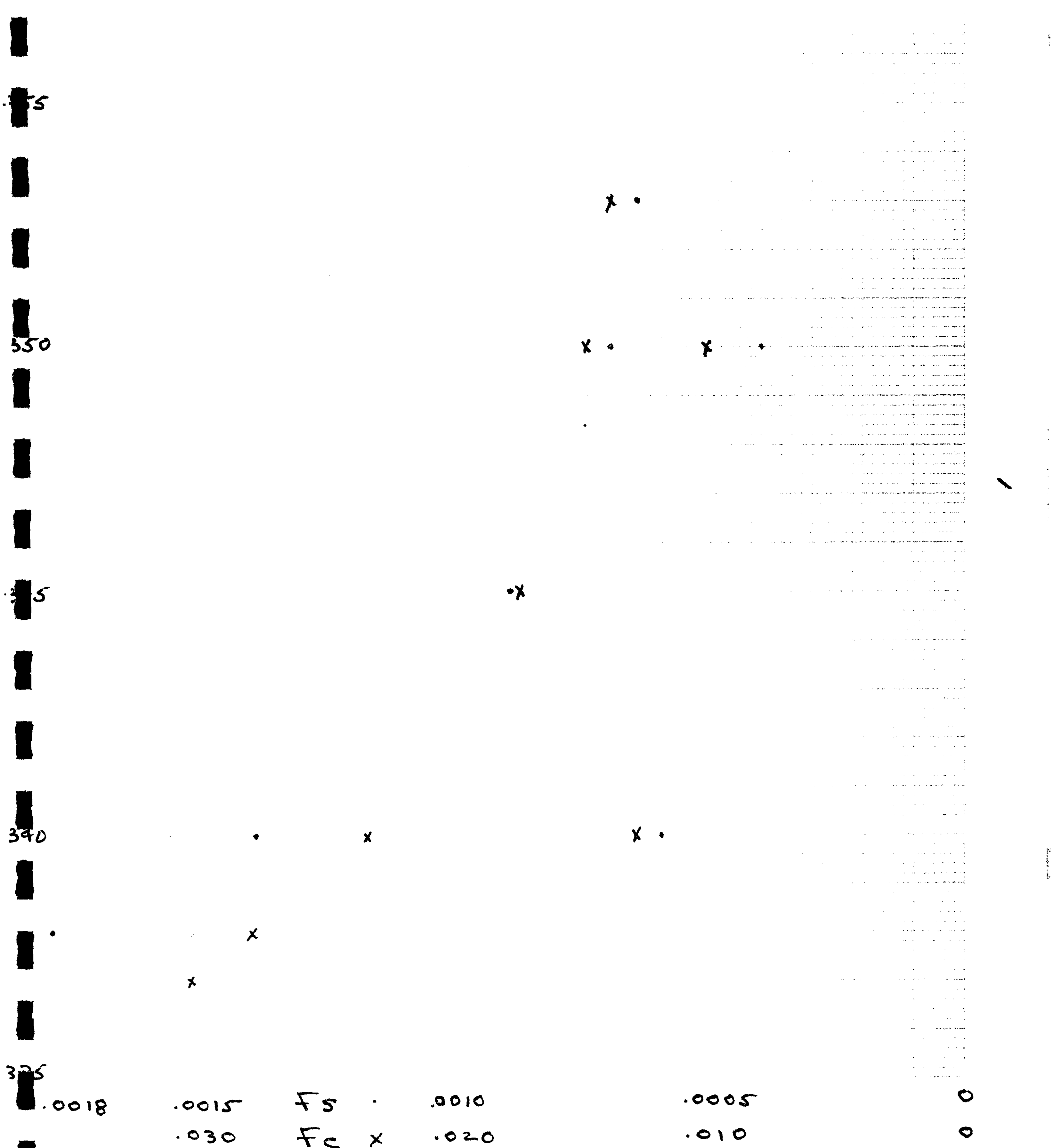
T = 512 sec.

4000	22	.0412
4300	44	.0791
4316	48	.0857
4317	53	.0938
4318	57	.100
4319	87	.1452
4320	229	.3090

It does seem as if the Horner Plot data does go into a straight line, for the upper chamber and possibly the lower chamber. Computed Horner Plot permeabilities then are 147 md from the lower chamber build-up and 414 md from the upper chamber build-up.

PLOT NO. 13

2952 meter pretest build-up
File 38



PE906206

This is an enclosure indicator page.
The enclosure PE906206 is enclosed within the container PE906202 at this location in this document.

The enclosure PE906206 has the following characteristics:

ITEM_BARCODE =	PE906206
CONTAINER_BARCODE =	PE906202
NAME =	Horner Plot (No.14)
BASIN =	GIPPSLAND
PERMIT =	VIC/P17
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Horner Plot No.14 (enclosure from attacment 3 to WCR) for Omeo-1
REMARKS =	
DATE_CREATED =	4/02/83
DATE_RECEIVED =	11/08/83
W_NO =	W788
WELL_NAME =	OMEO-1
CONTRACTOR =	
CLIENT_OP_CO =	AUSTRALIAN AQUITAINE PETROLEUM

(Inserted by DNRE - Vic Govt Mines Dept)

RFT SUITE NO. 1 - RUN NO. 1

2854 Meters - File 16

Pretest Spherical and Radial Cylindrical Build-up

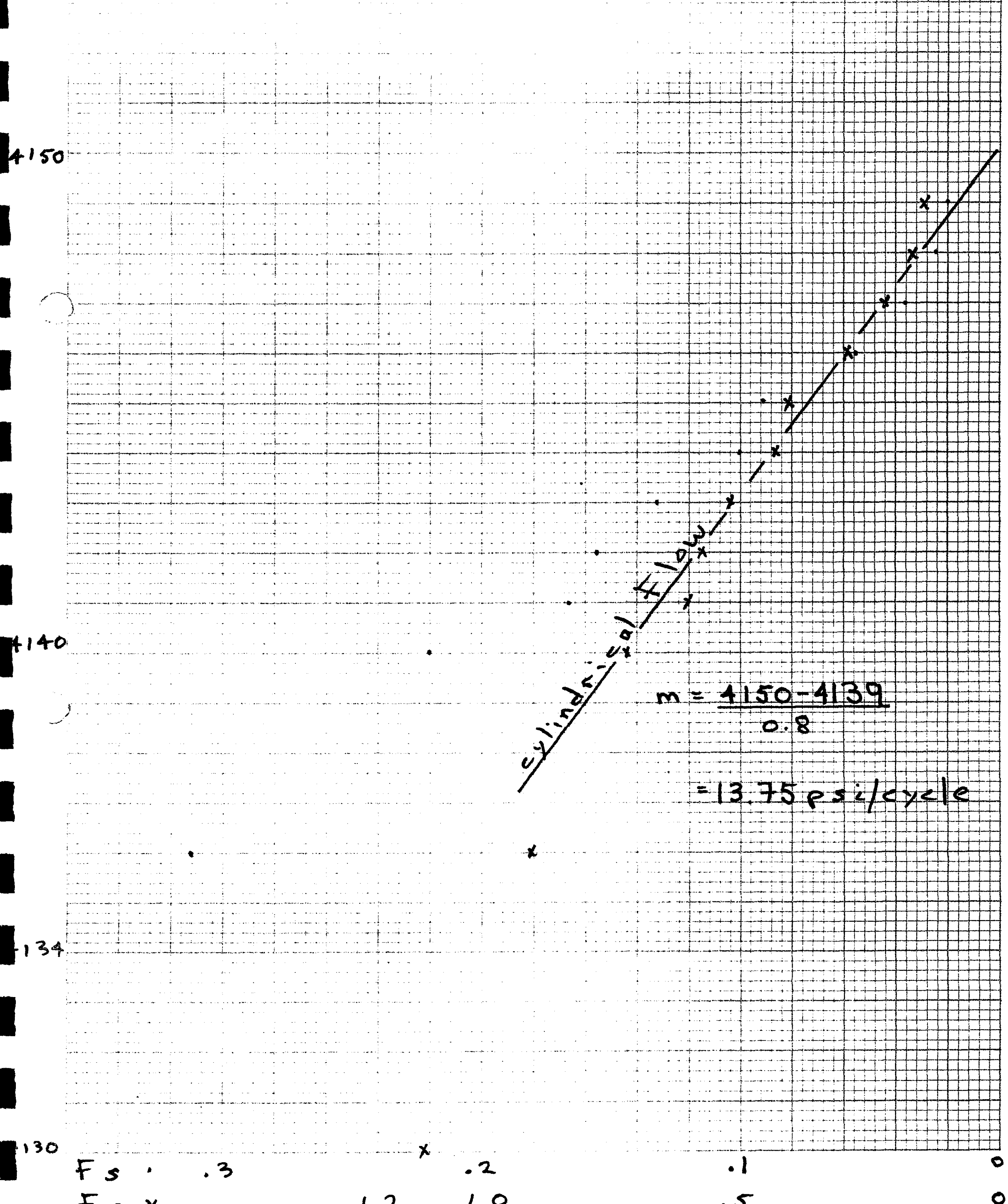
T_1 = 12.8 sec. T_2 = 4.8 sec. q_1 = .78 cc/sec.
q_2 = 2.08 cc/sec. u = .3 cp Porosity = .15
$C_t = 3 \times 10^{-6}\ psi^{-1}$ h = 120 cm

Pressure (PSIG)	DT (sec)	Fs (DT)	Fc (DT)
4130	5.2	.433	1.115
4136	7.2	.313	.907
4140	10.0	.220	.725
4141	12.8	.167	.606
4142	13.6	.156	.579
4143	15.6	.133	.522
4144	19.6	.101	.437
4145	21.2	.092	.410
4146	31.2	.056	.298
4147	42.8	.037	.227
4148	58.4	.025	.172
4149	65.0	.021	.156

An examination of Plot No. 15 shows that the build-up probably goes into radial cylindrical line with a slope of 13.75 PSI per cycle for a radial cylindrical permeability of 0.38 md assuming a bed thickness of 120 cm from the CYBERLOOK.

