INTERPRETATIVE DATA.

Palynological analysis of cuttings samples between 1440 and 3030 metres in Jarver-1, offshore Sorell Basin.

by

Alan D. Partridge

Biostrata Pty Ltd
A.B.N. 39 053 800 945

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Summary

Palynological analyses have been performed on 38 cuttings samples from Jarver-1 between 1440 and 3030m and the final results are summarised in Table 1. The spore-pollen assemblages form am almost complete succession from the uppermost *Phyllocladidites mawsonii* Zone to Lower *Lygistepollenites balmei* Zone, while the microplankton assemblages form an incomplete succession from the *Kiokansium polypes* Subzone of the *Palaeohystrichophora infusorioides* Zone to no younger than the *Eisenackia crassitabulata* Zone. The overall age range is latest Turonian to Early Paleocene. Possible equivalence to the stratigraphic units in the Port Campbell Embayment of the Otway Basin is discussed.

Table 1. Palynological and Stratigraphic Summary of Jarver–1.

Age	Spore-Pollen Zones/Subzones (Microplankton Zones/Subzones)	Depths (mMD)	Stratigraphic Equivalence
Early Paleocene	Lower *Lygistepollenites balmei* Zone (*Eisenackia crassitabulata* to *Alisocysta circumtabulata* Zones)	1440 to 1450m (1440m)	Wangerrip Group
Late Maastrichtian	Upper *Forcipites longus* Zone (*Manumiella druggii* Zone)	1570 to 1620m (1530 to 1680m)	Massacre Shale to Timboon Sandstone
Early Maastrichtian	Lower *Forcipes longus* Zone (*Palaeostomocystis ovata* Zone) (*Isabelidinium pellucidum* Zone)	1750 to 1790m (1750m) (1790m)	Timboon Sandstone
Early Maastrichtian to Late Campanian	Lower *F. longus* to *T. lilliei* Zones (*Isabelidinium greenense* Zone)	1880 to 1940m (1880 to 1940m)	Paaratte Formation
?Late Campanian	Seven indeterminate assemblages	1968 to 2226m	?Paaratte Formation
Early Campanian	*Nothofagidites senectus* Zone (*Xenikoon australis* Zone)	2304 to 2358m (2304 to 2358m)	Paaratte Formation
Santonian	*Tricolporites apoxyexinus* Zone (*Isabelidinium rotundatum* Subzone)	2598 to 2628m (2598 to 2628m)	Belfast Mudstone Unit C or Nullawarre Greensand
Santonian	*Tricolporites apoxyexinus* Zone (*Isabelidinium cretaceum* Zone)	2706m (2706 to 2742m)	Belfast Mudstone Unit C
?Santonian	Two indeterminate assemblages	2766 to 2790m	?Belfast Mudstone
Santonian	*Tricolporites apoxyexinus* Zone (*Odontochitina porifera* Zone)	2808 to 2952m (2808 to 2952m)	Belfast Mudstone Unit B
?Early Coniacian to ?Late Turonian	*Phyllocladidites mawsonii* Zone (*Kiokansium polypes* to *Trithyrodinium* Subzone)	2970 to 3030m (2970 to 3030m)	Belfast Mudstone to Flaxman Formation

Introduction

Thirty-eight cuttings samples have been analysed for palynomorphs in the Jarver-1 exploration well through the basal part of the Cenozoic to Upper Cretaceous succession encountered between 1440 and 3030m. The well was drilled by Santos Ltd during May and June 2008, and is located in permit T/33P within the Sorell Basin, offshore western Tasmania. The objective of the study was to provide age subdivision of the succession penetrated using palynology.

Materials and Methods: The study is based on 88 palynological slides from 38 cuttings samples which where prepared at the Santos Ltd Palynological Laboratory in Adelaide. The slides were received by the author on 11th July 2008 and five Provisional Reports providing initial results were submitted between the 17th July and 11th August. Analysis of the samples was based on assemblage counts of over 150 palynomorphs in the more productive samples and rapid scanning of all the remaining slides. In those samples with low organic-residue recovery and low concentrations of palynomorphs all the specimens found on supplied slides were counted.

Results: Final interpretative results of the palynological analysis are provided in Tables 1 and 2. Basic assemblage data comprising the visual organic residues yields, palynomorph concentrations on the slides, the preservation of the palynomorphs, and the number of spore-pollen and microplankton species recorded from individual samples are provided in Table 3. All palynological slides supplied and examined are listed in Table 4.

Overall, the visual organic-yields varies from moderate to very low, with less than half of the samples categorised as having moderate to good concentrations of palynomorphs on the slides. For about one-quarter of the samples analysed the supplied slides contained less than 100 identifiable palynomorph specimens. Preservation of the palynomorphs is mostly fair to good through the shallowest 500 metres, but declines to mostly poor to fair through the deepest 1600 metres of the stratigraphic succession.

The poor recovery of organic-residues and low recovery of palynomorphs is understood to be mainly due to the selective removal of fine-grained lithologies from the cuttings during either the drilling operations or the collection and subsequent washing and drying of the cuttings. These problems could not be compensated for in the laboratory preparation of the samples and are reflected in the palynological assemblages recorded, which are interpreted to be skewed or biased towards the larger palynomorph specimens and species. Relative to palynological studies of other wells penetrating equivalent stratigraphic successions in the greater Otway Basin the palynological assemblages recorded from Jarver-1 contain higher abundances of the larger dinocysts and the bigger spore species, and lower abundances of the smaller gymnosperm and angiosperm pollen (eg. *Dilwynites* and *Nothofagidites* species).

Description of Range Chart: The palynomorphs identified in the samples are documented on the accompanying StrataBugs™ range chart which display the recorded palynomorph species in the cuttings samples proportional to their depth in the well and in terms of their percentage abundance. The palynomorphs recorded are split between different categories. The panel labelled SP Categories provides total percentage of spores, gymnosperm and angiosperm pollen counted in the samples. The species within these categories are then displayed in separate panels for spores, gymnosperm pollen and angiosperm pollen. The panel labelled Microplankton-% provides a breakdown of the total microplankton count into categories of environmental significance, with their abundances expressed as a percentage of the combined spore-pollen and microplankton count. The following panel labelled Microplankton provides the abundances of individual species as a percentage of just the microplankton count. The panel labelled Other palynomorphs provides the abundance of a number of miscellaneous categories expressed as a percentage of the combined count of the spore-pollen and the Other palynomorphs. The final biostratigraphic panel records interpreted reworked Permian, Triassic and Early Cretaceous species. Within the panels the species are plotted in order of their youngest occurrences or alternatively in alphabetical order. In addition to the biostratigraphic panels on the left of the chart are displayed columns which give a Depth Scale, the Casing points and a Lithological column based on the proportions of three principal lithologies in the cuttings descriptions. Two columns for the Spore-Pollen and Microplankton zones identifies are also included.

The following codes or abbreviations apply to the individual species occurrences and abundances on the range chart:

Numbers	=	Percentage abundances
+	=	Species outside of count
C	=	Caved species
R	=	Reworked species
?	=	Questionable identification of species.

