# ORDOVICIAN CONODONT DISTRIBUTION IN SELECTED PETROLEUM EXPLORATION WELLS, CANNING BASIN, WESTERN AUSTRALIA

*by*
*Robert S Nicoll*



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## DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

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# ORDOVICIAN CONODONT DISTRIBUTION IN SELECTED PETROLEUM EXPLORATION WELLS, CANNING BASIN, WESTERN AUSTRALIA

ROBERT S. NICOLL

## INTRODUCTION

An examination of Ordovician conodont faunas from 42 wells in the Canning Basin from which Ordovician conodont faunas have been recovered has been undertaken to provide biostratigraphic control on Ordovician sedimentation in the basin, especially in the Willara Sub-basin and adjacent Broome Arch areas (Table 1). In addition, preliminary conodont biostratigraphic data from the Prices Creek Ordovician outcrop area on the northern margin of the basin are also mentioned (Nicoll & others, 1993).

The recovery of conodont elements from samples is highly variable, and few of the wells have yielded the abundant faunas that are desirable for biostratigraphic control. However, most wells have provided enough data to establish a generalised conodont based biostratigraphy through the interval from the Nambeet Formation to the top of the Nita Formation. Conodonts in the Bongabinni Formation are of Ordovician age but are not included in a formal zone. A number of the samples appear to have been over-acidised when originally processed. The resulting conodonts are etched and discoloured. This also means that some of the conodonts may have been destroyed in the processing. The possibility exists that new processing of some of these samples might result in better control of the section.

Material presented includes samples originally prepared and examined by Robert McTavish of WAPET in the 1960's-1970's (McTavish, 1973), samples prepared for Western Mining in the 1980's by Simon Watson (Watson, 1988) and Robert S. Nicoll, determinations by Norman Savage, and material prepared by the Australian Geological Survey (BMR) in the period 1965-1993. Where possible, all previous identifications have been checked for this report. This has not been possible with the samples studied by N.M. Savage (University of Oregon) because the prepared material has not been located.

All samples have been examined for thermal maturation using conodont colour alteration and the results indicated on the well summary sheet and against each sample.

The stratigraphic determinations used in this report have been drawn from a number of sources. Most have been taken from the well completion reports, but some have been modified to conform with revised interpretations of well stratigraphy.

## CONODONT ZONATION

Existing Ordovician conodont zonations used in North America and Europe cannot be applied directly to the Canning Basin because facies and biogeographic controls on the conodont

fauna of the basin have resulted in many of the Baltic and North American zonal species being absent or scarce in the basin. The conodont zonation scheme of McTavish & Legg (1976), consisting of 10 zones (OCA-OCJ) is not used because these zones were never defined in the literature and no report was ever produced relating this zonal scheme to the distribution of conodonts in specific wells. Figure 1 outlines a preliminary conodont zonation scheme for the Canning Basin that will be used for this study.

**Devonian - unzoned**

Devonian conodonts have not been examined in this report, but will be the subject of a separate study. Several wells have conodonts in the upper part of the Carribuddy Group (Sahara Formation) which indicate a Devonian age, but not enough material has been recovered to identify a zone.

**Silurian - unzoned**

A small conodont fauna recovered from the Worral Formation (lower carbonate member) from Acacia 1 (511-519 m) contained elements assigned to *Ozarkodina hassi*. This would indicate a middle Llandovery age for the lower part of the Worral Formation.

**Ordovician**
**Unzoned interval**

Some wells have had conodont elements recovered from the lower part of the Carribuddy Group (Bongabinni Formation). In most cases only one or two elements have been recovered in any one sample. No generic or specific identifications have been made on the material, however the elements appear to have Ordovician rather than Silurian or Devonian affinities. Samples from Kunzea 1 (261-292 m) have the most abundant and best preserved conodont elements from the Bongabinni Formation. It is recommended that more samples from this interval, in Kunzea 1, be studied to better establish the age relationship of the top of the Nita Formation and the base of the Carribuddy Group.

***Phragmodus - Plectodina* Zone**

Conodonts indicative of this zone include *Eoplacognathus suecicus*, *Onyxodus acuoliratus*, *Phragmodus polystrophos*, *Plectodina aculeatus* and *P. onychodonta*. Based on the presence of graptolites (McTavish & Legg, 1976; VandenBerg & Cooper, 1992) this fauna is correlated with the Victorian Darriwillian *Pseudoclimacograptus? decoratus* Zone (Da3). The zone is found in the upper part of the Goldwyer Formation and the Nita Formation.

***Histiodella holodentata* Zone**

Conodonts indicative of the *Histiodella holodentata* Zone include *Coleodus* sp., *Falodus keramis*, *Histiodella holodentata*, and *Phragmodus spicatus*. The base of the zone is placed at the first occurrence of *Histiodella holodentata*. Based on the presence of graptolites (McTavish & Legg, 1976; VandenBerg & Cooper, 1992) this fauna is correlated with the Victorian Darriwillian *Undulograptus? intersitus* Zone (Da 2). The zone is found in the

uppermost part of the Willara Formation and in the lower part of the Goldwyer Formation.

***Histiodella altifrons* Zone**

This zone is identified by the presence of *Histiodella altifrons* and *H. sinuosa*. This zone, and the underlying *Jumudontus gananda* Zone, are both found in the Willara Formation.

***Jumudontus gananda* Zone**

This zone is identified by the presence of *Jumudontus gananda*, *Bergstroemognathus hubeiensis*, *Trigonodus larapintinensis*, *Prioniodus amadeus* and *Prioniodus alatus*.

***Oepikodus communis* Zone**

Conodonts indicative of this zone include *Oepikodus communis*, *Oepikodus cleftus* (ms name), *Bergstroemognathus hubeiensis*, *Trigonodus larapintinensis* and *Protoprioniodus yapu*. This zone is found in the lower part of the Gap Creek Formation and in the base of the Willara Formation.

***Prioniodus elegans - Bergstroemognathus extensus* Zone**

This zone is identified by the presence of *Prioniodus elegans*, *Bergstroemognathus extensus*, *Scolopodus rex* and *Acodus deltatus*. The zone is found in the Emanuel Formation and in the upper part of the Nambeet formation.

***Drepanoistodus - Paltodus* Zone**

Conodonts indicative of this zone include a large unornamented species of *Drepanoistodus* and *Paltodus deltifer*. The zone is found in the Kudata Dolomite and the upper part of the Nambeet Formation.

## ORDOVICIAN SEDIMENTATION AND BIOSTRATIGRAPHY

Ordovician sedimentation in the Canning Basin appears to have been initiated in the Tremadoc (= Lancefieldian or Warendian) by deposition of a basal transgressive sandstone sequence known as the Nambeet Formation in the western part of the Willara Sub-basin and in the Fitzroy Trough as the Kunian Sandstone. The Nambeet Formation changes upward into an mixes shale carbonate unit whish is equivalent to the Kudata Dolomite in Prices Creek outcrop area (Nicoll & others, 1993). The Nambeet Formation is oldest and thickest in the Samphire Marsh 1 well (775 m) where the *Drepanoistodus - Paltodus* Zone is recognised near the base of the unit, but above the basal sands. In the Fitzroy Trough the *Drepanoistodus - Paltodus* Zone is recognised in the Kudata Dolomite in the subsurface of the Gap Creek area (Nicoll & others, 1993). The scattered exposures of the Carranya Beds (Playford & others, 1975), located south of Halls Creek in the eastern part of the basin are poorly dated, but may be roughly time equivalent to the Kunian Sandstone - lower Nambeet Formation section, based on an initial analysis of a poorly preserved trilobite fauna (Veevers & Wells, 1961; Shergold & Laurie, pers. comm., 1992).

The upper part of the Nambeet Formation and the Emanuel Formation are marked by fauna of the *Prioniodus elegans - Bergstroemognathus extensus* Zone. In the type section of the Emanuel Formation, preliminary analysis of the conodont fauna indicates several zonal subdivisions of the *P. elegans - B. extensus* Zone will be recognised, but in the subsurface sample density has not been sufficient to attempt any such subdivision (Nicoll, 1992).

The lower part of the Willara Formation and the base of the Gap Creek Formation are marked by the appearance of the *Oepikodus communis* Zone fauna. Either stratigraphic picks of these formations are inconsistent across the basin, or some of these units are diachronous because in some wells the base of the Willara Formation is in the *P. elegans - B. extensus* Zone (Thangoo 1A) and in other wells the top of the Nambeet Formation is picked in the *Oepikodus communis* Zone (Edgar Range 1). Additional stratigraphic analysis and log interpretation may clarify this problem.

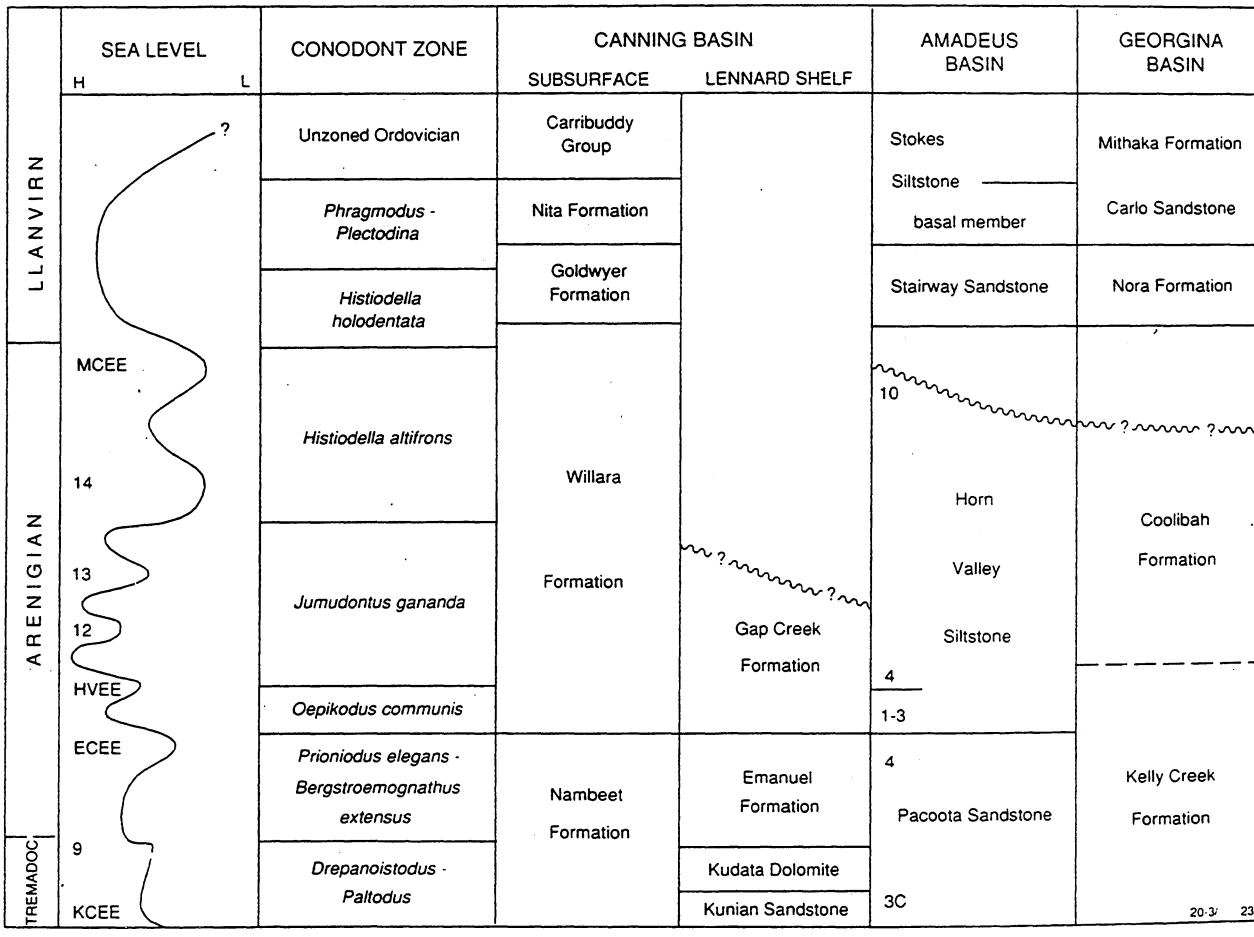


Figure 1. Sea-level curve for the Early Ordovician and correlation of the Canning, Amadeus and Georgina Basins. From Nicoll & others (1993), modified from Nielsen (1992a, 1992b) and Nicoll & others (1988, 1992). Curve is smoothed from the more detailed curve constructed by Nielsen. Data are not available to extend the curve to include the Carribuddy Group.

The *Oepikodus communis* Zone is succeeded sequentially by the *Jumudontus gananda* and the *Histiodella altifrons* Zones. Neither of these zones are clearly differentiated in most wells, but both zones can be recognised in some wells. Part of this problem is that there may be a stratigraphic break near the top of the
Willara Formation where non-deposition or erosion has removed some section, especially that with the diagnostic *Histiodella altifrons* Zone fauna.

The *Histiodella holodentata* Zone is recognised in most wells that penetrate the lower part of the Goldwyer Formation. In most wells the base of the *H. holodentata* Zone is found in the top of the Willara Formation. This zone does not appear to be present in the outcrop section.

The *Histiodella holodentata* Zone is succeeded in the upper part of the Goldwyer Formation by the *Phragmodus - Plectodina* Zone. This uppermost named Ordovician conodont zone is present in the upper part of the Nita Formation. There is no sharp break between the Nita Formation and the overlying Bongabinni Formation, the lowermost unit of the Carribuddy Group. Conodont faunas appear to become gradually less diverse upward in the section, possibly reflection a gradual development of deteriorating marine environment (Watson, 1988).

A very limited conodont fauna has been found in several wells where sufficient samples of the non-evaporitic facies of the Carribuddy Group have been sampled. These conodont elements are not abundant enough, or well enough preserved to be identified, but they appear to be of Ordovician rather than Silurian or Devonian affinities.

The basal carbonate member of the Worral Formation has produced a taxonomically and numerically limited Early Silurian (Llandovery) in the WMC Accacia 1 well. This is the only report of Early Silurian conodont faunas in Western Australia. Late Silurian conodonts have been recovered from the Dirk Hartog Formation in the Carnarvon Basin, but not from the Canning Basin where no late Silurian sediments have been identified.

## SEA-LEVEL CURVE AND BASIN STRATIGRAPHY

Recent studies of global eustatic sea-level fluctuation in the Cambro-Ordovician of Australia and Scandinavia (Nicoll & others, 1992; Nielsen, 1992a, 1992b) have outlined a detailed sea-level curve for the Late Cambrian and Early Ordovician of Australia. Using the improved conodont and graptolite biostratigraphic control these curves are applied to the Canning Basin (Fig. 2). They show a series of fluctuating sea-level events through the section. Of special note is the regression (sea-level low) in the upper part of the interval of Willara Formation deposition. The curve corresponding to the Goldwyer and Nita Formation is just sketched in and will probably be modified following more detailed study.

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# TABLE 1. LOCALITY INFORMATION FOR WELLS.

| WELLNAME | LATITUDE | LONGITUDE | TOTAL DEPTH | AGE-AT-TD | COMPANY/ YEAR |
|---|---|---|---|---|---|
| ACACIA 1 | -19.331670 | 124.995000 | 1209 | ORDOVICIAN | WMC 1981 |
| ANNA PLAINS 1 | -19.338610 | 121.466670 | 1161 | ORDOVICIAN | SOC 1987 |
| AQUILA 1 | -18.582780 | 122.669170 | 1735 | ORDOVICIAN | EAGLE 1982 |
| BARBWIRE 1 | -19.177220 | 125.016390 | 1071 | ORDOVICIAN | WAPET 1972 |
| BLACKSTONE 1 | -17.587220 | 124.350280 | 3049 | ORDOVICIAN | WAPET 1967 |
| CANOPUS 1 | -18.948060 | 123.866940 | 1779 | ORDOVICIAN | GETTY 1982 |
| CARINA 1 | -19.354720 | 123.078890 | 1603 | ORDOVICIAN | GETTY 1982 |
| CONTENTION HEIGHT 1 | -22.426670 | 127.225280 | 1791 | ORDOVICIAN | AQUITA 1973 |
| CUDALGARRA 1 | -19.221670 | 122.320830 | 1703 | ORDOVICIAN | SOC 1984 |
| DODONEA 1 | -19.386390 | 125.160840 | 2215 | ORDOVICIAN | WMC 1985 |
| EDGAR RANGE 1 | -18.756940 | 123.594170 | 1968 | ORDOVICIAN | TOTAL 1968 |
| FRANKENSTEIN 1 | -21.382220 | 123.015830 | 2803 | PROTEROZOIC | COMM 1988 |
| GINGERAH HILL 1 | -19.470278 | 122.365833 | 1473 | ORDOVICIAN | BHP-UTAH 1988 |
| GOLDWEYER 1 | -18.379720 | 122.382770 | 1439 | PRECAMBRIAN | WAPET 1958 |
| GREVILLEA 1 | -18.354440 | 125.632770 | 2586 | PRECAMBRIAN | IEDC 1982 |
| HEDONIA 1 | -18.276670 | 122.401390 | 1543 | PRECAMBRIAN | GULF 1984 |
| KIDSON 1 | -22.616670 | 125.006110 | 4431 | ORDOVICIAN | WAPET 1966 |
| KUNZEA 1 | -19.535000 | 124.989720 | 450 | ORDOVICIAN | WMC 1984 |
| LEO 1 | -19.248610 | 122.344440 | 2411 | ORDOVICIAN | COMM 1988 |
| MATCHES SPRINGS 1 | -18.691110 | 124.053050 | 2835 | ORDOVICIAN | TOTAL 1969 |
| MCLARTY 1 | -19.395830 | 123.658330 | 2591 | ORDOVICIAN | TOTAL 1968 |
| MUNRO 1 | -19.863060 | 122.474440 | 2116 | PRECAMBRIAN | WAPET 1972 |
| MUSCA 1 | -19.338610 | 122.955560 | 1535 | ORDOVICIAN | GETTY 1982 |
| NITA DOWNS 1 | -19.155000 | 122.200000 | 1849 | ORDOVICIAN | SOC 1983 |
| PARDA 1 | -18.935830 | 122.009450 | 1907 | PRECAMBRIAN | WAPET 1965 |
| PEGASUS 1 | -20.097500 | 123.951110 | 2995 | ORDOVICIAN | AMOCO 1988 |
| PERCIVAL 1 | -20.331940 | 126.082220 | 2448 | ORDOVICIAN | WMC 1985 |
| PICTOR 1 | -18.764440 | 123.714720 | 2146 | PRECAMBRIAN | BHP 1984 |
| PICTOR 2 | -18.765871 | 123.713621 | 2146 | ORDOVICIAN | BRIDGE 1990 |
| ROEBUCK BAY 1 | -18.158330 | 122.458340 | 1219 | ORDOVICIAN | WAPET 1956 |
| SAMPHIRE MARSH 1 | -19.518890 | 121.180830 | 2031 | PRECAMBRIAN | WAPET 1958 |
| SANTALUM 1A | -19.473050 | 124.868330 | 629 | ORDOVICIAN | WMC 1983 |
| SOLANUM 1 | -19.366390 | 124.961670 | 834 | ORDOVICIAN | WMC 1984 |
| SUNSHINE 1 | -18.459980 | 122.892160 | 738 | ORDOVICIAN | BRIDGE 1991 |
| TAPPERS INLET 1 | -16.859170 | 122.588890 | 2856 | PRECAMBRIAN | WAPET 1971 |
| THANGOO 1 | -18.368330 | 122.889440 | 1059 | ORDOVICIAN | WAPET 1959 |
| THANGOO 1A | -18.364440 | 122.885830 | 1655 | PRECAMBRIAN | WAPET 1960 |
| THANGOO 2 | -18.442220 | 122.909160 | 1472 | PRECAMBRIAN | WAPET 1973 |
| VELA 1 | -19.411950 | 122.893330 | 1908 | ORDOVICIAN | GETTY 1982 |
| WHISTLER 1 | -18.373661 | 122.894366 | 884 | ORDOVICIAN | BRIDGE 1991 |
| WILLARA 1 | -19.180000 | 122.070560 | 3903 | ORDOVICIAN | WAPET 1965 |
| WILSON CLIFFS 1 | -22.277500 | 126.781940 | 3722 | PROTEROZOIC | AQUITA 1968 |

CANNING BASIN CONODONT IDENTIFICATIONS

WELL **ACACIA 1**

CONODONT BIOSTRATIGRAPHY: Using WMC stratigraphic picks the conodont biostratigraphy is as follows. The *Phragmodus-Plectodina* Zone is found in the lower part of the Nita Formation. The *Histiodella holodentata* Zone extends from the lowest part of the Nita Formation to a depth of 1055 m in the Goldwyer Formation. The *Prioniodus elegans-Bergstroemognathus extensus* Zone is present in the well from 1197 to 1208 m. No zones are established in the interval 1055 to 1197 m.

CAI: Max CAI 1.5 at 1208 m.

COMMENTS: Well establishes Silurian age of basal unit of Worral Formation. Distribution of *Phragmodus - Plectodina* and *Histiodella holodentata* Zones does not agree with zonal and stratigraphic picks in other wells. The *Histiodella holodentata* Zone is not normally found in the upper half of the Goldwyer Formation. The stratigraphic picks used in the WMC report should be re-evaluated. The *P. elegans - B. extensus* Zone fauna at the base of the well should indicate the upper part of the Nambeet Formation, or no higher than the basal part of the Willara Formation.

| Depth | CAI value | Conodont abundance | Identification |
|---|---|---|---|
| **WORRAL FORMATION** | | | |
| 511.64-514.24 | 1 | 4 | Ozarkodina cf . 0. hassi<br>indt frags. |
| 519.7-522.53 | 1 | 3 | Ozarkodina cf . 0. hassi<br>indt frags. |
| **CARRIBUDDY GROUP** | 524.3-693.4 | | |
| no conodonts recovered | | | |
| **NITA FORMATION** | 693.4-854.7 m | | |
| 754.73-756.65 | 1 | 39 | Erraticodon patu<br>Protopanderodus primitus<br>Trigonodus larapintinensis<br>Stolodus sp. A.<br>Drepanodus arcuatus<br>indt frags. |

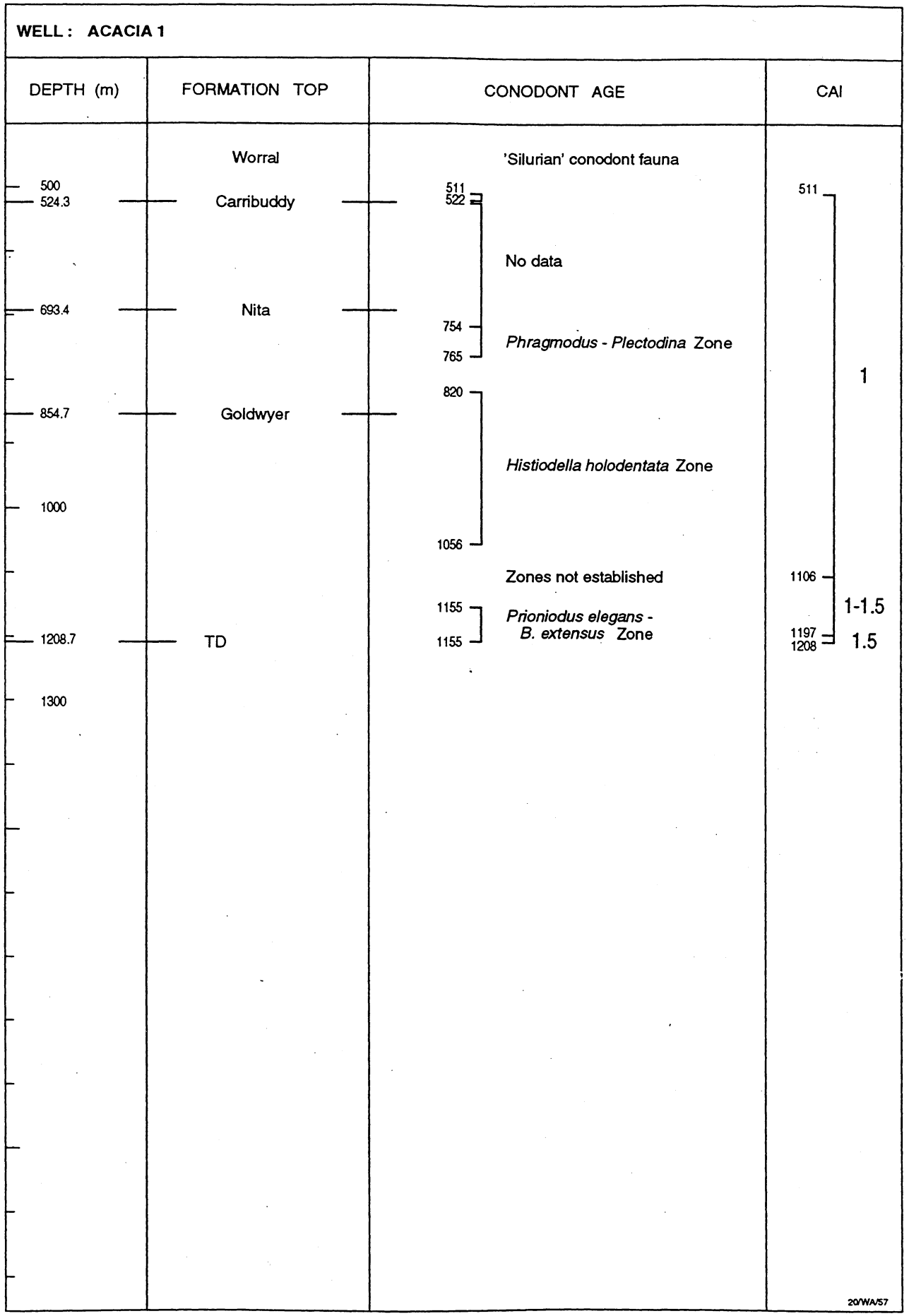
| | | | |
|---|---|---|---|
| 756.65-758.7 | 1 | 29 | Erraticodon patu<br>Trigonodus larapintinensis<br>Phragmodus sp. indet.<br>Belodella sp. indet.<br>Drepanodus arcuatus<br>Protopanderodus primitus<br>indt frags. |
| 758.7-760.79 | 1 | 18 | Phragmodus sp. indet.<br>Protopanderodus primitus<br>Drepanodus arcuatus<br>Belodella sp. indet.<br>Trigonodus larapintinensis<br>gen. indet. A. sp. A<br>indet frags. |
| 760.79-763.0 | 1 | 26 | Erraticodon patu<br>Protopanderodus primitus<br>Stolodus sp. A.<br>Drepanodus arcuatus<br>Belodella sp. A.<br>Eoplacognathus sp. indet.<br>indet elements<br>indet frags. |
| 763.0-765.02 | 1 | 13 | Erraticodon patu<br>Protopanderodus primitus<br>Phragmodus sp. indet.<br>Drepanodus arcuatus<br>?Stolodus sp. A.<br>indet frags. |
| 815.96-818.0 | - | 1 | indet frag. |
| 818.0-820.33 | 1 | 2 | indet elements |
| 820.33-823.13 | 1 | 23 | Histiodella holodentata<br>Protopanderodus primitus<br>Protoprioniodus yapu<br>gen. indet. A. sp. A.<br>indet frags.<br>Coleodus? sp.<br>indt element |
| 824.99-827.8 | 1 | 24 | Histiodella holodentata<br>Acodus buetefueri<br>Protopanderodus primitus<br>Drepanoistodus pitjanti<br>Stolodus sp. A.<br>Protoprioniodus yapu<br>indt frags. |

| | | | |
|---|---|---|---|
| **GOLDWYER FORMATION** | 854.7-1208.7? (=TD) | | |
| 896.02-897.8 | 1 | 1 | Drepanoistodus basiovalis |
| 897.98-900.75 | 1 | 6 | Protopanderodus primitus<br>gen. indet. A. sp. A.<br>indt elements |
| 906.06-908.29 | 1 | 83 | Histiodella holodentata<br>Protoprioniodus yapu<br>Protopanderodus primitus<br>Drepanoistodus basiovalis<br>gen. indet. A. sp. A.<br>indt elements<br>indt frags. |
| 953.42-956.03 | - | 3 | Drepanoistodus pitjanti<br>indt frags. |
| 961.4-963.91 | - | I | Drepanoistodus pitjanti |
| 994.87-997.5 | 1 | 2 | Drepanoistodus pitjanti<br>Protoprioniodus yapu |
| 997.5-999.7 | 1 | 3 | Protoprioniodus yapu<br>Drepanoistodus pitjanti<br>Prioniodus sp. indet. |
| 999.7-1002.03 | 1 | 8 | Drepanoistodus pitjanti<br>indt frags. |
| 1002.03-1004.92 | 1 | 1 | Drepanoistodus pitjanti |
| 1004.92-1006.86 | 1 | 9 | Drepanoistodus pitjanti<br>indt elements |
| 1043.3-1045.67 | 1 | 25 | Histiodella holodentata<br>Belodella jemtlandica<br>Protopanderodus primitus<br>Polonodus sp. indet.<br>Oistodus lanceolatus<br>Protoprioniodus yapu<br>gen. indet. A. sp. A<br>indt elements |
| 1045.67-1048.14 | 1 | 6 | gen. indet. A, sp. A.<br>indt elements<br>indt frags. |
| 1048.41-1050.99 | 1 | 8 | Histiodella holodentata<br>Drepanoistodus pitjanti<br>indt elements |

| | | | |
|---|---|---|---|
| 1050.99-1053.46 | 1 | 28 | gen. indet. A. sp. A<br>Oistodus lanceolatus<br>Drepanoistodus pitjanti<br>Belodella sp.A.<br>Protopanderodus primitus<br>Coleodus? sp.<br>indt elements<br>indt frags. |
| 1053.46-1055.74 | 1 | 44 | Histiodella holodentata<br>Coleodus?<br>Acodus buetefueri<br>Protoprioniodus yapu<br>Drepanoistodus pitjanti<br>Protopanderodus primitus<br>gen. indet. A. sp. A.<br>indt elements<br>indt frags. |
| 1098.91-1101.01 | 1 | 25 | Drepanoistodus pitjanti<br>indt elements<br>indt frags.<br>gen. indet. A. sp. A. |
| 1101.01-1103.72 | 1-1.5 | 7 | Drepanoistodus pitjanti<br>indt elements<br>indt frags. |
| 1103.72-1106.17 | 1-1.5 | 8 | Drepanoistodus pitjanti<br>indt elements<br>indt frags. |
| 1106.17-1108.66 | 1-1.5 | 1 | indt element |
| 1108.66-1111.36 | 1-1.5 | 9 | indt frags. |
| 1198.23-1150.57 | - | 1 | Drepanoistodus pitjanti |
| 1150.57-1153.09 | 1-1.5 | 33 | Drepanoistodus sp. A.<br>Belodella sp. indet.<br>gen. indet. A. sp. A.<br>Scolopodus rex<br>Scolopodus sp. A.<br>indt frags. |
| 1153.09-1155.91 | - | 3 | indt frags. |
| 1155.91-1158.1 | 1-1.5 | 12 | Scolopodus rex<br>Drepanoistodus sp. A.<br>indt elements<br>indt frags. |
| 1158.1-1160.9 | 1-1.5 | 9 | Drepanoistodus sp. A.<br>Scolopodus rex<br>indt frags. |

| | | | |
|---|---|---|---|
| 1197.13-1199.45 | 1.5 | 33 | Bergstroemognathus extensus<br>Protopanderodus sp. A.<br>indt elements<br>indt frags. |
| 1199.45-1202.02 | 1.5 | 5 | indt elements |
| 1202.02-1205.09 | 1.5 | 12 | Protopanderodus sp. A.<br>indt elements<br>indt frags. |
| 1205.07-1207.42 | 1.5 | 19 | Bergstroemognathus extensus<br>Scolopodus rex<br>indt elements<br>indt frags. |
| 1207.42-1208.47 | 1.5 | 27 | Scolopodus rex<br>indt elements<br>indt frags. |

**TD 1208.7**



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **ANNA PLAINS 1**

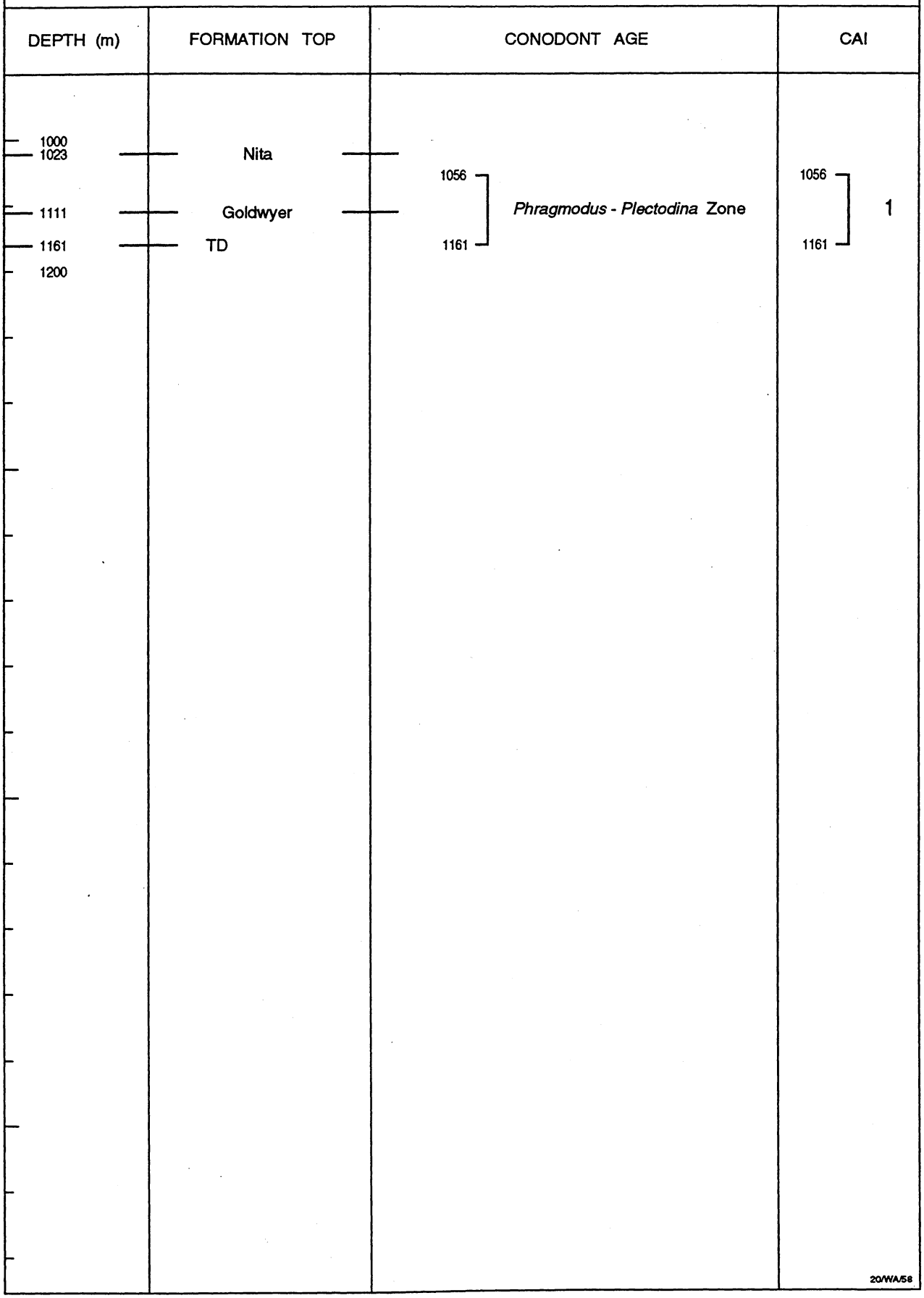
CONODONT BIOSTRATIGRAPHY: The limited conodont fauna recovered is indicative of the *Phragmodus - Plectodina* Zone. There is no indication that the *Histiodella holodentata* Zone was reached at TD.

