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Amoco Australia Petroleum Company

Palynology Review of Previous  
Oil Drilling, Bass Basin,  
Australia

Roger Morgan

BUREAU OF MINERAL RESOURCES

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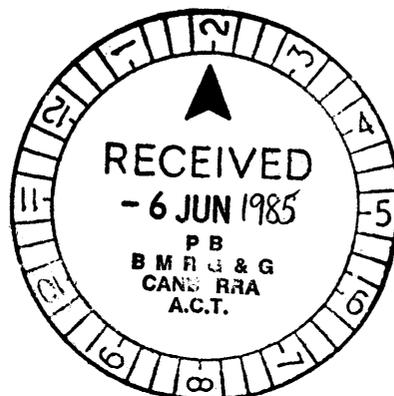
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PALYNOLOGY REVIEW OF PREVIOUS OIL DRILLING, BASS BASIN,  
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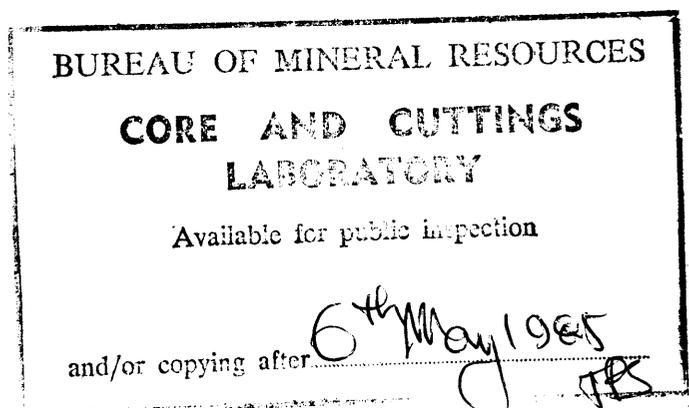
by

ROGER MORGAN



for Amoco Australia

20 February, 1985.



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I SUMMARY

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A. The existing Tertiary zonation appears to be valid, although the distinctive zone fossils can be rare to extremely rare. There is thus a need for generous sidewall coring programmes (every 30m below the Demons Bluff Formation) and long and patient palynological logging of the residues, particularly in the M. diversus Zone.

The Cretaceous zonation, at least the senectus to striatus interval, cannot be regarded as fully tested in the Bass Basin, due to the lack of drilled sections.

B. The zonal assignments given on the Esso Data Sheets are generally very reliable. In some cases, new samples have changed assignments by part of a zone, or increased confidence in low confidence intervals. In several cases, dates have been obtained from section previously considered to be barren.

C. Within the zonation, the most reliable picks are the top asperopolus (= base asperus), top balmei (= base diversus) and top longus (= base balmei). Where these are picked with Good (= 1) or Excellent (= 0) confidence levels, correlations should be bent to fit.

The other zone boundaries (intra asperus, base asperopolus, intra diversus and intra balmei) are more subtle, and should be regarded as more open to question. Correlations could probably be bent (in the appropriate sense) by up to half a zone or subzone.

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The top middle asperus, top upper balmei and top longus boundaries are essentially top range (extinction) based, and can more easily be moved shallower than deeper. The others are essentially base range based, and can more easily be moved deeper than shallower.

- D. Strong regional continuity, (but large thickness variations particularly in the diversus Zone) suggests that there is no period of strong uplift in the drilled sections, and that there is no erosive regional "diversus unconformity". This event appears to mark a change in tectonic style with increased activity on down-to-the-basin faulting.
- E. Insufficient and inappropriate sampling means that the maturity information should be considered tentative. Sampling was performed for biostratigraphic reasons, not geochemical ones.

The data does suggest that maturity is highest around the basin margin, and lowest in the basin centre. It also suggests (using the TAI Scale) that all wells (with the possible exception of Poonboon-1) drilled section mature for oil generation, although few have drilled to peak oil generation maturities. About half the wells appear to have penetrated gas/condensate mature sediments, but only one appears to have drilled into section post-mature for any liquid hydrocarbons.

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## II INTRODUCTION

Amoco Australia initiated a review of all previous drilling after taking up acreage in the Bass Basin.

Most of the previous work was performed by Lew Stover and Alan Partridge of Esso, between 1971 and 1974. A revision of the Gippsland Basin Zonation for use in the Bass Basin was written (Partridge, 1973) and has been held confidentially by the Tasmanian Mines Department. These early wells were systematically reviewed by Alan Partridge, some in 1973, and some in 1978.

Two wells (Aroo No. 1 and Nangkero No. 1) were studied in 1974 by Wayne Harris, then at the South Australian Mines Department. These were operated by Haemitite and also revised for in-house Esso use by Alan Partridge, one in 1975, the other in 1978. Summary data sheets for all the Bass Basin wells drilled to that date were compiled in an Esso report (Partridge, 1979), submitted confidentially to the Tasmanian Mines Department. These data sheets were approved for release in an unpublished Master's thesis by Felix Aquing (Aqing, 1980), in a study of the Eastern View Coal Measures.

Since then Pelican No. 4 and Pipipa No. 1 have been drilled. No palynology appears to exist for Pelican No. 4. Palynology for Pipipa No. 1 was performed by Howard Stacey of Esso in 1982.

The palynology in the well completion reports is now available to Amoco, as the current licence holders. The well summary sheets are available both through Aquing's thesis,

and by the permission of Esso and BHP. The summary zonation report (Partridge 1973) is available by kind permission of Esso and BHP.

The aims of the present review were thus to -

- (a) Check the validity of the zonation.
- (b) Check the validity of the zonal assignments in the studied wells.
- (c) Indicate the source, sense and magnitude of possible errors.
- (d) Check organic maturity levels.

To achieve these aims, all available reports have been examined, and 73 new samples have been taken.

A preliminary memo based only on a brief examination of the reports was produced in October 1984 (Morgan, 1984 a).

The existing data was plotted onto a stratigraphic cross-section in December 1984 (Morgan 1984 b).

The biostratigraphy results have been sent by telex, during the four calendar weeks during which they were examined.

This report presents the results of the 73 new samples, as well as reviewing the available palynology reports in more detail than before. The biostratigraphy is summarized in a new set of revised data sheets (Appendix II) and on a stratigraphic cross-section (Appendix III). The palynomorph range charts are in Appendix I. The new maturity data are

expressed as TAI (Thermal Alteration Index) and plotted as maturity profiles in Appendix IV.

### III BIOSTRATIGRAPHY

The wells are considered in alphabetical order, for convenience of information retrieval.

#### A. AROO-1

A detailed report by Wayne Harris is available. The Esso zonal assignments differ slightly from those of Harris, but can be justified by the following events.

top middle asperus : 6715 ft : toprange of P. adenanthoides.

base middle asperus : 6825 ft : baserange of T. magnificus.

base lower asperus : 7431 ft : cannot see justification at this depth, but it must be at 6920 ft. or deeper due to base range of N. falcata. Esso give the top asperopolus pick a 2 (= Poor) rating.

base asperopolus : 8615 ft : baserange of S. rotundus.

lower diversus sample : 8944 ft : baserange of M. diversus, toprange of C. gigantis.

top upper balmei : 8990 ft : toprange of L. balmei and G. rudata.

base upper balmei : 9080 ft : baserange of P. leightonii (presumably P. grandis) and Wetzeliella homomorpha.

base balmei : 10294 ft : balmei assemblage without older indicators.

Four new samples were examined in an attempt to date the bottom part of the section, considered barren by Harris. Two of these samples yielded good assemblages and dated the following criteria.

A. AROO-1 Ctd.

top longus : 10650 ft (cuttings) : toprange of T. sectilis,  
T. longus and T. confessus.

base longus : 10818 ft : baserange of common G. rudata  
and scarce Nothofagidites, and of T. waiparaensis.

The base range of T. verrucosus occurs at 10650-90 ft  
(Cutts.).

Environments were non-marine, with only rare lacustrine  
dinoflagellates present.

B. BASS-1

A brief report by Jack Douglas is not useful. The Esso  
assignments are based on subsequent in-house Esso work  
which is not available.

No new samples were taken from Bass-1.

The data thus cannot be assessed, beyond the fact that  
Esso assign confidence ratings of 1 (= Good) to all  
zonal boundaries.

C. BASS-2

No reports are available for Bass-2, and the Esso data  
is not available.

A single new sample was taken in Bass-2, but proved to  
be barren.

Esso rate almost all of their data with a confidence  
rating of 1 (= Good).

D. BASS-3

No reports are available for Bass-3, and the in-house data of Esso is not available.

Three new core samples were examined. Two were assigned to middle asperus on the following criteria, and do not modify the Esso data. These samples contain low quantities of low to moderate diversity dinoflagellates, indicating marginal marine environment.

top middle asperus : 5033 ft : top range T. magnificus,  
P. adenanthoides, P. incurvatus, T. ambiguus,  
P. leightonii, B. elegansiformis, B. verrucosus.

base middle asperus : 5034 ft : base range T. magnificus,  
P. rectomarginus.

One was assigned to the longus Zone, on the following criteria and modifies the high confidence Esso pick downwards by 4 feet.

base longus : 7443 ft : base range of T. verrucosus,  
S.(T.) punctatus, common G. rudata.

The Esso data has mostly 1 (= Good) or 2 (= Poor) confidence ratings.

E. CORMORANT-1

No reports are available; nor is the Esso in-house data.

Nine new samples were examined, and were assigned as below.

They do not alter the Esso picks.

top upper diversus : 6547 ft : lack of younger indicators.  
base upper diversus : 6549 ft : base range of P. pachypolus.  
top middle diversus : 7316 ft : lack of younger indicators.  
base middle diversus : 7326 ft : base range of P.  
leightonii, and of A. acutullus at 7316 ft.  
undated : 8683, 8688 ft : fossils carbonised.  
top lower diversus : 9104 ft : lack of younger indicators.  
base lower diversus : 9126 ft : base range of I. notabilis,  
P. pseudomoides.

The Esso data has variable confidence rating from 0  
(= Excellent) to 2 (= Poor), reflecting the high level of  
thermal maturity.

F. DONDU-1

A detailed report by Lew Stover is available. The current  
Esso assignments are identical to those in this report,  
and his reasons remain valid.

Three new samples were examined. The upper one is assigned  
to lower balmei, consistent with previous assignments. The  
lower two are assigned to longus, on the criteria below.  
Notably, Stover recorded T. confessus from 9690 ft., but  
in the absence of supporting evidence, did not recognise  
the longus Zone. The present data thus alters the Esso  
summary by recognising longus where the section was pre-  
viously considered to be lower balmei (although at a Poor  
(= 2) confidence rating).

F. DONDU-1 Ctd.

lower balmei : 9239 ft : presence of consistent G. rudata without younger or older indicators.

top longus : 9400 ft : top ranges of T. confessus, T. waiparaensis and ?T. lillei.

base longus : 9518 ft : base range of S.(T.) punctatus and T. verrucosus.

Environments are non-marine, with only rare lacustine dinoflagellates present.

G. DURROON-1

A palynology report by Alan Partridge is available, but it lacks detailed range data. The current Esso summary sheets agree totally with this report except for two details. First, the pannosus Zone has been abandoned, and merged with paradoxa. Second, the suggestion that the distocarinatus Zone may be represented is abandoned, and a disconformity suggested instead.

Disconformities are present at the asperus/lower balmei boundary, at the senectus/triplex boundary (4490 ft), and possibly at the triplex/paradoxa boundary.

It is evident that the striatus to senectus interval is not easy to interpret, due to the scarcity of the usual zone fossils, and the apparent absence through disconformity, of some of the more distinctive Zones. The implications elsewhere in the basin are unknown, but this part of the zonation cannot be regarded as fully tested in the Bass Basin.

G. DURROON-1 Ctd.

Six new samples were examined. The upper four (4700 - 4955 ft) contain low diversity well preserved assemblages, but lack diagnostic forms. They are essentially undated except for a broad Late Cretaceous age. In addition, one (4800 ft) <sup>1463</sup> is obviously contaminated with younger elements include H. harrisii and Nothofagidites spp. Telephone conversations and the available report indicate that Partridge saw both Proteacidites spp. and P. mawsonii. Had I seen these species, I would also have assigned these samples to the triplex Zone.

The lower two samples are assigned as below, consistent with the Esso data sheets.

top paradoxa : 5550 ft : top range of C. paradoxa without younger indicators.

base paradoxa : 5552 ft : base range of C. paradoxa.

Environments are very marginal marine in the upper samples (where rare acritarchs occur) and non-marine in the lower two samples.

Esso confidence levels are mostly 1 (= Good), but scarcity of zone fossils means that there are some thick intervals between distinctive zonal assemblages.