Author citations for most of the recorded spore-pollen species can be sourced from the papers by Dettmann (1963, 1986), Dettmann & Playford (1968), Helby *et al.* (1987) and Stover & Partridge (1973). Author citations for the microplankton species can be sourced from the indexes for dinocysts and other miscellaneous organic-walled microplankton prepared by Fensome *et al.* (1990), and Williams *et al.* (1998). Manuscript species names and combinations are indicated by "sp. nov." or "comb. nov." on the range chart and "ms" in the text. Most of the manuscript species used are derived from PhD theses of Marshall (1984) and Partridge (1999).

Geological Discussion

The palynological results indicate that the suite of cuttings samples supplied from Jarver-1 extend from somewhere in the bottom half of the Sherbrook Group to the base of the Wangerrip Group. However, as copies of the electric logs were not supplied for integration with the palynological results it is not possible to accurately apply the revised formation nomenclature proposed for these groups by Partridge (2001). Instead, the following discussion provides a general outline of the likely stratigraphic assignment of the samples based solely on consideration of their palynomorph content and the principal cuttings lithologies displayed graphically on the StrataBugs™ range chart.

The palynological succession starts below the 20" casing shoe at 1407m with Early Paleocene assemblages that would be equivalent to either the basal Pebble Point Formation or the upper part of the Massacre Shale in subsurface well sections in the Port Campbell Embayment on the northern margin of the Otway Basin. This is underlain by a Late Maastrichtian interval containing a thick *Manumiella druggii* Zone which would be equivalent to the lower upper part of the Massacre Shale or the uppermost Timboon Formation. It is important to note however that: **(i)** the youngest microplankton assemblages recorded in Jarver-1 are older than all microplankton assemblages reported from the type outcrop section of the Pebble Point Formation, and **(ii)** the cuttings over the interval 1407 to 1760m are predominantly sand suggesting the Massacre Shale may not be present. The current sampling suggests a thickness for the *M. druggii* Zone of 150 metres, but considering the overlying and underlying sampling gaps it could be as much as 300 metres thick.

The next group of assemblages lying between the base of the *M. druggii* Zone at 1680m and the top of the *Xenikoon australis* Zone at 2304m covers part of the Late Cretaceous that is generally poorly sampled for palynology and therefore poorly understood in the greater Otway Basin. The spore-pollen assemblage are particularly poor through this interval, although entirely consistent with the expected *Tricolporites lilliei* and Lower *Forcipites longus* Zones (Partridge, 2006). The associated microplankton assemblage are more informative with two new zones and one previously recognised zone found above the 13-3/8" casing point at 1942m. Based on the most recent work by the author the new *Palaeostomocystis ovata* Zone at 1750m, and emended *Isabelidinium pellucidum* Zone at 1790m, would be regarded as belonging to the Timboon Formation, while the new *Isabelidinium greenense* Zone would be considered approximately equivalent to the *Isabelidinium korojonense* Zone and represent the top of the Paaratte Formation. Inspection of the lithological column on the range chart suggests the logical position of the top of the Paaratte Formation is at 1860m. Sadly, there still remains a ~350 metre thick section below the base of the casing and the top of the *X. australis* Zone which lack adequate palynological control.

The underlying *Xenikoon australis* Zone at 2304m and 2358m can be typical of either the basal Paaratte Formation in proximal (onshore) areas, or the upper Skull Creek Mudstone in more distal (offshore) areas according to Partridge (2001, fig.2). Considering the location of these assemblages at the sandy base of a mostly siltstone interval, which overlies a predominantly claystone interval, the suggested position for the top of the Skull Creek Formation is around 2350m. The next oldest *Nelsoniella aceras* Zone was not recovered in the Jarver-1 well but would be expected to lie within the unsampled interval between 2358 and 2598m, which also correspond to the most “shaly” interval on the cuttings descriptions.

The next group of assemblages between 2598 and 2952m would all be equivalent to the Belfast Mudstone and its lateral facies the Nullawarre Greensand (Partridge, 2001, fig.2). The spore-pollen assemblages belong to the broad *Tricolporites apoxyexinus* Zone, but finer resolution is provided by the associated microplankton. The *Isabelidinium rotundatum* Subzone at 2598 and 2628m and all samples down to the base of the parent *Isabelidinium cretaceum* Zone at 2742m would be equivalent to Unit C of the Belfast Mudstone, while the *Odontochitina porifera* Zone between 2808 and 2952m would be equivalent to Unit B of the Belfast Mudstone. There is no clear lithological break on the cuttings descriptions at which to place the top of Unit C, but the top of Unit B could be placed at approximately 2785m at the based of a significant sand.

At the bottom of Jarver-1 the two deepest assemblages at 2970 and 3030m contain spore-pollen assemblages considered diagnostic of the *Phyllocladidites mawsonii* Zone, while the associated microplankton are best placed in either the *Kiokansium polypes* or *Trithyrodinium* Subzones within the upper *Palaeohystrichophora infusorioides* Zone (Partridge, 2006). These zone assignments suggests that at TD the Jarver-1 well had penetrated no older than the Banoon Member or Unit C of the Flaxman Formation

Surprisingly missing from the palynological assemblages recovered in Jarver-1 is any clear evidence for the presence of either the *Conosphaeridium striatoconum* microplankton Zone or the equivalent *Clavifera vultuosus* spore-pollen Subzone of the *P. mawsonii* Zone. This section could be very thin or absent, but potentially could also be masked by cavings from the most “shaly” portion of the *O. porifera* Zone between 2815 and 2910m.

Biostratigraphy

The samples analysed in Jarver-1 are initially classified according to the Australian standard palynological zonation schemes established by Stover & Partridge (1973) and Helby *et al.* (1987). Finer resolution is then achieved using the local spore-pollen and microplankton subzones described from the Otway Basin by Partridge (1999, 2001). Finally, two new local microplankton zones, and one revived or emended zone, are used to describe new assemblages recovered from the late Campanian to mid-Maastrichtian interval. Correlation of the zones to the latest Geologic Time Scale of Gradstein *et al.* (2004) is in accord with the chart prepared by Partridge (2006). A recent summary of the zonation schemes can also be found in the latest edition of the *Geology of Victoria* (Partridge & Dettmann, 2003).

Lower *Lygistepollenites balmei* spore-pollen Zone
Interval: 1440 to 1450 metres
Age: Early Paleocene.

The two shallowest samples, from just below the 20" casing shoe at 1407m, contain Early Paleocene assemblages with approximately equal proportions of spore-pollen and marine microplankton. The terrestrially derived component is dominated by *Dilwynites* spp. (average 33% of SP count) and *Podocarpidites* spp. (average 19%), with secondary abundances of *Cyathidites* spp., *Phyllocladidites mawsonii* and *Proteacidites* spp. which all average less than 10%. The assemblages are no younger than the *L. balmei* Zone based on the presence of the eponymous species *Lygistepollenites balmei* in association with *Gambierina rudata* and *Australopollis obscurus*, and both samples are considered no younger than the Lower subzone based on the occurrence of *Proteacidites angulatus* in the bottom sample.

