



COMPLETION REPORT  
FOR  
OIL DEVELOPMENT N.L.'s  
ANGLESEA WELL NO. 1  
P.P.L. 256, VICTORIA.

WCR  
ANGLESEA -1  
W468

PETROLEUM PROSPECTING LICENCE

NO. 256

VICTORIA

ANGLESEA WELL NO. 1

Well drilled by -

Oil Development N.L.

(now Alliance Oil Development Australia N.L.)

in association with

Planet Oil Company N.L.

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PLATES -

- ✓ 1. Torquay Embayment, Port Phillip Basin - Structural features and distribution of pre-Pliocene stratigraphic units - and location of O.D.N.L. Anglesea Well No. 1.
- ✓ 2. Geologic cross-section through O.D.N.L. Anglesea Well No. 1, before and after drilling.
- ✓ 3. Composite well log, O.D.N.L. Anglesea Well No. 1 (in 4 sheets).

APPENDICES -

1. Petrological Reports:

- (a) Lithologic description of cores, by P. W. Bollen to 8,200 feet, J. Cundill to 9,176 feet, and N. A. Meyers to 10,065 feet.
- (b) Lithologic description of side-wall cores, by J. Cundill.
- (c) Mineral composition of Core No. 12 at 3,160 feet, by J. C. Kennedy, Senior Chemist, Mines Department of Victoria. (included in Appendix 4, below)

2. Paleontological Reports:

- (a) Preliminary palynological examination, Oil Development N.L. Anglesea No. 1 bore core, by J. Douglas, Mines Department of Victoria.
- (b) Plant remains, O.D.N.L. Anglesea No. 1 Well, by J. Douglas, Mines Department of Victoria.
- (c) Micropalaeontological report on Anglesea No. 1 Well, by D. J. Taylor, Mines Department of Victoria.

3. Average mud properties and mud materials used.

4. Examination of core and cuttings from O.D.N.L. Anglesea Well No. 1, by J. C. Kennedy, State Laboratories, Melbourne.

5. Core Analyses, by Bureau of Mineral Resources.

ENCLOSURES -

Electric Logs, scales 1" = 100 feet and 5" = 100 feet.

Run No. 1	- 390 to	2289 feet
Run No. 2	- 2298 to	4233 feet
Run No. 3	- 4050 to	6313 feet
Run No. 4	- 6200 to	7893 feet
Run No. 5	- 7700 to	8954 feet
Run No. 6	- 8834 to	10040 feet

Microlog - Caliper surveys, scales 1" = 100 feet and 5" = 100 feet.

Run No. 1	= 390 to	2287 feet
Run No. 2	= 2298 to	4233 feet
Run No. 3	= 4150 to	6313 feet
Run No. 4	= 6200 to	7893 feet (Caliper, 2298 to 7893 feet)

Run No. 5 - 7700 to 8954 feet  
Run No. 6 - 8700 to 10028 feet

Continuous Dipmeter Survey, scale 1" = 100 feet

Run No. 1 - Interpretation, 4800 to 7886 feet.

D.S.T. Pressure Charts

D.S.T. No. 1 (no pressure recorders available)  
D.S.T. No. 2 (pressure charts not available)  
D.S.T. No. 3 Top and bottom charts  
D.S.T. No. 4 Top and bottom charts

OIL DEVELOPMENT N. L.

COMPLETION REPORT

FOR

O.D.N.L. ANGLESEA WELL NO. 1

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I. SUMMARY

Oil Development N.L.'s Anglesea Well No. 1 was drilled with a National 50 Rig, under contract with Reading and Bates (Australia) Pty. Ltd. first to a depth of 8,200 feet with 4½" drill pipe; it was then later deepened to 10,065 feet with light weight drill tubing. After drilling 17" hole to 389 feet and setting surface casing, 12¼" hole was drilled to 2,296 feet and the intermediate string was set at 2,295 feet, before drilling 8¾" hole to final depth. Logging and core analyses indicated very low porosity and generally nil permeability in the target Cretaceous section; formation tests carried out in the open hole on two intervals were unsuccessful due to failure to obtain a packer seal in caved hole and the well was abandoned as a dry hole.

After penetrating the Anglesea Member of the Demon's Bluff Formation (late Eocene to early Oligocene) to 390 feet, the well passed through the Eastern View Coal Measures (Paleocene to early Eocene) and entered the arkosic sandstones, siltstones and mudstones of the Otway Group (Lower Cretaceous) at 1932 feet and continued in the sequence to final depth of 10,065 feet, which was the limit of the depth capacity of the rig with the light-weight drill tubing available at the time. It was hoped that a wedge of the marine Middle and Upper Cretaceous sediments which yielded petroliferous gas in the adjoining Otway Basin would be present at this location, below the Eastern View Coal Measures and resting unconformably on the Otway Group. However, as this primary target proved to be absent, the secondary objective of seeking porosity within or at the base of the Otway Group was pursued to the maximum of the capacity of the available equipment. No porous and permeable intervals were found in the portion of the Otway Group that was penetrated, but the possibility of the presence of porous beds at the unconformable contact of the Otway Group with presumed Lower Paleozoic basement could not be tested as the thickness of the Otway Group at this location proved to be much greater than was anticipated.

Some questionable traces of crude oil were reported in the upper part of the Otway Group sequence and indications of hydrocarbon gas in the drilling fluid were consistently evident while the well was drilling between 3,600 feet and final depth.

II. INTRODUCTION

Oil Development N.L.'s Anglesea Well No. 1 was originally planned to be drilled to a target depth of 7,500 feet or shallower basement with the object of determining

whether Middle and/or Upper Cretaceous sediments, which had already yielded substantial quantities of petroliferous gas in the adjoining Otway Basin, are present in this area and also to search for porous reservoir beds either within the Lower Cretaceous Otway Group sequence itself or at its contact with the presumed Lower Paleozoic basement. The location for this well, designed as an off-structure stratigraphic test, was selected in the south-western corner of P.P.L.256, where subsurface studies and seismic surveys indicated that the sedimentary section above the Lower Paleozoic basement could be expected to be thickest.

The well passed through 390 feet of lignitic clays and fine sands of the Anglesea Member of the Demon's Bluff Formation (late Eocene to early Oligocene), exposed at the surface of the location, followed by 1,542 feet of sands, gravels, brown coal and clays of the Eastern View Coal Measures (Paleocene to early Eocene) and then through 6,268 feet of hard, tight arkosic sandstones, siltstones and mudstones of the Otway Group (Lower Cretaceous) to the depth of 8,200 feet, which was the maximum depth that could be reached with the 4½" drill pipe being used. As the well was still in the Otway Group at this depth it was decided to deepen the well by using lighter weight drill tubing in an attempt to find porosity deeper in the sequence, or along the unconformity with the underlying presumed Lower Paleozoic basement; however, the well reached its limit of 10,065 feet, still in the Otway Group, without achieving either of these objectives, and it was abandoned as a dry hole but left in suitable condition for re-entry should further deepening be considered later.

Rotary drilling was commenced at the site at 9.45 a.m. on 23rd May, 1962, with a National-50 rig owned and operated by Reading and Bates (Australia) Pty. Ltd. A surface string of 13⅝" casing was set and cemented to surface in 17" hole on 24th May at 389 feet and an intermediate string of 9⅝" casing was set in 12¼" hole at 2,295 feet, and cemented back to 1,290 feet on 8th June, 1962; thereafter, drilling of 8¾" hole was continued to the depth limit of the 4½" drill pipe at 8,200 feet. After this depth, drilling of 8¾" hole was resumed using a lighter weight drilling string to its depth limit at 10,065 feet, which was reached on 8th November, 1962.

A series of electric and microlog-caliper surveys were run between the shoe of the surface string of casing and the bottom of the open hole, and a continuous dipmeter survey was run between 4,800 and 7,886 feet. After the final logs were run, a series of sidewall cores were taken at selected intervals between 3,771 and 5,212 feet.

A total of 33 cores were cut at intervals between 490 feet and final depth. A Hughes Type J 30-foot core barrel was used with 8¾" soft formation bits for cores 1 to 6 (Tertiary) and 8¾" hard formation bits for cores 7 to 29 (Otway Group); as coring times became very slow at depth in the hard sediments of the Otway Group, a Truco diamond head was used for the last four cores (30 to 33). The average coring rate for the last four cores cut with the

conventional hard formation bits was  $1\frac{1}{2}$  feet per hour with a new bit for each core, as compared with the average rate of 4 feet per hour with the single diamond bit used for the last four cores. Cuttings were collected at intervals of ten feet throughout the drilling of the well.

A JW mud gas detector was put into operation after the well had reached a depth of 2,800 feet, but no signs of hydrocarbon gas were encountered in the mud until 3,600 feet, after which they were consistently evident in varying intensity to total depth. Some questionable traces of crude oil were reported from the upper part of the Otway Group, but formation tests attempted were unsuccessful due to lack of suitable packer seats in caving hole.

Deviation surveys were run at frequent intervals after entering the Otway Group, as the fairly steep dip of these sediments began to cause excessive deviation from the vertical; the deviation over the last few hundred feet of hole had reached 8 degrees.

The well was abandoned by setting two cement plugs in the open hole, one above and below the shoe of the intermediate string of casing, and one at the top of the casing string, after which a steel plate was welded on top of the casing. Abandonment was completed on 9th November and the rig was off the site by 13th November, 1962.

### III. WELL HISTORY

#### (1) General Data:

##### (a) Well Name and Number:

Oil Development N.L. Anglesea Well No. 1

##### (b) Location:

The well was located on Crown land 3 chains east of the south-eastern corner of allotment 20, section 2, township of Anglesea, Parish of Jan Juc, Victoria, at Latitude  $38^{\circ}24'26''$  S, Longitude  $144^{\circ}11'53''$  E; its location is indicated on Plate 1.

##### (c) Tenement Holder:

Alliance Oil Development Australia N.L., known prior to 1st January, 1963, as Oil Development N.L.; registered office, 100 Collins Street, Melbourne, Victoria.

##### (d) Details of Petroleum Tenement:

Petroleum Prospecting Licence No. 256 occupies an area of 149 square miles extending inland from Bass Strait for about 9 miles between Anglesea and Barwon Heads (see Plate 1); the date of expiry of this tenement is 31st December, 1963.

Under the terms of an agreement with the previous titleholder, Westralian Oil Limited holds a 20 per cent interest in this licence without any financial commitment for exploration until a gross amount of



£200,000 has been expended on the exploration of this Licence; thereafter, Westralian Oil Limited will bear 20 per cent of the cost of any further expenditure undertaken on the Licence.

In return for meeting 25 per cent of the cost of O.D.N.L. Anglesea Well No. 1, Planet Oil Company N.L. has also earned a 20 per cent working interest in P.P.L256.

(e) District:

The area in which O.D.N.L. Anglesea Well No. 1 was drilled is generally referred to as the Geelong District; geologically, the well is located in the Torquay embayment of the Port Phillip Basin.

(f) Total Depth:

The well was drilled to a total depth of 10,065 feet below the level of the Kelly bushing, which was 13 feet above ground level.

(g) Date Drilling Commenced:

23rd May, 1962.

(h) Date Drilling Completed:

7th November, 1962.

(i) Date Well Abandoned:

9th November, 1962.

(j) Date Rig Released:

9th November, 1962.

(k) Drilling Time in Days to Total Depth:

171 days.

(l) Elevation:

Kelly bushing (datum for drilling depths) -  
78.06 feet above sea level.

Rotary Table: 76.81 feet above sea level  
Ground Level: 65.06 feet above sea level

(m) Status:

Abandoned as a dry hole with three plugs each of 50 sacks, set in the hole and a plug of 5 sacks set at the head of the casing.

(n) Cost of Well:

Approximately £195,500.

(2) Drilling Data:

(a) Name and address of Drilling Contractor:

Reading and Bates (Australia) Pty. Ltd., Mobil Centre, 2 City Road, South Melbourne.

(b) Drilling Plant:

Make - National Ideal  
Type - 50

Rated capacity with 4½" drill pipe - 8,200 feet  
Rated capacity with 3½" drill pipe - 10,000 feet

Motors: make General Motors  
type Series 6/71  
BHP 304

(c) Mast:

Make - Lee C. Moore  
Type - Jack-Knife

Rated capacity - 950,000 lbs.

(d) Pumps:

Make - National Ideal  
Type - C150B C250  
Size - 7½" x 12" 7¼" x 15"

Pump Motors, Rig Motors: make - General Motors  
type - Series 6/71  
BHP - 304

(e) Blowout Preventer Equipment:

Make: Hydril	Cameron Spacesaver	Schaffer
Size: 12"	12"	10"
Series:(A.P.I.)-900	900	900

(f) Hole Sizes and Depths:

<u>Depths</u>		<u>Diameter</u>
0' -	30'	23"
30' -	389'	17"
389' -	2,296'	12¼"
2,296' -	10,045'	8¾"
10,045' -	10,065'	6¼"

(g) Casing and Liner Details:

Size	- 18¾"	13¾"	9⅝"
Weight	- -	48	36
Grade	- -	H40	J55
Range	- 2	2	2
Setting depth-	30'	389'	2,295'

(h) Casing and Liner Cementing Details:

Size	18⅝"	13¾"	9⅝"
Setting Depth	30'	389'	2,295'

Quantity of cement used (sacks)	50	350	350
Cemented to		Surface	Surface 1290'
Method used		Cement from surface	Single Plug Double Plug

(i) Drilling Fluid:

From 30' to 389' a light bentonite mud was used and, after setting the 13 $\frac{3}{8}$ " casing, the cement contaminated mud was discarded and fresh mud was mixed for drilling the 12 $\frac{1}{4}$ " hole to 2,296 feet.

The mud for drilling this 12 $\frac{1}{4}$ " hole consisted of a Bentonite and fresh water mud which had the following average properties:-

Weight	9.9 lbs per U.S. Gallon
Viscosity	41 seconds (Marsh Funnel)
Filtrate	10 c.c.s.
Wall Cake	2/32 inches
p.H.	8
Sand Content	1%

Treatment consisted of the addition of C.M.C. to control water loss, and the addition of Myrtan and caustic soda mixture to control viscosity.

After setting the 9 $\frac{5}{8}$ " casing the cement contaminated mud was discarded and new mud mixed for drilling the 8 $\frac{3}{4}$ " hole from 2,296 feet.