CAI: Max CAI 1 at 1161 m.

COMMENTS: Well penetrated only the upper part of the Goldwyer Formation.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** not encountered | | | |
| **NITA FORMATION** 1023.0-1111.0 m | | | |
| 1041-1056 | - | 0 | |
| 1056-1071 | **1** | 3 | *Protopanderodus* |
| 1071-1086 | **1** | 6 | *Protopanderodus* |
| 1086-1101 | - | 0 | |
| 1101-1116 | - | 0 | one fish tooth |
| **GOLDWYER FORMATION** 1111.0-1161.0 m (TD) | | | |
| 1116-1131 | **1** | 15 | *Drepanoistodus* sp.<br>?*Phragmodus* sp. |
| 1131-1146 | **1** | 20 | *Drepanoistodus* sp.<br>*Scolopodus* sp. |
| 1146-1161 | **1** | 35 | *Drepanoistodus* sp.<br>*Erraticodon cf. balticus*<br>*Phragmodus* sp.<br>*Protopanderodus* sp. |
| **WILLARA FORMATION** not drilled | | | |
| **NAMBEET FORMATION** not drilled | | | |

**WELL : ANNA PLAINS 1**



CANNING BASIN CONODONT IDENTIFICATIONS

WMC **AQUILA No. 1**

CONODONT BIOSTRATIGRAPHY: The very limited fauna recovered from the upper part of the Nita Formation is probably representative of the *Phragmodus - Plectodina* Zone. The fauna from the upper part of the Willara Formation is diagnostic of the *Histiodella holodentata* Zone, and by stratigraphic position is probably from the lower part of the zone..

CAI: Max CAI 1.5 at 1182 m. No data available from the lower part of the well.

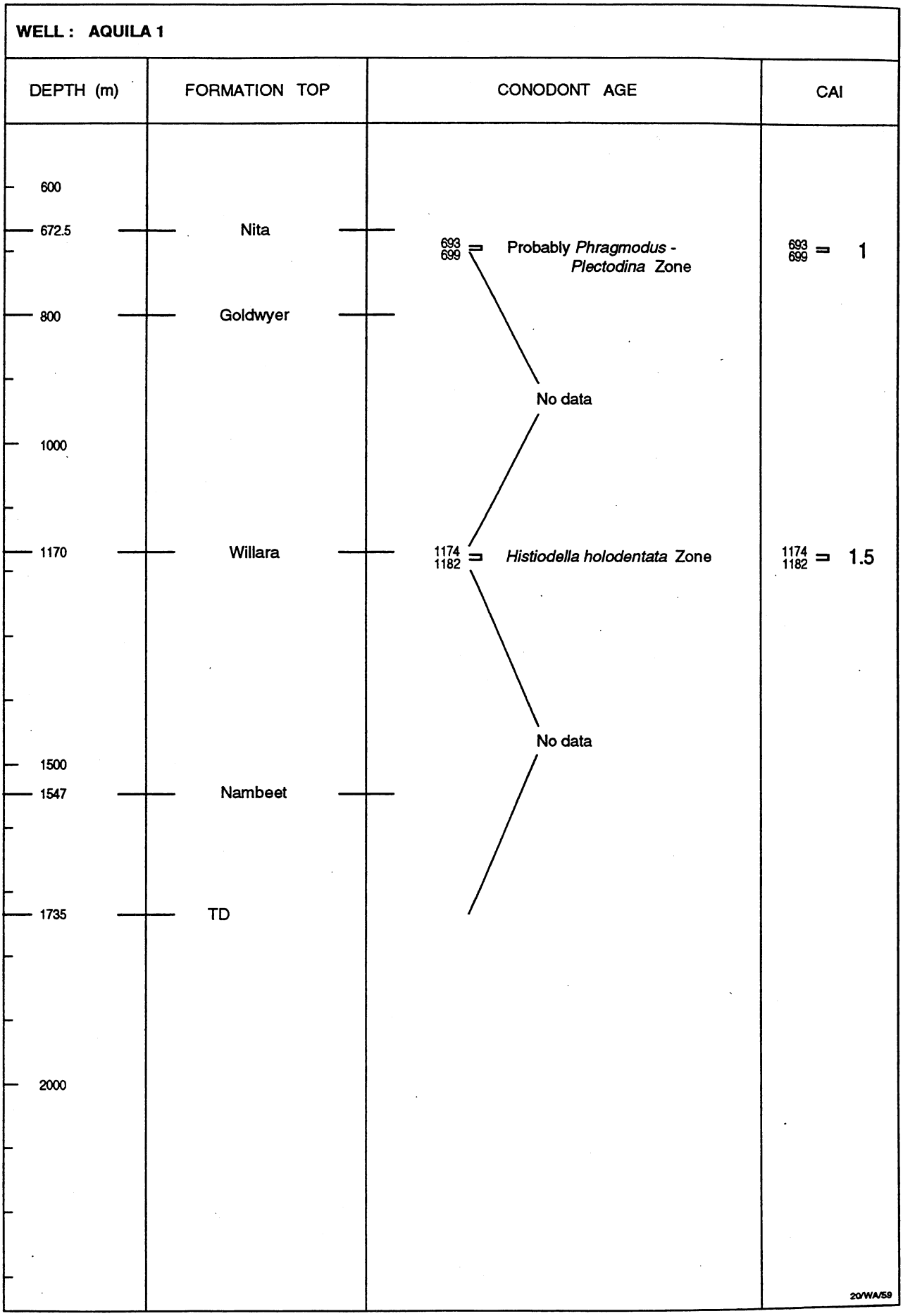
COMMENTS: Recovery of elements of the *Histiodella holodentata* Zone in the upper part of the Willara Formation is expected. Data limited to only two intervals, one each in the upper parts of both the Nita and Willara Formations.

| Depth (m) | CAI value | Conodont abundance | Identification |
|---|---|---|---|
| **NITA FORMATION** | 672.5-800 m | | |
| 693-693.3 | **1** | 3 | indt. frags. |
| 699.1-699.38 | **1** | 5 | indt. frags. |
| 699.5-699.8 | **1** | 10 | *Plectodina* sp. |
| **GOLDWYER FORMATION** | 800-1170 m | | |
| no samples | | | |
| **WILLARA FORMATION** | 1170-1547.5 m | | |
| 1174.5-1174.77 | **1.5** | 21 | *Coelodus* sp.<br>*Drepanoistodus cf. pitjanti*<br>*Histiodella holodentata*<br>*Juanognathus* sp.<br>*Protopanderodus nogamii* |
| 1175.35-1175.65 | **1.5** | 17 | *Drepanoistodus cf. pitjanti*<br>*Protopanderodus nogamii* |
| 1176.14-1176.5 | **1.5** | 19 | *Drepanoistodus cf. pitjanti*<br>*Histiodella holodentata*<br>*Protopanderodus nogamii* |

| | | | |
|---|---|---|---|
| 1179.05-1179.3 | **1.5** | 4 | *Juanognathus* sp.<br>*Protopanderodus nogamii* |
| 1182.65-1182.9 | **1.5** | 19 | *Histiodella holodentata*<br>*Juanognathus* sp.<br>*Microzarkodina marathonensis*<br>*Protopanderodus nogamii* |

**NAMBEET FORMATION** 1547.5- (TD) m

no samples



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **BARBWIRE 1**

CONODONT BIOSTRATIGRAPHY: The three samples from the Nita Formation are not age diagnostic. The *Phragmodus* - *Plectodina* Zone is found in the upper part of the Goldwyer Formation between 782 - 884 m. The highest appearance of *Histiodella holodentata*, at 896 m, marks the top of the *H. holodentata* Zone, which extends to the bottom of the well at 1071 m.

CAI: Max CAI 1 at 1071 m = TD.

COMMENTS: Several of the samples were acid etched in the original processing. Element recovery in these samples would probably have been better than is now indicated. The break between the *Phragmodus-Plectodina* and the *Histiodella holodentata* zones occurs at about the expected level. The base of the hole is probably near the base of the Goldwyer Formation.

| Depth (m) | value | abundance | Identification |
|---|---|---|---|
| **DEVONIAN** | 470.0-1192.6' | (143.3-363.6 m) | |
| 790-800' | **1** | 14 | *Icriodus* |
| 890-900' | **1** | 5 | *Icriodus* sp.<br>*Polygnathus* sp. |
| 1140-1150' | **1** | 3 | *Icriodus* sp. |
| 1290-1300' | **1** | 1 | *Icriodus* sp. |
| 1390-1400' | **1** | 1 | indt. S element |
| 1440-1450' | **1** | 3 | *Icriodus* sp.<br>*Polygnathus* sp. |
| **CARRIBUDDY GROUP** | 1501.58-2395.4' | (457.8-730.3 m) | |

**NITA FORMATION** 2395.4-2566.27′ (730.3-782.4 m)

| | | | |
|---|---|---|---|
| 2390-2400′ (728.66-731.71 m) | **1** | 2 | indt. frag. |
| 2440-2450′ (743.90-746.95 m) | **1** | 1 | 1ndt. frag. |
| 2540-2550′ (774.39-777.44 m) | ?**1** | 20 | indt. frags.<br>all acid etched |

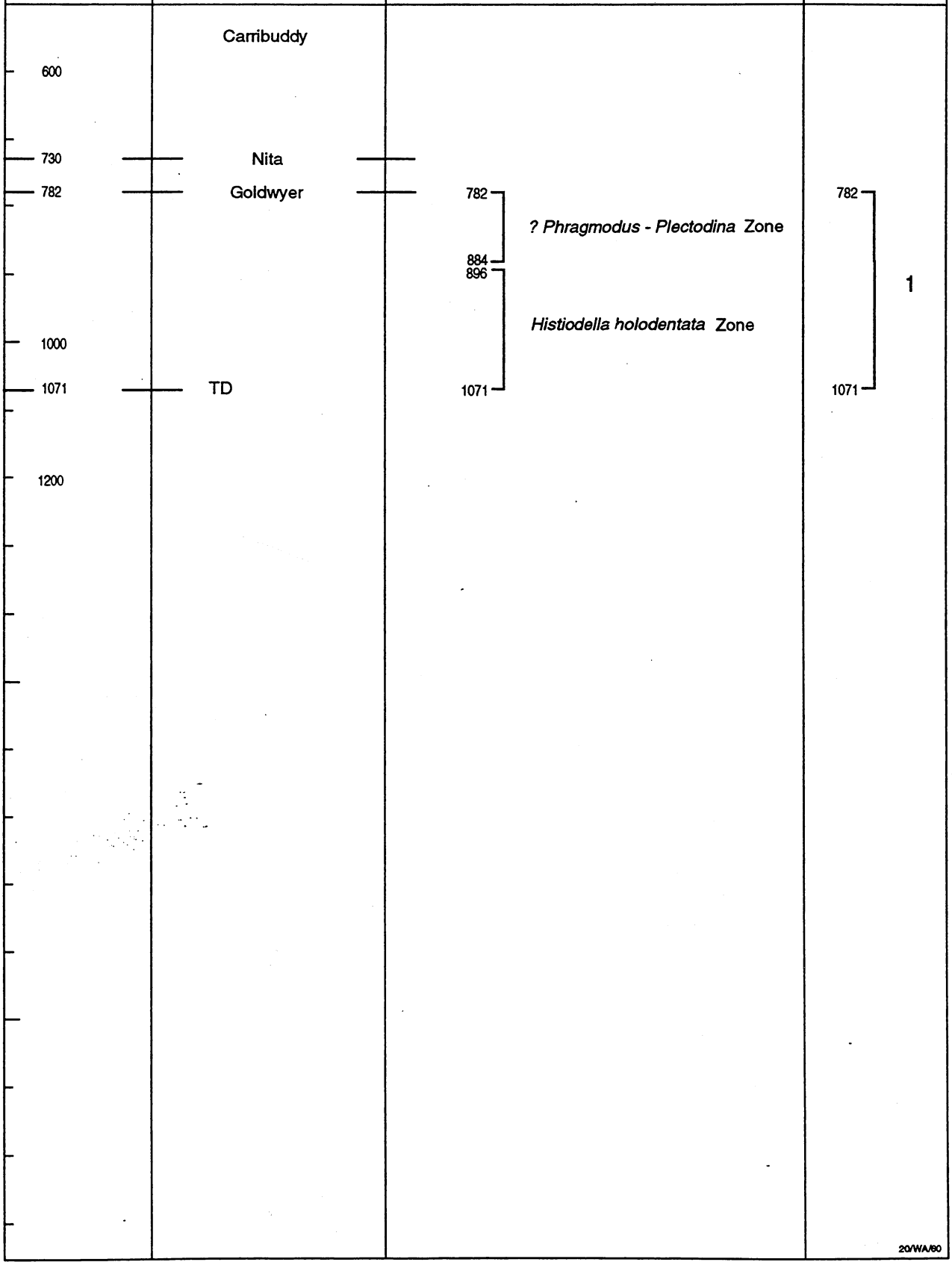
GOLDWYER FORMATION 2566.27-3514.2′=TD (782.4-1071.4 = TD m)

| | | | |
|---|---|---|---|
| 2590-2600′ (789.63-792.68 m) | **1** | 24 | *Drepanoistodus* sp.<br>*Erraticodon* sp.<br>*Phragmodus polystrophos* |
| 2640-2650′ (804.88-807.93 m) | **1** | 121 | *Ansella* sp.<br>*Erraticodon* cf. *E. balticus*<br>*Drepanoistodus* sp.<br>*Onyxodus acuolisatus*<br>*Phragmodus polystrophos*<br>*Protopanderodus* sp. |
| 2690-2700′ (820.12-823.17 m) | **1** | 72 | *Ansella* sp.<br>?*Eoplacognathus* sp.<br>*Erraticodon* cf. *E. balticus*<br>*Drepanoistodus* sp.<br>*Juanognathus* sp.<br>*Onyxodus acuoliratus*<br>*Phragmodus polystrophos*<br>*Protopanderodus gradatus*<br>*Protopanderodus* sp. |
| 2740-2750′ (835.37-838.41 m) | **1** | 8 | indt. frags. |
| 2790-2800′ (850.61-853.66 m) | **1** | 34 | *Ansella* sp.<br>*Drepanoistodus* sp.<br>*Erraticodon* cf. *E. balticus*<br>*Juanognathus leptosomatus*<br>*Juanognathus* sp.<br>*Protopanderodus gradatus*<br>*Protopanderodus* cf.*P. nogamii* |

| | | | |
|---|---|---|---|
| 2840-2850' (865.83-868.90 m) | 1 | 15 | *Erraticodon* cf. *E. balticus*<br>*Juanognathus* sp.<br>*Protopanderodus nogamii*<br>acid etched |
| 2890-2900' (881.10-884.15 m) | 1 | 4 | *Protopanderodus gradatus*<br>acid etched |
| 2940-2950' (896.34-899.39 m) | 1 | 30 | *Histiodella holodentata*<br>*Protopanderodus nogamii*<br>all material badly acid etched |
| 2990-3000' (911.59-914.63 m) | 1 | 25 | ?*Falodus keramis*<br>?*Phragmodus spicatus*<br>*Trigonodus* sp. |
| 3040-3050' (926.83-929.88 m) | 1 | 6 | ?*Phragmodus* sp. |
| 3090-3100' (942.07-945.12 m) | 1 | 7 | *Drepanoistodus* sp<br>*Protopanderodus gradatus* |
| 3190-3200' (972.56-975.61 m) | 1 | 16 | *Acodus* sp.<br>*Cordylodus horridus*<br>*Drepanoistodus* sp.<br>?*Histiodella* sp. |
| 3240-3250' (987.80-990.85 m) | 1 | 28 | *Acodus* sp.<br>*Drepanoistodus* sp.<br>*Histiodella holodentata*<br>*Phragmodus spicatus*<br>*Protopanderodus gradatus* |
| 3290-3300' (1003.05-1006.10 m) | 1 | 4 | indt. frags. |

| | | | |
|---|---|---|---|
| 3340-3350' (1018.29-1021.34 m) | **1** | 23 | *Drepanoistodus* sp.<br>*Histiodella holodentata*<br>*Phragmodus spicatus*<br>*Protopanderodus gradatus*<br>*Trigonodus* sp. |
| 3390-3400' (1033.54-1036.59 m) | **1** | 18 | *Drepanoistodus* sp.<br>*Microzarkodina* sp.<br>*Phragmodus* sp. |
| core 2<br>3502-3503' (1067.68-1067.99 m) | **1** | 211 | *Ansella* sp.<br>*Coelodus* sp.<br>*Drepanoistodus pitjanti*<br>*Drepanoistodus* sp.<br>*Falodus keramis*<br>*Histiodella holodentata*<br>*Juanognathus* sp.<br>*Microzarkodina* sp.<br>*Protopanderodus gradatus* |
| core 2<br>3507-3508' (1069.21-1069.51 m) | **1** | 67 | *Ansella* sp.<br>*Drepanoistodus pitjanti*<br>*Drepanoistodus*<br>*Eoplacognathus* sp.<br>*Histiodella holodentata*<br>*Phragmodus* sp.<br>?*Polonodus* sp.<br>*Protopanderodus gradatus*<br>*Triangularis* sp. |
| core 2<br>3514' (1071.34 m) | **1** | 36 | *Ansella* sp.<br>*Drepanoistodus pitjanti*<br>*Histiodella holodentata*<br>*Juanognathus* sp.<br>?*Polonodus* sp<br>*Protopanderodus nogamii* |

**WELL : BARBWIRE 1**



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **BLACKSTONE 1**

CONODONT BIOSTRATIGRAPHY: The conodont fauna recovered from cores in this well is neither abundant or diverse. The fauna from cores 16-19 (2220-2460 m) all appear to represent the *Phragmodus-Plectodina* Zone, but not enough diagnostic species are present to be positive in this determination. The single broken fragment recovered from core 25 (3009-3012 m) is not identifiable.

CAI: Max CAI = 2 at 2460 m.

COMMENTS: This examination of the conodont fauna tends to support the earlier interpretation of ages in the well compatible with interpretation of the Nita and Goldwyer Formations in the well, rather than the older Gap Creek-Emanuel Formations. The fauna is differentiated from that in other wells in the basin by the presence of *Belodina* sp.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **POULTON FORMATION** 1915.67-2222.60 m | | | |
| **NITA FORMATION** 2222.60-2606.7 m | | | |
| core 16 | | | |
| 7284-7312' | **1** | 16 | |
| (2220.73-2229.26 m) | | | *Drepanoistodus* sp indet. |
| core 17 | | | |
| 7510-7517' | **1.5** | 18 | |
| 2289.63-2291.77 m) | | | *Belodina* sp |
| | | | *Phragmodus* sp. indet. |
| | | | *Plectodina* sp. indet |
| core 18 | | | |
| 7770-7790' | **1.5** | 7 | |
| (2368.90-2375.00 m) | | | *Belodina* sp. |
| | | | *Drepanoistodus* sp. |
| core 19 | | | |
| 8066'/ | **2** | 68 | |
| 8065'5"-8071'6.5" | | | *Ansella* sp. indet. |
| (2459.15 m/2458.98-2460.83 m) | | | *Belodina* sp. |
| | | | *Drepanoistodus* sp. |
| | | | *Eoplacognathus* cf.*E. suecicus* |
| | | | *Protopanderodus* cf.*P. nogamii* |
| **GOLDWYER FORMATION** 2606.7-3050.3 m =TD | | | |
| core 25 | | | |
| 9870-9880' | - | 1 | |
| (3009.15-3012.02 m) | | | indet. coniform fragment |

**WELL : BLACKSTONE 1**

| DEPTH (m) | FORMATION TOP | CONODONT AGE | CAI |
|---|---|---|---|
| 1900 | | | |
| 1915.67 | Poulton | | |
| 2000 | | | |
| 2222.60 core 16 | Nita | 2220 *Phragmodus - Plectodina* Zone | 2222 — 1 |
| core 17 | | | 2290 — 1.5 |
| core 18 | | | 2375 ┐ 2 |
| core 19 | | 2460 ┘ | 2460 ┘ |
| 2500 | | | |
| 2605 | Goldwyer | | ? ND |
| 3000 core 25 | | 3010 — Not zoned | |
| 3050 | TD | | |

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CANNING BASIN CONODONT IDENTIFICATIONS

WELL **CANOPUS 1**

Samples for this well held by Norm Savage, comments based on his faunal list and not verified.

CONODONT BIOSTRATIGRAPHY: *Phragmodus* - *Plectodina* Zone fauna from 1115 to 1205 m. Not zoned from 1215 to 1385 m. From 1395 to 1465 probably representing *Histiodella holodentata* Zone, but *H. holodentata* not identified. Not zoned from 1465 to 1705 m. Probably *Oepikodus communis* Zone from 1715 to 1745 m. *P. elegans* - *B. extensus* Zone from 1755 to TD.

CAI: Max CAI = 2-3 at 1755 m.

COMMENTS: Would need to see samples to be happy with some of the identifications, for example *Oepikodus communis* at 1535 m and *Oepikodus evae* at 1715 m.

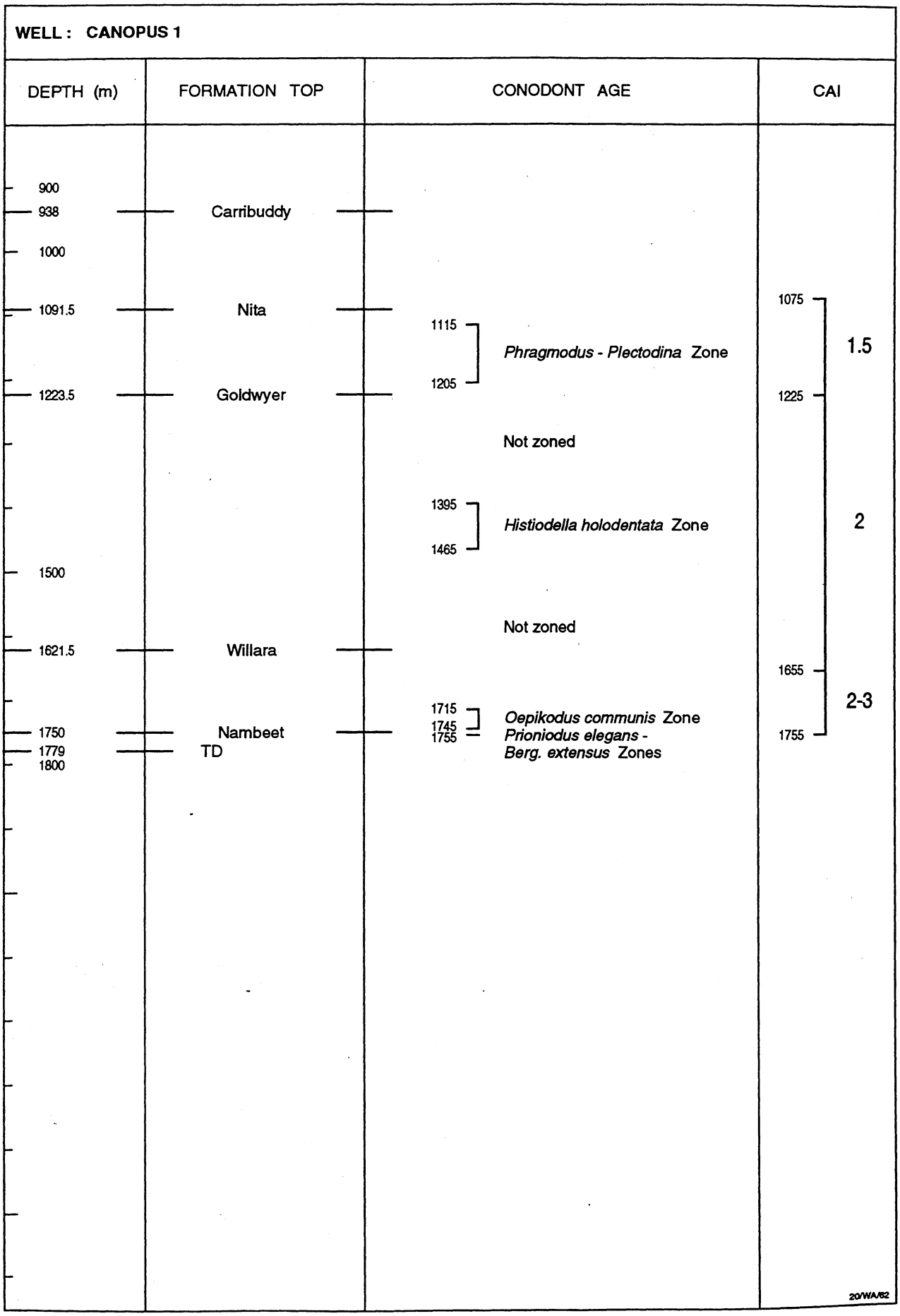
| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** 938.0-1091.5 | | | |
| 1065 | - | 0 | |
| 1075 | **1.5** | 1 | sp. indet. |
| 1085 | - | 0 | |
| **NITA FORMATION** 1091.5-1223.5 | | | |
| 1095 | **1.5** | 1 | sp. indet. |
| 1105 | **1.5** | 1 | sp. indet. |
| 1115 | **1.5** | 2 | *Phragmodus flexuous* |
| 1125 | **1.5** | 2 | *Plectodina aculeata* |
| 1135 | - | 0 | |
| 1145 | - | 0 | |
| 1155 | - | 0 | |
| 1165 | **1.5** | 2 | *Phragmodus flexuosus* |

| | | | |
|---|---|---|---|
| 1175 | **1.5** | 2 | *Ptiloconus strachanognathus* |
| 1185 | **1.5** | 5 | *Oistodus* |
| 1195 | - | 0 | |
| 1205 | **1.5** | 16 | *Cordylodus*<br>*Phragmodus flexuosus* |
| 1215 | **1.5** | 14 | sp. indet. |
| **GOLDWYER FORMATION** 1223.5-1621.5 | | | |
| 1225 | **1.5** | 2 | sp. indet. |
| 1235 | **2** | 1 | *Staufferella* sp. |
| 1245 | - | 0 | |
| 1255 | - | 0 | |
| 1265 | - | 0 | |
| 1275 | **2** | 4 | *Drepanoistodus basiovalis*<br>*Erismodus* |
| 1285 | - | 0 | |
| 1295 | **2** | 1 | sp. indet. |
| 1305 | **2** | 4 | *Drepanoistodus basiovalis* |
| 1315 | **2** | 2 | sp. indet. |
| 1325 | - | 0 | |
| 1335 | **2** | 1 | sp. indet. |
| 1345 | **2** | 6 | *Drepanoistodus basiovalis* |
| 1355 | - | 0 | |

| | | | |
|---|---|---|---|
| 1365 | **2** | 1 | sp. indet. |
| 1375 | - | 0 | |
| 1385 | **2** | 1 | sp. indet. |
| 1395 | **2** | 5 | *Eoplacognathus suecicus* |
| 1405 | **2** | 3 | *Phragmodus flexuosus* |
| 1415 | **2** | 1 | sp. indet. |
| 1425 | - | 0 | |
| 1435 | **2** | 1 | sp. indet. |
| 1445 | - | 0 | |
| 1455 | **2** | 1 | *Eoplacognathus suecicus* |
| 1465 | - | 0 | |
| 1475 | **2** | 2 | sp. indet. |
| 1485 | - | 0 | |
| 1495 | **2** | 5 | *Drepanoistodus forceps*<br>*Protopanderodus gradatus* |
| 1505 | **2** | 1 | sp. indet. |
| 1515 | **2** | 2 | sp. indet. |
| 1525 | **2** | 4 | sp. indet. |
| 1535 | **2** | 2 | *Oepikodus communis* |
| 1545 | **2** | 2 | *Drepanodus sculponea* |

| | | | |
|---|---|---|---|
| 1555 | - | 1 | sp. indet. |
| 1565 | **2** | 1 | sp. indet. |
| 1575 | **2** | 2 | sp. indet. |
| 1585 | - | 0 | |
| 1595 | - | 0 | |
| 1605 | **2** | 1 | *Oistodus contractus* |
| 1615 | **2** | 4 | *Scolopodus gracilis* |
| **WILLARA FORMATION** 1621.5-1750 | | | |
| 1625 | **2** | 1 | sp. indet. |
| 1635 | **2** | 1 | *Scolopodus* sp. |
| 1645 | - | 0 | |
| 1655 | **2** | 10 | sp. indet. |
| 1665 | **2-3** | 2 | sp. indet. |
| 1675 | **2-3** | 4 | sp. indet. |
| 1685 | **2-3** | 3 | sp. indet. |
| 1695 | - | 0 | |
| 1705 | **2-3** | 5 | sp. indet. |
| 1715 | **2-3** | 10 | *Oepikodus evae*<br>*Periodon flabelum* |
| 1725 | **2-3** | 6 | sp. indet. |
| 1735 | **2-3** | 3 | *Drepanoistodus forceps* |
| 1745 | **2-3** | 2 | *Juanognathus variabilis* |
| NAMBEET FORMATION 1750-1779=TD | | | |
| 1755 | **2-3** | 2 | *Scolopodus peselephantis* |

**WELL : CANOPUS 1**



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **CARINA 1**

CONODONT BIOSTRATIGRAPHY: The Paltech Pty Ltd samples are of limited use, but the identification of an element of *Eoplacognathus* in sample 1580 m places this interval in the *Phragmodus-Plectodina* Zone. The Savage samples yielded no useful biostratigraphic result.

CAI: Max CAI = 2 at 1670 m.