PLOT NO. 15

2854 meter pretest buildup
File 16



RFT SUITE NO. 1 - RUN NO. 1

2858 Meters - File 17

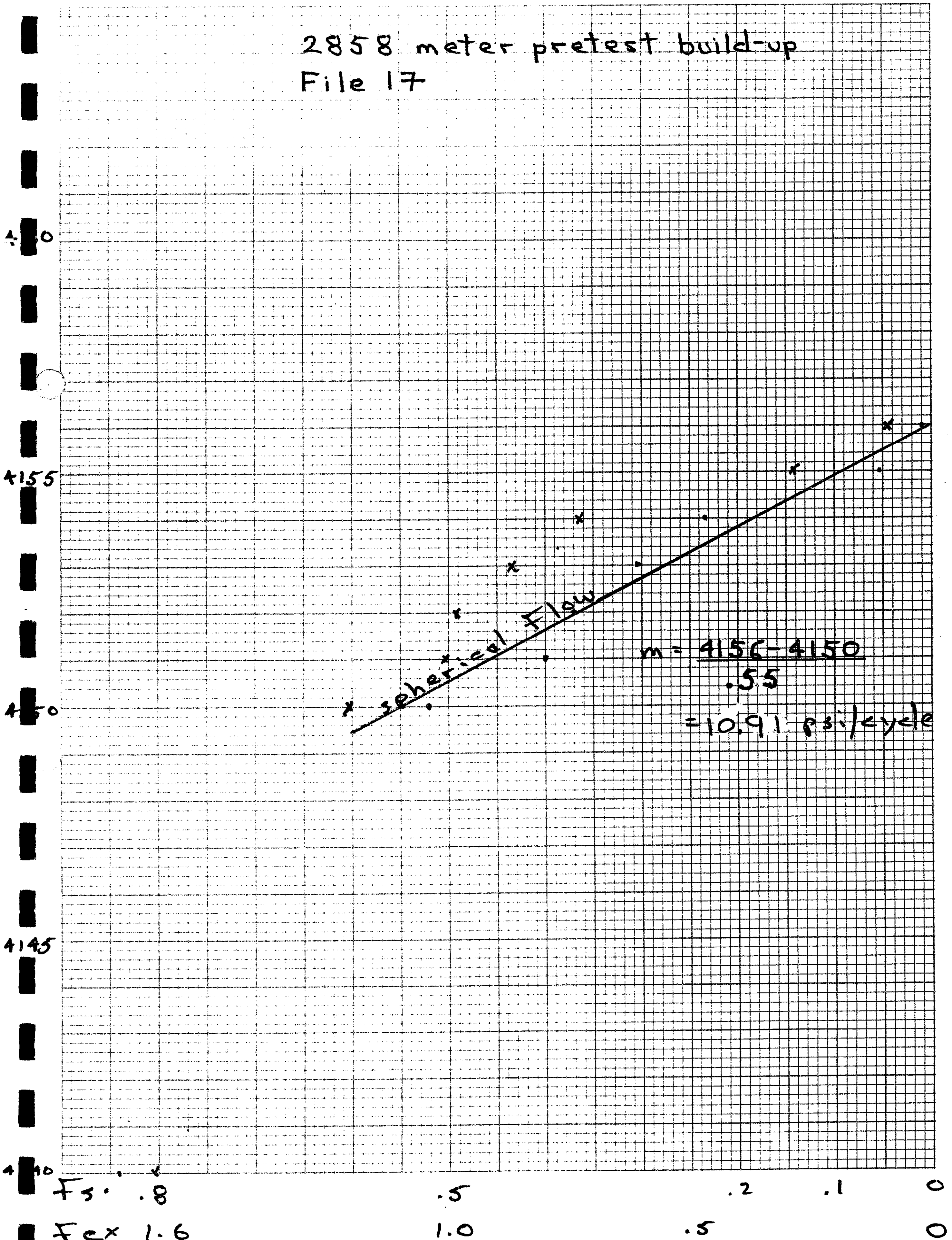
Pretest Radial and Spherical Build-up

T_1 = 12 sec. T_2 = 6 sec. q_1 = .83 cc/sec.
q_2 = 1.67 cc/sec. u = .3 cp Porosity = .10
$C_t = 3 \times 10^{-6}$ psi^{-1} h = 200 cm

Pressure (PSIG)	DT (sec)	Fs (DT)	Fc (DT)
4140	2.0	.841	1.609
4150	3.6	.519	1.209
4151	4.8	.401	1.033
4152	5.2	.372	.987
4153	6.4	.305	.872
4154	8.4	.233	.734
4155	30.	.054	.284
4156	108.	.010	.091

Plot No. 16 seems to best fit the spherical flow model with the straight line slope of 5.46 PSI per cycle for a spherical permeability of 0.67 md.

PLOT NO. 16



2858 meter pretest build-up
File 17
4160
4155
4150
4145
4140
spherical Flow
m = (4156-4150)/.55
=10.91 psi/cycle
Fs .8 .5 .2 .1 0
Fex 1.6 1.0 .5 0

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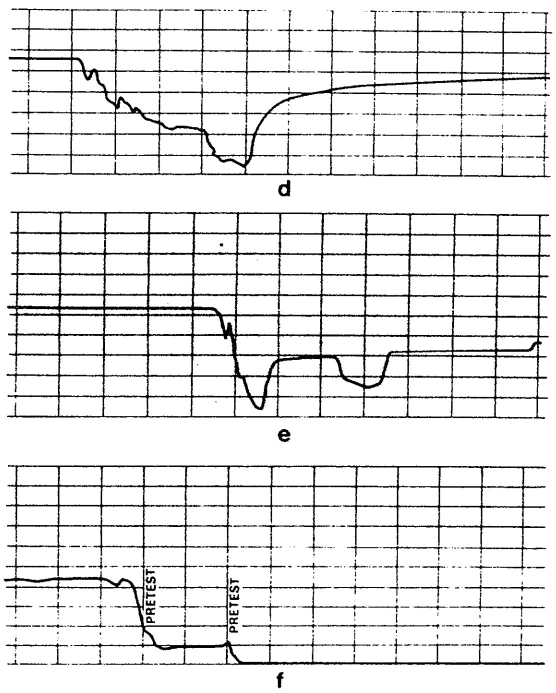


FIG. III-1 (d, e, f): Typical RFT pretest records showing probe plugging.

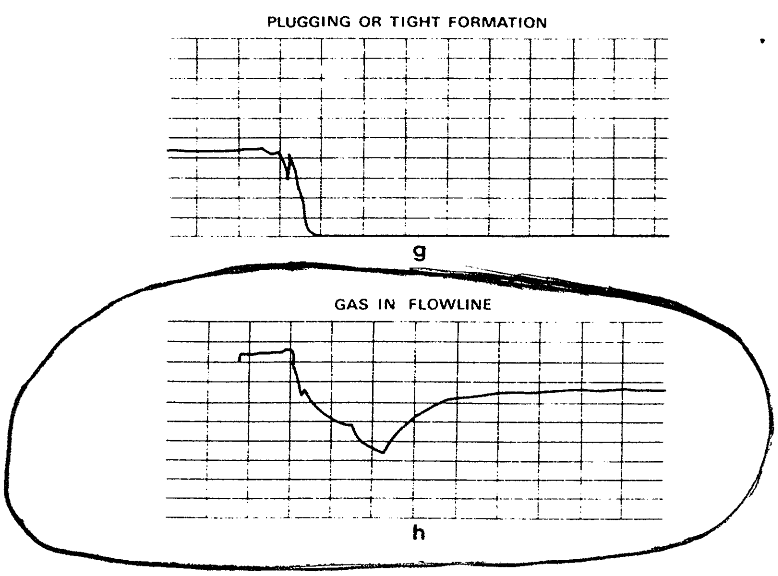


FIG. III-1 (g, h): Typical RFT pretest records in tight formation and when gas is present in the flowline.

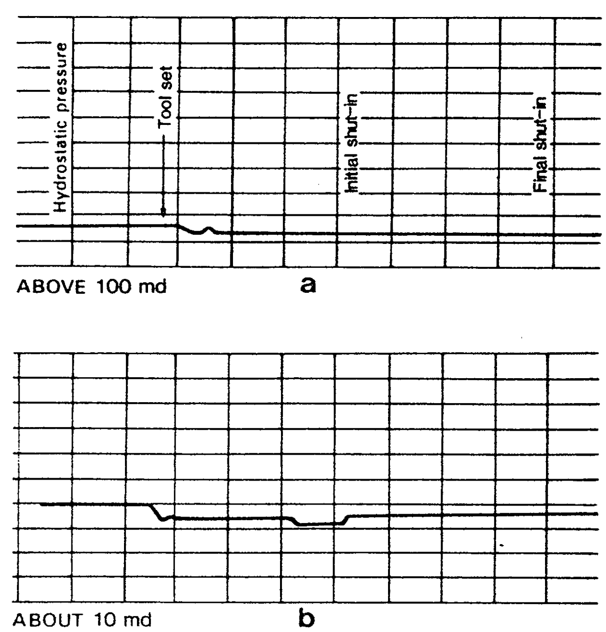
where complete plugging occurs during the second pretest. Complete plugging at the beginning of the first pretest (fig. III-1g) might be mistaken for a test in a tight formation.

If gas is trapped in the flowline, the pressure profile will look as shown in Fig. III-1h. Due to the expansion of gas in the system, the pressure drops with the piston motion. Consequently, the flow into the pretest chambers is not at a constant rate and permeability cannot be derived from drawdown.

1.2. Permeability Indication in Valid Pretests

Qualitatively, the analog pretest pressure profile gives an excellent quicklook estimation of the formation permeability in the vicinity of the probe. More quantitative permeability evaluation is possible, as will be explained in a later chapter of this book.

Fig. III-2a is an example of good permeability, above 100 md; Fig. III-2b is an indication of moderate permeability of about 10 md. Fig. III-2c suggests low permeability, of the order of 1 md, while Fig. III-2d shows a very low pretest flowing pressure, indicative of a permeability of the order of 0.1 md or less. The limit is the dry test or total plugging as in Fig. III-1g



where Δp_{skin} = incremental pressure drop due to alteration.

In RFT units this equation becomes:

$$(p_i - p)_{ss} = \frac{1170\ q\mu}{k_d r_p}(2C + S_s) \qquad (3.2.3)$$

where:

$$S_s = \frac{\Delta p_{skin} k_d r_p}{1170\ q\mu}$$

When the medium is anisotropic, it is suggested that the isotropic permeability k be replaced by k_s, the equivalent spherical permeability from build-up analysis.

In practical situations the spherical flow skin factor, S_s, can only be obtained by measuring $(pi - p)_{ss}$ at the end of a flow period, determining the permeability of the unaltered zone from build-up analysis, and using the equation:

$$(p_i - p)_{ss} = \frac{1170\ q\mu}{k_s r_p}(2C + S_s)$$

to calculate S_s.

3.3. Upper Limit of Measurable Drawdown Rate

The maximum inflow rate, $q_{s,max}$, at which fluid can flow to the RFT probe from the formation without having the system pressure fall below that fluid's bubble point pressure (at reservoir temperature) is:

$$q_{s,max} = \frac{k_d r_p (p_i - p_b)}{1170\ \mu\ (2C + S_s)} \qquad (3.3.1)$$

where:

k_d = spherical drawdown permeability — in md
r_p = effective probe radius — in cm
p_i = formation pressure — in psi
p_b = bubble point pressure of filtrate — in psi
μ = filtrate viscosity — in cp
C = flow shape factor
S_s = Spherical flow skin factor

The displacement rate of the first piston is approximately 0.67 cc/sec and for the second piston is 1.67 cc/sec. If one of these rates exceeds $q_{s,max}$, the pretest system will be drawn to the bubble point of the sampled fluid (water, for example) and flashing of that fluid will occur in the chambers. The analog pressure record then has the characteristic form illustrated in Fig. III-5. This phenomenon occurs in very low permeability formation or if there is plugging or formation damage near the probe giving a large spherical skin factor, S_s.