From 2,296 feet to 8,200 feet a bentonite and fresh water mud was used which had the following average properties:

Weight	10.58 lbs per U.S. Gallon
Viscosity	54 seconds (Marsh Funnel)
Filtrate	7.9 ccs.
Wall Cake	2/32 inches
p.H.	8.6
Sand Content	1%

During the drilling of this section of hole the mud weight gradually increased from 9.8 lbs/U.S. gallon up to 11.0 lbs/U.S. gallon, with a corresponding increase in viscosity from 44 seconds to 76 seconds. This increase was due to the gradual build up of clay solids in the mud. During these increases the sand content remained constant at 1%.

When the hole reached a depth of 8,200 feet a cement plug was placed in the hole in order to run a drill stem test. The cement-contaminated mud was treated with sodium bicarbonate to counteract the cement.

Before this cement plug was drilled out prior to drilling ahead the rig was temporarily shut-down while waiting for lighter weight drill pipe. During this time the drilling fluid was maintained with an increased viscosity.

The cement plug was drilled out after running the drill stem test; the cement contamination in the mud was treated with sodium bicarbonate, and the viscosity was controlled with Myrtan and caustic soda mixtures. These controls resulted in a mud with the following average

properties:

Weight	10.5 lbs/U.S. Gallon
Viscosity	106 seconds
Filtrate	8.0 ccs.
Wall Cake	2/32 inches
p.H.	10

At a depth of 8,707 feet diesel fuel was added to the mud in order to assist the drilling operations. For drilling between 8,707 and 10,065 feet, a mud with the following average properties was used:

Weight	10.5 lbs/U.S. Gallon
Viscosity	150 seconds
Filtrate	7.4 ccs.
Wall Cake	2/23 inches
p.H.	10

Average properties of the mud for each weekly period during the drilling of the well, and the quantities of mud materials used, are shown in Appendix 3. As the caliper log showed evidence of considerable caving, the viscosity of the mud was increased during the drilling of the lower part of the section below about 7,500 feet.

(j) Water Supply:

The water supply was obtained from the Anglesea town supply.

(k) Perforating and Shooting Record:

Nil

(l) Plugging back and Squeeze Cementing jobs:

No squeeze cementing jobs were undertaken. A temporary anchor plug was set at 7,740 to 7,840 feet, using 44 sacks of cement with average slurry weight of 15.5 lbs/U.S.gallon, to provide a seat for the tailpipe of the formation tester; this proved satisfactory for the test which failed, however, because no seat for the packer could be obtained.

For the abandonment of the well, plugs were set as follows:

<u>Plug No.</u>	<u>Depth</u>	<u>No. of sacks cement</u>
1	7,550 - 7,450'	50
2	4,900 - 4,800'	50
3	2,350 - 2,250'	50
4	12' to surface	5

(m) Fishing Operations:

The following eight fishing operations were successfully carried out:

<u>No.</u>	<u>Depth</u>	<u>Fish</u>	<u>Equipment left in hole</u>
1	2,378'	6 drill collars	Nil
2	3,931'	Cones and bearings from bit	Nil
3	5,951'	13 drill collars	Nil

<u>No.</u>	<u>Depth</u>	<u>Fish</u>	<u>Equipment left in hole</u>
4	6,364'	Cones and bearings from bit	Nil
5	6,388'	11 drill collars and 30 feet of drill pipe	Nil
6	6,544'	2 drill collars	Nil
7	6,723'	2 drill collars and Totco instrument; during fishing 67 stands of drill pipe also lost	Nil
8	8,200'	Cone and bearings from bit	Nil

(n) Side-tracked Hole:

Nil

(3) Logging and Testing:

(a) Ditch Cuttings:

Cuttings were collected from the shale shaker at intervals of 10 feet during drilling but, while coring, the interval was reduced to 5 feet. Cuts of the washed ditch samples were distributed to the Bureau of Mineral Resources, the Mines Department of Victoria and Oil Development N.L.

(b) Coring:

Coring was carried out according to the original programme, and a total of 33 cores were cut. The depth between cores down to No. 22 at 5,766 feet averaged about 260 feet, but later cores were taken at intervals of about 500 feet owing to the lack of any significant change in the lithology of the Otway Group. The first 29 cores were cut with a Hughes Type J core barrel with hard and soft formation  $8\frac{3}{4}$ " core heads; one soft formation bit was used for the first six cores and hard formation bits for the remainder as follows: No. 2, Cores 7-9; No. 3, Cores 10-13; No. 4, Cores 14, 15, 23; No. 5, Cores 16-18; No. 6, Cores 19-22; No. 7, Core 24; No. 8, Core 25; No. 9, Core 26; No. 10, Core 27; No. 11, Core 28; No. 12, Core 29. The last four cores were cut with a 30-foot  $5\frac{3}{4}$ " diameter D.S. core barrel fitted with a Truco CFC2M diamond core head  $6\frac{1}{8}$ " x  $2\frac{7}{8}$ ", owing to the slow penetration rate obtained with the conventional hard formation coring bit. The average coring rate for the last four cores cut with the conventional hard formation bits was  $1\frac{1}{2}$  feet per hour with a new bit for each core, as compared with the average rate of 4 feet per hour with the single diamond bit used for the last four cores.

The cored intervals and recovery are as follows:

<u>Core No.</u>	<u>Interval</u>	<u>Footage Cored</u>	<u>Footage Recovered</u>	<u>% Recovery</u>	<u>Time (Hours)</u>
1	490 - 510'	20	8	40	-
2	789 - 809'	20	4 $\frac{1}{4}$	21	-
3	1,090 - 1110'	20	5	25	2 $\frac{1}{2}$
4	1,214 - 1234'	20	4	20	4 $\frac{1}{4}$
5	1,506 - 1526'	20	10	50	1 $\frac{1}{2}$
6	1,778 - 1798'	20	11	55	1 $\frac{1}{2}$
7	1,931 - 1951'	20	19	95	10
8	2,225 - 2245'	20	20	100	8 $\frac{1}{2}$
9	2,286 - 2296'	10	9	90	3 $\frac{3}{4}$
10	2,557 - 2567'	10	10	100	7 $\frac{1}{4}$
11	2,860 - 2870'	10	10	100	2 $\frac{1}{4}$
12	3,158 - 3168'	10	5	50	3
13	3,460 - 3470'	10	7	70	3 $\frac{1}{2}$
14	3,724 - 3734'	10	2	20	7
15	3,734 - 3744'	10	0	0	2 $\frac{1}{2}$
16	4,011 - 4021'	10	10	100	6 $\frac{1}{2}$
17	4,223 - 4234'	11	11	100	4 $\frac{1}{2}$
18	4,517 - 4527'	10	9	90	3 $\frac{1}{4}$
19	4,819 - 4829'	10	5 $\frac{1}{2}$	55	2 $\frac{1}{2}$
20	5,161 - 5171'	10	9	90	5 $\frac{1}{4}$
21	5,487 - 5497'	10	6	60	3 $\frac{1}{2}$
22	5,766 - 5776'	10	7	70	7 $\frac{1}{2}$
23	6,237 - 6247'	10	9	90	7 $\frac{1}{4}$
24	6,723 - 6727'	4	3	75	2 $\frac{3}{4}$
25	6,759 - 6773'	14	10	71	7
26	7,255 - 7265'	10	9 $\frac{1}{2}$	95	7 $\frac{3}{4}$
27	7,544 - 7550'	6	6	100	4
28	7,857 - 7867'	10	9	90	6 $\frac{1}{4}$
29	8,190 - 8200'	10	8	80	6 $\frac{3}{4}$
30	8,690 - 8707'	17	17	100	3 $\frac{1}{2}$
31	9,156 - 9176'	20	19	95	4
32	9,641 - 9656'	15	2 $\frac{1}{2}$	17	4 $\frac{3}{4}$
33	10,045 - 10065'	20	20	100	5 $\frac{3}{4}$
<b>Total</b>		<u>437</u>	<u>294<math>\frac{3}{4}</math></u>		

A total of 437 feet of formation was cored, from which 294 $\frac{3}{4}$  feet of core was recovered; the average percentage recovery was 67.4. Samples of the core were sent to the Bureau of Mineral Resources and the remainder of the core was lodged with the Mines Department of Victoria. Descriptions of the cores are contained in Appendix 1(a).

(c) Sidewall Cores:

A total of 20 sidewall cores, all in the Otway Group section, were obtained from the following depths: 3771 feet (2 cores), 3772 feet (2 cores), 3773 feet, 3774 feet, 5196 feet, 5198 feet, 5199 feet, 5201 feet, 5203 feet, 5204 feet, 5205 feet, 5206 feet, 5207 feet, 5208 feet, 5209 feet, 5210 feet, 5211 feet, 5212 feet. These core samples are described in Appendix 1(b).

(d) Electrical and other logging:

Electrical and microlog-caliper surveys were made by Schlumberger Seaco, Inc. and recorded at scales

of 1" and 5" per 100 feet; a continuous dipmeter survey was also run by Schlumberger Seaco, Inc. and recorded at the scale of 1" per 100 feet. The types of logs and the intervals covered are as follows:

<u>Logs:</u>	<u>Run No.</u>	<u>Interval</u>
<u>Electric Log:</u> with S.P., 16" normal amplified, 16" normal, 64" normal and 18'8" lateral curves.	1	390 - 2,289'
	2	2,298 - 4,233'
	3	4,050 - 6,313'
	4	6,200 - 7,893'
	5	7,700 - 8,954'
	6	8,834 - 10,040'
<u>Microlog:</u> with microinverse 1" x 1" curve and micronormal 2" curve.	1	390 - 2,287'
	2	2,298 - 4,233'
	3	4,150 - 6,313'
	4	6,200 - 7,893'
	5	7,700 - 8,954'
	6	8,700 - 10,028'
<u>Caliper log:</u>	1	390 - 2,287'
	2	2,298 - 4,233'
	3	4,150 - 6,313'
	4	2,298 - 7,893'
	5	7,700 - 8,954'
	6	8,700 - 10,028'
<u>Continuous Dipmeter:</u>	1	4,800 - 7,886'

(e) Drilling Time and Gas Log:

A geograph record of drilling time was kept throughout the drilling of the well after the surface string of casing had been set, and a JW mud gas detector was in operation after the well had reached the depth of 2,800 feet. These results are shown graphically on the composite log.

(f) Formation Tests:

Four drill stem tests were attempted in open hole but on each occasion the packer seat could not be held long enough to obtain a satisfactory test and all were unsuccessful. DST No. 1 covered the interval 2,220 to 2,296 feet, DST No. 2 from 7,683 to 7,738 feet, DST No. 3 from 7,688 to 7,738 and DST No. 4 from 7,672 to 7,738 feet.

The first test was carried out by the drilling contractor using a Johnson "E" tool with 11-inch type "X" packer, and the remainder by the Halliburton Company, using a 5" Halliburton Hydrospring tester with 7 $\frac{3}{4}$ " packer. No pressure recorders were available at the time of the first test, and pressure charts for the third and fourth tests only are available.

(g) Deviation Surveys:

A total of 83 deviation surveys were run with a Totco instrument; the results of these surveys are shown below:

<u>Depth</u> (feet)	<u>Deviation</u> (degrees)	<u>Depth</u> (feet)	<u>Deviation</u> (degrees)	<u>Depth</u> (feet)	<u>Deviation</u> (degrees)
96	0	5865	2 $\frac{3}{4}$ +	8104	4
207	$\frac{1}{4}$ +	5968	3 $\frac{1}{2}$ -	8157	4 $\frac{1}{4}$
308	$\frac{1}{4}$ +	6049	4	8169	4 $\frac{1}{4}$
508	1-	6049	4 $\frac{1}{4}$	8190	4 $\frac{1}{2}$

<u>Depth</u> (feet)	<u>Deviation</u> (degrees)	<u>Depth</u> (feet)	<u>Deviation</u> (degrees)	<u>Depth</u> (feet)	<u>Deviation</u> (degrees)
1012	$\frac{3}{4}$	6237	$3\frac{1}{4}$	8321	5
1214	$1\frac{1}{2}$	6310	$3\frac{3}{4}$	8371	$4\frac{1}{2}$
1501	2	6455	$3\frac{3}{4}$	8529	5
1725	$1\frac{1}{2}$	6603	$3\frac{1}{2}$	8640	$5\frac{1}{4}$
2089	$1\frac{1}{4}$	6661	4	8690	$4\frac{1}{4}$
2557	1	6844	$3\frac{3}{4}$	8820	$4\frac{1}{4}$
2860	Misrun	6917	$3\frac{1}{4}$	8958	$4\frac{1}{4}$
3158	2	7113	3-	9070	$4\frac{1}{2}$
3460	4	7209	3	9156	$4\frac{1}{4}$
3585	4	7255	3	9248	7
3607	4	7291	3	9323	$7\frac{3}{4}$
3724	$3\frac{3}{4}$	7345	3-	9360	$6\frac{1}{4}$
3832	3+	7391	3+	9412	7+
3931	3-	7439	$2\frac{3}{4}$	9464	7
4154	$2\frac{3}{4}$	7455	3	9516	6
4331	2+	7616	$2\frac{3}{4}$	9591	7
4427	2-	7668	$2\frac{3}{4}$	9641	7
4684	$1\frac{1}{2}$	7729	$2\frac{3}{4}$	9720	8
4945	$1\frac{1}{4}$	7801	$3\frac{1}{4}$	9770	8
5161	2-	7857	$3\frac{1}{2}$	9816	8+
5292	2-	7906	4-	9870	8+
5487	2-	7983	4	9928	8
5577	$2\frac{1}{4}$	8025	4	9990	8
5766	$2\frac{1}{4}$	8077	$4\frac{1}{2}$		

Owing to the rather steep dips (mostly 20 to 25 degrees) in the hard beds of the Otway Group below about 2,000 feet considerable difficulty was experienced in maintaining straight hole and deviation of the hole at a minimum. After 7,900 feet the deviation gradually increased from 4 degrees to 7 degrees at 9,248 feet, and ranged between 6 and 8 degrees after this to final depth.

(h) Temperature Surveys:

No continuous temperature surveys of the hole were run but the bottom-hole temperatures recorded by Schlumberger Seaco, Inc. during logging operations are as follows: 107° F at 2,287 feet; 140° F at 4,233 feet; 152° F at 6,313 feet; 168° F at 7,894 feet; 186° F at 8,954 feet; 240° F at 10,028 feet. The sharp increase in temperature between 8,954 and 10,028 feet suggests that the final depth of the well was probably not far above basement.