COMMENTS: Two sets of samples from Carina No. 1 have been examined for conodont determination. Savage examined 13 samples in the interval 1000 - 1670 m, recovered only fragments of elements and was not able to identify any element to generic level. Paltech Pty Ltd examined 7 samples in the same interval and recovered identifiable conodonts from three samples; 1520, 1580 and 1670 m. If they can be located, both sets of samples should be re-examined.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| (S after depth indicates data from Savage, P = data from Paltech) | | | |
| **CARRIBUDDY GROUP** 694.0-1472.8 m | | | |
| 1000 S | - | 0 | |
| 1000 P | - | 0 | |
| **NITA FORMATION** 1472.8-1550.8 m | | | |
| 1480-1490 S | - | 0 | |
| 1500 S | **2** | 1 | sp. indet. |
| 1500 P | - | 0 | |
| 1510 S | **2** | 3 | sp. indet. |
| 1510-1520 S | **2** | 2 | sp. indet. |
| 1520 P | **2** | 1 | *Scolopodus* sp. |
| 1520-1530 S | - | 0 | |
| 1530-1540 S | - | 0 | |

| | | | |
|---|---|---|---|
| 1540 P | - | 0 | |
| 1540-1550 S | - | 0 | |
| **GOLDWYER FORMATION** | 1550.8-1603 m | =TD. | |
| 1550-1560 S | **2** | 5 | sp. indet. |
| 1570-1580 S | **2** | 2 | sp. indet. |
| 1580 P | **2** | 20 | *Cordylodus* sp.<br>*Eoplacognathus* sp.<br>*Oepikodus* sp.<br>*Prioniodus* sp. |
| 1580-1590 S | **2** | 2 | sp. indet. |
| 1590-1600 S | **2** | 5 | sp. indet. |
| 1670 S | **2** | 7 | sp. indet. |
| 1670 P | **2** | 3 | *Drepanoistodus* sp.<br>*Panderodus unicostatus*<br>sp. indet. |

**WELL : CARINA 1**

| DEPTH (m) | FORMATION TOP | CONODONT AGE | CAI |
|---|---|---|---|
| 684 | Carribuddy | | |
| 700 | | | |
| 1000 | | | |
| 1473 | Nita | | |
| 1500 | | | 1500 |
| 1551 | Goldwyer | | 2 |
| | | 1580 — *Phragmodus - Plectodina* Zone | |
| 1603 | TD | | 1603 |
| 1700 | | | |

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CANNING BASIN CONODONT IDENTIFICATIONS

WELL **CONTENTION HEIGHTS 1**

CONODONT BIOSTRATIGRAPHY: Samples in the interval 1341-1463 belong to the *Phragmodus-Plectodina* Zone. Sample 1463.4-1493.9 m has a *Histiodella holodentata* Zone fauna, including the name giver. Samples from the interval 1478-1585 m have a fauna that probably is indicative of the *Jumudontus gananda* Zone.

CAI: Max CAI = 1.5 at 1585 m.

COMMENTS: I question the stratigraphic picks used below. The fauna in the interval 1341 to 1463 m is associated with the upper Goldwyer Formation through Nita Formation interval. The fauna from the sample 1463.4-1493.9 is found in the lower part of the Goldwyer Formation. The fauna from samples in the interval 1478 to 1585 would be found in the Willara Formation.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| [stratigraphic picks from GSWA data sheets] | | | |
| **CARRIBUDDY GROUP** 911-1343 m | | | |
| no samples | | | |
| **NITA FORMATION** | | | |
| not recognised | | | |
| **GOLDWYER FORMATION** 1343-1580 m | | | |
| 4400-4500' (1341.5-1372.0 m) | **1** | 5 | ?*Plectodina* sp.<br>?*Protopanderodus* indt. fragments |
| 4450-4650' (1356.7-1417.7 m) | **1** | 10 | indt. fragments |
| 4500-4600' (1372.0-1402.4 m) | **1** | 2 | ?*Plectodina* sp. |
| 4600-4700' (1402.4-1432.9 m) | **1** | 5 | *Plectodina* sp.<br>*Phragmodus polystrophos*<br>indt. fragments |
| 4650-4850' (1417.7-1478.7 m) | **1** | 11 | ?*Phragmodus* sp<br>indt. fragments |

| | | | |
|---|---|---|---|
| 4700-4800' (1432.9-1463.4 m) | **1** | 16 | *Erraticodon* sp.<br>*Phragmodus polystrophos*<br>*Trigonodus* sp.<br>indt. fragments |
| 4800-4900' (1463.4-1493.9 m) | **1** | 52 | *Ansella* sp.<br>*Erraticodon* sp.<br>*Histiodella holodentata*<br>*Juanognathus* sp.<br>*Phragmodus spicatus*<br>*Trigonodus* sp. |
| 4850-5050' (1478.7-1539.6 m) | **1.5** | 112 | *Ansella* sp.<br>*Drepanoistodus pitjanti*<br>*Erraticodon* cf. *E. patu*<br>?*Plectodina* sp.<br>*Trigonodus larapintinensis* |
| 5000-5100' (1524.4-1554.9 m) | **1.5** | 20 | *Aphelognathus* sp.<br>*Drepanoistodus* sp.<br>*Erraticodon* sp.<br>*Trigonodus* sp. |
| 5050-5150' (1539.6-1570.1 m) | **1.5** | 140 | *Erraticodon* sp<br>*Plectodina* sp.<br>*Trigonodus larapintinensis* |
| 5100-5200' (1554.9-1585.4 m) | **1.5** | 6 | indt. fragments |

**WILLARA FORMATION**

not recognised

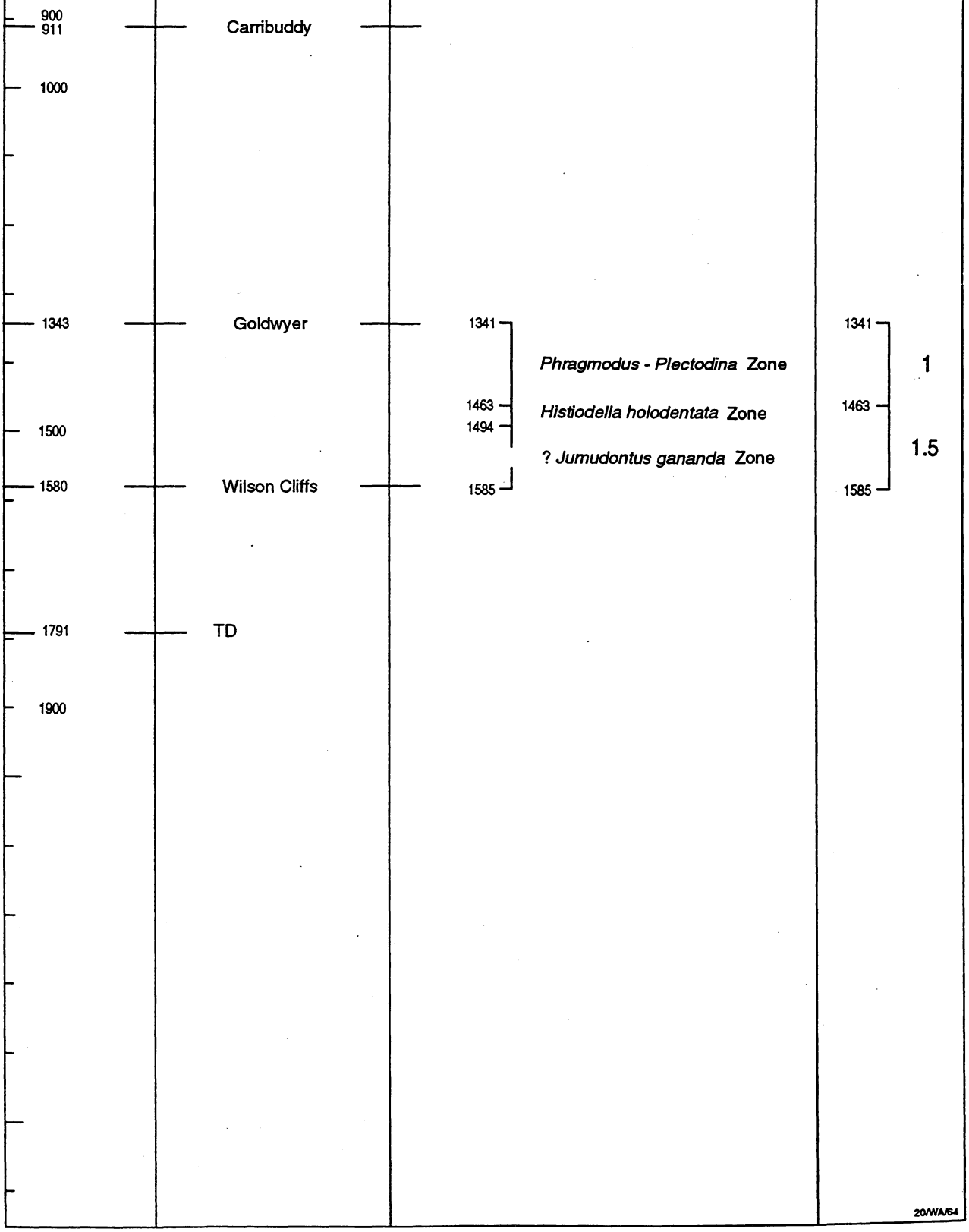
**NAMBEET FORMATION**

not recognised

**WILSON CLIFFS SANDSTONE** 1580-1791 (TD)

no samples

**WELL : CONTENTION HEIGHTS 1**



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **CUDALGARRA 1**

CONODONT BIOSTRATIGRAPHY: Conodont fauna not adequate for purposes of zonation.

CAI: Max CAI = 2.5 at 1700 m.

COMMENTS: Samples held by Norm Savage. Probably not useful for biostratigraphic purposes. The zones of mineralization in this well may have changed the CAI value of the conodonts. This needs to be investigated.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** 1174.0-1330.0 | | | |
| **NITA FORMATION** 1330.0-1408.5 | | | |
| **GOLDWYER FORMATION - WILLARA FORMATION** 1408.5-1703 =TD | | | |
| 1620 | - | 0 | |
| 1640 | - | 0 | |
| 1660 | **2-3** | 8 | *sp. indet.* |
| 1680 | **2-3** | 2 | *sp. indet.* |
| 1700 | **2-3** | 4 | *Drepanoistodus forceps*<br>*Panderodus* sp. |

**WELL : CUDALGARRA 1**

| DEPTH (m) | FORMATION TOP | CONODONT AGE | CAI |
|---|---|---|---|
| 1174<br>1200 | Carribuddy | | |
| 1330 | Nita | | |
| 1409 ? | ? Admiral Bay Carbonate Group | | |
| 1500 | | No samples examined | |
| 1703 | TD | Fauna probably not diagnostic | 1660<br>1700 2-3 |
| 1800 | | | |

20/WA/65

CANNING BASIN CONODONT IDENTIFICATIONS

WELL **DODONEA 1**

CONODONT BIOSTRATIGRAPHY: *Phragmodus* - *Plectodina* Zone fauna is found in samples from 1544 to 1549 m. Sample from 2040 m cannot be dated.

CAI: Max CAI = 2 at 2040 m.

COMMENTS: Only three samples appear to have been processed.

| Depth | CAI value | Conodont abundance | Identification |
|---|---|---|---|
| 1544.66-1545.0 | **1** | 15 | *Erraticodon* sp.<br>*Onyxodus acuoliratus* |
| 1548.5-1549.0 | **1** | 21 | *Erraticodon balticus*<br>*Phragmodus* sp.<br>*Onyxodus acuoliratus* |
| 2040.5-2040.6 | **2** | 2 | sp. indet. |

**WELL : DODONEA 1**

| DEPTH (m) | FORMATION TOP | CONODONT AGE | CAI |
|---|---|---|---|
| 1200 | | | |
| 1411 | Carribuddy | | |
| 1500 | | | |
| 1527 | Goldwyer | 1544 – 1549 *Phragmodus - Plectodina* Zone | 1544 – 1549 1 |
| 1746 | Willara | | |
| 1910 | Nambeet | | |
| 2000 | | 2040 Sample not zoned | 2040 2 |
| 2185 | Basement | | |
| 2215 | TD | | |

20/WA/66

CANNING BASIN CONODONT IDENTIFICATIONS

WELL **EDGAR RANGE 1**

CONODONT BIOSTRATIGRAPHY: The *Phragmodus - Plectodina* Zone is present is the Nita Formation (core 4). The *Histiodella holodentata* Zone is well developed only in the top of the Willara Formation (core 9). The fauna from cores 10 and 11 are not diagnostic but probably are from the undifferentiated *Histiodella altifrons* and *Jumudontus gananda* Zones. The *Oepikodus communis* Zone is well developed between 1682 and 1786 m.

CAI: Max CAI 3 at 1785 m.

COMMENTS: *Phragmodus - Plectodina* Zone in Nita Formation is well defined. The Goldwyer Formation (cores 5 and 6) lack diagnostic elements, but the combination of *Histiodella holodentata*, and *Prioniodus alatus* in the upper part of the Willara Formation is indicative of the lower part of the *Histiodella holodentata* Zone. is well defined. The *Oepikodus communis* Zone is well developed in cores 12 and 13.

**NITA FORMATION** 2462-3025' (750.6-922.6 m)

| | | | |
|---|---|---|---|
| core 3<br>2737-2747'<br>(834.5-837.5 m) | **1** | 2 | indt. frags. |
| core 4<br>2747-2753.5'<br>(837.5-839.5 m) | **1** | 20 | *Juanognathus* sp.<br>*Plectodina onychodonta*<br>*Protopanderodus nogamii* |
| 2762.7-2767'<br>(842.0-843.6 m) | **1** | 8 | *Plectodina onychodonta* |

**GOLDWYER FORMATION** 3025-4438' (922.6-1353.0 m)

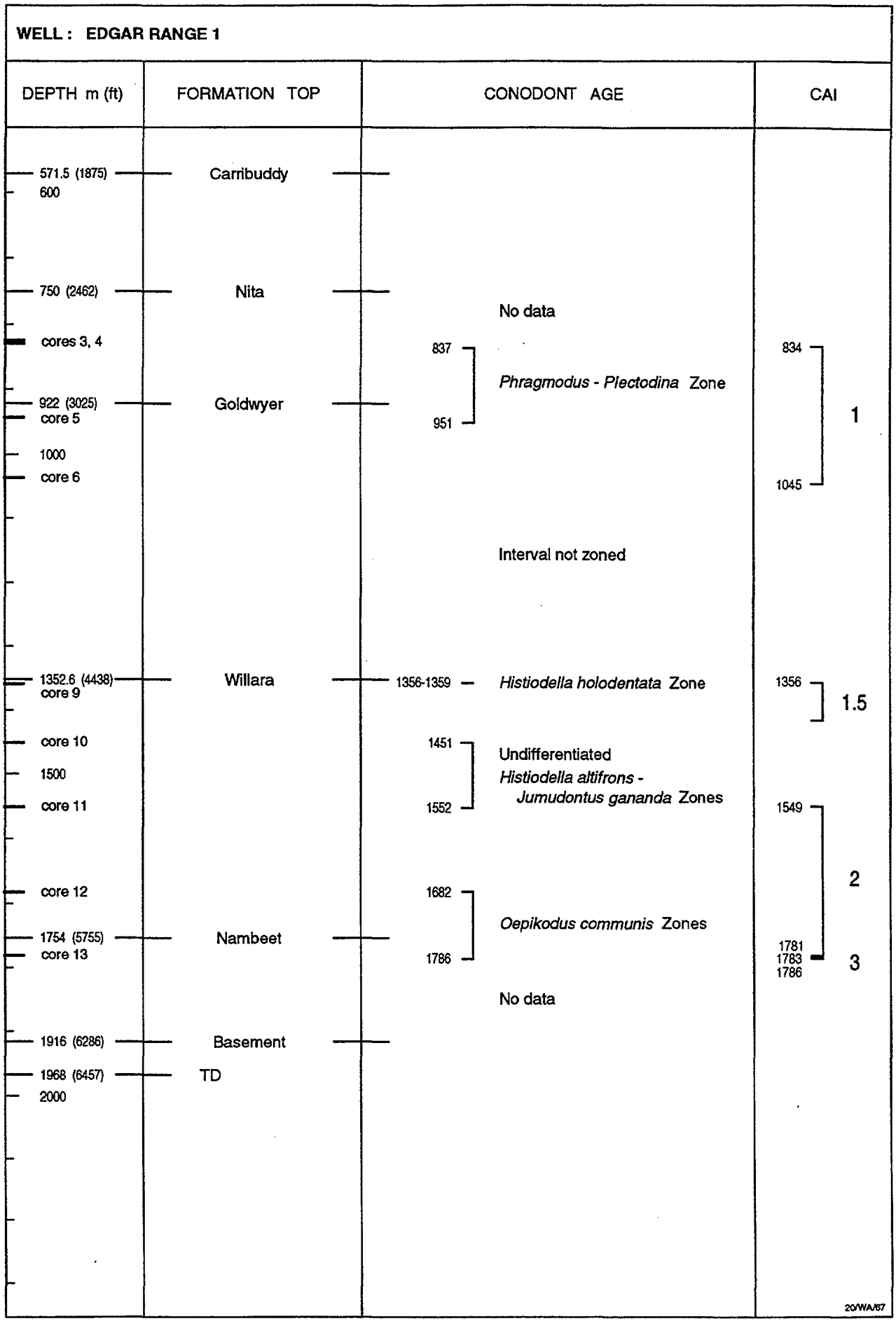
| | | | |
|---|---|---|---|
| core 5<br>3115-3120'<br>(949.7-951.2 m) | ? | 10 | *Eoplacognathus* sp. indt.<br>*Oistodella* sp.<br>*Protopanderodus nogamii* |
| core 6<br>3420-3429'<br>(1042.7-1045.4 m) | **1** | 2 | *Drepanoistodus* sp. indt. |

**WILLARA FORMATION** 4438-5755' (1353.0-1754.6 m)

| | | | |
|---|---|---|---|
| core 9<br>4450-4460'<br>(1356.7-1359.8 m) | **1.5** | 240 | *Ansella*<br>*Drepanoistodus pitjanti*<br>*Histiodella holodentata*<br>*Juanognathus leptosomatus*<br>*Microzarkodina marathonensis*<br>*Prioniodus alatus*<br>*Protopanderodus gradatus*<br>*Protopanderodus nogamii*<br>*Protoprioniodus histion*<br>*Trigonodus larapintinensis* |
| core 10<br>4760-4770'<br>(1451.2-1454.3 m) | ? | 2 | ?*Trigonodus* sp. |
| core 11<br>5082-5092'<br>(1549.4-1552.4 m) | **2** | 38 | *Protopanderodus nogamii*<br>*Protoprioniodus nyinti*<br>?*Scolopodus* sp.<br>*Trigonodus larapintinenses* |
| core 12<br>5517-5523'<br>(1682.0-1683.8 m) | **2** | 60 | *Drepanoistodus* sp.<br>*Oepikodus communis*<br>*Protopanderodus* cf. *gradatus*<br>*Protoprioniodus* sp. |

**NAMBEET FORMATION** 5755-6286' (1754.6-1916.5 m)

| | | | |
|---|---|---|---|
| core 13<br>5835-5842'<br>(1779.0-1781.1 m) | **2** | 74 | *Bergstroemognathus* sp.<br>*Drepanoistodus* sp.p<br>*Oepikodus communis*<br>*Protopanderodus nogamii*<br>*Protoprioniodus* sp |
| 5849.5-5858'<br>(1783.4-1786.0 m) | **3** | 215 | *Bergstroemognathus hubeiensis*<br>*Drepanoistodus* sp.p<br>*Oepikodus communis*<br>*Protopanderodus nogamii*<br>*Protoprioniodus* sp |



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **FRANKENSTEIN 1**

CONODONT BIOSTRATIGRAPHY: Unzoned Ordovician in the lower part of the Carribuddy Group (1795-2000 m). No data yet from Nita Formation, but *Phragmodus - Plectodina* Zone in samples from upper part of the Goldwyer Formation. *Histiodella holodentata* Zone from 2351 to 2414 m. From 2420 to 2537 the faunas examined are not diagnostic, but in the sample 2537-2543 a good *Jumudontus gananda* Zone fauna was recovered. From 2645 to 2675 the fauna is indicative of the *Prioniodus elegans - Bergstroemognathus extensus* Zone. No elements of the *Oepikodus communis* fauna have thus far been identified.

CAI: Max CAI = 2 at 2675 m.

COMMENTS: The few conodont elements recovered from the interval 1795 to 2000 m, in the lower part of the Carribuddy Group are the best direct conodont evidence of both the marine nature of this part of the unit and its Ordovician age.(((CHECK THIS) The elements are similar to elements from the same interval in the Contention Heights well ))). There is no effective age control on the interval between 2420 and 2537 m, but the *Jumudontus gananda* Zone fauna is distinctive. Again there is no age control on the interval 2543 to 2645 m, but the good fauna in the interval 2645-2651 is diagnostic of the *Prioniodus elegans - Bergstroemognathus extensus* Zone.

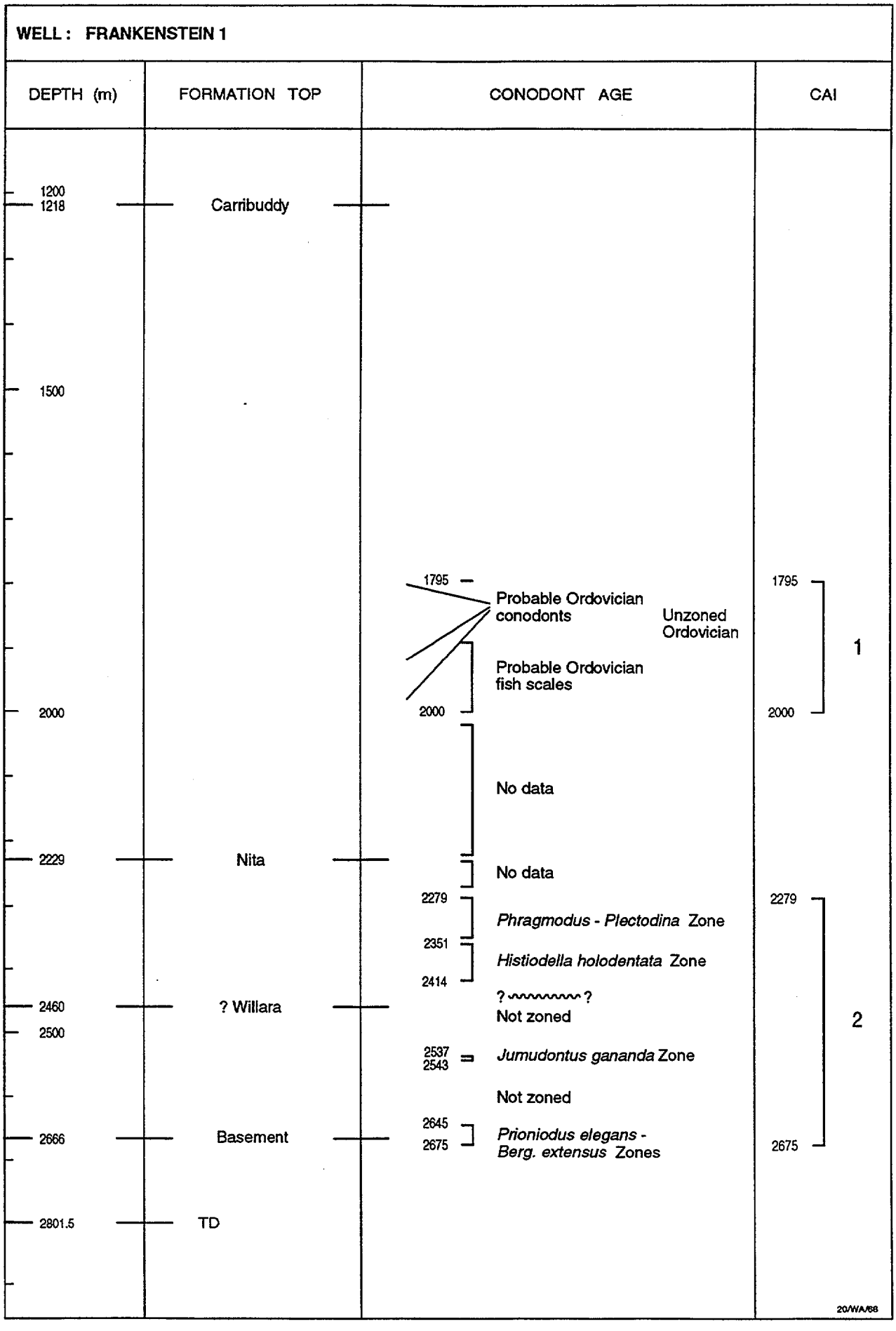
| DEPTH | WEIGHT(Kg) | ABUNDANCE | CAI |
|---|---|---|---|
| **CARRIBUDDY GROUP** | 1218-2229 m | | |
| 1765-1770 | 0.330 | 0 | - |
| 1770-1775 | 0.400 | 0 | - |
| 1775-1780 | 0.335 | 0 | - |
| 1780-1785 | 0.565 | 0 | - |
| 1785-1790 | 0.470 | 0 | - |
| 1790-1795 | 0.375 | 0 | - |
| 1795-1800 | 0.440 | 1 indt. element fragment | 1 |
| 1800-1805 | 0.445 | 1 indt. element fragment | 1 |
| 1805-1810 | 0.455 | 0 | - |

| | | | | |
|---|---|---|---|---|
| 1810-1815 | 0.500 | | 0 | - |
| 1815-1820 | 0.250 | | 0 | - |
| 1820-1825 | 0.340 | | 0 | - |
| 1825-1830 | 0.370 | | 0 | - |
| 1830-1835 | 0.335 | | 0 | - |
| 1835-1840 | 0.320 | | 0 | - |
| 1840-1845 | 0.340 | | 0 | - |
| 1845-1850 | 0.300 | | 0 | - |
| 1850-1855 | 0.410 | | 0 | - |
| 1855-1860 | 0.340 | | 0 | - |
| 1860-1865 | 0.290 | | 0 | - |
| 1865-1870 | 0.365 | | 0 | - |
| 1870-1875 | 0.500 | | 0 | - |
| 1875-1880 | 0.445 | | 0 | - |
| 1880-1885 | 0.370 | | 0 | - |
| 1885-1890 | 0.340 | | 0 | - |
| 1890-1895 | 0.510 | indt. phosphatic fragment (1) | 0 | - |
| 1895-1900 | 0.350 | | 0 | - |
| 1900-1905 | 0.360 | | 0 | - |
| 1905-1910 | 0.360 | | 0 | - |
| 1910-1915 | 0.400 | indt. phosphatic fragment (1) | 0 | - |
| 1915-1920 | 0.380 | | 0 | - |
| 1920-1925 | 0.475 | indt. phosphatic fragment (2) | 0 | - |
| 1925-1930 | 0.400 | | 0 | - |
| 1930-1935 | 0.410 | indt. coniform element<br>indt. phosphatic fragment (2) | 1 | 1 |

| | | | | |
|---|---|---|---|---|
| 1935-1940 | 0.415 | | 0 | - |
| | | indt. phosphatic fragment (1) | | |
| 1940-1945 | 0.340 | | 0 | - |
| 1945-1950 | 0.400 | | 0 | - |
| 1950-1955 | 0.325 | | 0 | - |
| | | indt. phosphatic fragment (1) | | |
| 1955-1960 | 0.420 | | 0 | - |
| | | indt. phosphatic fragment (3) | | |
| 1965-1970 | 0.380 | | 0 | - |
| | | indt. phosphatic fragment (6) | | |
| 1970-1975 | 0.420 | | 0 | - |
| | | indt. phosphatic fragment (2) | | |
| 1975-1980 | 0.335 | | 0 | - |
| | | indt. phosphatic fragment (6) | | |
| 1980-1985 | 0.330 | | 0 | - |
| 1885-1990 | 0.385 | | 0 | - |
| 1990-1995 | 0.490 | | 0 | - |
| 1995-2000 | 0.505 | | 1 | 1 ? |
| | | indt. element | | |
| | | indt. phosphatic fragment (2) | | |
| 2000-2005 | 0.350 | | 0 | - |
| | | indt. phosphatic fragment (1) | | |
| 2005-2010 | 0.410 | | 0 | - |
| 2010-2015 | 0.350 | | 0 | - |
| **NITA FORMATION** | 2229-2460 m | | | |
| 2279-2285 | 0.445 | | 20 | 2 |
| | | *Phragmodus* sp. indt. | | |
| 2285-2291 | 0.400 | | 31 | 2 |
| | | *Phragmodus* sp. indt. | | |
| | | *Drepanodus* sp. indt. | | |
| 2291-2297 | 0.375 | | 35 | 2 |
| | | *Phragmodus polystrophos* | | |
| | | *Plectodina* sp. indt. | | |
| | | *Eoplacognathus* sp. indt. | | |

| | | | |
|---|---|---|---|
| 2297-2303 | 0.445 | 73 | 2 |
| | | *Plectodina* sp. indt. | |
| | | *Phragmodus* sp. indt. | |
| | | *'Eopanderodus'* | |
| 2303-2309 | 0.420 | 70 | 2 |
| | | *Phragmodus* sp. indt. | |
| | | *'Eopanderodus'* spp. | |
| 2309-2315 | 0.375 | 44 | 2 |
| | | *Phragmodus* sp. indt. | |
| 2315-2321 | 0.300 | 50 | 2 |
| | | *Phragmodus* sp. indt. | |
| | | *Drepanodus* sp. | |
| | | *'Eopanderodus'* spp. | |
| | | ?*Histiodella* sp. indt. | |
| 2321-2327 | 0.530 | 54 | 2 |
| | | *Plectodina* sp. indt. | |
| 2327-2333 | 0.600 | 55 | 2 |
| | | *Phragmodus* sp. indt. | |
| | | *'Eopanderodus'* spp. | |
| 2333-2339 | 0.425 | 83 | 2 |
| | | *Phragmodus polystrophos* | |
| | | *'Eopanderodus'* spp. | |
| 2345-2351 | 0.380 | 103 | 2 |
| | | *Drepanodus* spp | |
| | | *Phragmodus* sp. indt. | |
| | | *'Eopanderodus'* spp. | |
| | | *Scalpellodus* cf. *latus* | |
| 2351-2357 | 0.400 | 104 | 2 |
| | | *Histiodella* cf. *holodentata* | |
| | | *Plectodina* cf. *onychodonta* | |
| | | *'Eopanderodus'* spp. | |
| | | ?*Erraticodon* sp. | |
| | | *Drepanodus* sp. | |
| 2357-2363 | 0.455 | | |
| 2393-2402 | 0.290 | 59 | 2 |
| | | *Drepanodus* "post"*pitjanti* | |
| | | *Trigonodus larapintinensis* | |
| | | *Histiodella* cf. *holodentata* | |
| 2402-2408 | 0.330 | 22 | 2 |
| | | *Phragmodus* sp. indt. | |
| | | *Drepanodus* "post"*pitjanti* | |

| | | | | |
|---|---|---|---|---|
| 2408-2414 | 0.335 | | 37 | 2 |
| | | *Phragmodus* sp. indt. | | |
| | | *'Eopanderodus'* spp. | | |
| | | ?*Histiodella* sp. indt. | | |
| 2414-2420 | 0.355 | | 54 | 2 |
| | | *Histiodella holodentata* | | |
| | | *Phragmodus* sp. indt. | | |
| | | *'Eopanderodus'* spp. | | |
| 2420-2426 | 0.480 | | 52 | 2 |
| | | *Phragmodus* sp. indt. | | |
| **WILLARA FORMATION** | | 2460-26666 m =TD. | | |
| 2519-2525 | 0.560 | | 178 | 2 |
| | | *Erraticodon* sp. indt. | | |
| | | *Trigonodus larapintinensis* | | |
| 2525-2531 | 0.595 | | | |
| 2531-2537 | 0.390 | | | |
| 2537-2543 | 0.515 | **** | 389+ | 2 |
| | | *Bergstroemognathus hubeiensis* | | |
| | | *Prioniodus amadeus* | | |
| | | *Protoprioniodus aranda* | | |
| | | *Erraticodon* | | |
| | | *Jumudontus gananda* | | |
| 2645-2651 | 0.515 | | 347 | 2 |
| | | *Bergstroemognathus extensus* | | |
| | | *Acodus emanuelensis* | | |
| | | *Paroistodus parallelus* | | |
| | | *Acodus deltatus* | | |
| 2657-2663 | 0.270 | | 237 | 2 |
| | | *Bergstromognathus extensus* | | |
| | | *Acodus deltatus* | | |
| | | *Paroistodus parallelus* | | |
| | | *Scolopodus rex* | | |
| 2663-2669 | 0.445 | **** | 127 | 2 |
| | | *Prioniodus* sp. | | |
| 2669-2675 | 0.325 | | 83 | 2 |
| | | *Cornuodus longibasis* | | |
| | | *Prioniodus* sp. | | |



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **GINGERAH HILL 1**

CONODONT BIOSTRATIGRAPHY: Devonian, probably Middle or Late.

CAI: Max CAI = 1.5 at 800 m

COMMENTS: The three conodont elements recovered in sample 800.5-801.5 are ramiform elements and are most probably part of a Devonian conodont apparatus. No precise age can be ascribed to the specimens, but they are most definately not Ordovician and almost certainly not Silurian in age. An associated fish fauna confirms a Devonian age.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** | | | |
| 800.5-801.5 m GH1/A01 | **1.5** | 3 | sp. indet. |
| 816.0-817.0 m GH1/A02 | - | 0 | |
| 827.9-828.9 m GH1/A03 | - | 0 | |
| 851.6-852.6 m GH1/A04 | - | 0 | |
| 868.4-869.4 m GH1/A05 | - | 0 | |
| 889.9-890.9 m GH1/A06 | - | 0 | |
| 910.5-911.5 m GH1/A07 | - | 0 | |
| 929.3-930.3 m GH1/A08 | - | 0 | |
| 950.0-951 0 m GH1/A09 | - | 0 | |
| 961 5-962.5 m GH1/A10 | - | 0 | |

| WELL : GINGERAH HILL 1 | | | |
|---|---|---|---|
| DEPTH (m) | FORMATION TOP | CONODONT AGE | CAI |
| 500 | Carribuddy | 800 — Devonian conodonts | — 1.5 |
| 1000 | | | |

20/WA/69

CANNING BASIN CONODONT IDENTIFICATIONS

WELL **GOLDWYER 1**

CONODONT BIOSTRATIGRAPHY: The *Phragmodus - Plectodina* Zone is recorded in core 1 (874-876 m) and core 2 (899-904 m) contains the *Histiodella holodentata* Zone fauna, which extends down to core 10 (983 m). No diagnostic specimens were recovered between 984 and 1083 m. The fauna from 1084 to 1350 represents an undifferentiated *Histiodella altifrons* and *Jumudontus gananda* Zones interval. Core 15 has an *Oepikodus communis* Zone fauna and cores 17 and 18 both have a *Prioniodus elegans - Bergstroemognathus extensus* Zone fauna.
CAI: Max CAI = 3 at 1410 m.