H. KONKON-1

A fully detailed palynology report by Lew Stover is available. The current Esso data sheets agrees totally with this report, and the criteria used continue to be valid.

H. KONKON-1 Ctd.

The longus sample at the base (4904 ft) appears to be correctly assigned despite the absence of the usual zone fossils. Stover argues for a disconformity at the balmei/lower diversus boundary.

Data confidence is Good (= 1) or Excellent (= 0) with minor exceptions.

No new samples were studied.

I. NANGKERO-1

A detailed report by Wayne Harris is available. The Esso zonal assignments differ slightly from those of Harris. Esso appear to have been rather cautious in their interpretation of the Harris data. I would consider that several more subdivisions can be recognised with confidence. I cannot see the Esso justification for assigning a sample from 5527 ft. to the tuberculatus Zone, as Harris only provides inconclusive data for a sample at 5525 ft. Presumably, Esso resampled the core for themselves.

Two new samples were taken from 7401 and 7405 ft., and are assigned to the upper diversus Zone because they contain M. tenuis, P. pachypolus and S. cainozoicus, without any indicators of the overlying zone. They are non-marine. These results further justify the refined subdivision presented.

middle asperus : 6275 ft : presence of T. magnificus.

I. NANGKERO-1 Ctd.

- top lower asperus : 6626 ft : top range of M. diversus.  
base lower asperus : 6988 ft : base range of M. ornamentalis.  
top asperopolus : 7113 ft : top scarce Nothofagidites.  
base asperopolus : 7113 ft : base range of N. asperus,  
S. rotundus and T. leuros.  
top upper diversus : 7394 ft : lack of younger indicators.  
base upper diversus : 7747 ft : base range of P. pachypolus,  
M. tenuis and K. waterbolkkii (7635 ft).  
top middle diversus : 8000 ft : lack of younger indicators  
in a good assemblage.  
base middle diversus : 8155 ft : base range of I. gremius,  
P. tuberculiformis.  
top lower diversus : 8250 ft : absence of younger indicators.  
base lower diversus : 8250 ft : base range of M. diversus,  
P. kopiensis.  
top upper balmei : 9003 ft : top range of L. balmei,  
G. rudata.  
base upper balmei : 9350 ft : base range of W. homomorpha.

Confidence ratings are mostly 1 (= Good), but the relatively few samples result in long undated intervals.

J. NARIMBA-1

A detailed report by Lew Stover is available. The current Esso assignments do not differ from the report, and the criteria used by Stover remain valid.

Two new samples were studied from 9752 and 9756 ft. The upper one is assigned to the lower diversus Zone by containing a top range for consistent T. gillii, and base

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J. NARIMBA-1 Ctd.

ranges for P. pseudomoides and I. notabilis. The lower sample also contains consistent T. gillii, but lacks the other forms. On the absence of balmei Zone indicators, it would also be assigned to lower diversus. These assignments are consistent with the Esso picks. The samples are marginal marine, containing rare dinoflagellates.

Confidence ratings are mostly 1 (= Good).

K. PELICAN-1

No palynology report is available, nor is the Esso in-house data.

Ten new samples were studied. These are not in conflict with the Esso picks, but have the effect of confidently lowering the base of the middle diversus Zone by 500 ft., and raising the top and lowering the base of the upper balmei Zone by 1 ft. The new samples are assigned as below.

- top middle diversus : 8379 ft : absence of younger indicators plus top range of T. gillii at 8548 ft.
- base middle diversus : 9269 ft : base range of P. ornatus, T. ambiguus plus base ranges of B. arcuatus, L. lanceolatus at 8548 ft.
- top lower diversus : 10,083 ft : top range of common T. gillii.
- base lower diversus : 10,086 ft : absence of older indicators and base ranges of C. orthoteichus and P. pseudomoides.

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K. PELICAN-1 Ctd.

top upper balmei : 10,394 ft : top range of L. balmei  
and G. rudata, P. langstoni (at 10,396 ft).

base upper balmei : 10,396 ft : base range of H. harrisii  
and P. langstoni.

The middle and lower diversus section is marginal marine and non-marine, with samples variably containing very few or no dinoflagellates. The balmei section is non-marine.

Confidence levels are mostly 1 (= Good) with some 2 (= Poor), especially near the base of the well.

L. PELICAN-2

No palynology report is available, nor is the Esso in-house data.

Seven new samples were studied. These do not conflict with the Esso picks but lower the base of lower asperus by 540 ft (which lowers the low confidence top of lower diversus by at least 500 ft). The new samples are assigned as below.

lower asperus : 6980 ft : base range of N. falcata  
without younger indicators.

middle diversus : 9598 ft : base range of A. luteoides  
without younger indicators.

indeterminate : 9610 ft : low diversity assemblage.

top lower diversus : 9803 ft : top range of T. gillii  
without younger indicators.

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L. PELICAN-2 Ctd.

base lower diversus : 9917 ft : base range of P. pseudomoides without older indicators.

The lower asperus sample is non-marine, containing no dinoflagellates. The middle diversus sample is near-shore marine, containing a low content (5%) of low to moderate diversity dinoflagellates. The lower diversus samples are non-marine, containing very few lacustrine dinoflagellates.

Confidence levels are mostly 1 (= Good) with some 2 (= Poor), especially near the asperopolus Zone.

M. PELICAN-3

A palynology report by Alan Partridge is available, but no range data is included. The zonal criteria are not named in the report and so cannot be evaluated. In the report, Partridge favours an "upper diversus" (in the old sense = upper and middle diversus in the current sense) assignment for most of the diversus interval, based on picked cuttings, implying that the lower diversus Zone is missing through disconformity. On the Esso data sheet, he refuses to repeat this, and states that the samples cannot be assigned to any subzone. He now considers that the lower M. diversus Zone is present at unknown depth. In any case, it is obvious that the diversus zone is much thinner in Pelican-3 than in the other Pelican wells.

Eleven new samples were examined. All were assigned to the balmei Zone as below. They lower the base of upper

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M. PELICAN-3 Ctd.

balmei by 65 ft., and increase confidence levels.

top upper balmei : 8147 ft : top range of L. balmei and G. rudata.

base upper balmei : 8285 ft : base range of P. incurvatus and of P. grandis (at 8147 ft).

top lower balmei : 8535 ft : lack of younger indicators  
- confidence thus low.

base lower balmei : 9514 ft : lack of older indicators  
- confidence thus low.

All the balmei samples are non-marine.

Confidence levels are high (usually 1 = Good) above the asperopolus Zone. In the critical diversus interval, confidence is Fair (= 3). In the balmei interval, confidence is Fair (= 3) to Good (= 2).

N. PELICAN-4

No palynology has previously been performed.

Four new samples were examined and assigned as below.

top middle diversus : 9338 ft : top range of T. gillii and the absence of younger indicators.

base middle diversus : 9350 ft : base range of T. ambiguus and the base range of A. acutullus and B. elongatus at 9338 ft.

top low diversus : 9575 ft : top range of common T. gilli and the absence of younger indicators.

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VIA FACSIMILE

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N. PELICAN-4 Ctd.

base lower diversus : 9604 ft : base range of P. pseudomoides and base range of M. diversus at 9575 ft., and the absence of older indicators.

All samples were non-marine, totally lacking dinoflagellates.

Confidence levels are 1 (= Good), but there is almost no data available.

O. PIPIPA-1

A brief palynology report, including range charts, is available, authored by Howard Stacey. The criteria on which assignments are made, are not discussed. The range chart justifies the following breakdown, which reassigns one sample (1526.7m) from the middle asperus Zone into the lower asperus Zone.

upper asperus : 1383.2m (4537 ft) : absence of younger or older indicators.

top middle asperus : 1414.2m (4639 ft) : top range of P. esobalteus.

base middle asperus : 1521.2m (4991 ft) : base range of T. magnificus, P. stipplatus.

top lower asperus : 1526.7m (5009 ft) : lack of younger indicators.

base lower asperus : 1640.6m (5382 ft) : base range of N. falcata.

diversus or younger : 1999.0m (6558 ft) : lack of older indicators in a moderately diverse assemblage.

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O. PIPIPA-1 Ctd.

A single new sample from 2066.4m (6780 ft) was processed, but was barren of palynomorphs.

Confidence levels are Good (= 1) to Poor (= 2) in the asperus interval. No good data exists deeper in the well, due to carbonization.

P. POONBOON-1

No palynology report is available, nor is the in-house Esso data. The assignments can thus not be independently assessed.

Two new samples were examined, and assigned to the longus Zone as below. These are consistent with the Esso data summary.

top longus : 10691 ft : top range of common G. rudata  
with rare Nothofagidites - low confidence.  
base longus : 10705 ft : base range of common G. rudata  
with rare Nothofagidites plus base range of  
S.(T.) punctatus at 10691 ft.

These samples are non-marine, although one (10705 ft) contains very rare lacustrine dinoflagellates.

Esso confidence ratings are almost all Good (= 1).

Q. TAROOK-1

No palynology report is available, nor is the in-house Esso data.

Q. TAROOK-1 Ctd.

Eight new samples were examined, and assigned as shown below. These assignments are totally compatible with the Esso data, extend the base of the middle diversus Zone down by 1 ft., and increase confidence levels.

indeterminate : 7725 ft : assemblage not sufficiently diverse for assignment.

top upper diversus : 7834 ft : lack of younger indicators.

base upper diversus : 8549 ft : base range of P. pachypolus and S. cainozoicus.

top middle diversus : 8970 ft : absence of younger indicators plus top range of T. gillii at 9096 ft.

base lower diversus : 9098 ft : base range of B. verrucosus and of A. acutullus and P. ornatus at 9096 ft.

All the diversus samples are marginally marine, as they contain small numbers of low diversity dinoflagellates.

Confidence levels are generally Good (= 1).

R. TOOLKA-1

A detailed palynology report by Lew Stover is available, but the picks in the report do not correspond at all to the Esso summary sheet. It appears that all depths on the summary sheet have been typed one zone too high, thus dating all intervals one zone young.

Assuming this to be the case, the depths on the report and the data summary correspond exactly. Stover does not, however, discuss the criteria on which zonal assign-

R. TOOLKA-1 Ctd.

ments are made, although he states that he relies heavily on the dinoflagellates. Without understanding his dinoflagellate reasons, I cannot justify his detailed assignments from the range charts, although I would not grossly change the breakdown. My zonal assignments, using his data, are presented below.

top middle asperus : 4540 ft : top range of S. cainozoicus,  
T. ?magnificus.

base middle asperus : 5113 ft : base range of P.  
rectomarginus, T. ?magnificus.

top lower asperus : 5263 ft : lack of younger indicators.

base lower asperus : 5461 ft : lack of older indicators.

top asperopolus : 5657 ft : top range of M. tenuis and  
of P. grandis and P. tuberculiformis at 5854 ft.

base asperopolus : 5854 ft : base range of T. leuros.

top upper diversus : 5957 ft : lack of younger indicators.

base upper diversus : 6150 ft : base range of P. pachyopolus  
and of M. tenuis at 5957 ft.

top middle diversus : 6343 ft : absence of younger  
indicators.

base middle diversus : 6817 ft : base range of P.  
tuberculiformis and of T. ambiguus at 6449 ft.

top lower diversus : 6828 ft : absence of younger indicators.

base lower diversus : 7100 ft : base range of M. diversus  
and absence of older indicators.

Confidence levels for these assignments are mostly 1  
(= Good).

R. TOOLKA-1 Ctd.

No new samples were examined.

S. YURONGI-1

A detailed palynology report by Lew Stover is available. The Esso summary sheet has identical assignments to the report. Range charts justify the zonal assignments which are based on criteria still considered valid. Although the upper diversus Zone was not identified, a disconformity is not necessarily inferred.

No new samples were examined.

Confidence levels are uniformly Good (= 1).

#### IV ZONATION

##### A. VALIDITY

The Tertiary Zonation is regarded as fully valid, having been tested in the new samples, and in the interpretation of old data. However, zone fossils can be scarce, particularly in the diversus to asperopolus intervals, and generous sidewall coring programmes and long and patient logging of the residues are required. In general terms, the zonation is similar to that used in the Gippsland and Otway Basins, but the ranges of several important species are distinctly different between the basins. In addition, the dinoflagellate horizons which occur in the Gippsland Basin giving an independent dating source, do not occur in the Bass Basin. The dinoflagellates are not often seen, and rarely assist the dating.

The Cretaceous Zonation cannot be regarded as fully tested in the Bass Basin. The only well penetrating section older than the Maastrichtian longus Zone is Durroon-1. Even there, two and half zones (distocarinatus, pachyexinus and lower senectus) are apparently lost due to disconformity, and the triplex Zone is less distinctive than usual. However, there is no reason to believe that the existing zonation (extensively tested in the adjacent Gippsland and Otway Basins) will not be valid.

