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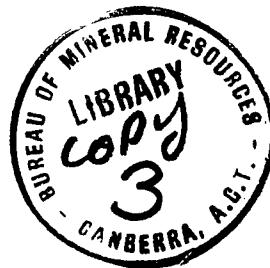
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COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT  
BUREAU OF MINERAL RESOURCES  
GEOLOGY AND GEOPHYSICS

RECORDS:

1965/88



PALynOLOGICAL CORELATION OF PLANET TOOLOCOMBILLA No.1  
CRYSTALBROOK No.1 & WARRONG No1, EDDYSTONE 1:250,000  
SHEET AREA, SURAT BASIN, QUEENSLAND.

by

P.R.Evans and E.A. Hodgson

The information contained in this report has been obtained by the Department of National Development, as part of the policy of the Commonwealth Government, to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

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SUMMARY

The results of a palynological examination of selected samples of cores and cuttings from Planet Tooloombilla No. 1, Crystalbrook No. 1 and Warrong No. 1 Wells are recorded and used to correlate these wells with each other, and neighbouring wells in the Denison Trough. A few probably Lower Carboniferous spores were extracted from Warrong No. 1, Core 11. The thin Permian section in Warrong No. 1 includes palynological units ?Pla, ?Plb, P3c, P3d and P4. No microfloras could be obtained from the sections which lithologically correlate with Lower Triassic sediments in the region. The Lower Jurassic acritarch horizon is present at Tooloombilla and Crystalbrook, the most westerly occurrence of these fossils yet proven.

INTRODUCTION

By agreement with Alliance Oil Development Australia N.L., holder of Authority to Prospect 81P, Queensland, Planet Exploration Co. Pty Ltd drilled three exploratory wells, Tooloombilla No. 1, Crystalbrook No. 1, and Warrong No. 1 within the Eddystone 1:250,000 Sheet area (G55/7) (see Table 1 and Plate) in order to examine the sediments west of the Bowen Basin (Denison Trough), south of the Springsure Shelf, and below the Surat Basin. Palynological examination of selected samples from these wells was initially undertaken to identify the ages of pre-Jurassic sediments, but the project was extended to locate the Lower Jurassic acritarch horizon in the Tooloombilla and Crystalbrook wells. Certain results from this study (obtained by E.A.H.) were incorporated in the well completion reports (Myers, 1964a, b, c). However, all the palynological data obtained are summarized in the following report, and are used to correlate the three wells with each other.

WELL	LAT.(S)	LONG.(E)	HEIGHT GL	TD
			KB	
Tooloombilla 1	25°52'50"	147°57'40"	1358	1367 D 1750
Crystalbrook 1	25°29'03"	147°59'35"	1647	E 1755
Warrong 1	25°09'46"	147°53'37"	2043	D 2060
			2052	E 2061
				D 3573
				E 3579

TABLE 1: Co-ordinates and total depths of wells.  
GL = Ground Level; KB = Kelly Bushing  
TD = Total Depth; D = Driller's depth  
E = Electric log depth

OBSERVATIONSA. Tooloombilla No.1Core 1 750 feet

The sample contained many well preserved Jurassic spores and pollens, rare acritarchs and a few re-cycled Permian pollens ("Nuskoisporites" spp.).

Spores and Pollens

Cyathidites spp.  
Baculatisporites comauensis  
Ischyosporites sp.  
Lycopodiumsporites rosewoodensis  
Tsugaepollenites segmentatus  
Perotrilites sp.  
Classopollis sp.  
Disaccites spp.  
Ginkgocycadophytus spp.  
"Nuskoisporites" spp.

This assemblage is of Jurassic age. The presence of Tsugaepollenites segmentatus, Lycopodiumsporites rosewoodensis and Ischyosporites sp., and the relatively low proportion of Classopollis sp. in the sample suggests an upper J2 and J3 age even though the J3 unit marker Murornati sp. was not observed. The sample is a correlate of a point in the Hutton Sandstone of the Surat Basin.

Cuttings over interval 1030-1060 feet

Examined solely for their acritarch content. See Table 2 for results.

Core 2 1060 feet

The microflora recorded in this sample, though relatively poor, is essentially similar to that of Core 1. It included:-

Cyathidites sp.  
Ischyosporites sp.  
Tsugaepollenites segmentatus  
Classopollis sp.  
Disaccites spp.  
Ginkgocycadophytus sp.  
"Nuskoisporites" sp. } (recycled Permian pollens)  
Striatiti sp.

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\* Code symbols of this type, refer here to the palynological units described by Evans (1964; in Mines Administration Pty Ltd, 1963b, c; Cundill, 1963).

