

**PALYNOLOGICAL ANALYSIS OF SAMPLES FROM  
MEGASCOLIDES-1, ONSHORE GIPPSLAND BASIN**

**for  
Karoo Gas Australia Ltd**

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## **INTRODUCTION**

Twelve samples from the wildcat exploration well Megascolides-1, drilled in the Narracan Trough Gippsland Basin, were submitted by Mark Smith of Karoon Gas Australia Ltd for palynological analysis. All samples provided were cuttings, except for one core sample from 1890m. The samples were sent to Core Laboratories Australia Pty Ltd for fast turn around palynological processing. Processed slides provided were 1 unsieved and 1 sieved kerogen and 2 oxidised slides. All sample detail and palynomorphs recorded are presented in Table 1.

The most recent published review of the Early Cretaceous palynostratigraphy specifically for the Gippsland Basin is that of Dettmann (1986). Helby *et al.* (1987) provided an Australia wide palynostratigraphy for the Mesozoic, simplifying the framework of the zonation scheme and removing local basin specific ranges. For Victoria, Morgan (1997) has most recently provided modifications of the latter scheme, although these are specifically related to the Otway Basin. This report is based on the Helby *et al.* (1987) scheme with acknowledgment of the range variation of some species that are relevant to dating Victorian sequences. Unfortunately all of these biostratigraphic schemes, which are based on core and SWC, rely heavily on oldest occurrences of species. Extinction events and acme events which are more usable in cuttings samples due to down hole contamination are not a strong feature of these schemes. Therefore the ages given must be regarded in the light this problem.

Organic maturity data in the form of spore-colour was also determined using the scale of Batten (1996). This colour index has been correlated with vitrinite reflectance and these possible values are given in the report.

## **PALYNOSTRATIGRAPHY**

**Cuttings sample at 2000m (top of volcanics)** was essentially barren and only an unsieved kerogen slide was provided. This slide contained very finely dispersed black/brown organic material and similarly coloured structured organic material. Palynomorphs were very rare and dark brown/black in colour and damaged. No definite age determination was possible, but probably Early Cretaceous.

**Cuttings samples at 1895m - 1780m (core at 1890m)** contained a mixed assemblage of pale grains (obvious downhole contamination) and apparently in place dark brown grains. Zone indicator species such as *Cyclosporites hughesii*, *Dictyosporites speciosus*, *Foraminisporis wonthaggiensis* and *Triporoletes reticulatus* are absent or rarely recorded. The presence of *Pilosporites notensis* in these samples could suggest an upper *Foraminisporis wonthaggiensis* Zone age in the sense of Morgan (1997). This

grain occurred rarely and was present in both pale (obvious contamination) and dark coloured (in place or contamination) forms. Therefore, because of the problem of downhole contamination and the lack of support of other species, the samples are definitely regarded as no older than *F. wonthaggiensis* Zone in age and tentatively placed in the upper part of the zone.

**Cuttings samples at 1550-1235m** contained the zone indicator species *P. notensis* in high numbers. The samples are therefore no older than upper *F. wonthaggiensis* Zone. The age indicative taxa *Foraminisporis asymmetricus* at 1235m may suggest the base of the overlying *Cyclosporites hughesii* Zone.

**Cuttings samples at 1005-550m** contained mixed assemblages with indicators of the upper *F. wonthaggiensis* (*P. notensis*) and younger *C. hughesii* (*F. asymmetricus*) and *Crybelosporites striatus* (*Crybelosporites striatus*) zones. Based on the age given to the preceding samples this section in the well is definitely upper *F. wonthaggiensis* in age and is tentatively suggested to be in the younger, *C. hughesii* Zone.

**Cuttings samples at 295m** contains the only occurrences of *Cooksonites variabilis*. *C. variabilis* becomes extinct towards that top of the *C. hughesii* Zone (Dettmann, 1986; Morgan, 1997). As such this sample cannot be younger than this zone in spite of the presence of *Crybelosporites striatus*, the zone species for the overlying zone, in the sample.

**Cuttings sample at 75m** has the only occurrence of *Coptospora striata* which first appears within the *Crybelosporites straitus* Zone. This zone could possibly be reached in this sample, but must occur in the overlying sediments to explain its presence and that of *C. striatus* as downhole contamination in the lower samples.

## SUMMARY OF SUGGESTED AGES

<b>2000m</b>	Early Cretaceous?
<b>1895m -1780m</b>	<i>Foraminisporis wonthaggiensis</i> Zone, possibly upper part of zone
<b>1550-1235m</b>	Upper <i>Foraminisporis wonthaggiensis</i> Zone
<b>1005-550m</b>	Possible <i>Cyclosporites hughesii</i> Zone
<b>295m</b>	<i>Cyclosporites hughesii</i> Zone
<b>75m</b>	<i>Cyclosporites hughesii</i> Zone, possibly <i>Crybelosporites striatus</i> Zone

## **SPORE-POLLEN COLOUR (TAI)**

Spore-pollen colour was consistent throughout the section examined in the well, and it was easily possible to disregard those grains with a very anomalous colour for the depth examined. The basal sample at 2000m had rare palynomorphs that were very dark brown-black in colour suggesting a correlation with a vitrinite reflectance ( $R_o$ ) value in the range of between 2 and 3. Palynomorphs in the samples from 1895m through to 1550m were dark brown in colour suggesting correlation with a  $R_o$  of 1.0 to 1.5. The samples at 1235m and 1105m contained medium brown palynomorphs ( $R_o$  0.6-1.0), while between 770 to 550 the colour was a medium orange brown ( $R_o$  0.5-0.6). The samples from 295 and 75m were a lighter yellow/orange brown ( $R_o$  0.5).

## **REFERENCES**

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