##### B. ERRORS

Within the zonation, some boundaries are more distinctive than others, and are thus picked with higher confidence. These are shown with a double asterisk on the list below,

and with thick lines on the well correlation. Where one of these boundaries is picked with an Excellent (= 0) or Good (= 1) confidence rating, the seismic should be bent to fit, or the conflict resolved by discussion or new samples.

Lower confidence boundaries are shown by a single asterisk. Where these boundaries have high confidence ratings, the seismic should not cross-cut more than half a zone without the conflict being resolved by new samples.

The arrows show the sense of likely error, or the direction in which a boundary can more easily be moved. Those boundaries marked with an upright arrow are picked on top ranges, or extinctions. Their true location in the well is thus as picked, or shallower in the well. If they must be moved, it is easier to go shallower, and unlikely that they might be deeper. Those boundaries with arrows pointing down are those picked substantially on base ranges. They are thus likely to be as picked, or deeper in the well. If these boundaries must be moved, it is easier to go deeper, and less likely that they might be shallower.

top upper <u>asperus</u> (= base <u>tuberculatus</u> )	* ↓
top middle <u>asperus</u>	* ↑
top lower <u>asperus</u>	* ↓
top <u>asperopolus</u>	** ↓
top upper <u>diversus</u>	* ↓
top middle <u>diversus</u>	* ↓
top lower <u>diversus</u>	* ↓
top upper <u>balmei</u>	** ↑

top lower <u>balmei</u>	* ↓
top <u>longus</u>	** ↑
top <u>lillei</u>	* ↓
top <u>senectus</u>	* ↓
top upper <u>pachyexinus</u>	* ↓
top lower <u>pachyexinus</u>	* ↓
top <u>triplex</u>	* ↓
top <u>distocarinatus</u>	** ↓
top <u>paradoxa</u>	* ↓
top <u>striatus</u>	* ↓
top <u>asymmetricus</u>	* ↓
top <u>wonthaggiensis</u>	* ↓
top <u>australiensis</u>	* ↓
base <u>australiensis</u>	* ↓

C. REGIONAL CONTINUITY

There is extremely good regional continuity, with notably few disconformities in the drilled wells. This suggests continued subsidence, with few if any significant tectonic uplifts. Sediment supply appears to have continually matched or exceeded subsidence, maintaining a coal measures terrestrial plain facies for a very extended time.

Marine influence was virtually excluded, despite its presence in the adjacent Otway Basin through much of the Late Cretaceous, and intermittently through the Tertiary in both the Gippsland and Otway Basins. The most marine parts of the section are in the middle diversus (Early Eocene) and middle asperus (Late Eocene). In the middle diversus Zone, influence is minor, and does not disturb the lithological facies pattern. In the middle asperus

Zone, subsidence finally outstrips supply, and the marine shale Demon's Bluff Formation is deposited, followed by the calcareous marine Oligocene to Miocene sequence.

Thickness variations are most marked in the upper balmei to asperopolus interval, and probably reflect the time of most activity in the down-to-the-basin fault systems. The high degree of continuity of the diversus subzones (despite sometimes enormous thickness variation) suggests that there is no regional "diversus unconformity", but rather that it reflects a change in tectonic style.

V MATURITY DATA

A. INTRODUCTION

Spore-colour estimates were made on all the new samples. These have been expressed in the Staplin Thermal Alteration Index (TAI) scale, and plotted directly onto Maturity Profiles, presented in Appendix IV. The principal points on the colour scale are thus -

- 2.0 - yellow
- 2.5 - yellow/brown or amber/yellow or lightorange
- 3.0 - mid brown
- 3.5 - dark brown
- 4.0 - black

The oil and gas/condensate maturity windows are shown on the Maturity Profiles. If Amoco usage differs significantly from this, the scales may need to be altered, and the conclusions modified accordingly.

Most of the samples were taken in the diversus or reportedly barren intervals for biostratigraphic reasons.

The data are thus generally too few and too close together to establish reliable profiles. More detailed measurement based geochemistry performed on samples taken for geochemical purposes will yield more accurate and useful data. The present TAI measurements should be considered inferior to any such other data, and used chiefly as a check.

The present data do, however, have some use. It is possible to extrapolate loosely to determine approximate

intervals of currently mature sediment, and to determine if any particular well is in an area of high or lower maturity, relative to other wells in the basin.

B. AROO-1

Only four measurements were made, all close together. Confidence is therefore low. Currently oil mature sediments may lie between 8,000 and 10,500 ft. Thermal maturity may be slightly high relative to other wells in the basin.

C. BASS-3

Only three measurements were made, and these do not form a very credible trend. Currently oil mature sediments may possibly lie between 7,500 ft and 10,000 ft (T.D. is at 7,978 ft.). Thermal maturity may be slightly high relative to other wells.

D. CORMORANT-1

Eight measurements were made over a reasonable depth range. Confidence is therefore moderate. Currently oil mature sediments may lie at 6,000 - 8,500 ft. Thermal maturity is very high relative to other wells.

E. DONDU-1

Three measurements were made over a short interval. Confidence is therefore low. Currently oil mature sediments may lie at 7,000 to 9,000 ft. Thermal maturity is high relative to other wells.

F. DURROON-1

Six measurements were made over about 1000 ft. Confidence is low to moderate. Currently oil mature sediments may lie at 6,000 to 9,500 ft. Thermal maturity is high relative to other wells, but then heating times are substantially longer.

G. NANKERO-1

Two measurements were made close together. Confidence is therefore low. Currently oil mature sediments may lie at 8,500 - 11,000 ft. (T.D. is at 9,440 ft.). Thermal maturity may be average for the basin.

H. NARIMBA-1

Two measurements were made close together. Confidence is therefore low. Currently oil mature sediments may lie at 8,500 - 11,000 ft. Thermal maturity may be average for the basin.

I. PELICAN-1

Ten measurements were made over a two thousand foot interval. Confidence is moderate. Currently oil mature sediments may lie at 9,500 - 12,000 ft (T.D. is at 10,428 ft). Thermal maturity is slightly low relative to other wells in the basin.

J. PELICAN-2

Six measurements were made over three thousand feet. Confidence is moderate. Currently oil mature sediments may lie at 8,000 - 10,500 ft (T.D. is at 10,066 ft). Thermal maturity is average for the basin.

K. PELICAN-3

Eleven measurements were made over 1,500 feet of section. Confidence is moderate. Currently oil mature sediments may lie at 7,500 - 10,000 ft. Thermal maturity is average for the basin.

L. PELICAN-4

Four measurements were made over a short distance. Confidence is low. Currently oil mature sediments may lie at 8,500 - 11,500 ft. Thermal maturity may be slightly low for the basin.

M. PIPIPA-1

No measurement was made possible, as the sample was barren of palynomorphs.

N. POONBOON-1

Two measurements were made close together. Confidence is therefore low. Currently oil mature sediments may lie at 10,500 - 13,000 ft (T.D. is at 10,715 ft). Thermal maturity may be low for the basin.

O. TAROOK-1

Seven measurements were made. Confidence is low to moderate. Currently oil mature sediments may lie at 8,500 - 11,000 ft (T.D. is at 9,100 ft). Thermal maturity is thus probably average for the basin.

P. CONCLUSIONS

Some values obtained are notably different than others obtained in the same well, resulting in a poor trend.

This occurs particularly in Cormorant-1. This may be partly due to the operator error involved in a visual estimate, and partly due to depositional conditions resulting in altered spore colours before they are finally incorporated in the sediment. This can occur in both directions. Darkening can occur by the staining from tannin rich backswamp or stagnant pond conditions. Lightening can occur by oxidation in subaerial bank deposits. Where such variations occur, they can be generally ignored if in conflict with the bulk of the data, or evaluated against other maturity indicators.

Thermal maturity in the basin appears to show considerable variation. Highest maturity appears to be around the edges of the basin, in the wells Cormorant-1, Dondu-1, Durroon-1, Pelican-3, Bass-3 and Aroo-1 (see map figure 1). In these, currently oil mature sediments may occur as shallow as 6,000 ft., with an oil window generally at 7,000 - 10,000 ft.

Average maturity occurs over most of the central part of the basin in Nankero-1, Narimba-1, Tarook-1, Pelican-2 and Pelican-4, where currently oil mature sediments may occur at about 8,500 - 11,000 ft.

Low maturity occurs in the basin centre (Poonboon-1) and possibly in Pelican-1. Currently oil mature sediments occur in these wells at 9,500 - 12,000 ft. However, given the low numbers of samples examined, these estimates may not be valid.

All wells (with the possible exception of Poonboon-1) seem to have penetrated oil mature sediments, although few have drilled to peak oil generation maturities.

About half the wells (Aroo-1, Cormorant-1, Dondu-1, Durroon-1, Narimba-1, Pelican-2 and Pelican-3) appear to have penetrated gas/condensate mature sediments. Only Cormorant-1 appears to have drilled through that window, into dry gas mature sediments.

IV REFERENCES

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Partridge, A. (1973) Revision of the Spore Pollen Zonation in the Bass Basin. Esso Palaeontology Report 1973/4.

Partridge, A. (1979) Revision of Bass Basin Palynology and Micropalaeontology Data Sheets. Esso Palaeontology Report 1979/19.