(i) Other surveys:

The continuous dipmeter survey (see Composite Log, Sheets 2-4), from which a total of 44 dips mostly classed as "good" or "fair" were calculated in the interval between 4,800 and 7,886 feet, conformed reasonably closely with the degree of dip recorded from the cores, taking into consideration the deviation of the hole, which ranged between  $1\frac{3}{4}$  and 4 degrees over the section surveyed. Most of the dips ranged between 16 and 24 degrees, with extremes of 12 and 43 degrees.

Between the first reading at 4,869 feet and the 12th



reading at 6,696 feet the direction of dip ranged between the extremes of  $S34^{\circ}W$  and  $S54^{\circ}E$ , but the majority of dips ranged between only a few degrees east and west of south. Between readings 13 and 31 (6,768 and 7,353 feet) the majority of the dips are consistently almost due south, the maximum range being between  $S15^{\circ}W$  and  $S8^{\circ}E$ .

Readings 32 to 36 showed a more easterly direction of dip ranging between  $N87^{\circ}E$  and  $S13^{\circ}E$ , which may indicate proximity to a fault in the section between 7364 and 7496 feet. Readings 37 to 40 show a similar direction to the dips in readings 13 to 31, whereas the last few readings 41 to 44, show a dip direction ranging between 7 and 38 degrees west of south.

#### IV. GEOLOGY

##### (1) Summary of Previous Work:

###### (a) Surface Geology:

The surface geology of the Torquay Embayment of the Port Phillip Basin (see Stach, 1961), most of which is contained within P.P.L. 256, is reasonably well known from broad Government surveys made in the latter half of the last century, and from surveys made by a series of individual geologists in later years, mostly on small scattered areas within the embayment.

Much of the inland surface is covered by thin superficial deposits of Pliocene and younger fluviatile sands and clays, and by basalt flows of late Pliocene age. The older Tertiary formations, unconformably underlying the younger superficial deposits, are well exposed in coastal cliffs in the southwestern portion of the embayment, and a few exposures are known in parts of the deeper stream valleys that dissect the region. The coastal cliff sections were re-described in detail recently (Raggatt and Crespin, 1955), but some amendments to age correlation have since been made (Carter, 1958). Parts of the hinterland have been described in some detail, mainly in a series of papers by Coulson (1960 and earlier).

###### (b) Stratigraphy:

From the above, and other sources, the generalised stratigraphic sequence in the Torquay embayment appears to be as follows:

###### Cretaceous

Otway Group - up to and exceeding 8,000 feet.

This term is used for the conglomerates, grits, arkoses, feldspathic sandstones, siltstones and mudstones, containing plants remains and coal, that are exposed in the Barrabool Hills and Otway Ranges, which form the northern and western boundaries, respectively, of the Torquay embayment. The Otway Group was formerly considered to be of Jurassic age, but more recently (Cookson and Dettman, 1958), this sequence has been considered to be of early Cretaceous age. Coulson (1960) considers that the northern margin of the early Cretaceous lake in which the sediments of the Otway Group were deposited was close to the present course of the Barwon River, immediately to the north of the Barrabool Hills, where a basal conglomerate with pebbles derived from Lower Paleozoic rocks rests on Cambrian diabase.

###### Possible middle to upper Cretaceous - ?

It was suspected that equivalents of the formations of middle to late Cretaceous age, found at depth in the adjoining Otway Basin to the west, might be present in the deeper portions of the Torquay Embayment, and particularly in the Anglesea Trough in the southwestern corner of the embayment. This sequence is known elsewhere in Victoria only in the subsurface, and its presence has not yet been proved in the Torquay embayment.

###### Eocene

Eastern View Coal Measures - 300 to 1500 feet +

This formation, considered to be of Paleocene to early Eocene age, overlies the Otway Group with a marked angular

unconformity in the southwestern portion of the Torquay Embayment, where Raggatt and Crespin (1955) measured about 300 feet of sands and lignitic clays, with interbedded seams of brown coal exposed at the surface. However, a well drilled more recently by the Mines Department about two miles north of Anglesea (Angahook No. 23) penetrated 1,132 feet of similar sediments, correlated with the Eastern View Coal Measures, without reaching its base. Raggatt and Crespin (1955) consider that the shallow wells drilled near Torquay (Jan Juc Nos. 2 - 5) passed through about 100 feet of this unit before entering sediments of the Otway Group; the thin seams of brown coal recorded in these wells, however, are believed to correspond to similar thin seams known to be present in the upper part of the younger Demon's Bluff Formation.

#### Boonah Sandstone - ? 1200 feet? and less

This formation was defined by Raggatt and Crespin (1955) from limited exposures overlying Eastern View Coal Measures in the southwestern corner of the embayment, where its thickness was considered to be not more than 1200 feet; it consists dominantly of loose quartz sands with some gravels and clays, and it may represent a non-lignitiferous facies of the upper part of the much thicker section of the Eastern View Coal Measures, as known from the subsurface data obtained from wells drilled farther to the east. This probable facies equivalent of the upper part of the Eastern View Coal Measures is probably of early Eocene age.

#### Demon's Bluff Formation - 500 to 1,300 feet

This lithologic unit, probably ranging in age from late Eocene to early Oligocene, was divided into three members by Raggatt and Crespin (1955); it has a total thickness of about 1,300 feet in the southwestern portion of the embayment, near Anglesea, but is at most 500 feet thick in the shallow wells drilled near Torquay.

The Anglesea (lowest) member consists dominantly of dark siltstone whereas the upper members, each only about 70 feet thick, consist of dark greywacke, (Addiscot Member) overlain in places by alternations of shale with volcanic breccia and agglomerate (Angahook Member), with a thin seam of brown coal at the base.

#### Post-Eocene

The younger units of the sequence in the Torquay embayment, the Torquay Group (late Oligocene), "Balcombian" (early Miocene), "Kalimnan" (early Pliocene), and the Newer Basalt (late Pliocene), are not relevant to the results obtained from the drilling of the Anglesea well; these units have been discussed elsewhere (Stach, 1961).

#### (c) Subsurface Geology:

The distribution of the older formations beneath the thin cover of younger deposits has been revealed to some extent by shallow shafts, bores and auger holes in various areas. The Otway Group was found at shallow depth in the eastern part of the Bellarine Peninsula in shafts dug for coal about a century ago; "Balcombian" marine fossiliferous clays were proved over a wide area in the northern part of the embayment by shallow boring for the Geelong sewer outfall, and for geological investigations of siltation in Lake Connemare (Coulson, 1935).

Wells drilled for oil, water and brown coal, to depths ranging between several hundred and 2,050 feet, have provided further data on the subsurface distribution and thickness.

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of some of the stratigraphic units recognised in the area; they have also acted as subsurface controls for interpretation of the results of seismic surveys conducted in 1960 by Oil Development N.L.

Several of these wells drilled in the vicinity of Torquay (see Plate 2) entered sediments of the Otway Group after passing through varying thicknesses of the Tertiary sequence, and it was possible in some areas to identify seismic reflecting horizons which corresponded closely to the subsurface boundary between the Otway Group and the overlying Tertiary sediments as determined by these wells. From these data, generalised contours at intervals of 100 feet were developed to show the main topographic features of the surface of the Otway Group, as indicated on Plate 1. From this it became evident that the greatest thickness of sediments overlying the Otway Group would be expected in the Anglesea Trough, between the Torquay Horst to the east and the Otway Uplift to the west. The results of aeromagnetic survey of the adjoining offshore area also tended to support this conclusion.

Seismic reflection traverses indicated a thickness of up to 4,500 feet of conformable section in the portion of the Anglesea Trough in the southwestern corner of P.P.L. 256, which was presumed to represent the lower Tertiary sequence, possibly conformably underlain by Middle to Upper Cretaceous sediments, from which substantial quantities of petroliferous gas had already been produced in the adjoining Otway Basin. Wells drilled in the vicinity of Anglesea had already proved a thickness of more than 1400 feet of the lower Tertiary sequence without passing out of it, and the site for the off-structure stratigraphic test, O.D.N.L. Anglesea Well No. 1, was selected in the area where the seismic survey indicated that the greatest thickness of sediments could be expected. The well was designed to determine whether younger Cretaceous sediments are present beneath the Tertiary sequence, and whether any porous zones might be present within or at the base of the Lower Cretaceous Otway Group sequence. After drilling to the original target depth of 7500 feet without passing out of the Otway Group the well was deepened to 10,065 feet, the limit of the depth capacity of the rig, still within the Otway Group.

(d) Structure:

The positions of the boundaries between the older Tertiary lithologic units suggest the general form of a broad nose-like structure with its axis plunging easterly away from the Otway Uplift and with generally low dips on all flanks (see Plate 1). This structure was probably developed during emergence of the embayment in late Miocene time as a result of a general downward tilt from the Otway Uplift toward the east, accompanied by slight upwarp along the axis of the nose, in the area to the south of the Barrabool Hills.

Along the coastal section between Eastern View and Point Addis, the older Tertiary sediments dip at rather steep angles (about 30 degrees) near Eastern View but, farther to the northeast, the dips are generally less than 10 degrees, toward the sea, and the strike is approximately parallel to the general ENE trend of the coastline. Between Point Addis and Torquay the strike apparently changes gradually to a northerly direction, and then to westward inland on the northern flank of the nose.

The topographic features of the surface of the Otway Group, beneath the cover of Tertiary sediments, appears to have been developed by block faulting in late Mesozoic time, followed by subsequent erosion. The contours on the surface of the Otway Group (see Plate 2) indicate the presence

of three topographically high areas separated by two trough-like depressions; from northeast to southwest these five subsurface topographic features are respectively as follows: Bellarine Horst, Barwon Trough, Torquay Horst, Anglesea Trough, Otway Uplift. In both of the troughs the throw of the bounding faults was apparently progressively greater toward the southeast, away from the positive area of the Barrabool Hills with its core of Cambrian diabase.

The present land area covered by the Bellarine Horst, Barwon Trough and Torquay Horst was probably emergent and subjected to erosion until early Oligocene time, but the present offshore area of the Barwon Trough, to the southeast of the present coastline, may have been a site of deposition during Eocene and possibly late Mesozoic time. In the Anglesea Trough, however, the downthrow along the bounding faults was evidently much greater than on the northern side of the Torquay Horst, because at least 2,000 feet of Tertiary sediments older than those represented to the northwest were known to be present in the trough before the drilling of C.D.N.L. Anglesea Well No. 1.

The seismic reflection survey conducted by Oil Development N.L. during 1960 provided farther evidence of the greater thickness of post-Otway Group sediments in the Anglesea Trough; however, the drilling of the Anglesea well has shown that the original estimate from the seismic survey of 4,500 feet of post-Otway Group sediments in this area was erroneous because of multiple reflections. The expected Middle and Upper Cretaceous section underlying the Tertiary sequence was not present at the site of Anglesea well, but the thickening of sedimentary section seaward from the Anglesea Trough, shown by aeromagnetic survey, indicates that such a section may well be present in the offshore area to the southeast. In the Anglesea well the dips in the Otway Group down to Core No. 29 (8190 to 9200 feet) are fairly uniform, ranging between 20 and 25 degrees, and the continuous dipmeter shows that the dip is generally toward the south. In Core No. 30 (8690 to 8707 feet), however, the dip averages 70 degrees and the core shows many slickensides and fractures, infilled with calcite, indicating that it is in a fault zone or in proximity to a fault. The dips in the succeeding three cores range between 35 and 45 degrees, suggesting that this lower part of the section is in a different fault block.

(2) Stratigraphy of O.D.N.L. Anglesea Well No. 1

O.D.N.L. Anglesea Well No. 1 commenced drilling in the lower part of the Anglesea Member of the Demon's Bluff Formation, penetrated the Eastern View Coal Measures between 370 and 1932 feet, and then continued through the hard consolidated sediments of the Otway Group to its final depth of 10,065 feet. The descriptions of these lithologic units as represented in the well section are as follows:

Anglesea Member of Demon's Bluff Formation:

Age: Late Eocene to early Oligocene  
Interval: Surface to 390 feet.

Cuttings from this portion of the well section consisted of clay and loose sand grains. The clays are dark brown, lignitic and slightly micaceous and the sands consist mostly of fine subangular grains of clear quartz, sometimes stained with limonite, together with occasional flecks of mica and rare grains of pyrite. The section is presumed to consist of thicker beds of clay interbedded with thinner beds of loosely consolidated sands and siltstones, from which the loose quartz

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grains found in the cuttings were derived. A few tests of foraminifera were observed in some of the cuttings. No logs were run over this portion of the section.

#### Eastern View Coal Measures

Age: Paleocene to early Eocene  
Interval: 390 to 1932 feet.

<sup>118</sup>  
The cuttings from this interval consisted of loose sand grains and gravel, together with clay and brown coal. The gravels consist of small pebbles of subrounded quartz, mostly about 2 mm in diameter, with occasional flakes of mica. The sands are loose, unconsolidated, generally coarse grains of subrounded quartz with a few small flakes of mica and occasional grains of pyrite. The clays are soft, plastic, grey to brownish-grey, micaceous in some places, and with lignitic fragments scattered throughout. The brown coals contain occasional fragments of resin. Fragments of unidentifiable mollusc shells are present in some parts of the section. From the electric log, this portion of the section consists of thick beds of the coarser sediments interbedded with thinner beds of clay and brown coal; the electric log shows a greater proportion of clay in the section than is indicated by the cuttings and it is evident that much of the clay was absorbed into the drilling fluid. In the interpreted lithologic log the electrical characteristics of the soft brown coals have been taken as being similar to those for the clays, rather than showing the abnormally high resistivity on the electric log that is characteristic of normally hard and dense coals.

In the section from 390 to 1300 feet sands and brown coal seams are dominant in the upper part and gravels in the lower part. Between 1300 and 1770 feet, gravels are dominant in the upper part and sands are dominant in the lower part. From 1770 to 1880 feet the section consists of interbedded sands and gravels with seams of brown coal and a few thin beds of clay. The lowermost portion of the section, between 1880 and 1932 feet, contains fragments of reworked arkose, siltstone and mudstone derived from the Otway Group intermingled with the sand and gravel. Core No. 7, cut from 1931 to 1951 feet, recovered 19 feet of hard consolidated sediments of the Otway Group, but the electric log indicates that the top of the Otway Group is at about 1932 to 1933 feet; this slight discrepancy is probably due to driller's error in depth measurement.

An assemblage of marine microplankton of probable early Eocene age, was found in Core No. 2 (789 to 809 feet), but Cores 3 to 6, taken between 1090 and 1798 feet, contained only pollens and angiosperm leaf cuticle.