COMMENTS: It is unusual that a *Histiodella holodentata* Zone fauna was not located in the upper most part of the Willara Formation. Core 11 (1083-1085 m) has a resonable fauna, but no elements considered diagnostic the *Histiodella holodentata* Zone.

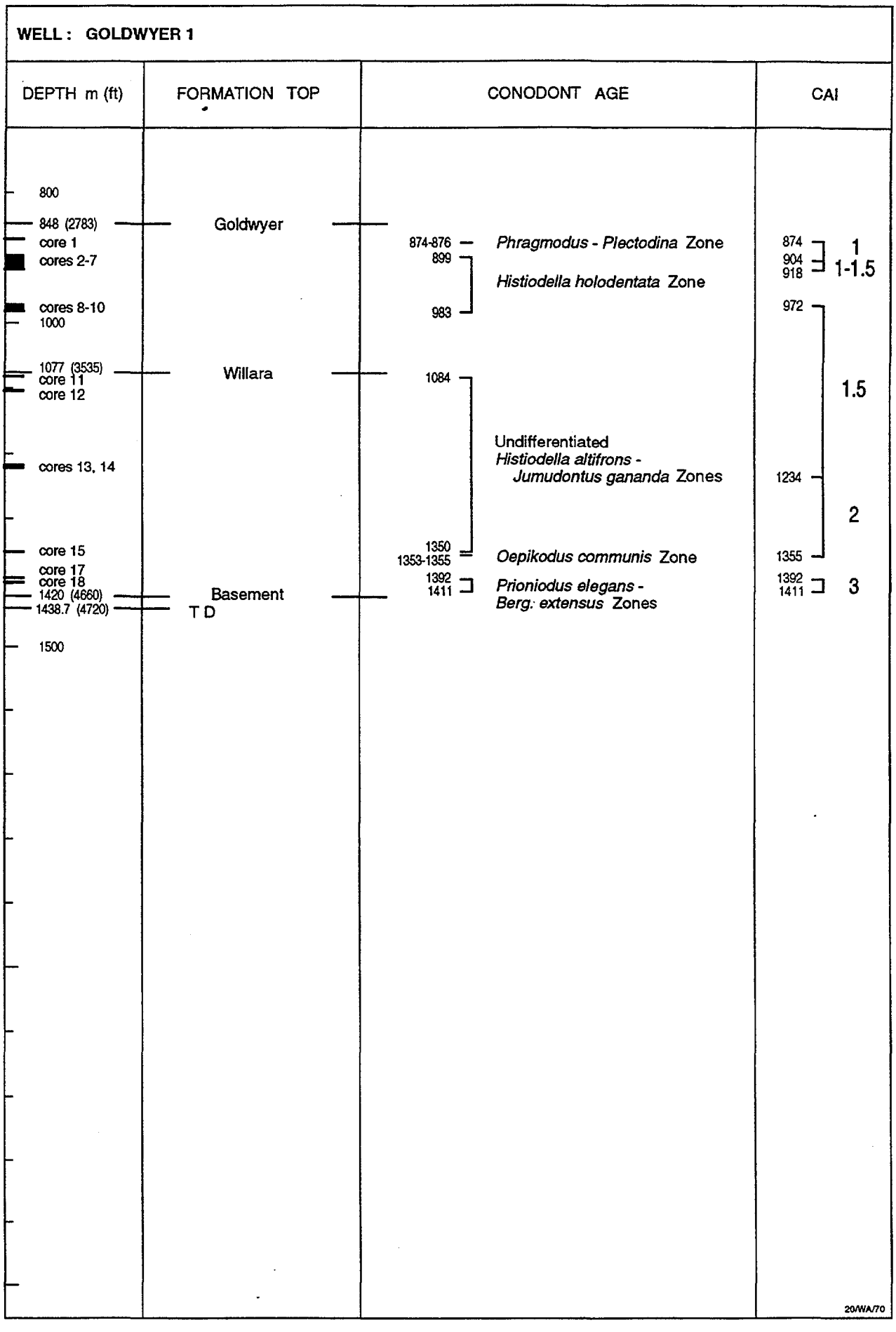
| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **GOLDWYER FORMATION** 2783-3535' (848.5-1077.7 m) | | | |
| core 1<br>2867-2876'<br>(874.1-876.8 m) | **1** | 6 | *Drepanoistodus* sp.<br>*Eoplacognathus* sp.<br>*Onyxodus acuoliratus* |
| core 2<br>2951-2965<br>(899.7-904.0 m) | **1** | 85 | *Ansella* sp.<br>*Coleodus*<br>*Drepanoistodus*<br>*Falodus keramis*<br>*Periodon aculeatus*<br>*Protopanderodus gradatus*<br>*Protopanderodus nogamii* |
| core 3<br>2965-2974'<br>(904.0-906.7 m) | **1-1.5** | 23 | *Histiodella holodentata*<br>*Protopanderodus gradatus*<br>*Protopanderodus* sp. |

| | | | |
|---|---|---|---|
| core 4<br>2974-2985'<br>(906.7-910.1 m) | **1-1.5** | 152 | |
| | | | *Ansella* sp.<br>?*Coleodus*<br>*Drepanoistodus forceps*<br>*Falodus keramis*<br>*Histrodella holodentata*<br>*Periodon aculeatus*<br>*Protopanderodus gradatus*<br>*Protopanderodus nogamii* |
| core 5<br>2985-2994'<br>(910.1-912.8 m) | **1-1.5** | 36 | |
| | | | *Acodus* sp.<br>*Ansella* sp.<br>*Drepanoistodus forceps*<br>*Histiodella holodentata*<br>*Periodon*<br>*Phragmodus spicatus*<br>*Protopanderodus gradatus* |
| core 6<br>2994-3002'<br>(912.8-915.2 m) | **1-1.5** | 32 | |
| | | | *Coelocerodontus* sp.<br>*Cornuodus* sp.<br>*Drepanoistodus forceps*<br>*Drepanoistodus* sp. nov. A<br>*Protopanderodus gradatus*<br>*Protopanderodus nogamii* |
| core 7<br>3002-3011'<br>(915.2-918.0 m) | **1-1.5** | 19 | |
| | | | *Drepanoistodus forceps*<br>*Protopanderodus gradatus*<br>*Protopanderodus nogamii* |
| 3000-3050'<br>(914.6-929.9 m) | **1.5** | 1 | |
| | | | indt. fragments |
| 3100-3150'<br>(945.1-960.4 m) | **1.5** | 1 | |
| | | | indt. fragments |

| | | | |
|---|---|---|---|
| core 8<br>3191-3201'<br>(972.9-975.9 m) | **1.5** | 99 | *Ansella* sp.<br>*Drepanoistodus forceps*<br>*Drepanoistodus* cf. *pitjanti*<br>*Falodus keramis*<br>*Histiodella holodentata*<br>*Protopanderodus gradatus*<br>*Protopanderodus nogamii*<br>*Protoprioniodus histion* |
| core 9<br>3201-3215'<br>(975.9-980.2 m) | **1.5** | 4 | indt. fragments |
| core 10<br>3215-3227'<br>(980.2-983.8 m) | **1.5** | 18 | *Ansella* sp.<br>*Drepanoistodus* cf. *pitjanti*<br>*Histiodella holodentata*<br>*Protoprioniodus histion* |
| 3250-3300'<br>(990.9-1006.1 m) | **1.5** | 2 | *Drepanoistodus* cf. *pitjanti*<br>*Periodon* sp. |
| 3350-3400'<br>(1021.3-1036.6 m) | **1.5** | 4 | indt. fragments |
| 3400-3450'<br>(1036.6-1051.8 m) | **1.5** | 4 | indt. fragments |
| 3450-3500'<br>(1051.8-1067.1 m) | **1.5** | 2 | indt. fragments |
| **WILLARA FORMATION** 3535-4660' (1077.7-1420.7 m) | | | |
| core 11<br>3555-3561'<br>(1083.8-1085.7 m) | **1.5** | 79 | *Ansella* sp.<br>*Coleodus* sp.<br>*Drepanoistodus pitjanti*<br>*Erraticodon* sp.<br>*Juanognathus leptosomatus*<br>*Protopanderodus gradatus*<br>*Protopanderodus nogamii*<br>*Trigonodus larapintinensis* |

| | | | |
|---|---|---|---|
| core 12 | | | |
| 3613-3629' (1101.5-1106.4 m) | **1.5** | 71 | *Ansella* sp.<br>*Coleodus* sp.<br>*Drepanoistodus* sp.<br>*Juanognathus leptosomatus*<br>*Protopanderodus nogamii*<br>*Trigonodus larapintinensis* |
| 3900-3950' (1189.0-1204.3 m) | **1.5** | 2 | |
| core 13 | | | |
| 3995-4013' (1218.0-1223.5 m) | **1.5** | 375 | *Ansella* sp.<br>*Coleodus* sp.<br>*Drepanoistodus pitjanti*<br>*Drepanoistodus* sp.<br>*Erraticodon* sp.<br>*Juanognathus leptosomatus*<br>*Microzarkodina* sp.<br>*Protopanderodus nogamii*<br>*Scolopodus filosus*<br>*Trigonodus larapintinensis* |
| core 14 | | | |
| 4013-4025' (1223.5-1227.1 m) | **1.5** | 336 | *Coleodus* sp.<br>*Cornuodus longibasis*<br>*Drepanoistodus pitjanti*<br>*Drepanoistodus* sp.<br>*Erraticodon* sp.<br>*Juanognathus leptosomatus*<br>*Oepikodus* sp.<br>*Protopanderodus nogamii*<br>*Scolopodus filosus*<br>*Trigonodus larapintinensis* |
| 4000-4050' (1219.5-1234.8 m) | **1.5** | 1 | ?*Periodon* sp. |
| 4050-4100' (1234.8-1250.0 m) | **2** | 2 | *Drepanoistodus* sp. |
| 4100-4150' (1250.0-1265.2 m) | - | 3 | |

| | | | |
|---|---|---|---|
| 4150-4200' (1265.2-1280.5 m) | **2** | 6 | |
| 4200-4250' (1280.5-1295.7 m) | **2** | 2 | *Drepanoistodus* sp. |
| 4250-4300' (1295.7-1311.0 m) | - | 1 | |
| 4300-4400' (1311.0-1341.5 m) | - | 1 | |
| core 15 | | | |
| 4438-4446' (1353.0-1355.5 m) | **2** | 104 | ?*Ansella* sp.<br>*Drepanoistodus*<br>*Oepikodus communis*<br>?*Periodon* sp. (M, P)<br>*Protopanderodus gradatus* |
| 4400-4450' (1341.5-1356.7 m) | **2** | 2 | |
| 4450-4500' (1356.7-1372.0 m) | ? | 1 | |
| core 17 | | | |
| 4568-4574' (1392.7-1394.5 m) | **3** | 8 | *Acodus emanuelensis*<br>*Drepanoistodus* sp. |
| 4600-4650' (1402.4-1417.7 m) | **1.5-2** | 1 | ?*Acodus emanuelensis* |
| core 18 | | | |
| 4618-4629' (1407.9-1411.3 m) | **3** | 68 | *Bergstroemognathus extensus*<br>?*Loxodus* sp. nov.<br>*Prioniodus* sp.<br>*Drepanoistodus* sp. |



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **GREVILLEA 1**

CONODONT BIOSTRATIGRAPHY: The sample at 2100 m is consistent with identifications of conodonts in the outcrop sections of the Gap Creek Formation. This sample is indicative of the *Jumudontus gananda* Zone. The sample at 2375 m has no biostratigraphic value. The sample at 2425 m is anomalous and may indicate downhole contamination. The fauna of *Bergstroemognathus extensus* and *Serratognathus bilobatus* is found in the upper part of the Emanuel Shale in the type section.

CAI: Max CAI = 2 at 2425 m.

COMMENTS: See above about downhole contamination in sample 2425 m.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **POULTON FORMATION** 1817-1953 m | | | |
| 1800 m | - | 0 | |
| 1850 m | - | 0 | |
| 1900 m | - | 0 | |
| **GAP CREEK FORMATION** 1953-2165 m | | | |
| 1950 m | - | 0 | |
| 2100 m | **2** | 9 | *Bergstroemognathus* cf *B. hubeiensis*<br>*Drepanoistodus* cf *D. pitjanti*<br>*?Trigonodus larapintinensis* |
| **EMANUEL FORMATION** 2165-2399 m | | | |
| 2250 m | - | 0 | |
| 2300 m | - | 0 | |
| 2350 m | - | 0 | |
| 2375 m | **2** | 4 | indt. fragments |

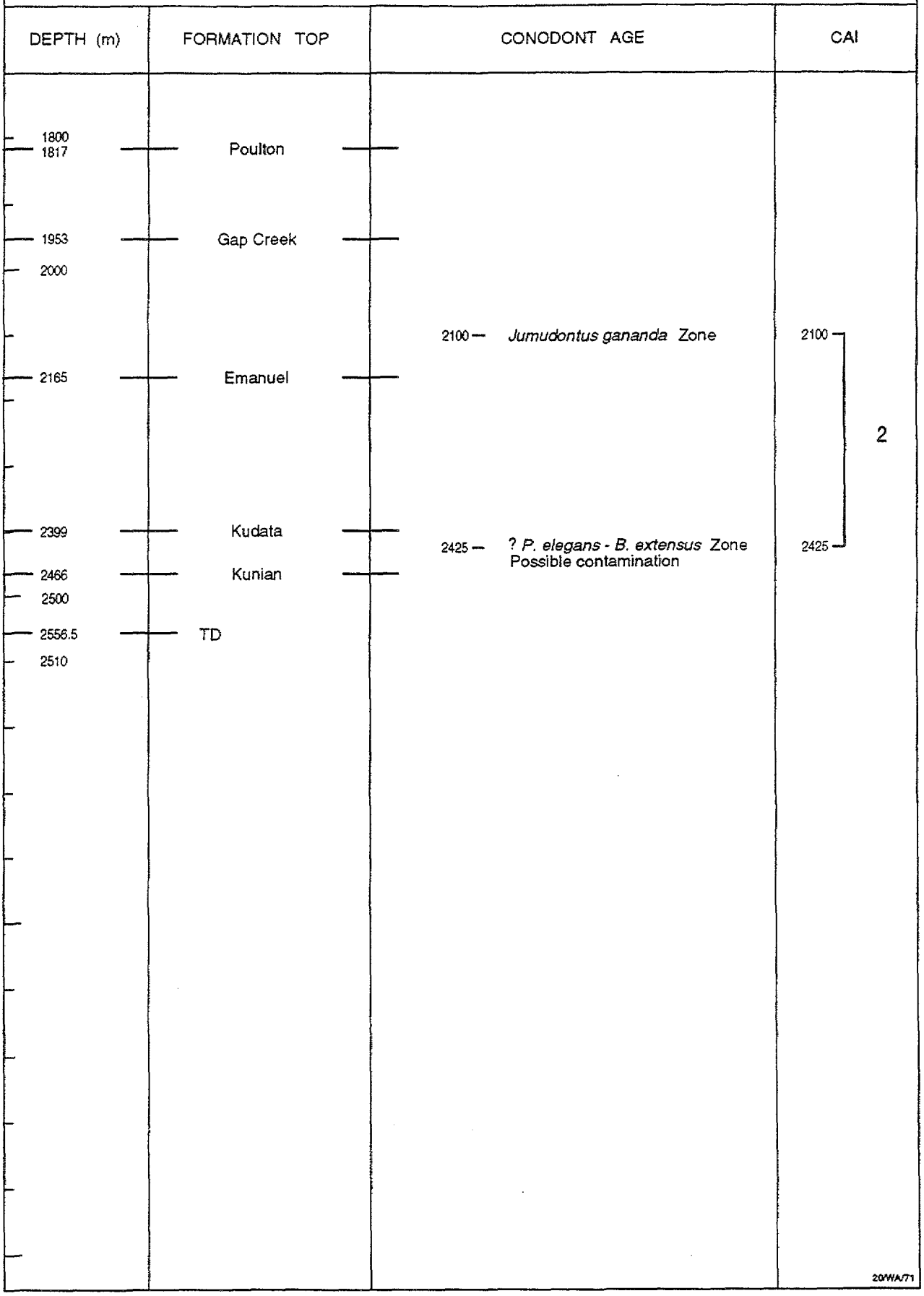
**KUDATA FORMATION** 2399-2466 m

| | | | |
|---|---|---|---|
| 2425 m | **2** | 10 | *Bergstroemognathus* cf *B. extensus*<br>*Protopanderodus* sp.<br>*Serratognathus bilobatus* |
| 2450 m | - | 0 | |

**KUNIAN SANDSTONE** 2466-2556.5 m

no samples

**WELL : GREVILLEA 1**



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **HEDONIA 1**

CONODONT BIOSTRATIGRAPHY: The interval 1471-1486 is assigned to the *Prioniodus elegans-Bergstroemognathus extensus* Zone. The interval 1441-1471 is assignable to either the *Prioniodus elegans-Bergstroemognathus extensus* Zone or the *Oepikodus communis* Zone. Specimens from higher in the well are not age diagnostic.

CAI: Max CAI = 2 at 1500 m.

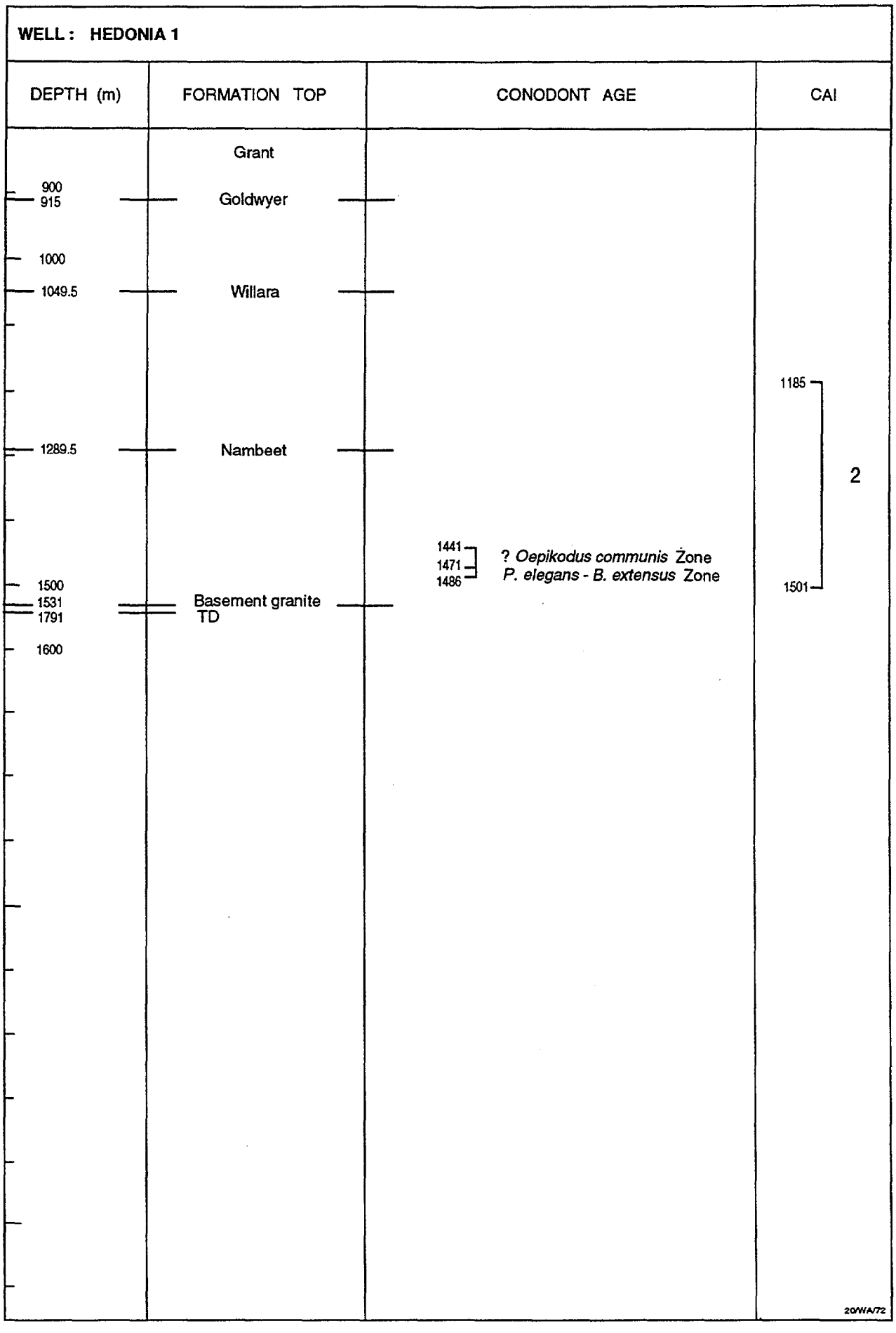
COMMENTS: This suite of samples was examined by Norm Savage and identifications have not been confirmed. The Savage identification of *Oepikodus evae* is questionable, as this species has not been found elsewhere in the basin, and this material probably should be assigned to either *Oepikodus communis* or *Prioniodus* spp. The identification of *Paroistodus parallelus* in sample 1471-1486 indicates an assignment to the *Prioniodus elegans-Bergstroemognathus extensus* Zone. If the specimens Savage has assigned to *O. evae* are assignable to *Prioniodus*, than that designation is compatible with a Nambeet pick. If the *Oepikodus* specimens are assignable to either *O. evae* or *O. communis*, than that interval should be regarded as part of the Willara Formation (*Oepikodus communis* Zone).

The fragment reported in sample 870-900 is interesting because this interval is interpreted as Grant Formation. The element would appear to be of Ordovician age. Three alternative interpretations are possible: 1. the element is reworked into the Grant Formation, 2. the Grant determination is wrong and the unit is Nita or Carribuddy, 3. the element was from lab contamination.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **GRANT GROUP** 488.5-915.5 m | | | |
| 510-541 | - | 0 | |
| 540-570 | - | 0 | |
| 550-580 | - | 0 | |
| 580-610 | - | 0 | |
| 610-640 | - | 0 | |
| 660-670 | - | 0 | |
| 670-700 | - | 0 | |
| 700-730 | - | 0 | |
| 750-780 | - | 0 | |
| 780-810 | - | 0 | |
| 810-840 | - | 0 | |
| 840-870 | - | 0 | |
| 870-900 | **2** | 1 | sp. indet. |
| 900-930 | - | 0 | |

| | | | |
|---|---|---|---|
| **GOLDWYER FORMATION** 915.5-1049.5 m | | | |
| 930-960 | - | 0 | |
| 960-990 | - | 0 | |
| 990-1020 | - | 0 | |
| 1020-1050 | - | 0 | |
| **WILLARA FORMATION** 1049.5-1289.5 m | | | |
| 1185-1216 | **2** | 6 | *Drepanoistodus forceps* sp. indet. |
| 1231-1246 | - | 0 | |
| 1246-1276 | **2** | 1 | *Protopanderodus* sp. |
| 1276-1306 | **2** | 1 | *Protopanderodus* sp. |
| **NAMBEET FORMATION** 1289.5-1531 m | | | |
| 1306-1336 | **2** | 1 | sp. indet. |
| 1336-1366 | - | 0 | |
| 1366-1396 | **2** | 1 | *Protopanderodus* sp |
| 1396-1411 | - | 0 | |
| 1411-1426 | - | 0 | |
| 1426-1441 | - | 0 | |
| 1441-1456 | **2** | 2 | *Oepikodus evae* |
| 1456-1471 | **2** | 2 | *Juanognathus variabilis* |
| 1471-1486 | **2** | 1 | *Paroistodus parallelus* |
| 1486-1501 | **2** | 1 | sp. indet. |
| 1501-1516 | - | 0 | |
| 1516-1531 | - | 0 | |
| **PRECAMBRIAN GRANITE** 1531-1543 m = TD | | | |
| 1531-1543 =TD | - | 0 | |

**WELL : HEDONIA 1**



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **KIDSON 1**

CONODONT BIOSTRATIGRAPHY: see comments

CAI: Max CAI = 3 at 4370 m

COMMENTS: This small and poorly preserved fauna does not contain elements that assist in asessing a biostratigraphic age.

| Depth (m) | value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** 8818-14040' (2688.4-4280.5 m) | | | |
| **?GOLDWYER FORMATION** 14040-14478' (4280.5-4414.0 m) | | | |
| core 21<br>14325-14334'<br>(4367.4-4370.1 m) | **3** | 30 | ?*Phragmodus* sp.<br>*Trigonodus* sp.<br>indt. fragments |
| **?WILLARA FORMATION** 14478-14539'TD (4414.0-4431 m TD) | | | |
| NO SAMPLES | | | |

**WELL : KIDSON 1**

| DEPTH (m) | FORMATION TOP | CONODONT AGE | CAI |
|---|---|---|---|
| | Carribuddy | | |
| 4100 | | | |
| 4280 | ? Goldwyer | | |
| | | 4367 — Sample not zoned | 4367 — 3 |
| 4414 | Willara | | |
| 4431 | TD | | |
| 4500 | | | |

20/WA/73

CANNING BASIN CONODONT IDENTIFICATIONS

WELL **KUNZEA 1**

CONODONT BIOSTRATIGRAPHY: The species of *?Erismodus* recovered from the Carribuddy Group is similar to some of the broken specimens recovered in several other wells from the lower part of the Carribuddy Group. This material is the best preserved from this interval and more should be obtained in an effort to identify the species. The two fragments in the sample 288-290 m are too broken to identify, but they look like specimens found in the Nita Formation. This interval (261-292 m) is not zoned, but is Ordovician. The interval 292-396.96 m has a fauna typical of the *Phragmodus-Plectodina* Zone. The fauna in sample 397.07 is not
diagnostic. The interval 397.65-450 n is representative of the *Histiodella holodentata* Zone.

CAI: Max CAI = 1 at 450 m.

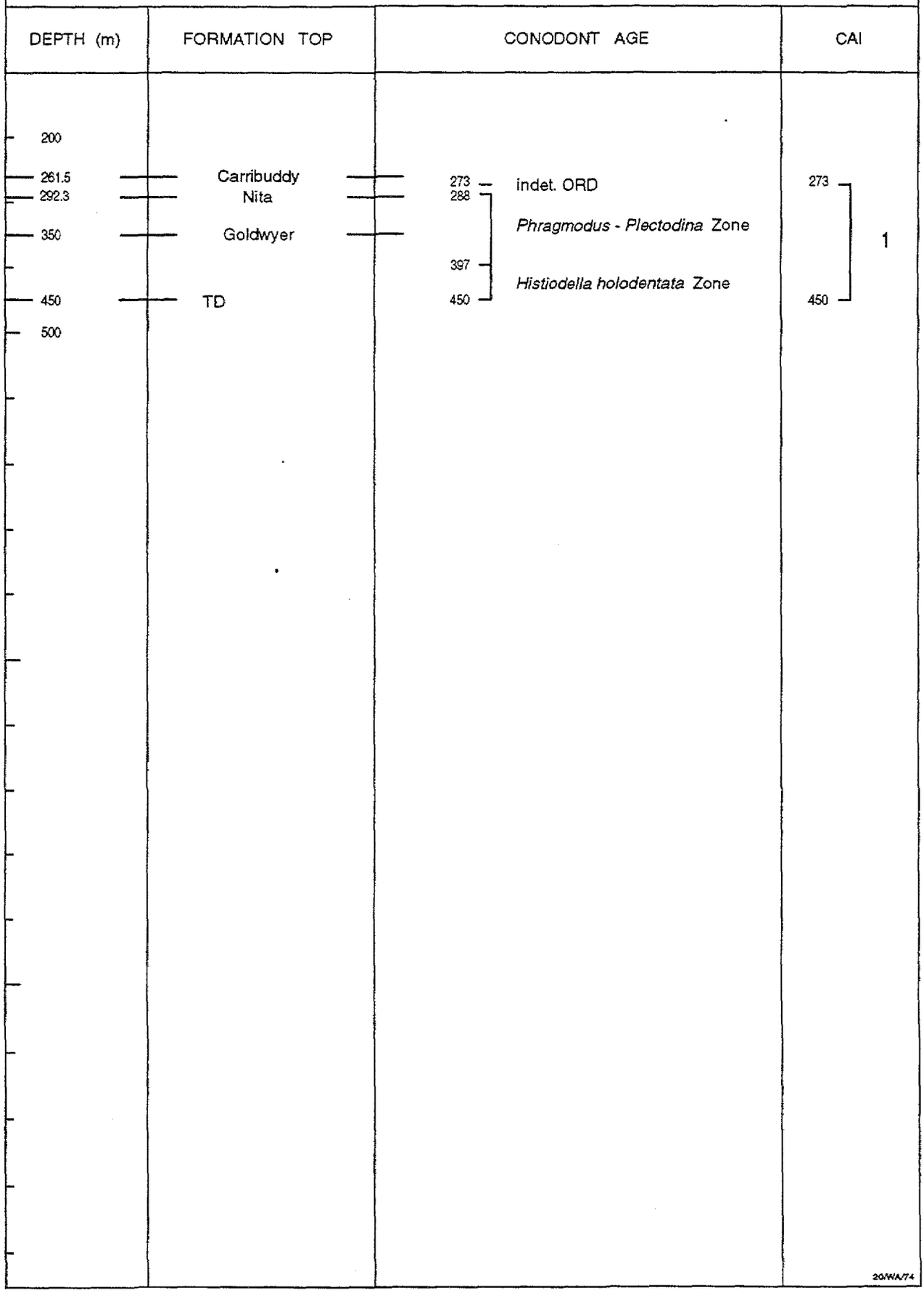
COMMENTS: The boundary between the *Phragmodus-Plectodina* and *Histiodella holodentata* Zones is narrowed to the interval 396.96 to 397.4 m. The age of the lower part of the Carribuddy Group could possibly be determined by examination of more samples in the interval 261-292 m.

| Depth (m) | value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** 261.5-292.3 m | | | |
| 273.53-274.5 m | **1**? | 16 | *?Erismodus* sp. indet. |
| 278.75-279.7 m | - | 0 | |
| 288-290 m | **1** | 2 | *?Plectodina* sp. indet. |
| **NITA FORMATION** 292.3-350 m | | | |
| 292.5-294 m | **1** | 5 | *?Juanognathus* sp. indet. |
| 320-321 m | **1** | 37 | *Drepanoistodus* sp.<br>*Erraticodon* sp.<br>*Juanognathus* sp.<br>*Phragmodus* sp.<br>*Plectodina* sp.<br>*Protopanderodus nogamii*<br>*Trigonodus cf.larapintinensis* |

**GOLDWYER FORMATION** 350-450 m TD.367-368 m

| | | | |
|---|---|---|---|
| 367-368 m | **1** | 35 | *Drepanoistodus* sp.<br>*Erraticodon* cf *E. balticus*<br>*Phragmodus polystrophos*<br>*Trigonodus* sp. |
| 390-391 m | - | 0 | |
| 396.74-396.96 m | **1** | 58 | *Ansella* sp. indet.<br>*Drepanoistodus* sp. indet.<br>*Onyxodus acuoliratus*<br>*Phragmodus polystrophos* |
| 397.07 m | **1** | 42 | *Drepanoistodus* sp. indet.<br>*Phragmodus* sp. indet.<br>*Protopanderodus nogamii*<br>*Trigonodus* sp. indet. |
| 397.4 m | **1** | 15 | *Drepanoistodus pitjanti*<br>*Drepanoistodus* sp. indet.<br>*Scolopodus cornuformis* |
| 397.65-397.96 m | **1** | 9 | *Histiodella holodentata*<br>*Scolopodus cornuformis* |
| 408-409 m | **1** | 24 | *Drepanoistodus pitjanti*<br>?*Juanognathus* sp. indet.<br>*Protopanderodus nogamii*<br>*Protoprioniodus histion*<br>*Scolopodus cornuformis*<br>*Trigonodus larapintinensis* |
| 449-450 m | **1** | 393 | *Ansella* sp.<br>*Drepanoistodus pitjanti*<br>*Drepanoistodus* sp. indet.<br>*Falodus keramis*<br>*Histiodella holodentata*<br>*Phragmodus spicatus*<br>*Protopanderodus gradatus*<br>*Protopanderodus nogamii*<br>*Protoprioniodus histion*<br>*Scolopodus cornuformis*<br>*Trigonodus larapintinensis* |

**WELL : KUNZEA 1**



CANNING BASIN CONODONT IDENTIFICATIONS

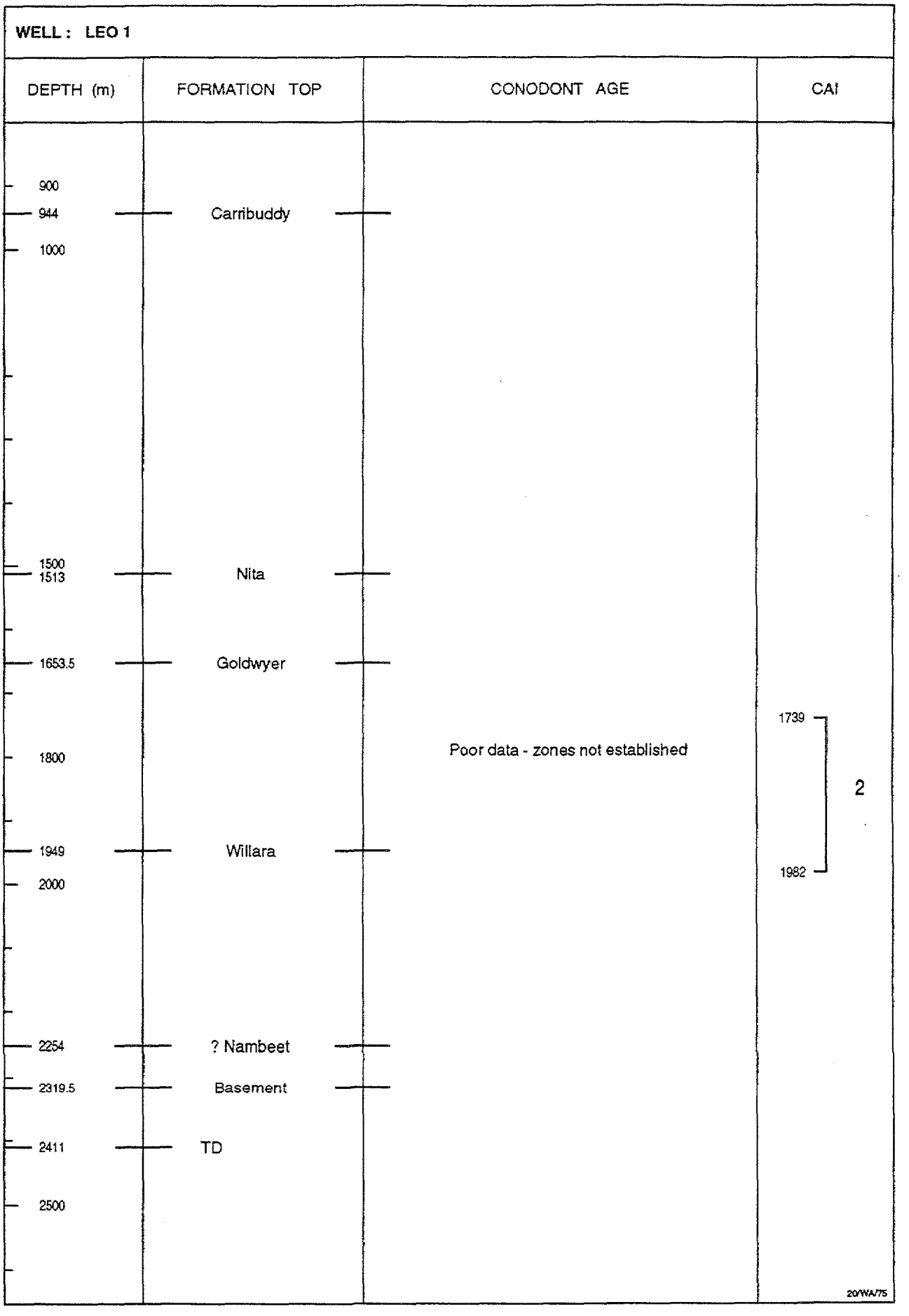
WELL **LEO 1**

CONODONT BIOSTRATIGRAPHY: see comments.