# VICTORIA TASMANIA

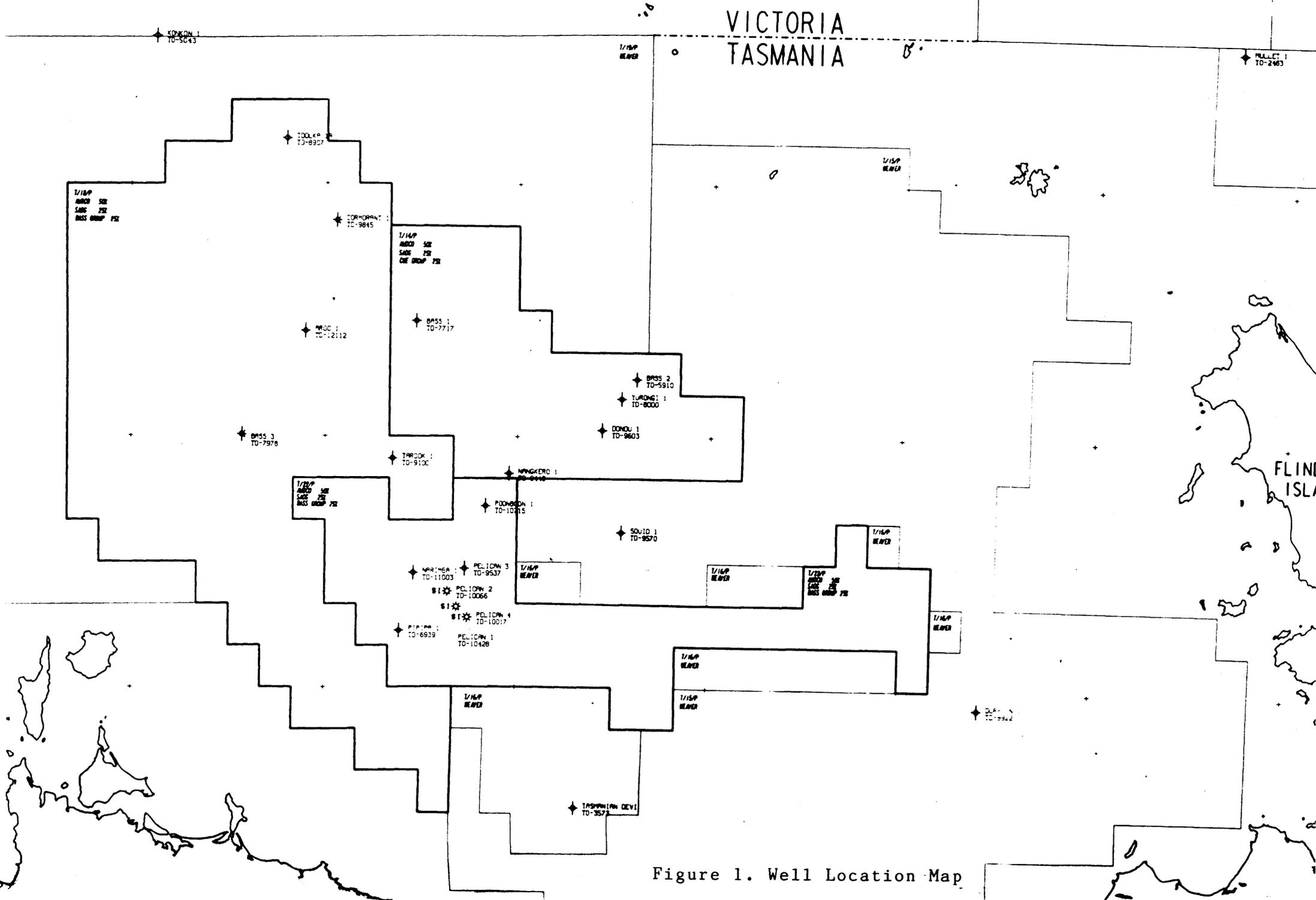


Figure 1. Well Location Map

APPENDIX I

RANGE CHARTS

## BASS BASIN REVIEW S/P

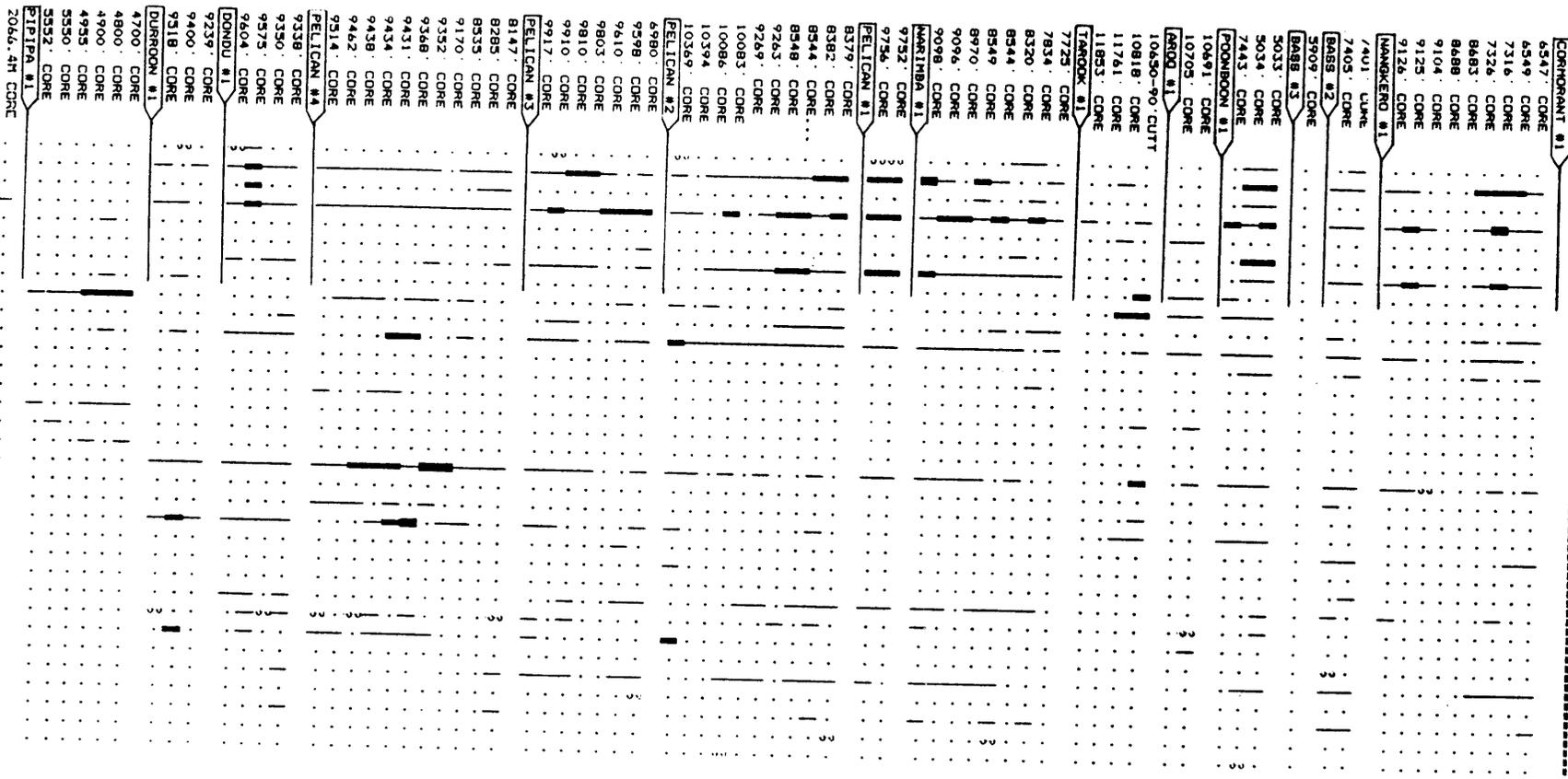
### CHECKLIST OF GRAPHIC ABUNDANCE BY ALPHABETICAL ORDER

-  = Abundant
-  = Common
-  = Few
-  = Rare
-  = Very Rare
- ? = Questionably Present
- . = Not Present

Sample ID	Depth (ft)	Core Type	Species
<b>CONROBANT #1</b>			
6547	CORE		AEQUITRIADITES SPINULOSUS
6549	CORE		AEQUITRIADITES TILCHAENESIS
7316	CORE		ANACOLOSIDITES ACUTULLUS
7326	CORE		ANACOLOSIDITES LUTEOIDES
8483	CORE		ANNULISPORITES FOLLICULOSA
8488	CORE		ARAUCARIACITES AUSTRALIS
9104	CORE		AUSTRALOPOLLIS OBSCURUS
9125	CORE		BANKSIEACIDITES ARCATUS
9126	CORE		BANKSIEACIDITES ELONGATUS
7401	CORE		BEAUPREIDITES ELEGANSIFORMIS
7402	CORE		BEAUPREIDITES VERRUCOSUS
8485 #2			BIRETRISPORITES SPECTABILIS
5909	CORE		CALLIALASPORITES DAMPIERI
8488 #3			CAMEROZONOSPORITES OMAIOENSIS
5033	CORE		CERATOSPORITES EQUALIS
5034	CORE		CICATRICOSISPORITES AUSTRALIENSIS
7443	CORE		CICATRICOSISPORITES CUNEIFORMIS
POONBROOK #1			CICATRICOSISPORITES LUDBROOKIAE
10691	CORE		CLAVIFERA TRIPLEX
10705	CORE		CONTIGNISPORITES FORNICATUS
AROD #1			COPTOSPORA PARADOXA
10650-90	CUTT		COROLLINA TOROSUS
10818	CORE		COUPERISPORITES TABULATUS
11761	CORE		CRATERISPORITES ROTUNDAS
11853	CORE		CRVBELOSPORITES STRIATUS
TARROOK #1			CUPANIEIDITES ORTHOTEICHUS
7725	CORE		CYATHIDITES AUSTRALIS
7834	CORE		CYATHIDITES GIGANTIS
8320	CORE		CYATHIDITES MINOR
8344	CORE		CYATHIDITES SPLENDENS
8549	CORE		CYPERACEAE
8970	CORE		DACRYCARPITES AUSTRALIENSIS
9096	CORE		DILMYNITES GRANULATUS
9098	CORE		
NAWIMBA #1			
9752	CORE		
9756	CORE		
<b>PELICAN #1</b>			
8379	CORE		
8382	CORE		
8544	CORE		
8548	CORE		
9263	CORE		
9269	CORE		
10083	CORE		
10086	CORE		
10394	CORE		
10369	CORE		
<b>PELICAN #2</b>			
6980	CORE		
9598	CORE		
9610	CORE		
9803	CORE		
9810	CORE		
9910	CORE		
9917	CORE		
<b>PELICAN #3</b>			
8147	CORE		
8285	CORE		
8535	CORE		
9170	CORE		
9352	CORE		
9368	CORE		
9431	CORE		
9434	CORE		
9438	CORE		
9462	CORE		
9814	CORE		
<b>PELICAN #4</b>			
9338	CORE		
9350	CORE		
9875	CORE		
9604	CORE		
<b>DOMDU #1</b>			
9239	CORE		
9400	CORE		
9518	CORE		
<b>DURROON #1</b>			
4700	CORE		
4800	CORE		
4900	CORE		
4955	CORE		
5550	CORE		
5552	CORE		
<b>PIPIPA #1</b>			
2066	4th CORE		

- AEQUITRIADITES SPINULOSUS
- AEQUITRIADITES TILCHAENESIS
- ANACOLOSIDITES ACUTULLUS
- ANACOLOSIDITES LUTEOIDES
- ANNULISPORITES FOLLICULOSA
- ARAUCARIACITES AUSTRALIS
- AUSTRALOPOLLIS OBSCURUS
- BANKSIEACIDITES ARCATUS
- BANKSIEACIDITES ELONGATUS
- BEAUPREIDITES ELEGANSIFORMIS
- BEAUPREIDITES VERRUCOSUS
- BIRETRISPORITES SPECTABILIS
- CALLIALASPORITES DAMPIERI
- CAMEROZONOSPORITES OMAIOENSIS
- CERATOSPORITES EQUALIS
- CICATRICOSISPORITES AUSTRALIENSIS
- CICATRICOSISPORITES CUNEIFORMIS
- CICATRICOSISPORITES LUDBROOKIAE
- CLAVIFERA TRIPLEX
- CONTIGNISPORITES FORNICATUS
- COPTOSPORA PARADOXA
- COROLLINA TOROSUS
- COUPERISPORITES TABULATUS
- CRATERISPORITES ROTUNDAS
- CRVBELOSPORITES STRIATUS
- CUPANIEIDITES ORTHOTEICHUS
- CYATHIDITES AUSTRALIS
- CYATHIDITES GIGANTIS
- CYATHIDITES MINOR
- CYATHIDITES SPLENDENS
- CYPERACEAE
- DACRYCARPITES AUSTRALIENSIS
- DILMYNITES GRANULATUS





- NOTHOFAGUS ASPERUS
- NOTHOFAGUS BRACHYSPINULOSUS
- NOTHOFAGUS DEMINUTUS
- NOTHOFAGUS ENARCIODUS/HETERUS
- NOTHOFAGUS ENDURAS
- NOTHOFAGUS FALCATUS
- NOTHOFAGUS FLEMINGII
- NOTHOFAGUS SEMECTUS
- OSMUNDACIDITES HELLMANII
- PERIPOROPOLLENITES DEMARCATUS
- PERIPOROPOLLENITES POLYORATUS
- PERIPOROPOLLENITES VESICUS
- PEROMONOLITES DENSUS
- PEROTRILETES MORGANII
- PEROTRILETES JUBATUS
- PEROTRILETES LINEARIS
- PEROTRILETES MAJUS
- PHYLLOCLADIDITES HANSONII
- PHYLLOCLADIDITES RETICULOSACCATUS
- PHYLLOCLADIDITES VERRUCOSUS
- PODOSPORITES MICROSACCATUS
- POLYCOLPITES ESOBALTEUS
- POLYCOLPITES LANGSTONII
- POLYCOLPITES SIMPLEX
- PROTEACIDITES "HEAVY GRANDIS"
- PROTEACIDITES ADENANTHOIDES
- PROTEACIDITES ANHLOSEXINUS
- PROTEACIDITES ANGULATUS
- PROTEACIDITES ANNULARIS
- PROTEACIDITES ASPEROPOLUS
- PROTEACIDITES CF. SYMPHONEMOIDES
- PROTEACIDITES CLAPUS
- PROTEACIDITES CRASSUS

2066. 4H CORE

CORCORANT #1	
8547 CORE	.
6549 CORE	.
7316 CORE	.
7326 CORE	.
8683 CORE	.
8688 CORE	.
9104 CORE	.
9125 CORE	.
9126 CORE	.
NANKEREND #1	
7101 CORE	.
7405 CORE	.
BASS #2	
5909 CORE	.
BASS #3	
5033 CORE	.
5034 CORE	.
7443 CORE	.
FOONBORN #1	
10691 CORE	.
10705 CORE	.
ARDO #1	
10650-90 CUTT	
10818 CORE	.
11761 CORE	.
11853 CORE	.
TARDOK #1	
7725 CORE	.
7834 CORE	.
8320 CORE	.
8544 CORE	.
8548 CORE	.
9263 CORE	.
9269 CORE	.
10083 CORE	.
10086 CORE	.
10394 CORE	.
10399 CORE	.
PILICAN #2	
6980 CORE	.
9598 CORE	.
9610 CORE	.
9805 CORE	.
9810 CORE	.
9910 CORE	.
9917 CORE	.
PILICAN #3	
8147 CORE	.
8285 CORE	.
8535 CORE	.
9170 CORE	.
9352 CORE	.
9368 CORE	.
9431 CORE	.
9434 CORE	.
9438 CORE	.
9462 CORE	.
9514 CORE	.
PILICAN #4	
9338 CORE	.
9350 CORE	.
9575 CORE	.
9604 CORE	.
DONDU #1	
9239 CORE	.
9400 CORE	.
9518 CORE	.
DURROON #1	
4700 CORE	.
4800 CORE	.
4900 CORE	.
4955 CORE	.
5350 CORE	.
5552 CORE	.
PIPIPA #1	
2066.4M CORE	.