#### Otway Group

Age: Early Cretaceous  
Interval: 1932 to 10,065 feet.

<sup>588M</sup>  
The cuttings from this interval consisted of varying percentages of fragments of arkosic sandstone, siltstone and mudstone; as caving of the wall of the hole took place continually during the drilling of the well, mainly in the mudstone sections, a considerable amount of contamination of the bottom-hole cuttings must have taken place and it is probable that the percentages of mudstones recorded are generally higher than is actually the case. The cores taken in the Otway Group indicate that the section consists of a thin alternation of arkosic sandstones, siltstones and mudstones, with the individual beds rarely exceeding a few feet in thickness; the interpreted lithology shown on the composite log therefore shows only what is believed to be the dominant rock type in each portion of the Otway Group section as the scale of the log

is too small to represent the individual thin beds of the alternation.

The arkosic sandstone, mottled grey and white, consists of about 75 per cent of well rounded clear, white and grey quartz grains and 25 per cent of soft white friable feldspar. The siltstones are greyish, dense and slightly micaceous. The mudstones are dark grey, dense, homogeneous and slightly micaceous. Carbonaceous matter is present throughout the section, generally as thin laminae, but some thin seams of black coal are present, particularly between 2200 and 2700 feet.

Palynological examination of Core No. 7 (1931 to 1951 feet), the first core to be taken in the Otway Group, revealed the presence of numerous microspores typical of the Lower Cretaceous non-marine sequence elsewhere in Victoria. Plant remains, including Taeniopteris spatulata and Sphenopteris sp. are present in a number of cores taken from lower in the section; these are also typical of the Lower Cretaceous non-marine sequence in Victoria.

A marked change in the electrical characteristics of the Otway Group section is evident when compared to those of the overlying Tertiary section; both the S.P. and resistivity curves retreat sharply in the Otway Group below the contact with the Tertiary and this characteristic is consistently maintained to final depth.

### (3) Relevance to Occurrence of Petroleum

The drilling of the Anglesea well has shown that it is unlikely that the Middle and Upper Cretaceous sediments from which petroliferous gas was obtained in the adjoining Otway Basin will be found between the Lower Cretaceous Otway Group and the overlying Tertiary sequence within the limits of P.P.L. 256, although the results of aeromagnetic survey suggest that they may be present in the offshore area to the southeast of the Anglesea Trough.

The Tertiary sequence penetrated by the Anglesea well is regarded as having very little potential for petroleum as the bulk of the section consists of coarse sands and gravels, with only thin interbeds of clay and thicker beds of brown coal; however, one sample from Core No. 5 (at 1509 feet), showed a strong golden colour in solvent after extraction (see Appendix 5), but this may have been due to the presence of lignitic material.

In the Otway Group section, fluorescence which may have been attributable to the presence of residual traces of crude oil were first recorded in tight dense arkosic sandstone from Core No. 8 (2225 to 2245 feet), but none was observed in the succeeding Core No. 9 (2286 to 2296 feet). In Core No. 13 (3460 to 3470 feet) traces of residual crude oil showing strong fluorescence were reported on broken faces of arkosic sandstone, and strong fluorescence of the cuttings persisted intermittently in the section down to about 4300 feet; the presence of traces of crude oil in a cuttings sample from 4200 to 4210 feet was confirmed by the Senior Chemist, Mines Department of Victoria, but solvent extractions made by the Bureau of Mineral Resources on most of the cores taken in the Otway Group gave no indications of the presence of crude oil (see Appendices 4 and 5).

The mud gas detector unit came into operations when the well had reached 2800 feet, but the first indications of hydrocarbon gas in the mud began to be registered at 3600 feet and these indications persisted to a greater or less extent down to final depth; more pronounced build-ups of the



hydrocarbon gas content of the drilling fluid were evident at the intervals 4800 to 4950 feet, 5000 to 5140 feet, 7210 to 7240 feet, and 8660 to 8790 feet. The mud gas detector unit indicated that the gas consisted of methane with a variable but often substantial percentage of heavier hydrocarbons, which suggests the presence of small quantities of possibly petroliferous gas throughout most of the Otway Group section.

It was hoped that some porous and permeable beds or porosity arising from fractures, might be present within the Otway Group itself, or at least a zone of porosity along the unconformity of the Otway Group with the underlying presumed Lower Palaeozoic basement, as such situations had produced showings of petroliferous gas and traces of crude oil in wells drilled into the Otway Group both in the Gippsland Basin to the east and the Otway Basin to the west. However, the electric logs and the core analyses (see Appendix 5) indicated abnormally low porosity, mostly of the order of 3 to 5 per cent, and a complete lack of permeability except in one case (Core No. 19, 2562 feet) from which a horizontal permeability of 4 millidarcys was measured. Fracturing was evident in some of the cores and cuttings, but in all cases the fractures appeared to be completely infilled with calcite. As the well was still in the Otway Group at the original target depth of 7,500 feet, it was decided to continue drilling with lighter drill pipe to the maximum depth capacity of the rig, in an attempt to reach possibly porous beds along the unconformity with basement; this, however, was not achieved, and the well was abandoned while still in the normal sediments of the Otway Group.

As the site of this well was selected in an area where the greatest thickness of sediments could be expected in P.P.L. 256, the possibility still exists that porous beds along the unconformity between the Otway Group and basement may be intersected at shallower depth farther to the north and northeast toward the margin of the Lower Cretaceous basin.

#### (4) Porosity and Permeability of Section

The Tertiary sequence overlying the Otway Group, consisting mostly of loose or poorly consolidated sands and gravels, is generally highly porous and permeable, as indicated by the electric logs. Only two cores from the Tertiary sequence were analysed. Core No. 5 (1509 feet), consisting of quartz sand and gravel with varying amount of clay matrix, showed an effective horizontal porosity of 29 per cent and vertical porosity of 26 per cent, but the permeability was not measured; Core No. 6 (1784 feet), consisting of sandy mudstone, has an effective horizontal porosity of 13 per cent and vertical porosity of 15 per cent, but is lacking in permeability.

The porosity and permeability of the Otway Group section, in relation to its bearing on the occurrence of petroleum, has been discussed in the section immediately preceding.

#### (5) Contributions to Geological Knowledge

The main objective of the Anglesea well was to determine the stratigraphic section in an area within P.P.L. 256 where the sedimentary section was believed to be thickest and, in particular, to test for a possible section of Middle to Upper Cretaceous sediments which it was anticipated might be wedging out toward the north and northeast between the Paleocene to early Eocene Eastern View Coal Measures and the underlying Lower Cretaceous Otway Group. Should no such Middle to Upper Cretaceous section, from which petroliferous gas had already been produced in the adjoining Otway Basin, be present in this area, the secondary objective was to determine whether any

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porous beds or fractured zones are present in the Otway Group itself, or a porous zone at the unconformity with presumed Lower Paleozoic basement, from which oil and/or gas might be produced.

The drilling of the Anglesea well showed that the Otway Group at this location is directly overlain by the Eastern View Coal Measures and that it is unlikely that the Middle to Upper Cretaceous sequence of the adjoining Otway Basin is present anywhere within the area of P.P.L. 256; aeromagnetic survey of the adjoining offshore area, however, indicates that the Middle to Upper Cretaceous sequence may be present at depth in the offshore area to the southeast of the Anglesea Trough. The well also proved a much greater thickness of the Otway Group sediments in this area than was expected, and that no porous beds or fractured zones which might have been productive here or farther updip are present in the 8,133 feet of Otway Group sediments which were penetrated, down to the depth capacity of the rig; basement was still beyond the depth capacity of the rig, but the sharp rise of bottom-hole temperature in the lower part of the section suggested that it was probably not far below final depth.

The continuous dipmeter results, in conjunction with the dips shown in the cores, indicated that the upper part of the Otway Group section, is dipping generally toward the south at about 20 to 25 degrees; at about 8700 feet (Core No. 30), the well apparently passed through a fault zone into another fault block in which the dips range between 35 and 45 degrees. This evidence of subsurface faulting (average dip of 70 degrees in Core No. 30), together with other evidence of faulting elsewhere in the area, suggests the possibility of fault traps in the Otway Group farther toward the margin of the basin on the northern side of the Barrabool Hills but, unless porosity is developed elsewhere in the Otway Group section, the only remaining target would be a porous zone developed at the unconformable contact with basement, which has not yet been proved at depth in the area of P.P.L. 256.

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PE903874

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document.

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PERMIT = PPL256  
TYPE = WELL  
SUBTYPE = MAP  
DESCRIPTION = Structural Features and Distribution of  
Pre-Pliocene Stratigraphic Units, Torquay  
Embayment Port Phillip Basin (enclosure  
from WC ) for Anglesea-1  
REMARKS =  
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DATE\_RECEIVED =  
W\_NO = W468  
WELL\_NAME = Anglesea-1  
CONTRACTOR = Geodrafting Services  
CLIENT\_OP\_CO = Alliance Oil Development Australia NL

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PE903875

This is an enclosure indicator page.  
The enclosure PE903875 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE903875 has the following characteristics:

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PERMIT = PPL256  
TYPE = WELL  
SUBTYPE = CROSS\_SECTION  
DESCRIPTION = Geological cross section through  
O.D.N.L Anglesea 1 before and after  
drilling (enclosure from WCR) for  
Anglesea-1  
REMARKS =  
DATE\_CREATED = 20/05/63  
DATE\_RECEIVED =  
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CONTRACTOR = Geodrafting Services  
CLIENT\_OP\_CO = Alliance Oil Development Australia NL

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APPENDIX 1 (a)

PETROLOGICAL REPORT

LITHOLOGIC DESCRIPTION OF CORES

By: P. W. Bollen (1-29), J. Cundill,  
(30, 31), N. A. Meyers (32, 33):

Note: The lithology of each core is described in sections from top to bottom of the recovered section.

- Core No. 1: Interval cored, 490 to 510 feet; recovery, 8'0", 40%.  
8' 0" Beds of soft brown coal, average thickness 4", separated by thin laminations and stringers of loose sand and gravel. Yellow resinous material is present in the brown coal and the sands consist of subangular to subrounded coarse grains of quartz, ranging up to pebble size.
- Core No. 2: Interval cored, 789 to 809 feet; recovery, 4'3", 21%.  
3' 6" Siltstone, soft greyish, argillaceous and micaceous, containing a small amount of fine quartz sand  
8" Clay, brownish grey, plastic, with very thin irregular laminae of very fine grained sand and silt containing some small flakes of mica, and some thin laminae of brown coal.  
1" Brown coal.
- Core No. 3: Interval cored, 1090 to 1110 feet; recovery, 5'7", 28%.  
3'0" Clay, greyish, fairly soft and plastic, micaceous.  
1'7" Sand, lignitic, brownish, fine to medium grained, micaceous, interbedded with  
Lignite, impure, micaceous.  
1'0" Brown Coal.
- Core No. 4: Interval cored, 1214 to 1234 feet; recovery, 3'10", 19%.  
1'4" Clay, greyish, sandy, micaceous, containing a few small lignitic fragments.  
2'6" Gravel, quartzose, with greyish clay matrix, grading to sandy soft greyish plastic clay.
- Core No. 5: Interval cored, 1506 to 1526 feet; recovery, 10'0", 50%.  
10'0" Sand and gravel, consisting of subrounded quartz grains ranging from 0.5 to 3.0 mm. in diameter, set in varying amounts of greyish clay matrix; small stringers and fragments of lignite are scattered irregularly throughout the section, together with disseminated granules of pyrite; a nodule of pyritic sandstone, 2" in diameter, is present in the argillaceous matrix at 7'6" from the top of the core.

Cont'd.....

- Core No. 6: Interval cored, 1778 to 1798 feet; recovery 11'0", 55%.
- 2'0" Sandstone, pale grey, medium grained, porous, composed of subangular to subrounded clear and milky quartz grains, with a few pale yellowish quartz grains, set in a light grey argillaceous matrix; it contains many thin irregular current bedded lenses of brown coal up to  $\frac{1}{8}$ " thick, and a few thin lenses of coarse grained sand.
  - 3'4" Pebbly Sandstone, composed of subrounded to subangular granules and small pebbles of clear and milky quartz together with a few pebbles of black shale, set in a matrix of medium grained sandstone similar to that in the top section of core; some stringers of greyish silt and a few thin laminae of brown coal are also present.
  - 3'0" Mudstone, grey, arenaceous, with a few small pebbles of quartz and rare fragments and thin laminae of brown coal.
  - 1'0" Mudstone, as above, but containing irregular inclusion of darker grey and light brown mudstone, and laminae of brown coal up to  $\frac{3}{8}$ " thick.
  - 1'8" Sandstone, as in the top section of the core, but fine grained.
- Core No. 7: Interval cored, 1931 to 1951 feet; recovery, 19'0", 95%.
- 9" Arkosic sandstone, fine to medium grained, mottled grey, white and greenish, slightly friable, with a thin lamina of black coal near the top of the section.
  - 18'3" Thin beds and laminae of mudstone, siltstone and fine grained arkosic sandstone.  
Mudstone, greyish, slightly friable, massive, with little indication of bedding.  
Siltstone and fine sandstone, arkosic, light grey, thinly interlaminated, make up 30% of total thickness of the core; thin laminae of coaly material are present and the bedding is distorted in places, probably because of current bedding. At 5'9" and 14'9" from the top of the core sections about 3" wide appear to contain dense brownish cherty silica.
- Core No. 8: Interval cored, 2225 to 2245 feet; recovery, 20'0", 100%.
- 20'0" Arkosic sandstone, mottled grey and white, consisting of 70-80% of well rounded medium to coarse grains of colourless, whitish and greyish quartz, 20-30% of soft friable white felspar, and accessory indeterminate well rounded greenish grains; a few thin laminae of coal, up to 5 mm. in thickness, are present between 4 and 8 feet from the top of the core, and large irregular fragments of bedded mudstone are scattered in the arkose between 11'6" - 11'9" and 17'6" - 18'0" from the top of the core.
- Dip: The arkosic sandstone is massive, but the thin laminae of coal between 4 and 8 feet from the top of the core indicate a dip ranging between 20 and 25 degrees.

Cont'd.....

