WCR
BRAESIDE-1
(W770)

BEACH PETROLEUM

W770

BEACH PETROLEUM NO LIABILITY

BRAESIDE NO. 1 - P.E.P. 93

WELL COMPLETION REPORT

Prepared by: S. Guba,
July 1982.

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ENCLOSURES

SUMMARY

Braeside No. 1 was drilled over 21 days from the 3rd to the 24th April, 1982, as a new field wildcat exploration well in the Peterborough area of the P.E.P. 93.

The well was proposed as an updip test of the Eumeralla sandstones which produced oil and water in Port Campbell No. 4.

At the Waarre level, the well encountered minor gas associated with the overlying coals in the Flaxman Formation. The porous sands (31.3%) of the Upper Waarre section were cored followed by a DST attempt (DST No. 1) which failed to find a packer seat. No significant hydrocarbons were identified at this level on the wireline logs.

At the Eumeralla Formation level, several clayey sand zones were encountered accompanied by small amounts of gas and some fluorescence. Fluorescence ranged from 5 - 70%, pinpoint to solid bright white, yellow white giving an instant to slow streaming to crush cut. The interval 1923.9 - 1939.1 m was tested by DST 2 which recovered 23.9 bbls. mud and salt water.

The interval 2094-97 m was tested by RFT 1 but indicated extremely low porosity.

Core, cuttings, tests and logs confirmed the tight and clayey nature of the Lower Cretaceous Eumeralla Formation.

The non-correlatibility of the Eumeralla Sands at Braeside No. 1 with those in the Port Campbell No. 4 well point to their thin and highly variable occurrence.

After logging at T.D. the hole was plugged and abandoned on the 28th April, 1982.

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1. PURPOSE OF WELL

The Braeside No. 1 well was proposed as a test of potentially oil bearing Eumeralla Formation reservoir rocks.

In 1964 Frome Broken Hill drilled Port Campbell No. 4 . This well produced up to 215 bbls/day of water and oil from sands within the Eumeralla Formation. The proposed well was expected to intersect the zone of interest at approximately 100 metres higher than at Port Campbell No. 4.

The zone of interest was drilled using a saturated mud system (KCI/polymer) to minimize formation damage in the sensitive volcano-clastic sandstones of the Eumeralla Formation. To further increase well deliverability, initial planning for varying types of well stimulation had been completed.

This well was proposed as a potential oil producer and if successful could have led to the development of a series of Eumeralla Formation oil plays in the Basin.

Coincidentally the Braeside No. 1 well tested the Waarre Formation under structurally favourable conditions (Figure 1).

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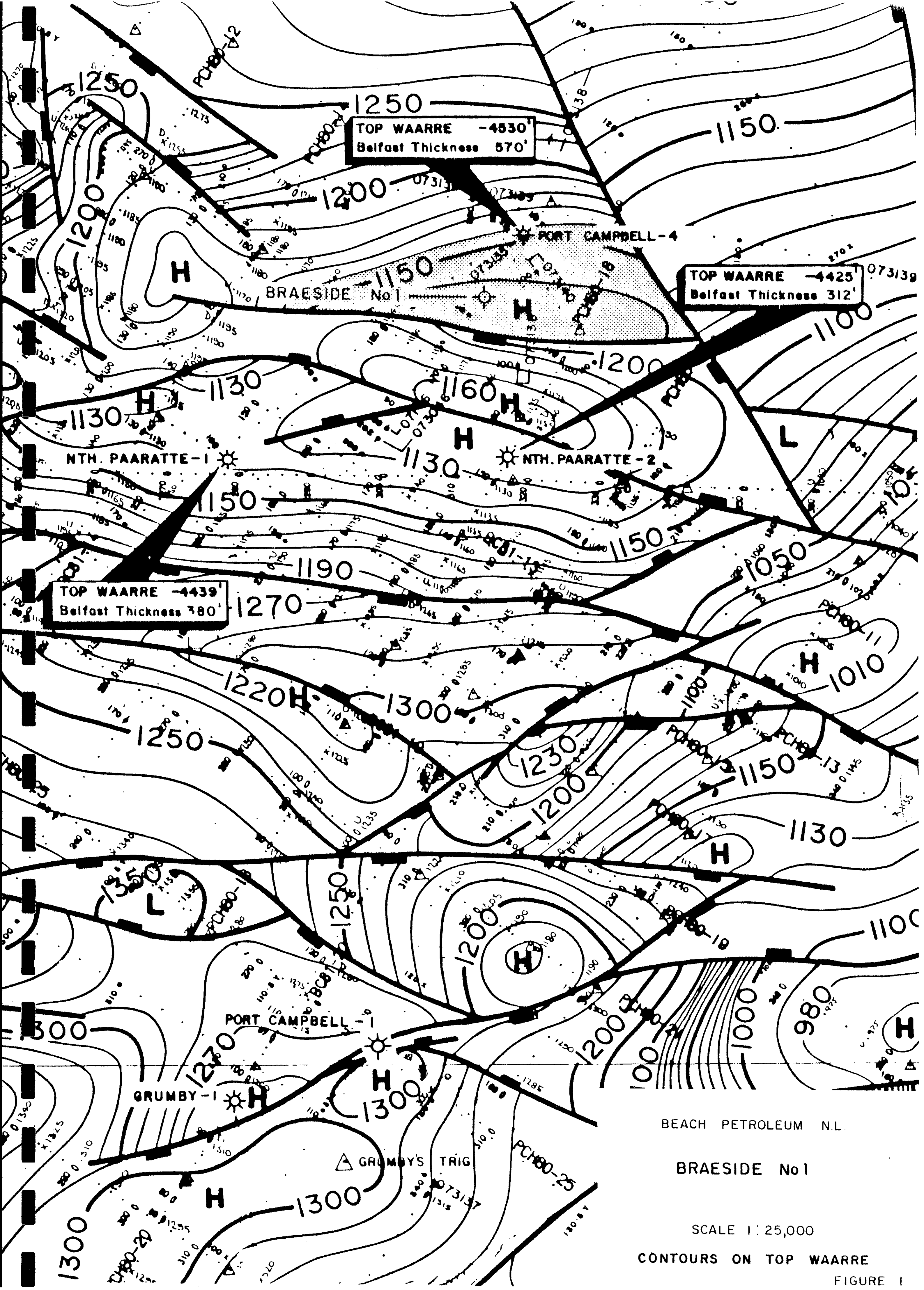

BEACH PETROLEUM N.L.

BRAESIDE No1

SCALE 1:25,000

CONTOURS ON TOP WAARRE

FIGURE 1

REGIONAL LOCATION MAP

VICTORIA PEP 93

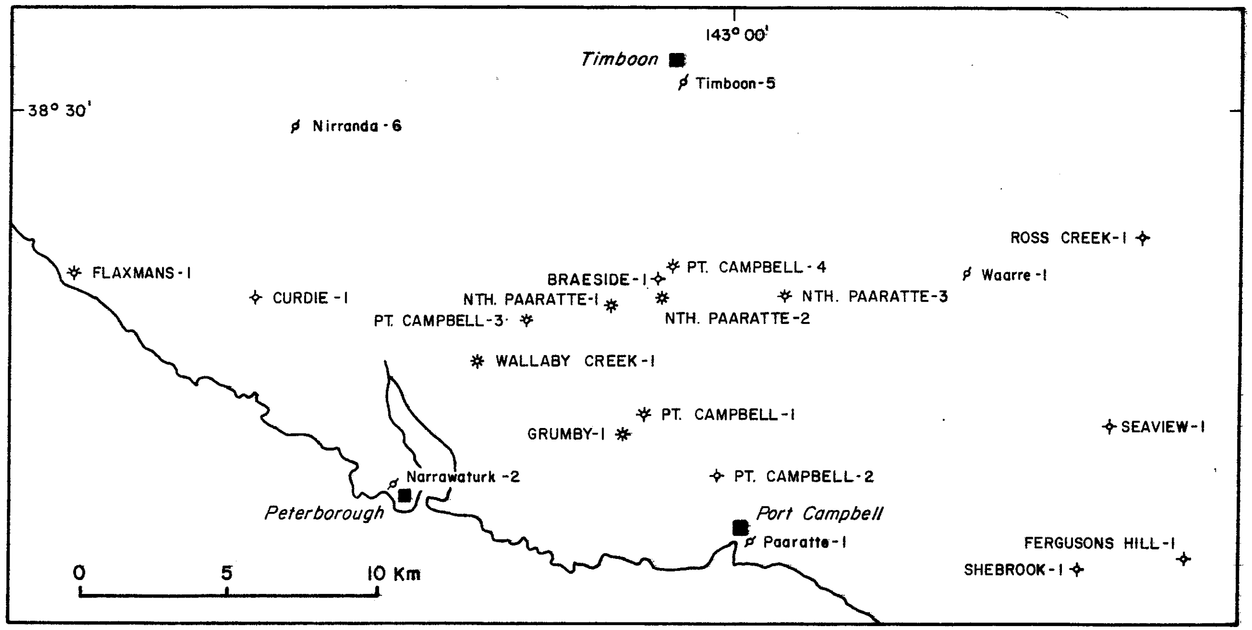

FIGURE 2

The well was drilled by Richter Drilling Pty. Ltd., National 610, Rig No. 7 with the following contract services:-

Halliburton Manufacturing and Services Ltd.	- Testing and Cementing.
Schlumberger Seaco Inc.	- Wireline Logging.
Exploration Logging of Australia Ltd.	- Mud Logging.
Baroid N.L.	- Mud Engineering.

Beach Petroleum N.L. was the operator for the well.

2. WELL HISTORY

2.1. Location (Refer Figure 2)

(i)	Co-ordinates (approx.)	: 38° 32' 33" South 142° 58' 21" East
(ii)	Geophysical Control	: Shot Point 103 Line 71-46, Shell Development (Aust.), 1971 Warrnambool-Pomborneit Seismic Survey.
(iii)	Real Property Description	: Parish of Paaratte Shire of Otway County of Heytesbury
(iv)	Property Owner	: Mr. L.M. Loft Paaratte Pastoral Co. Port Campbell.
(v)	District	: Via Colac Victoria Colac SJ-54-12 1:250,000 Map Sheet

2.2. General Data (Refer Figure 3)

(i)	Well Name and Number	: Braeside No. 1
(ii)	Tenement	: P.E.P. 93
(iii)	Elevation	: Ground Level - 122.41m ASL Kelly Bushing - 128.71 m ASL (All depths are referred to K.B.).
(iv)	Total Depth	: Drilling 2300 m Schlumberger 2300 m
(v)	Date Drilling Commenced	: 3/4/82 at 0815 hours
(vi)	Date Total Depth Reached	: 24/4/82 at 1115 hours
(vii)	Date Rig Released	: 28/4/82 at 0615 hours
(viii)	Drilling Time to Total Depth	: 21 days
(ix)	Status	: Plugged and Abandoned

2.3. Drilling Data

2.3.1.	Drilling Contractor	: Richter Drilling Pty. Ltd., 11th Floor, 43 Creek Street, BRISBANE, Qld. 4000
2.3.2.	Drilling Rig	: National 610, Rig No. 7. Details of the drilling plant are included in Appendix 5.

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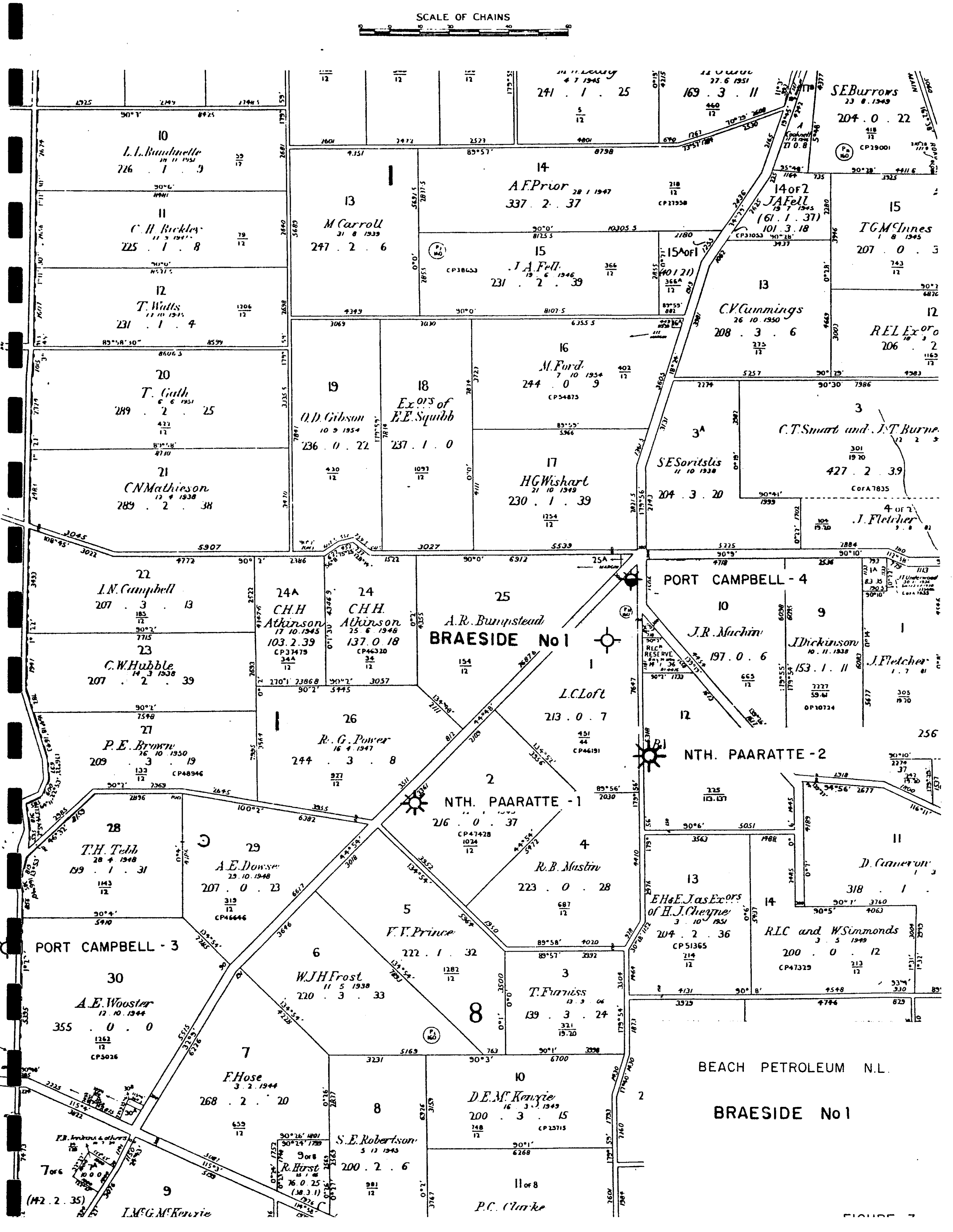
PAARATTE

COUNTY OF HEYTESBURY



2. WELL HISTORY - Cont'd

2.3. Drilling Data - Cont'd

2.3.3. Casing and Cementing Details

(i) Conductor

A 20" conductor was set at 10 m.

Surface Casing

Size	13-3/8 inch
Weight	54.5 lbs/ft.
Grade	J55
Range	3
Coupling	ST & C
Centraliser	At 180 m and 190 m
Float Collar	At 183 m
Shoe	At 195 m
Cement	300 sacks Class A neat followed by 156 sacks Class A plus 1% $CaCl_2$.
Cemented to	Surface
Method	Dual (Top + Bottom) plug displacement
Equipment	Halliburton skid mounted pump.

Intermediate Casing

Size	9-5/8 inch
Weight	Top to bottom 2 joints - 43.5 lbs/ft 59 joints - 36 lbs/ft
Grade	Top to bottom 2 joints - N80 59 joints - J55
Range	3
Coupling	STC
Centraliser	735 m and 725 m
Float Collar	728 m
Shoe	740 m
Cement	385 sacks Class A containing 0.5% HR-7

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2. WELL HISTORY - Cont'd

2.3. Drilling Data - Cont'd

2.3.3. Casing and Cementing Details - Cont'd

Intermediate Casing - Cont'd

Cemented to	400 m
Method	Dual (Top + Bottom) plug displacement
Equipment	Halliburton skid-mounted pump

(ii) Plugs

Plug No. 1

Interval	1600 to 1420 m (180 m)
Cement	230 Sacks Class A plus 0.6% HR-7
Method	Balanced
Tested	No

Plug No. 2

Interval	1290 to 1190 m (100 m)
Cement	130 Sacks Class A plus 0.6% HR-7
Method	Balanced
Tested	No

Plug No. 3

Interval	800 to 700 m (100 m)
Cement	240 Sacks Class A plus 0.25% HR-7
Method	Open ended drill pipe
Tested	Yes. Top felt at 647 m.

Plug No. 4

Interval	Surface
Method	Hand mixed
Tested	Seen

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2. WELL HISTORY - Cont'd

2.3. Drilling Data - Cont'd

2.3.4. Drilling Fluid

For a detailed summary see Appendix 6.

(i) 17½" Hole, 0-203 m

The well was spudded using a freshwater/gel mud with a bentonite content of 57 kg/m^3 and a funnel viscosity of 45 secs/qt.

The range of properties:-

SG : 1.03-1.06

Viscosity : 45-35

Water Loss: Not Taken

(ii) 12¼" Hole, 203-744 m

Having drilled out the cement, the Gellibrand Marl was control drilled, the pump rate increased and the viscosity maintained at less than 35 sec/qt. No 'mud rings' occurred.

Viscosity was maintained when drilling through the Dilwyn Formation.

The range of properties:-

SG : 1.06-1.10

Viscosity : 35-43 secs

Water Loss: 12.8-15.2

(iii) 8½" Hole, 744-2300 m

The 8½" hole was drilled using a KCI/Polymer mud system throughout its entire length.

Range of properties:

SG : 1.08 increasing to 1.16

Viscosity : 39-46 secs

Water Loss: 6.4-9

No problems were experienced during the drilling of the 8½" hole apart from time taken for reaming of some tight sections.

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2. WELL HISTORY - Cont'd

2.3. Drilling Data - Cont'd

2.3.5. Water Supply

Drilling water was obtained from the Port Campbell-Timboon pipeline which passed close to the wellsite. Water was delivered from the pipeline through a 3" "lay flat" plastic hose.

2.4. Formation Sampling and Testing

2.4.1. Cuttings

Lagged samples of cuttings were collected from the shale shaker at the following intervals:-

Surface	to	30 m	-	Nil
30 m	to	1350 m	-	at 10 m frequency
1350 m	to	2300 m	-	at 3 m frequency

Four splits were made; one unwashed, air dried and two washed, oven dried, samples for Beach Petroleum N.L., and one washed, oven dried sample for the Victorian Department of Minerals and Energy.