- PROTEACIDITES GRANDIS
- PROTEACIDITES INCURVATUS
- PROTEACIDITES KOPIENSIS
- PROTEACIDITES LAPIS
- PROTEACIDITES LATROBENSIS
- PROTEACIDITES LEIGHTONII
- PROTEACIDITES ORNATUS
- PROTEACIDITES PACHYPOLUS
- PROTEACIDITES PSEUDOHODIS
- PROTEACIDITES RECAVUS
- PROTEACIDITES RECTOMARGINIS
- PROTEACIDITES RETICULATUS
- PROTEACIDITES RETICULOSABRATUS
- PROTEACIDITES RUGULATUS
- PROTEACIDITES SCABRATUS
- PROTEACIDITES SCITUS
- PROTEACIDITES SPP.
- PROTEACIDITES STIPLATUS
- PROTEACIDITES TENUIEXINUS
- PROTEACIDITES TUBERCULIFORMIS
- PROTEACIDITES TUBERCULOTUMULATUS
- RETITRILETES
- RETITRILETES AUSTRORUATIDITES
- RETITRILETES ROSEWOODENSIS
- RICCIA BOXATUS
- RUGULATISPORITES HALLATUS
- SANTALUMIDITES CAINOZOICUS
- SAPOTACEIDAEAPOLLENITES ABACUS
- SAPOTACEIDAEAPOLLENITES ROTUNDUS
- SCHIZAEA DIGITATOIDES
- SPINIZOOCLIPITES PROMINATUS
- STEREISPORITES TRIPUNCTISPORIS PUNCT.
- STEREISPORITES ANTIQUISPORITES



## COMMENTS

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**CORMORANT #1**  
**6547 CORE**  
6549 CORE YIELD LEAN. PRESERVATION EXCELLENT.  
7316 CORE YIELD O.K., PRESERVATION VERY POOR.  
7326 CORE YIELD GOOD. PRESERVATION VERY POOR.  
8683 CORE YIELD EXCELLENT. PRESERVATION - COOKED.  
8688 CORE YIELD GOOD - ALL COOKED.  
9104 CORE YIELD EXCELLENT. PRESERVATION VERY POOR.  
9125 CORE YIELD EXCELLENT. PRESERVATION VERY POOR.  
9126 CORE YIELD EXCELLENT. PRESERVATION VERY POOR.

**NANKERO #1**  
7401 CORE YIELD EXCELLENT. PRESERVATION EXCELLENT.  
7405 CORE YIELD EXCELLENT. PRESERVATION GOOD.

**BABB #2**  
5909 CORE YIELD VERY LEAN. PLANT TRACHEID ONLY.

**BABB #3**  
5033 CORE YIELD EXCELLENT. PRESERVATION FAIR.  
5034 CORE YIELD EXCELLENT. PRESERVATION FAIR.  
7443 CORE YIELD EXCELLENT. PRESERVATION POOR.

**POONBOON #1**  
10691 CORE YIELD EXCELLENT. PRESERVATION POOR - LOTS OF CUTICLE.  
10705 CORE YIELD EXCELLENT. PRESERVATION POOR.

**AROO #1**  
10650-90 CUTT  
10818 CORE YIELD EXCELLENT. PRESERVATION VERY POOR.  
11761 CORE YIELD - NON-EXISTENT TO VERY VERY POOR. PRESERVATION - NON-EXISTENT.  
11853 CORE YIELD POOR. PRESERVATION - NON-EXISTENT.

**TAROOK #1**  
7725 CORE YIELD EXCELLENT. PRESERVATION - UNDER-SIZED.  
7834 CORE YIELD FAIR. PRESERVATION EXCELLENT.  
8320 CORE YIELD EXCELLENT. PRESERVATION O.K..  
8544 CORE YIELD EXCELLENT. PRESERVATION VERY GOOD.  
8549 CORE YIELD EXCELLENT. PRESERVATION FAIR.  
8970 CORE YIELD MODERATE - MOSTLY INERT., PRESERVATION GOOD.  
9096 CORE YIELD EXCELLENT. PRESERVATION FAIR.  
9098 CORE YIELD EXCELLENT. PRESERVATION FAIR.

**NARIMBA #1**  
9752 CORE YIELD EXCELLENT. PRESERVATION GOOD.  
9756 CORE YIELD EXCELLENT. PRESERVATION O.K. - LOTS OF CUTICLE.

**PELICAN #1**  
8379 CORE YIELD EXCELLENT. PRESERVATION O.K..  
8382 CORE YIELD EXCELLENT. PRESERVATION - GOOD TO EXCELLENT.  
8544 CORE... YIELD EXCELLENT. PRESERVATION GOOD - LOTS OF HUGE CUTICLE.  
8548 CORE YIELD EXCELLENT. PRESERVATION O.K. - A BIT OF CUTICLE.  
9263 CORE YIELD EXCELLENT. PRESERVATION GOOD.  
9269 CORE YIELD EXCELLENT. PRESERVATION O.K..  
10083 CORE YIELD EXCELLENT. PRESERVATION POOR - PLENTY OF CUTICLE.  
10086 CORE YIELD EXCELLENT. PRESERVATION POOR - LOTS OF CUTICLE.  
10394 CORE YIELD EXCELLENT. PRESERVATION POOR - MASSIVE CUTICLE.  
10369 CORE YIELD EXCELLENT. PRESERVATION FAIR - HUGE CUTICLE.

**PELICAN #2**  
6990 CORE YIELD POOR. PRESERVATION EXCELLENT.  
9598 CORE YIELD EXCELLENT. PRESERVATION EXCELLENT.  
9610 CORE YIELD POOR. VERY MANY BUGS. PRESERVATION O.K..  
9803 CORE YIELD GOOD. PRESERVATION POOR.  
9810 CORE YIELD EXCELLENT. PRESERVATION POOR. LOTS OF MEGA CUTICLE.  
9910 CORE YIELD EXCELLENT. PRESERVATION POOR. LOTS OF CUTICLE.  
9917 CORE YIELD EXCELLENT. PRESERVATION POOR.

**PELICAN #3**  
8147 CORE YIELD EXCELLENT. PRESERVATION O.K..  
8285 CORE YIELD EXCELLENT. PRESERVATION EXCELLENT.  
8535 CORE YIELD EXCELLENT. PRESERVATION O.K..  
9170 CORE YIELD EXCELLENT. PRESERVATION O.K..  
9352 CORE YIELD O.K., VAST HUGE CUTICLE.  
9368 CORE YIELD EXCELLENT. PRESERVATION O.K..  
9431 CORE YIELD GOOD. PRESERVATION GOOD  
9434 CORE YIELD EXCELLENT. PRESERVATION GOOD  
9438 CORE YIELD EXCELLENT. PRESERVATION INERT. CUTICLE COMMON. BUGS GOOD.  
9462 CORE YIELD EXCELLENT. PRESERVATION - LOTS OF CUTICLE.  
9514 CORE YIELD GOOD. PRESERVATION GOOD.

**PELICAN #4**  
9338 CORE YIELD EXCELLENT. PRESERVATION - LOTS OF CUTICLE.  
9350 CORE YIELD EXCELLENT. PRESERVATION O.K..  
9575 CORE YIELD EXCELLENT. PRESERVATION O.K..  
9604 CORE YIELD EXCELLENT. PRESERVATION POOR TO O.K..

**DONDU #1**  
9239 CORE YIELD O.K., PRESERVATION VERY POOR - COOKED - LOTS OF INERTITE.  
9400 CORE YIELD O.K., PRESERVATION POOR.  
9518 CORE YIELD O.K., PRESERVATION POOR.

**DURROON #1**  
4700 CORE YIELD EXCELLENT. PRESERVATION EXCELLENT. NON-DESCRIPT.  
4800 CORE YIELD O.K., PRESERVATION EXCELLENT - ?CONTAMINATION.  
4900 CORE YIELD EXCELLENT. PRESERVATION EXCELLENT. 52 ACETABULARS.  
4955 CORE YIELD EXCELLENT. PRESERVATION EXCELLENT.  
5550 CORE YIELD EXCELLENT. PRESERVATION EXCELLENT.  
5552 CORE YIELD EXCELLENT. PRESERVATION EXCELLENT. NON-MARINE.

**PIPIPA #1**  
2066.4M CORE YIELD O.K., PRESERVATION INERTITE ONLY - COOKED. MINOR CONTAMINATION ONLY.

## BASS BASIN REVIEW DINOS

### DESCRIPTION:

COMPILED BY ROGER MORGAN ON BEHALF OF AMOCO DURING THE MONTHS OF JANUARY AND FEBRUARY 1985.

### CHECKLIST OF GRAPHIC ABUNDANCE BY ALPHABETICAL ORDER

-  = Abundant
-  = Common
-  = Few
-  = Rare
-  = Very Rare
- ? = Questionably Present
- . = Not Present



Sample ID	Depth (m)	Core Type	Species
<b>CORHORRANT #1</b>			
6547	CORE		EILEYIA LOPHOPHORA
6549	CORE		KENLEVIA PACHYCEPATA
7316	CORE		LEJEUNEA SP.
7326	CORE		LINGULODINIUM MACHAEROPHORUM
8683	CORE		MICROHYSTRIDIUM SPP.
8688	CORE		MICROFASTA EVANSII
9104	CORE		MILLIOUDDINIUM TENUITABULATUM
9125	CORE		MOKKALLACYSTA SP.
9126	CORE		MURATODINIUM FIMBRIATUM
9126	CORE		NUMMUS SP.
7401	CORE		OPERCULODINIUM CENTROCARPUM
7405	CORE		PHTHANEROPERIDIUM COHATUM
7405	CORE		PHTHANEROPERIDIUM ECHINATUM
7405	CORE		PHTHANEROPERIDIUM GEMINATUM
7405	CORE		RHOMBODINIUM DRACO
7405	CORE		RHOMBODINIUM GLABRUM
7405	CORE		SAMLANDIA CHLAMYDOPHORA
7405	CORE		SPINIDIINIUM SP.
7405	CORE		SPINIFERITES RAMOSUS
7405	CORE		THALASSIPHORA PELAGICA
7405	CORE		TRICHOODINIUM NIRSUTUM
7405	CORE		TURBIOSPHAERA GALEATA
7405	CORE		VALENSIELLA CLATHRODERMA
7405	CORE		WETZELIELLA ARTICULATA
<b>BASE #2</b>			
5909	CORE		
<b>BASE #3</b>			
5033	CORE		
5034	CORE		
7443	CORE		
<b>FOONBROOK #1</b>			
10691	CORE		
10705	CORE		
<b>ARGO #1</b>			
10650-90	CUTT		
10818	CORE		
11761	CORE		
11853	CORE		
<b>FRASER #1</b>			
7725	CORE		
7834	CORE		
8320	CORE		
8544	CORE		
8549	CORE		
8970	CORE		
9096	CORE		
9098	CORE		
<b>MARITIMA #1</b>			
9752	CORE		
9756	CORE		
<b>PELICAN #1</b>			
8379	CORE		
8382	CORE		
8544	CORE		
8548	CORE		
9243	CORE		
9260	CORE		
10083	CORE		
10086	CORE		
10394	CORE		
10396	CORE		
<b>PELICAN #2</b>			
6980	CORE		
9398	CORE		
9610	CORE		
9803	CORE		
9810	CORE		
9910	CORE		
9917	CORE		
<b>PELICAN #3</b>			
8147	CORE		
8285	CORE		
8535	CORE		
9170	CORE		
9352	CORE		
9368	CORE		
9431	CORE		
9434	CORE		
9438	CORE		
9462	CORE		
9514	CORE		
<b>PELICAN #4</b>			
9338	CORE		
9350	CORE		
9575	CORE		
9604	CORE		
<b>DONDU #1</b>			
9239	CORE		
9400	CORE		
9518	CORE		
<b>DURRODN #1</b>			
4700	CORE		
4800	CORE		
4900	CORE		
4955	CORE		
5350	CORE		
5552	CORE		
<b>PIPIPA #1</b>			
2066	4M	CORE	

APPENDIX II

PALYNOLOGY WELL DATA SHEETS

B A S I N: BASS

ELEVATION: KB: +32 Feet GL: -250 feet

WELL NAME: AROO-1

TOTAL DEPTH: 12,112 feet.