- Core No. 9: Interval cored, 2286 to 2296 feet; recovery, 9'0", 90%.
- 6'4" Arkosic Sandstone, greyish, fine to medium grained, with some thin laminae of carbonaceous matter.
- 1'0" Thin interbeds of arkosic sandstone, light grey, fine grained, and siltstone, dark grey, in about equal proportions.
- 7" Arkosic sandstone, greyish to buff coloured, fine grained, slightly calcareous.
- 1'1" Arkosic Sandstone, greyish, fine to medium grained, with a few laminae of dark grey siltstone.
- Dip: The carbonaceous laminae in the arkosic sandstone dip at 20 degrees.
- Core No. 10: Interval cored, 2557 to 2567 feet; recovery, 10'0", 100%.
- 10'0" Mudstone with some thin interbeds of arkosic sandstone. The mudstone is dark grey and homogeneous, with a few inclusions up to 2½" in diameter of dolomitic mudstone, pinkish brown, dense and semicrystalline. The arkosic sandstone is mottled grey and white with fine to very fine subangular to subrounded grains of clear, milky and grey quartz and white feldspar; some thin laminae of black coal are present.
- Dip: Generally about 35 degrees. High angle slickensides are present in the core at 1'6" and 6'0" from the top.
- Core No. 11: Interval cored, 2860 to 2870 feet; recovery 10'0", 100%.
- 10'0" Arkosic Sandstone, mottled grey and slightly brownish in places, massive, fine-grained, with colourless to greyish quartz grains and a very few flakes of muscovite; a few thin laminae of carbonaceous material are present.
- Dip: The carbonaceous laminae indicate a dip of about 20 degrees.
- Core No. 12: Interval cored, 3158 to 3168 feet; recovery, 5'0", 50%.
- 1'2" Arkosic Sandstone, mottled grey and white, fine to very fine grained, with subangular to subrounded grains of quartz in slightly calcareous matrix and a few thin carbonaceous laminae, interbedded with grey siltstone and grey to dark grey mudstone.
- 1'0" Arkosic Sandstone, as above, but medium grained.
- 10" Mudstone, grey to dark grey, with irregular inclusions of brownish colour and thin beds and laminae of black coal.
- 4" Arkosic Sandstone, light greyish brown, fine to medium grained, with calcareous cement.
- 1'8" Siltstone, grey, with some thin interbeds of mudstone and arkosic sandstone, as above.
- Dip: Dips range between 10 and 15 degrees. Some fractures up to 1/16" wide, infilled with calcite, are present in the top one foot of core.

Cont'd.....

- Core No. 13: Interval cored, 3460 to 3470 feet; recovery, 7'0", 70%.  
7'0" Arkosic Sandstone, mottled light grey and white, medium grained grading to fine-grained in places, subangular to subrounded grains of quartz with a very few thin laminae of black coal. The freshly broken surface of the core shows small irregular light brown oil stains which showed yellow fluorescence.
- Dip: No dip observed. High angle fractures infilled with thin veins of calcite are present in some places.
- Core No. 14: Interval cored, 3724 to 3734 feet; recovery, 2'0", 20%.  
2'0" Arkosic Sandstone, mainly grey but partly mottled with white, medium grained, hard and tight, with poorly sorted subangular grains of quartz and feldspar and a very few thin carbonaceous laminae.
- Dip: No dip observed. A few thin high angle fractures infilled with calcite are present in the core.
- Core No. 15: Interval cored, 3734 to 3744 feet; recovery, nil, 0%.
- Core No. 16: Interval cored, 4011 to 4021 feet; recovery, 10'0", 100%.  
7" Siltstone, light to medium grey, slightly greenish in places, and slightly micaceous and carbonaceous.  
4'3" Siltstone, medium grey, somewhat finer than above, and not micaceous or carbonaceous.  
3'1" Mudstone, dark grey to brownish, massive, slightly carbonaceous.  
1'10" Siltstone, light to medium grey, slightly greenish in places and slightly micaceous.  
1'1" Mudstone, dark grey, massive, slightly carbonaceous.
- Dip: Generally at 15 degrees throughout the core.
- Core No. 17: Interval cored, 4223 to 4234 feet; recovery, 11'0", 100%.  
11'0" Arkosic Sandstone, generally light grey with some light mottling, fine to medium grained, composed of subangular to subrounded grains of clear, milky and grey quartz and feldspar in a slightly calcareous matrix, and with a few thin carbonaceous patches, and plant remains at one foot from base of core.
- Dip: The arkosic sandstone is massive throughout, but the lamina with plant remains dips at 25 degrees.
- Core No. 18: Interval cored, 4517 to 4527 feet; recovery, 9'0", 90%.  
9'0" Arkosic Sandstone, light grey, fine to medium grained, tight, with a few thin beds and laminae of dark grey mudstone in the lower 7 feet of core.
- Dip: The dip is indeterminable because of extensive fracturing, mostly in the lower 7 feet of core; most of the fractures, completely infilled with calcite, are at high angles and displacements of up to 3" are evident along some fractures.
- Core No. 19: Interval cored, 4819 to 4829 feet; recovery, 5'6", 55%.  
1'8" Arkosic sandstone and siltstone irregularly interbedded and interlaminated. The arkosic sandstone is pale grey with some mottling of white, hard, tight and calcareous, fine to very fine grained, with subrounded

quartz grains and a few feldspar grains, and a few thin carbonaceous laminae; pale yellow fluorescence is evident in some places and possibly some light amber oil staining. The siltstone is grey, slightly micaceous, and with a few thin carbonaceous laminae. Thin veins of calcite cut across the bedding in this section of core.

1'11" Siltstone as above, but interbedded with mudstone, dark grey, with thin laminae of plant remains; calcite veins are also present.

1'11" Arkose and siltstone as in top 20" of core, but more regularly bedded.

8" Mudstone, dark greyish-brown, very calcareous.

Dip: The overall dip is 10 degrees.

Core No. 20: Interval cored, 5161 to 5171 feet; recovery, 9'0", 90%.

3'3" Thin alternating beds of arkosic sandstone and mudstone.

Arkosic sandstone, mottled white and grey, fine grained, hard and tight, with subrounded grains of quartz and some feldspar, slightly micaceous, in a kaolinitic and calcareous matrix. Mudstone, dark grey, hard. Some yellow fluorescence is evident in places, and rare traces of brownish oil staining are visible under magnification.

3'7" Arkosic Sandstone, light grey, fine grained, as in section above, but containing thin laminae of mudstone and carbonaceous matter; no fluorescence was observed.

2'2" Mudstone, dark grey, sheared and brecciated, with many fracture planes, some slickensided and some infilled with calcite.

Dip: Dips of 15 degrees observed in upper 3'3" of core, but the bedding is generally disturbed by fracturing.

Core No. 21: Interval cored, 5487 to 5497 feet; recovery, 6'0", 60%.

6'0" Arkosic Sandstone, light grey and mottled white, hard and tight, fine grained, with subrounded grains of quartz and less feldspar than usual set in a matrix partly siliceous and partly calcareous; some thin carbonaceous laminae between 3'3" and 4'0" from top of core also contain a few small flakes of mica. The top 1'4" and the bottom 1'0" show fracture planes infilled with white calcite and a few grains of pyrite are present on some slickensided surfaces.

Dip: Ranges between 23 and 25 degrees.

Core No. 22: Interval cored, 5766 to 5776 feet; recovery, 7'0", 70%.

9" Siltstones, thinly laminated light grey, dark grey and black, depending on amount of included carbonaceous matter, slightly micaceous.

3'6" Sandstone, mottled blue grey and white, fine to medium grained, mostly subrounded to subangular grains of quartz with very little feldspar present, set in a hard siliceous matrix.

1'3" Mudstone, black and carbonaceous, interlaminated with light grey siltstone as in top section of core.

Cont'd.....



1'8" Siltstone as in top 9" of core, but more grains of feldspar are present.

Dip: The upper 9" of core shows dips averaging 30 degrees.

Core No. 23: Interval cored, 6237 to 6247 feet; recovery, 9'0", 90%.

11" Siltstone, medium grey, very fine grained, dense and tight, slightly micaceous and with disseminated grains of carbonaceous matter; faint yellow fluorescence seen in places, but no evidence of oil staining.

7" Mudstone, grey, hard, dense.

3'5" Interbedded siltstone, as above, and mudstone, as above, with the individual beds ranging from thin laminae up to 3" thick.

2'6" Mudstone, as above, with a few thin beds of siltstone, as above.

2'1" Siltstone, as in top section of core.

Dip: The dips observed range between 25 and 30 degrees; fractures infilled with calcite are present in some places.

Core No. 24: Interval cored, 6723 to 6727 feet; recovery, 3'0", 75%.

12" Mudstone, black and carbonaceous, with a few small current-bedded lenses of siltstone.

2" Siltstone, black and carbonaceous, with a few fragments of black coal.

22" Arkosic sandstone, grey with some white mottling, very fine grained to fine grained and becoming medium grained toward base, with subangular to subrounded grains of quartz and feldspar in a partly siliceous and partly calcareous matrix; scattered inclusions up to 1/8" thick and 1" long of black coal and brown mudstone are present and a few fractures infilled with calcite.

Dip: The observed dips are about 25 degrees.

Core No. 25: Interval cored, 6759 to 6773 feet, recovery, 10'0", 71%.

3" Mudstone, black and carbonaceous, very hard.

5'0" Thin alternating beds and laminae of arkosic sandstone and siltstone. The sandstone is grey, mottled with white, hard and tight, grading from very fine to medium grained, with subrounded to subangular grains of quartz and feldspar in a siliceous matrix. The siltstone is grey, with some black carbonaceous and slightly micaceous laminae.

1'4" Siltstone, as above.

3'5" Interbedded arkosic sandstone, as above, and siltstone, as above. In the lower 1'3" of this section a few interbeds of black mudstone are also present.

Dip: The dips observed are at 25 degrees. A few fractures infilled with calcite are present.

Core No. 26: Interval cored, 7255 to 7265 feet; recovery, 9'6", 95%.

3'0" Sandstone, slightly arkosic, current-bedded, hard and tight, grey with dark grey to black laminations, fine grained, slightly carbonaceous, and with siliceous cement.

3'6" Siltstone, dark grey, slightly micaceous, with a few scattered plant remains.

- 1'6" Sandstone, as in top section of core.
- 3" Mudstone, black and carbonaceous.
- 1'3" Sandstone, as above.

Dip: The average dip in the core is 20 degrees.

Core No. 27: Interval cored, 7544 to 7550 feet; recovery, 6'0", 100%.

- 4" Arkosic sandstone, mottled grey and white, generally hard and tight but slightly friable in places, fine to medium grained, with subangular to subrounded grains in a mainly siliceous but partly calcareous matrix.
- 5'8" Mudstone, black and carbonaceous, with some interbeds up to 4" thick of arkosic sandstone, as above.

Dip: The dips observed average 25 degrees.

Core No. 28: Interval cored, 7857 to 7867 feet; recovery, 9'0", 90%.

- 6'0" Mudstone, with interbeds and lenses of arkosic sandstone. The mudstone is dark grey to black, and carbonaceous. The arkosic sandstone is mottled light grey and white, medium to fine grained and grading to siltstone in places, tight and hard, with subangular to subrounded grains in a dominantly calcareous matrix.
- 1'6" Mudstone, as above, with thin interbeds of siltstone, slightly micaceous.
- 1'6" Arkosic Sandstone, as above, but generally medium grained and with several scattered laminae of carbonaceous mudstone.

Dip: The observed dips average 25 degrees.

Core No. 29: Interval cored, 8190 to 8200 feet; recovery, 8'0", 80%.

- 7" Arkosic Sandstone, mottled grey and white, medium to fine grained, with subangular to subrounded grains in a dominantly siliceous but partly calcareous matrix; inclusions of grey laminated siltstone up to 2" long and 1" thick are present.
- 1'3" Siltstone, grey, slightly micaceous, very uniformly laminated with very fine grained sandstone and darker grey siltstone, slightly friable in bottom 1/2" of section.
- 2'9" Arkosic Sandstone, as in top section, but with fewer and smaller inclusions, generally well rounded.
- 1'3" Siltstone, laminated as above, but also showing some current bedding near base, and slightly friable near top of section.
- 2'1" Arkosic Sandstone, as above, but containing scattered laminae of dark grey siltstone.

Dip: The observed dips range between 18 and 20 degrees.

Core No. 30: Interval cored, 8690 to 8707 feet; recovery, 17'0", 100%.

- 11'0" Interlaminated and thinly interbedded mudstones, shales siltstones and sandstones. The mudstones are dark grey to black, firm, slightly silty in places, with traces of mica and a few carbonaceous fragments, and slightly shaley habit in places. The shales are black, slightly carbonaceous, very slightly micaceous and fissile in places. The siltstones are medium grey, argillaceous, hard and tight, with scattered feldspars and rare carbonaceous specks. The arkosic

sandstones are medium grey, fine grained, hard and tight.

Dip: In this section of core the bedding is irregular and undulating and some small scale depositional slumping is evident; however, the dips are obviously steep, ranging from 50 to 80 degrees and averaging about 70 degrees. Slickensided surfaces and calcite infilled fractures, both at random angles, are common throughout the section.

6'0" Consists predominantly of dark grey to black mudstones, as above, with a few thin beds and laminae of shale and siltstone, the latter being somewhat more argillaceous than in the upper section.

Dip: The bedding is irregular and indefinite but the dips appear to range between 45 and 75 degrees. Slickensides and calcite infilled fractures are common as in the upper part of the core. The steep dips, slickensides and fractures indicate that this portion of the section is in or near a fault zone.

Core No. 31: Interval cored, 9156 to 9176 feet; recovery, 19'0", 95%.

5'6" Interbedded and interlaminated arkosic sandstone, shale and mudstone. The arkosic sandstone is light to medium grey, fine grained, compact, firm and tight, with subangular grains of grey quartz and brownish-grey feldspar in an argillaceous and calcareous matrix; carbonaceous matter is scattered throughout and rare traces of white and brown mica are also present. The shale and mudstone are dark grey to black, carbonaceous, and with traces of mica; in places they grade into argillaceous siltstones. Poorly preserved plant fossils, mostly of the Taeniopteris type are present in places.

Dip: The sandstones range in thickness from laminar size up to 5"; some lensing and depositional slumping is apparent but the bedding is generally regular, with dips consistently at about 45 degrees.

6'6" Shale and mudstones, dark grey to black, generally carbonaceous, silty in places and grading rarely to argillaceous siltstone; plant remains including Taeniopteris, are very common throughout this section and rarely they are partly pyritized. The upper part of this unit has a shaley habit, but the lower part is dominantly mudstone.

Dip: The bedding is quite distinct and the dip is consistently about 45 degrees.