2.4.2. Cores

(i) Conventional

Two 4 inch diameters cores were cut using a standard Christensen core barrel with a C9 8½" O.D. corehead.

Preliminary results of analyses and core descriptions are included in Appendix 3. Both cores are stored by the Department of Minerals and Energy. A separate detailed report will be compiled when data becomes available.

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2. WELL HISTORY - Cont'd

2.4. Formation Sampling and Testing - Cont'd

2.4.2. Cores - Cont'd

Core No. 1 (1485 - 1494.4 m) Rec. 8.7 m (92.5%)

The entire section was wrapped in 'glad wrap', then wrapped in 'alfoil', dipped in seal peel, labelled and boxed.

Plugs (1" diam. x 2" long) were taken at regular intervals (3 per metre). Plugs in shales or argillaceous siltstone were not taken. Complete porosity and permeability determinations were carried out on each plug.

Complete grain density determination was carried out on every second plug.

Core No. 2 (1936 - 1939.8 m) Rec. 3.56 m (93.7%)

Samples of the section were wrapped in 'glad wrap' followed by 'alfoil' and dipped in seal peel at regular intervals (20 centimetres per metre).

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2. WELL HISTORY - Cont'd

2.4. Formation Sampling and Testing - Cont'd

2.4.2. Cores - Cont'd

(ii) Sidewall

Thirty sidewall cores were attempted. Twenty-seven were recovered. Two bullets were lost. One core remained unrecovered.

No. 1	2276.5	No. 16	1849.8 (LB)
No. 2	2275.6	No. 17	1801.4
No. 3	2234.0	No. 18	1751.0
No. 4	2210.0	No. 19	1700.5
No. 5	2147.5	No. 20	1656.5
No. 6	2111.7	No. 21	1604.5
No. 7	2096.2 (NR)	No. 22	1603.6
No. 8	2095.4	No. 23	1579.3
No. 9	2094.0	No. 24	1552.5
No.10	2049.0	No. 25	1482.5
No.11	1997.0	No. 26	1463.5
No.12	1994.0	No. 27	1409.5
No.13	1986.0	No. 28	1404.0
No.14	1984.6 (LB)	No. 29	1349.2
No.15	1902.5	No. 30	1322.2

NR - No Recovery

LB - Lost Bullet

Descriptions and analyses of the cores are enclosed as Appendix No. 1.

2. WELL HISTORY - Cont'd

2.4. Formation Sampling and Testing - Cont'd

2.4.3. Formation Tests

(i) Conventional

Drill Stem Test No. 1 (Refer to Appendix 4)

Interval Tested	:	1479.3 - 1493.8 m
Formation Tested	:	Waarre Formation
Packer set at	:	1477.5 m and 1479.3 m
Misrun	:	Packer Seat Failure.

Drill Stem Test No. 2 (Refer to Appendix 4)

Interval Tested	:	1923.9 - 1939.1 m	
Formation Tested	:	Eumeralla Formation	
Packer set at	:	1922.03 m and 1923.86 m	
Valve Open (1)	:	67 minutes - weak air blow decreasing to very weak blow after 20 minutes.	
Final Shut-In(1)	:	62 minutes	
Pressures	:	Initial hydrostatic	3194.5
(Bottom gauge at 1939.08 m)		Initial Flow (1)	86.2
		Final Flow (1)	797.4
		Shut-In (1)	2348.8
		Final Hydrostatic (BHT = 77.7°C)	3215.7
Recovery	:	590 m of rathole mud and saltwater (23.9 bbls, 17,500 ppm Cl^-)	
Assessment	:	The Lower Cretaceous Eumeralla Formation, although tight some permeability exists containing formation water.	

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2. WELL HISTORY - Cont'd

2.4. Formation Sampling and Testing - Cont'd

2.4.3. Formation Tests - Cont'd

(ii) Wireline

Eight pressure readings were attempted during one run in the hole with the Schlumberger Repeat Formation Tester (RFT) - see Enclosure 7. The pressure response in the prechamber was too slow to warrant sampling. All zones indicated extremely low porosity/permeability.

Pressure Readings (psi)

Depth(m)	I.H.P.	I.F.P.	B.U.P.	F.H.P.	B.U.T.(min.)
2094.7	3505	12.5	3485	3506	41.5 mins.
2095.4	Seal	Failure			
2095.5	Seal	Failure			
2095.5	Seal	Failure			
2095.8	3506	8.5	9	3506	3 mins.
2096.0	3505	9	8	3506	4 mins.
2096.5	Seal	Failure			
2097.1	3506	8.5	3461	3511	48 mins.

I.H.P. Initial Hydrostatic Pressure
I.F.P. Initial Flow Pressure
B.U.P. Build-Up Pressure
F.H.P. Final Hydrostatic Pressure
B.U.T. Build-Up Time

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2. WELL HISTORY - Cont'd

2.5. Logging and Surveys

2.5.1. Mud Logging

A skid-mounted Exploration Logging (EXLOG) unit was used to provide penetration rate, continuous mud gas monitoring, intermittent mud and cuttings gas analyses, pump rate and mud volume data and cuttings descriptions.

The Mud Log is enclosed as Enclosure 1.

2.5.2. Wireline Logging

Schlumberger recorded the following logs in open hole and a portion of the Gamma Ray log in cased hole:-

Run 1

Dual Laterolog (DLL-MSFL-SP-GR-CAL)

DLL-CAL 740 m (9-5/8" Casing Shoe) - 2300 m (T.D.)
MSFL 1185 m - 2300 m (T.D.)
GR 195 m (13-3/8" Casing Shoe) - 2300 m (T.D.)

Sonic Log (BHC-GR)

740 m (9-5/8" Casing Shoe) - 2300 m (T.D.)

Density Neutron Log (FDC-CNL-CAL-GR)

1450 m - 2300 m (T.D.)

Dipmeter (HDT)

1350 m - 2150 m

These logs are included as enclosures 3-6.

2. WELL HISTORY - Cont'd

2.5. Logging and Surveys - Cont'd

2.5.3. Deviation Surveys

The results of deviation surveys using a TOTCO survey instrument were:-

1/2°	@	33	m	1°	@	998	m
1/2°	@	70	m	1/2°	@	1149	m
3/4°	@	108	m	1/2°	@	1297	m
1°	@	165	m	1°	@	1460	m
1°	@	202	m	2°	@	1601	m
3/4°	@	315	m	2-1/2°	@	1705	m
1-1/8°	@	465	m	4-1/2°	@	1996	m
1-3/4°	@	623	m	7-1/2°	@	2154	m
1-3/4°	@	744	m	10°	@	2294	m
1/2°	@	801	m				

2.5.4. Velocity Survey

No Velocity Survey was carried out.

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3. RESULTS OF DRILLING

3.1. General

Braeside No. 1 was a new field wildcat that encountered no significant hydrocarbons and was subsequently plugged and abandoned.

A drill stem test was attempted and a core was recovered from the upper section of the reservoir sands of the Waarre Formation. Minor gas was associated in this section with the overlying coals. The top of the Waarre Formation was penetrated 22 m lower than predicted, at 1487 m (K.B.). The logs indicate a gross thickness of 102 metres. Porosity calculations from logs complemented with determinations by core analysis indicate an average of 29%.

A successful drillstem test and coring operation were made in a zone of the primary target, the Eumeralla Formation. The top of the formation, containing irregularly interbedded potential reservoir sands, was penetrated 7 metres deeper than anticipated and had a gross thickness of 711 metres. Log-based calculations indicate a porosity range of 11-28% and water saturation of 100% throughout the sands. No porosity determinations were derived by core analysis. Several sands contained gas (C1 to C4 sometimes C5) and displayed up to 70% bright yellow white fluorescence giving strong to slow streaming and crush cut. However, gas amounts of less than 89 units in a background of 10 units were not tested. No samples were collected with the RFT due to the low porosity of the zones tested.

The cuttings, tests and logs confirm the clayey nature of these sands.

A comparison of the intersected stratigraphy with the prognosed section is shown on Figure 4.

BRAESIDE No.1

FORMATION TOPS

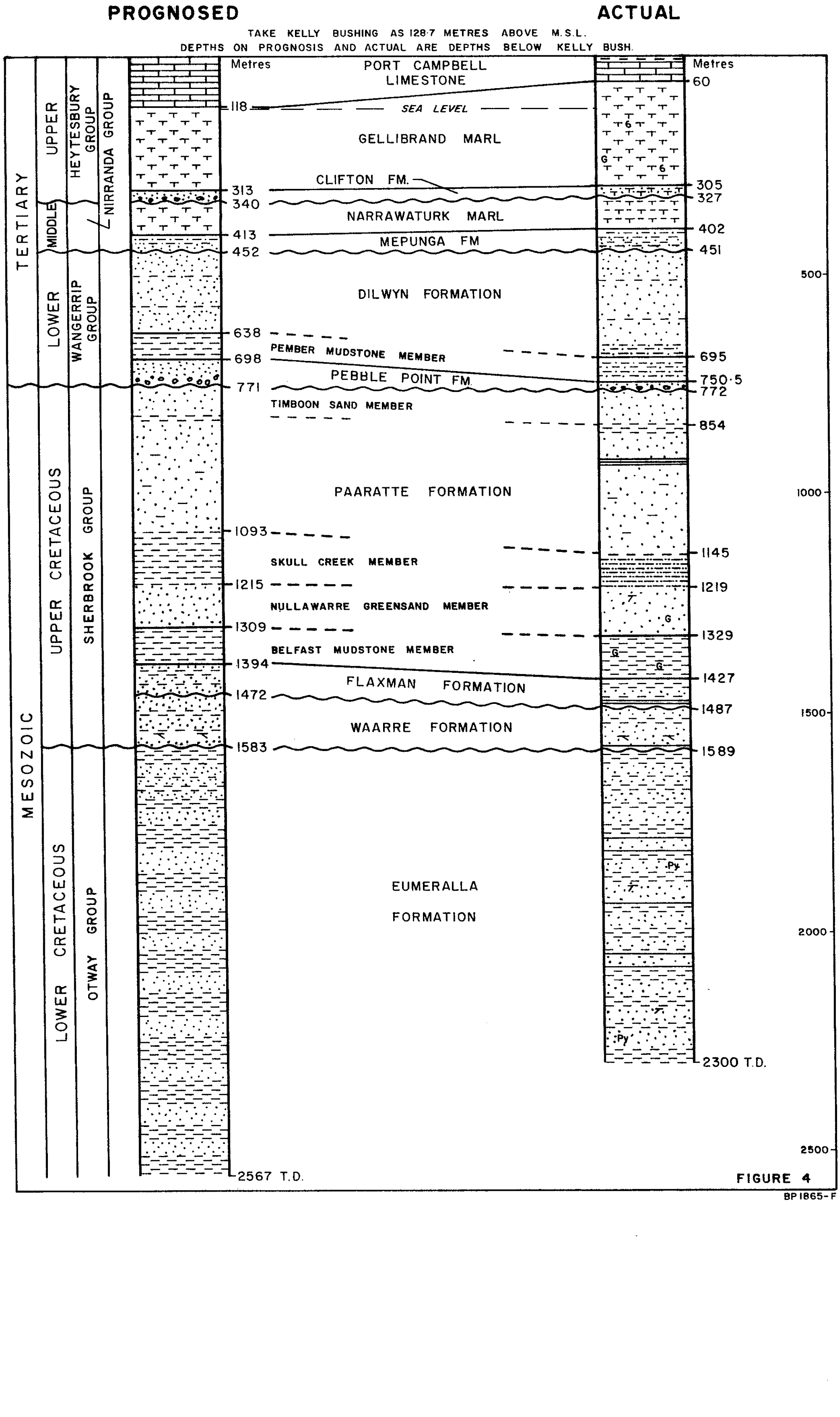

FIGURE 4

BP 1865-F

3. RESULTS OF DRILLING - Cont'd

3.2. Stratigraphy

The following formation tops have been picked using cuttings descriptions, mudlog and wireline log data:-

Group	Formation	KB(m)	Subsea(m)	Thickness(m)
Heytesbury	Port Campbell Limestone	Surface	+ 129	537
	Gellibrand Marl	60	+ 69	245
	Clifton	305	- 176	22
Nirranda	Narrawaturk	327	- 198	75
	Mepunga	402	- 273	49
Wangerrip	Dilwyn	451	- 322	244
	(Pember Mudstone Member)	695	- 566	55.5
	Pebble Point	750.5	- 621.5	21.5
Sherbrook	Paaratte	772	- 643	655
	(Timboon Sand Member)	772	- 643	76
	(Skull Creek Member)	1145	-1016	74
	(Nullawarre Greensand Member)	1219	-1090	110
	(Belfast Mudstone Member)	1329	-1200	98
	Flaxman	1427	-1298	60
	Waarre	1487	-1358	102
Otway	Eumeralla	1589	-1460	653
	Basal Sandstone	2242	-2113	58
	T.D.	2300.0 m	-2171	

(i) All formation tops within the Heytesbury Group are behind casing and have been defined by cuttings descriptions and mud logging techniques.

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3. RESULTS OF DRILLING - Cont'd

3.2. Stratigraphy - Cont'd

(ii) All formation tops within the Nirranda Sub-groups and Wangerrip Group are behind casing and have been defined by Schlumberger's Gamma Ray log, in addition to cuttings descriptions and mud logging techniques. The Resistivity and Sonic logs were also run through the Pebble Point Formation.

(iii) The above techniques were used in locating all Formation Tops in both the Sherbrook and Otway Groups. Further, the density/neutron tool was also run in these two lowermost groups.

FORMATION	LITHOLOGIC DESCRIPTION
HEYTESBURY GROUP	
Port Campbell Limestone	Surface - 60 m Surface - 17 m CLAYSTONE, medium yellow, very soft, sticky, moderately calcareous. 17-60 m. CALCARENITE, medium grey, friable fine grained, abundant shell fragments (bryozoa, forams, shell fragments) trace argillaceous material in part, trace pyrite, trace glauconite.
Gellibrand Marl	60-305 m MARL, medium grey, very soft, abundant fossil fragments (bryozoans, forams, brachiopods, echinoid spines, gasteropods) trace pyrite, trace glauconite.
Clifton	305-327 m CALCARENITE, yellow orange grey, loose to hard, non crystalline, crystalline in part, common very coarse subrounded brown translucent, iron-stained, quartz grains, very poorly sorted, ferruginous, calcareous, fossiliferous.

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3. RESULTS OF DRILLING - Cont'd

3.2. Stratigraphy - Cont'd

FORMATION	LITHOLOGIC DESCRIPTION
NIRRANDA SUB-GROUP	
Narrawaturk	327-402 m MARL, medium to dark brown, very soft, sticky, massive, 15% approx. fossil fragments, moderately pyritic (includes pyritized fossils) trace glauconite, rare fine-coarse quartz grains.
Mepunga	402-451 m SANDSTONE, clear to white to medium brown, loose, fine to very coarse, dominantly medium, sub-angular to sub-rounded, moderately sorted quartz grains, dispersive argillaceous matrix, trace silica cement, trace pyrite, rare glauconite, fair to good visual porosity with minor Claystone at base medium grey brown, soft, very dispersive.
WANGERRIP GROUP	
Dilwyn	451-695 m 451-568 m SANDSTONE, clear, medium yellow, loose, fine to coarse, dominantly medium, sub-rounded to sub-angular dominantly sub-rounded, moderate to well sorted quartz grains, trace medium brown lithic fragments, dispersive clay matrix, trace pyrite, rare glauconite, occasional carbonaceous material finely micaceous increasing with depth, fair to good visual porosity with minor interbeds of:- Claystone, light brown grey, soft, dispersive moderately calcarous.

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3. RESULTS OF DRILLING - Cont'd

3.2. Stratigraphy - Cont'd

FORMATION	LITHOLOGIC DESCRIPTION
Dilwyn - Cont'd	568-695 m SANDSTONE, very light grey to very light brown, very fine to very coarse, dominantly coarse, sub-angular to sub-rounded, moderately sorted quartz grains with common glauconite and lithics, abundant clay matrix in part, trace carbonaceous detritus, strong dolomite cement in part, poor visible porosity interbedded and interlaminated with minor:- Silty Claystone medium brown grey, firm dispersive, moderately carbonaceous and glauconitic, minor pyrite, arenaceous in part.
Pember Mudstone Member	695-750.5 m SILTY CLAYSTONE, medium grey brown, firm, dispersive moderately carbonaceous and glauconitic, minor pyrite, arenaceous in part.
Pebble Point	750.5-772 m SANDSTONE clear, white, yellow, loose, medium to granule, dominantly coarse, sub-rounded to sub-angular, dominantly sub-angular, poorly sorted quartz with common red brown, light grey green lithics, very fine argillaceous matrix, weak silica and pyrite cement trace coal, good visual porosity.

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3. RESULTS OF DRILLING - Cont'd

3.2. Stratigraphy - Cont'd

FORMATION	LITHOLOGIC DESCRIPTION
SHERBROOK GROUP	
Paaratte	772-1145 m 772-820 m SILTSTONE, medium dark grey, firm to hard, sub-fissile, slightly calcareous, very fine, carbonaceous detritus. 820-1050 m SANDSTONE, white, light grey, loose, coarse to granule, dominantly granule, sub-angular to angular dominantly angular moderately sorted quartz, fine argillaceous matrix, weak silica and pyritic cement, trace pyrite nodules trace coal, fair visual porosity interbedded and inter-laminated with:- Silty Claystone medium grey to medium brown grey, soft, very dispersive, common carbonaceous detritus, finely micaceous, minor pyrite, arenaceous in part. 1050-1145 m SILTSTONE light to medium dark grey, soft, very dispersive, very finely arenaceous in part very carbonaceous in part, finely micaceous interbedded with and grading to:- Sandstone off white, loose to hard, silt to fine dominantly very fine, sub-angular to sub-rounded, moderately sorted quartz, nil to strong ankerite, dolomite and siliceous cements, very poor to poor visual porosity becoming coarse to very coarse and poorly sorted over last 5 metres.

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3. RESULTS OF DRILLING - Cont'd

3.2. Stratigraphy - Cont'd

FORMATION	LITHOLOGIC DESCRIPTION
Skull Creek Member	1145-1219 m SILTSTONE, medium to dark grey, very soft, firm in part, argillaceous in part, finely arenaceous in part, moderate carbonaceous matter, finely micaceous, trace pyrite, trace medium brown dolomite and ankerite rare coarse calcite crystals.
Nullawarre Greensand Member	1219-1329 m 1219-1265.5 m SANDSTONE, light to dark green, loose, very fine to very coarse dominantly medium to coarse, sub-angular to sub-rounded, moderately sorted, abundant glauconite staining on quartz grain surfaces trace to abundant, dark green argillaceous matrix increasing with depth strong dolomite cement in part trace silica cement, trace pyrite, poor to good visual porosity. 1265.5-1329 m SANDSTONE, medium to light green, pale yellow green, loose, dominantly fine to medium, sub-angular to sub-rounded moderately sorted quartz, abundant glauconite staining, minor grey lithics, minor glauconite grains, moderate dark green clay and silt matrix, trace silica and glauconitic cement fair to good visual porosity, grading over last 20 m to:- SILTSTONE, medium green grey, very soft, very dispersive, finely micaceous, strong glauconization, common finely arenaceous, finely micaceous, minor crystalline pyrite.