The marine component is dominated by the schizosporous algae *Paralecaniella indentata* (average >50% of MP count), and the dinocyst *Glaphyrocysta retiintexta* (average ~20%). The shallower sample is probably equivalent to either the *Eisenackia crassitabulata* or *Alisocysta circumtabulata* Zones of Partridge (1999), based on the presence of the manuscript species *Eisenackia hapuku* sp. nov., which can be characterised by “high paratabular pads” with incomplete internal reticulation. The zone assignment of the deeper sample is uncertain, but based on the occurrence of a single endocyst with a characteristic 3I archeopyle diagnostic of the genus *Trithyrodinium* it is feasible that the sample could represent either the *Palaeoperidinium pyrophorum* Zone or *Trithyrodinium evittii* Acme zone of Partridge (1999).

The samples also contain rare Eocene pollen and frequent Early Miocene dinocysts which are most likely derived from the section above the 20" casing shoe. The presence of these younger species suggested that a significant volume of caved rock remained in the rat-hole after running the casing.

Upper *Forcipites longus* spore-pollen Zone and
***Manumiella druggii* microplankton Zone**
Interval: 1530 to 1680 metre
Age: Late Maastrichtian.

The five samples assigned to the Upper *F. longus* and *M. druggii* Zones confirm the presence of a Late Maastrichtian section that is minimum of 150 metres thick, but which could easily be twice that thickness considering the overlying and underlying sampling gaps. The recovered assemblages are split 75 to 80% marine microplankton and 20 to 25% terrestrial spore-pollen.

The microplankton assemblages are assigned to the *M. druggii* Zone based on the dominance of an intergrading morphological complex of the *Manumiella* species *M. druggii*, *M. conorata* and *M. seelandica* which in total average ~70% of the MP count, and ~50% of the total count across all samples in zone. Most specimens are either assigned to *Manumiella conorata* or alternatively are fragmentary, with their apical and antapical extremities broken, and are consequently lumped together on the range chart under *Manumiella* spp. (indet. specimens). In contrast, to the relative abundance of good specimens of *M. conorata*, the other two end-member species *M. druggii* and *M. seelandica* are comparatively rare. The next most abundant species are *Paralecaniella indentata* and *Glaphyrocysta retiintexta* which are most likely caved from the overlying Paleocene section. The only other significant species is a common large brown sphere with a 2I archeopyle, which is recorded on the range chart under the manuscript name *Sorelasphaera* gen. et sp. nov., and rare *Deflandrea diebelii* whose the LAD (Last Appearance Datum) in the well is recorded at 1570m.

The moderate diversity spore-pollen assemblages are roughly equally dominated by *Proteacidites* spp., *Podocarpidites* spp. and *Dilwynites* spp. The samples are assigned to the Upper *F. longus*

Zone based on the LADs of *Beaupreaidites orbiculatus* and *Proteacidites crotonoides* at 1580m, *Grapnelispora evansii* at 1620m, and the FAD (First Appearance Datum) of *Tripunctisporis maastrichtiensis* at 1620m.

Lower *Forcipites longus* spore-pollen Zone
Interval: 1750 to 1790 metre, possibly extending to 1880 metres
Age: Late Campanian to Early Maastrichtian.

Although spore-pollen, at an average of ~55% of the total count, are slightly more abundant than microplankton in these three assemblages, the low yields have resulted in relatively bland spore-pollen assemblages which lack any clear dominance by individual species, or species groups. In addition, zone index species are extremely rare, and as a consequence the samples are assigned to the Lower *F. longus* Zone based on the presence of single specimens of key species in the individual samples. These marker species consist of *Grapnelispora evansii* at 1750m, *Tetracolporites verrucosus* at 1790m and *Proteacidites reticuloconcavus* ms at 1880m. However, because the last species is associated with older dinocysts it potentially could be caved into the next older *Tricolporites lilliei* Zone.

***Palaeostomocystis ovata* microplankton Zone — new**
Sample at: 1750 metres
Age: Late? Maastrichtian.

The new *Palaeostomocystis ovata* Zone was first established in the Gippsland Basin where it has been found in wells along the edge of the continental shelf and upper continental slope in the south-east portion of the basin. The zone is defined as the interval from the LAD of *Isabelidinium pellucidum* to the LAD of *Palaeostomocystis ovata* (Wilson) Eisenack *et al*. 1973. The zone partly fills a longstanding gap in the microplankton succession in the Gippsland Basin between the top of the *Isabelidinium korojonense* Zone and base of the *Manumiella druggii* Zone (Helby *et al*., 1987; Partridge 1999, 2006). In the Gippsland Basin the samples that have been assigned to the zone are characterised by near monospecific assemblages of the eponymous species.

In Jarver-1 the single sample assigned to *P. ovata* Zone also contains the LADs of *Alterbidinium acutulum*, *Xiphophoridium alatum* and *Odontochitina echinata* sp. nov. of Marshall 1984 in addition to the LAD of the eponymous species *Palaeostomocystis ovata*. The joint youngest occurrences of these four species strongly suggests that Jarver-1 has penetrated a slightly older assemblage than the *M. druggii* Zone, notwithstanding the fact that the microplankton assemblage at 1750m remains completely dominated by the *Manumiella druggii-conorata-seelandica* complex which represents 64% of MP count, and 30% of the total count. However, based on comparison with the Gippsland Basin where there is no observed overlap in the range of *P. ovata* with the index species for the *M. druggii Zone*, in the 11 samples from 5 wells which have so far assigned to the zone, it is interpreted that the whole *Manumiella druggii-conorata-seelandica* species complex is most likely caved into the sample at 1750m, and this also applies to all deeper samples.

***Isabelidinium pellucidum* microplankton Zone — emended**
Sample at: 1790 metres
Age: probably Early Maastrichtian.

The original *Isabelidinium pellucidum* Zone dates back to the early palynological studies on the Otway Basin by Evans (1966), who recognised the occurrence of the eponymous species in the Paaratte Formation (or "Curdies Beds") as a potential marker for the microplankton assemblages younger than his original *Xenikoon australis* Zone. However, the zone was not recognised by Helby *et al*. (1987), although it can be considered partly subsumed into their *Isabelidinium korojonense* Zone. Nor was the zone recognised in the subsequent studies by Partridge (1999; 2001). More recent studies have nevertheless demonstrated that an emended concept for the zone is a useful subdivision of the hitherto unzoned interval between the *I. korojonense* and *M. druggii* Zones, in both the Otway and Gippsland basins. This emended zone concept can be defined as the interval from the LAD of *Isabelidinium korojonense* (or equivalent) to the LAD of *Isabelidinium pellucidum*.

In Jarver-1 the emended zone concept is applicable to the assemblage from the cuttings at 1790m which contains the joint LADs of *Isabelidinium pellucidum*, *Canninginopsis bretonica* and *Leberidocysta lancelinica* of sp. nov. of Marshall 1984, associated with an increased abundance of *Nummus* spp. (>12% of MP count). The microplankton assemblage is however still dominated by the younger *Manumiella druggii-conorata-seelandica* species complex (representing ~40% of MP count, and ~20% of the total count) which is interpreted to be caved.

***Isabelidinium greenense* microplankton Zone — informal**
(= *Isabelidinium korojonense* microplankton Zone — partim)
Interval: 1880 to 1940 metres
Age: mid to Late Campanian.