3'4" Arkosic sandstone, light to medium grey, fine grained, compact and tight, composed of subangular grains of grey quartz and brownish-grey feldspars in a grey argillaceous and moderately calcareous matrix; dark grey laminae of carbonaceous matter and brown mica are present in places.

Dip: The traces of bedding indicate a dip of 45 degrees.

4'2" Mudstone, dark grey to black, slightly shaley and micaceous in places, with a few silty laminae in the upper part and carbonaceous flecks and poorly preserved plant remains increasing in abundance towards base of core.

Dip: Bedding becomes increasingly indistinct toward base of core, but the dip is generally 45 degrees. Near base of core, slickensides and calcite-infilled fractures are present, generally roughly parallel to the bedding.

Core No. 32: Interval cored, 9641 to 9656 feet; recovery, 2'7", 17%.

4'5" Shale, dark grey and black, carbonaceous, with coaly flecks and poorly preserved plant fragments, and a few small slickensides.

Dip: The bedding shows dips of 45 degrees.

1'0" Mudstone, dark grey, silty, slightly micaceous, with carbonaceous flecks, grading to and thinly interbedded with siltstone, medium grey, very argillaceous, slightly calcareous and micaceous, with traces of carbonaceous flecks and very rare calcite-infilled fractures.

Dip: The bedding dips regularly at 45 degrees.

1'2.5" Mudstone, in part with shaley habit, dark grey to black, carbonaceous, with abundant flecks of coaly material and poorly preserved plant fragments, and a few small slickensides and calcite-infilled fractures.

Dip: Indeterminable in this section.

Core No. 33: Interval cored, 10,045 to 10,065 feet; recovery, 20'0", 100%.

8'0" Interlaminated and thinly interbedded mudstone, and siltstone, with very few beds of sandstone. The mudstone is shaley in places, dark grey to black, slightly micaceous, with some silty laminae and a few carbonaceous flecks and plant remains. The siltstone is medium grey to brownish grey, argillaceous, slightly calcareous and micaceous in places, fairly hard, and with a few carbonaceous specks. The sandstone, is tight, medium grey to light brownish grey, very fine grained and arkosic, consisting of subangular grains of feldspar and quartz in an argillaceous and calcareous matrix.

Dip: Generally about 30 degrees.

7'6" Mudstone, shaley in places, dark grey to black, fairly hard, very rarely slightly micaceous and silty in places, with a few poorly preserved plant remains.

Dip: The bedding is very indistinct, and reliable dips are not determinable.

3'6" Interlaminated arkosic sandstone, siltstone and mudstone. The sandstone is similar to that in the upper section of core, but it also contains scattered flecks and laminae of carbonaceous material and few angular fragments of mudstone. The siltstone is brownish grey to dark brownish grey, fairly hard, argillaceous and calcareous, with rare specks of carbonaceous matter and flakes of mica. The mudstone, shaley in part, is black, slightly micaceous and slightly calcareous in places, with a few carbonaceous specks and a few lenses up to  $\frac{1}{2}$ " thick of carbonaceous material.

Dip: Irregular owing to current bedding, but ranges from 20 to 45 degrees and averages about 35 degrees. A few thin calcite-infilled fractures at an angle of about 60 degrees are also present.

1'0" Mudstone, very silty and grading to argillaceous siltstone, brownish grey, hard and with subconchoidal fracture, containing dark grey and black flecks and inclusions of probably carbonaceous material.

Dip: Bedding indefinite and dip indeterminable.

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APPENDIX 1(b)

LITHOLOGIC DESCRIPTION OF SIDE-WALL CORES

By: J. Cundill

Depth: 3771 feet (two cores)

(a) Recovery:  $\frac{3}{4}$ " of core mostly as small fragments.

Lithology: Arkosic sandstone, pale brown and light grey, fine grained grading to medium grained in places. It consists of subangular grey and clear vitreous quartz and white to pale brown partly decomposed feldspars in a kaolinitic and slightly siliceous cement. The sandstone is slightly calcareous, with a trace of carbonaceous material, and very rare indeterminate green specks; it is tight but generally fairly friable, although some chips with a vitreous appearance are slightly siliceous and harder.

(b) Recovery:  $\frac{3}{4}$ " of core as several large fragments.

Lithology: As in core 3771 (a) but all with vitreous appearance due to the presence of clear quartz and some slight silification. All fragments are uniformly tight.

Depth: 3772 feet (two cores)

(a) Recovery:  $\frac{1}{4}$ " as small broken fragments.

Lithology: As in core 3771 (a) above, but slightly coarser grained and generally fairly friable, but tight.

(b) Recovery:  $\frac{3}{4}$ " as small broken fragments.

Lithology: As in core 3771 (b), tight, fine to medium grained, moderately hard, of vitreous appearance and with the cement generally slightly siliceous.

Depth: 3773 feet

Recovery: 1" of core as several large pieces.

Lithology: Arkosic sandstone, whitish grey, fine grained, fairly soft, consisting of subangular clear, pale grey and brownish quartz grains, pale brown partly decomposed feldspars, and kaolin in a whitish kaolinitic matrix. The sandstone is tight, slightly calcareous, and it contains scattered flecks of carbonaceous material.

Depth: 3774 feet

Recovery:  $\frac{1}{2}$ " of core mostly of small fragments consisting of 80% of arkosic sandstone and 20% of mudstone.

Lithology: The arkosic sandstone is light brownish grey, fine grained, moderately hard and tight; it consists of subangular clear, light grey and brownish quartz grains, pale brown partly decomposed feldspars, and rare indeterminate green specks, in a slightly siliceous and calcareous kaolinitic matrix. The mudstone is soft to moderately hard, dark grey to black, slightly micaceous, silty, with a few flecks of carbonaceous matter and traces of calcite infilling fractures.

Cont'd.....

Depth: 5196 feet

Recovery:  $\frac{1}{2}$ " of core in small fragments consisting of 80% of arkosic sandstone and 20% of mudstone.

Lithology: The arkosic sandstone is whitish grey, fine grained, soft, friable and very tight; it consists of very much decomposed pale brown feldspars and greyish quartz in a high percentage of kaolinitic matrix, and in places it grades to a sandy feldspathic kaolin clay. The mudstone is dark grey to black and it contains a few scattered poorly preserved plant remains.

Depth: 5198 feet

Recovery: 1" of core in several large fragments.

Lithology: Tight arkosic sandstone as in core from 5196 feet, but it does not grade into sandy kaolin clay; it contains a few flecks of carbonaceous matter and is very slightly calcareous.

Depth: 5199 feet

Recovery:  $\frac{1}{4}$ " of core, mostly as large fragments.

Lithology: Arkosic sandstone, slightly calcareous and tight, grey, very fine grained, consisting of subangular partly decomposed grains of feldspar and quartz in a kaolinitic matrix; flecks of carbonaceous matter are fairly common, and traces of white mica and grey argillaceous material are also present.

Depth: 5201 feet

Recovery:  $\frac{1}{4}$ " of core as a mixture of large and small fragments consisting of 90% of arkosic sandstone and 10% of mudstone.

Lithology: The arkosic sandstone is similar to that of the core from 5196 feet; it is tight and very friable, and has a high percentage of kaolin. The mudstone is also similar to that from 5196 feet.

Depth: 5203 feet

Recovery:  $\frac{1}{2}$ " of core as a mixture of large and small fragments.

Lithology: Tight arkosic sandstone similar to that from 5196 feet, very friable and with a few flecks of carbonaceous material; calcite is fairly common as an infilling in fractures.

Depth: 5204 feet:

Recovery:  $\frac{1}{4}$ " of core as one fragment.

Lithology: Tight arkosic sandstone, fairly firm, light greyish brown, fine to medium grained, consisting of subangular grey quartz grains and pale brown feldspars in a feldspathic kaolinitic matrix; a few flecks of carbonaceous material are present.

Depth: 5205 feet

Recovery:  $\frac{1}{4}$ " of core as one fragment.

Lithology: Tight arkosic sandstone as in core from 5204 feet, with rare traces of white mica.

Depth: 5206 feet

Recovery:  $\frac{1}{2}$ " of core as small fragments.

Lithology: Tight arkosic sandstone as in core from 5204 feet with a trace of white mica.

Depth: 5207 feet

Recovery:  $\frac{3}{4}$ " of core as small fragments.

Lithology: Tight arkosic sandstone similar to that from 5204 feet, but softer and with a higher proportion of kaolinitic cement.

Depth: 5208 feet

Recovery:  $\frac{1}{2}$ " of core as small fragments.

Lithology: Tight arkosic sandstone, slightly calcareous, light brownish grey, fine grained, soft and friable, consisting of light grey quartz grains and subangular pale brown feldspars in a feldspathic and kaolinitic matrix; some scattered flecks of carbonaceous material and dark grey argillaceous material are also present.

Depth: 5209 feet

Recovery: 1" of core mostly as large fragments consisting of 60% arkosic sandstone and 40% of interlam-  
inated arkosic sandstone and shale.

Lithology: Tight arkosic sandstone similar to that from 5208 feet, but harder; it contains abundant carbonaceous flecks and laminae, and grey argillaceous matter in places. The shale is dark grey to black carbonaceous, slightly micaceous, soft, and with some inclusions of coal fragments.

Depth: 5210 feet

Recovery: 1" of core as one large and a few small fragments.

Lithology: Tight arkosic sandstone, whitish grey, fine grained, soft and friable, consisting of grey quartz grains and subangular very light brown and white partly decomposed feldspars in a feldspathic and kaolinitic matrix; it contains a number of laminations of black carbonaceous material.

Depth: 5211 feet

Recovery: 1" of core as one large and several small fragments.

Lithology: Tight arkosic sandstone similar to that at 5210 feet, but ranging to medium grained and with only traces of carbonaceous material as small flecks; a rare trace of mica is also present.

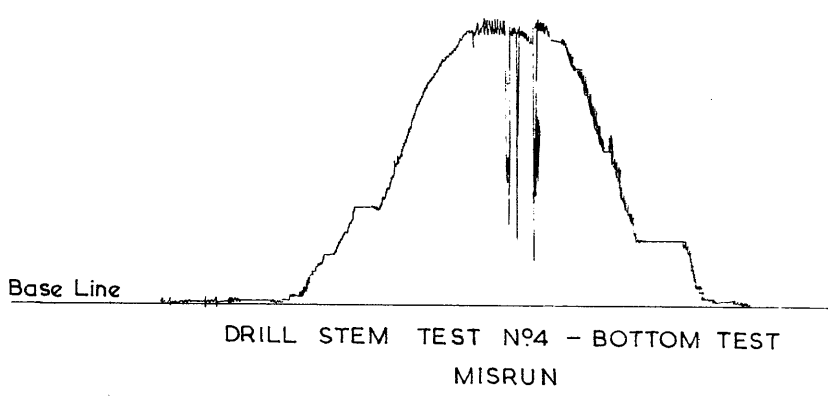
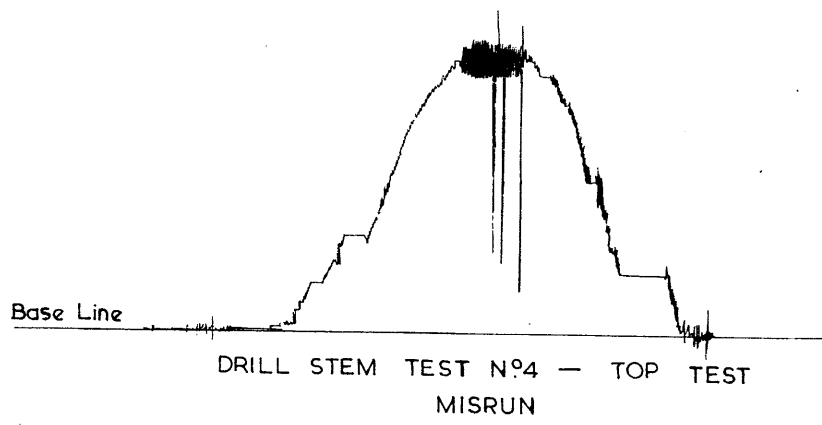
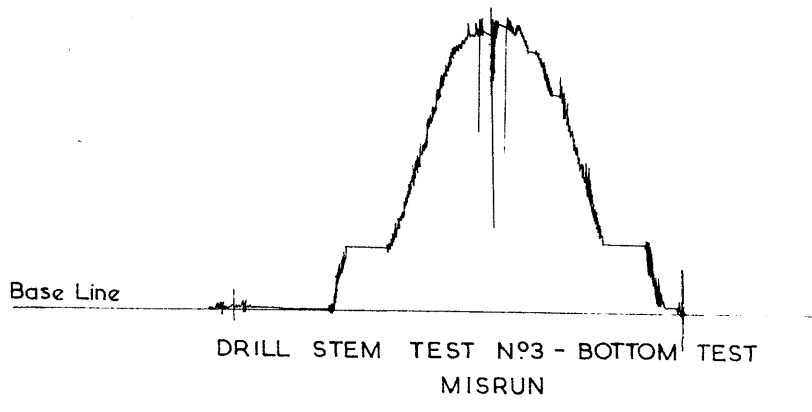
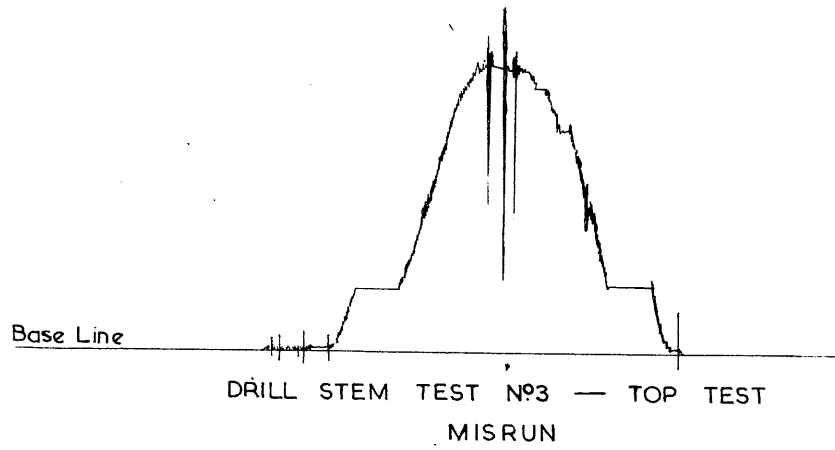
Depth: 5212 feet

Recovery: 1" of core as several large fragments.