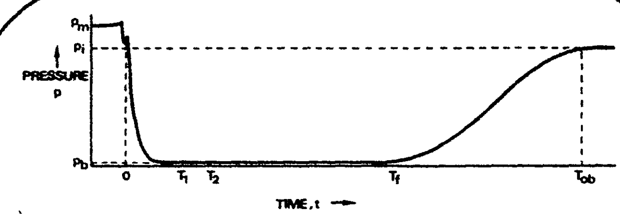


FIG. III-5: Record limited drawdown test.

For the following typical parameter values and standard probe size:

$$\mu = 0.5 \text{ cp}$$
$$S_s = 0$$
$$p_b = 15 \text{ psi (at } 250^\circ \text{ F)}$$
$$p_i = 4\ 000 \text{ psi}$$

the maximum inflow rate becomes $q_{s,max} = 1.4\ k_d$. Hence drawdown permeabilities of less than around 1 md yield maximum inflow rates less than the second piston displacement rate.

In a case where the first piston displacement rate also exceeds $q_{s,max}$, the pressure in the chambers rapidly falls to p_b at which point vapourization commences. The probe inflow rate and chamber pressure now remain essentially constant at $q_{s,max}$ and p_b respectively until a cumulative volume of 20 cc of filtrate has entered the system. This fill up time, T_f, in Fig. III-5 depends on the value of $q_{s,max}$ and is longer than the period of piston motion T_2. Flashing of water continues until the second piston stops at time T_2; from T_2 until T_f the water vapour condenses as incoming filtrate refills the pretest system with liquid.

It is apparent from the pressure response that when flashing occurs, the flowrate does not follow the two-rate process but essentially remains constant, i.e.:

$$q_{s,max} \text{ is also } = V_d/T_f$$

where

DIVIDER PAGE

AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.

OMEO NO. 1

REVIEW OF 2 JANUARY 1983 LOGS

BOWLER LOG CONSULTING SERVICES PTY. LTD.

JACK BOWLER
Telephone: (051) 56 6170

P.O. BOX 2,
PAYNESVILLE. 3880
VICTORIA,
AUSTRALIA

13th January, 1983

Mr. Frank Brophy,
Australian Aquitaine Petroleum Pty. Ltd.,
Elf Aquitaine Petroleum Pty. Ltd.,
14th Floor,
99 Mount Street,
NORTH SYDNEY. N.S.W. 2060.

Dear Frank,

Please find my comments on the 2nd January, 1983 logs run on Omeo No. 1.

Basically they indicate hydrocarbons from 2845 to 2960 meters with most of the section quite shaley. Porosity averages around 10 per cent and water satuaration about 65 to 70 per cent.

The playback of the near and far neutron countrates suggests the presence of gas from 2847 to 2857 meters (gross).

The SP still suggests a Rw of 0.07 or 35,000 PPM NaCl.

Yours very truly,

J Bowler

J. Bowler.

Enc.

Rw Determination

The two small shale breaks at 2959 and 2952.5 meters are all that is available to establish a shale base line in the area of interest. In fact the neutron response of 25 per cent limestone porosity is low compared to the normal 40 per cent expected for a shale. This may be due to a thin bed effect and or the possibility that the lithology is not shale but silt or something else. With the SP baseline thus established the SP below 2960 averages + 10 mv at the best and - 10 mv above 2950 up to 2845.

Rmf is 0.092 at a bottom hole temperature of 100 degrees centigrade or about 25,000 PPM NaCl. Rmfeq then is 0.078. For SP of - 10 mv Rweq is then 0.06 and Rw is 0.067 at 100 degrees centigrade equivalent to 35,000 PPM NaCl. Rw then, for the interval from 2960 to 2845, of 0.07 seems reasonable. Working downward from a shale baseline established at 2785 to 2780 the average SP appears to also be - 10 mv over the 2845 to 2960 interval.

CYBERLOOK of 2nd January, 1983

The CYBERLOOK using Rw = 0.07 tells the same story as the earlier one showing hydrocarbons over the 2845 to 2960 interval. This time resistivity is taken from the induction instead of the laterolog shallow and deep. There is little difference in these resistivities except for the improved thin bed response of the laterolog compared to the induction. The neutron logs are basically the same except for badly washed out hole in the first run. The hole conditions in the $8\frac{1}{2}$ inch hole are much better than in the $12\frac{1}{4}$ inch hole. As a result the MSFL was used to calculate the flushed zone water saturation Sxo. It is interesting to note the computation is showing residual hydrocarbons in the flushed zone from 2849 to 2950. Due to the poor $12\frac{1}{4}$ inch hole conditions it was decided not to compute Sxo on the previous CYBERLOOK as the results would be misleading and show too much moveable hydrocarbons (the difference between Sw and Sxo). Both CYBERLOOKS would suffer in the same way from poor hole conditions affecting the density log quality because the 3rd December, 1982 density log was used in both.

Neutron Countrate Playback

The CNL neutron tool consists of one source and two detectors at different distances from the source. The far spacing detector will 'see' deeper into the formation than will the near spacing detector. As a result in a shale or a water saturated sand the effect of the formation will be about the same on both detectors. In an invaded gas bearing formation the effect will be to effectively reduce the count rates of the far spacing detector more than those of the near spacing detector.

The far spacing (FCNL) and near spacing (NCNL) countrate scales have been selected in such a way that they overlie each other in a water wet sand as at 2802 to 2844. In a gas bearing zone as at 2847 to 2851 and 2852 to 2857 a 'separation' may be seen due to the presence of gas. A much reduced 'separation' continues downward to 2951 meters and may be due to gas, light liquid hydrocarbons or lithology effects or log scaling effects. It is interesting to note the opposite direction of 'separation' at the 1952.5 and 2959 shales. Note also the separation at 2706 which may be due to a lithology effect. It is difficult to be sure that this 'separation' below 2857 is due to hydrocarbons but is is encouraging.

Sonic Resistivity Crossplot

As a cross check of the CYBERLOOK a sonic resistivity crossplot using Rw = 0.07 and a quartz lithology was made. Water saturations average around 70 per cent and porosities 10 to 15 per cent. The best porosity is 20.5 per cent with a water saturation of 35 per cent at 2850.5 meters. These results are not too different from the CYBERLOOK except for the average CYBERLOOK porosity of 10 per cent which is a result of the shale correction.

TABLE NO. 1

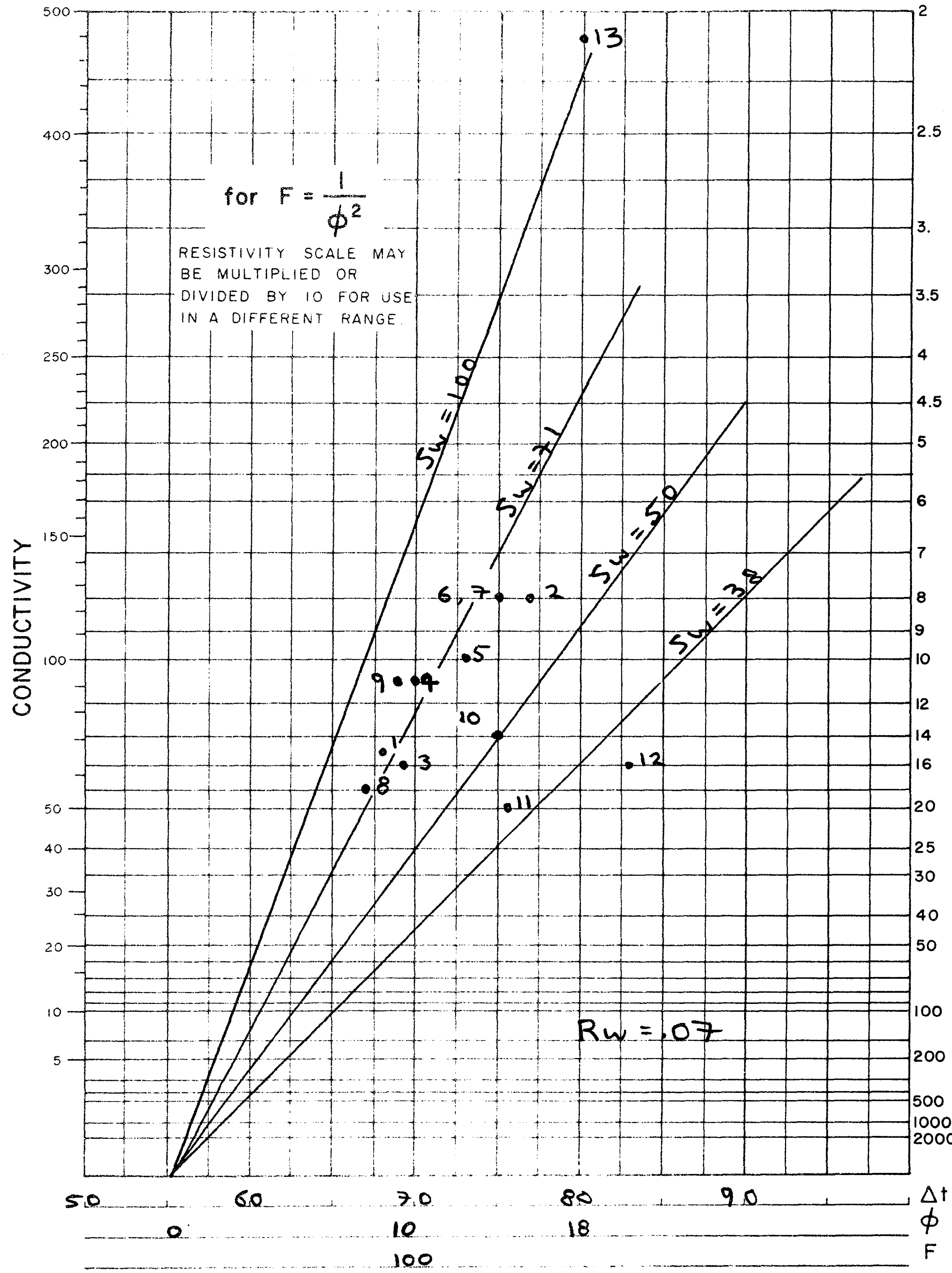
SONIC RESISTIVITY CROSSPLOT

Level	Depth	Induction Resistivity	Sonic	Per Cent Porosity	Per Cent Water Saturation
1	2959	15	68	Shale	
2	2952.5	8	77	Shale	
3	2945.5	16	69	10	67
4	2940	11	70	11	74
5	2933	10	73	13	67
6	2918.5	8	75	15	67
7	2908	8	75	15	67
8	2897	18	67	8.5	73
9	2865	11	69	10	80
10	2856	14	75	15	50
11	2854	20	76	15.5	40
12	2850.5	16	83	20.5	35
13	2761	2.1	80	18	102

NOTE : No corrections to porosity and water saturation have been made for shale content of the formation.