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3. RESULTS OF DRILLING - Cont'd

3.2. Stratigraphy - Con'td

FORMATION	LITHOLOGIC DESCRIPTION
Belfast Mudstone Member	1329-1427 m SILTSTONE grading to Claystone, medium to dark grey, soft, to firm, soft and sticky to firm, abundant glauconite pellets. Finely micaceous, trace carbonaceous material at top; trace pyrite; massive and crystalline to disseminated.
Flaxmans	1427-1487 m SILTSTONE/CLAYSTONE as above with minor interbeds of:- Sandstone, light grey green, hard, very fine - medium dominantly medium, sub-angular to sub-rounded, poorly sorted, quartz grains, fine silt and clay matrix, supporting also some pale yellow brown, coarse rounded quartz grains, trace calcite veining, trace dolomite cement increasing with depth, occasional glauconite, trace disseminated amber, occasional carbonaceous flecks, trace pyrite, poor visible porosity. 1481-1485 m Coal, black, hard, conchoidal fracture, pyritic in part.
Waarre	1487-1589 m 1487-1501 m SANDSTONE, light grey, friable, fine to coarse, dominantly fine, sub-angular to sub-rounded, moderately well sorted, common white clay matrix, trace calcite cement, fair to visible porosity, rare moderately bright white fluorescence with very slow pale whitish yellow

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3. RESULTS OF DRILLING - Cont'd

3.2. Stratigraphy - Cont'd

FORMATION	LITHOLOGIC DESCRIPTION
Waarre - Cont'd	streaming cut followed by a very weak pale whitish yellow crush cut. The identity of the fluorescing mineral, occasionally associated with disseminated pyrite, may be residual oil. A thin bed of Dolomitic Sandstone occurs at 1495 m. Minor interlaminations of and grading to:- Silty Claystone medium grey, soft, finely micaceous and carbonaceous, fissile, occasional glauconitic flecks. 1501-1520 m SANDSTONE clear to white to light grey, loose, very fine to very coarse dominantly coarse but fining to medium with depth, rounded to angular dominantly sub-angular, poorly sorted, trace fine silt and clay matrix, trace pyrite and calcite cement, occasional carbonaceous flecks, fair visible porosity. Trace fluorescence for Sandstone, Siltstone medium grey to dark grey, firm, sub-fissile commonly carbonaceous, finely micaceous, common argillaceous matrix, minor glauconite grading over one metre into:- 1520-1589 m SILTY CLAYSTONE, medium grey, soft, dispersive, finely arenaceous in part, common carbonaceous detritus, common pyrite, finely micaceous, trace medium brown Amber, trace medium brown cryptocrystalline Dolomite. minor glauconite decreasing with depth, slightly calcareous minor light grey chert at base becoming interbedded and interlaminated with:-

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3. RESULTS OF DRILLING - Cont'd

3.2. Stratigraphy - Cont'd

FORMATION	LITHOLOGIC DESCRIPTION
Waarre - Cont'd	1526-1589 m SANDSTONE, light grey, hard, very fine to fine dominantly fine, increasing to medium size with depth, sub-angular to sub-rounded, well sorted, moderate white clay matrix, common carbonaceous matter and often pyritized, strong silica cement, trace pyrite cement, trace dolomite nodules to dolomitic cement very poor visible porosity, trace Amber, trace residual oil fluorescence with thin interbeds of:- 1560-1575 m COAL, black brittle, shiny to sub-vitreous, conchoidal, commonly pyritic in part.
OTWAY GROUP	
Eumeralla	1589-2300 m Unit 1 - 1589-2243 m 1589-1700 m SILTY CLAYSTONE, light to medium blue, grey, soft, sticky micaceous, finely arenaceous, trace Amber, trace chert, common glauconite, rare pyrite, common Coal in part, black, shiny, brittle, conchoidal, trace pyrite interbedded with:- SANDSTONE off white to very light grey, speckled, loose becoming dominantly firm with depth (after 1600 m), very fine to pebble, dominantly coarse but becoming dominantly fine sub-angular and moderately well sorted quartz grains with depth.

.../

3. RESULTS OF DRILLING - Cont'd

3.2. Stratigraphy - Cont'd

FORMATION	LITHOLOGIC DESCRIPTION
Eumeralla - Cont'd	abundant multicolored lithics, common chlorite and white clay matrix becoming abundant with depth, trace pyrite and occasional carbonaceous flecks with depth, trace calcite cement, very poor to poor visual porosity, graded to and interbedded with:- 1700-approx. 1920 m SILTY CLAYSTONE, light to medium dark blue to medium grey brown, soft, sticky, carbonaceous material, finely micaceous and arenaceous, trace coal and pyrite, interbedded with:- SANDSTONE off white, light blue grey, firm, loose in part, dominantly fine grained, well sorted, sub-angular quartz, abundant silt and clay matrix rare, calcite cement, trace pyrite cement, occasional carbonaceous flecks although common between 1780-1800 m., coally material in part pyritic, abundant multicolored lithics, light grey, green, red, very poor to poor visual porosity although fair in part. Approx. 1920-2243 m SANDSTONE light grey, dominantly soft, very fine to medium occasionally coarse dominantly fine, sub-angular to sub-rounded, dominantly sub-angular, well sorted, quartz, abundant white clay and dark green matrix but slightly less in parts where associated with fluorescence, abundant grey, green, red lithics, common carbonaceous matter, weak calcite cement to common in part, rare coarse brown biotite flecks and pyrite, moderate silica cement, very poor visual porosity to poor

3. RESULTS OF DRILLING - Cont'd

3.2. Stratigraphy - Cont'd

FORMATION	LITHOLOGIC DESCRIPTION
Eumeralla - Cont'd	porosity where associated with zones of patchy bright yellow white fluorescence giving a very slow strong bright milky white streaming to crush cut only with occasional thin-beds of:- Coal, black, shiny, brittle, conchoidal, pyritic in part interbedded and inter-laminated with:- SILTY CLAYSTONE light to medium dark grey, soft to firm, dominantly firm, sticky, fissile, common carbonaceous material, laminaceous in part, occasional micaceous in part, trace glauconite, finely arenaceous in part, trace pyrite.
Basal Sandstone	2242 - 2300 m. SANDSTONE light grey green, medium to dark grey, hard, very fine to fine dominantly fine, rounded to sub-angular dominantly sub-rounded, dominantly quartz with medium to dark grey lithics, common chloritic, clay matrix, common calcitic and silicic cements, common carbonaceous detritus, trace pyrite, trace biotite flakes, trace glauconite, trace coal; black, hard brittle and conchoidal, very poor visual porosity, with minor interbeds of:- Silty Claystone, light medium grey, firm to hard dominantly hard, sub-fissile, common carbonaceous material, finely micaceous, rare pyrite, finely arenaceous, in part.

.../

3. RESULTS OF DRILLING - Cont'd

3.4. Structure

The Braeside structure can be recognised on seismic as an Otway Group anticline, truncated up-dip by a normal E-W crestal fault downthrown to the south. (See Figure 1) Due to the poor quality of seismic at the Eumeralla Formation level the definition of a fully closed structure is not possible. Mapping of the top Waarre level indicates that Braeside No. 1 is located up-dip at this level. It was thought that top Otway level was also up-dip from Port Campbell No. 4. This is well supported by Port Campbell No. 4 dipmeter.

A number of approaches were taken to try to correlate the sandstones of the Eumeralla Formation between Port Campbell No. 4 and Braeside No. 1 wells.

Comparison of wireline logs, drilling rates and extrapolation of beds using dips provided for Braeside No. 1 section failed to indicate any reliable correlations.

The non-correlatibility of sandstones within the Eumeralla Formation between these two wells only 300 metres apart, confirms that these sandstones are thin and highly variable.

Both the original and the amended HDT results conflict with:-

(i) azimuth of hole deviation
(ii) interpreted dip from a CDM run on the Port Campbell No. 4 well.
(iii) comparison of subsea level at:-
  - base Waarre Formation and
  - base Eumeralla Formation (See Table 1).

Consequently, HDT results have not been included in any interpretation to date.

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COMPARISON OF FORMATION TOPS

AT PORT CAMPBELL NO. 4 AND BRAESIDE NO. 1

Formation Name	Subsea (m)	
	Port Campbell No. 4	Braeside No. 1
Port Campbell Limestone	+ 134	+ 129
Gellibrand Marl	+ 62	+ 69
Clifton	- 146	- 176
Narrawaturk	- 198	- 198
Mepunga	- 259	- 273
Dilwyn	- 302	- 322
Pember Mudstone Member	- 500	- 566
Pebble Point		- 621.5
Paaratte	- 622	- 643
Skull Creek Member		-1016
Nullawarre Greensand Member	-1116	-1090
Belfast Mudstone Member	-1207	-1200
Flaxman	-1343	-1298
Waarre	-1381	-1358
Eumeralla	-1492	-1460
Basal Sandstone	-2134	-2113
T.D.	-2463	-2171

TABLE 1

.../

3. RESULTS OF DRILLING - Cont'd

3.5. Porosity/Water Salinity/Saturation

Waarre Formation

(i) Porosity

Average porosity in upper Waarre Formation is 31.3%. It was found that porosity values calculated using FDC/CNL crossplots were an average of 16% less than porosities determined by core analysis (See Appendix 3). In some cases the porosity differences exceeded 20%. With major corrections applied within the cored section these differences can be partly reduced. This difference can be partially offset when allowing for clay. Average clay contact in the cleaner sands is 9%.

However, by using the known porosities within the cored sections a sonic compaction factor was obtained. It appears that porosities evaluated from the sonic log using a compaction factor of 1.1 are more reliable than those porosities based on the FDC/CNL crossplot. Use of this compaction factor is limited to the Upper Waarre Formation only.

(ii) Formation Water Resistivity

Formation water resistivities were obtained from two sources.

Braeside DST 2, Rw = 0.17Ω @ 114^{o}F, Rec. (23.9 bbls)

(a) Resistivity-Porosity Crossplot using core derived porosities; RW = 0.21-0.22Ω @ 114^{o}F. (19,200 ppm Cl^{-})
(b) Salinities of formation water recovered from three drill stem tests of the Waarre Formation at Port Campbell No. 4 located 300 metres north of Braeside No. 1. RW = 0.40, 0.36, 0.275Ω @ 114^{o}F (9,900 ppm, 10,600 ppm, 14,300 ppm respectively). NaCl or Cl^{-}

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3. RESULTS OF DRILLING - Cont'd

3.5. Porosity/Water Salinity/Saturation - Cont'd

The accuracy of porosities determined by core analysis and the uncertainty of procedures used in obtaining salinity values from fluids recovered in DST's at Port Campbell No. 4 lends greater confidence to Rw values obtained from the R - Ø crossplot.

The range of Rw in the zone of interest is 0.21-0.275 @ 114^{o}F.

(iii) Formation Water Saturation

Water saturations were calculated for Rw = 0.21 and 0.275 @ 114^{o}F using (i) the Schlumberger nomograph chart SW-1 and (ii) the ratio method with chart SW-2. The log calculations confirm that SW = 100% for the Waarre Formation.

Eumeralla Formation

(i) Porosity

Porosity figures previously determined by core analysis at Port Campbell No. 4 crossplotted with their corresponding sonic transit times produced a matrix velocity of approximately 18,600 ft/sec.

Thus porosity evaluation from the sonic log of 17 sand zones in the Eumeralla Formation show a range of 11-28% with an average of 19%. Because of the effect of shale on the sonic log, this must be optimistic. Density/Neutron derived porosities shows a range of 14-26% with an average of 20%. However, FDC/CNL derived porosities of felspar sands are also over optimistic by a factor that depends on the types of felspar and thus far this has not been determined. The Density-Neutron crossplot indicates of Vshale range of 15-90%. The cleanest sands as determined by this crossplot at 1432.8 m were in fact tested by DST 2.

.../

3. RESULTS OF DRILLING - Cont'd

3.5. Porosity/Water Salinity/Saturation - Cont'd

(ii) Formation Water Resistivity

Salinity of water recovered from DST 11 at Port Campbell-4 indicates an Rw = 0.235 Ω @ 146°F between 1951-1964 m (K.B.) (Braeside DST 2 fluid Rw = 0.18 @ 146°F but recovery was too low).

(iii) Water Saturation

Water saturation determinations using the ratio method suggest SW=100% for all the sands.

See Appendix No. 8 for a tabulation of wireline logging evaluations.

3.6. Occurrence of Hydrocarbons/Source Rock - Maturation

3.6.1. Occurrence of Hydrocarbons

(i) Waarre Formation

A minor number of flecks of moderately bright white fluorescence with very slow streaming pale whitish yellow cut to very weak pale whitish yellow crush cut were identified and are believed to be traces of residual oil. Total gas in the drilling mud peaked at 60 units with a 4 units background (1 units = 200 ppm). Wireline log interpretation confirmed the lack of hydrocarbons. Therefore, the coals of the overlying Flaxman Fm. are considered the source of the gas which, when seen initially was thought to be coming from the uppermost Waarre Sandstone.

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3. RESULTS OF DRILLING - Cont'd

3.6. Occurrence of Hydrocarbons/Source Rock - Maturation - Cont'd

(ii) Eumeralla Formation

Approximately twenty separate sand zones between 1924-2236 m showed fluorescence and gas indications. The strongest gas show at 1930 m did not exceed 89 units (background 10 units) total gas (C1 to C4). Fluorescence in the sandstone had 20% patchy bright white to yellow-white fluorescence giving a strong slow streaming to crush bright milky white cut. This zone, the only to be tested by DST, recovered 23.9 bbls. mud and saltwater. Deeper sandstones had a range of 10-15% fluorescence. Two sands at intervals 2078-2081 m 2094-2100 m showing 40% and 70% solid to pinpoint fluorescence respectively. However, total gases (C1 to C5)) in the drilling mud were only 43 units and 59 units respectively. The interval 2094-2100 m was tested by RFT 1 and was shown to lack porosity/permeability.

3.6.2. Source Rock - Maturation

Nine samples:-

3 oven dried cuttings samples
1 core chip sample
5 sidewall core samples

were analysed for (i) Maceral Composition, (ii) Reflectance Index and Maturity and (iii) Total Organic Carbon.

Geochemical analysis (Appendix 2), have contributed to the following conclusions:-

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3. RESULTS OF DRILLING - Cont'd

3.6. Occurrence of Hydrocarbons/Source Rock - Maturation - Cont'd

1. The BELFAST MUDSTONE MEMBER is immature and a poor potential gas prone source.
2. The FLAXMAN FORMATION is at a low level of maturity and a poor potential gas source.
3. The WAARRE FORMATION is on the transition towards a low level of maturity but of poor source potential.
4. The EUMERALLA FORMATION maturity is marginal but increases with depth. (The low Rvmax value at 1939.3 metres has been disregarded since only two vitrinite particles were available for reflectance determination.) The formation is a poor oil and gas source (Figure 5).

3.7. Contribution to Geology

(i) The average porosity of the upper Waarre Formation as determined by core analysis is 31.3%. Reliable porosities can be calculated using a compaction factor of 1.1 on the sonic porosity evaluation chart.

(ii) The non-correlatibility of sandstones within the Eumeralla Formation, between Braeside No. 1 & Port Campbell No. 4 only 300 metres apart, confirms that these sandstones are thin and highly variable. They, therefore, cannot be considered further as exploration targets.

(iii) The maturity of the Eumeralla Formation is marginal to 2065 m, then it increases with depth. Geochemical analyses confirm this Formation to be a poor oil and gas source.

(iv) The absence of hydrocarbons in the Eumeralla Formation is attributed to the poor quality reservoir sands.