Lithology: Tight arkosic sandstone as in core from 5211 feet, but with slightly more carbonaceous matter and abundant calcite infilling fractures and in coarsely crystalline masses more than  $\frac{1}{4}$ " wide.



OIL DEVELOPMENT N.L.  
ANGLESEA WELL N°1  
DRILL STEM TEST CHARTS



COMPLETION REPORT - O.D.N.L. ANGLESEA WELL NO. 1

APPENDIX 2 (a)

PRELIMINARY PALYNOLOGICAL EXAMINATION  
OIL DEVELOPMENT N.L. ANGLESEA NO. 1  
BORE CORE.

Cores from Oil Development N.L.'s Anglesea No. 1 bore were treated by the hydrofluoric acid - Schulze's solution method, and the residues examined under the microscope. Types of acid insoluble microfossils isolated are listed below.

<u>Sampling Depth</u>	<u>Microfossils</u>
Core 2 789-809'	Hystriospheres and dinoflagellates including <u>Wetzeliella homomorpha</u> <u>Deflandrea sp. etc.</u> <u>Proteacidites sp. pollens.</u>
Core 3 1090-1110'	Much angiosperm leaf cuticle
Core 4 1214-1234'	Rather barren
Core 5 1506-1526'	Not examined
Core 6 1778-1798'	<u>Nothofagus pollens</u> predominate

Tertiary

Mesozoic

Core 7 1931-1951'	Many microspores including Mesozoic forms common in the Victorian non-marine Mesozoic sequence. <u>Cicatricosisporites australiensis</u> <u>Lycopodiumsporites austroclavatidites</u> <u>Neoraistrickia truncatus etc.</u>
Core 8 2225-2245'	Not examined

Comments:

The Tertiary Mesozoic boundary between 1798' and 1931' is marked by the appearance of many species of Mesozoic microspores at the latter depth. No marine microfossils were isolated below the Tertiary microplankton assemblage at 789' - 809' which on correlation with forms described by Deflandre and Cookson (1955) is probably Lower Eocene.

J. Douglas - Geologist

Reference

- Deflandre, C., and Cookson, Isabel, C., 1955 Fossil microplankton from Australian late Mesozoic and Tertiary sediments.  
Aust. J. Mar. Freshw. Res. 6, 2, 242-313

COMPLETION REPORT - O.D.N.L. ANGLESEA WELL NO. 1

APPENDIX 2 (b)

PLANT REMAINS - O.D.N.L. ANGLESEA NO.1 WELL

Plant remains were present in a number of cores obtained from the Mesozoic section of Oil Development N.L. Anglesea No. 1 Well. Most were extremely fragmentary, and it was difficult to distinguish the plant remains preserved as carbonaceous impressions from the hard black host sediments. Certain cores were treated with hydrofluoric acid Schulzes solution in an endeavour to obtain cuticular remains, but no workable cuticle was discovered.

Core 19

Stems or rhizomes were plentiful here, apparently from a single species. Preservation was too poor to enable identification.

Core 26 (7265 feet):

Small fertile pinnae with marginal sori were present. Fertile pinnae are rare in Western District deep bores, although sterile branches have been recorded from a number of bores including the Belfast No. 4 and Wangoom No. 6. As fertile pinnae from the Victorian Mesozoic have not been described, specific designation is unknown, but the pinnae in question appears to have originated in conjunction with sterile pinnae of the form genus Sphenopteris.

Core 27 (7544-7550 feet):

Long narrow leaves were prominent. These have a midrib with taeniopterid secondary veins, and possibly can be classified under Taeniopteris spatulata, Oldham and Morris. The leaves are much narrower than "typical" T. spatulata, and may represent specific variation. Sphenopteris fronds with elongated, fine pinnae were also fossilized in this core, of very similar form to Sphenopteris sp. from the Wangoom (3314-3320 feet) and Belfast (5353 feet) bores mentioned above.

A small unidentified seed was also obtained from this locality.

Core 31 (9156-9176):

Core samples lent by the Bureau of Mineral Resources contained relatively well preserved T. spatulata leaves.

Core 32 (9641-9656 feet):

Another core sample lent by the Bureau of Mineral Resources contained poorly preserved remains, one specimen of which possibly represents a group of appressed leaves. Preparations from the counterpart, held in the Geological Survey collection, to isolate cuticle for identification met with no success however.

John Douglas - Geologist.

COMPLETION REPORT - O.D.N.L. ANGLESEA WELL NO. 1

APPENDIX 2 (c)

MICROPALAEONTOLOGICAL REPORT ON  
ANGLESEA NO. 1 WELL

A detailed examination has been made on all cores from Oil Development's Anglesea No. 1 well. Rotary cuttings were examined from the surface to 2000 feet. No fauna was found, except in a core sample from core No. 7 (1931 to 1951 feet). This sample contained an upper Eocene fauna. On detailed re-examination of the core it is suspected that the original core sample was in fact "mud cake". All that can be concluded is that upper Eocene marine sediments are present above 1931 feet in this well. It is noted that upper Eocene foraminiferal faunas were reported by Reed (1961) from shallow bore samples in the Anglesea area.

D. J. Taylor - Geologist

5th December, 1962

Reference:

Reed, K. J., 1961

Micropalaeontological examination of samples - Torquay - Anglesea area. Unpublished Report, Geol. Surv. Vict.

COMPLETION REPORT - O.D.N.L. ANGLESEA WELL NO. 1

APPENDIX 3

AVERAGE PROPERTIES OF DRILLING FLUID

Period	Depth end of period	Weight (lb/US gall)	Viscosity (secs. Marsh)	Filtrate (cc.)	Wall Cake	pH	Sand	Salt (ppm Cl)
27/5	789'	9.3	35	60	1/32"	9	-	400
28/5-3/6	2162'	9.9	40	11.4	2/32"	8	1	495
4-10/6	2378'	9.9	42	8.3	2/32"	7	-	-
11-17/6	3460'	9.8	44	8.6	2/32"	8.4	-	290
18-24/6	3931'	10.2	44	7.6	2/32"	8.5	-	330
25/6-1/7	4588'	10.4	44	8.6	2/32"	8	1	-
2-8/7	5474'	10.4	45	8.5	2/32"	8	-	330
9-15/7	5996'	10.4	53	9.7	2/32"	8.5	-	390
16-22/7	6364'	10.5	50	8.4	2/32"	8.5	-	490
23-29/7	6661'	10.7	51	9.2	2/32"	9	1	470
30/7-5/8	6773'	10.7	57	8.7	2/32"	9	-	480
6-12/8	7113'	10.9	59	8.0	2/32"	9	-	490
13-19/8	7439'	11.0	59	7.3	2/32"	9	-	460
20-26/8	7729'	11.0	76	7.1	2/32"	9	-	460
27/8-2/9	8040'	11.0	70	7.1	2/32"	9	-	460
3-9/9	8200'	11.0	93	7.1	2/32"	9	-	450
10-16/9	8200'	10.7	130	8.6	2/32"	9	-	-
17-23/9	8200'	10.7	102	8.8	2/32"	9	-	-
24-20/9	8256'	10.5	143	9.3	2/32"	10	-	-
1-7/10	8529'	10.4	99	8.2	2/32"	10	-	800
8-14/10	8898'	10.5	106	8.0	2/32"	10	-	450
15-21/10	9248'	10.8	108	7.7	2/32"	10	-	700
22-28/10	9576'	10.6	107	7.2	2/32"	10	1	1050
29/10-4/11	9911'	10.5	150	7.3	2/32"	9.5	-	1150
5-8/11	10065'	10.6	154	7.3	2/32"	-	-	900

MUD MATERIALS USED

Additives (lbs)	17½" hole	12¼" hole	8¾" hole	Total
Bentonite	5,600	17,600	71,400	94,600
C.I.C.	55	175	5,755	5,985
Caustic Soda	0	275	2,725	3,000
Hyrtan	0	550	7,030	7,580
Starch	0	50	0	50
Sodium bicarbonate	90	0	4,490	4,580
Calgon	0	0	150	150
Barytes	0	0	672	672
Diesel oil (Gallons)	0	0	1,910	1,910

COMPLETION REPORT - O.D.N.L. ANGLESEA WELL NO. 1

APPENDIX 4

EXAMINATION OF CORE AND CUTTINGS FROM O.D.N.L. ANGLESEA WELL NO. 1

Two samples, obtained from Well No. 1 being put down for Oil Development N.L. and Planet Oil N.L. at Anglesea, were received at the Laboratory.

Sample No. 1:

This was portion of Core No. 12 (3158' - 3168') taken at 3160 feet. It was requested that this sample be analysed, to determine its mineral composition.

<u>Results:</u>	<u>No. 942</u>	<u>Sample No. 1</u>	<u>%</u>
Acid Insoluble		(SiO <sub>2</sub> etc.)	43.4
Ferrous Oxide		(FeO) <sub>x</sub>	16.2
Ferric Oxide		(Fe <sub>2</sub> O <sub>3</sub> )	8.7
Calcium Oxide		(CaO)	3.0
Magnesium Oxide		(MgO)	5.8
Carbon Dioxide		(CO <sub>2</sub> )	18.5
Undetermined		(H <sub>2</sub> O, Al <sub>2</sub> O <sub>3</sub> etc)	4.4
			-----
			100.0
			-----

x After allotting carbon dioxide to calcium and magnesium carbonates, the excess was calculated as Ferrous Carbonate from which the Ferrous Oxide was obtained.

<u>Hypothetical Combination of Carbonates</u>		<u>%</u>
Calcium Carbonate		5.3
Magnesium Carbonate		12.1
Ferrous Carbonate		26.1

Sample No. 2:

This sample consisted of drill cuttings taken between the depths of 4200 and 4210 feet. The isolation of any petroliferous residue contained in these cuttings was to be attempted. The material as received showed a mottled yellow fluorescence.

Result:                      No. 943                      Sample No. 2

Extraction of the cuttings left an oily residue which was not saponifiable with alcoholic potash.

Weight of cuttings extracted	37.75 gms.
Weight of Unsaponifiable Matter	0.016 gms.
% Unsaponifiable Matter	0.043 %

Cont'd.....

This matter was further refined by treatment with concentrated  $H_2SO_4$ , then solution in benzene, and clarifying with activated earth. This left a clear golden residue which gave a bright yellow fluorescence.

It would appear that traces of petroleum crudes are present in the cuttings examined.

John C. Kennedy -  
Senior Chemist  
Mines Department of Victoria  
(19th July, 1962)

CORE RESULTS SUMMARY SHEET

All cores received unsealed.

N.D. = Not Determined

Well or Area Name or No.	Date of Test	Core No.	Depth Ft.	Effective Porosity % by vol.		Permeability Millidarcies		Densities Gms/cc.			Saturation			Oil Character		Acid Solubility % by vol.	Remarks
				V	H	V	H	Virgin Bulk	Dry Bulk	Grain	Water % Pore spaces	Oil % Pore spaces	Oil tons per acre foot	Oil bbls per acre foot	Fluores in Solvent		
Anglesea No. 1	25/7/62 to 3/8/62	5	1509'4" to 1509'8"	26	29	N.D.	N.D.	N.D.	1.9%	2.64	60	Not Measureable	N.D.	Strong Golden Colour in Toluene	1	Friable Carbonaceous Material in core	
"	"	6	1784'0" to 1784'4"	15	13	Nil	Nil	N.D.	2.21	2.57	37	Nil Nil	N.D.	No Colour in Toluene.	1		
"	"	7	1947'0" to 1947'4"	11	8	Nil	Nil	N.D.	2.30	2.55	27	Nil Nil	N.D.	As above	16	Extraction repeat	
"	"	8	2231'0" to 2231'5"	8	5	Nil	Nil	N.D.	2.47	2.64	48	Nil Nil	N.D.	As above	34	Extraction repeat	
"	"	9	2298'8" to 2299'0"	12	12	Nil	Nil	N.D.	2.27	2.60	53	Nil Nil	N.D.	As above	7		
"	"	10	2561'8" to 2562'0"	7	8	Nil	4	N.D.	2.36	2.54	66	Nil Nil	N.D.	As above	3		
"	"	11	2867'2" to 2867'6"	4	7	Nil	Nil	N.D.	2.39	2.53	100	Nil Nil	N.D.	No Colour in Toluene	7		



Well or Area Name or No.	Date of Test	Core No.	Depth Ft.	Effective Porosity % by vol.		Permeability Millidarcies		Densities Gms/cc.			Saturation			Oil Character		Acid Solubility % by vol.	Remark	
				V	H	V	H	Virgin Bulk	Dry Bulk	Grain	Water %	Oil %	Oil tons per acre foot	Oil bbls per acre foot	Fluores. in Solvent			Extracted fluores. and Colour
Anglesea No. 1	25/7/62 to 3/8/62	12	3162'0" to 3162'4"	4	4	Nil	Nil	N.D.	2.50	2.60	100	Nil	Nil	Nil	N.D.	As above	6	
"	"	13	3460'6" to 3460'10"	4	4	Nil	Nil	N.D.	2.51	2.58	70	Nil	Nil	Nil	N.D.	As above	51	Core received Semi sealed.
"	"	13	3465'2" to 3465'8"	4	3	Nil	Nil	N.D.	2.52	2.62	100	Nil	Nil	Nil	N.D.	As above	50	As above
"	"	14	3724'0" to 3734'0"	5	3	Nil	Nil	N.D.	2.47	2.58	100	Nil	Nil	Nil	N.D.	As above	8	As above
"	"	16	4015'0" to 4015'4"	N.D.	8	N.D.	N.D.	N.D.	2.44	2.64	74	Nil	Nil	Nil	N.D.	As above	9	Repeating Extraction using Xylene
"	"	17	4227'0" to 4227'4"	8	6	Nil	Nil	N.D.	2.39	2.58	53	Nil	Nil	Nil	N.D.	No Colour in Toluene	16	Repeating Extraction using Xylene
"	17/8/62 to 27/8/62	18	4523'0" to 4523'6"	5	5	Nil	Nil	N.D.	2.43	2.55	100	Nil	Nil	Nil	N.D.	No Colour in Solvent	15	
"	"	19	4821'0" to 4821'4"	3	1	Nil	Nil	N.D.	2.62	2.68	100	Nil	Nil	Nil	N.D.	As above	30	