Schlumberger

RESISTIVITY VS POROSITY



DIVIDER PAGE

AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.

OMEO NO. 1

WELLSITE FORMATION EVALUATION
OF 18-19 JANUARY, 1983 LOGS

BOWLER LOG CONSULTING SERVICES PTY. LTD.

JACK BOWLER
Telephone: (051) 56 6170

P.O. BOX 2,
PAYNESVILLE. 3880
VICTORIA,
AUSTRALIA

21st January, 1983

To: F. Brophy
From: J. Bowler
Subject: Omeo No. 1; evaluation of 18-19 January, 1983 Logs.

Hand computations and Schlumberger CYBERLOOK basically agree on the following hydrocarbon bearing intervals:

Depth	Porosity	Water Saturation	Probable Production
3073-3081	10 to 15	40	Light Oil
3090-3098	7 to 12	60	Light Oil
3121-3129	13 to 15	40 to 60	Light Oil
3130-3137	14	60	Light Oil

Resistivity logs indicate invasion is shallow which suggests good permeability. Mudcake buildup on DLLMSFL also suggests good permeability. Pyrite will make computations pessimistic. These intervals look much better than any others further uphole.

Although the Schlumberger CYBERLOOK raises the gas flag over the four reservoir zones, I believe this is due to the presence of light oil and not gas but this must be confirmed by obtaining samples of formation fluids.

The overlaps of the cased hole neutron in the seven inch liner showed no change, after normalization, with the open hole neutron which is reasonable in a low permeability formation because it can take years for invasion fluids to dissapear in tight reservoirs.

Yours very truly,

J Bowler

J. Bowler.

DETERMINATION OF FORMATION WATER RESISTIVITY

1. Two computations of Rw from the SP were made:

   3035 - 3050

   SP = +28mv — Rmfe = 0.067 @ 215°F
   Rwe = 0.14 — Rw = 0.17 or 13,000 PPM NaCl.

   3140 - 3150

   SP = +30mv — Rmfe = 0.066 @ 220°F
   Rwe = 0.14 — Rw = 0.17 or 13,000 PPM NaCl.

2. Formation water resistivity from the resistivity from DLLMSFL against density plot is 0.21 at 222°F or 10,000 PPM NaCl.

3. Formation water resistivity selected from the Pass I CYBERLOOK is 0.22 at 222°F or 9,200 PPM NaCl.

CROSSPLOTS

Plot No. 1 of chart corrected DLLMSFL resistivity against density shows levels 3, 4, 5, 6 and 8 to be definite hydrocarbon zones. Level 1 also has a good possibility. The gamma ray shows these levels to be fairly clean. Shale corrected porosity and water saturation values are listed in Table No. 1.

Plot No. 2 of MSFL resistivity against density shows residual hydrocarbons at levels 3, 4, 5, 6 and 8 with less residuals at level 1. This is a good confirmation of hydrocarbons independent of the need to know Rw accurately. Rmf from this plot checks exactly the measured value. Flushed zone water saturation values, shale corrected, are listed in Table No. 2 along with invasion diameters and permeabilities computed from Schlumberger Chart K-2 assuming the fluid to be Oil.

Plot No. 3 of density and neutron shows first the log data plotted as solid dots. It can be seen that levels 1, 3, 4, 5, 6 and 8 fall just above the clean sand line. The data after removal of shale effect as represented by the gamma ray is plotted as a X. The solid line connecting the X and solid dot is the shale correction from the gamma ray. The oblong circle represents the area one would expect to find 0.15 g/cc gas sands of 10 to 15 percent porosity with 75% flushed zone water saturation. Heavier hydrocarbons would plot closer to the sand line. Because of this it appears the hydrocarbons are liquid. Possibly on the lighter end. Table No. 3 is a computation of hydrocarbon density from the density and neutron logs. Again it is levels 3, 4, 5, 6 and possibly 1 and 8 that seem to have liquid hydrocarbons.

TABLE NO. 1

Level	Depth	Pb	ØN	VSH	R	Rw	Ø	Sw
1	3160	2.45	6	0	24	.21	12	70
2	3141.5	2.45	10	7	12	.21	12.5	89
3	3132	2.40	10	13	25	.21	14.5	51
4	3126	2.45	6	0	92	.21	12	36
5	3125.5	2.40	9	7	57	.21	14.5	35
6	3122	2.40	10	17	31	.21	14	46
7	3092	2.51	10.5	27	25	.21	8.4	68
8	3078	2.40	11	7	53	.21	15	36
9	3045.5	2.50	9	20	17	.21	9	86
10	3035	2.44	10.5	13	12	.21	12.7	83
11	3024	2.45	12	20	12.5	.21	12	79
12	3008	2.52	10	7	16	.21	9	104
13	3038.5	2.62	20	100	18	-	Shale	
14	3070	2.62	23	100	13	-	Shale	
15	3033	2.60	22	100	15	-	Shale	

PSH = 2.62 ØNSH = 23 RSH = 13 GRSH = 150

GR Clean = 37.5 Temperature = 234°F for ØN correction and 222°F for Rw.

Porosity and water saturations are shale corrected.

Formation water salinity : 10,000 PPM NaCl

TABLE NO. 2

Level	MSFL	Rmf	Sxo	Diameter of Invasion (Inches)	Permeability (Md)
1	6	.08	87	-	-
2	4.5	.08	93	-	-
3	5	.08	74	25	2
4	8.5	.08	73	30	1
5	5	.08	76	29	5
6	5	.08	75	28	2
7	-	.08	-	25?	-
8	4	.08	82	31	5
9	7	.08	92	30	-
10	4	.08	94	18	-
11	5	.08	85	30	-
12	5	.08	120	40	-
13	18	-	-	-	-
14	2	-	-	-	-
15	10	-	-	-	-

Flushed zone water saturations (Sxo) are corrected for shale content.

Mud filtrate salininty: 29,000 PPM NaCl

TABLE NO. 3

Level	Depth	ØD COR	ØN COR	Shr	Hydrocarbon Density
1	3160	12	11.6	13	.75
2	3141.5	12	14.3	7	1.82 *
3	3132	15	12.7	26	.61
4	3126	12	11.6	27	.80
5	3125.5	15	13.2	24	.65
6	3122	14.8	11.7	25	.51
7	3092	8	9.6	-	-
8	3078	15	15.4	18	.90
9	3045.5	8.7	9.8	8	1.42
10	3035	12.5	13.3	6	1.24 *
11	3024	11.8	13.2	15	1.13
12	3008	7.8	14.3	0	-

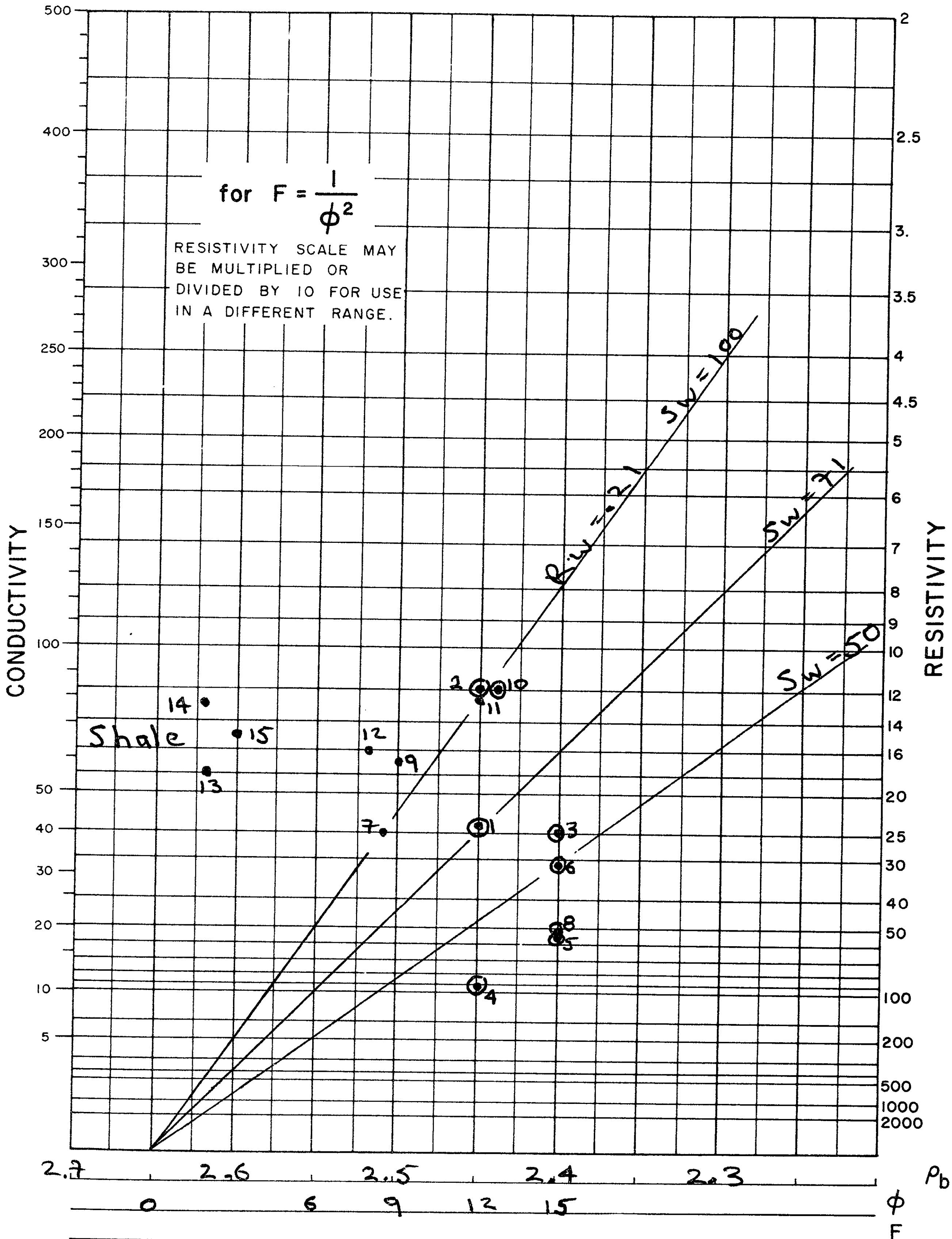
* Thin bed may affect readings.