The next two samples in the succession at 1880m and 1940m can be characterised by the occurrence of specimens of *Isabelidinium greenense* of the "*cretaceum*-shape" end-member illustrated by Marshall (1990; fig.21A-E), associated with the LADs of *Chatangiella packhamii* (at 1940m) and the additional *Odontochitina* species *O. fenestrata* sp. nov. of Marshall 1984 (at 1880m) and *O. indigena* Marshall 1988 (at 1940m). At the same time there is a marked decline in the abundance of caved specimens of the *Manumiella druggii-conorata-seelandica* species complex and a rise in the prominence of *Nummus* spp. In the Gippsland Basin the incoming of this new assemblage would be placed in the *Isabelidinium variabile* Superzone, and be considered no younger than the *Isabelidinium korojonense* Zone following Partridge (1999). This microplankton association would also equate to the *Tricolporites lilliei* Zone and is possible that both samples should be assigned to this spore-pollen zone. For the purposes of this report the informal *Isabelidinium greenense* Zone is defined at the interval from the LAD of *Xenikoon australis* to the LAD of *Isabelidinium greenense* which would make it effectively equivalent to the *I. korojonense* Zone.

Zone Indeterminate Interval: 1968 to 2226 metres
Age: Campanian.

The next seven sample analysed between 1968 and 2226m are all from **below** the 13-3/8" casing shoe at 1942m and are characterised by very lean assemblages. All slides from the seven samples were counted to give a range of 12 to 85 identifiable palynomorphs per sample, or an average of less than 30 palynomorphs per slide. Such low numbers of palynomorphs on the slides makes precise age dating extremely difficult, for although the assemblages are clearly consistent with a Late Cretaceous age none of the samples can confidently be assigned to a single spore-pollen or microplankton zone.

Most species recorded are long-ranging, and all the possible index species are only represented by single specimens. The most noteworthy are the pollen *Nothofagidites senectus* at 1968m and 2178m; *Nothofagidites endurus* at 1992m and 2178m; and *Stellidiopollis annulatus* at 2022m and 2178m. The only significant microplankton are *Odontochitina echinata* sp. nov. at 2022m, and a possible fragment of a dinocyst with an ornament characteristic of *Xenikoon australis* recorded at 2178m. Four of the seven samples also contain caved specimens of *Manumiella conorata* or *Manumiella* spp. so it is highly likely that many of the other species could also be caved.

***Nothofagidites senectus* spore-pollen Zone and *Xenikoon australis* microplankton Zone**
Interval: 2304 to 2358 metres
Age: Early Campanian.

The cuttings at 2304m gave a low to moderate organic yield containing a moderate diversity but distinct assemblage which can be confidently assigned to the *N. senectus* Zone based on the rare occurrence of *Nothofagidites senectus*, associated with the frequent occurrence of the secondary index species *Forcipites sabulosus* (4% of SP count), and to the *X. australis* Zone based on the abundant occurrence of *Xenikoon australis* (55% of MP count and 9% of SP + MP count), associated with common *Nelsoniella aceras*. The cuttings at 2358m, in contrast, gave a very lean assemblage with only 58 identifiable palynomorphs, but nevertheless these could be confidently assigned to both zones based on frequent occurrence of both *F. sabulosus* (5% of SP count) and *X. australis* (~9% of MP count). In additional the deeper sample contains the secondary index species *Nelsoniella semireticulata* and *N. tuberculata*, which do not range above this microplankton zone. Overall the assemblages are dominated by the gymnosperm pollen *Podocarpidites* spp. (average 28% of SP count) and *Araucariacites australis* (average 18%), and the eponymous dinocyst species *X. australis*.

***Tricolporites apoxyexinus* spore-pollen Zone**
Interval: 2598 to 2952 metres
Age: Santonian.

The *T. apoxyexinus* Zone is strictly defined as the interval from the FADs of *Tricolporites apoxyexinus* and/or *Ornamentifera sentosa* to the FAD of *Nothofagidites senectus* (Helby *et al*. 1987). Unfortunately, the principal index species can be very rare and inconsistent, and as neither were recorded in Jarver-1 identification of the zone has to rely on the oldest occurrences of the secondary index species *Latrobosporites amplus* and *L. ohaiensis*, and even weaker tertiary index species such as *Peninsulapollis gillii* and *Ilexpollenites primus* ms.

In Jarver-1 the base of the zone is placed at the FADs of *Latrobosporites ohaiensis* and *Ilexpollenites primus* ms at 2952m and *Latrobosporites amplus* and *Peninsulapollis gillii* in the immediately overlying sample at 2946m, while the top of zone is considered to range as high as 2598m based on the absence of any specimens of younger index species *Nothofagidites senectus* and *Forcipites sabulosus*. Furthermore, above 2598m there is a 240 metre sampling gap to the established base of the *N. senectus* Zone at 2358m.

Of the 16 cuttings samples analysed through the zone interval only 13 could be assigned to the zone even at the lowest confidence rating. The other three samples between 2742 and 2790m gave low yields with low diversity assemblage and are best left unzoned, although by superposition they must lie within the zone. The spore-pollen assemblages are consistently dominated by bisaccate gymnosperm pollen of *Podocarpidites* spp. which averages 35%. The next most abundant categories are spores of *Cyathidites* (average 13%), the alete gymnosperm pollen of the genera *Dilwynites* and *Araucariacites* (average 11%), and rather surprisingly the Cheirolepidaceae pollen *Corollina torosa* which averages 7%. The common occurrence of the last species is not typical of equivalent age assemblages in the northern Otway Basin so it may be indicative of local reworking from sediments of Early Jurassic age located either to the south or east of Jarver-1.

Samples between 2790 and 2844m (and possibly caved at 2970m) also contain the conspicuous occurrence of a new megaspore genus which is characterised by a single long phallic-like projection arising proximally from the central spore body, and a flange or skirt extending distally which is ornamented by numerous short “threads” which end in distinctive “crochet-like” hooks. The megaspore is given the manuscript name *Jarvamegaspora crochetensis* gen. et sp. nov. on the range charts. The genus *Ariadnaesporites* can be distinguished from this new genus by having threads which arise exclusively from the opposite proximal surface of the central spore body, and which also lack terminal hooks. This last occurrence of this new megaspore could prove a useful marker for the lower part of the *Tricolporites apoxyexinus* Zone. Specimens of the megaspore genus *Balmeisporites* are also recorded in this zone but they are considered to be much less abundant in the assemblages compared to equivalent age sections from the northern Otway Basin.

***Isabelidinium cretaceum* microplankton Zone and**
***Isabelidinium rotundatum* microplankton Subzone**
Interval: 2598 to 2742 metres
Age: Santonian.

The six samples are assigned to the parent *I. cretaceum* Zone based on the occurrence of *Amphidiadema denticulata* in the cuttings at 2628m, and the occurrence of single specimens of the *Isabelidinium cretaceum* in the two deepest cuttings at 2706m and 2742m, in accord with the zone concepts and species ranges provided in Helby *et al.* (1987, p.64-65). The *I. rotundatum* Subzone is identified in the two shallowest samples at 2598m and 2968m based on the occurrence of the eponymous species *Isabelidinium rotundatum* ms in both cuttings, and the presence of the morphologically similar species *Eucladinium kaikourense* in the deeper cuttings. The two middle cuttings, which lack the zone index species are included in the parent zone based on superposition. All the assemblages are dominated by *Heterosphaeridium* spp. which averages 54% of the microplankton counts.