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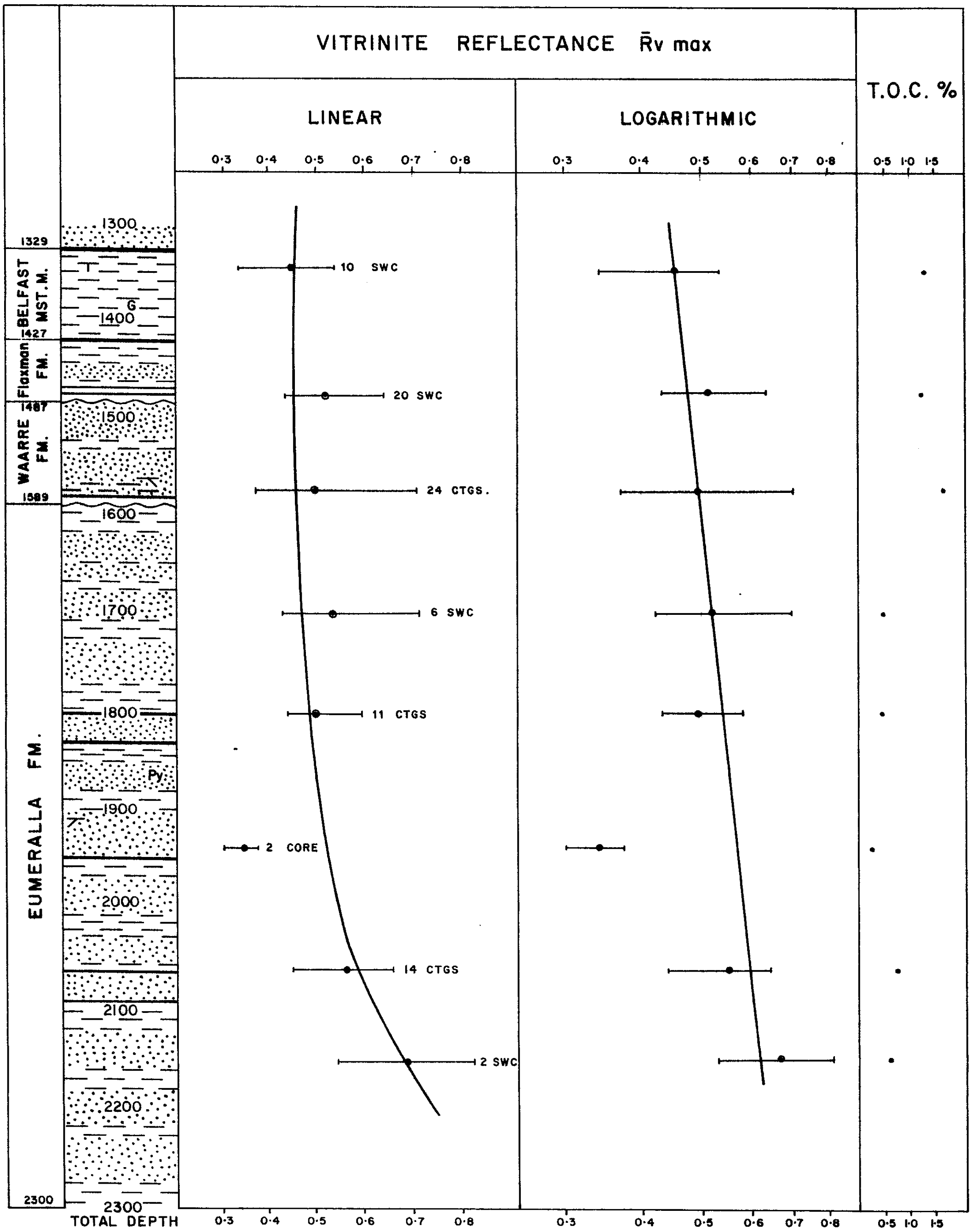
VITRINITE SOURCE ROCK MATURITY PROFILE — BRAESIDE No. 1



6 SWC :— R̄v max, Range, Number of Vitrinite particles in sample, sample type.

FIGURE 5

DRG No. 1869

APPENDIX 1

SIDEWALL CORE DESCRIPTIONS

NUMBER	DEPTH(m)	RECOVERY(cm)	DESCRIPTION
SWC 1	2276.5	2.0	SANDSTONE, light grey, hard, very fine, sub-angular, moderately well sorted, quartz grains, abundant carbonaceous detritus, abundant white to medium green argillaceous matrix, minor siliceous cement, very slightly calcareous, very poor visual porosity, dull orange natural fluorescence from cutitic material.
SWC 2	2275.6	1.6	SANDSTONE, light grey, hard, very fine, sub-angular, moderately well sorted, quartz grains, abundant carbonaceous detritus, abundant white to medium green argillaceous matrix, minor siliceous cement, very slightly calcareous, very poor visual porosity, dull orange natural fluorescence from cutitic material.
SWC 3	2234.0	1.6	SILTSTONE, medium green grey, firm, very finely micaceous, rare very fine carbonaceous material, very calcareous, patchy yellow white FLUORESCENCE, weak milky white CRUSH CUT FLUORESCENCE.
SWC 4	2210.0	1.6	SANDSTONE, light grey, hard, very fine, sub-angular, moderately well sorted quartz grains, abundant carbonaceous, detritus very abundant, white-medium green argillaceous matrix, minor silicic cement, very slightly calcareous, very poor visual porosity. No FLUORESCENCE/CUT.
SWC 5	2147.5	1.3	SILTY CLAYSTONE, medium green grey, firm, massive to sub-fissile, very finely micaceous, trace carbonaceous matter, very slightly calcareous.
SWC 6	2111.7	2.0	SANDSTONE, light-dark grey-green, very fine - fine, dominantly fine, friable to hard, sub-angular, moderately-well sorted, quartz with common grey-green lithics, abundant grey-green argillaceous matrix, trace calcareous and silicic cement, trace very weak dull orange FLUORESCENCE, very poor visual porosity.
SWC 7	2096.2		NO RECOVERY.
SWC 8	2095.4	1.0	SANDSTONE, light-dark grey-green, very fine-fine, dominant, fine, friable to hard, sub-angular, moderately sorted quartz, common grey lithics, abundant grey-green argillaceous matrix, trace silicic cement, very calcareous. NO FLUORESCENCE.
SWC 9	2094.0	2.0	SANDSTONE, light grey, friable-hard, very fine, sub-angular, moderately sorted, quartz grains with abundant dark grey lithics, minor medium green, orange-red lithics, abundant light grey argillaceous matrix, moderate calcareous, slightly siliceous, very poor visual porosity. NO FLUROESCENCE/CUT
SWC 10	2049.0	2.8	SANDSTONE, light grey, friable-hard, very fine, sub-angular, moderately sorted, quartz grains with abundant dark grey lithics, minor medium green, orange-red lithics, abundant, light grey argillaceous matrix, slightly calcareous, slightly siliceous, very poor visual porosity, no FLUORESCENCE/CUT.

.../

NUMBER	DEPTH(m)	RECOVERY(cm)	DESCRIPTION
SWC 11	1997.0	2.0	SANDSTONE, light grey, hard, very fine, sub-angular, well sorted, quartz grains, abundant light grey lithics, minor very fine carbonaceous specks,quartz, and minor medium grey lithics, abundant lignt grey argillaceous matrix, non-calcareous, moderately siliceous cement, very poor visual porosity, no FLUORESCENCE/CUT.
SWC 12	1994.0	1.0	SILTY CLAYSTONE, medium green grey, firm-hard, very finely micaceous, minor very fine carbonaceous material, massive to sub-fissile very slightly calcareous. No FLUORESCENCE/CUT.
SWC 13	1986.0	3.2	SANDSTONE, light greenish grey, hard, fine, grain, green, sub-angular, moderately well sorted, quartz grains, with common grey lithics, minor green orange and red lithics, abundant light grey argillaceous, matrix, trace siliceous cement, very poor visual porosity. No FLUORESCENCE/CT.
SWC 14	1984.6		NO RECOVERY - LOST BULLETT
SWC 15	1902.5	2.0	SANDSTONE, light grey, hard, very fine-fine, dominantly fine, sub-angular, well sorted, quartz grains abundant medium grey lithics, minor green and orange lithics, abundant light grey argillaceous matrix, trace siliceous cement, very poor visual porosity. No FLUORESCENCE/CUT.
SWC 16	1949.8		NO RECOVERY - LOST BULLETT
SWC 17	1801.4	5.0	SANDSTONE, light grey, hard, very fine-fine dominant fine, sub-angular to sub-rounded, well sorted quartz grains,abundant medium grey lithics, very abundant light grey argillaceous matrix, trace siliceous cement, very poor visual porosity, no FLUORESCENCE/CUT.
SWC 18	1751.0	3.2	CLAYEY SANDSTONE, medium grey, firm, dominant, very fine, well sorted, quartz grains, very abundant medium grey argillaceous, matrix, occasional light grey, minor green, orange red lithics, slightly calcareous, very poor visual porosity. No FLUORESCENCE/CUT.
SWC 19	1700.5	2.5	SILTY CLAYSTONE, light grey, firm, very fine, micaceous, minor very fine carbonaceous flecks, sub-fissile, slightly calcareous, no FLUORESCENCE/CUT.
SWC 20	1656.5	5.0	SANDSTONE, light green grey, firm-hard, very fine-fine dominantly fine, moderately well sorted, quartz grains, common medium grey lithics, abundant argillaceous matrix, weakly calcareous, very slightly siliceous, very poor visual porosity, no FLUORESCENCE/CUT.
SWC 21	1604.5	4.5	SANDSTONE, light green grey, firm, fine,green, sub-angular, well sorted, quartz grains, common medium grey, medium green lithics, very abundant argillaceous matrix, very calcareous, rare biotite flake, very poor visual porosity, trace pale yellow white natural FLUORESCENCE.

.../

NUMBER	DEPTH(m)	RECOVERY(cm)	DESCRIPTION
SWC 22	1603.6	4.5	SANDSTONE, light grey, firm, fine medium dominantly fine, sub-angular, moderately well sorted, quartz grains, common medium grey, medium green lithics, occasional orange red lithics, very abundant argillaceous matrix, common calcareous matrix, very poor visual porosity, no FLUORESCENCE/CUT.
SWC 23	1579.3	3.8	SANDSTONE, very light grey, hard, very fine-fine, dominantly very fine, well sorted, quartz grains, abundant light grey argillaceous matrix, minor carbonaceous flecks, non-calcareous, rare biotite flakes, very poor visual porosity, no FLUORESCENCE/CUT.
SWC 24	1552.5	3.2	SANDSTONE, very light grey, hard, very fine-fine, dominantly very fine, sub-angular, moderately - well sorted quartz, very abundant light grey argillaceous matrix, minor green, red, orange, lithics, non-calcareous, trace pyrite interlaminated with strongly carbonaceous silty CLAYSTONE dark grey, massive to sub-fissle, trace pyrite, trace pale yellow FLUORESCENCE no CUT.
SWC 25	1482.5	5.0	CLAYSTONE, medium grey, firm, massive, sticky, finely micaceous, very finely arenaceous, minor carbonaceous detritus.
SWC 26	1463.5	4.5	SILTY CLAYSTONE, medium grey, firm to hard, very finely arenaceous, trace, very fine carbonaceous flecks occasional very-fine disseminated pyrite, weakly calcareous, no FLUORESCENCE/CUT.
SWC 27	1409.5	5.0	CLAYSTONE, medium-dark grey, firm, sticky, moderately calcareous, abundant glauconitic pellets minor very fine carbonaceous specks, finely micaceous NO FLUORESCENCE/CUT.
SWC 28	1404.0	6.4	CLAYSTONE, medium-dark grey to medium grey brown, firm sticky, moderately calcareous, very abundant glauconitic pellets, finely arenaceous, occasional carbonaceous detritus.
SWC 29	1349.2	6.4	CLAYSTONE, medium to dark brown-grey, firm to hard, massive, sticky, noncalcareous, abundant fine, glauconitic, pellets, very finely arenaceous, finely micaceous. No FLUORESCENCE/CUT.
SWC 30	1322.2	6.4	CLAYEY SANDSTONE, pale yellow, hard, very fine-medium dominant fine, sub-angular to sub-rounded, moderately sorted, quartz grains, abundant medium green argillaceou matrix, non calcareous, trace carbonaceous matter, very poor visual porosity. No FLUORESCENCE/CUT.

APPENDIX 2

SOURCE/DATING DATA

Completed by A.C. Cook, University of Woolongong.

SOURCE/DATING DATA
BY A.C.COOK.

BRAESIDE No. 1

K.K. No.	Depth (m)	$\bar{R}_{v}max$	Range	N	Exinite Fluorescence (Remarks)
					BELFAST MUDSTONE 1329m
15529	1349.2 SWC 29 T.O.C. 1.27	0.45	0.34-0.53	10	Rare exinite, dinoflagellates, yellow, >sporinite, orange. (Claystone with abundant ?glauconitic pellets, d.o.m. sparse, I>V>E. Inertinite sparse, vitrinite rare, and occurring as small phytoclasts. Pyrite sparse.)
					FLAXMAN FORMATION 1437m
15530	1482.5 SWC 25 T.O.C. 1.19	0.51	0.43-0.63	20	Rare exinite, sporinite>>cutinite, orange to dull orange. (Siltstone>claystone, d.o.m. common, I>V>E. Inertinite sparse, vitrinite rare. Vitrinite as small to medium size phytoclasts, some possibly representing in situ roots. Pyrite sparse overall, but some large pyrite nodules.)
					WAARRE FORMATION 1487m
15531	1575 Ctgs T.O.C. 1.62	0.49	0.37-0.70	24	Sparse sporinite, yellow to dull orange, rare cutinite, dull orange. Rare fluorinite, green. (Claystone=mudstone=siltstone>sandstone. D.o.m. commmon, I>V=E. Inertinite and vitrinite both sparse. Pyrite common.)
					EUMERALLA FORMATION 1589m
15532	1700.5 SWC 19 T.O.C. 0.45	0.52	0.42-0.70	6	Sparse sporinite and cutinite, yellow to orange. (Mudstone with some siltstone, d.o.m. sparse, I=E>V. Inertinite sparse, vitrinite rare. Pyrite rare.)
15533	1800 Ctgs T.O.C. 0.39	0.49	0.43-0.58	11	Rare liptodetrinite and sporinite, orange to dull orange. (Claystone>siltstone>sandstone, rare massive vitrinite. D.o.m. rare to sparse, V>I>E. Vitrinite rare, inertinite rare. Carbonate minerals common, pyrite rare. The single grain of cutinite-rich coal may be a contaminant.)
15534	1939.3 Core 2 T.O.C. 0.18	0.34	0.30-0.37	2	Rare sporinite, cutinite, and resinite yellow orange to orange. (Siltstone, d.o.m. sparse, I>>E>V. Vitrinite very rare and the only occurrence found is resinous. Inertinite sparse)
15535	2065 Ctgs T.O.C. 0.70	0.55	0.44-0.64	14	Sporinite and cutinite, yellow to orange. (Claystone> siltstone, sparse to common, I>E>V. Vitrinite rare, inertinite sparse. Two grains of coal present, clarite and vitrite. Pyrite sparse.)
15536	2147 SWC5 T.O.C. 0.51	0.67	0.53-0.81	20	Rare sporinite, cutinite and resinite, orange. (Claystone with d.o.m. sparse to common, I=V>E. Vitrinite and inertinite sparse. Vitrinite phytoclasts relatively large.)
15537	2234 SWC3 T.O.C. 0.28	-		-	Rare sporinite, orange to dull orange. (Claystone, d.o.m. sparse, I>>E, no V. Inertinite sparse, exinite very rare.)

APPENDIX 3

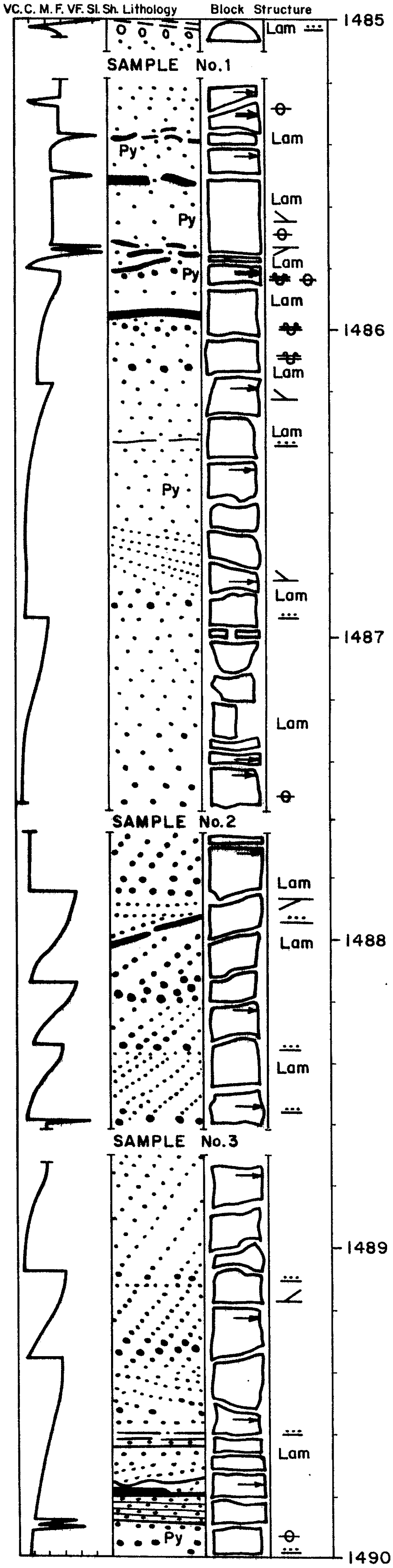
CORE DESCRIPTIONS AND ANALYSES

BRAESIDE No.1

CORE DESCRIPTION,

CORE No.1 INTERVAL : 1485-1494·4m RECOVERY : 8·7 m (92·5%)

FORMATION : WAARRE GEOLOGIST : S.GUBA.



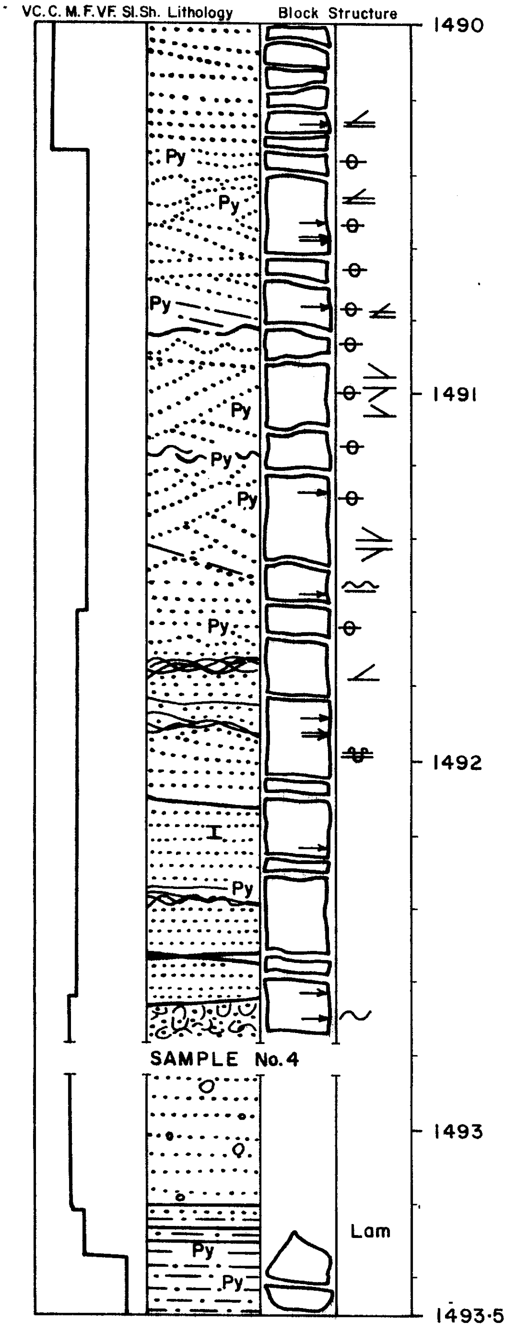
1485.0 - 1485.90m. SANDSTONE very light grey-white, hard, very fine to medium, dominantly fine grained, sub angular to sub rounded, well sorted, minor clay, rare mica flakes, some pyritic replacements of burrows average size 4mm. in diameter. Thin COAL and strongly carbonaceous SILTSTONE (as described below) as stringers reflecting the structure. Scour and Fill structures contain light grey, coarse grained, very poorly sorted, sub-rounded, quartz grains and are 1-2cm. thick. Associated are thin (1-10mm.) discontinuous laminae of carbonaceous SILTSTONE dark grey, firm, minor very fine to fine quartz grains, earthy abundantly micaceous and abundant carbonaceous detritus at 1485.01mm. and 1485.8mm. and COAL, black, firm, vitreous to earthy, platy to fibrous, micaceous.