CAI:

COMMENTS: The few samples examined are not helpful in establishing a conodont biostratigraphy in this well. The fauna in sample 2192-2196 m looks out of stratigraphic order and may be the result of down hole contamination.

| Depth (m) | value | abundance | Identification |
|---|---|---|---|
| **NITA FORMATION** 1513-1653.5 | | | |
| **GOLDWYER FORMTION** 1653.5-1949 | | | |
| 1739-1745 | **2** | 4 | *Plectodina* sp.<br>*Phragmodus* sp. |
| 1745-1751 | **2** | 3 | indt. frags. |
| **WILLARA FORMATION** 1949-2154 | | | |
| 1976-1982 | **2** | 47 | *Drepanoistodus* sp.<br>?*Histiodella* sp.<br>?*Prioniodus* sp. |
| 1994-2000 | **2** | 1 | *Baltoniodus* sp. |
| **NAMBEET FORMATION** 2154-2319.5 | | | |
| 2192-2196 | **2** | 20 | ?*Ansella* sp.<br>?*Histiodella* like P elements<br>*Protopanderodus* sp. |



CANNING BASIN CONODONT IDENTIFICATIONS

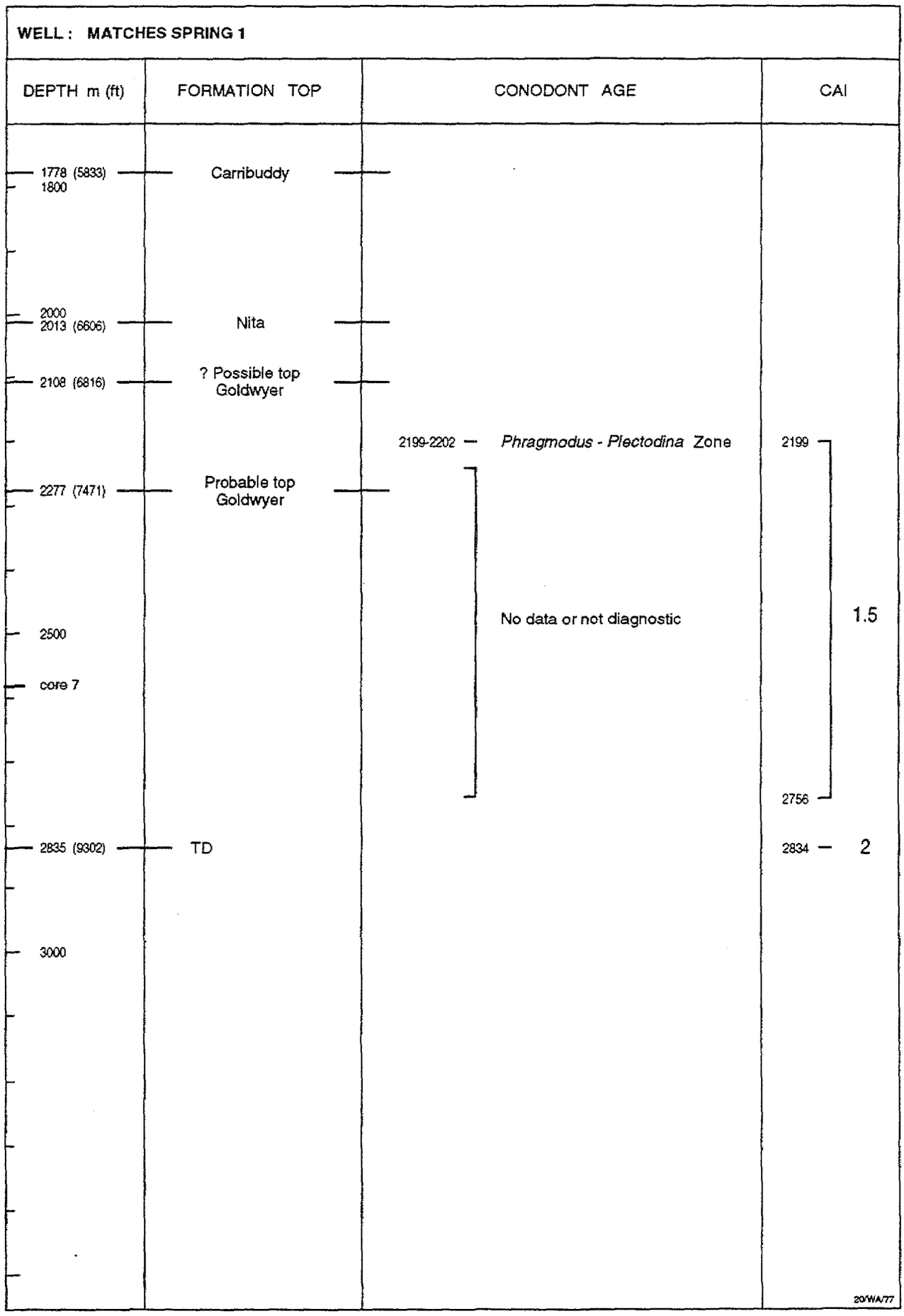
WELL **MATCHES SPRING 1**

CONODONT BIOSTRATIGRAPHY: Conodonts from core 14 are indicative of the *Phragmodus - Plectodina* Zone. None of the other samples contain an age diagnostic fauna.

CAI: Max CAI = 2 at 2834.5 m.

COMMENTS: see above.

| Depth (m) | value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** 5833-6606' (1778.3-2014 m) | | | |
| **NITA FORMATION** 6606-6916'(7471') (2014-2109.5 m)(2277.7) | | | |
| **GOLDWYER FORMATION** 6916'(7471)-?? (2109.5 (2277.7)-?? m) | | | |
| core 14 | | | |
| 7215-7225 (2199.7-2202.7 m) | **1.5** | 12 | *Belodina* sp.<br>*Drepanoistodus* sp.<br>*Eoplacognathus* sp.<br>*Onyxodus acuoliratus*<br>*Phragmodus polystrophos* |
| **?WILLARA FORMATION** ??-TD | | | |
| core 16 | | | |
| 9032-9042 | | | |
| 9034' (2754.3 m) | **1.5** | 1 | gen & species indt. |
| 9040' (2756.1 m) | **1.5** | 1 | gen & species indt. |
| core 17 | | | |
| 9282-9300' (2829.9-2835.4 m) | | | |
| 9286' (2831.1 m) | - | 4 | indt fragments |
| 9297' (2834.5 m) | **2** | 12 | *Drepanoistodus* aff. *pitjanti* |



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **McLARTY 1**

CONODONT BIOSTRATIGRAPHY: A sample from near the top of the Carribyddy Group (core 5) appears to be anomalous. This fauna is probably reworked because the elements are rounded, discolored, and apparently out of time or stratgraphic context. Indicated age context probably early Arenig and if correctly identified would have been sourced from the Willara Formation. The small sample from core 10 (1496 m.) has elements similar to those found in the same level in the Frankenstein 1 well and represents the unzoned Ordovician interval. The *Phragmodus - Plectodina* Zone is represented in cores 11 and 12. Core 13 has a non-diagnostic fauna, but core 14 is representative of the *Histiodella holodentata* Zone. Cores 15 and 16 are from the from either the *Histiodella altifrons* or the *Jumudontus gananda* Zones. Core 17 (22676-2279 m) contains an *Oepikodus communis* Zone fauna.

CAI: Max CAI = 2 at 2279 m.

COMMENTS: The reworked Ordovician fauna in the upper part of the Carribuddy Group indicates that erosion of Ordovician was taking place in a nearby part of the basin during the Devonian.

Core 15 (2065-2066 m) at the top of the Willara Formation does not contain the identifiable *Histiodella holodentata* Zone fauna typically present in the top of this unit and may indicate some erosion or an unconformity at the base of the Goldwyer Formation.

| Depth (m) | value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** 1483-5177' (452.1-1578.4 m) | | | |
| core 5<br>1524-1528'<br>(464.6-465.9 m) | **1** | 53 | ?*Bergstroemognathus* sp.<br>*Drepanoistodus pitjanti*<br>*Protopanderodus*<br>?*Reutterodus*<br>?*Trigonodus* |
| | | | *** This fauna is probably reworked, elements are rounded, discolored, and apparently out of time/strat. context. Indicated age context probably early Arenig. |
| core 10<br>4908-4911'<br>(1496.3-1497.5 m) | **1** | 2 | indt coniform frags. |

**NITA FORMATION** 5177-5540' (1578.4-1689.0 m)

| | | | |
|---|---|---|---|
| core 11 | | | |
| 5459-5468' | **1** | | |
| (1664.3-1667.0 m) | | 2 | |
| | | | *Plectodina* sp. |

**GOLDWYER FORMATION** 5540-6760' (1689.0-2061 m)

| | | | |
|---|---|---|---|
| core 12 | | | |
| 5767-5777' | | | |
| (1758.2-1761.8 m) | | | |
| *5767-5773' | **1** | | |
| (1758.2-1760.1 m) | | 288 | |
| | | | *Ansella* |
| | | | *Drepanoistodus basiovalis* |
| | | | *Eoplacognathus* sp. |
| | | | *Onyxodus acuoliratus* |
| | | | *Phragmodus polystrophos* |
| | | | *Plectodina* sp. |
| | | | *Protopanderodus nogamii* |
| *5774-5777' | **1** | | |
| (1760.4-1761.8 m) | | 470 | |
| | | | ?*Amorphognathus* sp. |
| | | | *Ansella* |
| | | | *Drepanoistodus basiovalis* |
| | | | ?*Eoplacognathus* sp. |
| | | | *Erraticodon balticus* |
| | | | *Onyxodus acuoliratus* |
| | | | *Phragmodus polystrophos* |
| | | | *Plectodina onychodonta* |
| | | | *Protopanderodus nogamii* |
| core 13 | | | |
| 6210-6214' | **1.5** | | |
| (1893.3-1894.5 m) | | 4 | |
| | | | ?*Drepanoistodus* sp. |
| core 14 | | | |
| 6569-6576' | **2** | | |
| (2002.7-2004.9 m) | | 52 | |
| | | | *Ansella* sp. |
| | | | *Drepanoistodus pitjanti* |
| | | | *Histiodella holodentata* |
| | | | *Microzarkodina* sp |
| | | | *Protopanderodus gradatus* |

**WILLARA FORMATION** 6760-7679' (2061-2341.2 m)

core 15
6775-6779' **1.5-2**
(2065.5-2066.8 m) 45

?*Juanognathus* sp.
*Protopanderodus gradatus*
*Protopanderodus nogamii*

core 16
7078-7088' **2**
(2157.9-2161 m) 425

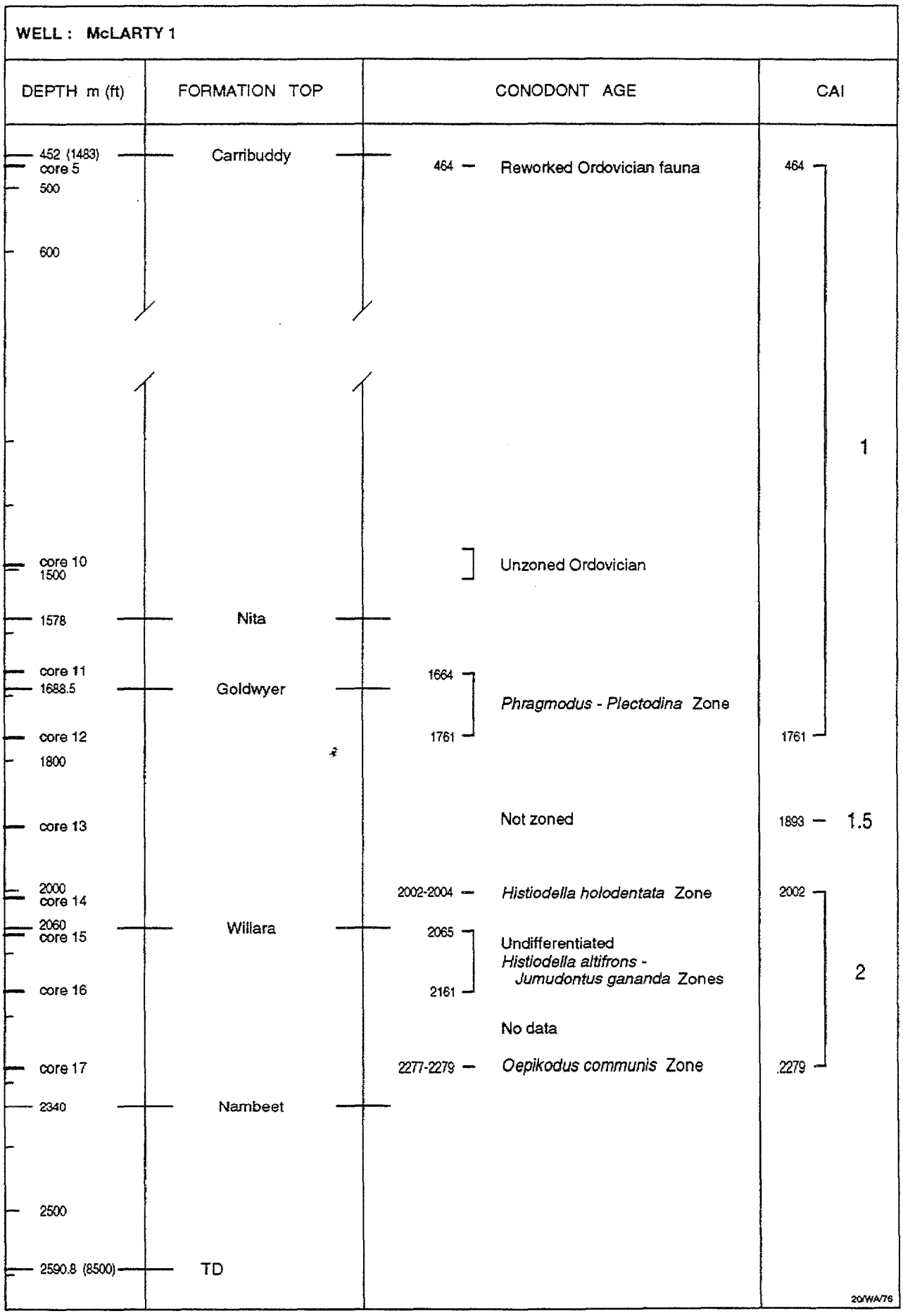
*Acodus* sp.
?*Baltoniodus* sp.
*Drepanoistodus pitjanti*
?*Erismodus*
*Erraticodon patu*
*Microzarkodina* sp.
*Protopanderodus nogamii*
*Trigonodus larapintinensis*

core 17
7468-7476' **2**
(2276.8-2279.3 m) 200

*Bergstroemognathus hubeiensis*
*Drepanoistodus* sp.
*Microzarkodina*
*Oepikodus communis*
*Protopanderodus gradatus*
*Protopanderodus nogamii*
*Protoprioniodus yapu*
?*Reutterodus* sp.
*Trigonodus larapintinensis*

**NAMBEET FORMATION** 7679-TD (2341.2 m - TD)

no conodont samples



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **MUNRO 1**

CONODONT BIOSTRATIGRAPHY: The *Phragmodus - Plectodina* Zone is found in the Nita Formation (1554.9 m) and possibly the upper part of the Goldwyer Formation (1646.3 m). The *Histiodella holodentata* Zone is present between 1661 and 1723 m. The fauna between 1737 and 1799 m is not diagnostic. The fauna between 1805 and 2000 m is tennatively assigned to the *Jumudontus gananda* Zone. The fauna at 2042 m represents the *Prioniodus elegans - Bergstroemognathus extensus* Zone.

CAI: Max CAI = 1.5 at 2042 m.

COMMENTS:

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| (ALL CUTTINGS SAMPLES) | | | |
| **NITA FORMATION** 4924-5196' | | | |
| 5100' (1554.9 m) | **1** | 16 | |
| | | | *Juanognathus* sp. |
| | | | *Phragmodus* sp. |
| | | | *Plectodina* sp. |
| | | | *Scolopodus* sp. |
| **GOLDWYER FORMATION** 5196-5905 | | | |
| 5400' (1646.3 m) | **1** | 3 | |
| | | | *Drepanoistodus* cf. *forceps* |
| 5450' (1661.6 m) | **1** | 28 | |
| | | | *Drepanoistodus* sp. |
| | | | *Erraticodon balticus* |
| | | | *Histiodella holodentata* |
| | | | ?*Phragmodus* sp. |
| | | | *Protopanderodus nogamii* |
| 5500' (1676.8 m) | **1** | 29 | |
| | | | *Erraticodon* sp. |
| | | | *Phragmodus spicatus* |
| | | | ?*Trigonodus* sp. |

| | | | |
|---|---|---|---|
| 5550' (1692.1) | **1** | 29 | ?*Erraticodon* sp.<br>*Phragmodus spicatus*<br>*Trigonodus larapintinensis* |
| 5600' (1707.3 m) | **1** | 7 | indt. fragments |
| 5650' (1722.6 m) | **1** | 44 | *Ansella* sp.<br>*Drepanoistodus* sp.<br>*Histiodella holodentata*<br>?*Oistodus* sp.<br>*Phragmodus* sp.<br>*Protopanderodus nogamii*<br>*Trigonodus* sp. |
| 5700' (1737.8 m) | - | 6 | indt. fragments |
| 5750' (1753.0 m) | **1** | 29 | *Ansella* sp.<br>*Drepanoistodus* cf. *pitjanti*<br>*Drepanoistodus* sp.<br>*Trigonodus* sp. |
| 5800' (1768.3 m) | **1** | 3 | indt. fragments |
| 5850' (1783.5 m) | **1** | 5 | indt. fragments |
| 5900' (1798.8 m) | **1-1.5** | 30 | *Drepanoistodus* sp.<br>*Oistodella* sp. |
| **WILLARA FORMATION** 5905-6600 | | | |
| 5924 (1806.1 m) | **1-1.5** | 13 | *Drepanoistodus pitjanti*<br>*Prioniodus alatus* |
| 5950 (1814.0 m) | ? | 1 | ?*Drepanoistodus* sp. |

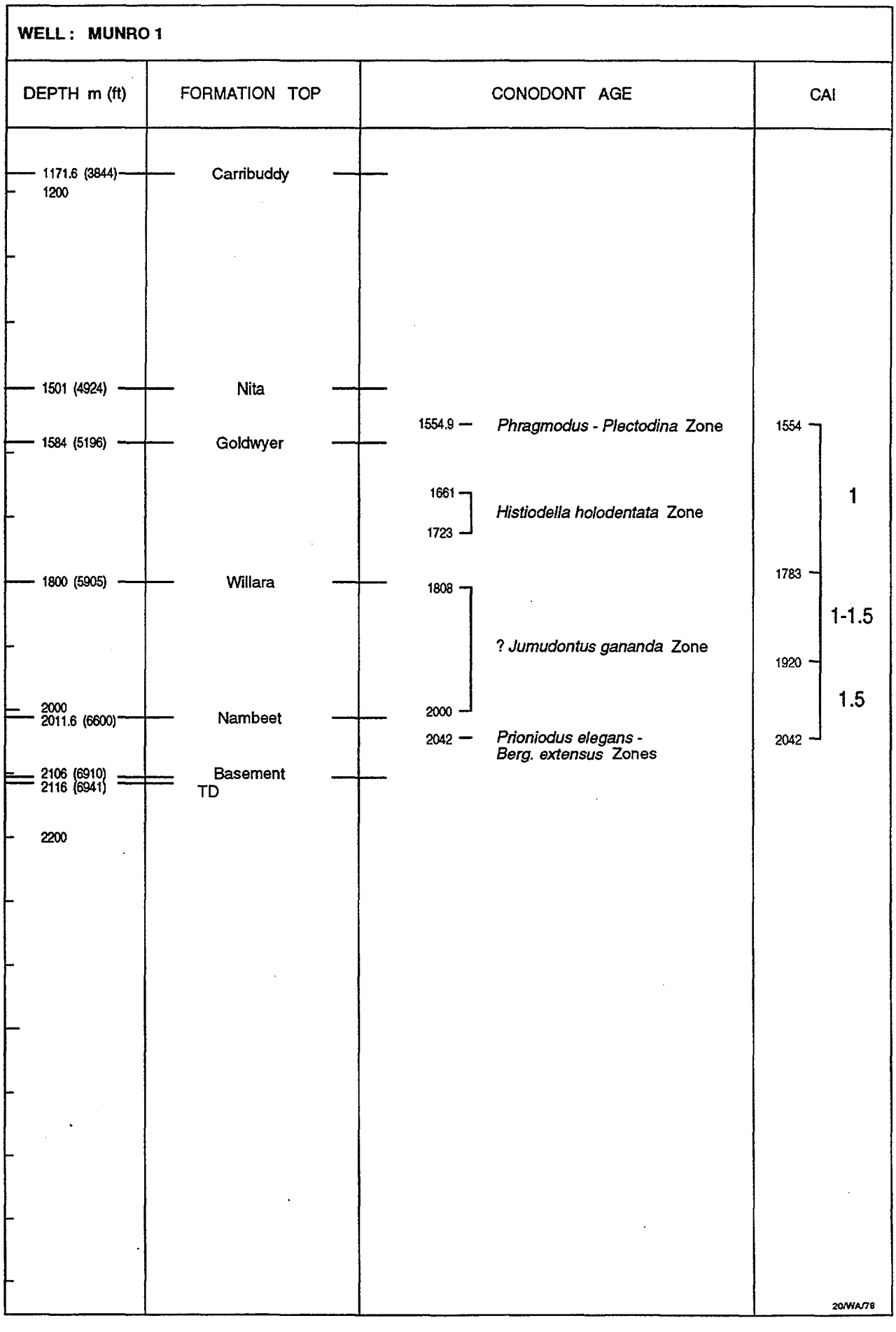
| | | | |
|---|---|---|---|
| 6000 (1829.3) | ? | 6 | all acid etched frags |
| 6050 (1844.5 m) | **1-1.5** | 39 | *Phragmodus* sp.<br>*Trigonodus larapintinensis*<br>*Oistodella* sp. A |
| 6100 (1859.8 m) | **1-1.5** | 16 | *Drepanoistodus* sp.<br>*Trigonodus larapintinensis* |
| 6150 (1875.0) | ? | 6 | all acid etched frags. |
| 6200 (1890.2 m) | **1-1.5** | 42 | *Drepanoistodus pitjanti*<br>?*Oepikodus* sp.<br>*Trigonodus larapintinensis*<br>*Oistodella* sp. |
| 6250 (1905.5 m) | **1-1.5** | 10 | *Drepanoistodus* sp. |
| 6300 (1920.7 m) | **1-1.5** | 35 | *Drepanoistodus pitjanti*<br>? *Plectodina* sp.<br>*Trigonodus larapintinensis* |
| 6350 (1936.0) | **1.5** | 35 | *Drepanoistodus* sp.<br>?*Oulodus* sp.<br>*Phragmodus* sp.<br>*Prioniodus* cf. *alatus*<br>*Trigonodus larapintinensis* |
| 6400 (1951.2 m) | **1.5** | 35 | *Drepanoistodus pitjanti*<br>?*Oulodus* sp.<br>?*Plectodina* sp.<br>*Trigonodus larapintinensis* |

| | | | |
|---|---|---|---|
| 6450 (1966.5 m) | **1.5** | 40 | *Drepanoistodus* sp.<br>?*Oulodus* sp.<br>?*Plectodina*<br>*Trigonodus larapintinensis* |
| 6500 (1981.7 m) | **1.5** | 37 | *Drepanoistodus pitjanti*<br>*Drepanoistodus* sp<br>?*Oulodus* sp. B<br>?*Plectodina* sp.<br>*Trigonodus larapintinensis* |
| 6550 (1997.0 m) | **1.5** | 9 | ?*Plectodina* sp.<br>*Trigonodus* sp. |

**NAMBEET FORMATION** 6600-6910 (2015.2-2106.7 m)

| | | | |
|---|---|---|---|
| 6600 (2012.2 m) | **1.5** | 26 | *Acodus* sp<br>*Erraticodon* sp.<br>*Drepanoistodus* sp.<br>?*Prioniodus/Oepikodus* sp.<br>cf.*Scolopodus rex* |
| 6650 (2027.4 m) | **1.5** | 13 | indt. frags. |
| 6700 (2042.7 m) | **1.5** | 30 | *Acodus* sp.<br>*Bergstroemognathus extensus*<br>*Cornuodus* sp.<br>?*Prioniodus* sp.<br>*Scolopodus rex* |

**WELL : MUNRO 1**



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **MUSCA 1**

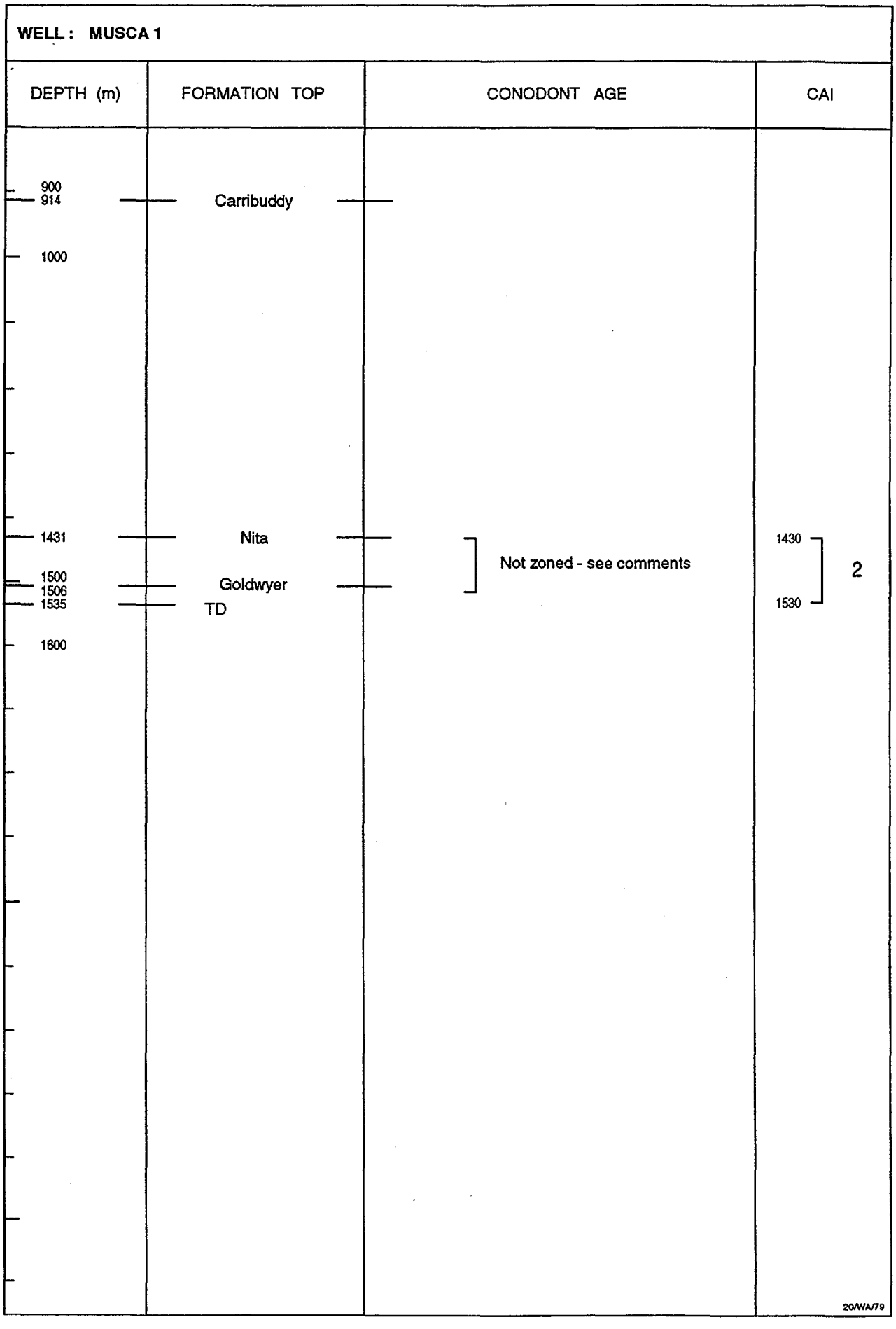
CONODONT BIOSTRATIGRAPHY: well not zoned - see comments

CAI: Max CAI = 2 at 1530 m.