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
	<i>P. tuberculatus</i>										
PALEOGENE	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>	6715	1				6825	1			
	Lower <i>N. asperus</i>	6920	1				7431	1			
	<i>P. asperopolus</i>	8189	2				8615	1			
	Upper <i>M. diversus</i>										
	Mid <i>M. diversus</i>										
	Lower <i>M. diversus</i>	8944	1				8944	1			
	Upper <i>L. balmei</i>	8990	1				9080	1			
	Lower <i>L. balmei</i>	9166	2				10294	1			
		<i>T. longus</i>	10650	1				10818	1		
LATE CRETACEOUS	<i>T. lilliei</i>										
	<i>N. senectus</i>										
	U. <i>T. pachyexinus</i>										
	L. <i>T. pachyexinus</i>										
	<i>C. triplex</i>										
	<i>A. distocarinatus</i>										
		<i>C. paradoxus</i>									
EARLY CRET.	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
		PRE-CRETACEOUS									

COMMENTS: All depths in feet.  
Samples below 10,818 feet were indeterminate.  
Demons Bluff Formation: 5950-6723 feet.

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton. or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: W.K. HARRIS  
A.D. PARTRIDGE  
D. MORGAN

DATE: 6 JUNE, 1974.  
2 JANUARY, 1975.

B A S I N: BASS  
 WELL NAME: BASS-1

ELEVATION: KB: +31 feet GL: -265 ft.  
 TOTAL DEPTH: 7,717 ft.

A G E	PALYNOLOGICAL ZONES	H I G H E S T D A T A					L O W E S T D A T A				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
	<i>P. tuberculatus</i>										
PALEOGENE	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>	5382	1				5905	1			
	Lower <i>N. asperus</i>	6405	1				6430	1			
	<i>P. asperopolus</i>	6930	1				6960	1			
	Upper <i>M. diversus</i>	7692	1				7717	1			
	Mid <i>M. diversus</i>										
	Lower <i>M. diversus</i>										
	Upper <i>L. balmei</i>										
	Lower <i>L. balmei</i>										
	LATE CRETACEOUS	<i>T. longus</i>									
<i>T. lilliei</i>											
<i>N. senectus</i>											
U. <i>T. pachyexinus</i>											
L. <i>T. pachyexinus</i>											
<i>C. triplex</i>											
<i>A. distocarinatus</i>											
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
PRE-CRETACEOUS											

COMMENTS: All depths in feet.  
At T.D. the well is still in the upper part of the Upper  
M. diversus Zone. Only main cores samples have been examined  
from this well.

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton. or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: L.E. STOVER & A.D. PARTRIDGE DATE: JUNE 1971  
A.D. PARTRIDGE MARCH 1973

B A S I N: BASS  
 WELL NAME: BASS-2

ELEVATION: KB: +31 feet GL: -280 ft.  
 TOTAL DEPTH: 5,910 ft.

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>	3050	1				3050	1			
	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>	3800	1				3822	1			
	Lower <i>N. asperus</i>	3992	1				4308	1			
	<i>P. asperopolus</i>	4463	1				4463	1			
	Upper <i>M. diversus</i>										
	Mid <i>M. diversus</i>	4573	1				4648	1			
	Lower <i>M. diversus</i>	4740	1				4861	2	4740	1	
	Upper <i>L. balmei</i>	4939	1				5220	1			
	Lower <i>L. balmei</i>	5405	1				5508	1			
LATE CRETACEOUS	<i>T. longus</i>										
	<i>T. lilliei</i>										
	<i>N. senectus</i>										
	U. <i>T. pachyexinus</i>										
	L. <i>T. pachyexinus</i>										
	<i>C. triplex</i>										
	<i>A. distocarinatus</i>										
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
PRE-CRETACEOUS											

COMMENTS: All depths in feet. The Upper M. diversus Zone is absent in this well owing to a disconformity at about 4500 feet. SWC at 4308 ft with 15% *P. asperopolus* is now regarded as Lower *N. asperus* in age following results from Barracouta-4, where a *P. asperopolus* acme occurs in this zone.

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: L.E. STOVER & A.D. PARTRIDGE DATE: JUNE 1971

DATA RECORDED BY: A.D. PARTRIDGE

B A S I N : BASS  
 WELL NAME : BASS-3

ELEVATION: KB: +31 feet GL: -202 feet  
 TOTAL DEPTH: 7,978 feet

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA					
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	
NEOGENE	<i>T. pleistocenicus</i>											
	<i>M. lipsis</i>											
	<i>C. bifurcatus</i>											
	<i>T. bellus</i>											
PALEOGENE	<i>P. tuberculatus</i>	4022	1				4022	1				
	Upper <i>N. asperus</i>	4516	2				4539	2				
	Mid <i>N. asperus</i>	4731	1				5465	1				
	Lower <i>N. asperus</i>	5540	2	5811	1		5907	1				
	<i>P. asperopolus</i>	6021	2	6155	1		6155	1				
	Upper <i>M. diversus</i>											
	Mid <i>M. diversus</i>	6421	1				6437	1				
	Lower <i>M. diversus</i>											
	Upper <i>L. balmei</i>	6600	1				6600	1				
	Lower <i>L. balmei</i>	6710	1				7203	2	7150	1		
	LATE CRETACEOUS	<i>T. longus</i>	7311	1				7710	2	7443	1	
		<i>T. lilliei</i>										
<i>N. senectus</i>												
U. <i>T. pachyexinus</i>												
L. <i>T. pachyexinus</i>												
<i>C. triplex</i>												
<i>A. distocarinatus</i>												
EARLY CRET.	<i>C. paradoxus</i>											
	<i>C. striatus</i>											
	<i>F. asymmetricus</i>											
	<i>F. wonthaggiensis</i>											
	<i>C. australiensis</i>											
PRE-CRETACEOUS												

COMMENTS: All depths in feet.

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: L.E. STOVER & A.D. PARTRIDGE DATE: JUNE 1971  
A.D. PARTRIDGE  
 DATA REVISED BY: P. MORGAN MARCH 1973

B A S I N : BASS ELEVATION: KB: +100 feet GL: -240 feet  
 WELL NAME: CORMORANT-1 TOTAL DEPTH: 9845 feet

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
	<i>P. tuberculatus</i>										
PALEOGENE	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>	3700	0				3920	0			
	Lower <i>N. asperus</i>	4305	1				4999	1			
	<i>P. asperopolus</i>	5356	1				5990	0			
	Upper <i>M. diversus</i>	6518	0				7154	2	7026	1	
	Mid <i>M. diversus</i>	7284	2				7635	1			
	Lower <i>M. diversus</i>	8820	1				9825	1			
	Upper <i>L. balmei</i>										
	Lower <i>L. balmei</i>										
	LATE CRETACEOUS	<i>T. longus</i>									
<i>T. lilliei</i>											
<i>N. senectus</i>											
U. <i>T. pachyexinus</i>											
L. <i>T. pachyexinus</i>											
<i>C. triplex</i>											
<i>A. distocarinatus</i>											
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
PRE-CRETACEOUS											

COMMENTS: All depths in feet. Samples between 7694 & 8683 feet are too carbonized for any age determination. Samples below 8682 feet are extremely poorly preserved and highly carbonized, but nothing older than Lower M. diversus was observed.

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton. or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: L.E. STOVER & A.D. PARTRIDGE DATE: JUNE 1971:/NOVEMBER 1972  
A.D. PARTRIDGE FEBRUARY 1973.

B A S I N: BASS  
 WELL NAME: DONDU-1

ELEVATION: KB: +32 feet L: -269 feet  
 TOTAL DEPTH: 9,603 feet

A G E	PALYNOLOGICAL ZONES	H I G H E S T D A T A					L O W E S T D A T A				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>										
	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>	4840	0				5600	1			
	Lower <i>N. asperus</i>	5700	1				6208	1			
	<i>P. asperopolus</i>	6530	1				6608	1			
	Upper <i>M. diversus</i>	6700	2				6700	2			
	Mid <i>M. diversus</i>	7075	2				7075	2			
	Lower <i>M. diversus</i>	7378	1				7688	2	7510	1	
	Upper <i>L. balmei</i>	7980	1	7674	2						
	Lower <i>L. balmei</i>						8960	2			
	LATE CRETACEOUS	<i>T. longus</i>	9400	1				9518	1		
<i>T. lilliei</i>											
<i>N. senectus</i>											
U. <i>T. pachyexinus</i>											
L. <i>T. pachyexinus</i>											
<i>C. triplex</i>											
<i>A. distocarinatus</i>											
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
PRE-CRETACEOUS											

COMMENTS: All depths in feet.  
Samples from deeper than 7000 feet generally contain poorly preserved assemblages with very few diagnostic species.

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton. or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: L.E. STOVER

DATE: AUGUST 1973

DATA REVIEWED BY: R. MORGAN

DATE: FEBRUARY 1985

B A S I N: BASS  
 WELL NAME: DURROON-1

ELEVATION: KB: +32 feet GL: -225 feet  
 TOTAL DEPTH: 9,922 feet

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA					
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	
NEOGENE	<i>T. pleistocenicus</i>											
	<i>M. lipsis</i>											
	<i>C. bifurcatus</i>											
	<i>T. bellus</i>											
PALEOGENE	<i>P. tuberculatus</i>	1300	1				1392	1				
	Upper <i>N. asperus</i>											
	Mid <i>N. asperus</i>	1847	1				1980	2	1874	1		
	Lower <i>N. asperus</i>											
	<i>P. asperopolus</i>											
	Upper <i>M. diversus</i>											
	Mid <i>M. diversus</i>											
	Lower <i>M. diversus</i>											
	Upper <i>L. balmei</i>											
	Lower <i>L. balmei</i>	2196	1				3035	1				
	LATE CRETACEOUS	<i>T. longus</i>	3415	1				3715	2	3594	1	
		<i>T. lilliei</i>	3844	1				4223	1			
<i>N. senectus</i>		4400	1				4400	1				
U. <i>T. pachyexinus</i>												
L. <i>T. pachyexinus</i>												
<i>C. triplex</i>		4510	1				5030	1				
<i>A. distocarinatus</i>												
EARLY CRET.	<i>C. paradoxus</i>	5500	1				7236	2	6880	1		
	<i>C. striatus</i>	7927	1				8480	1				
	<i>F. asymmetricus</i>	9650	1				9854	1				
	<i>F. wonthaggiensis</i>											
	<i>C. australiensis</i>											
PRE-CRETACEOUS												

COMMENTS: All depths in feet.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton. or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: A.D. PARTRIDGE DATE: JANUARY 1973  
R. MORGAN FEBRUARY 1975



B A S I N: BASS  
 WELL NAME: NANGKERO-1

ELEVATION: KB: +32 feet GL: -261 feet  
 TOTAL DEPTH: 9,440 feet

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>	5527	1				5527	1			
	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>	6275	1				6275	1			
	Lower <i>N. asperus</i>	6626	1				6988	1			
	<i>P. asperopolus</i>	7113	1				7113	1			
	Upper <i>M. diversus</i>	7394	2				7747	1			
	Mid <i>M. diversus</i>	8000	2				8155	1			
	Lower <i>M. diversus</i>	8250	2				8250	1			
	Upper <i>L. balmei</i>	9003	1				9350	1			
	Lower <i>L. balmei</i>										
LATE CRETACEOUS	<i>T. longus</i>										
	<i>T. lilliei</i>										
	<i>N. senectus</i>										
	U. <i>T. pachyexinus</i>										
	L. <i>T. pachyexinus</i>										
	<i>C. triplex</i>										
	<i>A. distocarinatus</i>										
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
PRE-CRETACEOUS											

COMMENTS: All depths in feet. Demons Bluff Formation 5747-6170 feet.  
T.D. 9440 feet. Early Eocene dinoflagellates occur between 7747  
and 8250 feet *W. homomorpha* Zone is present at 9350 feet.

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: W.K. HARRIS DATE: 29 JUNE 1974  
A.D. PARTRIDGE 28 NOVEMBER 1978

B A S I N: BASS  
 WELL NAME: NARIMBA-1

ELEVATION: KB: +32 ft GL: -253 ft  
 TOTAL DEPTH: 11,003 ft

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>										
	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>	5850	0				5850	0			
	Lower <i>N. asperus</i>	6160	2	6505	1		7243	2	6505	1	
	<i>P. asperopolus</i>	7434	1				7616	1			
	Upper <i>M. diversus</i>	7830	2	8120	1		8210	1			
	Mid <i>M. diversus</i>	8335	1				9170	1			
	Lower <i>M. diversus</i>	9246	1				10770	2	9952	1	
	Upper <i>L. balmei</i>										
	Lower <i>L. balmei</i>										
LATE CRETACEOUS	<i>T. longus</i>										
	<i>T. lilliei</i>										
	<i>N. senectus</i>										
	U. <i>T. pachyexinus</i>										
	L. <i>T. pachyexinus</i>										
	<i>C. triplex</i>										
	<i>A. distocarinatus</i>										
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
PRE-CRETACEOUS											

COMMENTS: All depths in feet.  
Demons Bluff Formation: 5428-5884 feet.

