# DEPARTMENT OF MINES AND ENERGY GEOLOGICAL SURVEY SOUTH AUSTRALIA



#### REPORT BOOK 96/3

PALYNOLOGICAL DATING AND CORRELATION OF LATE EOCENE SEDIMENTS FROM THE EUCLA BASIN, SOUTH AUSTRALIA.

DIAMOND VENTURES NL.

N F ALLEY

Biostratigraphy

JANUARY, 1996 DME

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Palynological dating and correlation of Late Eocene sediments from the Eucla Basin, South Australia.

Diamond Ventures NL.

Neville F. Allev

#### Summary

A sample from CAR3 No. 1 Well on Eyre Peninsula is Late Eocene in age and correlative with the marginal marine upper part of the Pidinga Formation.

#### Introduction

One sample of cuttings from 84-88 m depth in CAR3 No. 1 Well, Eyre Peninsula, was submitted by Diamond Ventures NL, Camberwell, Victoria, for palynological dating.

The laboratory processing was undertaken by Laola Pty. Ltd., Perth, and the microscope analyses and dating by Neville F. Alley, Principal Geologist, Mines and Energy, South Australia.

The data were processed and details presented graphically using Stratabugs 1.2 and CorelDraw 5 software.

#### General composition of the palynofloras (Fig. 1)

The sample produced a palynoflora of good yield and preservation.

The palynoflora is dominated by Nothofagidites pollen, especially the Brassospora group (N. deminutus/emarcidus/falcatus/heterus/incrassatus/vansteenisii species). Other common taxa are Haloragacidites harrisii and the conifers Microcachryidites antarcticus and Podocarpidites ellipticus. Although the Proteacidites group forms only a small percentage of the overall palynoflora, it is reasonably diverse in species.



A relatively small amount of marine microplankton (dinoflagellates) is present with moderate species diversity.

#### Dating and correlation

The presence of *Triorites magnificus* indicates a correlation with the largely Late Eocene Middle *Nothofagidites asperus* spore-pollen Zone of Stover and Partridge (1973, 1982; Fig 2). This species makes its oldest appearance at the base of the zone and is largely restricted in its time range to that zone. A marginal marine setting is indicated by the presence of the marine microplankton.

This designation is supported by the presence of the relatively diverse assemblage of the genus *Proteacidites*, in particular the species *P. grandis*, *P. kopiensis* and *P. pachypolus*, which are common associates of *T. magnificus* and are largely extinct by the latest Eocene.

The palynoflora is very similar to those of Late Eocene age in the eastern Eucla Basin (Aliey and Benbow, 1989; Alley and Beecroft, 1993). Because of its age and the presence of the marine microplankton the sediment is correlative with the upper part of the Pidinga Formation which is widespread in the Eucla Basin, underlying the Early to Middle Tertiary carbonates and occurring in palaeochannels several hundred kilometres inland from the coast (Fig. 3; Alley and Beecroft, 1993; Benbow et al., 1995). Deposition was undoubtedly related to the Tortachilla Transgression of McGowran (1989) which was a major sea level rise in the Late Eocene leading to deposition of the upper part of the Pidinga Formation (Alley and Beecroft, 1993).

#### Conclusions

The sample is Late Eocene in age and correlates with the upper marginal marine part of the Pidinga Formation in the Eucla Basin.



#### References

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### **DIAMOND VENTURERS**

## Department of Mines and Energy Parkside, South Australia

#### **DIAMOND VENTURERS CAR3 NO. 1**

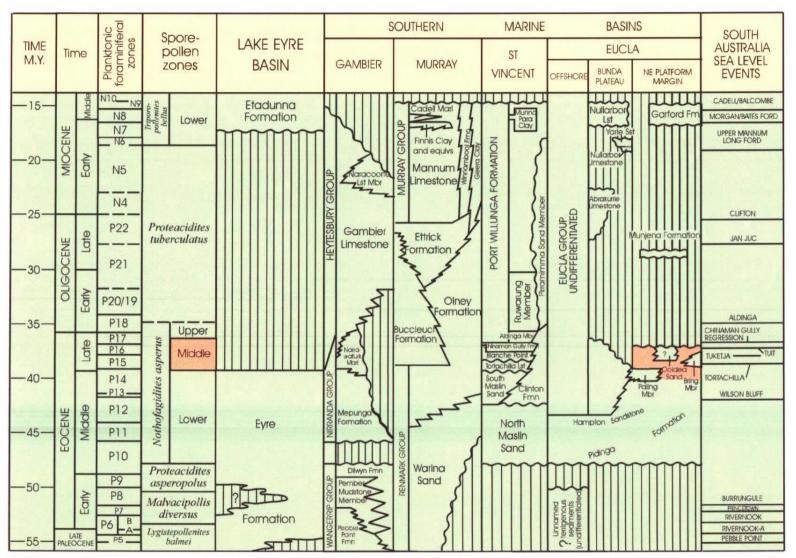
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84.00m CU						

Plan No. 1996-0723

Figure 1

Plan No. 1996-0724 foraminiferal **Planktonic** Sporezones TIME Time pollen M.Y. zones Middle N10. N9 15-Triporo-pollenites bellus N8 Lower MIOCENE N7 -N6 Early 20 N5 N4 25 Proteacidites P22 Late tuberculatus OLIGOCENE P21 30 Early P20/19 P18 35 Upper P17 Nothofagidites asperus Late P16 Middle P15 40 P14 Lower P13-P12 Middle EOCENE P11 45 P10 Proteacidites P9 asperopolus 50 P8 Early Malvacipollis P7 diversus ВА P6 Lygistepollenites balmei LATE PALEOCENE P5 55

Figure 2



Plan No. 1996-0725