COMMENTS: The identifications by Savage (see below) are questioned and need to be checked. The interpreted stratigraphic pick of Nita Formation to top Goldwyer Formation is not compatible with the conodont identifications, *Periodon flabellum* and *Scolopodus quadriplicatus*, species which would be expected in the Willara Formation.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** 913.8-1403.8 m | | | |
| **NITA FORMATION** 1430.8-1506.2 m | | | |
| 1430-1440 | **2** | 2 | *Scolopodus* cf. *quadriplicatus* |
| 1440-1450 | - | 0 | -- |
| 1450-1460 | - | 0 | -- |
| 1460-1470 | **2** | 1 | sp. indet. |
| 1470-1480 | **2** | 1 | sp. indet. |
| 1480-1490 | **2** | 1 | sp. indet. |
| 1490-1500 | - | 0 | -- |
| 1500-1510 | **2** | 1 | *Scolopodus* cf. *quadriplicatus* |
| **GOLDWYER FORMATION** 1506.2-1535 m | | | =TD. |
| 1510-1520 | **2** | 1 | sp. indet. |
| 1520-1530 | **2** | 4 | *Periodon flabellum* |

**WELL : MUSCA 1**



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **NITA DOWNS 1**

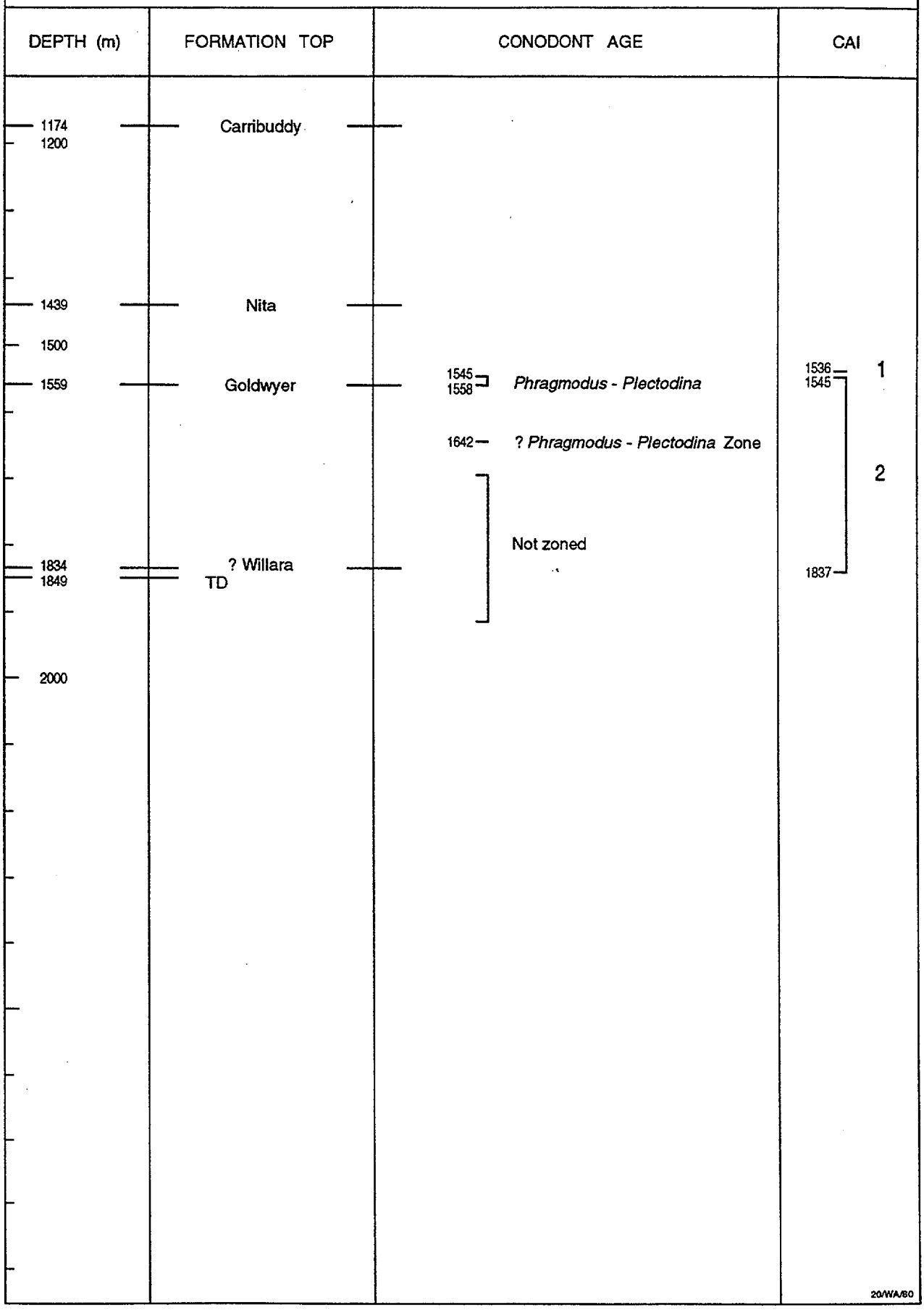
CONODONT BIOSTRATIGRAPHY: Samples from 1545 to 1558 are from the *Phragmodus - Plectodina* Zone. The sample at 1642 m is probably from the *Phragmodus - Plectodina* Zone. Samples from 1657 to 1849 m cannot be asigned to a zone.

CAI: Max CAI = 2 at 1837 m.

COMMENTS: Identifications on samples from 1642-1849 m by Norm Savage, which cannot be confirmed.

| Depth (m) | value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** 1174-1439 m | | | |
| **NITA FORMATION** 1439-1559 m | | | |
| 1536.6-1537.0 m | **1** | 1 | indt. fragment |
| 1545.4-1545.9 m | **2** | 5 | *Erraticodon balticus*<br>*Onyxodus acuoliratus* |
| 1549.5-1550.0 m | **2** | 1 | indt. coniform frag. |
| 1554.4-1554.9 m | **2** | 4 | *Erraticodon* cf. *E. balticus* |
| 1557.5-1557.9 m | **2** | 10 | *Erraticodon* cf. *E. balticus*<br>*Onyxodus acuoliratus*<br>*Phragmodus polystrophos* |
| **GOLDWYER FORMATION** 1559-1849 (TD) m | | | |
| 1642 m (NMS) | **2** | 9 | *Phragmodus flexuosus*<br>*Periodon aculeatus*<br>*Drepanoistodus arcuatus* |
| 1657 m (NMS) | - | - | fragments |
| 1837 m (NMS) | **2** | 2 | *Drepanodus sculponea* |
| 1849 m (NMS) | - | 2 | fragments |

**WELL : NITA DOWNS 1**



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **PARDA 1**

CONODONT BIOSTRATIGRAPHY: Core 1 (1185-1187 m) and core 2 (1315-1318 m) are from the *Phragmodus-Plectodina* Zone. Core 3 (1486-1490 m) cannot be zoned in detail, but is probably from the *Jumudontus gananda* Zone. Core 4 (1659-1663 m) is from the *Oepikodus communis* Zone.

CAI: Max CAI 1.5 at 1663 m.

COMMENTS: The abundant fauna in core 4 makes this a good zone determination.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** 3216-3820' (980.5-1164.6 m) | | | |
| **NITA FORMATION** 3820-4165' (1164.6-1269.8 m) | | | |
| core 1<br>3889-3895'<br>(1185.7-1187.5 m) | **1** | 56 | *Coelodus* sp.<br>?*Drepanoistodus* sp.<br>*Oistodella* sp.<br>*Phragmodus* sp.<br>*Plectodina onychodonta*<br>*Protopanderodus nogamii*<br>*Trigonodus* sp.<br>New genus new species A |
| * This fauna is very similar to a fauna found in the lower part of the Stokes Siltstone in the Amadeus Basin. | | | |
| **GOLDWYER FORMATION** 4165-4888' (1269.8-1490.2 m) | | | |
| core 2<br>4314-4324'<br>(1315.2-1318.3 m) | **1** | 65 | *Drepanoistodus basiovalis*<br>*Eoplacognathus* sp.<br>*Erraticodon* sp.<br>*Protopanderodus nogamii* |
| core 3<br>4877-4889'<br>(1486.9-1490.5 m) | **1-1.5** | 15 | *Microzarkodina marathonensis* |

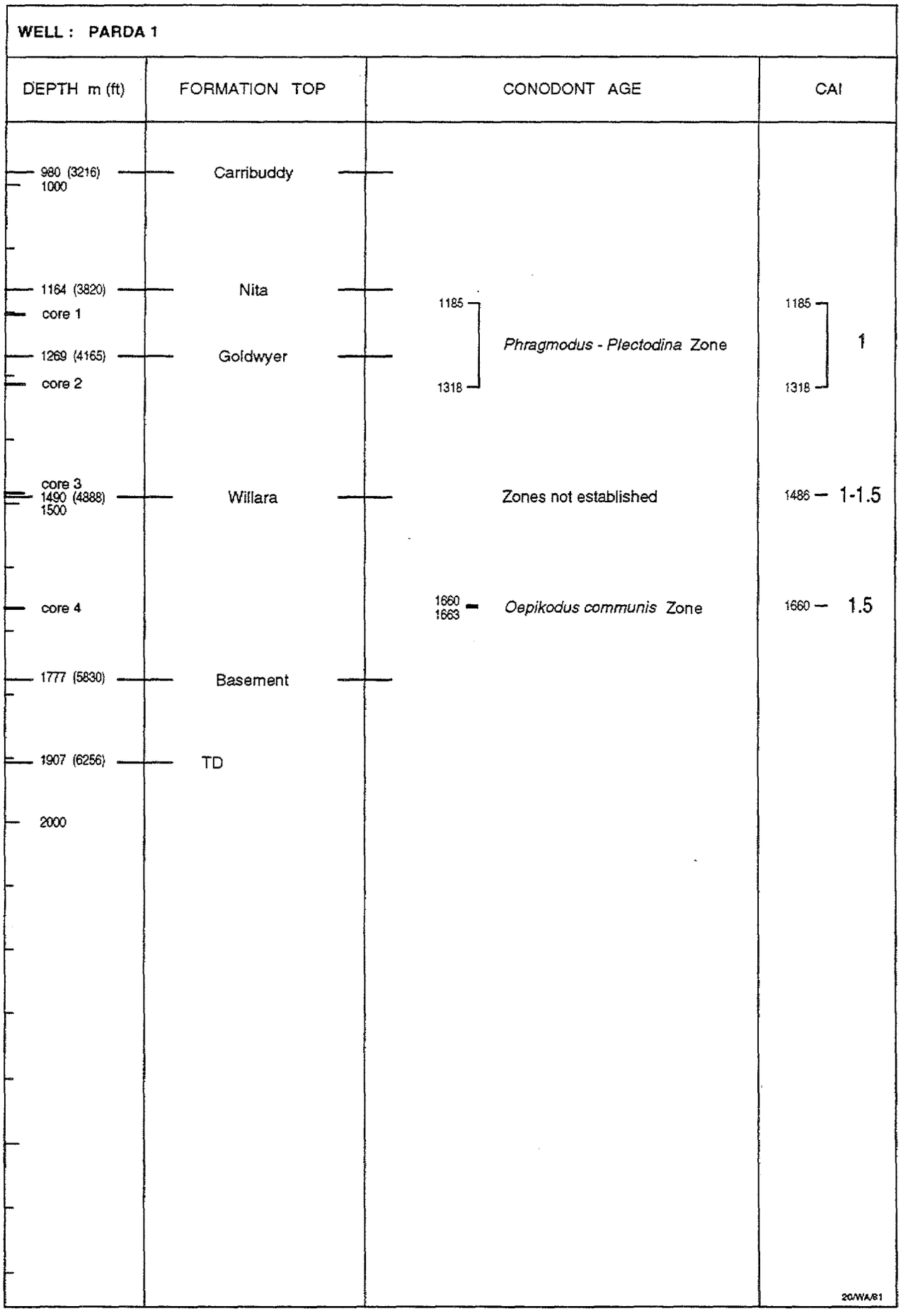
**WILLARA FORMATION** 4888-5830' (1490.2-1777.4 m)

core 4
5444-5456' **1.5** 428
(1659.8-1663.4 m)

?*Acodus* sp.
*Coleodus*
*Drepanoistodus* sp.
*Juanognathus leptosomatus*
*Oepikodus communis*
*Protopanderodus gradatus*
*Protopanderodus striatus*
*Protoprioniodus yapu*
*Reutterodus andinus*
*Scolopodus rex*

**NAMBEET FORMATION** absent??

**PRECAMBRIAN BASEMENT** 1777-1907 m (=TD)



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **AMOCO PEGASUS No. 1.**

CONODONT BIOSTRATIGRAPHY: The *Histiodella holodentata* Zone fauna is well developed in the interval from 2500 to 2650 m. A good *Histiodella altifrons* fauna is found in the 2700 m sample. The *Jumudontus gananda* Zone is found in the 2750 m sample and is mixed with an *Oepikodus communis* fauna in the 2800 m. sample. The *Prioniodus elegans - Bergstroemognathus extensus* Zone fauna in sample 2900 has a couple of *O. communis* Zone elements in it which probably are the result of the thick sample interval.

CAI: Max CAI = 2 at 2950 m.

COMMENTS: No data for upper part of Goldwyer and Nita Formation. Zonation for Goldwyer, Willara and Nambeet Formations is that expected. Good *Histiodella altifrons* fauna in sample 2700m. Faunas of *Jumudontus gananda* and *Oepikodus communis* Zones are mixed in sample 2800 m. This is probably the result of the sample being collected over a 50 m interval.

| DEPTH m | CONODONT ABUNDANCE | CAI VALUE | CONODONT FAUNA |
|---|---|---|---|
| **TANDALGOO SANDSTONE** | | | |
| 730 | 0 | | Devonian fish |
| **CARRIBUDDY GROUP** | | | |
| 1150 | 0 | | |
| 1200 | | | |
| 1250 | 0 | | |
| 1300 | | | |
| 1350 | 0 | | |
| 1400 | 0 | | |
| 1450 | 0 | | |
| 1500 | 0 | | |
| 1550 | | | |
| 1600 | 0 | | |
| 1650 | 0 | | |
| 1750 | 0 | | |

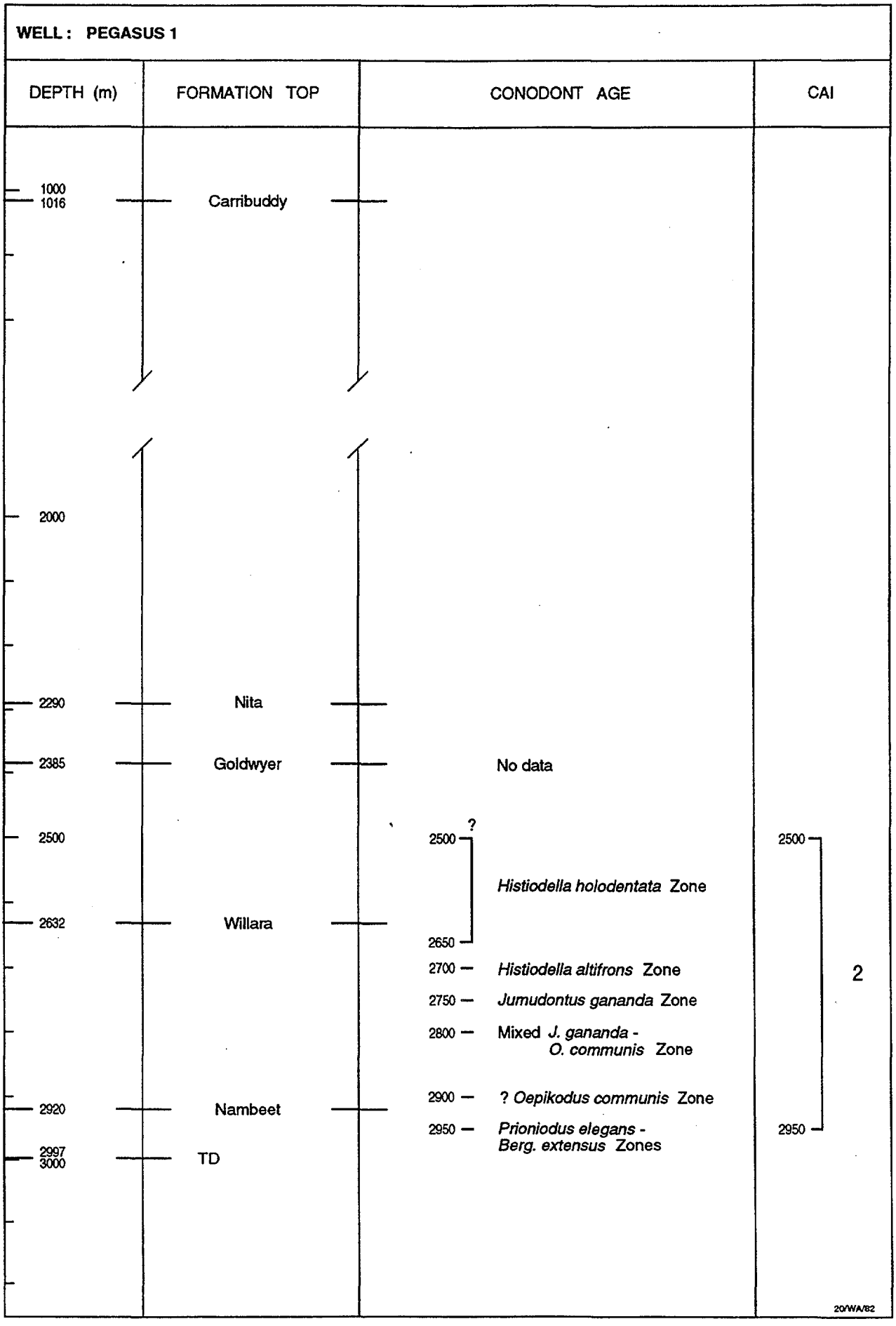
| | | | |
|---|---|---|---|
| 1800 | 0 | | |
| 1850 | | | |
| 1900 | 0 | | |
| 2000 | 0 | | |
| 2050 | 0 | | |
| 2100 | | | |
| 2150 | | | |
| 2200 | | | |
| 2250 | | | |
| **NITA FORMATION** 2290-2385 m | | | |
| 2300 | | | |
| 2350 | | | |
| **GOLDWYER FORMATION** 2385-2632 m | | | |
| 2450 | | | |
| 2500 | 116 | 2 | *Histiodella* cf. *H. holodentata*<br>*Trigonodus larapintinensis*<br>*Protopanderodus gradatus*<br>*Panderodus* sp. indt.<br>?*Oepikodus* sp. indt. |
| 2550 | 84 | 2 | *Appalachignathus* sp. nov.<br>*Drepanodus* sp.<br>*Histiodella holodentata*<br>*Panderodus* sp. indt.<br>*Phragmodus* sp. |
| 2600 | 130 | 2 | *Coelodus* sp.<br>*Drepanodus forceps*<br>*Erismodus* sp indt.<br>*Histiodella holodentata*<br>*Panderodus* sp.<br>*Phragmodus* sp. indt. |

**WILLARA FORMATION** 2632-2920 m

| | | | |
|---|---|---|---|
| 2650 | 142 | 2 | *Ansella* sp.<br>*Histiodella holodentata*<br>*Cornuodus longibasis*<br>*Drepanodus pitjanti*<br>*Erraticodon* sp indt.<br>?*Erismodus* sp. |
| 2700 | 130 | 2 | *Acodus emanuelensis* of Cooper<br>*Baltoniodus navis*<br>*Drepanodus pitjanti*<br>*Erraticodon* sp.<br>*Histiodella sinuosa*<br>*Prioniodus* cf. *P. amadeus*<br>*Panderodus primitus* |
| 2750 | 202 | 2 | *Acodus emanuelensis* of Cooper<br>*Ansella* sp.<br>*Drepanodus pitjanti*<br>?*Erraticodon* sp<br>*Oepikodus* sp.<br>?*Plectodina* sp.<br>*Prioniodus* sp.<br>*Protoprioniodus* sp. nov. *dentatus* |
| 2800 | 355 | 2 | *Bergstroemognathus hubeiensis*<br>*Drepanoistodus pitjanti*<br>*Jumudontus gananda*<br>?*Loxodus* sp. nov.<br>*Oepikodus 'cleftus'* ms. name<br>*Oepikodus communis*<br>*Oistodus lanceolatus*<br>*Protoprioniodus nyinti*<br>?*Scolopodus rex* |
| 2850 | 95 | 2 | *Bergstroemognathus* sp.<br>*Erraticodon* sp.<br>*Panderodus* sp.<br>*Oepikodus* sp. |

**NAMBEET FORMATION** 2920-TD m

| | | | |
|---|---|---|---|
| 2900 | 240 | 2 | *Bergstroemognathus hubeiensis*<br>*Bergstroemognathus extensus*<br>*Oepikodus* sp. indt.<br>*Panderodus primitus*<br>*Prioniodus* sp.<br>*Protoprioniodus* sp. indt.<br>*Serratognathus bilobata* |
| 2950 | 17 | 2 | *Bergstroemognathus* sp.<br>*Scolopodus rex*<br>indt. coniform elements |



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **PERCIVAL 1**

CONODONT BIOSTRATIGRAPHY: Samples in the interval 2028 to 2052 m, and probably those in the interval 2053 to 2067 m, belong to the *Phragmodus-Plectodina* Zone. No elements typical of the *Histiodella holodentata* to *Oepikodus communis* Zones were identified. The sample at 2170 contained no diagnostic conodont elements. The sample at 2316 m contained a fauna typical of the upper part of the *Prioniodus elegans-Bergstroemognathus extensus* Zone.

CAI: Max CAI = 3 at 2316 m.

COMMENTS: The lack of elements typical of the *Histiodella holodentata* Zone in the Goldwyer Formation between 2046 and 2067 m indicated that this interval probably represents the upper part of the formation. This does not support the WMC interpretation of a major unconformity between the Nita and Goldwyer Formations.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** 1868-2013 m | | | |
| **NITA FORMATION** 2013-2033 m | | | |
| 2028.5-2030.42 m | **2** | 48 | *Erraticodon* sp.<br>*Juanognathus* sp.<br>*Onyxodus acuoliratus*<br>*Phragmodus polystrophos*<br>*Protopanderodus* sp.<br>indt. fragments |
| **GOLDWYER FORMATION** 2033-2186 m | | | |
| 2046.35-2046.50 m | **2** | 5 | indt. fragments |
| 2052.00-2052.68 m | **2** | 33 | ?*Drepanoistodus* sp.<br>*Onyxodus acuoliratus*<br>*Phragmodus polystrophos*<br>indt. fragments |
| 2053.50-2054.00 m | **2** | 31 | *Drepanoistodus* sp.<br>*Erraticodon* sp.<br>?*Juanognathus* sp.<br>*Phragmodus* sp.<br>indt. fragments |

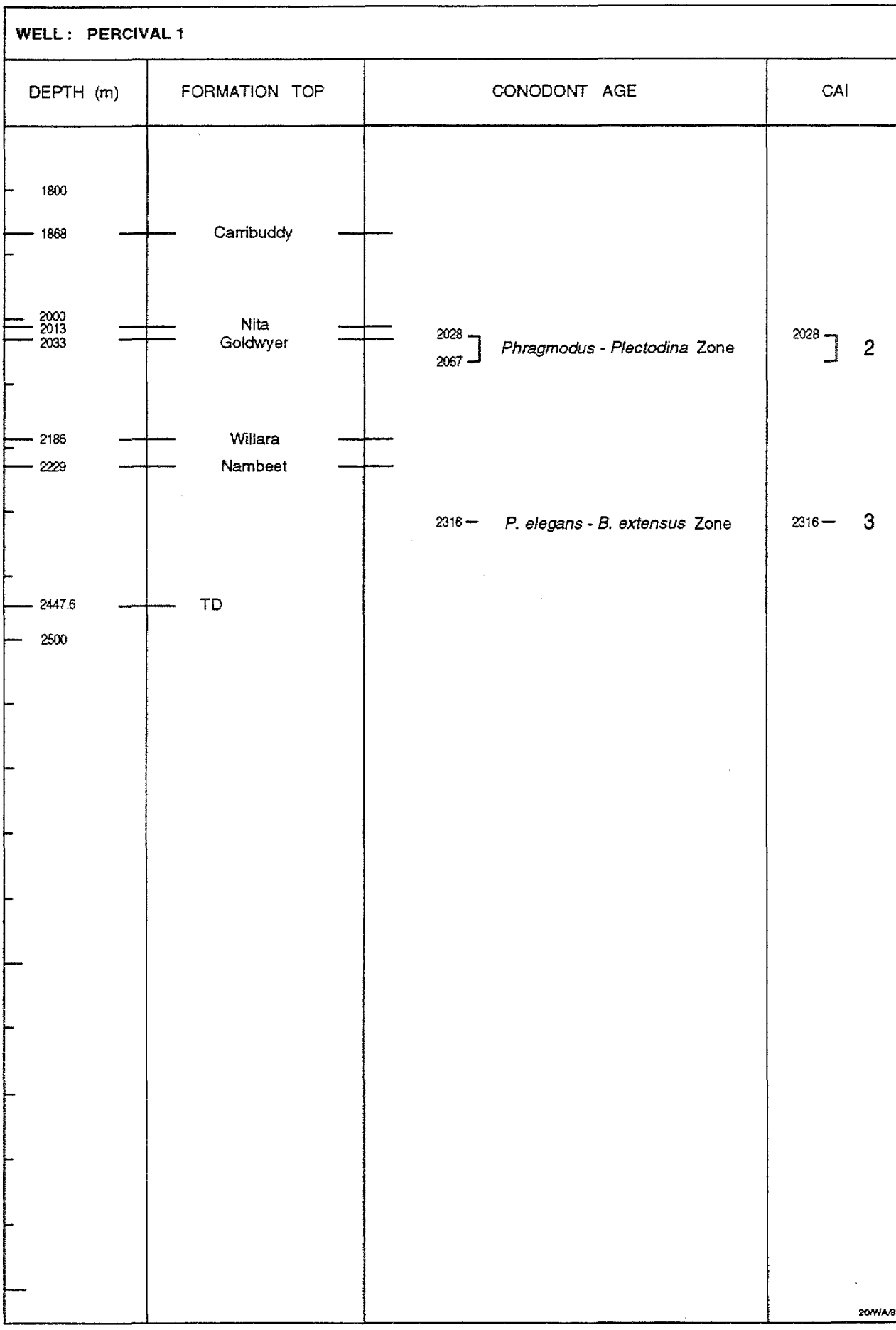
| | | | |
|---|---|---|---|
| 2056.10-2056.60 m | **2** | 15 | *Drepanoistodus* sp.<br>indt. fragments |
| 2058.25-2060.00 m | **2** | 36 | *Protopanderodus* sp.<br>*Triangulodus* sp.<br>indt. fragments |
| 2065.25-2065.40 m | **2** | 32 | *Periodon aculeatus*<br>*Trigonodus larapintinensis*<br>indt. fragments |
| 2067.00-2067.90 m | **2** | 29 | *Ansella* sp.<br>*Protopanderodus* sp.<br>*Trigonodus larapintinensis*<br>indt. fragments |
| 2170 m | **2** | 3 | indt. fragments |

**WILLARA FORMATION** 2186-2229 m

**NAMBEET FORMATION** 2229-2447.6 m (TD)

| | | | |
|---|---|---|---|
| 2316.00-2316.55 m | **3** | 208 | *Bergstroemognathus extensus*<br>*Drepanoistodus* sp.<br>*Prioniodus* sp.B McTavish<br>*Prioniodus* sp.<br>*Protoprioniodus* sp.<br>*Scolopodus rex* |

**WELL : PERCIVAL 1**



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **PICTOR 1**

CONODONT BIOSTRATIGRAPHY: The *Phragmodus-Plectodina* Zone extends fro 950 to 1300 m. The *Histiodella holodentata* Zone is found only in the sample 1400-1450 m. The *Histiodella altifrons* Zone is not identified, but the *Jumudontus gananda* Zone id definitely represented in sample 1850-1900 m and probably in sample 1650-1700 m. The *Prioniodus elegans-Bergstroemognathus extensus* Zone is represented in sample 2000-2050 m.

CAI: Max CAI = 2 at 2150 m.

COMMENTS: The bulk of what has been picked as Goldwyer Formation is placed in the *Phragmodus-Plectodina* Zone. Normal expectation would put the lower part of the Goldwyer Formation in the *Histiodella holodentata* Zone. The uppermost sample of the Willara Formation is in the *Histiodella holodentata* Zone, as is commonly observed in other wells. The recovery of *Paroistodus parallelus*, found in outcrop in the Emanuel Formation definitely documents the *P. elegans* - *B. extensus* Zone in the upper part of the Nambeet Formation.

| Depth (m) | value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** 733-879 m | | | |
| **NITA FORMATION** 879-1041 m | | | |
| 850-900 | - | 0 | |
| 900-950 | **1** | 2+1 | indet. frags* [one Devonian *Palmatolepis* in sample - is probable lab contamination] |
| 950-1000 | **1** | 43 | *Drepanoistodus* sp.<br>*Erraticodon* sp.<br>*Plectodina* sp.<br>*Protopanderodus gradatus*<br>*Protopanderodus* sp.<br>*Trigonodus* sp. |
| 1000-1050 | **1** | 31 | *Drepanoistodus* sp.<br>*Phragmodus* sp.<br>*Plectodina* sp. |

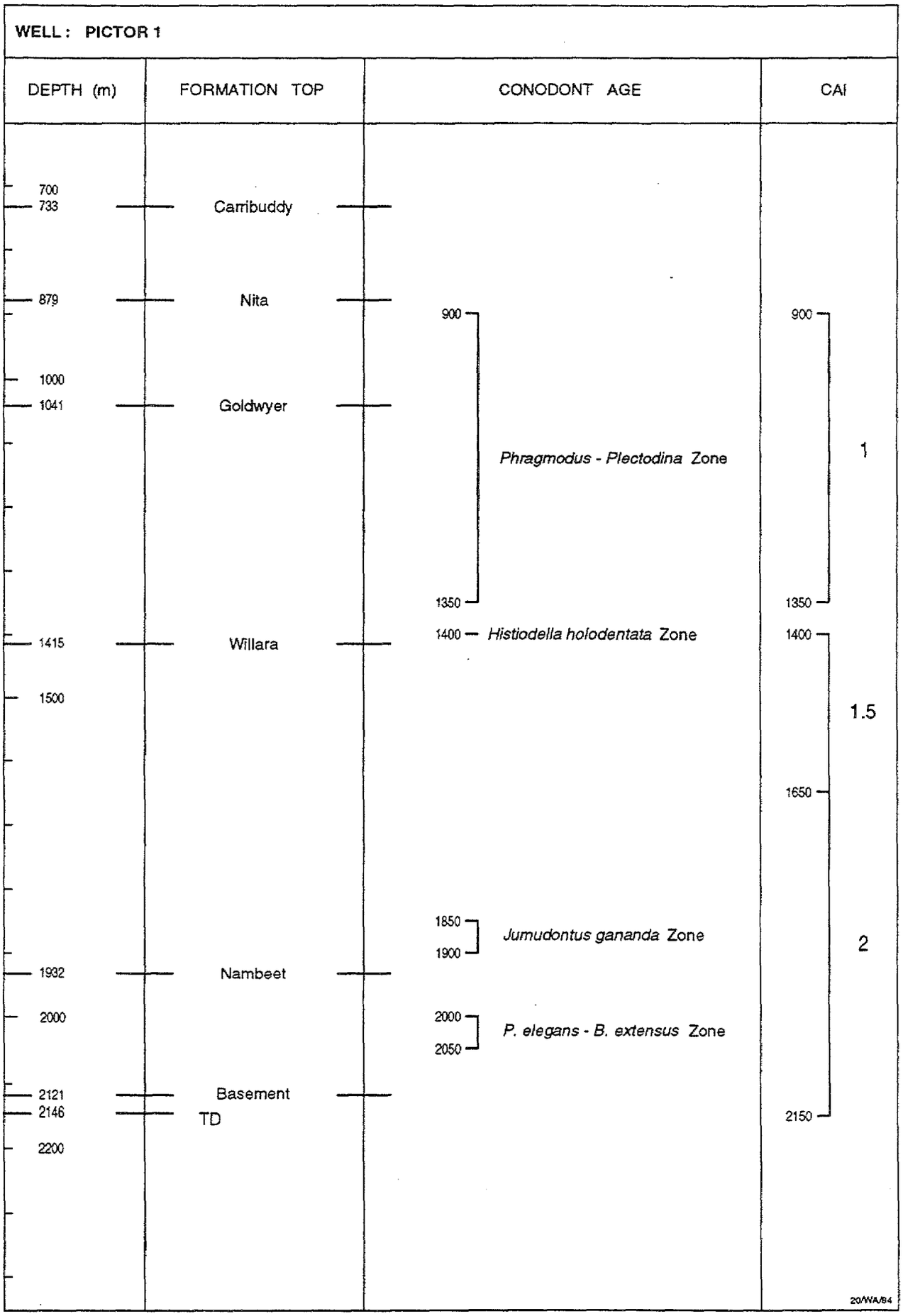
| | | | |
|---|---|---|---|
| **GOLDWYER FORMATION** 1041-1415 m | | | |
| 1050-1100 | **1** | 20 | *Ansella* sp.<br>*Drepanoistodus* sp.<br>*Erraticodon* sp.<br>*Eoplacognathus suecicus*<br>*Phragmodus cf. spicatus*<br>*Protopanderodus gradatus*<br>*Trigonodus* sp. |
| 1100-1150 | **1** | 3 | ?*Drepanoistodus* sp.<br>*Erraticodon* sp. |
| 1150-1200 | - | 0 | |
| 1200-1250 | **1** | 4 | ?*Drepanoistodus* sp.<br>*Eoplacognathus* sp. |
| 1250-1300 | **1** | 1 | *Eoplacognathus* sp. |
| 1300-1350 | **1** | 4 | *Onyxodus acuoliratus* |
| 1350-1400 | - | 0 | |
| **WILLARA FORMATION** 1415-1932 m | | | |
| 1400-1450 | **1.5** | 20 | *Drepanoistodus pitjanti*<br>*Eoplacognathus* sp.<br>*Erraticodon* sp.<br>*Histiodella holodentata* |
| 1450-1500 | - | 0 | |
| 1500-1550 | **1.5** | 3 | indet. frags. |
| 1550-1600 | **1.5** | 32 | *Ansella* sp.<br>*Drepanoistodus pitjanti* |
| 1600-1650 | **1.5** | 4 | *Protopanderodus* sp. |
| 1650-1700 | **2** | 46 | *Drepanoistodus pitjanti*<br>*Erraticodon* sp.<br>*Prioniodus* sp. |

| | | | |
|---|---|---|---|
| 1700-1750 | - | 0 | |
| 1750-1800 | - | 0 | |
| 1800-1850 | - | 0 | |
| 1850-1900 | **2** | 16 | *Prioniodus amadeus* |
| 1900-1950 | **2** | 1 | indet. frag. |

**NAMBEET FORMATION** 1932-2121 m

| | | | |
|---|---|---|---|
| 1950-2000 | - | 0 | |
| 2000-2050 | **2** | 1 | *Paroistodus parallelus* |
| 2050-2100 | - | 0 | |
| 2100-2150 | **2** | 1 | indet. frag. |

**PRE-CAMBRIAN BASEMENT** 2121-2146 m =TD.



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **PICTOR 2**

CONODONT BIOSTRATIGRAPHY: Only conodonts belonging within the *Phragmodus* - *Plectodina* Zone were recovered.