The above Hydrocarbon Density computations are made on the log data of Tables 1 and 2 as per the concept of Chart CP-10 on page 36 of Schlumberger 1979 Chart Book and suggest the hydrocarbons may be liquid. This is in contrast to the CYBERLOOK gas Flag which suggested the hydrocarbons to be gas.. The above calculations are sensitive a number of assumptions and corrections to the log data among which is using the Gamma Ray as a clay indicator.

PLOT NO. 1

Schlumberger

RESISTIVITY VS POROSITY

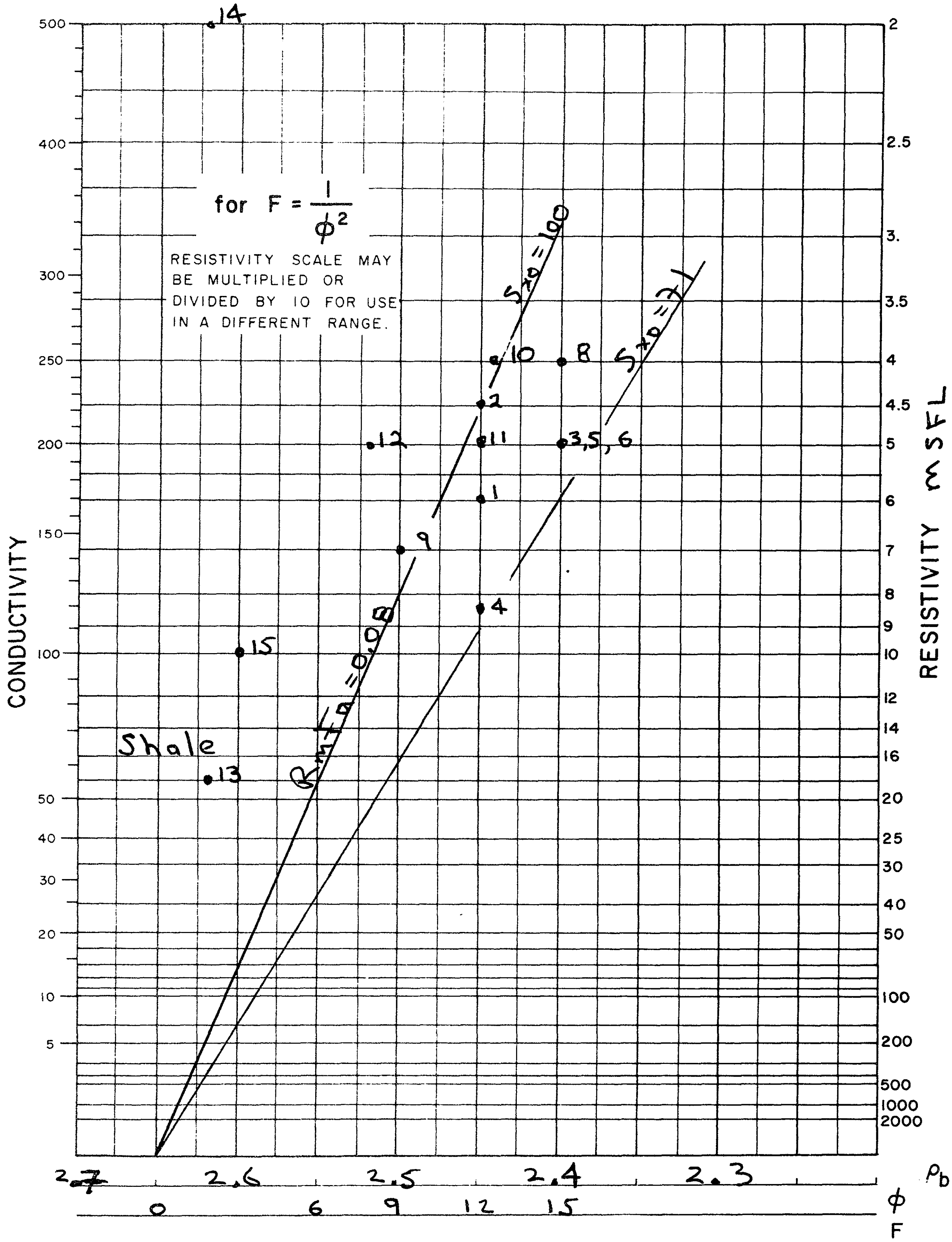


⊙ Clean

Level 10 is sand with no show in core.

PLOT NO. 2

RESISTIVITY VS POROSITY



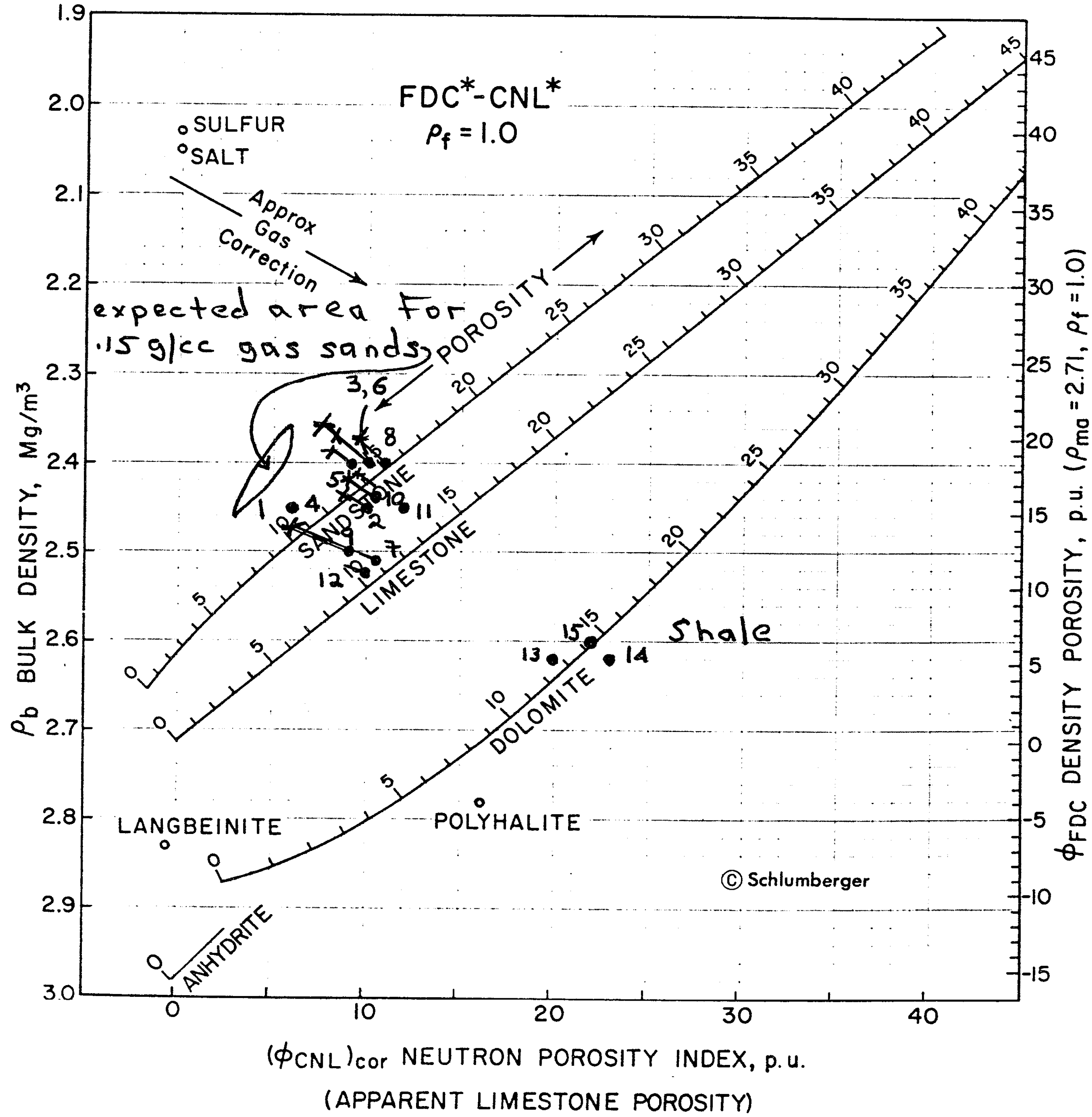
Level 10 is sand with no show in core.

Schlumberger

POROSITY AND LITHOLOGY DETERMINATION FROM FORMATION DENSITY LOG AND COMPENSATED NEUTRON LOG (CNL*)

FRESH WATER, LIQUID-FILLED HOLES

PLOT NO. 3



*Mark of Schlumberger

CP-1c

DIVIDER PAGE

AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.

OMEO NO. 1

QUICK INTERPRETATION OF 28, 29 JANUARY 1983 DIPMETER CYBERDIP AND EVALUATION OF OPEN HOLE LOGS

BOWLER LOG CONSULTING SERVICES PTY. LTD.

JACK BOWLER
Telephone: (051) 56 6170

P.O. BOX 2,
PAYNESVILLE. 3880
VICTORIA,
AUSTRALIA

4th February, 1983

Mr. Frank Brophy,
Australian Aquitaine Petroleum Pty. Ltd.,
Elf Aquitaine Centre,
14th Floor,
99 Mount Street,
NORTH SYDNEY. 2060.

Dear Frank,

Please find enclosed my quick look interpretation of the dipmeter CYBERDIP and open hole logs of 28, 29 January, 1983 from Omeo No. 1

In addition to the 20 degrees NE structural dip there is a major feature near the bottom of the well suggesting either an unconformity or a fault.

The logs show that the hydrocarbon zone in the upper 6 inch hole extends down to 3185 meters. In addition there are good 'log shows' below 3319 meters to total depth.

Yours very truly,

J. Bowler.

Enc.

I. QUICK INTERPRETATION OF DIPMETER CYBERDIP

There seems to be three major and one minor zone present from 3379 to 2987 meters. These zones are most apparent from the SP, density-resistivity crossplot and the CYBERDIP.

3379 - 3320

The large red pattern from 3330 - 3340 is independent of lithology and may be due either to an unconformity at 3310 to 3320 or to a fault system (more likely) below. There are several possibilities as to what type of fault may exist.

1. Growth Fault - with rollover to the SW in the downthrown block to the NE of the fault. Fault strike is NW-SE and intersects the borehole around 3340. The two blue arrows immediately below suggest drag on the upthrown block into the NE dipping fault.

2. Normal Drag Fault - with drag to the SW in the SW downthrown block. The fault would then be dipping to the SW and striking to the NW-SE and intersecting the borehole at 3340.

3. Thrust Fault - with drag in the upthrown NE block. The fault would dip to the NE and strike to the NW-SE and intersect the borehole at 3340.

Because of the blue pattern (only two dips) the Growth Fault seems to be the best candidate. This interpretation can possibly be confirmed by other data such as seismic or VSP.