1485.90 - 1490.36m. SANDSTONE consists of ten upwards fining sequences with a thickness range of 0.16 - 1.07m. and an average thickness of 0.44m. One representative sequence appears as follows between 1488.54 - 1489.08m.:-
The upper boundary of the sequence is sharp, straight and shows dipping beds.
1488.54 - 1488.57m. SANDSTONE very pale yellowish greyish white, firm to friable, fine grained, well sorted, sub-rounded, trace carbonaceous detritus.
1488.57 - 1488.58m. Thin discontinuous laminations of carbonaceous SILTSTONE (1mm. in thickness) dominating at the base of a sequence but also occuring with irregularity throughout the sequence : black, soft, vitreous to earthy fibrous with trace pyrite cement, and interbedded with SANDSTONE as above. Degree of sorting decreasing to moderate with presence of coarse quartz grains.
1488.58 - 1488.60m. SANDSTONE very pale yellowish greyish white, friable, very fine to coarse grained, dominantly medium grain, sub-rounded, moderately well sorted, trace muscovite flakes, minor carbonaceous flecks.
1488.60 - 1488.72m. Sample removed.
1488.72 - 1488.81m. SANDSTONE very pale yellowish greyish white to friable, fine to coarse, dominantly medium, sub-angular to sub-rounded, moderately well sorted, rare silt ; white soft matrix, trace mica, minor carbonaceous flecks, good visual porosity, overlying a straight, graded boundary of less than 1cm. into:-
1488.82 - 1489.08m. SANDSTONE pale brownish yellowish light grey white, very friable, very fine to very coarse, dominantly coarse grain, sub-angular to sub-rounded, dominantly sub-rounded, very poorly sorted, greasy lustre on quartz grains, rare clay matrix, minor carbonaceous detritus, trace mica flakes (muscovite), rare pyrite cement, good visual porosity. Some of the sequences contain one or two small nodules (up to 1cm.) of quartz grains cemented by replacement pyrite in the form of relic burrows.

1489.53 - 1489.95m. SANDSTONE moderately well sorted, dominantly fine grained quartz grading to a poorly sorted, dominantly coarse grained SANDSTONE with depth. Between 1489.84m. and 1489.92m. are COAL and CARBONACEOUS interlaminations from 1-17mm. thick, black, soft, subvitreous to earthy, subconchordal to fibrous.
1489.95m. Large (4x2cm.) nodule of poorly sorted, fine to coarse quartz grains, cemented by pyritic replacement of an infilled burrow.

BP 1876A

CORE DESCRIPTION Cont'd.



1490.36 - 1491.59m. SANDSTONE very pale greenish greyish off white, firm, very fine to medium, dominantly fine, sub-rounded, moderately well sorted, degree of sorting increases with depth, common white to pale orange brown silt and white clay matrix, trace siliceous cement becoming common with depth, trace mica, common nodules of replacement pyrite in burrows (size range 2-30 mm.) trace carbonaceous flecks, poor visual porosity to very poor with depth, with interlaminations of carbonaceous SILTSTONE. dark grey, soft, greasy, fissile, micaceous, organic detrital content is variable and reflects cross-stratified and ripple mark structures, either as sharply defined or finely graduational features within the SANDSTONE. The lower boundary is straight and graduational over 1cm.

1491.59 - 1493.21m. SANDSTONE light yellow grey off white, friable, dominantly upper fine grain size, well sorted, sub-rounded, occasional white clay and silt matrix, trace calcareous cement, trace carbonaceous flecks, pyritic replacement of occasional burrows, good porosity with their laminations of carbonaceous SILTSTONE and COAL black friable, vitreous to earthy, fibrous trace pyrite. The laminations highlight cross-stratification and ripple marks. From 1492.66m. sorting is extremely poor and quartz grainsize ranges from very fine to light grey granules dominantly medium.

1493.21 - 1493.33m. Influx of organic detritus dominates. Carbonaceous siltstones as described below with minor (2-5mm) interlaminations of SANDSTONE, off white, very fine grain, well sorted, common clay/silt matrix, very poor visual porosity.
1493.33 - 1493.50m. Carbonaceous SILTSTONES dark grey, very firm, fissile, micaceous, strongly pyritic in part occuring as laminae (3-10mm. thick) with occasional thin (2mm.) COAL stringers, black, sub-vitreous, to earthy, fibrous.

SAMPLE No...... Sample of Core removed.
→ Small plug taken.
⇒ Large plug taken.

Hydrocarbons:- Nil fluorescence. Trace residual oil. Interpreted as water saturated.

BP1876B

CORE DESCRIPTION - Cont'd

STRUCTURE

CROSS BEDDING:- 1. XI-Cross stratification at 1485.6 m and between 1490.55 m - 1491.60 m.

2. Omikron - Stratification between approx. 1486.27 m and 1490.15 m. These high angle features show dipping foreset beds typical of river point bar deposits.

3. Kappa - Cross stratification or climbing ripples at 1490.80 m and 1491.74 m indicative of high rates of deposition.

BURROWS:- Common between 1489.90 m - 1491.43 m but also occurring between 1485.7 - 1487.56 m.

SLUMP:- Found at 1492.7 m due to gravitational slumping on a depositional slope.

SCOUR AND FILL:- Containing SANDSTONE: poorly sorted, fine to very coarse dominantly coarse quartz grains at 1485.27 m, 1486.03 m and 1486.12 m.

Lam THIN LAMINATION:- Common throughout the section.

GRADED BEDDING:- Occurs within each of the ten sequences between 1485.70 m and 1490.36 m.

RIPPLE MARKS:- Occurs at 1491.51m.

DEPOSITIONAL ENVIRONMENT

Medium to higher energy braided stream point bar deposits.

REFERENCES

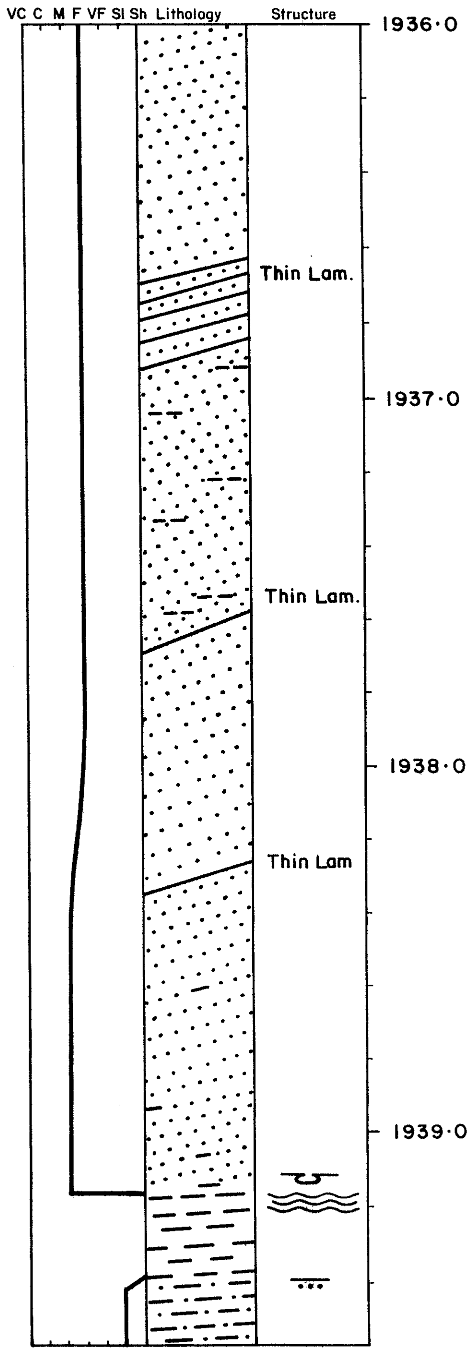
Conybeare and Crook; Manual of Sedimentary Structures. (BMR)
Swanson; Sample Examination Manual (AAAG)

BRAESIDE No.1

CORE DESCRIPTION

CORE No.2 INTERVAL : 1936·0 – 1939·8 metres RECOVERY : 1939·56 m.

FORMATION : EUMERALLA GEOLOGIST : S.GUBA.



1936.0-1936.73 metres. SANDSTONE light blue grey, speckled, fine grained, subangular, moderate to well sorted quartz grains with abundant grey, red, green lithics. Common light grey, occasional light brown clay matrix, moderate siliceous cement, 'minor' carbonaceous detritus and rare biotite, light brown, coarse grained, flaky. Poor visual porosity.

1936.73-1936.90 metres. SANDSTONE as above with thin (1-3mm.) discontinuous laminations of carbonaceous detritus / COAL; black, soft, earthy to subvitreous. Dip which is reflected by these interlaminations is 24°. Also occasional CLAY clast's (1x3mm.) light blue grey, soft, finely arenaceous, in part carbonaceous.

1936.90-1939.17 metres. SANDSTONE, as described as for 1936.0-1936.73 metres interval with a slight increase in medium grain size fraction with depth from 1937.8 metres. Increase in clay fraction with depth. Lower boundary is sharp and undulatory.

1939.16 metres. CLAY clast (5.0cm.) light green grey, firm, subfissile, finely micaceous.

1939.17-1939.33 metres. SHALE; medium grey, very hard, finely micaceous, very silty common fine carbonaceous detritus, dominantly sub-fissile grading over approximately 4cm. into:-

1939.33-1939.56 metres. SILTSTONE light blue grey, hard, abundant very fine arenaceous fraction, finely micaceous, minor fine carbonaceous detritus, dominantly sub-fissile.

HYDROCARBONS

Nil Fluorescence observed : Interpreted as water saturated

STRUCTURE

Thin Lam :– Thin (1-10mm.) dipping laminations

:– Load clast

:– Irregular bedding

:– Graded bedding

REFERENCES

Conybeare and Crook; Manual of Sedimentary Structures. (BMR)

Swanson; Sample Examination Manual (AAPG)

ANALYSES

The results for Braeside # 1 were reached by the following manner:-

Bulk Volume:

Is measured by displacement, using mercury as the liquid pressure medium because of its high surface tension. The mercury pump is calibrated to 0.01 cubic centimeters.

Porosity:

Is measured by a Helium Porosimeter to determine the amount of grain volume in the sample. Porosity being determined by bulk volume-grain volume, helium is used because of the small molecule size, ability to diffuse rapidly, and adsorption of helium on the rock surface is minimal.

Permeability:

Is a measure of the ability of a porous material to transmit fluid. Samples are run on a Gas Permeameter, which is calibrated within plus or minus 5% each day. A complete check of the permeameter, and orifice recalibration is conducted once a month.

Calculated Grain Density:

Is obtained by using measurements from the mercury pump, (Bulk Volume) Helium Porosimeter, (Grain Volume) and analytical balance (Dry Sample Weight).

18/6/82

RESULTS FOR BRAESIDE NO. 1 CORE NO. 1

SAMPLE NUMBER	DEPTH METRES	PERMEABILITY KA	POROSITY HE INJ	GRAIN DENSITY
1	1485.22	437.	30.5	2.68
2	1485.46	633.	27.4	
3	1485.83	876.	30.4	2.66
4	1486.20	3090.	32.6	
5	1486.44	1680.	30.3	2.67
6	1486.83	1530.	29.7	
7	1487.43	4420.	31.4	2.68
8	1487.72	4900.	34.5	
9	1488.25	2610.	32.7	2.69
10	1488.56	1160.	33.2	
11	1488.77	10980.	33.8	2.69
12	1489.24	9550.	29.2	
13	1489.58	1880.	32.3	2.69
14	1489.80	6490.	31.7	
15	1490.25	2290.	29.8	2.71
16	1490.57	.17	13.0	
17	1490.74	.08	9.9	2.66
18	1491.29	.04	5.8	
19	1491.54	LT.01	5.0	2.67
20	1491.88	548.	26.7	
21	1492.23	311.	27.9	2.68
22	1492.65	1180.	26.6	
23	1492.79	3000.	23.6	2.67

CODE: LT = LESS THAN

APPENDIX 4

DRILL STEM TEST RESULTS

HALLIBURTON SERVICES

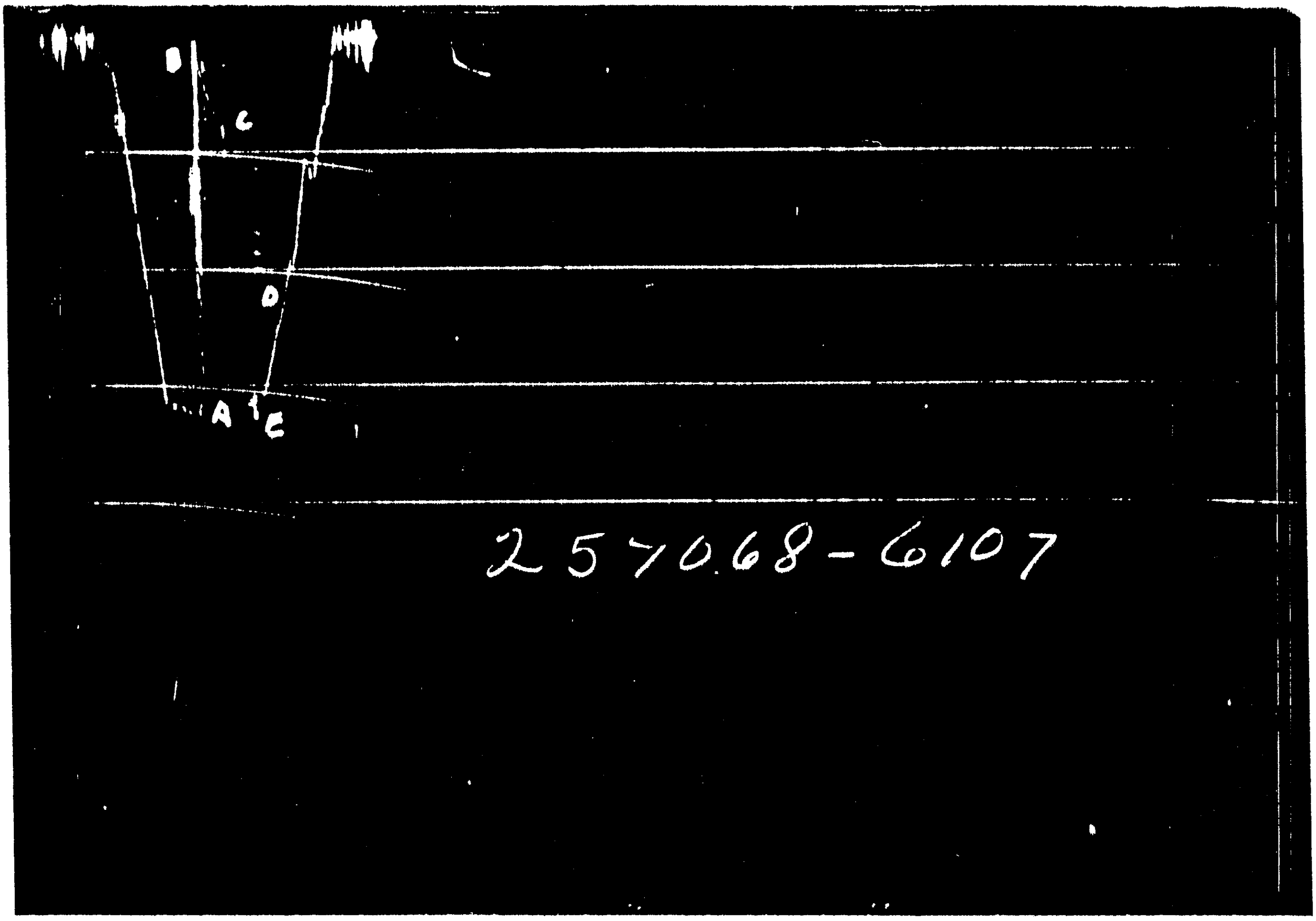
TICKET NO. 25706800

21-SEP-82

ADELAIDE

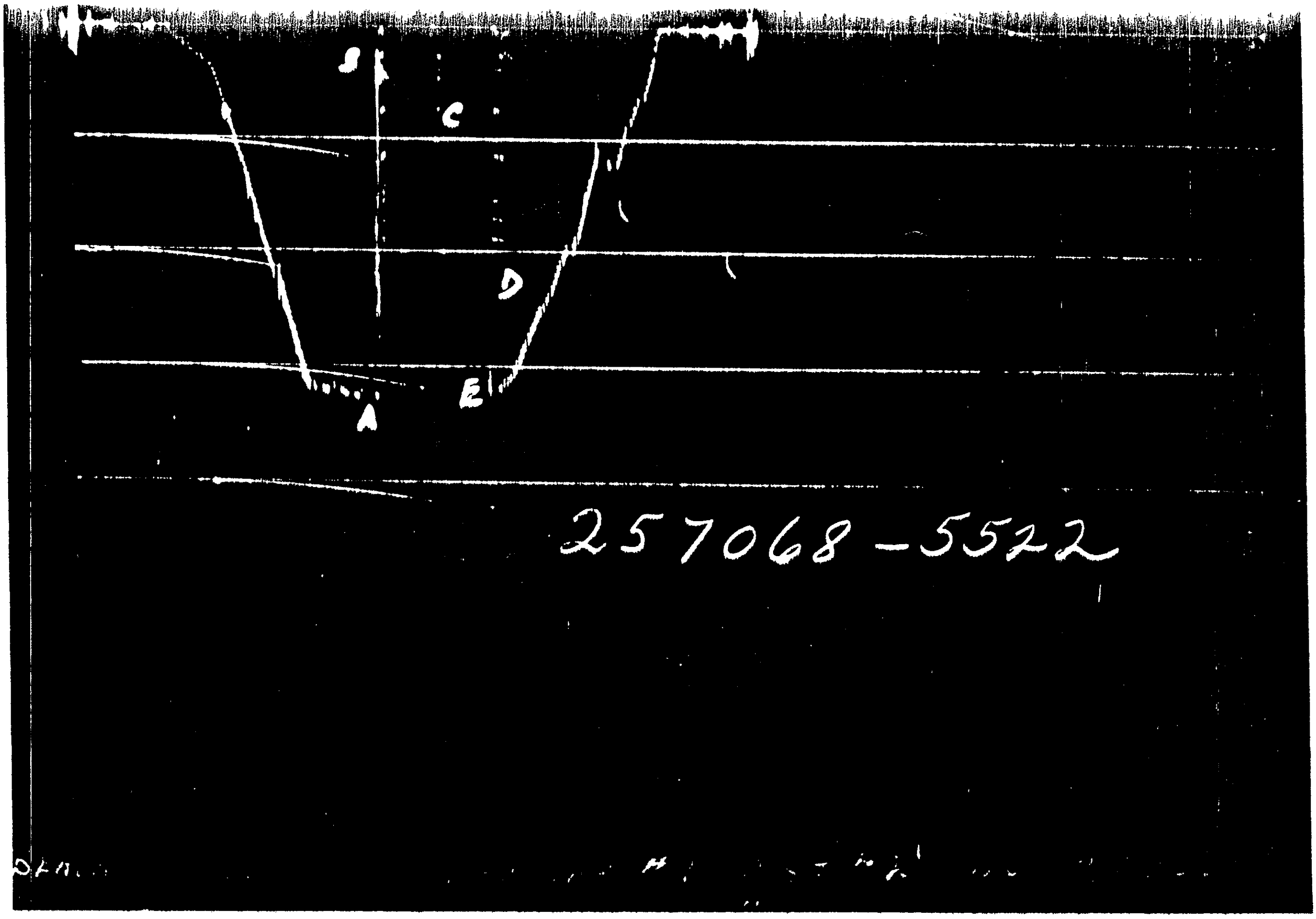
FORMATION TESTING SERVICE REPORT

LEASE NAME	BRAESIDE
WELL NO.	1
TEST NO.	2
TESTED INTERVAL	6312.' - 6365.'
LEASE OWNER/COMPANY NAME	BEACH PETROLEUM
LEGAL LOCATION SEC. - TWP. - RNG.	
FIELD AREA	WILDCAT
COUNTY	VICTORIA
STATE	AUSTRALIA DRSM