CAI: Max CAI = 1 at 1085 m (=TD)

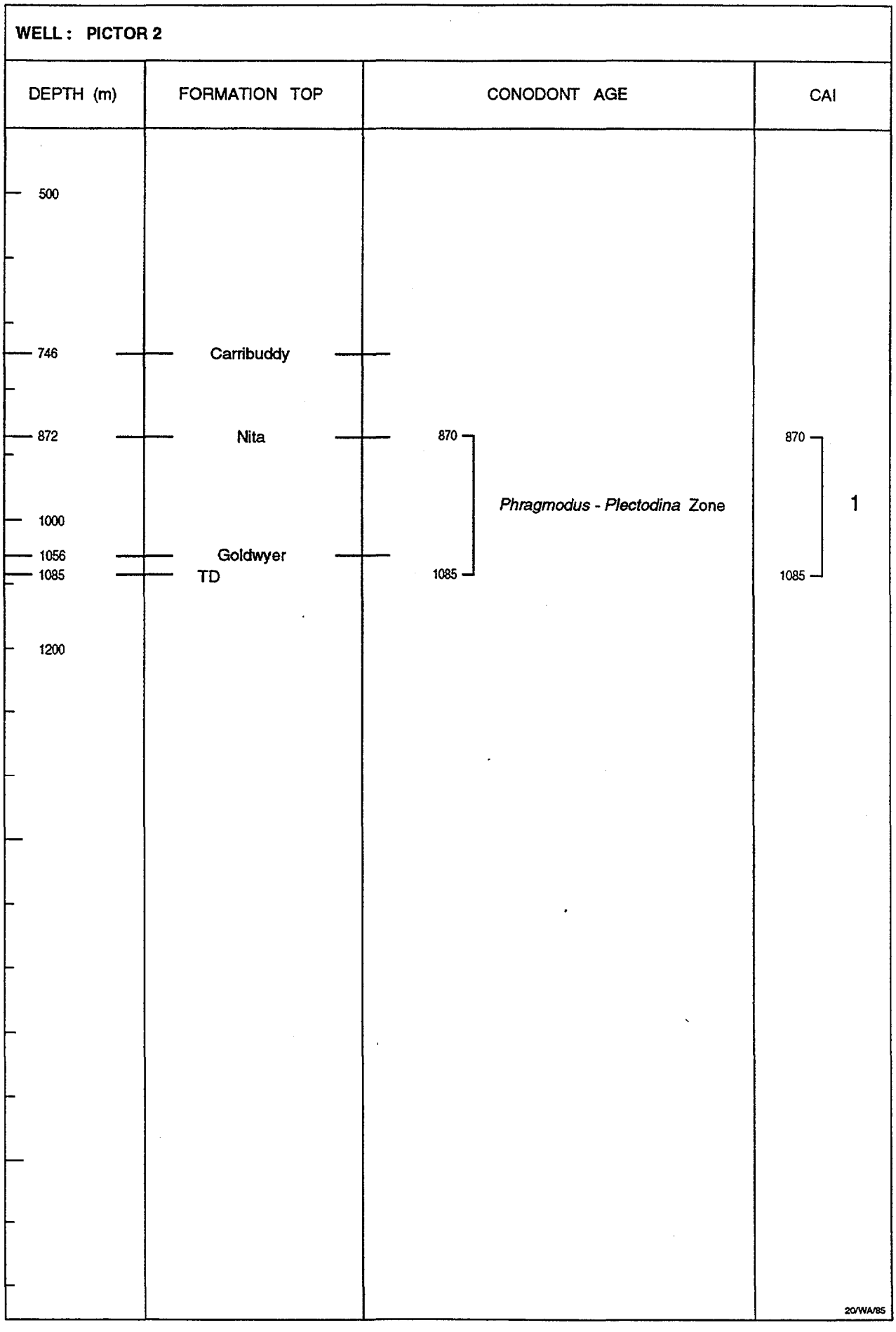
COMMENTS: Conodont distribution compares with observations in the Pictor 1 well.

| Depth (m) | value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** (746.6-872.3 m) | | | |
| 750-765 | - | 0 | |
| 765-780 | - | 0 | |
| 780-795 | - | 0 | |
| 795-810 | - | 0 | |
| 810-825 | - | 0 | |
| 825-840 | no data | | |
| 840-855 | - | 0 | |
| 855-870 | - | 0 | |
| **NITA FORMATION** (872.3-1056 m) | | | |
| 870-885 | **1** | 1 | |
| 885-900 | - | 0 | |
| 900-915 | - | 0 | |
| 915-930 | - | 0 | |
| 930-960 | no samples | | |
| 960-975 | **1** | 1 | |
| 975-990 | **1** | 24 | *Plectodina* sp. |
| 990-1005 | - | 0 | |
| 1005-1020 | **1** | 2 | |

| | | | |
|---|---|---|---|
| 1020-1035 | **1** | 47 | *?Plectodina* |
| 1035-1050 | **1** | 8 | |

**GOLDWYER FORMATION** (1056-1085 [TD] m)

| | | | |
|---|---|---|---|
| 1050-1065 | **1** | 51 | *Phragmodus* sp. |
| 1065-1080 | - | 0 | |
| 1080-1085 [TD] | **1** | 8 | |



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **ROEBUCK BAY 1**

CONODONT BIOSTRATIGRAPHY: The limited fauna recovered is probably representative of the *Phragmodus-Plectodina* Zone.

CAI: Max CAI =1 at 1217 m.

COMMENTS: Some of the elements in the core 47 (1195-1198 m) sample are possibly reworked.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** not encountered | | | |
| **NITA FORMATION** 3354-3660' (1022.6-1115.9 m) | | | |
| no samples | | | |
| **GOLDWYER FORMATION** 3360-4010' TD (1115.9-1222.6 m) | | | |
| core 46<br>3818-3826'<br>(1164.0-1166.5) | **1** | 15 | *Plectodina* sp. |
| core 47<br>3920-3930'<br>(1195.1-1198.2 m) | **1** | 121 | *Drepanoistodus* sp.<br>*Plectodina* sp. |
| ** Some (?most) of these elements are rounded, possibly (probably) post-depositional transport or reworking. Also part of sample was badly acid etched in processing. | | | |
| core 48<br>3983-3993'<br>(1214.3-1217.4 m) | **1** | 7 | *Plectodina* sp. |
| **WILLARA FORMATION** not drilled | | | |
| **NAMBEET FORMATION** not drilled | | | |

**WELL : ROEBUCK BAY 1**

| DEPTH (m) | FORMATION TOP | CONODONT AGE | CAI |
|---|---|---|---|
| 1000 | | | |
| 1022.6 | Nita | | |
| 1115.9 | Goldwyer | | |
| | | 1164 – 1217 ? *Phragmodus - Plectodina* Zone | 1164 – 1217 1 |
| 1222.6 | TD | | |
| 1300 | | | |

20/WA/86

CANNING BASIN CONODONT IDENTIFICATIONS

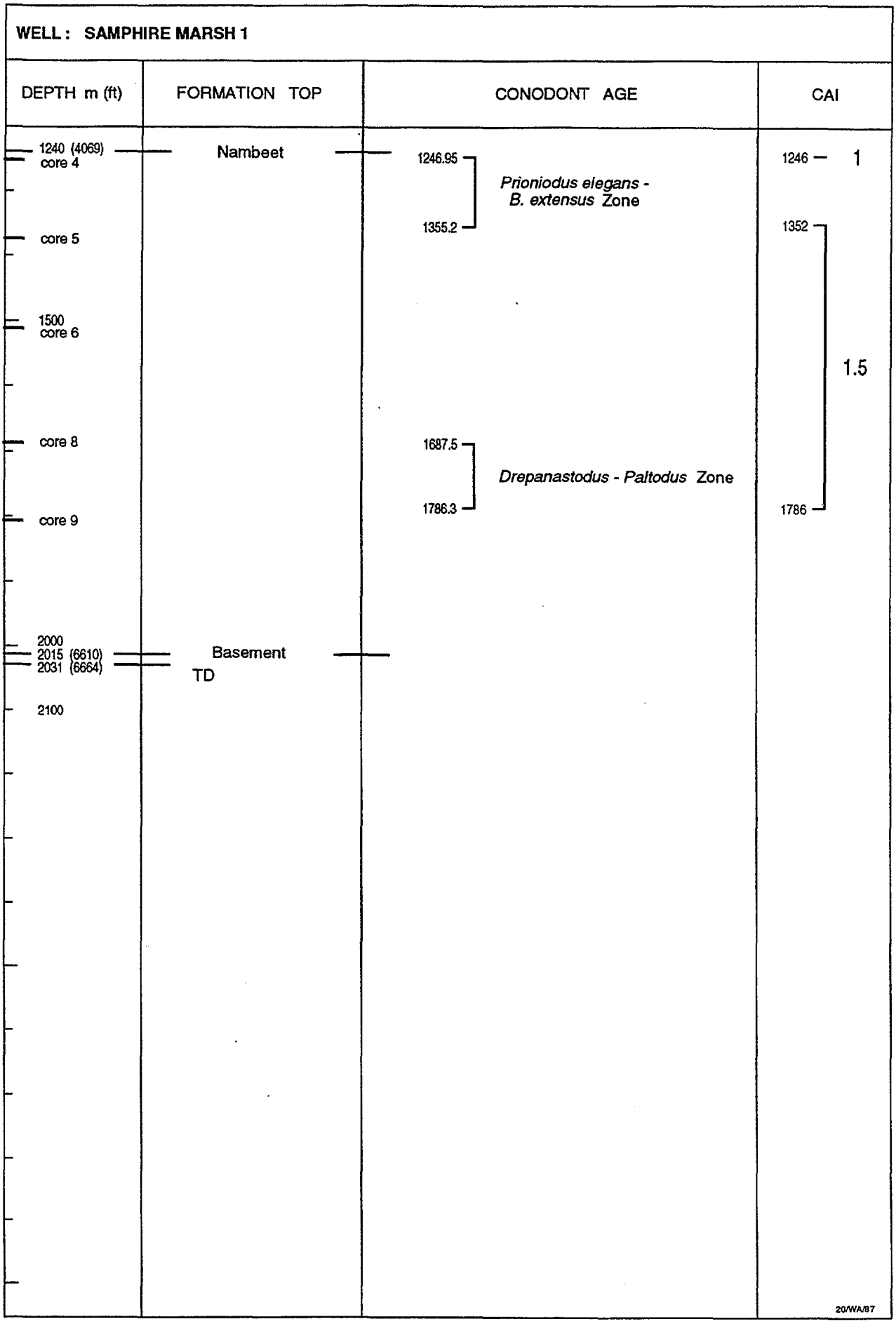
WELL **SAMPHIRE MARSH 1**

CONODONT BIOSTRATIGRAPHY: Samples from cores 4 and 5 (1246-1355 m) are typical of the *Prioniodus elegans-Bergstroemognathus extensus* Zone. The small fauna in core 6 (1504-1507 m) is not diagnostic. The fauna in cores 8 and 9 are representative of the *Drepanoistodus-Paltodus* Zone.

CAI: Max CAI = 1.5 at 1786 m.

COMMENTS: This well, in core 9, contains the oldest conodont fauna recovered from the subsurface of the Canning Basin, and is similar to the fauna from the Kudata Dolomite in the Prices Creek outcrop area.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **NAMBEET FORMATION** 4069-6610' (1240.5-2015.2 m) | | | |
| core 4<br>4090-4100'<br>(1246.95-1250 m) | **1** | 172 | *Acodus* cf. *deltatus*<br>*Bergstroemognathus extensus*<br>*Cornuodus longibasis*<br>*Oepikodus* sp.<br>*Prioniodus elegans*<br>*Prioniodus* sp. nov.B McTavish<br>*Scolopodus rex* |
| core 5<br>4435-4445'<br>(1352.1-1355.2 m) | **1.5** | 19 | ?*Oepikodus* sp.<br>*Scolopodus rex*<br>?*Walliserodus* sp. |
| core 6<br>4936-4943'<br>(1504.9-1507.0 m) | **1.5** | 10 | *Periodon* sp. nov. A<br>?*Walliserodus* sp. |
| core 8<br>5535-5547'<br>(1687.5-1691.2 m) | **1.5** | 8 | *Drepanoistodus* sp.<br>?*Scolopodus* sp. |
| core 9<br>5849-5859'<br>(1783.2-1786.3 m) | **1.5** | 20 | *Drepanoistodus* sp.<br>*Paltodus deltifer*<br>*Scolopodus* sp. |



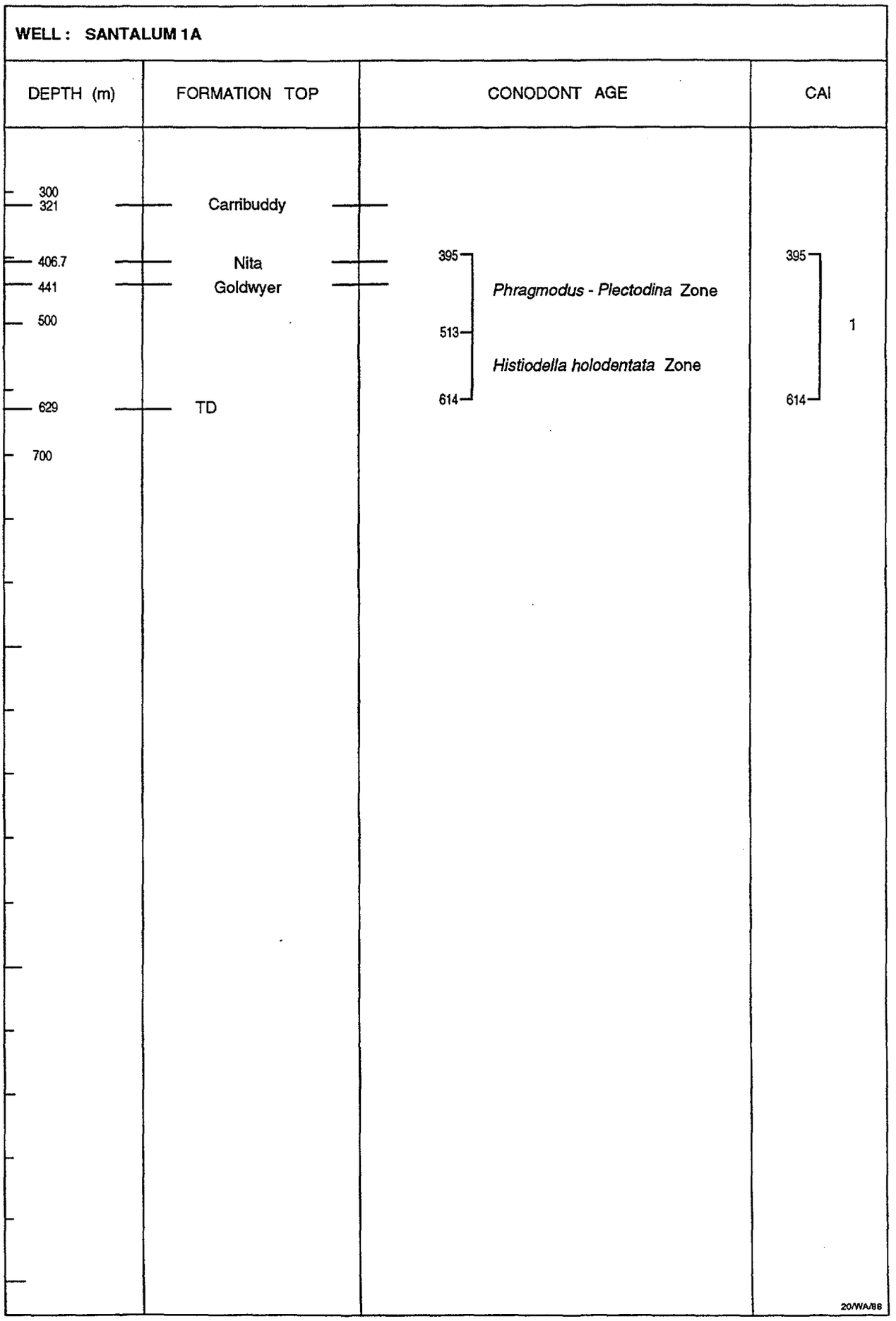
CANNING BASIN CONODONT IDENTIFICATIONS

WELL **SANTALUM 1A**

CONODONT BIOSTRATIGRAPHY: The fauna of the interval belongs to the *Phragmodus - Plectodina* Zone. The *Histiodella holodentata* Zone is found in the interval 513 to 614 m.

CAI: Max CAI = 1 at 614 m.

COMMENTS: Detailed identifications in samples from this well are those published by Simon Watson (1988). Spot checks show basic agreement with his determinations.



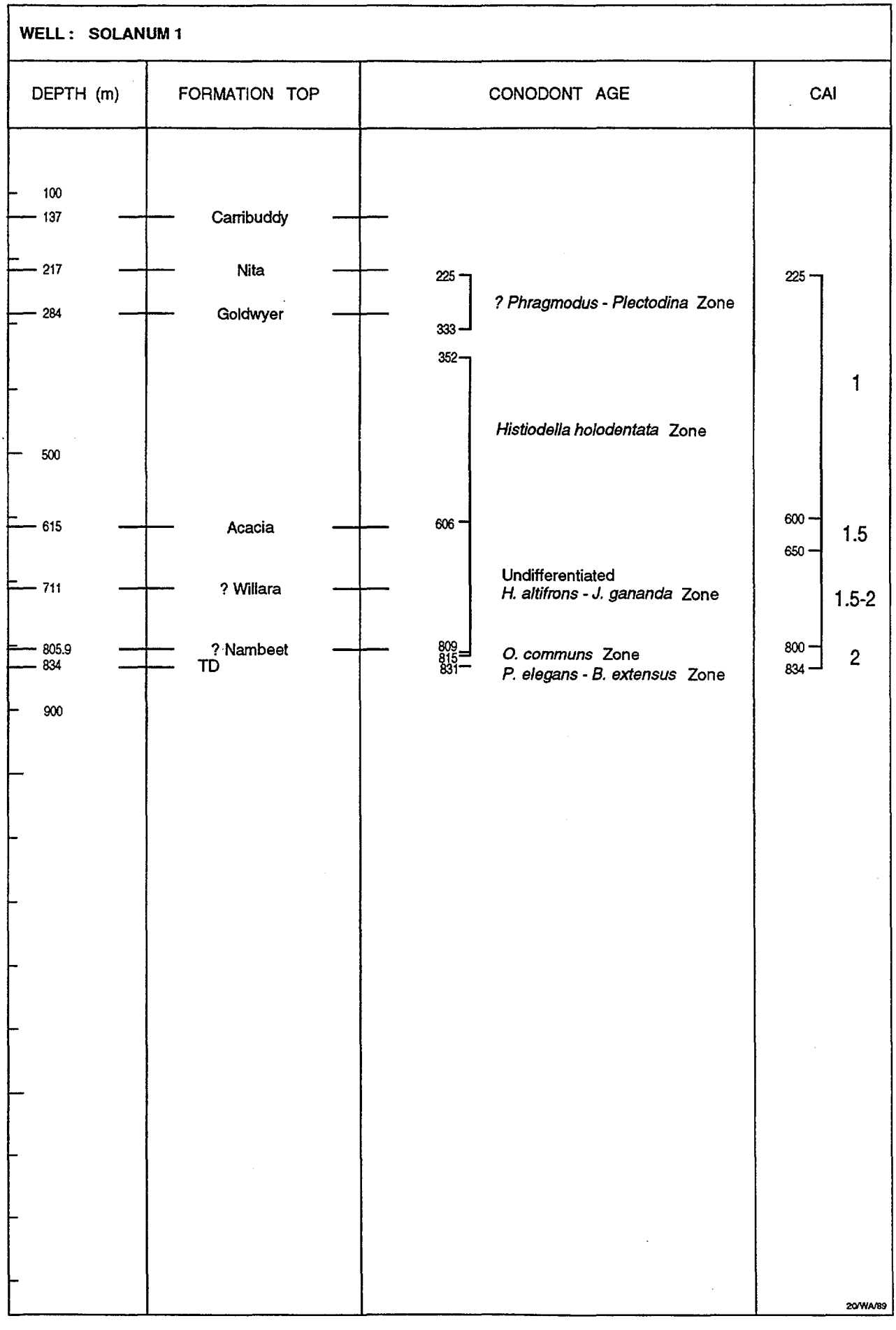
CANNING BASIN CONODONT IDENTIFICATIONS

WELL **SOLANUM 1**

CONODONT BIOSTRATIGRAPHY: The *Phragmodus* - *Plectodina* Zone is found in the interval 225-333 m. *Phragmodus polystrophos* and *Onyxodus acuoliratus* first appear in the sample at 333.07 m and highest appearance of *Histiodella holodentata* is in the sample 352-353 m. The *Histiodella holodentata* Zone is found in the interval 352 to 606 m, based on the range of *H. holodentata.* Conodonts in the interval 606 to 760 m are not diagnostic and this interval is assigned to an undifferentiated *H. altifrons* - *Jumudontus gananda* Zone. The presence of *Oepikodus communis* in samples between 809 and 815 m indicate the *O. communis* Zone. The presence of *Serratognathus bilobatus* and *Bergstroemognathus extensus* in the sample 831-832.25 m mark the *Prioniodus elegans* - *B. extensus* Zone.

CAI: Max CAI = 2 at 832 m.

COMMENTS: Detailed identifications in samples from this well are those provided in a report by Simon Watson, and have not been included here. Spot checks show basic agreement with his determinations.



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **SUNSHINE 1**

CONODONT BIOSTRATIGRAPHY: The conodont fauna is reasonably abundant in both samples. The presence of elements of *Eoplacoghathus suecicus, Onyxodus acuoliratus* and *Phragmodus polystropos* in the samples indicates that they contain faunas of the *Phragmodus - Plectodina* Zone.

CAI: Max CAI = 1 at 738 m.

COMMENTS: Following comparison with the distribution of Canning Basin Ordovician conodonts published by Watson, the samples examined from Sunshine No. 1 represent the upper part of the Goldwyer Formation or possibly part of the Nita Formation.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **? NITA or GOLDWYER FORMATION** | | | |
| 691 m | 1 | 115 elements | *Ansella* sp.<br>*Drepanoistodus* sp.<br>*Eoplacognathus suecicus*<br>*Onyxodus acuoliratus*<br>*Phragmodus* sp. indt.<br>*Protopanderodus* sp. indt. |
| 738 m | 1 | 73 elements | *Ansella* sp. indt.<br>*Drepanoistodus* sp. indt.<br>*Eoplacognathus* sp. indt.<br>*Plectodina* sp.<br>*Periodon* sp.<br>*Phragmodus polystrophos*<br>*Protopanderodus* sp. |

**WELL : SUNSHINE 1**

| DEPTH (m) | FORMATION TOP | CONODONT AGE | CAI |
|---|---|---|---|
| 100 | | | |
| 500 | | | |
| | ? Nita / Goldwyer | 691 – 738 *? Phragmodus - Plectodina* Zone | 691 – 738 1 |
| 800 | | | |

20/WA/90

CANNING BASIN CONODONT IDENTIFICATIONS

WELL **TAPPERS INLET 1**

CONODONT BIOSTRATIGRAPHY: The limited fauna in samples 6350 and 6514' cannot be zoned, see comments. Samples in the interval 6700 to 7150' have a limited fauna, but can be associated with the *Phragmodus-Plectodina* Zone. The fauna in samples from 7250 to 9200' cannot be assigned to a zone.

CAI: Max CAI = 3 at 9200' (2805 m).

COMMENTS: The single fragment recovered from sample 6350' is broken and cannot be identified, however the preserved basal cavity is similar to that found in species of *Ozarkodina* and related genera that range in age from late Silurian to Middle Devonian. This morphology is not known in the Late Devonian. The single coniform element in sample 6514' is broken, rounded and probably reworked. It is almost certainly of Ordovician age, but does not date the interval. The conodont fauna from samples in this well is impoverished and few of the good zonal indicator species were recovered.

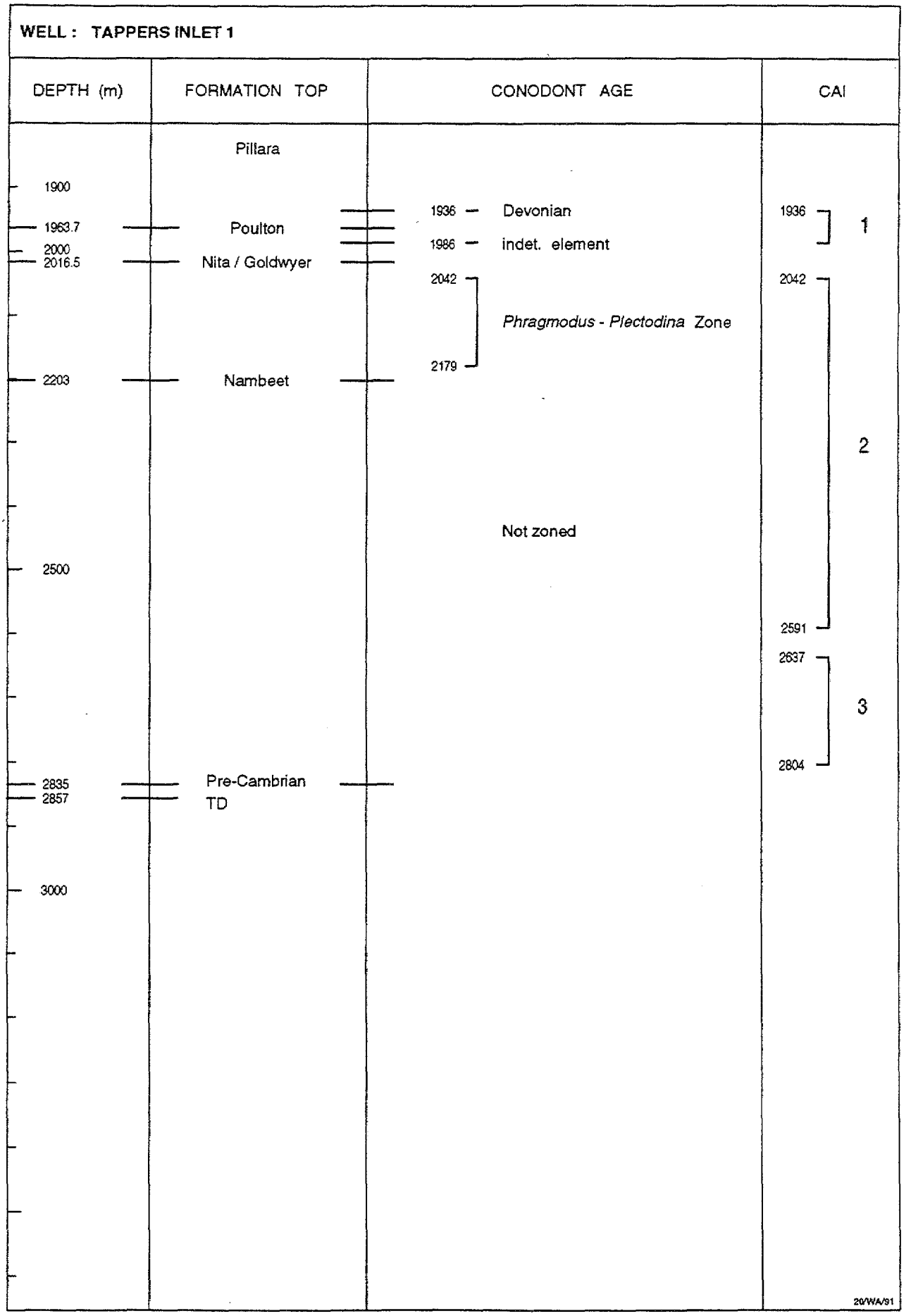
| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **PILLARA FORMATION** 5025-6441' ( m) | | | |
| 6350' (1936 m) | **1** | 1 | *?Ozarkodina* sp. |
| **POULTON FORMATION** 6441-6614' (1963.7-2016.5 m) | | | |
| 6514' (1986.0) | **1** | 1 | indt coniform element |
| **?NITA FORMATION** | | | |
| **?GOLDWYER FORMATION** 6614-7226' (2016.5-2203.0 m) | | | |
| 6700' (2042.7 m) | **2-3** | 1 | indt ramiform element |
| 6700-6750' (2042.7-2058.0 m) | **2** | 3 | *Protopanderodus* cf. *P. gradatus* |
| 6750-6800' (2058.0-2073.2 m) | **2** | 1 | indt. fragment |
| 6800-6850' (2073.2-2088.4 m) | **2** | 1 | *Drepanoistodus* sp. |
| 6850' BDC (2088.4 m) | **2** | 6 | *Erraticodon* sp.<br>indt fragments |

| | | | |
|---|---|---|---|
| 6850-6900′ (2088.4-2103.7 m) | **2** | 4 | *Erraticodon balticus*<br>*Drepanoistodus* sp. |
| 6900′ (2103.7 m) | **2** | 1 | indt coniform element |
| 6950′ (2118.9 m) | **2** | 3 | *Erraticodon* sp. |
| 7050′ (2149.4 m) | **2** | 2 | *Drepanoistodus* sp. |
| 7100′ (2164.6 m) | **2** | 6 | *Erraticodon balticus*<br>*Microzarkodina* sp.<br>*Paroistodus* sp.<br>*Trigonodus* sp. |
| 7150′ (2179.9 m) | **2** | 4 | *Ansella* sp.<br>*Drepanoistodus forceps*<br>*Protopanderodus* cf. *P. gradatus* |

**?WILLARA FORMATION**

**NAMBEET FORMATION** 7226-9300′ (2203.0-2835.4 m)

| | | | |
|---|---|---|---|
| 7250′ (2210.4 m) | **2** | 2 | *Drepanoistodus* cf. *D. forceps*<br>*Drepanoistodus* sp. |
| 7580′ (2311.0 m) | **2** | 2 | *Drepanoistodus* sp. R<br>indt. fragment |
| 8050′ (2454.3 m) | **?2** | 2 | *Drepanoistodus* sp. R<br>indt. fragment |
| 8500′ (2591.5 m) | **?2** | 5 | *Drepanoistodus* sp.<br>indt. fragments |
| 8500′ (BDC) (2591.5 m) | **?2** | 5 | indt fragments |
| 8650′ (2637.2 m) | **3** | 3 | ?*Cornuodus* sp. |
| 9200′ (2804.9 m) | **3** | 1 | *Drepanoistodus* sp. |



CANNING BASIN CONODONT IDENTIFICATIONS

## WELL **THANGOO 1**

CONODONT BIOSTRATIGRAPHY: The sample from core 2 (871.65-875.30m) is representative of the *Phragmodus-Plectodina* Zone. The sample from core 3 (959.45-961.89 m) is from the *Histiodella holodentata* Zone. The sample from core 4 (1033.84-1036.89 m) does not indicate a specific zone, but is probably from the *Histiodella holodentata* Zone.

CAI: Max CAI = 1.5 at 3401' (1036.89 m).