3320 - 3180

This zone is characterized by a lack of dip computations and high bulk density. A 25 degree Easterly structural dip direction is suggested between 3290 and 3310.

3180 - 3379

This zone reflects a 20 degree NE structural dip. Superimposed on this dip seem to be sedimentary dip patters within the sands as at 3100 meters.

This is meant to only be a quick look interpretation of the dipmeter. A much more meaningful interpretation can be done on the CLUSTER and GEODIP results as more arrows will be present.

II. EVALUATION OF OPEN HOLE LOGS

Four crossplots of the open hole log data have been made. Of the four, the density-resistivity is the most interesting (Plot No. 2). It shows the log data falling into 3 zones :

Zone 1	3365 - 3319
Zone 2	3308.5 - 3190
Zone 3	3180.5 - 3172.

Zone 3 is just the downward continuation of the upper sands in the previously logged 6 inch hole. Zone 2 appears to have a Rw of 0.06 at bottom hole temperature which is the same as the mud filtrate resistiity. This means that if the deep resistivity devices are reading RmF they will only see the flushed zone saturation. The SP is mostly flat over this interval which is what would be expected over a deeply invaded formation. The GR and density-neutron suggest the interval is about 50 per cent or more clay or shale so it is not likely to be a good reservoir. The SW (actually Sxo if very deep invasion exists) suggests this interval may be a good source rock. The other explanation for the anomalous density-resistivity plot response is the minerals are much heavier than the 2.65 g/cc of quartz and more porosity exists than is seen on plot 2 and the data of Zone 2 would then shift to the right, have a higher Rw and subsequently higher water saturations.

The Schlumberger CYBERLOOK is in agreement with the location of hydrocarbon anomalies in Zones 1 and 3. Porosities however are lower. In Zone 2 the reconstructed wet resistivity is greater than the actual measured resistivity suggesting that a lower clay water or formation water resistivity is required for the CYBERLOOK. In any case this is further confirmation of an anomalous zone.

To summarize, Zones 1 and 3 contain hydrocarbons. Zone 2 is anomalous, deeply invaded, clayey, and may contain heavy minerals and may be a source rock.

Water saturation and porosity values of the more interesting levels are listed in Table 1. Based on the 3 sidewall cores from the bottom of Zone 1 I believe the clay is more likely to be dispersed than laminated and as a result the porosities are too high and the water saturations are too low in Table 1 for Zone 1. For Zone 1 the CYBERLOOK porosity of around 8 - 10 per cent is better. The hydrocarbon anomalies still exist.

TABLE NO. 1

Level	Depth	LLD	Sonic	PB	ØN	VSH	Ø	Water Saturation
1	3365	11	76	2.37	16	11	18	62
2	3355	14	74	2.48	18	38	11	69
3	3341	17	71	2.50	21	55	10	61
4	3336	16	76	2.45	15	24	13	63
5	3326	10	78	2.45	21	44	13	70
6	3320	7	87	2.40	22	37	16.5	73
7	3319	17	75	2.48	18	38	11	63
8	3308.5	14	76	2.56	20	64	6.5	58
9	3300.5	10	78	2.46	21	46	12.5	46
10	3285	12	75	2.50	18	45	10	50
11	3254	12	71	2.55	17	52	7	63
12	3248.5	14	70	2.58	20	67	5	67
13	3235	13	75	2.55	18	55	7	60
14	3212.5	12	67	2.45	17	31	13	43
15	3190	18	70	2.56	21	69	7	48
16	3180.5	27	70	2.44*	8	0	13	61
17	3172.5	17	80	2.34*	9	0	18	56
18	3172	12	82	2.34*	9	0	19	63

* Denotes sonic reading converted to density assuming quartz lithology (Denisty is affected by bad hole).

PBSH = 2.65 ØNSH = 25 RSH = 20 PGR = 2.65
Temperature = 270 degrees F. Sonic SH = 65 - 70
Rw = .19 for Levels 1 - 7 (Zone 1)
Rw = .06 for Levels 8 - 15 (Zone 2)
Rw = .21 for Levels 16 - 18 (Zone 3)

Porosities are shale corrected using the density-neutron as a shale indicator. Water saturations are from the Indonsia Sw equation.

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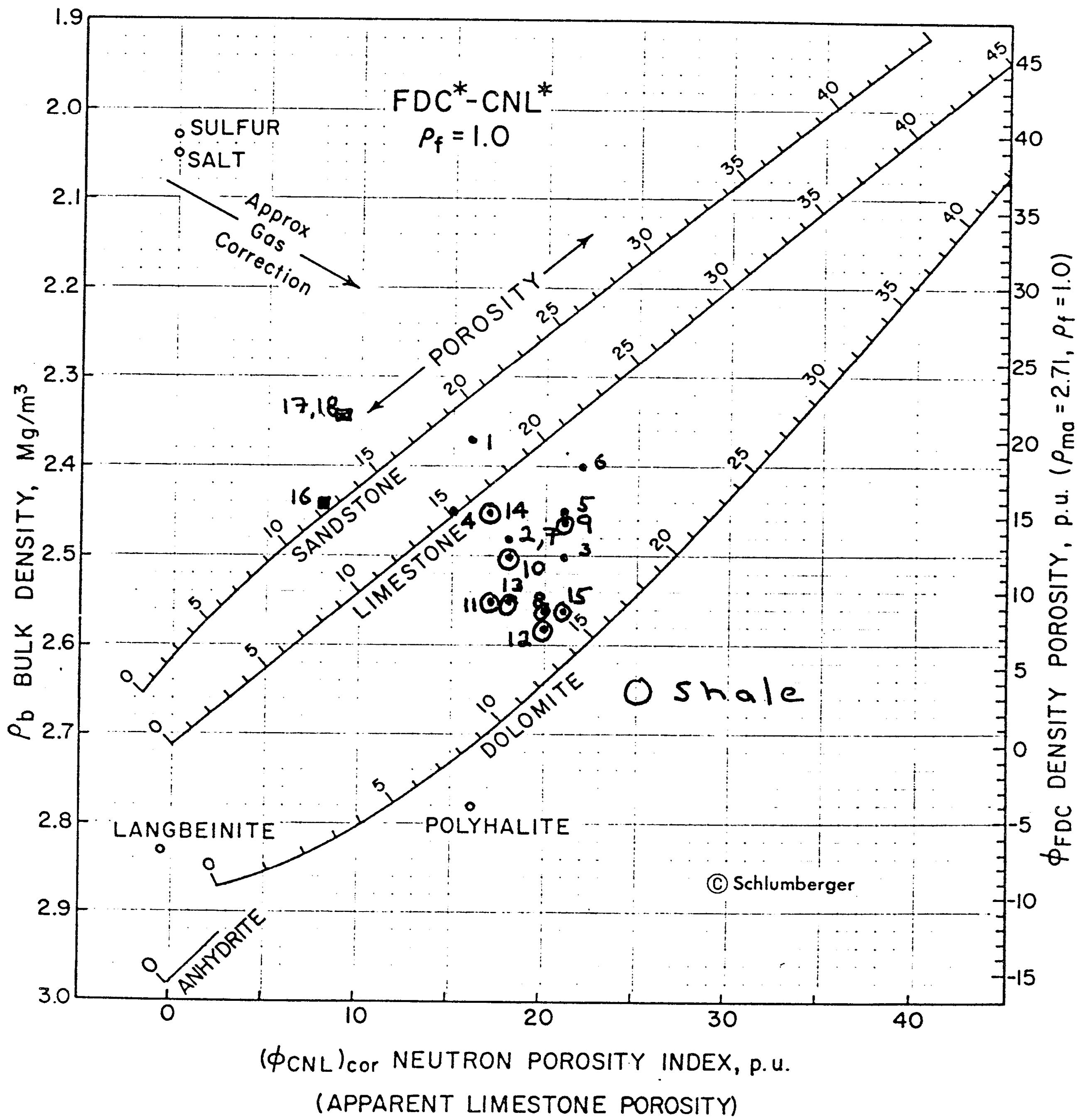
POROSITY AND LITHOLOGY DETERMINATION FROM FORMATION DENSITY LOG AND COMPENSATED NEUTRON LOG (CNL*)