Zone Indeterminate Interval: 2766 to 2790 metres
Age: Santonian.

The next two samples cannot be confidently assigned to either the *I. cretaceum* or *O. porifera* Zone. The shallower cuttings is lean with less than 10 microplankton recorded, while the deeper cuttings contains an almost monospecific assemblage *of Heterosphaeridium heteracanthum*, but lack any accompanying index species. This latter sample nevertheless shows greater similarity with the deeper samples based on the shallowest occurrence of rare specimens of a large cyst with a coarsely reticulate sculpture which is tentatively compared with *Valensiella griphus*.

***Odontochitina porifera* microplankton Zone**
Interval: 2808 to 2952 metres
Age: Santonian.

The microplankton assemblages over this interval are dominated by *Heterosphaeridium* spp., which average 70% of the MP count, and are assigned to the *O. porifera* Zone based on the presence of the eponymous species *Odontochitina porifera* in 7 of the 8 samples. Other species characteristics of the assemblages are the rare presence of *Odontochitina cribropoda* and a gradual increase in abundance of the colonial algae *Amosopollis cruciformis* with depth to a maximum of 27% in the deepest sample. In the original Provisional Report the deeper cuttings at 2892m and 2952m were tentatively assigned to the *C. tripartita* Subzone based on the presence of rare specimens of *Chatangiella tripartita*, but upon plotting all the data on the range chart it proved impossible to confidently identify this subzone due to the rarity of the eponymous species and the morphological variability of the specimens referred to the species.

The interval also contains rare specimens of a large cyst with a coarsely reticulate sculpture which is a cross between *Schizosporis reticulatus* and *Valensiella griphus*. Because insufficient specimens were recorded to be confident about the identification these specimens are recorded on the range chart as either *Valensiella* sp. aff. *V. griphus* or as reworked specimens of *Schizosporis reticulatus*.

The preferred assignments of the sample at 2952m to the *O. porifera* Zone and the immediately underlying sample at 2970m to the *Kiokansium polypes* or *Trithyrodinium* Subzones suggests that the Coniacian age *Conosphaeridium striatoconum* Zone is missing in Jarver-1. However, it is possible the latter zone could be masked by cavings from the “shaly” interval described in the cuttings between 2815 and 2910m. The only hint in the assemblages that this could be a possibility is the higher abundances of *Amosopollis cruciformis* at 2946 and 2952m, and the presence of single specimens of the spores *Clavifera vultuosus* ms and *Cyatheacidites tectifera* at 2952m

***Phyllocladidites mawsonii* spore-pollen Zone**
Interval: 2970 to 3030 metres
Age: latest Turonian to basal Coniacian.

The bottom two samples analysed in Jarver-1 are assigned to the *P. mawsonii* Zone principally on the absence of index species diagnostic of younger zones. The FAD of *Phyllocladidites mawsonii* is recorded in the shallower sample while the FAD of the former index species *Clavifera triplex* occurs in the deeper sample. Although both assemblages are dominated by *Podocarpidites* spp. with an average abundance of 39%, the abundances of the secondary species are significantly different.

For example, the cuttings at 2970m is most like the assemblages from the overlying *T. apoxyexinus* Zone, with abundant *Dilwynites* and *Araucariacites* pollen (20% of SP count), and common *Corollina torosa* (12%) and *Cyathidites* spores (9%). In contrast, in the deeper cuttings at 3030m gleichenaceous spores are conspicuous and represent 22% of the SP count. Species represented are *Clavifera triplex* at 9%, *Gleicheniidites circinidites* at 12% and *G. ancorus* ms at <1%. As no similar abundances of any of these species are recorded in shallower samples in Jarver-1 it would be highly unlikely that they could be caved from higher in the well. Notwithstanding the fact that there certainly are caved palynomorphs in the deepest cuttings exemplified by presence of three well-preserved specimens of *Manumiella conorata*!

In this author’s experience *Clavifera triplex* only occurs sporadically and in low abundance (<1%) through the Waarre Formation and does not become common in assemblages (>5%) until somewhere in the Flaxman Formation, or even higher in the stratigraphic succession. This correlation is supported by the rare presence of *Gleicheniidites ancorus* ms in the deepest cuttings which suggests the oldest age reached is equivalent to the *G. ancorus* Subzone. Based on these observation the Jarver-1 well is interpreted to have penetrated no older than the Flaxman Formation, and perhaps no older than the Banoon Member (Partridge, 2001).

***Kiokansium polypes* to *Trithyrodinium* Subzones of**
***Palaeohystrichophora infusorioides* microplankton Zone**
Interval: 2970 to 3030 metres
Age: latest Turonian to basal Coniacian.

The shallower assemblage at 2970m contains abundant microplankton (~25% of combined MP + SP count) which are dominated by *Heterosphaeridium* spp. at 40% and *Amosopollis cruciformis* at 28% of MP count. The assemblage also contains the rare LADs of poorly preserved *Valensiella griphus* and *Tanyosphaeridium salpinx* as well as tentatively identified specimens of *Kiokansium polypes* and *Isabelidinium evexus* ms favouring assignment to the *K. polypes* Subzone. However, as multiple specimens of *Trithyrodinium* spp. are also recorded the assemblage could also belong to the next younger *Trithyrodinium* Subzone. The latter possibility is based on recent work in other wells in the Otway Basin which has demonstrated that *Valensiella griphus* can range younger than *Kiokansium polypes* and overlap with the oldest range of *Trithyrodinium* spp.

The deepest assemblage at 3030m contains significant lower microplankton abundance (~5% of combined MP + SP count), and as all the species recorded occur higher in the well it is possible that all specimens could be caved. If not caved, the presence of multiple specimens of *Trithyrodinium* spp. favours assignment to the *Trithyrodinium* Subzone.

As a consequence of the uncertainties expressed about both assemblages the preferred interpretation is to assign them to a composite interval covering both subzones.

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Table 2. Interpretative assemblage data for Jarver-1, offshore Sorrel Basin.