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: L.E. STOVER DATE: JANUARY 1974  
A.D. PARTRIDGE DECEMBER 1978

BASIN: BASS  
 WELL NAME: PELICAN-1

ELEVATION: KB: +100 ft GL: -251 ft  
 TOTAL DEPTH: 10,428 ft 9/16

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>										
	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>	5748	1				5933	1			
	Lower <i>N. asperus</i>	6057	2	6100	1		6604	1			
	<i>P. asperopolus</i>	6834	1				7346	1			
	Upper <i>M. diversus</i>	7527	1				7752	1			
	Mid <i>M. diversus</i>	8198	1				9269	1			
	Lower <i>M. diversus</i>	9282	1				10315	2	10086	1	
	Upper <i>L. balmei</i>	10394	1				10396	2			
	Lower <i>L. balmei</i>										
LATE CRETACEOUS	<i>T. longus</i>										
	<i>T. lilliei</i>										
	<i>N. senectus</i>										
	U. <i>T. pachyexinus</i>										
	L. <i>T. pachyexinus</i>										
	<i>C. triplex</i>										
	<i>A. distocarinatus</i>										
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
PRE-CRETACEOUS											

COMMENTS: All depths in feet.

VIA  
 AIR MAIL

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: L.E. STOVER & A.D. PARTRIDGE DATE: NOVEMBER 1971  
A.D. PARTRIDGE  
P. MORGAN MARCH 1973

B A S I N: BASS  
 WELL NAME: PELICAN-2

ELEVATION: KB: +100 ft GL: -255 ft  
 TOTAL DEPTH: 10,066 ft 10/16

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>										
	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>	5900	1				5949	2	5900	1	
	Lower <i>N. asperus</i>	6242	1				6980	1			
	<i>P. asperopolus</i>	7340	2				7505	2			
	Upper <i>M. diversus</i>	7702	1				8323	2	8150	1	
	Mid <i>M. diversus</i>	8740	1				9598	1			
	Lower <i>M. diversus</i>	9803	1				10009	1			
	Upper <i>L. balmei</i>										
	Lower <i>L. balmei</i>										
	LATE CRETACEOUS	<i>T. longus</i>									
<i>T. lilliei</i>											
<i>N. senectus</i>											
U. <i>T. pachyexinus</i>											
L. <i>T. pachyexinus</i>											
<i>C. triplex</i>											
<i>A. distocarinatus</i>											
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
PRE-CRETACEOUS											

COMMENTS: All depths in feet.

VIA  
FACSIMILE

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton. or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: L.E. STOVER & A.D. PARTRIDGE DATE: NOVEMBER 1971  
A.D. PARTRIDGE MARCH 1973

BASIN: BASS  
 WELL NAME: PELICAN-3

ELEVATION: KB: +32 ft GL: -263 ft  
 TOTAL DEPTH: 9,537 ft 11/16

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>	4600	1				4800	1			
	Upper <i>N. asperus</i>	5000	1				5400	2			
	Mid <i>N. asperus</i>	5460	1				5980	2	5950	1	
	Lower <i>N. asperus</i>	6257	1				6628	2	6540	1	
	<i>P. asperopolus</i>	6800	1				7100	3	6800	1	
	Upper <i>M. diversus</i>	7320	3								
	Mid <i>M. diversus</i>						7930	3			
	Lower <i>M. diversus</i>										
	Upper <i>L. balmei</i>	7950	3	8147	1		8285	1			
	Lower <i>L. balmei</i>	8300	3	9367	1		9520	1			
LATE CRETACEOUS	<i>T. longus</i>										
	<i>T. lilliei</i>										
	<i>N. senectus</i>										
	<i>U. T. pachyexinus</i>										
	<i>L. T. pachyexinus</i>										
	<i>C. triplex</i>										
	<i>A. distocarinatus</i>										
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
PRE-CRETACEOUS											

COMMENTS: All depths in feet. The SWC's are considered to be unreliable below 6800 ft and have not been used to zone the well. The sample between 7320 ft and 7930 ft belong to the *M. diversus* Zone but it is not possible to determine from the cuttings to which sub-division they belong.

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: A.D. PARTRIDGE  
 A.D. PARTRIDGE  
 P. B. MORGAN

DATE: JULY 1972  
 MARCH 1973

VIA CONFIDENCE RATING FILE

B A S I N: BASS  
 WELL NAME: PELICAN-4

ELEVATION: KB: +82 ft GL: -254 ft  
 TOTAL DEPTH: 10,009 ft 12/16

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>										
	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>										
	Lower <i>N. asperus</i>										
	<i>P. asperopolus</i>										
	Upper <i>M. diversus</i>										
	Mid <i>M. diversus</i>	9338	1				9350	1			
	Lower <i>M. diversus</i>	9575	2				9604	1			
	Upper <i>L. balmei</i>										
	Lower <i>L. balmei</i>										
LATE CRETACEOUS	<i>T. longus</i>										
	<i>T. lilliei</i>										
	<i>N. senectus</i>										
	U. <i>T. pachyexinus</i>										
	L. <i>T. pachyexinus</i>										
	<i>C. triplex</i>										
	<i>A. distocarinatus</i>										
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
	PRE-CRETACEOUS										

COMMENTS: All depths in feet.

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- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: R. MORGAN

DATE: FEBRUARY 1985

B A S I N: BASS  
 WELL NAME: PIPIPA-1

ELEVATION: KB: +69 ft GL: -73m  
 TOTAL DEPTH: 2115m (6939 ft) (-239

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>										
	Upper <i>N. asperus</i>	1383.0	2	(4537 ft)			1383.0	2	(4537 ft)		
	Mid <i>N. asperus</i>	1414.2	1	(4639 ft)			1521.2	1	(5009 ft)		
	Lower <i>N. asperus</i>	1526.7	2	(5052 ft)			1640.6	1	(5382 ft)		
	<i>P. asperopolus</i>										
	Upper <i>M. diversus</i>										
	Mid <i>M. diversus</i>										
	Lower <i>M. diversus</i>										
	Upper <i>L. balmei</i>						1999.0	3	(6558 ft)		
	Lower <i>L. balmei</i>										
	LATE CRETACEOUS	<i>T. longus</i>									
<i>T. lilliei</i>											
<i>N. senectus</i>											
U. <i>T. pachyexinus</i>											
L. <i>T. pachyexinus</i>											
<i>C. triplex</i>											
EARLY CRET.	<i>A. distocarinatus</i>										
	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
PRE-CRETACEOUS											

COMMENTS: Fossil recovery very poor below 1640.6m

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- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton. or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: HOWARD E. STACY DATE: 25 AUGUST 1982

BASIN: BASS ELEVATION: KB: +32 ft GL: -259 ft  
 WELL NAME: POONBOON-1 TOTAL DEPTH: 10,715 ft

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>	3450	1				4940	1			
	Upper <i>N. asperus</i>	5250	1				5550	1			
	Mid <i>N. asperus</i>	5600	1				6525	1			
	Lower <i>N. asperus</i>	6600	1				7200	1			
	<i>P. asperopolus</i>	7300	1				7602	1			
	Upper <i>M. diversus</i>	7800	1				7800	1			
	Mid <i>M. diversus</i>	7960	1				8118	1			
	Lower <i>M. diversus</i>	8250	1				8700	1			
	Upper <i>L. balmei</i>	8788	1				8980	3	8823	1	
	Lower <i>L. balmei</i>	9050	3	9957	1		10608	1			
	LATE CRETACEOUS	<i>T. longus</i>	10654	1				10715	1		
<i>T. lilliei</i>											
<i>N. senectus</i>											
U. <i>T. pachyexinus</i>											
L. <i>T. pachyexinus</i>											
<i>C. triplex</i>											
EARLY CRET.	<i>A. distocarinatus</i>										
	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
	PRE-CRETACEOUS										

COMMENTS: All depths in feet.

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- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: A.D. PARTRIDGE DATE: OCTOBER 1972  
A.D. PARTRIDGE MARCH 1973

B A S I N: BASS  
 WELL NAME: TAROOK-1

ELEVATION: KB: +32 feet GL: -261 ft  
 TOTAL DEPTH: 9,100 ft

A G E	PALYNOLOGICAL ZONES	H I G H E S T D A T A					L O W E S T D A T A				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>										
	Upper <i>N. asperus</i>	5200	1				5630	2	5400	1	
	Mid <i>N. asperus</i>	5792	0				6323	1			
	Lower <i>N. asperus</i>	6436	2	6650	1		7028	2	6834	1	
	<i>P. asperopolus</i>	7130	2	7440	1		7725	1			
	Upper <i>M. diversus</i>	7834	1				8575	1			
	Mid <i>M. diversus</i>	8680	1				9098	1			
	Lower <i>M. diversus</i>										
	Upper <i>L. balmei</i>										
	Lower <i>L. balmei</i>										
LATE CRETACEOUS	<i>T. longus</i>										
	<i>T. lilliei</i>										
	<i>N. senectus</i>										
	U. <i>T. pachyexinus</i>										
	L. <i>T. pachyexinus</i>										
	<i>C. triplex</i>										
	<i>A. distocarinatus</i>										
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
PRE-CRETACEOUS											

COMMENTS: All depths in feet.

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- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: A.D. PARTRIDGE DATE: NOVEMBER 1972  
A.D. PARTRIDGE MARCH 1973

B A S I N: BASS  
 WELL NAME: TOOLKA 1

ELEVATION: KB: +32 ft GL: -258 ft  
 TOTAL DEPTH: 8,907 ft

AGE	PALYNOLOGICAL ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>										
	Upper <i>N. asperus</i>										
	Mid <i>N. asperus</i>	4540	1				5113	1			
	Lower <i>N. asperus</i>	5263	2				5461	2			
	<i>P. asperopolus</i>	5657	1				5854	1			
	Upper <i>M. diversus</i>	5957	2				6150	1			
	Mid <i>M. diversus</i>	6343	1				6817	1			
	Lower <i>M. diversus</i>	6828	2				7100	1	7288	2	
	Upper <i>L. balmei</i>										
	Lower <i>L. balmei</i>										
	LATE CRETACEOUS	<i>T. longus</i>									
<i>T. lilliei</i>											
<i>N. senectus</i>											
U. <i>T. pachyexinus</i>											
L. <i>T. pachyexinus</i>											
<i>C. triplex</i>											
<i>A. distocarinatus</i>											
EARLY CRET.	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
PRE-CRETACEOUS											

COMMENTS: All depths in feet.  
Samples barren between 7362 and 8896 feet.

- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: L.E. STOVER  
R. MORGAN

DATE: MAY 1974

B A S I N: BASS  
 WELL NAME: YURONGI -1

ELEVATION: KB: +32 Ft GL: -272 ft  
 TOTAL DEPTH: 8,000 ft

A G E	PALYNOLOGICAL ZONES	H I G H E S T D A T A					L O W E S T D A T A				
		Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time
NEOGENE	<i>T. pleistocenicus</i>										
	<i>M. lipsis</i>										
	<i>C. bifurcatus</i>										
	<i>T. bellus</i>										
PALEOGENE	<i>P. tuberculatus</i>										
	Upper <i>N. asperus</i>	4145	0				4145	0			
	Mid <i>N. asperus</i>	4400	0				4600	1			
	Lower <i>N. asperus</i>	5037	1				5195	1			
	<i>P. asperopolus</i>	5415	1				5610	1			
	Upper <i>M. diversus</i>										
	Mid <i>M. diversus</i>	5825	1				6075	1			
	Lower <i>M. diversus</i>	6130	1				6400	1			
	Upper <i>L. balmei</i>	6620	1				7000	1	7096	2	
	Lower <i>L. balmei</i>	7420	1				7935	1			
LATE CRETACEOUS	<i>T. longus</i>										
	<i>T. lilliei</i>										
	<i>N. senectus</i>										
	U. <i>T. pachyexinus</i>										
	L. <i>T. pachyexinus</i>										
	<i>C. triplex</i>										
EARLY CRET.	<i>A. distocarinatus</i>										
	<i>C. paradoxus</i>										
	<i>C. striatus</i>										
	<i>F. asymmetricus</i>										
	<i>F. wonthaggiensis</i>										
	<i>C. australiensis</i>										
	PRE-CRETACEOUS										

COMMENTS: All depths in feet.  
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- CONFIDENCE RATING:
- 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton.
  - 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton.
  - 2: SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.
  - 3: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton or both.
  - 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another.