GAUGE NO: 6107 DEPTH: 6290.1 BLANKED OFF: NO HOUR OF CLOCK: ___

ID	DESCRIPTION	PRESSURE REPORTED	PRESSURE CALCULATED	TIME REPORTED	TIME CALCULATED	TY
A	INITIAL HYDROSTATIC		3212.7			
B	INITIAL FIRST FLOW		67.7	67.0	66.4	F
C	FINAL FIRST FLOW		841.6			
C	INITIAL FIRST CLOSED-IN		841.6	62.0	62.6	C
D	FINAL FIRST CLOSED-IN		2366.8			
E	FINAL HYDROSTATIC		3209.7			



GAUGE NO: 5522 DEPTH: 6361.8 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		3223.4			
B	INITIAL FIRST FLOW		204.6	67.0	66.4	F
C	FINAL FIRST FLOW		879.5			
C	INITIAL FIRST CLOSED-IN		879.5	62.0	62.6	C
D	FINAL FIRST CLOSED-IN		2376.7			
E	FINAL HYDROSTATIC		3217.0			

EQUIPMENT & HOLE DATA

FORMATION TESTED:
NET PAY (ft):
GROSS TESTED FOOTAGE: 52.5
ALL DEPTHS MEASURED FROM: R. KELLY BUSHING
CASING PERFS. (ft):
HOLE OR CASING SIZE (in): 8.500
ELEVATION (ft): 229
TOTAL DEPTH (ft): 6364.8
PACKER DEPTH(S) (ft): 6306, 6312
FINAL SURFACE CHOKE (in): 0.500
BOTTOM HOLE CHOKE (in): 0.750
MUD WEIGHT (lb/gal): 9.60
MUD VISCOSITY (sec): 43
ESTIMATED HOLE TEMP. (°F):
ACTUAL HOLE TEMP. (°F): 172 @ 6361.8 ft

TICKET NUMBER: 25706800
DATE: 4-19-82 TEST NO: 2
TYPE DST: OPEN HOLE
HALLIBURTON CAMP: ADELAIDE
TESTER: TREVOR BURKE
WITNESS: GEORGE BERG
DRILLING CONTRACTOR: RICHTER DRILLING

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm
	@ °F	ppm

SAMPLER DATA

Psig AT SURFACE:
cu.ft. OF GAS:
cc OF OIL:
cc OF WATER:
cc OF MUD:
TOTAL LIQUID cc:

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): @ °F
GAS/OIL RATIO (cu.ft. per bbl):
GAS GRAVITY:

CUSHION DATA

TYPE	AMOUNT	WEIGHT

RECOVERED:

23.9 BBLS. OF FORMATION WATER

MEASURED FROM TESTER VALVE

REMARKS:

TYPE & SIZE MEASURING DEVICE:					TICKET NO: 25706800
TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
4-19-82					
1110					LOADED BT'S
1120					MADE UP TOOLS
1300					TOOLS MADE UP, RAN IN HOLE
1713					TOOL OPENED WITH WEAK BUBBLE
1715					WEAK BUBBLE
1720					WEAK BUBBLE
1725					WEAK BUBBLE
1730					BUBBLE SLOWLY DECREASED
1735					VERY WEAK BUBBLE
1740					VERY WEAK BUBBLE
1745					VERY WEAK BUBBLE
1750					VERY WEAK BUBBLE
1755					VERY WEAK BUBBLE
1800					VERY WEAK BUBBLE
1805					VERY WEAK BUBBLE
1810					VERY WEAK BUBBLE
1815					CLOSED DCIP FOR FIRST CIP
					PERIOD.
1922					UNSEATED PACKER AND PULLED
					OUT OF THE HOLE
2355					TOOLS OUT OF THE HOLE.

TICKET NO: 25706800	GAUGE NO: 6107
CLOCK NO: 26206 HOUR: 48	DEPTH: 6290.1

HALLIBURTON SERVICES

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t+\Delta t}$	$\log\frac{t+\Delta t}{\Delta t}$
			FIRST FLOW			
B	1	0.0	67.7			
	2	11.0	319.0	251.3		
	3	22.0	455.8	136.9		
	4	33.0	570.9	115.1		
	5	44.1	671.1	100.2		
	6	55.0	759.9	88.8		
C	7	66.4	841.6	81.7		
			FIRST CLOSED-IN			
C	1	0.0	841.6			
	2	4.0	1929.7	1088.1	3.8	1.248
	3	8.0	2023.5	1181.9	7.2	0.968
	4	12.0	2087.9	1246.4	10.2	0.815
	5	16.0	2138.1	1296.5	12.9	0.712
	6	20.0	2178.4	1336.8	15.4	0.636
	7	24.0	2206.1	1364.5	17.6	0.576
	8	28.0	2232.6	1391.0	19.7	0.528
	9	32.0	2255.6	1414.0	21.6	0.488
	10	36.0	2278.2	1436.6	23.4	0.454
	11	40.1	2294.5	1452.9	25.0	0.425
	12	44.0	2312.7	1471.1	26.5	0.400
	13	48.0	2325.4	1483.8	27.8	0.378
	14	52.0	2339.3	1497.7	29.2	0.358
	15	56.0	2351.4	1509.8	30.4	0.340
D	16	62.6	2366.8	1525.2	32.2	0.314

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t+\Delta t}$	$\log\frac{t+\Delta t}{\Delta t}$

REMARKS:

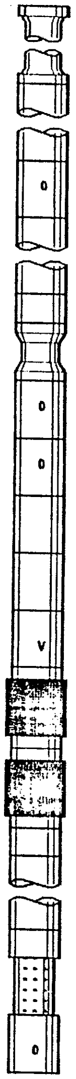
TICKET NO: 25706800	GAUGE NO: 5522
CLOCK NO: 9474 HOUR: 24	DEPTH: 6361.8

HALLIBURTON SERVICES

REF		MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
			FIRST FLOW			
B	1	0.0	204.6			
	2	11.0	440.3	235.7		
	3	22.0	536.3	96.0		
	4	33.0	626.4	90.1		
	5	44.0	720.7	94.3		
	6	55.0	798.5	77.8		
C	7	66.4	879.5	81.1		
			FIRST CLOSED-IN			
C	1	0.0	879.5			
	2	4.0	1824.4	944.9	3.8	1.244
	3	8.0	1970.6	1091.1	7.1	0.970
	4	12.0	2055.3	1175.8	10.1	0.816
	5	16.0	2116.6	1237.1	12.9	0.712
	6	20.0	2162.9	1283.3	15.4	0.636
	7	24.0	2201.1	1321.6	17.6	0.576
	8	28.0	2229.6	1350.1	19.7	0.528
	9	32.0	2257.2	1377.7	21.6	0.488
	10	36.0	2278.4	1398.9	23.4	0.454
	11	40.0	2298.7	1419.2	25.0	0.425
	12	44.0	2316.4	1436.9	26.5	0.400
	13	48.0	2332.2	1452.7	27.9	0.377
	14	52.0	2345.6	1466.1	29.2	0.358
	15	56.0	2358.5	1479.0	30.4	0.340
D	16	62.6	2376.7	1497.2	32.2	0.314

REMARKS:

TICKET NO. 25706800



		O.D.	I.D.	LENGTH	DEPTH
1	DRILL PIPE......................	4.500	3.826	5812.6	
3	DRILL COLLARS...................	6.250	2.810	369.6	
50	IMPACT REVERSING SUB...........	6.250	2.810	1.0	6182.2
3	DRILL COLLARS...................	6.250	2.810	93.4	
5	CROSSOVER......................	5.750	3.000	0.7	
11	HANDLING SUB & CHOKE ASSEMBLY...	5.870	2.500	2.6	
12	DUAL CIP VALVE.................	5.000	0.870	4.1	
60	HYDROSPRING TESTER.............	5.000	0.750	5.0	6288.1
80	AP RUNNING CASE................	5.000	3.750	4.0	6290.1
15	JAR............................	5.000	1.750	5.0	
16	VR SAFETY JOINT................	5.000	1.000	2.8	
70	OPEN HOLE PACKER...............	7.750	2.250	6.0	6305.9
70	OPEN HOLE PACKER...............	7.750	2.250	6.0	6311.9
5	CROSSOVER......................	5.750	2.430	1.0	
3	DRILL COLLARS..................	6.250		30.9	
5	CROSSOVER......................	6.000	2.250	0.9	
21	PERFORATED TAIL PIPE...........	5.000	3.000	15.0	
81	BLANKED-OFF RUNNING CASE........	5.000	2.440	4.1	6361.8

TOTAL DEPTH 6364.8

EQUIPMENT DATA

EQUATIONS FOR DST LIQUID WELL ANALYSIS

Transmissibility	$\frac{kh}{\mu} = \frac{162.6\ QB}{m}$	$\frac{\text{md-ft}}{\text{cp}}$
Indicated Flow Capacity	$kh = \frac{kh}{\mu}\mu$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Damage Ratio	$DR = .183\ \frac{P^{*} - P_{f}}{m}$	—
Theoretical Potential w Damage Removed	$Q_{T} = Q\ DR$	BPD
Approx. Radius of Investigation	$r_{i} = 4.63\sqrt{kt}$	ft

EQUATIONS FOR DST GAS WELL ANALYSIS

Indicated Flow Capacity	$kh = \frac{1637\ Q_{g}\ T}{m}$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Skin Factor	$S = 1.151\left[\frac{m(P^{*}) - m(P_{f})}{m} - \text{LOG}\ \frac{kt}{\phi\ \mu\ c_{t} r_{w}^{2}} + 3.23\right]$	—
Damage Ratio	$DR = \frac{m(P^{*}) - m(P_{f})}{m(P^{*}) - m(P_{f}) - 0.87\ mS}$	—
Indicated Flow Rate (Maximum)	$AOF_{1} = \frac{Q_{g}\ m(P^{*})}{m(P^{*}) - m(P_{f})}$	MCFD
Indicated Flow Rate (Minimum)	$AOF_{2} = Q_{g}\sqrt{\frac{m(P^{*})}{m(P^{*}) - m(P_{f})}}$	MCFD
Approx. Radius of Investigation	$r_{i} = 0.032\sqrt{\frac{kt}{\phi \mu c_{t}}}$	ft

APPENDIX 5

DETAILS OF DRILLING PLANT

NATIONAL 610, RIG NO.7

INVENTORY

6 May, 1980

DRAWWORKS	National 610M, 750 HP rating 1 1/8" Drilling Line, National 82 catheads. Satellite Automatic Drilling Control. Parmac 281 Hydromatic brake.
COMPOUND	National two section DT-18-¼ T Drive.
ENGINES	2 Caterpillar 3408 Turbocharged Diesel industrial engines. National C195-80F torque converters.
MUD PUMPS	2 National 8P-80 triplex single acting slush pumps each with: Hydril K20-3000 pulsation dampers. Cameron B2 reset relief valves Cameron Tp. D pressure guages Integrally mounted charging pumps
MUD PUMP DRIVE	2 National L shaped single engine V-belt independent pump drive each with Caterpillar D398 TA series B diesel industrial engine National C300-64 FH. torque conv.
MAST	Dreco 133ft by 21ft leg spread mast stem with accessories including; Working cluster of five 42" sheaves and one 42" fastline sheave Decard casing stabbing board.
SUBSTRUCTURE	Dreco 20ft self elevating substructure complete.
ROTARY TABLE	National C275
BLOCK	National TP 540G250
SWIVEL	National P300
KELLY DRIVE	Varco Type HDS
MIXING PUMP	Warman 6/4 centrifugal with 50hp. Newman electric motor.
MUD AGITATORS	4 Brandt Model M.A.7.5 HP
MUD TANKS	3 Fabricated 34' x 10' x 6' 8" - Total 750 bbl.
SHALE SHAKER	Brandt Dual Tandem.
DESANDER	Demco model 122
DEGASSER	SWACO
DESILTER	Pioneer T12-E4HV economaster
GENERATING PLANT	2 Caterpillar 3408 Turbocharged Diesel Industrial Engines. 275 KW prime 200/480 V 3 PH 60HZ mounted in utility house.
RIG LIGHTING	System of twin 48" 60W fluorescents and 8 400W mercury vapour floodlights.

UTILITY HOUSE	Fabricated skid mounted containing generator sets and switch gear.
B.O.P's & ACCUMULATOR	1 Hydril GK-12"-3000 Annular 1 12"-3000 Cameron 'U' hydraulic double ram preventor 1 Hydril 5½in. 5000P.S.I. upper kelly cock 1 Hydril lower kelly guard 1 Grey inside B.O.P. 1 wettrol Model 108-10S
AIR SYSTEM	1 Sullair series 10-30LAC package compressor 1 Atlas Copco LT930 1 27 cu. ft. air receiver 1 40 cu. ft. air receiver 1 Ingersoll-Rand KU air winch
CHOKE MANIFOLD	C.I.W. 2" 5000psi CHOKE 3" Valves
DRILL PIPE	10,000 ft. 4½in. O.D.,X-Hole connections.
DRILL COLLARS	12 8in x 30ft long 30 6½in x 30ft long
KELLEYS	1 Drilco 5¼ in hexagonel
STABILIZERS	Grant 12¼ in. Grant 8½ in.
FISHING TOOLS	To suit pipe and collars being run.
HANDLING TOOLS	Lamb power tong Spinner-hawk drill pipe spinner Tools to suit pipe, collars, casing being run.
SUBSTITUTES	To suit drill string connections.
INSTRUMENTATION	Martin Decker Type 'D' weight indicator with type 'D' anchor and E80 sensator Martin Decker MVTX4AK-3A mud volume totalizer Martin Decker MFSX2A mud flow, full and stroke system Geolograph 6-Pen "Drill Sentry" Totco Operating Unit No. 6
TOOL HOUSE	Fabricated, skid mounted.
DOG HOUSE	" " "
MECHANIC SHACK	" " "
FUEL TANKS	Fabricated, skid mounted, twin 10,000 L.
PIPE RACKS	6 sets fabricated.
CAT WALKS	1 set fabricated.
WATER TANK	400 bbl fabricated, skid mounted.
JUNK BOXES	2 fabricated, skid mounted.
MUD TESTING	Baroid No. 821 rig laboratory.

APPENDIX 6

DRILLING FLUID RECAP

INDEX

INTRODUCTION

The Braeside No. 1 well, an oil exploration well, was drilled to a T.D. of 2300m using freshwater - gel mud for the 17½" and 12¼" holes to 744m and a KCl/Polymer mud for the 8½" hole to T.D.

The purpose of the KCl/Polymer mud was to limit clay hydration within sands in the Eumarella Formation, the primary objective. It was felt by the operator that any potential production in these sands with interstitial clay could be severely hindered if drilled with a freshwater mud, especially as formation fracturing was also being considered.

As only poor oil shows were encountered and no actual oil was flowed during the one successful test (another attempted test, failed to get a packer seat), the success of the mud in achieving this purpose was never tested. It did however, result in a good stable hole with very few drilling problems.

In fact, the only time lost from drilling, except for tripping, coring and testing, was for some tight hole on trips, partly due to having a good gauge hole anyway.

BAROID AUSTRALIA PTY. LIMITED

NL INDUSTRIES

WELL SUMMARY

Baroid Engineers: Alan Searle
Manfred Olejniczak

Operator	:	Beach Petroleum
Well Number	:	Braeside #1
Location	:	Otway Basin
Contractor	:	Richter Drilling
Rig	:	7
Total Depth	:	2300m
Water Depth/KB to Ocean Floor	:	N/A
Arrived on Location	:	2/4/82
Spud Date	:	3/4/82
* Date Reached T.D.	:	24/4/82
* Total Days Drilling	:	23
Date off Location	:	27/4/82
Total Days on Well	:	26
* Total Cost of Mud Materials	:	$36,823.33
* Mud Costs/m	:	$16.01
* Mud Costs/day	:	$1,601.01
Engineer Service (26 days) @ $275.00	:	$7,150.00
Total Cost Materials and Engineer Service	:	$43,973.33
Mud Materials not Charged to Drilling	:	None
Engineer Service Not Charged to Drilling	:	None
Casing Program	:	13.3/8" casing at 194.3m 9.5/8" casing at 744m

* Calculated as from actual spud to P and A or final casing run and testing program started etc. Started P and A on 26/4/82

BEACH PETROLEUM

BRAESIDE # 1

DISCUSSION BY INTERVAL

17½" Hole

0 - 203m

The well was spudded at 0815 hours, April 3, 1982, using a freshwater/gel mud with a Bentonite content of approximately 57 kg/m³ and a funnel viscosity of 45 sec/qt.

Surface limestone was drilled to a depth of 70 metres before encountering the Gellibrand marl. After drilling 40 metres into the marl "mud rings" began to occur and these were a problem all the way to T.D. at 203m. Large quantities of mud were lost pumping out "mud rings" and cleaning out the flowline and shaker box; some of this mud was recovered by jetting the cellar back into the pits, but heavy dilution was still required. By T.D. the dilution required to maintain volume resulted in the funnel viscosity being reduced to 35 sec/qt.

At 193m, after circulating out a mud ring, a wiper trip was made. A further 10 metres of hole were drilled, then the well was circulated while cleaning out the cellar. The 13.3/8" casing was then run and cemented at 194.3m.

DISCUSSION BY INTERVAL (Cont'd)

12¼" Hole
203 - 744 metres.

After testing B.O.P.'s, ran in and tagged cement at 183.3 metres. Drilled out cement and shoe, made new hole from 202 - 207 metres and performed a leak off test (equivalent mud weight 1.81 S.G.).