Sample Type	Depth metres	Spore-Pollen Zones (Microplankton Zones)	CR*	Comments and Key Species Present
Cuttings	1440m	Lower *L. balmei* Zone (*E. crassitabulata* to *A. circumtabulata* Zones) **early Paleocene**	D4 D4	Microplankton (MP) ~19% LADs of *Lygistepollenites balmei* and *Gambierina rudata*, and LADs of *Deflandrea speciosus* and rare *Eisenackia hapuku* sp. nov. without younger zone index species.
Cuttings	1450m	Lower *L. balmei* Zone **early Paleocene**	D3	MP ~40%, with *Paralecaniella indentata* 57% of MP count. LADs of *Proteacidites angulatus* and *Trithyrodinium* sp.
Cuttings	1530m	(*M. druggii* Zone) **Late Maastrichtian**	D2	MP ~70%, with *Manumiella conorata* 58% of MP count. LADs of *Manumiella druggii, M. conorata,* and *M. seelandica*.
Cuttings	1570m	Upper *F. longus* Zone (*M. druggii* Zone) **Late Maastrichtian**	D4 D1	MP ~53%, with *Manumiella* spp. >50% of MP count. LADs of *Deflandrea diebelii*, *Beaupreaidites orbiculatus* and *Proteacidites* (*Propylipollis*) *crotonoides*.
Cuttings	1580m	Upper *F. longus* Zone (*M. druggii* Zone) **Late Maastrichtian**	D4 D2	MP ~74%, with *Manumiella* spp. >75% of MP count. LAD of *Proteacidites clinei* ms.
Cuttings	1620m	Upper *F. longus* Zone (*M. druggii* Zone) **Late Maastrichtian**	D3 D2	MP ~79% with *Manumiella* spp. ~73% of MP count. LAD of *Grapnelispora evansii* and FAD of *Tripunctisporis maastrichtiensis*.
Cuttings	1680m	*F. longus* Zone (*M. druggii* Zone) **Late? Maastrichtian**	D3 D2	MP ~75% with *Manumiella* spp. ~82% of MP count. SP assemblage sparse but containing *Tetracolporites verrucosus* and *Proteacidites* (*Propylipollis*) *crotonoides*.
Cuttings	1750m	Lower *F. longus* Zone (*P. ovata* Zone) **Early Maastrichtian**	D3 D2	MP ~48% with *Manumiella* spp. ~64% of MP count. LADs of *Palaeostomocystis ovata*, *Alterbidinium acutulum* and *Odontochitina echinata* ms. FAD of *Grapnelispora evansii*.
Cuttings	1790m	Lower *F. longus* Zone (*I. pellucidum* Zone) **Early Maastrichtian to Late Campanian**	D3 D2	MP ~53%, with caved? *Manumiella* spp. ~45% of MP count. LADs of *Isabelidinium pellucidum, Canninginopsis bretonica* and *Tricolporites lilliei*. FAD of *Tetracolporites verrucosus*.
Cuttings	1880m	Lower *F. longus* Zone (*I. greenense* Zone) **Late Campanian**	D3 D2	MP ~28%, with *Paralecaniella indentata* 45% of MP count. LADs of *Isabelidinium greenense* and *Odontochitina fenestrata* ms. FAD of *Proteacidites reticuloconcavus* ms.
Cuttings	1940m	Lower *F. longus* to *T. lilliei* Zones (*I. greenense* Zone) **Late Campanian**	D4 D2	MP >30%, with *Nummus* sp. 27% of MP count. LADs of *Odontochitina indigena*, and *Chatangiella packhamii*. FAD of *Deflandrea diebelii*. SP assemblage not diagnostic.
Cuttings	1968m	Zone indeterminate **undiff. Late Cretaceous**		Low recovery with <75 identifiable palynomorphs on one slide. Long-ranging Late Cretaceous species present. MP only 5%.
Cuttings	1992m	Zone indeterminate **undiff. Late Cretaceous**		Low recovery with only 30 palynomorphs on one slide. No key species recorded. MP ~7% but all specimens probably caved.
Cuttings	2022m	Zone indeterminate **undiff. Late Cretaceous**		Low recovery with <100 identifiable palynomorphs on 2 slides. No zone index species recorded. MP >40%, but mostly caved.
Cuttings	2076m	Zone indeterminate **undiff. Late Cretaceous**		Low recovery of only 50 palynomorphs on one slide. No key species recorded. MP ~20% but all specimens probably caved.
Cuttings	2136m	Zone indeterminate **undiff. Late Cretaceous**		Very low recovery with <20 identifiable palynomorphs on 2 slides. All recorded species known from Late Cretaceous.

Table 2. Interpretative assemblage data for Jarver-1 (continued)

Sample Type	Depth metres	Spore-Pollen Zones (Microplankton Zones)	CR*	Comments and Key Species Present
Cuttings	2178m	Zone indeterminate **undiff. Late Cretaceous**		Low recovery with <60 identifiable palynomorphs on 2 slides. Possible fragment of *Xenikoon australis* was recorded.
Cuttings	2226m	Zone indeterminate **undiff. Late Cretaceous**		Very low recovery with <20 identifiable palynomorphs on 2 slides. All recorded species known from Late Cretaceous.
Cuttings	2304m	*N. senectus* Zone (*X. australis* Zone) **Early Campanian**	D3 D3	MP ~16%, with *Xenikoon australis* >50% of MP count. LADs of *Nelsoniella aceras* and *Forcipites sabulosus.*
Cuttings	2358m	*N. senectus* Zone (*X. australis* Zone) **Early Campanian**	D3 D3	MP ~27% in low recovery of <60 palynomorphs on single slide. LADs of *Nelsoniella tuberculata* and *N. semireticulata.* FAD of *Xenikoon australis*.
Cuttings	2598m	*T. apoxyexinus* Zone (*I. rotundatum* Subzone) **late Santonian**	D5 D3	MP ~30% with *Heterosphaeridium* spp. ~52% of MP count. LADs of *Isabelidinium rotundatum* and *Gillinia hymenophora*.
Cuttings	2628m	*T. apoxyexinus* Zone (*I. rotundatum* Subzone) **late Santonian**	D5 D2	MP ~53%, with *Heterosphaeridium* spp. ~56% of MP count. FADs of *Isabelidinium rotundatum, Eucladinium kaikourense*, and *Amphidiadema denticulata*.
Cuttings	2676m	*T. apoxyexinus* Zone (*I. cretaceum* Zone) **Santonian**	D5 D5	MP ~47%, with *Heterosphaeridium* spp. ~25% of MP count. MP zone assignment based on stratigraphic superposition, but includes LAD of *Odontochitina cribropoda.*
Cuttings	2694m	*T. apoxyexinus* Zone (*I. cretaceum* Zone) **Santonian**	D5 D5	MP ~55%, with *Heterosphaeridium* spp. at ~78% of MP count. MP zone assignment based on stratigraphic superposition, but includes LAD of *Odontochitina porifera*.
Cuttings	2706m	*T. apoxyexinus* Zone (*I. cretaceum* Zone) **Santonian**	D5 D3	MP ~64%, with *Heterosphaeridium* spp. 53% of MP count. MP zone assignment based on single specimen of *Isabelidinium cretaceum*.
Cuttings	2742m	(*I. cretaceum* Zone) **Santonian**	D3	Low recovery with <100 identifiable palynomorphs on 2 slides. MP <10%, but includes FAD of *Isabelidinium cretaceum*.
Cuttings	2766m	Zone indeterminate **undiff. Late Cretaceous**		Low recovery with only 60 palynomorphs on 2 slides. Both MP and SP assemblages non-descript. MP ~15%.
Cuttings	2790m	Zone indeterminate **undiff. Late Cretaceous**		MP ~43%, with *Heterosphaeridium* spp. ~82% of MP count. LAD of new *Jarvamegaspora crochetensis* gen. et sp. nov.
Cuttings	2808m	*T. apoxyexinus* Zone (*O. porifera* Zone) **Santonian**	D5 D3	MP ~62%, with *Heterosphaeridium* spp. ~90% of MP count. LADs of consistent *Odontochitina porifera,* and possible *Chatangiella tripartita.*
Cuttings	2820m	*T. apoxyexinus* Zone (*O. porifera* Zone) **Santonian**	D5 D3	MP ~55%, with *Heterosphaeridium* spp. ~78% of MP count. *Odontochitina porifera*, *O. cribropoda* and poor *Chatangiella tripartita* all present, with *Amosopollis cruciformis* ~2% of MP.
Cuttings	2844m	*T. apoxyexinus* Zone (*O. porifera* Zone) **Santonian**	D5 D3	MP ~30%, with *Heterosphaeridium* spp. at ~61% of MP count. Assemblage contains *Odontochitina cribropoda* along with common *Amosopollis cruciformis* (~10% of MP).
Cuttings	2868m	*T. apoxyexinus* Zone (*O. porifera* Zone) **Santonian**	D5 D5	MP ~22%, with *Heterosphaeridium* spp. ~66% of MP count. Zone assignments based on stratigraphic superposition, as assemblage lacks key index species.