FRESH WATER, LIQUID-FILLED HOLES

PLOT NO. 1

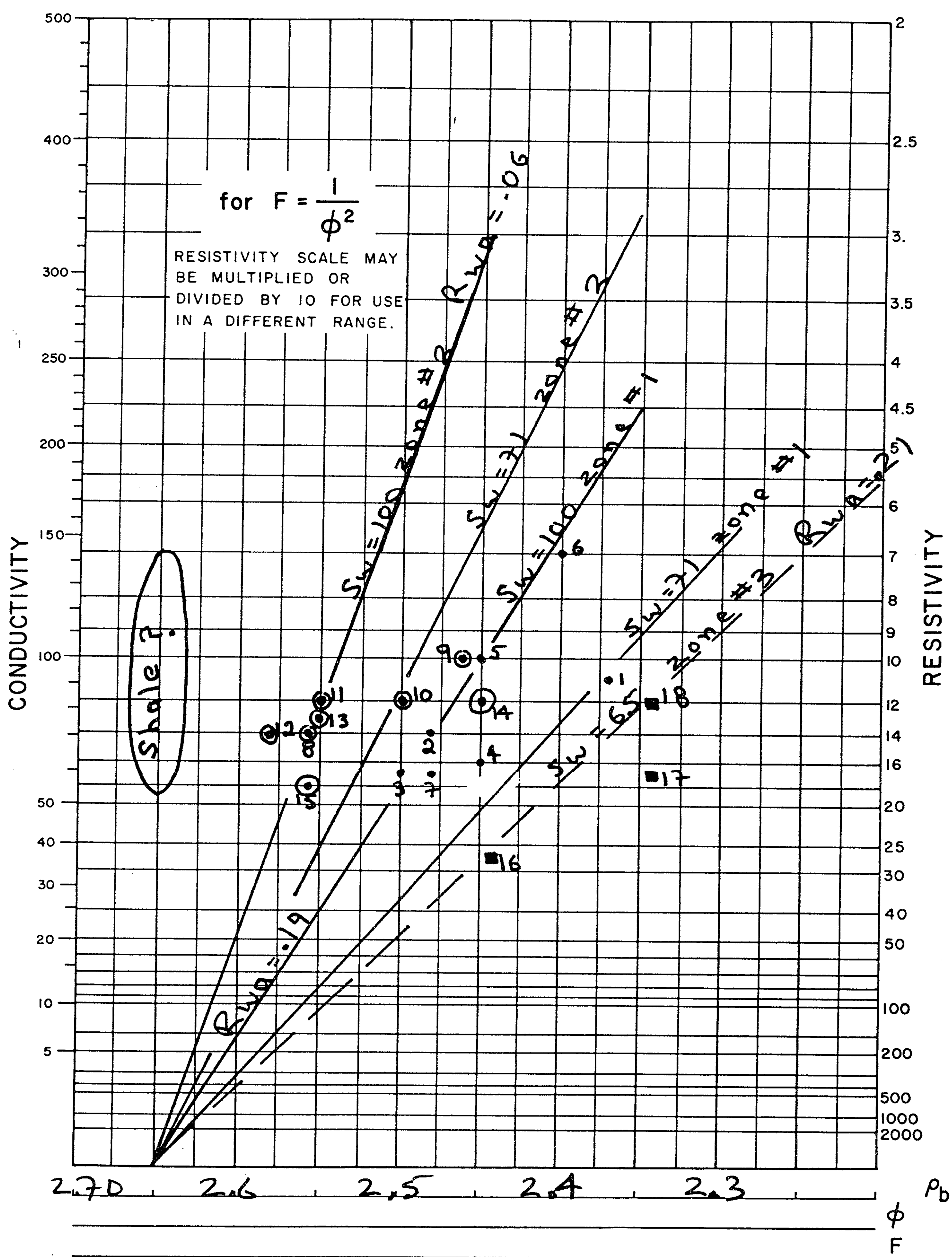


*Mark of Schlumberger

Schlumberger

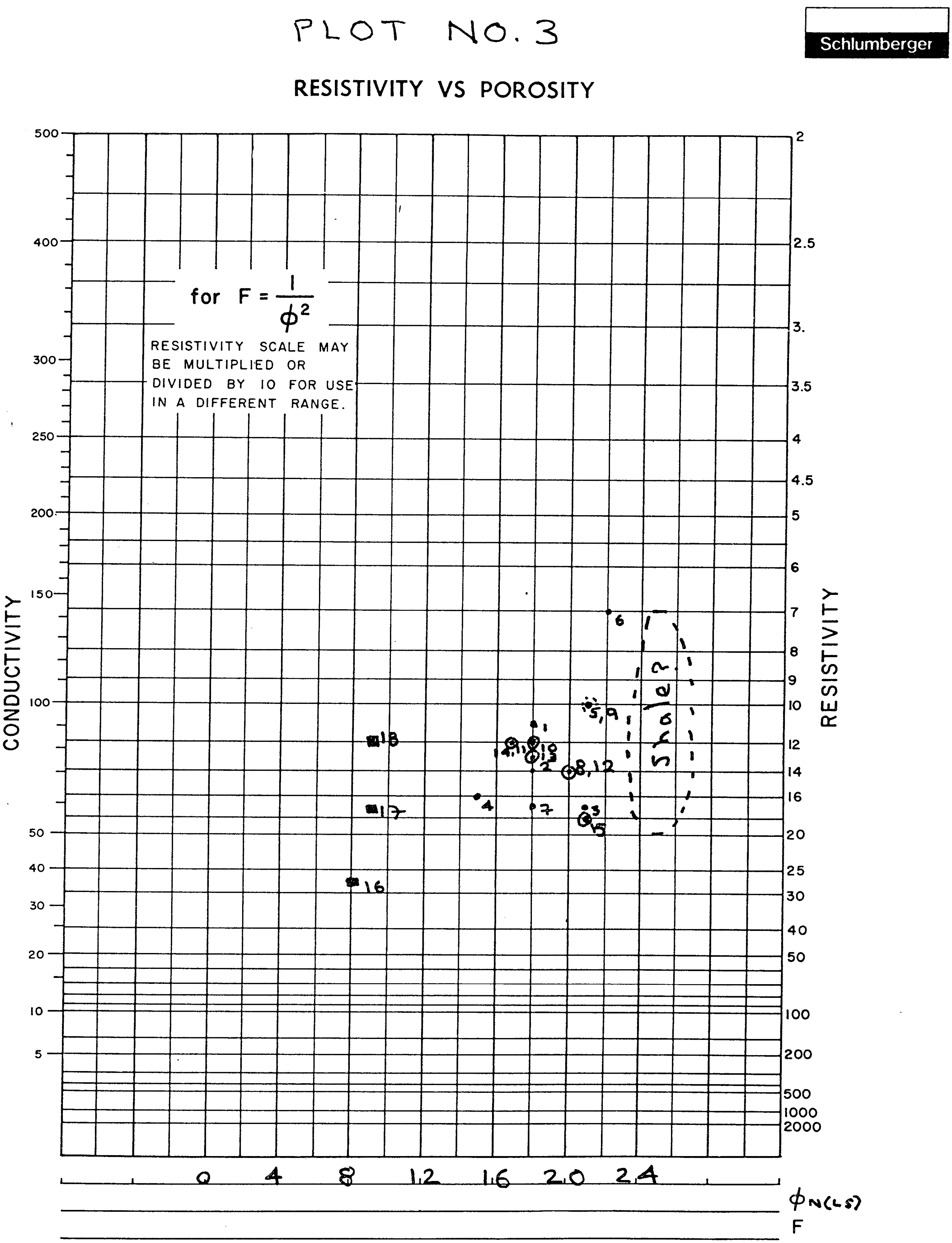
PLOT NO. 2

RESISTIVITY VS POROSITY



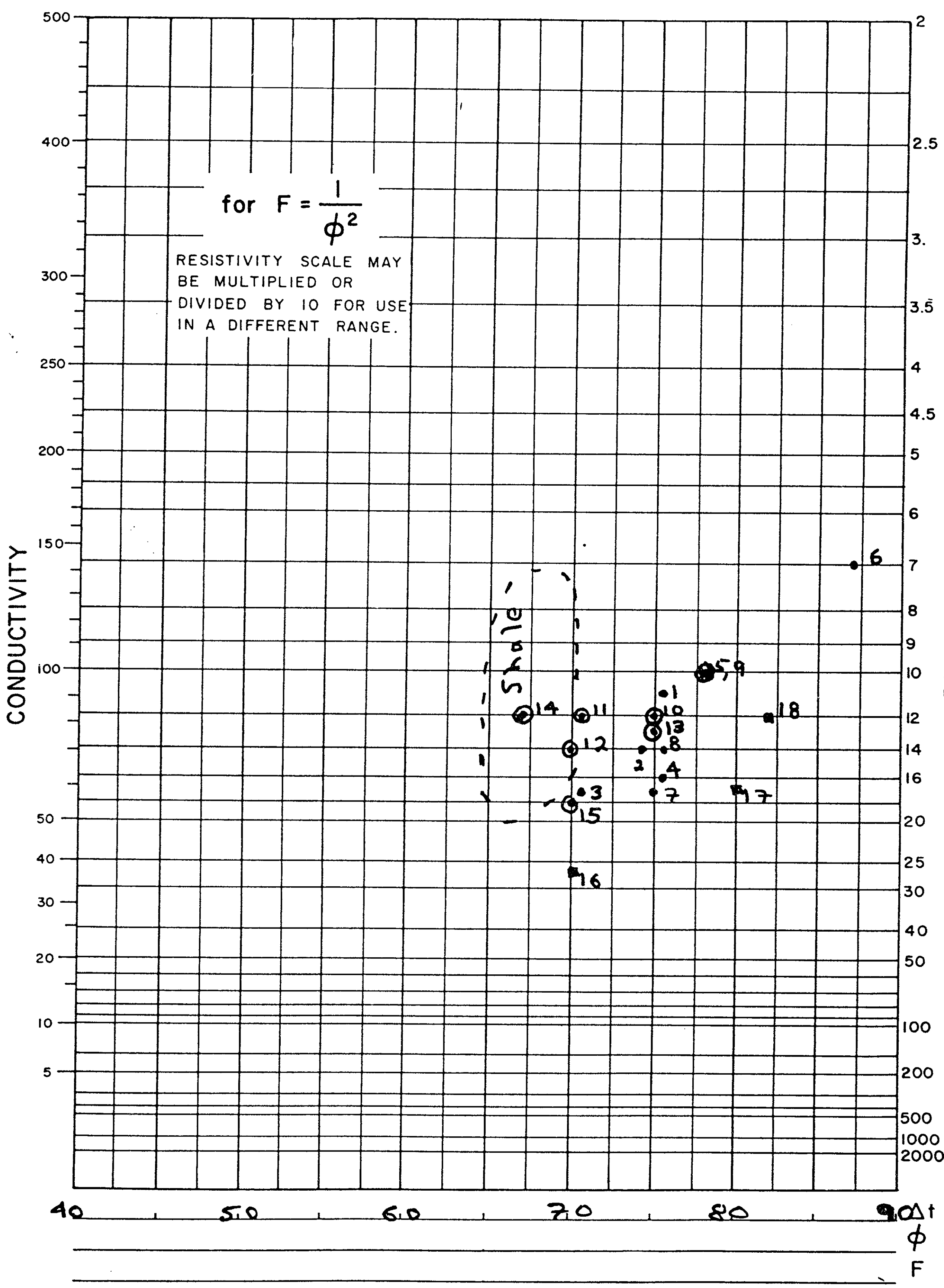
PLOT NO. 3

RESISTIVITY VS POROSITY



PLOT NO. 4

RESISTIVITY VS POROSITY



Divider Page

AUSTRALIAN AQUITAINE PETROLEUM PTY. LTD.

OMEO NO. 1

INTERPRETATION OF 31 JANUARY, 1983
RFT PRESSURES AND RECOVERIES

BOWLER LOG CONSULTING SERVICES PTY. LTD.

JACK BOWLER
Telephone: (051) 56 6170

P.O. BOX 2,
PAYNESVILLE. 3880
VICTORIA,
AUSTRALIA

4th February, 1983

Mr. Frank Brophy,
Australian Aquitaine Petroleum Pty. Ltd.,
14th Floor Elf Aquitaine Centre,
99 Mount Street,
NORTH SYDNEY. N.S.W. 2060.

Dear Frank,

Please find my interpretation of the RFT job made on Omeo No. 1 on 31st January, 1983.

The reservoir appears to be laminated with permeabilities from the RFT pretest ranging from 0.5 to 163 md. There appears to be a continuous .56 g/cc hydrocarbon column from 3073 to 3185 meters. There may also be another .56 g/cc hydrocarbon column extending to 3245 meters.

Yours very truly,

J. Bowler

J. Bowler.

Enc.

I. PRESSURE PLOTS

A. Formation Pressure Plot No. 1 Interpretation

The 0.433 PSI/FT water gradient line (1.0 g/cc) is extrapolated down from the 2725 meters pressure of 3856 PSIG plus 15 PSI to convert to PSIA of 3871.

It is possible to construct a .56 g/cc gradient through tests 1,2, and 3 which would have a hydrocarbon-water contact at 3185 meters. If the same .56 g/cc gradient was drawn through tests 5 and 7 another hydrocarbon-water contact would be at 3245 meters. This would mean the shale at 3118 is an effective permeability barrier and two reservoirs exist.