To minimize the problem of mud rings the marl was control drilled at 20m/hr, hydraulics were improved by increasing the pump rate (2 pumps used at 75 strokes/min each) and viscosity was maintained at less than 35 sec/qt. Dilution and BARAFOS were used to maintain the viscosity while CONDET was used to prevent bit balling. No "mud rings" occurred, so these measures can be considered a success.

When drilling the Dilwyn Formation AQUAGEL was added to maintain viscosity. Some minor mud losses occurred due to sand plugging shaker screens.

Casing point was reached at 744m, 32m into the Pember Formation. A wiper trip was made then 9.5/8" casing was run and cemented at 744 metres.

DISCUSSION BY INTERVAL (Cont'd)

8½" Hole
744 - 2300m.

The 8½" hole was drilled using a KCl/Polymer mud system throughout it's entire length.

To improve hole stability and most importantly, to save time, the new mud was mixed in freshly cleaned mud tanks and the hole displaced with it prior to drilling out the 9.5/8" casing shoe. This meant that no actual drilling time was lost, as would have been the case if the hole had to be displaced with new mud during the actual drilling of the section, a process which would have cost the best part of a full day.

The initial makeup of the KCl/Polymer mud on drilling out the shoe was:-

MONPAC	3.7 kg/m³	(1.3 ppb)
XC POLYMER	1.9 kg/m³	(0.7 ppb)
KCl	68.5 kg/m³	(24 ppb)

As the KCl used was of approximately 75% purity the above KCl concentration was equivalent to 51.3 kg/m³ (18 ppb) for 100% purity, or produced a 5% KCl by weight. This makeup provided an initial P.V./Y.P. of 15/15 and filtrate loss of 9 ccs.

As drilling progressed the polymer concentration was boosted slightly to maintain the Y.P. at, or slightly over 20 for the remainder of the well. This was done to provide improved hole cleaning, as some "balls" of sample were observed on the shakers at the lower Y.P., suggesting samples rolling around the annulus. It also reduced aeration tendencies of the mud. The filtrate settled down to a steady level around 7 ccs as the solids content of the mud stabilized.

.../Cont'd

DISCUSSION BY INTERVAL (Cont'd)

8½" Hole (Cont'd)

Maintenance treatments were almost wholly carried out by additions of premixed mud from the pill tank in batches of approximately 8m³ (50 bbl). These had a total polymer content of around 8.6 kg/m³ (3 ppb) to make up for polymer losses to the cuttings, wellbore and solids equipment. As a result of this approach, mud properties remained very stable and the potential problems of foaming/aeration and polymer lumps interfering with surface equipment were avoided. Also of importance, the drill crew always knew what to do to maintain the mud system.

The relative proportions of MONPAC to XC-POLYMER used remained at an overall 3:1 but more of the XC-POLYMER was used towards T.D., where tripping was more prevalent to provide slightly higher gels and improved cuttings removal.

The only problem experienced during the drilling of the section was persistent tight hole on trips, with fill on running back to bottom. On several occasions, when circulating out after reaming down, numerous thick pieces of firm wallcake were observed on the shakers. This suggested that the hole was closely in gauge over much of its length (later confirmed on the caliper log) and that filter cake buildup was occurring opposite permeable sections contributing to the tight hole. This filter cake, together with some cuttings, would be pushed down ahead of the bit on R.I.H. to cause apparent fill. No fill was noticed on connections or surveys and during 2 days of logging at T.D. The Schlumberger tools went repeatedly to bottom, indicating that the mud was successfully cleaning the hole and supporting cuttings. This suggested that the time lost with tight hole and reaming could have been reduced by improved filtrate control through the use of an additional non-viscosifying filtrate reducer, such as DEXTRID.

.../Cont'd

DISCUSSION BY INTERVAL (Cont'd)

8½" Hole (Cont'd)

On drilling through the Belfast shale, spalling due to overpressure was again noticed and the mud weight increased 1.14 S.G. (9.5 ppg) from 1.10 S.G. (9.2 ppg). This successfully controlled the formation. The increase in mud weight was done by boosting the KCl content to 10% by weight. This was felt to be the more effective, rather than using Barite, for such a small increase, as it further increased formation inhibition and would not be lost through the desilter as would Barite. As drilling progressed the mud weight continued to increase to a maximum of 1.17 S.G. and was later stabilized at 1.16 S.G. by T.D. This was due to increased drill solids which the solids equipment could not keep up with, nevertheless it was not considered too excessive and did not effect mud performance.

In retrospect the KCl/Polymer mud performed as well as could have been hoped for and all personnel were happy with it. In particular, it produced a good gauge hole which remained very stable for logging without any wiper trips required.

CONCLUSION AND RECOMMENDATIONS

Overall, the mud program as eventually carried out in practice, can be regarded as quite successful in producing a good hole with a minumum of problems, at still quite a low cost.

As pointed out in the discussion of the 12¼" hole, a combination of high dilution rates, additions of BARAFOS and CONDET can successfully control "mud ring" problems in the near surface marls.

Also, the tight hole problems may be reduced with a further reduced water loss control, with a product such as DEXTRID.

BIT RECORD

COUNTRY: AUSTRALIA	STATE: VICTORIA	FIELD: OTWAY BASIN	LOCATION: PAARATTE
WELL: BRAESIDE NO. 1	CONTRACTOR: RICHTER DRILLING	RIG: NO. 7	
OPERATOR: BEACH PETROLEUM	TOOL PUSHERS: L. Klassen/G. Beck	SPUD: 3/4/82	REACHED T.D.: 24/4/82
UNDER SURFACE:	UNDER INTER.:	PUMP NO.1 LINER: 6 x 8½	PUMP NO.2 LINER: 6 x 8½
PIPE: 4½	COLLARS: 8/6	MUD:	

no.	size	make	type	jets 32nd	depth out(m)	mtrs.	hours	m/h	accum. drlg. hours	tonne wt.	rpm	ver. dev.	pump pres. psi.	spm 1	spm 2	mud wt.	mud vis.	mud w.l.	formation, remarks
1	17½	HTC	3AJ	OPEN	203	203	19	10.7	19	6.8	100	-	-	130	-	1.06	35	NC	Limestone/Marl
2	12¼	HTC	X3A	3x15	744	541	38.5	14	57.5	4.5-11.3	60 to80	1 3/4	1000	75	75	1.10	35	15.2	Marl/Sandstone
3	8½	SMITH	SDGH	3x12	1158	414	18	23.0	75.5	20	80	½	1460		120	1.07	41	8.3	Sandstone
4	8½	SMITH	SDGH	3x12	1330	172	10½	16.4	86.0	32	80	½	1450		120	1.09	41	7.3	Sandstone/Shale
5	8½	SMITH	F2	3x12	1485	155	12	12.9	98.0	30	80		1700		120	1.10	41	6.6	Shale/Sandstone
6	8 7/16	CHRIS	C9 CORE	-	1494	9	3	3.0	101.0	15	55		650		75	1.14	45	7.0	
RR 5	8½	SMITH	F2	3x12	1610	116	25 3/4	4.5	126.75	30	80		1700		120	1.14	43	7.2	Sandstone/Shale
6	8½	SMITH	F2	3x12	1936	326	28¼	11.4	155.00	30	80		1500		120	1.15	40	7.0	Shale W/Sands
7	8½	SMITH	F2	3x12	2218	282	56½	5.0	211.50	30	80		1550		120	1.16	42	7.0	Shale W/Sands
8	8½	SMITH	F2	3x12	2300	82	22¼	3.6	233.75	30	80		1575		120	1.16	44	7.7	Shale W/Sands

BARROID

BAROID DIVISION N.L. INDUSTRIES
DRILLING FLUID PROPERTY RECAP

Company BEACH PETROLEUM
Well BRAESIDE NO. 1
Contractor/Rig RICHTER DRILLING 7

date 1982	depth m.	hole size "	temp. °C.	wt. sg.	vis. sec.	P.V.	Y.P.	gels 10 sec.	gels 10 min.	w.l. a.p.i	cake mm	w.l. hpht	°C	filtrate anal. pf	filtrate anal. Cl.ppm	filtrate anal. Ca.	sand %	retort anal.% oil	retort anal.% wat.	retort anal.% sol.	mbc kg/m³	PH	activity	formation
3/4	-	-	-	1.03	45																		Spudded well 0815hrs, Drilled 17½" hole.	
4/4	175	17½	-	1.08	37	9	9	2	15	NC	-	-	-	.6	150	TR	TR	0	96	4	-	9.5	Problems with mud rings	Marl
5/4	203	17½	-	1.06	35	7	6	1	8	NC	-	-	-	.3	150	TR	TR	0	96	4	-	9.0	Set 13.3/8" casing.	
6/4	203	17½	-	1.06	35	7	6	1	8	NC	-	-	-	.3	150	TR	TR	0	96	4	-	9.0	Nipple up B.O.P.'s	
7/4	225	12¼	33	1.05	43	7	22	25	37	NC	-	-	-	1.25	250	20	TR	0	96	4	-	12.0	Drilled out cement, Drilled 12¼"	Marl
8/4	565	12¼	-	1.07	31	6	5	1	6	15.2	2	-	-	.1	150	TR	TR	0	96	4	-	9.0	Hole	Marl Sand
9/4	744	12¼	40	1.10	35	9	7	2	12	12.8	2	-	-	.05	100	TR	TR	0	94	6	-	8.5	Run casing	
10/4	744																						Mixing Kill Mud	
11/4	1087	8½	-	1.08	39	15	15	1	3	9.0	½	-	-	.6	28000	55	1.5	0	96	4	11.4	11.0	Drilling	
12/4	1158.4	8½	41	1.07	41	18	23	1	3	8.3	½	-	-	.4	25000	60	.5	0	96	4	11.4	10.5	Drilling	
13/4	1350	8½	-	1.09	41	18	22	2	3	7.3	½	-	-	.2	28000	180	.25	0	96	4	11.4	9.5	Drilling	
14/4	1485	8½	47	1.10	41	20	20	2	4	6.6	½	-	-	.1	27500	250	.1	0	95	5	9.99	9.0	Drilling	
15/4	1494	8½	-	1.14	45	20	20	2	4	7.0	½	-	-	.2	55000	80	.25	0	92	8	9.99	9.5	Cut core	
16/4	1530	8½	42	1.14	43	20	20	2	4	7.2	½	-	-	.1	53000	100	.1	0	92	8	11.4	9.0	Ran DST Cont. Drill	
17/4	1718	8½	-	1.14	38	16	18	2	4	7.5	½	-	-	.1	53000	120	.1	0	92	8	11.4	9.0	Drilling	

MATERIAL AND COST ANALYSIS

GRAPHS

BAROID DIVISION N.L. INDUSTRIES
DRILLING FLUID PROPERTY RECAP

Company BEACH PETROLEUM
Well BRAESIDE NO. 1
Contractor/Rig RICHTER DRILLING 7

date 1982	depth m.	hole size "	temp. °c.	wt. sg.	vis. sec.	P.V.	Y.P.	gels 10 sec	gels 10 min	w.l. a.p.i	cake mm	w.l. hpht	°c	filtrate anal. pf	Cl.ppm	Ca.	sand %	retort anal.% oil	wat.	sol.	mbc kg/m³	PH	activity	forma
8/4	1910	8½	51	1.15	40	20	23	3	6	7.0	½	-	-	.1	50000	180	.1	0	91	9	11.4	9.0	Drilling	
19/4	1940	8½	-	1.15	43	20	25	3	6	6.4	½	-	-	.1	51000	180	.1	0	91	9	11.4	9.0	Drilling, cut core	
20/4	1940	8½	-	1.15	42	20	23	3	6	7.1	½	-	-	.1	52000	200	.1	0	91	9	11.4	9.0	Ran DST	
21/4	2043	8½	51	1.15	41	20	25	3	6	7.2	½	-	-	.1	50500	200	.25	0	91	9	14.3	9.0	Drilling	
22/4	2150	8½	-	1.17	40	20	25	3	6	7.3	½	-	-	.1	50000	80	.1	0	90	10	14.3	9.0	Drilling	
23/4	2218	8½	-	1.16	42	20	23	3	6	7.0	½	-	-	.1	49500	100	.1	0	91	9	14.3	9.0	Drilling	
24/4	2287	8½	53	1.16	39	18	20	3	5	7.5	½	-	-	.1	49000	200	.1	0	90	10	14.3	9.0	Drilling	
25/4	2300	8½	-	1.16	44	17	24	3	6	7.7	½	-	-	.1	45000	120	.1	0	90	10	14.3	9.0	Reached T.D.	
26/4	2300	8½	-	1.16	44	17	24	3	6	7.7	½	-	-	.1	45000	120	.1	0	90	10	14.3	9.0	Logging	
27/4	2300																						Setting Cmt. Plugs.	

RELEASED

BAROID MATERIAL RECAP

COMPANY BEACH PETROLEUM
LOCATION Otway Basin, Victoria
WELL Braeside #1
COST/DAY $904.31
COST/M $8.91
COST/M/DAY $4.46
COST/M³ $11.13
COST/M³/DAY $5.57

MUD TYPE Freshwater/Gel
CONTRACTOR Richter Drilling
DRILLING DAYS/PHASE 2
ROTATING HRS/PHASE 19
TOTAL DRILLING 203m
MUD CONSUMPTION FACTOR 0.80 m³/m
DATE

PHASE HOLE SIZE 17½"
INTERVAL TO 203m
FROM 0

MATERIAL	UNIT	COST UNIT	QUANTITY				TOTAL COST	
			ESTIMATE	KG/M³	ACTUAL	KG/M³	ESTIMATE	ACTUAL
AQUAGEL	100 lb	15.35			102			1,565.70
CAUSTIC SODA	40 kg	30.32			6			181.92
SODA ASH	40 kg	15.25			4			61.00
CHEMICAL	m³				3			
DIESEL								
FRESH WATER	m³				159.5			
SEA WATER								
TOTAL MUD MADE	m³				162.5			
COST LESS BARYTES								1,808.62
COST W/BARYTES								1,808.62

COMMENTS Problem with mud rings in Gellibrand marl responsible for high dilution rate. Used 1 sack Calcium Chloride for cement job $13.83.

BAROID MATERIAL RECAP

COMPANY: BEACH PETROLEUM
LOCATION: Otway Basin, Victoria
WELL: Braeside #1
COST/DAY: $746.18
COST/M: $4.14
COST/M/DAY: $1.38
COST/M³: $14.97
COST/M³/DAY: $4.99

MUD TYPE: Freshwater/gel
CONTRACTOR: Richter Drilling
DRILLING DAYS/PHASE: 3
ROTATING HRS/PHASE:
TOTAL DRILLING: 541m
MUD CONSUMPTION FACTOR: 0.276m³/m
DATE:

PHASE HOLE SIZE: 12¼"
INTERVAL TO: 744m
FROM: 203m

MATERIAL	UNIT	COST UNIT	QUANTITY				TOTAL COST	
			ESTIMATE	KG/M³	ACTUAL	KG/M³	ESTIMATE	ACTUAL
AQUAGEL	100 lb	15.35			74			1,135.90
BARAFOS	20 kg	42.70			2			85.40
CAUSTIC SODA	40 kg	30.32			2			60.64
CONDET	208 lt	209.25			2			418.50
SPERSENE	25 kg	32.91			2			65.82
SODIUM BICARB.	40 kg	17.11			7			119.77
BAROID	100 lb	7.50			47			352.50
CHEMICAL	m³				2.5			
DIESEL								
FRESH WATER	m³				147			
SEA WATER								
TOTAL MUD MADE	m³				149.5			
COST LESS BARYTES								1,886.03
COST W/BARYTES								2,238.53

COMMENTS: Used Barafos and Condet to control mud rings, also control drilled.
Baroid used for slugs.

BAROID MATERIAL RECAP

COMPANY BEACH PETROLEUM
LOCATION Otway Basin, Victoria
WELL Braeside #1
COST/DAY $1,820.90
COST/M $21.06
COST/M/DAY $1.17
COST/M³ $97.87
COST/M³/DAY $5.44

MUD TYPE KCl/Polymer
CONTRACTOR Richter Drilling
DRILLING DAYS/PHASE 18
ROTATING HRS/PHASE 176.25
TOTAL DRILLING 1556m
MUD CONSUMPTION FACTOR .215m³/m
DATE 29/4/82

PHASE HOLE SIZE 8½"
INTERVAL TO 2300m
FROM 744m

MATERIAL	UNIT	COST UNIT	QUANTITY ESTIMATE	KG/M³	ACTUAL	KG/M³	TOTAL COST ESTIMATE	TOTAL COST ACTUAL
POTASSIUM CHLORIDE	50 kg	9.50			820			7,790.00
MC PAC	50 lb	131.40			99			13,008.60
XC POLYMER	50 lb	295.00			34			10,030.00
CAUSTIC SODA	40 kg	30.32			19			576.08
SODIUM BICARB	40 kg	17.11			5			85.55
SODA ASH	40 kg	15.25			6			91.50
BARITE	100 lb	7.50			40			300.00
SULFLO W300	205 lt	685.20			1			685.20
CONDET	205 lt	209.25			1			209.25
CHEMICAL	m³							
DIESEL					13.4			
FRESH WATER	m³							
SEA WATER					321.50			
TOTAL MUD MADE	m³				334.9			
COST LESS BARYTES								32,476.18
COST W/BARYTES								32,776.18

COMMENTS Potassium Chloride locally purchased by Beach at $190//mton. Soda Ash was old each stock recapped at Baroid price for realistic drilling cost. 1 pallet of Barite was used together with KCl for initial weight increase as had insufficient KCl on site. No or Barite was used at all and no slugs were used for tripping.