COMMENTS: The fauna is typical of the upper and lower parts of the Goldwyer Formation.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **GOLDWYER FORMATION** 2797-3375' (852.74-1028.96 m) | | | |
| core 2<br>2859-2871'<br>(871.65-875.30 m) | **1.5** | 18 | *Eoplacognathus foliaceus*<br>*Erraticodon* sp.<br>*Phragmodus* sp.<br>*Protopanderodus nogamii* |
| core 3<br>3147-3155'<br>(959.45-961.89 m) | **1.5** | 14 | *Drepanoistodus costatus*<br>*Histiodella holodentata*<br>*Protopanderodus gradatus* |
| **WILLARA FORMATION** 3375-3475' (1028.96-1059.45 m) TD | | | |
| core 4<br>3391-3401'<br>(1033.84-1036.89 m) | **1.5** | 45 | *Drepanoistodus costatus*<br>*Drepanoistodus* sp.<br>*Juanognathus* sp.<br>*Protopanderodus gradatus*<br>*Protppanderodus nogamii*<br>*Trigonodus larapintinensis* |

WELL : THANGOO 1

| DEPTH (m) | FORMATION TOP | CONODONT AGE | CAI |
|---|---|---|---|
| 800 | | | |
| 852 | Goldwyer | 872-875 — *Phragmodus - Plectodina* Zone | 872 |
| | | 959-961 — *Histiodella holodentata* Zone | 1.5 |
| 1000 | | | |
| 1028 | Willara | 1035 — Not zoned | 1036 |
| 1059 | TD | | |
| 1200 | | | |

20/WA/92

CANNING BASIN CONODONT IDENTIFICATIONS

WELL **THANGOO 1A**

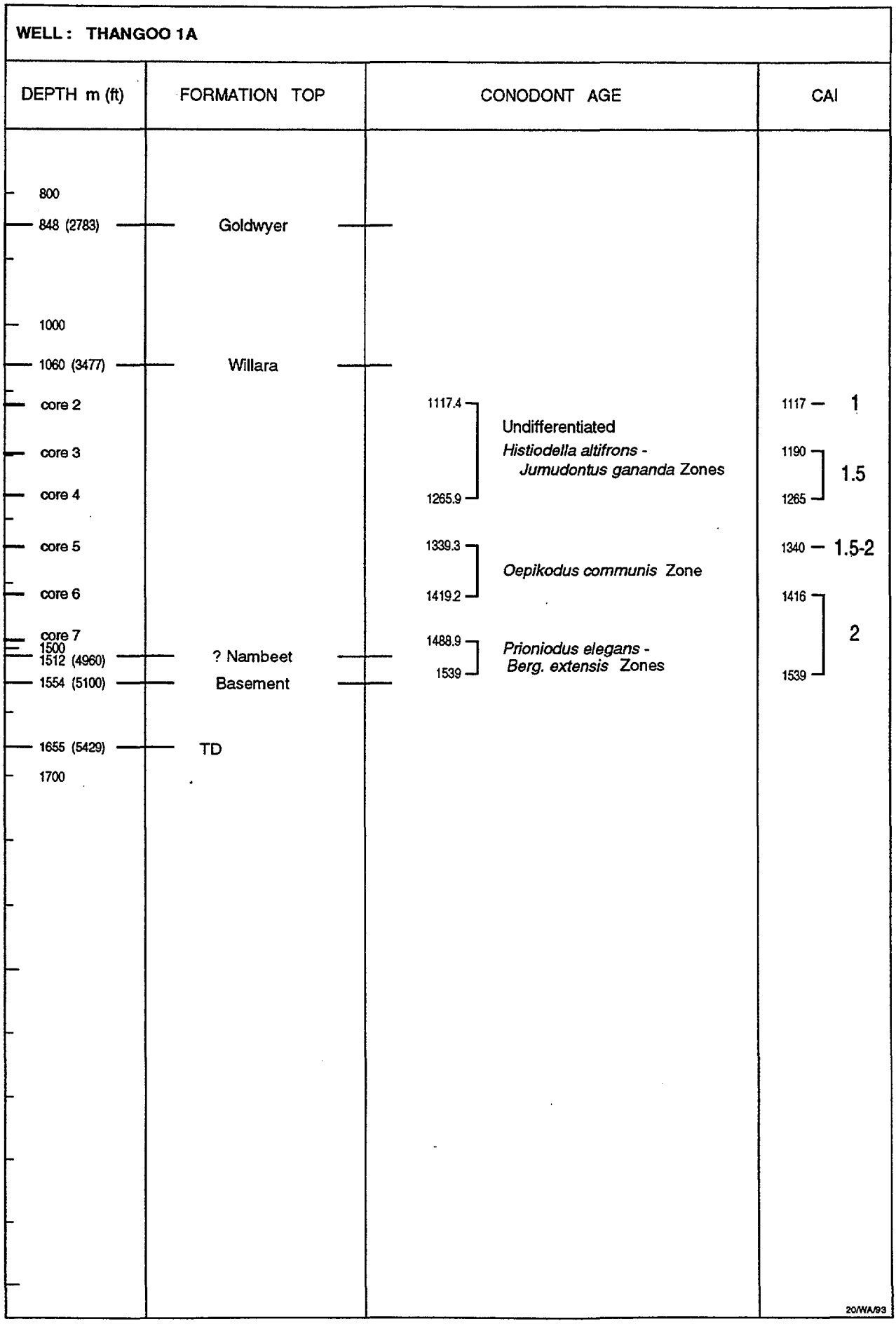
CONODONT BIOSTRATIGRAPHY: Samples from cores 2-4 (1117-1265 m) are from the undifferentiated *Histiodella altifrons* - *Jumudontus gananda* Zones. Samples from cores 5 and 6 (1339-1419 m) are from the *Oepikodus communis* Zone. Samples from cores 7 and 8 (1488-1539 m) are from the *Prioniodus elegans* - *Bergstroemognathus extensus* Zone.

CAI: Max CAI = 2 at 5048' (1539 m).

COMMENTS: No samples were processed from the Goldwyer Formation, but this well overlaps with Thangoo 1 and it should be possible to correlate the upper interval from that well.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **GOLDWYER FORMATION** 2782-3477' (848.2-1060.1 m) | | | |
| no conodont samples | | | |
| **WILLARA FORMATION** 3477-4960' (1060.1-1512.2 m) | | | |
| core 2 3665-3675' (1117.4-1120.4 m) | **1** | 6 | *Juanognathus* sp.<br>*Oepikodus* sp.<br>*Protopanderodus* sp. |
| core 3 3906-3917' (1190.9-1194.2 m) | **1.5** | 41 | *Baltoniodus* sp.<br>*Coelodus* sp.<br>*Drepanoistodus* sp.<br>*Juanognathus leptosomatus*<br>*Protopanderodus nogamii*<br>*Scolopodus cornuformis*<br>*Trigonodus larapintinensis* |
| core 4 4138-4152' (1261.6-1265.9) | **1.5** | 35 | ?*Baltoniodus* sp.<br>*Juanognathus* sp.<br>*Protopanderodus gradatus*<br>*Trigonodus larapintinensis* |

| | | | |
|---|---|---|---|
| core 5<br>4393-4403'<br>(1339.3-1342.4 m) | **1.5-2** | 275 | *Bergstroemognathus* sp.<br>*Juanognathus* sp. nov.dentatus<br>*Microzarkodina* sp. nov. A<br>*Oepikodus communis*<br>*Protopanderodus gradatus*<br>*Protopanderodus nogamii*<br>*Protoprioniodus* sp. nov. |
| core 6<br>4645-4655'<br>(1416.2-1419.2 m) | **2** | 55 | *Bergstroemognathus* sp.<br>*Microzarkodina* sp. nov. A<br>*Oepikodus communis*<br>*Protopanderodus gradatus*<br>*Protoprioniodus* cf. *yapu* |
| core 7<br>4898-4908'<br>(1288.9-1496.3 m) | **2** | 429 | *Acodus* ?sp.nov/cf?*transitans*<br>*Drepanoistodus* sp.<br>*Cornuodus longibasis*<br>*Scolopodus rex* |
| **NAMBEET FORMATION** 4960-5100' | | | |
| core 8<br>5038-5048'<br>(1536.0-1539.0 m) | **2** | 4 | ?*Oepikodus* sp.<br>*Reutterodus andinus* |



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **THANGOO 2**

CONODONT BIOSTRATIGRAPHY: Samples from core 1 (958.5-969.2 m) are from the *Histiodella altifrons* Zone. Samples from cores 2 and 3 (1064-1225 m) are probably from the *Jumudontus gananda* Zone, but only the possible presence of *Periodon* cf. *P flabelum* in core 3 is really diagnostic.

CAI: Max CAI = 2 at 5048' (1539 m).

COMMENTS: No samples with diagnostic conodonts were obtained from the Goldwyer Formation, but this well overlaps with Thangoo 1 and Thangoo 1A and it should be possible to correlate the three wells to develop a good biostrarigraphic control sequence for this part of the basin as a composite section.

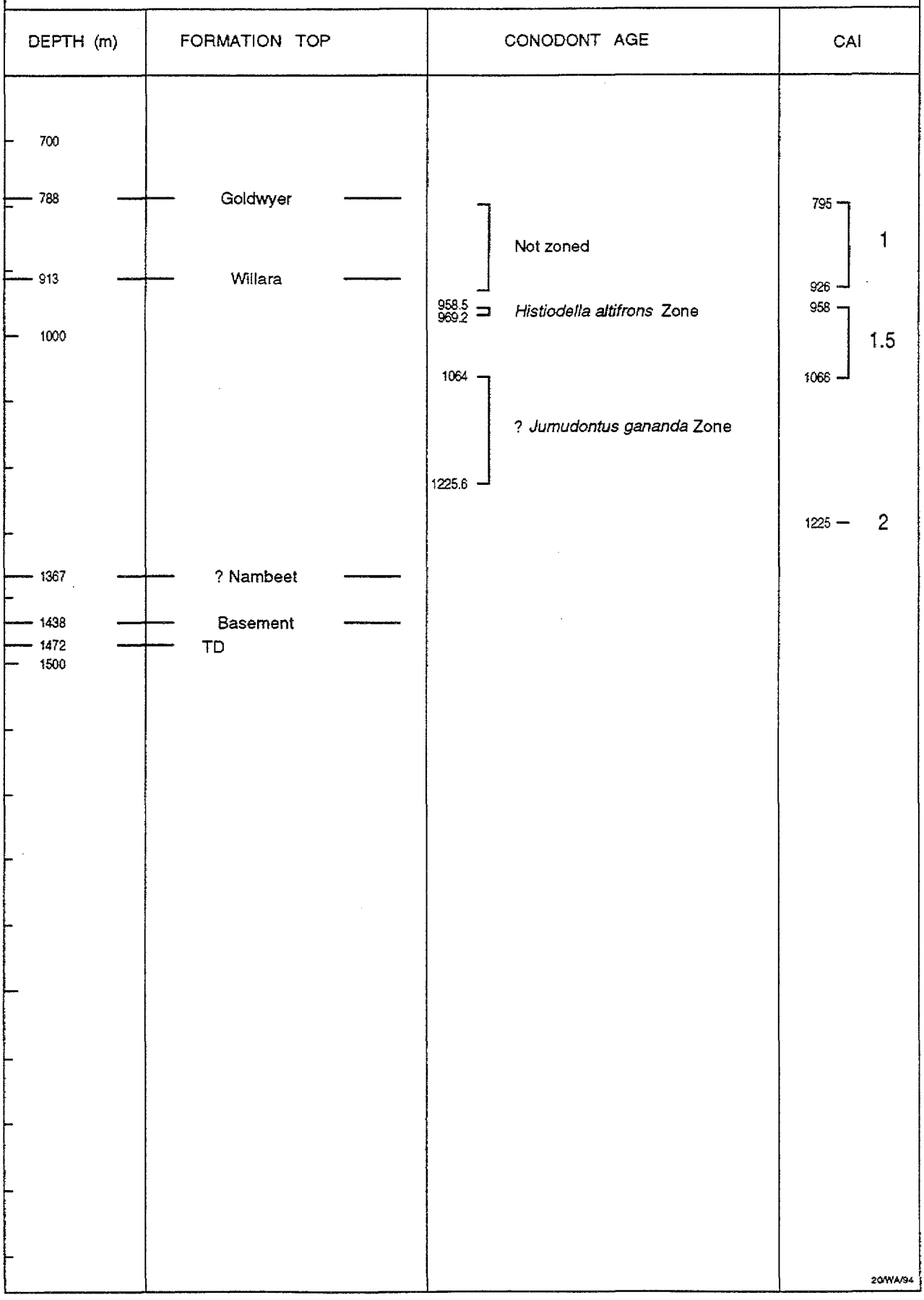
| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **GOLDWYER FORMATION** 2585-2995' (788.1-913.1 m) | | | |
| 2610-2620' (795.7-798.8 m) | **1** | 1 | *Drepanoistodus forceps* |
| 2640-2650' (804.9-807.9 m) | **1** | 3 | indt. frags. |
| 2790-2800' (850.6-853.7 m) | **1** | 2 | *Phragmodus* sp. |
| 2890-2900' (881.1-884.1 m) | **1** | 4 | *Drepanoistodus costatus* |
| **WILLARA FORMATION** 2995-4484' (913.1-1367.1 m) | | | |
| 3040-3050' (926.8-929.9 m) | **1** | 14 | ?*Bergstroemognathus* sp.<br>*Drepanoistodus pitjanti*<br>Gen. & sp. indt A, B |
| core 1<br>3144-3179' (958.5-969.2 m) | | | |

| | | | |
|---|---|---|---|
| *3144' (958.5 m) | **1.5-2** | 145 | *Ansella*<br>*Coelodus*<br>*Histiodella altifrons*<br>*Microzarkodina* sp. nov. A<br>*Oistodella*<br>*Protopanderodus gradatus*<br>*Protopanderodus nogamii*<br>*Protoprioniodus* sp.<br>?*Tasmanognathus* sp. nov. |
| *3166' (965.2 m) | **1.5** | 19 | *Coelodus* sp.<br>*Histiodella sinuosa*<br>*Protopanderodus nogamii* |
| *3179' (969.2 m) | **1.5** | 19 | *Baltoniodus* sp.<br>*Coelodus*<br>*Drepanoistodus* sp.<br>*Histiodella sinuosa*<br>*Prioniodus* sp.<br>*Protopanderodus nogamii* |
| core 2<br>3490-3499'<br>(1064.0-1066.8) | | | |
| *3490' (1064.0 m) | **1.5** | 140 | *Ansella* sp<br>*Baltoniodus* sp.<br>*Drepanoistodus* sp.<br>*Protopanderodus gradatus*<br>*Protopanderodus nogamii*<br>*Trigonodus larapintinensis* |
| *3499' (1066.8 m) | **1.5** | 69 | *Baltoniodus* sp.<br>*Drepanoistodus pitjanti*<br>*Protopanderodus nogamii*<br>*Trigonodus larapintinensis* |
| core 3<br>4010-4020'<br>(1222.6-1225.6 m) | **2** | 6 | ?*Baltoniodus* sp<br>*Periodon* cf. *flabelum*<br>*Protopanderodus gradatus* |

**NAMBEET FORMATION** 4484-4717' (1367.1-1438 m)

no samples

**WELL : THANGOO 2**



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **VELA 1**

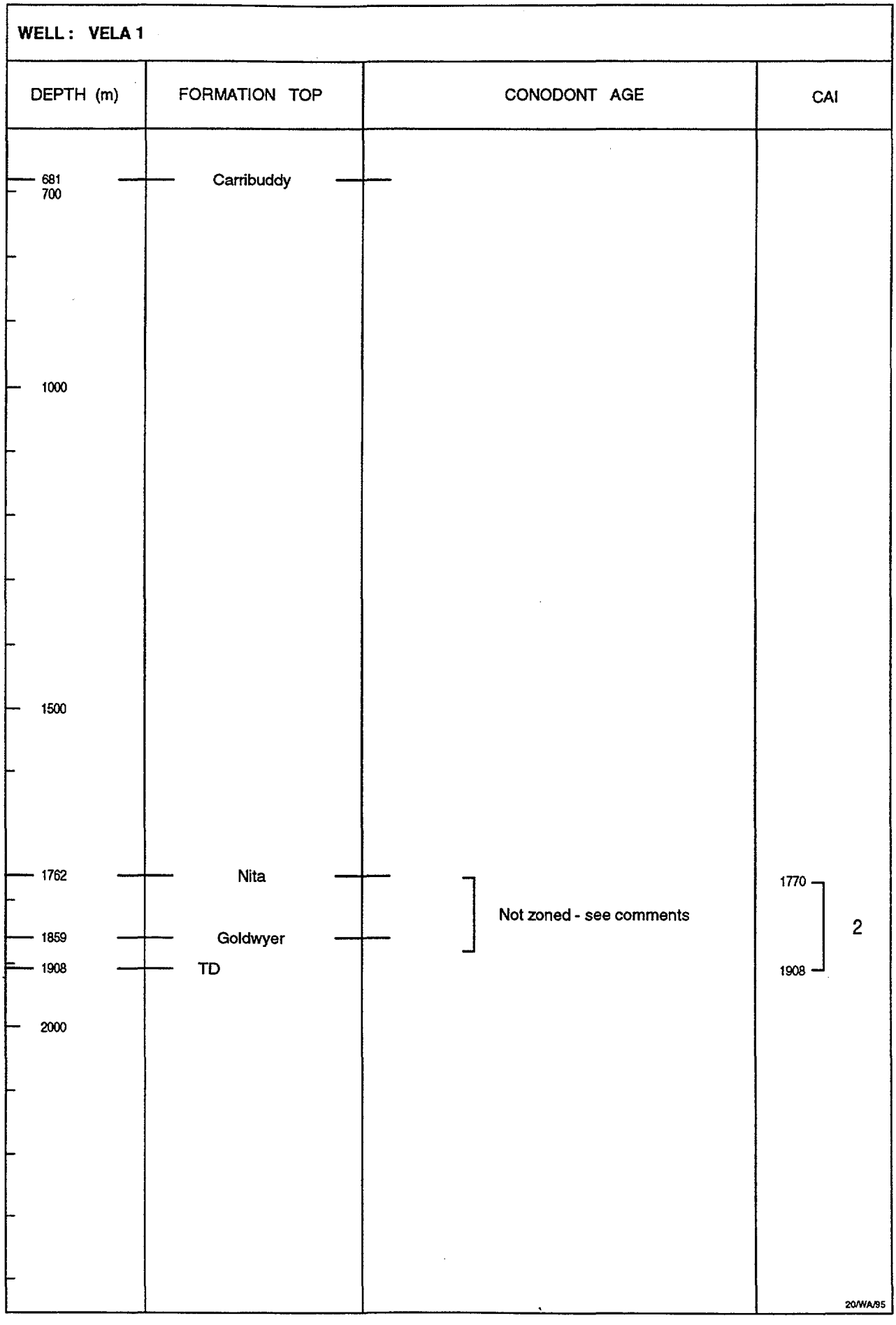
CONODONT BIOSTRATIGRAPHY: well not zoned - see comments

CAI: Max CAI = 2 at 1908.64 m (=TD).

COMMENTS: The identifications by Savage (see below) are questioned and need to be checked. The interpreted stratigraphic pick of Nita Formation to top Goldwyer Formation is not compatible with the conodont identifications, *Acodus brevis, Oepikodus* cf. *evae, Periodon flabellum*, species which would be expected in the Willara Formation.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **CARRIBUDDY GROUP** 691.0-1762.0 m | | | |
| **NITA FORMATION** 1762.0-1859.1 m | | | |
| 1760 | - | 0 | |
| 1770 | **2** | 1 | sp. indet. |
| 1780 | **2** | 2 | sp. indet. |
| 1790-1800 | **2** | 3 | *Juanognathus* cf. *variabilis* |
| 1800-1810 | - | 0 | |
| 1810-1820 | - | 0 | |
| 1820-1830 | **2** | 1 | sp. indet. |
| 1830-1840 | **2** | 2 | sp. indet. |
| 1840-1850 | - | 0 | |
| 1850-1860 | **2** | 1 | sp. indet. |
| **GOLDWYER FORMATION** 1859.1-1908.6 m =TD. | | | |
| 1860-1870 | - | 0 | |
| 1870-1880 | **2** | 5 | *Acodus* cf. *deltatus*<br>*Protopanderodus* cf. *rectus* |

| | | | |
|---|---|---|---|
| 1880-1890 | 2 | 6 | *Oepikodus cf. evae*<br>*Periodon flabellum*<br>*Protopanderodus cf. rectus* |
| 1890-1900 | - | 0 | |
| 1900-1908.64 | 2 | 1 | *Acodus brevis* |



CANNING BASIN CONODONT IDENTIFICATIONS

WELL **WHISTLER 1**

CONODONT BIOSTRATIGRAPHY: The conodont fauna is reasonably abundant in both samples, but the elements are small and most specimens are broken. Thus only generic level identification has been possible. This limits the biostratigraphic information of the samples. Samples are from the *Phragmodus-Plectodina* Zone.

CAI: Max CAI = 1 at 884 m.

COMMENTS: Comparison with the distribution of Canning Basin Ordovician conodonts published by Watson (1988) does indicate the absence of several taxa, such as *Histiodella holodentata*, *Bergstroemognathus* sp. and *Juanognathus leptosomatus*, that are abundant and restricted to the lower part of the Goldwyer Formation. Based on this absence of faunal elements, the samples examined from Whistler are thought to represent the upper part of the Goldwyer Formation or possibly part of the Nita Formation.

| Depth (m) | CAI value | abundance | Identification | |
|---|---|---|---|---|
| **upper GOLDWYER/NITA FORMATION** | | | | |
| 832 m | **1** | 84 | | |
| | | | *Eoplacognathus* sp. indt. | 14 |
| | | | *Phragmodus* sp. indt. | - |
| | | | *Protopanderodus* sp. indt. | 5 |
| | | | *Pygodus* sp indt. | 1 |
| 884 m | **1** | 101 | | |
| | | | *Ansella* sp. indt. | 3 |
| | | | *Drepanoistodus* sp. indt. | - |
| | | | *Eoplacognathus* sp. indt. | 10 |
| | | | *Phragmodus* sp. indt. | - |
| | | | *Pygodus* sp. indt. | 1 |

**WELL : WHISTLER 1**

| DEPTH (m) | FORMATION TOP | CONODONT AGE | CAI |
|---|---|---|---|
| 600 | | | |
| | | 832 – 884 ] Probably *Phragmodus - Plectodina* Zone | 832 – 884 ] 1 |
| 1000 | | | |

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CANNING BASIN CONODONT IDENTIFICATIONS

WELL **WILLARA 1**

CONODONT BIOSTRATIGRAPHY: Core 6 (1881 m) is from the *Phragmodus-Plectodina* Zone. Core 7 (2083 m) is in the *Histiodella holodentata* Zone. Samples in the interval 2264-2879 are in an undifferentiated interval of the *Histiodella altifrons* - *Jumudontus gananda* Zones. Core 13 (3018-3021 m) is from the *Oepikodus communis* Zone.

CAI: Max CAI = 4 at 3021 m

COMMENTS: An old sample from core 19 (3901-3904 m) has not been located for incorporation in this report.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **NITA FORMATION** 5694-6145' (1736.0-1873.5 m) | | | |
| no record of samples | | | |
| **GOLDWYER FORMATION** 6145-8560' (1873.5-2609.8 m) | | | |
| core 6 | | | |
| 6170-6180' (1881.1-1884.1 m) | **1-1.5** | 54 | |
| | | | *Drepanoistodus* sp. |
| | | | *Erraticodon* cf. *balticus* |
| | | | *Onyxodus acuolitatus* |
| | | | *Phragmodus polystrophos* |
| core 7 | | | |
| 6833-6845' (2083.2-2086.9 m) | **1.5** | 131 | |
| | | | *Drepanoistodus* sp |
| | | | *Erraticodon* sp. |
| | | | *Histiodella holodentata* |
| | | | *Juanognathus* sp. |
| | | | *Multioistodus* sp. A |
| | | | *Multioistodus* sp. B |
| | | | *Phragmodus spicatus* |
| | | | *Protopanderodus nogamii* |
| | | | *Protoprioniodus histion* |
| | | | *Trigonodus* sp. |
| core 8 | | | |
| 7427-7437' (2264.3-2267.4 m) | **2** | 134 | |
| | | | *Ansella* sp. |
| | | | ?*Juanognathus* sp. |
| | | | *Drepanoistodus* cf. *pitjanti* |
| | | | *Phragmodus* sp. |
| | | | *Protopanderodus nogamii* |
| | | | *Scolopodus* sp. |
| | | | *Trigonodus* sp. |

core 9
7795-7808' **2** 55
(2376.5-2380.5 m)

*Ansella* sp.
*Drepanoistodus* sp.
*Microzarkodina* sp.
*Phragmodus* sp.
?*Trigonodus* sp.

core 10
8352-8362' **2** 75
(2546.3-2549.4 m)

*Drepanoistodus* cf. *pitjanti*
?*Erraticodon* sp.

** sample acid etched and very fragmented.

**WILLARA FORMATION** 8560-10308' (2252.6-3142.7 m)

core 11
8808-8818' **3** 31
(2685.4-2688.4 m)

*Drepanoistodus pitjanti*
*Prioniodus* sp.
*Protopanderodus gradatus*
*Scolopodus filosus*

core 12
9435-9445' **4** 21
(2876.5-2879.6 m)

*Bergstroemognathus* sp.
*Protoprioniodus yapu*
*Scolopodus* sp.

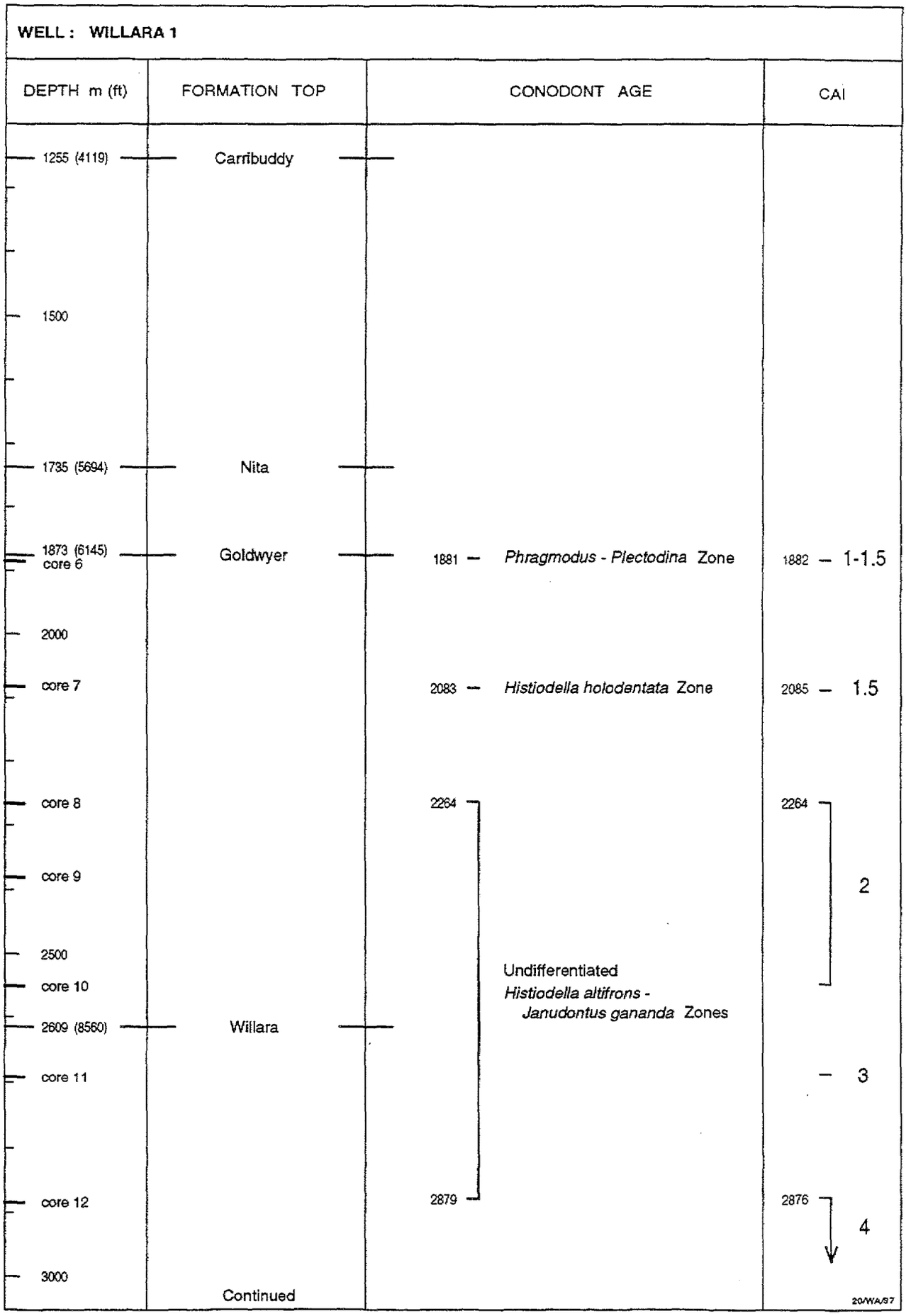
core 13
9900-9910' **4** 14
(3018.9-3021.3 m)

*Cornuodus longibasis*
*Oepikodus communis*
*Protoprioniodus gradatus*

**?NAMBEET FORMATION** 10308'-TD (3142.7-TD)

core 19
12796-12806' **3+** 1
(3901.22-3904.27 m)

indt. coniform fragment
*Scolopodus rex* also reported from this sample-seeWCReport



**WELL : WILLARA 1** Continued

| DEPTH m (ft) | FORMATION TOP | CONODONT AGE | CAI |
|---|---|---|---|
| 2600 | | | |
| 2609 (8560) | Willara | Undifferentiated<br>*Histiodella altifrons* -<br>*Janudontus gananda* Zones | 4 |
| core 11 | | | |
| core 12 | | 2879 | |
| 3000 | | | |
| core 13 | | 3018.9-3021 *Oepikodus communis* Zone | 3021 |
| 3142 (10308) | Nambeet | | |
| 3500 | | | |
| 3903 (12806) | TD | | |
| 4000 | | | |

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CANNING BASIN CONODONT IDENTIFICATIONS

WELL **WILSON CLIFFS 1**

CONODONT BIOSTRATIGRAPHY: The two samples between 966.5 and 1027.4 m each contains a single element, and neither provide a viable age date. The samples between 2625 and 2747 m contain elements indicative of the *Phragmodus-Plectodina* Zone. No elements restricted to the *Histiodella holodentata* Zone were recovered. Samples from the interval 2868 to 3219 m contain a fauna from the *Prioniodus elegans-Bergstroemognathus extensus* Zone.

CAI: Max CAI = 1.5 at

COMMENTS: These determinations are based of the processing of cuttings samples from the BMR (AGSO) Core Lab and most of the samples weighed no more than 150 g. Preservation is generally poor and the fauna is not abundant.

This interpretation would suggest that there is a significant stratigraphic break in the section with no Willara or lower Goldwyer Formation equivalent being preserved in this area of the basin.

| Depth (m) | CAI value | abundance | Identification |
|---|---|---|---|
| **?DEVONIAN** | | | |
| 3170-3270' (966.5-997.0 m) | **1** | 1 | indt. fragment (pectiniform) |
| 3270-3370' (997.0-1027.4 m) | **1** | 1 | indt. fragment |
| **CARRIBUDDY GROUP** 1779-2533 m | | | |
| no samples examined | | | |
| **NITA FORMATION-GOLDWYER FORMATION** 2533-2847 m | | | |
| 8410-8510' 2564.0-2625.0 m) | **1** | 2 | indt. fragments |
| 8610-8710' (2625.0-2655.5 m) | **1.5** | 4 | *Plectodins* sp.<br>indt. fragments |
| 8710-8810' (2655.5-2686.0 m) | **1.5** | 4 | indt. fragments |
| 8810-8910' (2686.0-2716.5 m) | **1.5** | 3 | indt. fragments |

| | | | |
|---|---|---|---|
| 8910-9010' (2716.5-2747.0 m) | **1.5** | 15 | *Erraticodon* sp.<br>indt. fragments |
| 9010-9110' (2747.0-2777.4 m) | **1.5** | 1 | indt. fragment |
| 9110-9210' (2777.4-2807.9 m) | - | 1 | indt. fragment |
| 9210=9310' (2807.9-2838.4 m) | - | 7 | indt. fragments |

**WILLARA FORMATION** not recognised??

**NAMBEET FORMATION = WILSONS CLIFF SANDSTONE** 2847-3503 (TD)

| | | | |
|---|---|---|---|
| 9310-9410' (2838.4-2868.9 m) | - | 8 | indt. fragments |
| 9410-9510' 2868.9-2899.4 m) | **1.5** | 6 | *Bergstroemognathus* cf. *B. extensus*<br>*Trigonodus* sp.<br>*Drepanoistodus* cf. *D. rex* |
| 9510-9610' (2899.4-2929.9 m) | **1.5** | 1 | indt. fragment |
| 9610-9710' (2929.9-2960.4 m) | **1.5** | 14 | *Juanognathus* sp.<br>*Trigonodus larapintinensis*<br>indt. fragments |
| 9710-9810' (2960.4-2990.9 m) | - | 3 | indt. fragments |
| 10010-10100' 3051.8-3128.0 m) | **1.5** | 3 | *Bergstroemognathus* cf. *B. extensus*<br>*Drepanoistodus* cf. *D. rex*<br>indt. fragment |
| 10260-10360' (3128.0-3158.5 m) | **1.5** | 3 | *Bergstroemognathus* sp.<br>indt. fragment |
| 10360-10460' (3158.5-3189.0 m) | **1.5** | 4 | *Drepanoistodus* cf. *D. rex*<br>indt. fragments |
| 10460-10560' (3189.0-3219.5 m) | **1.5** | 8 | *Drepanoistodus* cf. *D. rex*<br>indt. fragments |
| 10560-10660' (3219.5-3250 m) | **1.5** | 4 | indt. fragments |