Table 2. Interpretative assemblage data for Jarver-1 (continued)

Sample Type	Depth metres	Spore-Pollen Zones (Microplankton Zones)	CR*	Comments and Key Species Present
Cuttings	2892m	*T. apoxyexinus* Zone (*O. porifera* Zone) **Santonian**	D3 D3	MP ~30%, with *Heterosphaeridium* spp. ~64% of MP count. *Odontochitina porifera* common at 19% of MP count and containing single specimen of *Chatangiella tripartita*.
Cuttings	2916m	*T. apoxyexinus* Zone (*O. porifera* Zone) **Santonian**	D5 D5	MP ~34%, with *Heterosphaeridium* spp. ~74% of MP count. Assemblage contains *Odontochitina porifera* and *O. cribropoda* along with common *Amosopollis cruciformis* (~11% of MP).
Cuttings	2946m	*T. apoxyexinus* Zone (*O. porifera* Zone) **Santonian**	D3 D3	MP ~37%, with *Heterosphaeridium* spp. ~61% and *Amosopollis cruciformis* ~19% of MP count. *Odontochitina porifera* present and SP assemblage contains FADs of *Latrobosporites amplus* and *Peninsulapollis gillii*.
Cuttings	2952m	*T. apoxyexinus* Zone (*O. porifera* Zone) **Santonian**	D3 D3	MP ~24%, with *Heterosphaeridium* spp. ~48% and *Amosopollis cruciformis* ~27% of MP count. FADs of multiple specimens of *Odontochitina porifera* and *Chatangiella tripartita*. FADs of *Latrobosporites ohaiensis* and *Ilexpollenites primus* ms.
Cuttings	2970m	*P. mawsonii* Zone (*P. infusorioides* Zone *K. polypes* Subzone) **Coniacian – Turonian**	D5 D4	MP ~25%, with *Heterosphaeridium* spp. ~40% and *Amosopollis cruciformis* 28% of MP count. LADs of poorly preserved *Valensiella griphus* and possible *Kiokansium polypes* and *Isabelidinium evexus*. FAD of *Phyllocladidites mawsonii*.
Cuttings	3030m	*P. mawsonii* Zone (*P. infusorioides* Zone *Trithyrodinium* Subz.) **Coniacian – Turonian**	D3 D5	MP ~5% mainly *Amosopollis cruciformis* and *Trithyrodinium* spp. SP assemblage dominated by gymnosperm pollen but with spores *Clavifera triplex* 9% and *Gleicheniidites* spp. 13% of SP count. FAD of rare *Gleicheniidites ancorus* sp. nov.

*CR = Confidence Ratings according to STRATDAT database.
FAD & LAD = First and Last Appearance Datums.

CR = Confidence Ratings used in STRATDAT database and applied to Table 2.

Alpha codes: Linked to sample		**Numeric codes:** Linked to fossil assemblage		
A	Core	**1**	**Excellent confidence:**	High diversity assemblage recorded with key zone species.
B	Sidewall core	**2**	**Good confidence:**	Moderately diverse assemblage with key zone species.
C	Coal cuttings	**3**	**Fair confidence:**	Low diversity assemblage recorded with key zone species.
D	Ditch cuttings	**4**	**Poor confidence:**	Moderate to high diversity assemblage without key zone species.
E	Junk basket	**5**	**Very low confidence:**	Low diversity assemblage without key zone species.

Table 3. Basic assemblage data for Jarver-1, offshore Sorrel Basin.

Sample Type	Depth metres	Visual Yield	Palynomorph Concentration	Palynomorph Preservation	No. SP Species	No. MP Species
Cuttings	1440m	Low	Low-Moderate	Fair-Good	29+	13+
Cuttings	1450m	Low	Low	Poor-Good	27+	12+
Cuttings	1530m	Low	Moderate	Fair-Good	23+	15+
Cuttings	1570m	Low-Moderate	Moderate	Fair-Good	33+	15+
Cuttings	1580m	Low	Moderate	Poor-Good	22+	14+
Cuttings	1620m	Moderate	Moderate	Fair-Good	23+	15+
Cuttings	1680m	Moderate	Moderate	Poor-Good	25+	15+
Cuttings	1750m	Low	Low-Moderate	Poor-Good	38+	18+
Cuttings	1790m	Low-Moderate	Moderate	Fair-Good	32+	19+
Cuttings	1880m	Very Low	Moderate	Poor-Good	36+	13+
Cuttings	1940m	Low	Low	Poor-Good	37+	14+
Cuttings	1968m	Very Low	Very Low	Poor-Fair	22+	4+
Cuttings	1992m	Low	Very Low	Poor-Fair	19+	5+
Cuttings	2022m	Low	Very Low	Poor-Fair	23+	12+
Cuttings	2076m	Very Low	Very Low	Poor	13+	2+
Cuttings	2136m	Very Low	Negligible	Poor	7+	4+
Cuttings	2178m	Very Low	Very Low	Poor-Good	23+	4+
Cuttings	2226m	Very Low	Negligible	Poor	5+	2+
Cuttings	2304m	Low	Very Low	Poor-Fair	27+	5+
Cuttings	2358m	Very Low	Very Low	Poor-Fair	18+	10+
Cuttings	2598m	Low	Low	Poor-Fair	22+	10+
Cuttings	2628m	Very Low	Very Low	Poor-Fair	20+	11+
Cuttings	2676m	Low	Low	Poor-Fair	19+	10+
Cuttings	2694m	Low	Low	Poor-Fair	27+	11+
Cuttings	2706m	Moderate	Low	Poor-Fair	17+	14+
Cuttings	2742m	Low	Very Low	Poor	18+	7+
Cuttings	2766m	Low	Very Low	Poor	19+	6+
Cuttings	2790m	Low	Low	Poor	18+	7+
Cuttings	2808m	Moderate	Moderate	Poor	27+	15+
Cuttings	2820m	Moderate	Moderate	Poor	29+	15+
Cuttings	2844m	Moderate	Moderate	Poor-Very Poor	27+	12+
Cuttings	2868m	Moderate	Low-Moderate	Poor-Very Poor	30+	7+
Cuttings	2892m	Moderate	Low	Poor-Fair	33+	13+
Cuttings	2916m	Moderate	Low	Poor-Fair	26+	9+
Cuttings	2946m	Low	Low	Poor-Fair	29+	12+
Cuttings	2952m	Moderate	Moderate	Poor-Fair	42+	13+
Cuttings	2970m	Low-Moderate	Low-Moderate	Poor-Very Poor	37+	17+
Cuttings	3030m	Low	Moderate	Poor-Fair	23+	5+
				Average:	**25+**	**10+**

Table 4. Palynological slides from Jarver-1, offshore Sorrel Basin.