DATA RECORDED BY: L. E. STOVER DATE: NOVEMBER 1973  
R. MORGAN FEBRUARY 1985

APPENDIX III

WELL CORRELATION

APPENDIX IV

MATURITY PROFILES





MATURITY PROFILE - DONDU-1

AGE	ZONE	DEPTH (thous.ft)	immature		mature	dry gas		GAS / CONDENSAT				
			immature		margin	mature	post mature		OIL			
			yellow		orange	brown	black		COLOUR			
			0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
		1										
		2										
		3										
		4										
	L.Eo. mid. asp.	5										
	M.Eo. low. asp.	6										
	E.Eo. asper.	7										
	E.Eo. u.div.											
	E.Eo. mid. div.											
	E.Eo. low. div.	8										
	Paleo. balm	9										
	Mass. long	10										
	T.D.											
		11										
		12										

xxx



# MATURITY PROFILE - BASS-3

AGE	ZONE	DEPTH (thous. ft.)	Immature			mature	dry gas		GAS / CONDENSATE											
			Immature			marginal	mature	post mature		OIL										
			yellow		orange	brown	black	COLOUR		TAI										
			0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0								
		1																		
		2																		
		3																		
		4																		
		5																		
		6																		
		7																		
		8																		
		9																		
		10																		
		11																		
		12																		

Olig. tub.

L. E. asp.

L. E. mid. sep.

M. E. asp.

E. E. sep.

E. E. mid.

L. P. bal.

E. paleo. bal.

Maastrongue

T.D.

\*

\*

MATURITY PROFILE - NANGKERO 1

AGE	ZONE	DEPTH (thous. ft)	immature			mature	dry gas		GAS / CONDENSATE			
			immature			margin	mature	post mature		OIL		
			yellow		orange	brown		black		COLOUR		
			0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
		1										
		2										
		3										
		4										
		5										
	Olig. tub.	6										
	L. Eo. mid. asp.	7										
	M. Eo. low. asp.	8										
	E. Eo. asper.	9										
	E. Eo. up. div.	10										
	E. Eo. m. div.	11										
	E. Eo. l. div.	12										
	L. Pale up. balm.											
	T.D.											

x





MATURITY PROFILE - PELICAN-2

14/16

AGE	ZONE	DEPTH (thous. ft)	immature		mature	dry gas		GAS / CONDENSATE				
			immature		margin	mature	post mature		OIL			
			yellow		orange	brown	black		COLOUR			
			0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
		1										
		2										
		3										
		4										
		5										
	L.Eo. <del>div.</del>	6										
	M.Eo. low. asp.	7										
	E.Eo. asper.	8										
	E.Eo. up. div.	9										
	E.Eo. mid. div.	10										
	E.Eo. l. div.	11										
	T.D.	12										

x

x  
x  
x

TRANSMITTED  
VIA  
FACSIMILE



MATURITY PROFILE - PELICAN-4

16/16

AGE	ZONE	DEPTH (thous. ft.)	immature		mature	dry gas		GAS / CONDENSAT				
			immature		marg-inal	mature	post mature		OIL			
			yellow		orange	brown	black		COLOUR			
			0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
		1										
		2										
		3										
		4										
		5										
		6										
		7										
		8										
		9										
	E.E.o.m.div.											
	E.E.o.l.div.											
	T.D.	10										
		11										
		12										

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TRANSMITTED  
VIA  
FACSIMILE



# MATURITY PROFILE - TAROOK-1

AGE	ZONE	DEPTH (thous. ft)	immature			mature	dry gas		GAS / CONDENSATE			
			immature			margin	mature	post mature		OIL		
			yellow		orange	brown	black		COLOUR			
			0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
		1										
		2										
		3										
		4										
		5										
	L.Eo. up asp.											
		6										
	L.Eo. mid. asp.											
		7										
	M.Eo. low asp.											
		8										
	E.Eo. asper.											
		9										
	E.Eo. up. div.											
		10										
	E.Eo. mid. div.											
		11										
	T.D.	12										

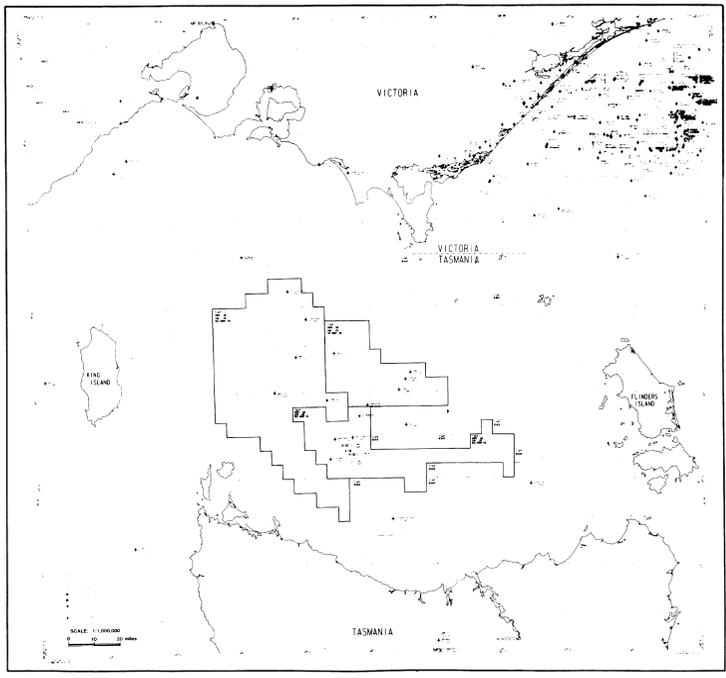
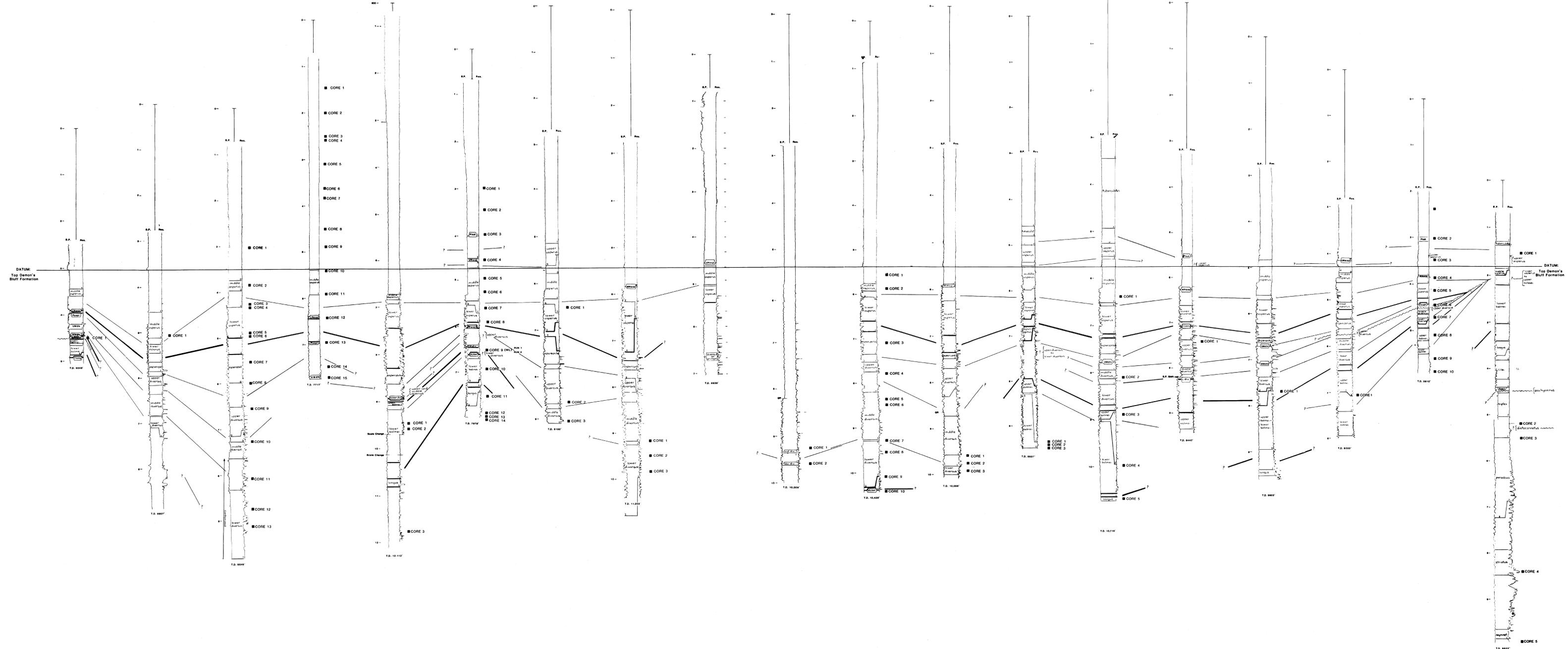
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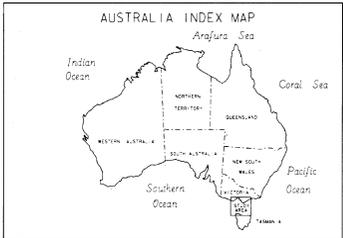
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Konkon-1 Esso 1973 W.D. 230° K.B. 92°  
 Toolka-1 Esso 1974 W.D. 240° K.B. 92°  
 Cormorant-1 Esso 1970 W.D. 240° K.B. 100°  
 Bass-1 Esso 1965 W.D. 242° K.B. 91°  
 Aroo-1 Hamille 1974 W.D. 240° K.B. 92°  
 Bass-3 Esso 1967 W.D. 242° K.B. 91°  
 Tarook-1 Esso 1972 W.D. 241° K.B. 92°  
 Narimba-1 Esso 1973 W.D. 243° K.B. 92°  
 Pipipa-1 Hamille 1982 W.D. 244° K.B. 89°  
 Pelican-4 Hamille 1979 W.D. 244° K.B. 92°  
 Pelican-1 Esso 1970 W.D. 242° K.B. 100°  
 Pelican-2 Esso 1970 W.D. 244° K.B. 100°  
 Pelican-3 Esso 1972 W.D. 242° K.B. 91°  
 Poonboon-1 Esso 1972 W.D. 244° K.B. 91°  
 Nangero-1 Hamille 1974 W.D. 241° K.B. 91°  
 Donda-1 Esso 1973 W.D. 244° K.B. 91°  
 Yurongi-1 Esso 1973 W.D. 271° K.B. 91°  
 Bass-2 Esso 1966 W.D. 244° K.B. 91°  
 Durroon-1 Esso 1972 W.D. 225° K.B. 92°



AGE (m.y.)	EPOCH	SERIES	SPORE-POLLEN ASSEMBLAGE ZONES	STRATIGRAPHY
24	MIocene-Pliocene			TORQUAY GROUP
24-37.5	OLIGOCENE		Fluv	DEMONSBLUFF FORMATION
37.5-40		Late	Upper Nohthapollites asperus (Cf. Hsu)	EASTERN VIEW
40-45		Middle	Middle Nohthapollites asperus (Cf. Hsu)	
45-50		Early	Lower Nohthapollites asperus (Cf. Hsu)	
50-55			Proteacites exaristatus (Cf. Hsu)	COAL LOWER MEASURES
55-60			Upper Lythopollenites bairdii (Cf. Hsu)	
60-65			Lower Lythopollenites bairdii (Cf. Hsu)	
65-88	LATE CRETACEOUS		Trichites longus (Cf. Hsu) T. sp. (Cf. Hsu) T. sp. (Cf. Hsu) T. sp. (Cf. Hsu)	OTWAY GROUP
88-98	EARLY CRETACEOUS		C. parvulus (Cf. Hsu) C. minutus (Cf. Hsu) F. acuminatus (Cf. Hsu)	



**Amoco Production Company**  
 AUSTRALIA  
 BASS BASIN POLYNOLY REVIEW  
 WELL CORRELATION AT 15.2.85  
 Scale: 1:5000 vertical - no horizontal scale  
 Date: 1 January 1985

Legend:  
 - [Symbol] preferred depth, no alternate  
 - [Symbol] alternative depth (shown for contrast)  
 - [Symbol] preferred depth, (long horizontal)  
 - [Symbol] confidence rating  
 - [Symbol] 0 Exact core at sea with zone species  
 - [Symbol] 1 Exact core at sea with zone species  
 - [Symbol] 2 Part-core at sea with zone species  
 - [Symbol] 3 Part-core at sea with zone species  
 - [Symbol] 4 Part-core at sea with zone species  
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