

Palynological Report



Client: Australian Aquitaine Petroleum
Study: Kyarra No. 1 Well, Gippsland Basin
Aims: Determination of age and distribution of kerogen types

INTRODUCTION

Thirty six sidewall cores from Kyarra No. 1 well drilled in the Gippsland Basin at Lat 38°40'51.9"S, Long 147°11'13.1"E in Vic P17 were processed by normal palynological procedures.

The basis for the biostratigraphy and consequent age determinations are based on Stover & Partridge (1973) and Partridge (1976) for the Tertiary sediments; and principally on Dettmann (1963), Dettmann & Playford (1969), with the modifications of Dettmann & Douglas (1976) and Burger (1973), for the Cretaceous sequence.

OBSERVATIONS AND INTERPRETATION

A. Biostratigraphy

Table I summarises the biostratigraphy and age determinations for the samples studied. Tables II to IV indicate the distribution of species identified in the Cretaceous and Tertiary sequences.

Preservation, and diversity data are indicated on Table 1. Most samples yielded reasonably well preserved and moderately diverse assemblages. Six samples were barren of plant microfossils.

1. Early Cretaceous, undifferentiated: 1257-1276 m.

In keeping with Early Cretaceous assemblages elsewhere in the Gippsland Basin, the assemblages from Kyarra No. 1 Well lack sufficient index forms to permit a confident correlation with accepted zonal schemes of this age. The presence of D. speciosus at 1276 m would suggest that that sample is no older than the D. speciosus zone but because of the low diversity there is little supportive evidence of this assignment. There is evidence of Triassic (e.g. Aratrisporites sp.) and Permian (striate bisaccate pollen) reworking in the lower samples from this interval. Otherwise there is nothing in the assemblage to indicate an age other than Early Cretaceous.

There are no marine indicators in the assemblage which is derived from a non-marine source.

2. Upper Lygistepollenites balmei zone: - 1215 m

Only one sample was recorded as belonging to this zone. The assemblage is characterised by L. balmei together with K. papillatus, N. flemingii, V. kopukuensis and C. orthoteichus. The presence of the latter species suggests a position close to L. balmei/M. diversus boundary.

The absence of marine phytoplankton indicates deposition in a non-marine environment.