Slide No.	Sample Type	Depth Metres	Catalogue Number	Santos Lab Prep. No.	Description
1	Cuttings	1440m		11604	Kerogen slide
2	Cuttings	1440m		11604	Oxidised slide
3	Cuttings	1450m		11605	Kerogen slide
4	Cuttings	1450m		11605	Oxidised slide
5	Cuttings	1530m		11642	Kerogen slide – half cover slip
6	Cuttings	1530m		11642	Kerogen slide
7	Cuttings	1570m		11636	Kerogen slide
8	Cuttings	1570m		11636	Oxidised slide
9	Cuttings	1580m		11643	Kerogen slide – half cover slip
10	Cuttings	1580m		11643	Kerogen slide
11	Cuttings	1620m		11644	Kerogen slide – half cover slip
12	Cuttings	1620m		11644	Kerogen slide
13	Cuttings	1620m		11644	Kerogen slide – half cover slip
14	Cuttings	1680m		11645	Kerogen slide – half cover slip
15	Cuttings	1680m		11645	Kerogen slide
16	Cuttings	1680m		11645	Kerogen slide – half cover slip
17	Cuttings	1750m		11593	Kerogen slide
18	Cuttings	1750m		11593	Kerogen slide
19	Cuttings	1790m		11595	Kerogen slide
20	Cuttings	1790m		11595	Kerogen slide
21	Cuttings	1880m		11647	Kerogen slide – half cover slip
22	Cuttings	1880m		11647	Kerogen slide – half cover slip
23	Cuttings	1940m		11591	Kerogen slide – half cover slip
24	Cuttings	1940m		11591	Kerogen slide
25	Cuttings	1968m		11648	Kerogen slide
26	Cuttings	1992m		11650	Kerogen slide
27	Cuttings	2022m		11652	Kerogen slide
28	Cuttings	2022m		11652	Kerogen slide – half cover slip
29	Cuttings	2076m		11658	Kerogen slide
30	Cuttings	2136m		11653	Kerogen slide
31	Cuttings	2136m		11653	Kerogen slide – half cover slip
32	Cuttings	2178m		11655	Kerogen slide
33	Cuttings	2178m		11655	Kerogen slide – half cover slip
34	Cuttings	2226m		11656	Kerogen slide – half cover slip
35	Cuttings	2226m		11656	Oxidised slide

Table 4. Palynological slides from Jarver-1, offshore Sorrel Basin (continued).

Slide No.	Sample Type	Depth Metres	Catalogue Number	Santos Lab Prep. No.	Description
36	Cuttings	2304m		11618	Kerogen slide
37	Cuttings	2304m		11618	Kerogen slide
38	Cuttings	2304m		11618	Oxidised slide
39	Cuttings	2358m		11620	Kerogen slide
40	Cuttings	2598m		11597	Kerogen slide
41	Cuttings	2598m		11597	Oxidised slide
42	Cuttings	2628m		11599	Kerogen slide – half cover slip
43	Cuttings	2628m		11599	Oxidised slide
44	Cuttings	2676m		11600	Kerogen slide
45	Cuttings	2676m		11600	Kerogen slide
46	Cuttings	2676m		11600	Oxidised slide
47	Cuttings	2694m		11601	Kerogen slide
48	Cuttings	2694m		11601	Oxidised slide
49	Cuttings	2706m		11602	Kerogen slide
50	Cuttings	2706m		11602	Kerogen slide
51	Cuttings	2706m		11602	Oxidised slide
52	Cuttings	2742m		11639	Kerogen slide
53	Cuttings	2742m		11639	Kerogen slide
54	Cuttings	2766m		11641	Kerogen slide
55	Cuttings	2766m		11641	Kerogen slide
56	Cuttings	2790m		11623	Kerogen slide – half cover slip
57	Cuttings	2790m		11623	Oxidised slide
58	Cuttings	2808m		11624	Kerogen slide – half cover slip
59	Cuttings	2808m		11624	Oxidised slide
60	Cuttings	2808m		11624	Oxidised slide
61	Cuttings	2820m		11625	Kerogen slide – half cover slip
62	Cuttings	2820m		11625	Oxidised slide
63	Cuttings	2820m		11625	Oxidised slide
64	Cuttings	2844m		11628	Kerogen slide
65	Cuttings	2844m		11628	Kerogen slide
66	Cuttings	2844m		11628	Kerogen slide
67	Cuttings	2868m		11630	Kerogen slide
68	Cuttings	2868m		11630	Kerogen slide
69	Cuttings	2868m		11630	Kerogen slide

Table 2. Palynological slides from Jarver-1, offshore Sorrel Basin (continued).

Slide No.	Sample Type	Depth Metres	Catalogue Number	Santos Lab Prep. No.	Description
70	Cuttings	2892m		11632	Kerogen slide
71	Cuttings	2892m		11632	Kerogen slide
72	Cuttings	2892m		11632	Kerogen slide
73	Cuttings	2892m		11632	Kerogen slide
74	Cuttings	2916m		11606	Kerogen slide
75	Cuttings	2916m		11606	Oxidised slide
76	Cuttings	2916m		11606	Oxidised slide
77	Cuttings	2946m		11607	Kerogen slide
78	Cuttings	2946m		11607	Oxidised slide
79	Cuttings	2946m		11607	Oxidised slide
80	Cuttings	2952m		11608	Oxidised slide
81	Cuttings	2952m		11608	Oxidised slide
82	Cuttings	2952m		11608	Oxidised slide
83	Cuttings	2970m		11610	Oxidised slide
84	Cuttings	2970m		11610	Oxidised slide
85	Cuttings	2970m		11610	Kerogen slide
86	Cuttings	2970m		11610	Kerogen slide – half cover slip
87	Cuttings	3030m		11611	Kerogen slide
88	Cuttings	3030m		11611	Kerogen slide – half cover slip

Well Name : Jarver-1

Operator : Santos Ltd
Well Code : JARVER-1
Lat/Long : 41°20' 27.25"S 144°14' 3.19"E
Interval : 1350m - 3100m
Scale : 1:5000
Chart date: 21 October 2008

Spudded : 16 May 2008
Completed : 18 June 2008
INTERPRETATIVE Spore-Pollen Range Chart
Sample interval 1440 to 3030m
Microscope analysis by Alan D. Partridge

Jarver-1

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Well Name : Jarver-1

Operator : Santos Ltd — Spudded : 16 May 2008

Well Code : JARVER-1 — Completed : 18 June 2008

Lat/Long : 41°20' 27.25"S 144°14' 3.19"E

Interval : 1350m - 3100m — INTERPRETATIVE Microplankton Range Chart

Scale : 1:5000 — Sample interval 1440 to 3030m

Chart date: 21 October 2008 — Microscope analysis by Alan D. Partridge

Jarver-1

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Jarver-1

Well Name : Jarver-1

Operator : Santos Ltd
Well Code : JARVER-1
Lat/Long : 41°20' 27.25"S 144°14' 3.19"E
Interval : 1350m - 3100m
Scale : 1:5000
Chart date : 21 October 2008

Spudded : 16 May 2008
Completed : 18 June 2008
INTERPRETATIVE Palynomorph Range Chart
Sample interval 1440 to 3030m
Microscope analysis by Alan D. Partridge

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