B. Mud Pressure Plot No. 2

The 1.27 g/cc mud gradient agrees well with the 1.29 g/cc mud weight. The increased scatter of the HP data compared to RFT data is due to the longer time required for HP gauge stabilization. This plot confirms the accuracy and repeatability of the two measuring systems on this job.

TABLE NO. 1

			Pressure			
			Formation		Mud	
Test No.	File No.	Depth (meters)	RFT (PSIG)	HP (PSIA)	RFT (PSIG)	HP (PSIA)
1	6	3077.5	4420	4439.6	5619	5642
2	7	3096	4440	4461.7	5653	5680
3	8	3104	4443	4463.8	5666	5692
4	9	3131.5	4567	4585.8	5717	5740
5	10	3126.5	4502	4519.6	5710	5730
6	11	3147.5	Seal Failure		5746	5766
7	12	3125	4502	4515.9	5706	5725

RFT pressures are temperature-pressure corrected in above table. HP pressures in above table are corrected to RFT measure point.

TABLE NO. 2

			Pressure		
			Formation	Mud	
Test No.	File No.	Depth (meters)	RFT (PSIA)	RFT (PSIA)	Permeability estimate (md)
1	6	3077.5	4435	5634	10
2	7	3096	4455	5668	5
3	8	3104	4458	5681	10
4	9	3131.5	4582	5732	1
5	10	3126.5	4517	5725	1
6	11	3147.5	Seal Failure	5761	-
7	12	3125	4517	5721	above 100

RFT pressures in above table are corrected to PSIA by adding 15 PSI to PSIG pressures.

II. CORRECTION TO RFT PRESSURE DATA OF SUITE NO. 1 RUN NO. 3 HP PRESSURES EVALUATION

Please note that I have made an error in correcting PSIA HP pressures to PSIG on Table No. 4 of the 4/12/82 Omeo No. RFT data. Instead of adding 14.7 PSI to correct to PSIG I should have subtracted 14.7 PSI. That means the pressures for File 117 and 122 should read 4188 PSIG and 4192 PSIG respectively.

Plots No. 2 and 3 of that report should be amended accordingly. Unfortunately this correction does not assist in clarifying the pressure plot.

Plot No. 1 also should be corrected so that the HP mud pressure reads 4842 PSIG before a correction is made to the RFT pressures. Since the point now falls off of the mud gradient line it looks as if the HP pressure cannot be trusted.

III. PRETEST DRAWDOWN PERMEABILITY
From K = 5660 q u/Pi - P

Where :
K = drawdown permeability in md
q = flowrate in cc/sec.
u = viscosity in cp of flowing fluid
Pi = reservoir pressure in PSIG
P = sampling pressure in PSIG

Note: pressures taken from RFT gauge due to its stability.

Test No.	File No.	Depth (meters)	K	q	u	P	Pi	Remarks
1	6	3077.5	23.	.83	.3	4360	4420	Pretest #1
1	6	3077.5	19.	1.67	.3	4270	4420	Pretest #2
2	7	3096	2.	.83	..3	3805	4440	Pretest #1
2	7	3096	2.	1.67	.3	3000	4440	Pretest #2
3	8	3104	4.4	.67	.3	4185	4443	Pretest #1
3	8	3104	4.2	1.67	.3	3760	4443	Pretest #2
4	9	3131.5	.8	.67	.3	3220	4567	Pretest #1
4	9	3131.5	1.	1.67	.3	1730	4567	Pretest #2
5	10	3126.5	.5	.67	.3	2000	4502	Pretest #1
5	10	3126.5	.6	1.67	.3	24	4502	Pretest #2
7	12	3125	163.	.77	.3	4494	4502	Pretest #1
7	12	3125	87.	1.67	.3	4470	4502	Pretest #2

The wide range of pretest drawdown permeabilities suggests a non-homogeneous reservoir. This is supported by the raw data from the HDT microresistivity curves in the sands which suggest laminations. This is further supported by the large number of dips computed within some of the sands by the CYBERDIP. There is a rough correlation between low permeability and laminations as at the 3100 meter sands. Conversely the 3125 and 3130 sands have fewer laminations and subsequent dips computed and are likely to be more uniform and permeable. The .5 md streak at 3126.5 and the 87 to 163 md streak at 3125 meteres further illustrate the laminated nature of the reservoir.

The laminated nature of the reservoir sands explains the high water saturations computed in the sands at 3090 - 95, 3100 - 3116, and 3140 - 3160. Those sands with less laminae (3120 - 28 and 3130 - 37) and fewer dips computed have lower water saturations. This means the hydrocarbon column extends continuously from 3073 to 3185 meters and does not have a number of separate water contacts as I previously thought.

IV. FLUID RECOVERY FROM 3125 METERS

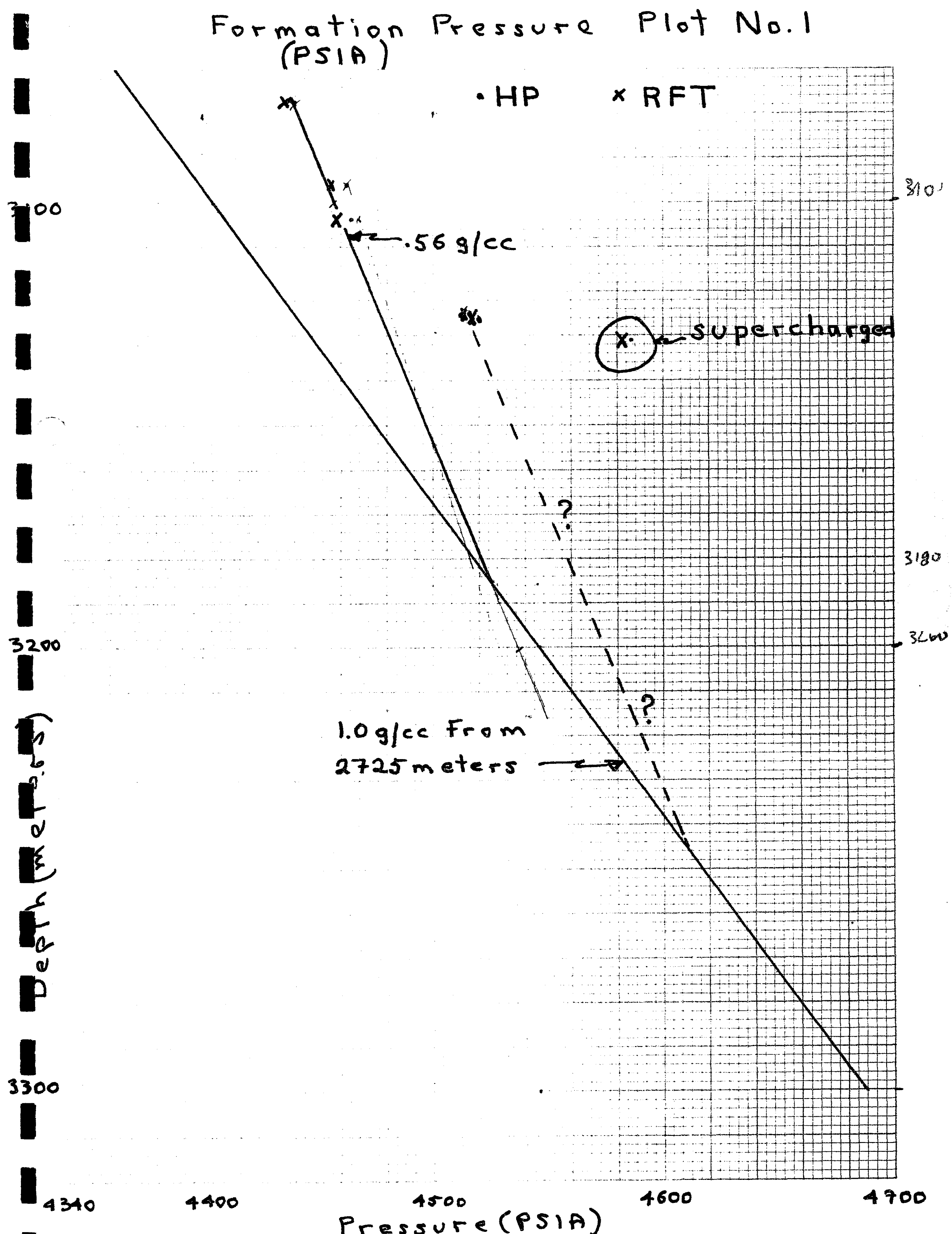
	Lower 10,400 cc Chamber	Upper 10,400cc Chamber
Sample Chamber surface pressure	1250 PSIG	1750 PSIG
20 litre gas bottle filled at surface at	180 PSIG	460 PSIG
Plus cubic feet of gas at S.T.P.	1.5	6
Water	7,500 cc.	3,750 cc.
Liquid hydrocarbon	Thin film	Thick film
Liquid hydrocarbon Fluorescence	Moderate to strong yellow	Moderate to strong yellow/white
Resistivity recovered water	.091 at 222 F, 24,500 PPM NaCl	.093 at 222 F, 24,000 PPM NaCl
RmF	.065 at 222 F, 35,000 PPM NaCl	.065 at 222 F, 35,000 PPM NaCl
Rw	.21 at 222 F, 10,000 PPM NaCl	.21 at 222 F, 10,000 PPM NaCl
Percent Formation water recovered	42?	44?
Percent Formation water recovered using 29,000 PPM NaCl mud filtrate from 19.1.83	24?	26?

The Lower Chamber was opened first and shut in prior to the opening of the Upper Chamber. Sampling pressure was allowed to build up only to 3,000 PSIG because we wanted to keep the testing time short because of hole conditions.

Prior to running the logs at 3170 on 19.1.83 the mud filtrate salinity was 29,000 PPM NaCl. On 28.1.83 it was 35,000 PPM NaCl. If on the day 3125 was drilled it was fresher, it may be that the percentage of formation water recovered is even less than 26 per cent. If the mud filtrate in the invaded zone was as fresh as 24,500 PPM NaCl then all the water recovered was filtrate and the zone will produce with no water cut!

Geoservices made an analysis of the recovered gas at the wellsite and found in per cent of total gas :

	Lower Chamber	Upper Chamber
C - 1	90.89	91.8
C - 2	6.73	5.21
C - 3	1.69	2.55
IC - 4	0.38	.31
NC - 4	0.31	.26
IC - 5	Nil	Trace
NC - 5	Nil	Trace


Formation Pressure Plot No. 1
(PSIA)
• HP
× RFT
.56 g/cc
supercharged
?
?
1.0 g/cc from
2725 meters
3100
3200
3300
3100
3180
3200
Depth (meters)
4340
4400
4500
4600
4700
Pressure (PSIA)

Mud Pressure Plot No. 2