Well or Area Name or No.	Date of Test	Core No.	Depth Ft.	Effective Porosity % by vol.		Permeability Millidarcies		Densities Gms/cc.			Saturation			Oil Character		Acid Solubility % by vol.	Remarks
				V	H	V	H	Virgin Bulk	Dry Bulk	Grain	Water % Pore space	Oil % Pore space	Oil tongsbls per acreacre footfoot	Fluores. in Solvent	Extracted and Colour		
Anglesea No. 1	17/8/62 to 27/8/62	20	5161'0" to 5161'4"	5	6	Nil	N.D.	Avg. 2.51	Avg. 2.66	41	Nil	Nil	F.D.	As above	Nil		
"	"	21	5491'0" to 5491'4"	4	3	Nil	Nil	N.D. 2.50	2.59	100	Nil	Nil	N.D.	As above	6		
"	"	23	6245'0" to 6245'4"	4	3	Nil	Nil	N.D. 2.60	2.69	100	Nil	Nil	N.D.	As above	9		
"	"	25	6763'7" to 6764'0"	3	3	Nil	Nil	N.D. 2.51	2.58	100	Nil	Nil	N.D.	As above	9		
<p>* Extractions repeated. No oil residue.</p> <p>NOTES: 1. Oil and water saturations obtained by Soxhlet extraction apparatus with toluene as solvent</p> <p>2. Porosities and permeabilities determined with Ruska field apparatus using air and dry nitrogen respectively as saturating and flowing media.</p> <p>3. Acid solubilities determined with 15% commercial hydrochloric acid.</p>																	

PE602645 #

This is an enclosure indicator page.  
The enclosure PE602645 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602645 has the following characteristics:

ITEM\_BARCODE = PE602645  
CONTAINER\_BARCODE = PE903873  
NAME = Composite Well Log, sheet 1 of 4  
BASIN = OTWAY  
PERMIT = PPL256  
TYPE = WELL  
SUBTYPE = COMPOSITE\_LOG  
DESCRIPTION = Composite Well Log, sheet 1 of 4  
(enclosure from WCR ) for Anglesea-1  
REMARKS =  
DATE\_CREATED = 13/11/62  
DATE\_RECEIVED =  
W\_NO = W468  
WELL\_NAME = Anglesea-1  
CONTRACTOR =  
CLIENT\_OP\_CO = Alliance Oil Development Australia NL

(Inserted by DNRE - Vic Govt Mines Dept)

PE602646 #

This is an enclosure indicator page.  
The enclosure PE602646 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602646 has the following characteristics:

- ITEM\_BARCODE = PE602646
- CONTAINER\_BARCODE = PE903873
- NAME = Composite Well Log, sheet 2 of 4
- BASIN = OTWAY
- PERMIT = PPL256
- TYPE = WELL
- SUBTYPE = COMPOSITE\_LOG
- DESCRIPTION = Composite Well Log, sheet 2 of 4  
(enclosure from WCR ) for Anglesea-1
- REMARKS =
- DATE\_CREATED = 13/11/62
- DATE\_RECEIVED =
- W\_NO = W468
- WELL\_NAME = Anglesea-1
- CONTRACTOR =
- CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602647 #

This is an enclosure indicator page.  
The enclosure PE602647 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602647 has the following characteristics:

- ITEM\_BARCODE = PE602647
- CONTAINER\_BARCODE = PE903873
- NAME = Composite Well Log, sheet 3 of 4
- BASIN = OTWAY
- PERMIT = PPL256
- TYPE = WELL
- SUBTYPE = COMPOSITE\_LOG
- DESCRIPTION = Composite Well Log, sheet 3 of 4  
(enclosure from WCR ) for Anglesea-1
- REMARKS =
- DATE\_CREATED = 13/11/62
- DATE\_RECEIVED =
- W\_NO = W468
- WELL\_NAME = Anglesea-1
- CONTRACTOR =
- CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602648

This is an enclosure indicator page.  
The enclosure PE602648 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602648 has the following characteristics:

- ITEM\_BARCODE = PE602648
- CONTAINER\_BARCODE = PE903873
- NAME = Composite Well Log, sheet 4 of 4
- BASIN = OTWAY
- PERMIT = PPL256
- TYPE = WELL
- SUBTYPE = COMPOSITE\_LOG
- DESCRIPTION = Composite Well Log, sheet 4 of 4  
(enclosure from WCR ) for Anglesea-1
- REMARKS =
- DATE\_CREATED = 13/11/62
- DATE\_RECEIVED =
- W\_NO = W468
- WELL\_NAME = Anglesea-1
- CONTRACTOR =
- CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602669

This is an enclosure indicator page.  
The enclosure PE602669 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602669 has the following characteristics:  
ITEM\_BARCODE = PE602669  
CONTAINER\_BARCODE = PE903873  
NAME = Anglesea 1 electrical log run 2 (2298ft  
- 4233ft)  
BASIN = OTWAY  
PERMIT = PPL256  
TYPE = WELL  
SUBTYPE = WELL\_LOG  
DESCRIPTION = Anglesea 1 electrical log run 2 (2298ft  
- 4233ft), enclosure from WCR  
REMARKS =  
DATE\_CREATED = 28/06/62  
DATE\_RECEIVED =  
W\_NO = W468  
WELL\_NAME = Anglesea-1  
CONTRACTOR = Schlumberger  
CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602681

This is an enclosure indicator page.  
The enclosure PE602681 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602681 has the following characteristics:

ITEM\_BARCODE = PE602681  
CONTAINER\_BARCODE = PE903873  
NAME = Anglesea 1 electrical log run 3  
BASIN = OTWAY  
PERMIT = PPL256  
TYPE = WELL  
SUBTYPE = WELL\_LOG  
DESCRIPTION = Anglesea 1 electrical log run 3,  
enclosure from WCR  
REMARKS =  
DATE\_CREATED = 20/07/62  
DATE\_RECEIVED =  
W\_NO = W468  
WELL\_NAME = Anglesea-1  
CONTRACTOR = Schlumberger  
CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)



PE602664

This is an enclosure indicator page.  
The enclosure PE602664 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602664 has the following characteristics:

- ITEM\_BARCODE = PE602664
- CONTAINER\_BARCODE = PE903873
- NAME = Anglesea 1 Electrical Log, run 1 (390ft  
- 2289ft)
- BASIN = OTWAY
- PERMIT = PPL256
- TYPE = WELL
- SUBTYPE = WELL\_LOG
- DESCRIPTION = Anglesea 1 electrical log run 1 (390ft  
- 2289ft), enclosure from WCR
- REMARKS =
- DATE\_CREATED = 6/06/62
- DATE\_RECEIVED =
- W\_NO = W468
- WELL\_NAME = Anglesea-1
- CONTRACTOR = Schlumberger
- CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602665

This is an enclosure indicator page.  
The enclosure PE602665 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602665 has the following characteristics:

- ITEM\_BARCODE = PE602665
- CONTAINER\_BARCODE = PE903873
- NAME = Anglesea 1 electrical log run 4 (6200ft  
- 7893ft)
- BASIN = OTWAY
- PERMIT = PPL256
- TYPE = WELL
- SUBTYPE = WELL\_LOG
- DESCRIPTION = Anglesea 1 electrical log run 4 (6200ft  
-7893ft), enclosure from WCR
- REMARKS =
- DATE\_CREATED = 29/08/62
- DATE\_RECEIVED =
- W\_NO = W468
- WELL\_NAME = Anglesea-1
- CONTRACTOR = Schlumberger
- CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602666

This is an enclosure indicator page.  
The enclosure PE602666 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602666 has the following characteristics:

- ITEM\_BARCODE = PE602666
- CONTAINER\_BARCODE = PE903873
- NAME = Anglesea 1 electrical log run 5 (7700ft  
- 8954ft)
- BASIN = OTWAY
- PERMIT = PPL256
- TYPE = WELL
- SUBTYPE = WELL\_LOG
- DESCRIPTION = Anglesea 1 electrical log run 5 (7700ft  
- 8954ft), enclosure from WCR
- REMARKS =
- DATE\_CREATED = 16/10/62
- DATE\_RECEIVED =
- W\_NO = W468
- WELL\_NAME = Anglesea-1
- CONTRACTOR = Schlumberger
- CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602671

This is an enclosure indicator page.  
The enclosure PE602671 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602671 has the following characteristics:

ITEM\_BARCODE = PE602671  
CONTAINER\_BARCODE = PE903873  
NAME = Electrical log run 6  
BASIN = OTWAY  
PERMIT = PPL256  
TYPE = WELL  
SUBTYPE = WELL\_LOG  
DESCRIPTION = Anglesea-1 Electrical log run 6,  
enclosure from WCR  
REMARKS =  
DATE\_CREATED = 8/11/62  
DATE\_RECEIVED =  
W\_NO = W468  
WELL\_NAME = Anglesea-1  
CONTRACTOR = Schlumberger  
CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602654 #

This is an enclosure indicator page.  
The enclosure PE602654 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602654 has the following characteristics:

ITEM\_BARCODE = PE602654  
CONTAINER\_BARCODE = PE903873  
NAME = Anglesea 1 microlog run 6 (8700ft -  
10028ft)  
BASIN = OTWAY  
PERMIT = PPL256  
TYPE = WELL  
SUBTYPE = WELL\_LOG  
DESCRIPTION = Anglesea 1 microlog run 6 (8700ft -  
10028ft), enclosure from WCR  
REMARKS =  
DATE\_CREATED = 8/11/62  
DATE\_RECEIVED =  
W\_NO = W468  
WELL\_NAME = Anglesea-1  
CONTRACTOR = Schlumberger  
CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602657

This is an enclosure indicator page.  
The enclosure PE602657 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602657 has the following characteristics:

- ITEM\_BARCODE = PE602657
- CONTAINER\_BARCODE = PE903873
- NAME = Anglesea 1 microlog run 1 (390ft -  
2287ft)
- BASIN = OTWAY
- PERMIT = PPL256
- TYPE = WELL
- SUBTYPE = WELL\_LOG
- DESCRIPTION = Anglesea 1 microlog run 1 (390ft -  
2287ft), enclosure from WCR
- REMARKS =
- DATE\_CREATED = 6/06/62
- DATE\_RECEIVED =
- W\_NO = W468
- WELL\_NAME = Anglesea-1
- CONTRACTOR = Schlumberger
- CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602658

This is an enclosure indicator page.  
The enclosure PE602658 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602658 has the following characteristics:

- ITEM\_BARCODE = PE602658
- CONTAINER\_BARCODE = PE903873
- NAME = Anglesea 1 microlog run 2 (2298ft -  
4233ft)
- BASIN = OTWAY
- PERMIT = PPL256
- TYPE = WELL
- SUBTYPE = WELL\_LOG
- DESCRIPTION = Anglesea 1 microlog run 2 (2298ft -  
4233ft), enclosure from WCR
- REMARKS =
- DATE\_CREATED = 28/06/62
- DATE\_RECEIVED =
- W\_NO = W468
- WELL\_NAME = Anglesea-1
- CONTRACTOR = Schlumberger
- CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602659

This is an enclosure indicator page.  
The enclosure PE602659 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602659 has the following characteristics:

- ITEM\_BARCODE = PE602659
- CONTAINER\_BARCODE = PE903873
- NAME = Anglesea 1 microlog run 3 (4150ft -  
6313ft)
- BASIN = OTWAY
- PERMIT = PPL256
- TYPE = WELL
- SUBTYPE = WELL\_LOG
- DESCRIPTION = Anglesea 1 microlog run 3 (4150ft -  
6313ft), enclosure from WCR
- REMARKS =
- DATE\_CREATED = 20/07/62
- DATE\_RECEIVED =
- W\_NO = W468
- WELL\_NAME = Anglesea-1
- CONTRACTOR = Schlumberger
- CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)



PE602662

This is an enclosure indicator page.  
The enclosure PE602662 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602662 has the following characteristics:

ITEM\_BARCODE = PE602662  
CONTAINER\_BARCODE = PE903873  
NAME = Anglesea 1 microlog run 4 (6200ft -  
7893ft)  
BASIN = OTWAY  
PERMIT = PPL256  
TYPE = WELL  
SUBTYPE = WELL\_LOG  
DESCRIPTION = Anglesea 1 microlog run 4 (6200ft -  
7893ft), enclosure from WCR  
REMARKS =  
DATE\_CREATED = 29/08/62  
DATE\_RECEIVED =  
W\_NO = W468  
WELL\_NAME = Anglesea-1  
CONTRACTOR = Schlumberger  
CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602663 #

This is an enclosure indicator page.  
The enclosure PE602663 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602663 has the following characteristics:

ITEM\_BARCODE = PE602663  
CONTAINER\_BARCODE = PE903873  
NAME = Anglesea 1 microlog run 5 (7700ft -  
8954ft)  
BASIN = OTWAY  
PERMIT = PPL256  
TYPE = WELL  
SUBTYPE = WELL\_LOG  
DESCRIPTION = Anglesea 1 microlog run 5 (7700ft -  
8954ft), enclosure from WCR  
REMARKS =  
DATE\_CREATED = 16/10/62  
DATE\_RECEIVED =  
W\_NO = W468  
WELL\_NAME = Anglesea-1  
CONTRACTOR = Schlumberger  
CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602699

This is an enclosure indicator page.  
The enclosure PE602699 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602699 has the following characteristics:

ITEM\_BARCODE = PE602699  
CONTAINER\_BARCODE = PE903873  
NAME = Anglesea 1 dipmeter log  
BASIN = OTWAY  
PERMIT = PPL256  
TYPE = WELL  
SUBTYPE = WELL\_LOG  
DESCRIPTION = Anglesea 1 dipmeter log, enclosure from  
WCR  
REMARKS =  
DATE\_CREATED = 29/08/62  
DATE\_RECEIVED =  
W\_NO = W468  
WELL\_NAME = Anglesea-1  
CONTRACTOR = Schlumberger  
CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)

PE602700

This is an enclosure indicator page.  
The enclosure PE602700 is enclosed within the  
container PE903873 at this location in this  
document.

The enclosure PE602700 has the following characteristics:

- ITEM\_BARCODE = PE602700
- CONTAINER\_BARCODE = PE903873
- NAME = Anglesea 1 continuous dipmeter log run  
1
- BASIN = OTWAY
- PERMIT = PPL256
- TYPE = WELL
- SUBTYPE = WELL\_LOG
- DESCRIPTION = Anglesea 1 continuous dipmeter log run  
1, enclosure from WCR
- REMARKS =
- DATE\_CREATED = 29/08/62
- DATE\_RECEIVED =
- W\_NO = W468
- WELL\_NAME = Anglesea-1
- CONTRACTOR = Schlumberger
- CLIENT\_OP\_CO = Oil Development N.L

(Inserted by DNRE - Vic Govt Mines Dept)