BAROID MATERIAL RECAP SUMMARY

COMPANY	BEACH PETROLEUM	MUD TYPES	Freshwater gel for 17½" and 12¼" holes.
LOCATION	Otway Basin, Vic.		KCl/Polymer for 8½" hole.
WELL NAME	Braeside #1		
CONTRACTOR	Richter Drilling		
COST/DAY	$1,601.01		
COST/M	$16.01		
COST/M/DAY	$0.70		
COST/M³	$56.92	TOTAL DEPTH	2300m
COST/M³/DAY	$2.47	TOTAL ROTATING HRS.	233.75
RECAPPED BY	Alan Searle	TOTAL DAYS ON HOLE	23
	Manfred Olejniczak	DATE	27/4/82
		DATE OF RECAP	29/4/82

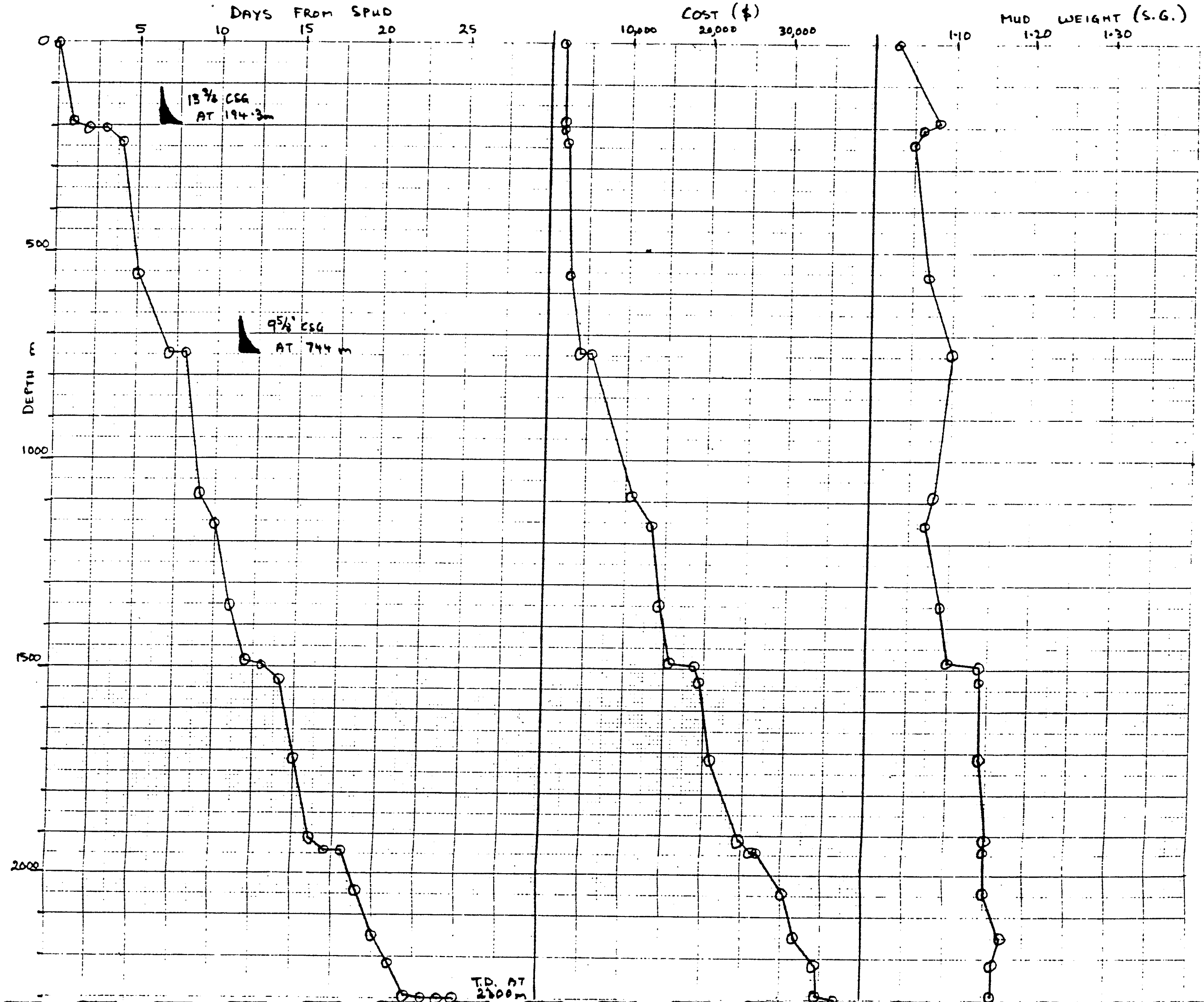
AMOUNT

HOLE SIZE	HOLE DRILLING	DRILLING DAYS
17½"	203m	2
12¼"	541m	3
8½"	1556m	18
TOTAL	2300m	23

WELL AVERAGE MUD CONSUMPTION .281m³/m

MATERIALS	UNIT	COST UNIT	QUANTITY				TOTAL COST	
			ESTIMATE	KG/m³	ACTUAL	KG/m³	ESTIMATE	ACTUAL
AQUAGEL	100 lb	15.35			176			2,701.60
CAUSTIC SODA	40 kg	30.32			27			818.64
SODA ASH	40 kg	15.25			10			152.50
SODIUM BICARB	40 kg	17.11			12			205.32
SPERSENE	25 kg	32.91			2			65.82
BARAFOS	20 kg	42.70			2			85.40
CONDET	205 lt	209.25			3			627.75
CALCIUM CHLORIDE	40 kg	13.83			1			13.83
SURFLO W300	205 lt	685.20			1			685.20
POTASSIUM CHLORIDE	50 kg	9.50			820			7,790.00
MONPAC	50 lb	131.40			99			13,008.60
XC POLYMER	50 lb	295.00			34			10,030.00
BARITE	100 lb	7.50			87			652.50
CHEMICAL	m³				18.9			
SALVAGE MUD								
DIESEL OIL								
FRESH WATER	m³				628.0			
SEA WATER								
TOTAL MUD MADE	m³				646.9			
COST LESS BARYTES								
COST WITH BARYTES								36,170.83
COMMENTS								~~36,823.33~~ 837-16

BEACH PETROLEUM'S BRAESIDE No 1. 1982.



APPENDIX 7

BIT RECORD

PRINTED IN U. S. A.

BIT RECORD

COUNTY	FIELD	STATE	SECTION	TOWNSHIP	RANGE	LOCATION	WELL NO.
	OTWAY BASIN	VICTORIA				BEAESIDE #1	

CONTRACTOR	RIG NO.	OPERATOR	TOOLPUSHER	SALESMAN
Richter	7	BEACH PETROLEUMS	BECK, KLASSEN	

SPUD	UNDER SURF.	UNDER INTER.	SET SAND ST.	REACHED T.D.	PUMP NO. 1	LINER	PUMP NO. 2	LINER	PUMP POWER	TYPE MUD
82/04/03				82/04/25	8P80	156x216	8P80	156x216		KCL POLYMER

DRILL PIPE	TOOL JOINTS SIZE	TYPE	O.D.	DRILL COLLARS NUMBER	O.D.	I.D.	LENGTH	DRAWWORKS POWER
	4½	XH		18	6½	2 13/16	190 m	

NO.	SIZE	MAKE	TYPE	JET 32ND IN	SERIAL	DEPTH OUT	FEET	HOURS	FT/HR	ACCUM DRLG HRS	WT. 1000 LBS.	R P M	VERT DEV.	PUMP PRESS	PUMP OPER-ATION	S P M 1	S P M 2	MUD WT	MUD VIS	MUD W.L	DULL. COND. T	B	G	OTHER	FORMATION REMARKS
1A	445	HTC	OSC3J	3x24	RR KT468	202	202	25½			12	120	1	2100		150		1.06	45		3	2	I		
1B	312	HTC	X3A	3x16	902UA	744	560	46½			24	90	1	5500		120		1.13	35	12.5	6	5	I		
1C	216	SMITH	SDGH	3x12	BP9025	1158	414	16			30	80	1	9700		120		1.07	41	8.3	8	2	3/8"		
2C	216	SMITH	SDGH	3x12	BV6019	1350	192	11¼			30	80	1	9700		120		1.09	41	7.3	5	3	I		
3C	216	SMITH	F-2	3x12	XA1593	1610	250	25¼			30	80	2	10500		120		1.14	38	7.5	3	3	I	Matrix wear	
4C	216	SMITH	F-2	3x12	XAS278	1936	326	28¾			30	80	2	10500		120		1.15	43	6.4	2	2	I		
5C	216	SMITH	F-2	3x12	XAS273	2218	278	60½			30	80	7	10800		120		1.16	42	7.0	3	4	I		
6C	216	SMITH	F-2	3x12	XAS279	2300	82	22¼			30	80	10	11000		120		1.16	44	7.7	1	1	I		

57 E

APPENDIX 8

WIRELINE LOG EVALUATION SHEETS

LOG EVALUATION SHEET : WAARRE FORMATION

No.	Depth(m) Schl.	Δt µs/ft	ø CNL p.u.	ρb FDC	ρb CORE	ø FDC/CNL	ø CNL/ρb Core	ø CORE	ø SONIC	Rw SP	Rw R-ø XPlot	Rw PC-4	Sw Archie F.	Sw Ratio	V_{SH}
1	1488.62	92	25	2.34	2.68	24	21	30.5	25		0.207Ω @ 114°F	0.40 Ω 114°F			20
2	1488.86	95	24	2.29	2.67	25	23.7	27.4	27						9
3	1489.23	97	23	2.31	2.66	24	22.5	30.4	28.4			0.36@114°F			10
4	1489.6	96	25	2.30	2.665	25	23	32.6	27.8						15
5	1489.84	100	26	2.27	2.67	26.8	24.7	30.3	30.5						11
6	1490.23	104	25	2.27	2.675	26.4	25	29.7	33						8
7	1490.83	103	26	2.26	2.68	27.5	25.5	31.4	32.5	0.19Ω @ 114°F (rows 1–12)					9
8	1491.12	103	25	2.25	2.685	27.4	26.4	34.5	32.5		0.22Ω @ 114°F				2
9	1491.65	104.5	26.5	2.25	2.69	28.0	26.5	32.7	33.2		0.21Ω @ 114°F		100	100	9
10	1491.96	104.5	26.5	2.26	2.69	27.5	26	33.2	33.2						10
11	1492.17	102	26.5	2.26	2.69	27.5	26	33.8	31.7						10
12	1492.64	104	25	2.24	2.69	27.6	27	29.2	33						0
13	1492.98	106	22.7	2.26	2.69	26	26	32.3	34.5						0
14	1493.20	101.5	24	2.30	2.70	25	24	31.7	30.5						10
15	1493.65	98	25	2.32	2.71	24.5	23	29.8	29						9
16	1493.97	97	22	2.36	2.685	21.8	20	13.0							15
17	1494.17	92	21.8	2.42	2.66	20	16	9.9							25
18	1494.69	75.5	16.5	2.53	2.665	14	9.5	5.8							38
19	1494.94	70	15.0	2.54	2.67	13	9	5.0							30

PC-4 = Port Campbell No. 4

LOG EVALUATION SHEET – WAARRE FORMATION															
No.	Depth(m) Schl.	Δt µs/ft	φ CNL	ρb FDC	ρb CORE	φ FDC/CNL	φ CNL/ρb CORE	φ CORE	φ SONIC	Rw SP	Rw R-φ XPlot	Rw PC-4	Sw ARCHIE F.	Sw RATIO	$V_{SH.}$
20	1495.28	69	22	2.45	2.675	19	14.4	26.7	10						30
21	1495.63	88	29	2.30	2.68	27.3	23.4	27.9	23						25
22	1496.05	104	30.5	2.25	2.675	29.5	26.2	26.6	33						20
23	1496.19	105	31	2.22	2.67	30.6	28	23.6	37						18
24	1502.2	101.5	24	2.23	NONE	27.8			31.6						
25	1503	104	24	2.21		28.4			33						
26	1503.5	104.2	25	2.23		28			33.2						
27	1506	89	20.5	2.40		20.4			23						
28	1508	100	25	2.20		29	TAKEN	NONE	30.5						
29	1509	99.5	20	2.25		24.8			30.1						
30	1511	89.4	20.5	2.32	TAKEN	23.2			22.0						
31	1513	90	22	2.27		25			23.6						
32	1514	91	22	2.26		25.5			24						
33	1515	91.5	21	2.24		25.9			24.5						
34	1518	98.5	29	2.24		29			29.4						
35	1519	99	29	2.25		28.9			29.7						
36	1526.5	86	20	2.37		20.5			21						
37	1556	102	25	2.28		21			31.9						
38	1559.6	102	28.5	2.25		28.5			31.9						

PC-4 = Port Campbell No. 4

LOG EVALUATION SHEET : WAARRE FORMATION

No.	Depth(m) Schl.	Δt µs/ft	ϕ p.u. CNL	ρb FDC	ρb CORE	ϕ FDC/CNL	ϕ CNL/ρb Core	ϕ CORE	ϕ SONIC	Rw SP	Rw R-ϕ XPlot	Rw PC-4	Sw Archie F.	Sw Ratio
39	1561.8	102	29	2.23	NONE TAKEN	29.5	TAKEN	NONE	31.9					
40	1567.7	86.5	28	2.4		28			21					
41	1581.5	92.5	24	2.32		24			25.5					
42	1584.4	94	26	2.31		25.5			26.5			0.275Ω @114°F	100	100
43	1588	100	30	2.23		30			30.5					

PC-4 = Port Campbell No. 4

LOG EVALUATION SHEET - EUMERALLA FORMATION

No.	Depth(m) Schl.	Δt μs/ft	φ CNL (p.u)	ρb FDC	Vshale (CNL-FDC X-PLOT)	φ FDC/CNL	φ SONIC	R MSFL	R LLD	Rxo/Rt	T°F	Rmf	Rw PC-4	Rmf/Rw	Sw Ratio
44	1684	87	30	2.36	70	26	24.5	2.2	6	0.36	136	·045	·26	·173	100
45	1827.4	87	28	2.38	66	24.4	24.5	2.0	4.5	0.44	140	·043	·255	·168	100
46	1863.4	87	27	2.37	55	24.2	24.5	2.0	4.5	0.44	140	·043	·255	·168	100
47	1897.0	84	31	2.43	100	24.5	22	4.5	4.1	1.097	146	·042	·235	·178	100
48	1901	85	29	2.40	86	24.5	23	2.0	3.6	0.556	146	·042	·235	·178	100
49	1929	85	27	2.41	70	23	23	2.5	3.7	0.676	149	·041	·230	·178	100
50	1932.4	92	27	2.28	15	26.8	27.5	2.0	4.4	0.455	150	·040	·230	·174	100
51	1958	83	26	2.37	25	23.6	21.5	3.6	4.5	0.8	151	·040	·230	·174	100
52	2079.8	79	18	2.50	45	15.6	18.5	12.5	8.4	1.49	156	·0395	·230	·172	100
53	2098.5	75	23	2.53	94	17.2	15.5	10	11.5	0.87	157	·0385	·230	·172	100
54	2110.5	75	24	2.47	75	19.5	15.5	12	8.5	1.412	158	·0382	·225	·1697	100
55	2123	75	22	2.52	82	17	15.5	11	10	1.1	158	·0382	·225	·1697	100
56	2150.5	77	23	2.45	60	19.5	17	10	8	1.25	158	·0382	·225	·1697	100
57	2151.5	75	21	2.47	53	18	15.5	12.5	10	1.25	158	·0382	·225	·1697	100
58	2169.5	75	18	2.50	45	15.6	15.5	12.5	10	1.25	159	·0380	·225	·1697	100
59	2202.6	75	21	2.45	26	18.5	15.5	12.5	9	1.389	160	·0380	·222	·1712	100
60	2244.6	69	17	2.55	68	14.1	11	28	24	1.16	161	·0370	·220	·1682	100

PC-4 = Port Campbell No. 4

APPENDIX 9

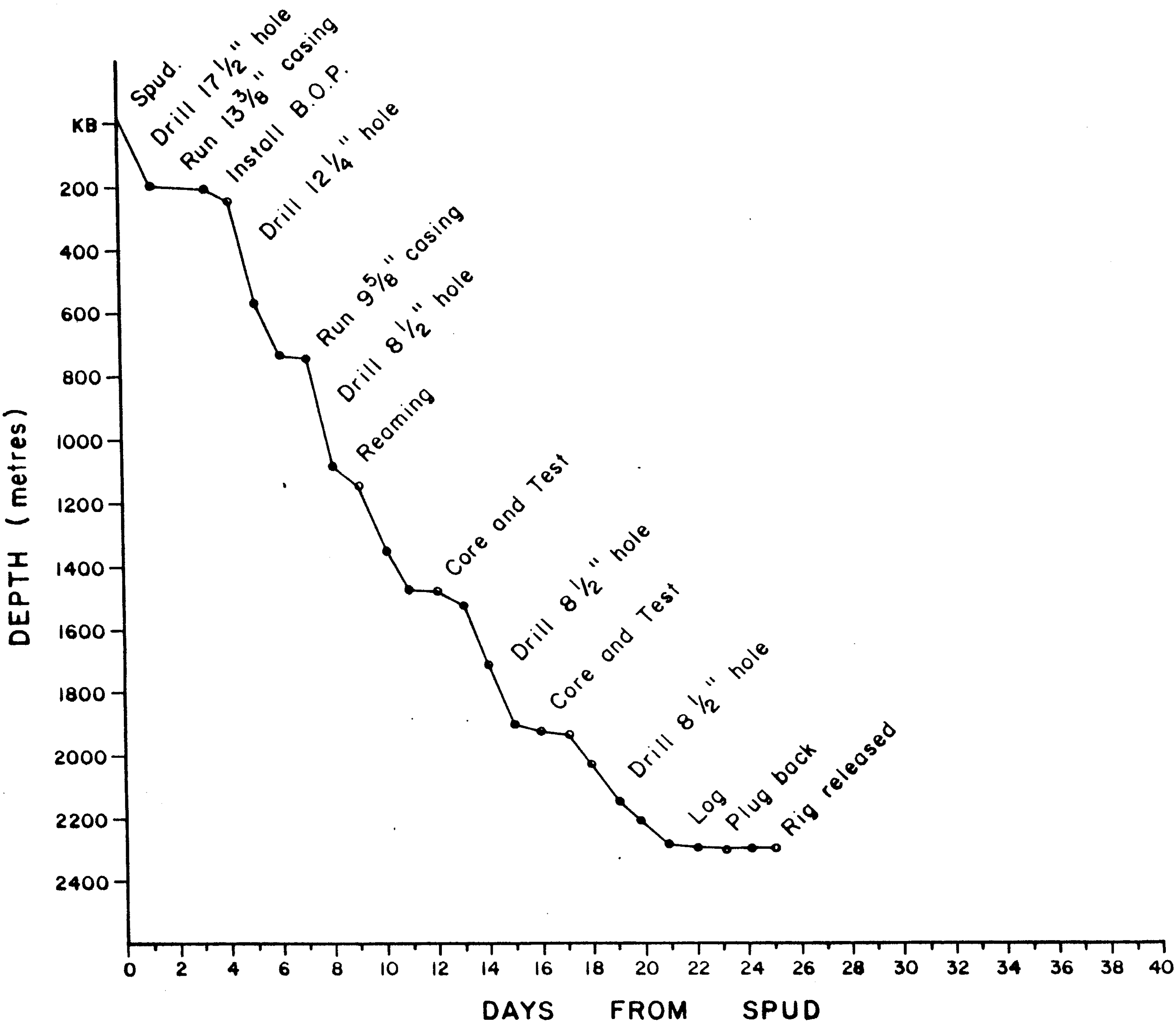
ACTUAL PENETRATION PROFILE

BRAESIDE No.1

SPUDDED : 0815 – 3·4·82

T.D. 2300m : 1115 – 24·4·82

RIG RELEASE : 0615 – 28·4·82



ACTUAL PENETRATION PROFILE

BP1864-F