TABLE I
KYARRA NO. 1 WELL
SUMMARY OF PALYNOLOGICAL DATA

| DEPTH (m) | SWC | PRESERVATION | DIVERSITY | SPORE POLLEN ZONE | DINOFLAGELLATE ZONE | CONFIDENCE LEVEL | ENVIRONMENT |
|--------------|-----|--------------|-----------|-------------------|---------------------|---------------------|-----------------|
| 980 | 59 | Good | V. low | Oligo/Miocene | unamed | 4 | Marine |
| 986.5 | 58 | Good | V. low | Oligo/Miocene | unamed | 4 | Marine |
| 991 | 57 | Good | V. low | Oligo/Miocene | unamed | 4 | Marine |
| 995.5 | 56 | Good | V. low | Oligo/Miocene | unamed | 4 | Marine |
| 1001 | 55 | Good | V. low | Oligo/Miocene | unamed | 4 | Marine |
| 1005.5 | 54 | Good | V. low | Oligo/Miocene | unamed | 4 | Marine |
| 1013 | 53 | Good | Moderate | U.N. asperus | ?P. coreoideum | 5 | Marginal marine |
| 1017 | 30 | Fair | Moderate | U.N. asperus | ?P. coreoideum | 5 | Marginal marine |
| 1020 | 29 | Good | Moderate | U.N. asperus | ?P. coreoideum | 5 | Marginal marine |
| 1024 | 28 | Good | Moderate | U.N. asperus | ?P. coreoideum | 5 | Marginal marine |
| 1026.5 | 27 | Good | Moderate | U.N. asperus | ?P. coreoideum | 5 | Marginal marine |
| 1074 | 49 | Good | Moderate | U.N. asperus | V. extensa | 5 | Marginal marine |
| 1095 | 46 | V. poor | V. low | Indeterminate | - | - | - |
| 1098 | 45 | Good | Moderate | U.N. asperus | V. extensa | 5 | Marginal marine |
| 1100 | 44 | Good | Moderate | U.N. asperus | - | 5 | Non marine |
| 1106 | 43 | Good | Moderate | U.N. asperus | V. extensa | 5 | Marginal marine |
| 1118 | 41 | Good | Moderate | U.N. asperus | - | 5 | Non marine |
| 1122.5 | 40 | Good | Moderate | U.N. asperus | V. extensa | 5 | Marginal marine |
| 1127.5 | 39 | Good | Moderate | U.N. asperus | - | 5 | Non marine |
| 1131 | 38 | Good | Moderate | U.N. asperus | - | 5 | Non marine |
| 1148.5 | 35 | Good | Moderate | M-U.N. asperus | V. extensa | 5 | Marginal marine |
| 1164.5 | 34 | Good | Moderate | M-U.N. asperus | - | 5 | Non marine |
| 1166 | 33 | Good | Moderate | M-U.N. asperus | - | 5 | Non marine |
| 1172.5 | 32 | Barren | - | - | - | - | - |
| 1178 | 31 | Barren | - | - | - | - | - |
| 1182.5 | 19 | Barren | - | - | - | - | - |
| 1207 | 17 | Barren | - | - | - | - | - |
| 1210 | 16 | Barren | - | - | - | - | - |
| 1215 | 14 | Good | Moderate | Upper L. balmei | - | 5 | Non marine |
| 1253 | 7 | Barren | - | - | - | - | - |
| 1257 | 6 | Fair | V. low | Early Cretaceous | - | - | Non marine |
| 1260 | 5 | Fair | V. low | Early Cretaceous | - | - | Non marine |
| 1265 | 4 | Fair | V. low | Early Cretaceous | - | - | Non marine |
| 1270 | 3 | Fair | V. low | Early Cretaceous | - | - | Non marine |
| 1275 | 2 | Fair | V. low | Early Cretaceous | - | - | Non marine |
| 1276 | 1 | Fair | V. low | Early Cretaceous | - | - | Non marine |

6-dot

11260M
1257M
1265M
1270M
1275M
1276M

Table II
Kyarra # 1 Cretaceous Spore / Pollen
CHECKLIST OF PRESENCE/ABSENCE BY LOWEST APPEARANCE

| | |
|--------|--|
| 11260M | AQUETRIRADITES SPINULOSUS |
| 1257M | ARATRISPORITES SP. |
| 1265M | BACULATISPORITES COMAUMENSIS |
| 1270M | CALLIALASPORITES DAMPIERI |
| 1275M | CERATOSPORITES EQUALIS |
| 1276M | CICATRICOSISPORITES AUSTRALIENSIS |
| | CINGUTRILETES CLAVUS |
| | COROLLINA SP. |
| | CORONATISPORA PERFORATA |
| | CYATHIDITES AUSTRALIS |
| | DICTYOTOSPORITES SPECIOSUS |
| | FALCISPORITES GRANDIS |
| | FALCISPORITES SIMILIS |
| | GLEICHENIIDITES SP. |
| | LYCOPODIUMSPORITES AUSTRALOCCLAVATIDITES |
| | LYCOPODIUMSPORITES ROSEWOODENSIS |
| | MICROCACHYRIDITES ANTARCTICUS |
| | PODOSPORITES SP. |
| | STEREISPORITES ANTIQUASPORITES |
| | VITREISPORITES PALLIOUS |
| | BOTRYOCOCCUS SP. |
| | GINKOCYCADOPHYTUS SP. |
| | ISCHYOSPORITES PUNCTATUS |
| | KLUKISPORITES |
| | LEPTOLEPIDITES SP. |
| | MATONISPORITES SP. |
| | NEORAISTRICKIA TRUNCATA |
| | PODOCARPIDITES SP. |
| | ROUSEISPORITES RADIATUS |
| | STRIATE BISACCATE INDET. |
| | VERYHACHIUM SP. |
| | DICTYOPHYLLIDITES HARRISII |
| | LEPTOLEPIDITES VERRUCATUS |
| | STAPLINISPORITES CAMINUS |
| | CYCADOPITES SP |