Core 3 1379 feet and swc 1430 feet

These samples contained relatively abundant spores and pollens including:-

Cyathidites sp.  
Stereisporites sp.  
Baculatisporites comaumensis  
Cadargasporites baculatus  
Lycopodiumsporites sp.  
Classopollis sp. (very common)  
Disaccites sp.  
Ginkgocycadophytus sp.  
"Nuskoisporites" sp. (re-cycled Permian pollen)

The presence of Cadargasporites baculatus\* and the abundance of Classopollis sp. indicates that the samples are of Lower Jurassic Unit J1 ("Zone 2") age. They are correlates of the Precipice Sandstone of the Surat Basin.

Core 4 1725 feet

Barren

## Tooloombilla No. 1

Cuttings	1030 - 1040 feet	1%
"	1040 - 1050 "	1%
"	1050 - 1060 "	1%
"	1060 "	1%

## Crystalbrook No. 1

Cuttings	330 - 340 feet	0%
"	340 - 350 "	2%
"	350 - 360 "	6.5%
"	360 - 370 "	0%

TABLE 2: Percentage of acritarchs relative to spores and pollens in cuttings from Tooloombilla No. 1 and Crystalbrook No. 1.

B. Crystalbrook No. 1Cuttings over interval 330 - 370 feet

Examined solely for their acritarchs content. See Table 2 for results.

There was no recovery from Cores 2 and 3. Cores 1 (598-608 feet) and 4 (1099-1104 feet) were inspected but they were not suitable for palynological study and were therefore not processed.

\*Cadargasporites baculatus was referred to as "Apiculati sp. nov." in previous reports.

Core 5 (1540-1560 feet) 1555 feet

The sample processed was a grey-green, well sorted, coarse grained sandstone, it contained non-diagnostic Triassic pollens (Alisporites spp.) and a number of poorly preserved, remanic Permian, forms including Protohaploxylinus limpidus and "Nuskoisporites" spp. The determination of a Middle - Upper Triassic, Tr 3 age for Core 6 limits the age of Core 5 to the Middle - Upper Triassic.

Core 6 (1675-1685 feet) 1684 feet

This sample, a light grey sandstone containing numerous angular fragments of grey shale, produced many well preserved spores and pollens including:-

- Calamospora sp.
- Todisporites sp.
- Granulatisporites spp.
- Thymospora ipsviciensis
- Aratrisporites spp. (fairly common)
- Ginkgocycadophytus sp.
- Alisporites spp. (common)

The assemblage is typical of the Middle-Upper Triassic Unit Tr 3. The abundance of Aratrisporites is of interest in that it suggests correlation of the sample with a point in the lower half of Unit Tr 3, in correlates of the upper part of the Clematis Sandstone or lower Moolayember Formation. Although the sample contained numerous lithic fragments no obviously recycled spores were observed but it is conceivable that the spores are derived from the soft, dark grey shale fragments.

Core 7 (1966-1976 feet) 1967 feet

Barren

Core 7 (1966-1976 feet) 1975 feet

Barren

C. Warrong No.1 WellCore 1 553 feet

Barren

Core 2 651 feet

Only a few non-diagnostic, disaccate pollen were observed in this sample. They do not permit the age of the core to be determined.

Core 3 1189 feet, Core 4 1426 feet, Core 5 699 feet

Spores recorded in these samples included abundant Alisporites spp. Aratrisporites sp. and Ginkgocycadophytus spp. together with re-cycled Permian forms such as "Nuskoisporites" sp. and Apiculati sp. Core 5 contained a richer microflora than either Core 1 or 4, it included Thymospora ipsviciensis and rare striate pollen. The microfloras of these samples indicate a Middle to Upper Triassic Unit Tr. 3 age. The abundance of Arattisporites sp. in them suggests that they are correlates of the upper part of the Clematis Sandstone or lower Moolayember Formation of the Surat Basin.

5.

Cuttings 1980-90 feet, 2020-30 feet

These samples were examined to determine if the well penetrated Lower Triassic sediments before entering the Permian succession. They contained many M-U Triassic spores including Aratrisporites, Alisporites and Ginkgocycadophytus but lacked typically Lower Triassic forms such as Taeniasporites and Quadrисporites horridus.

Core 7 2172-82 feet

A moderate number of well preserved spores and pollens was present in the sample including:-

Granulatisporites micronodosus  
Anapiculatisporites sp.  
Anapiculatisporites ericianus  
Kraeuselisporites apiculatus  
"Nuskoisporites" sp.  
Striatiti spp. (cancellatus and limpidus types)

This assemblage is of Upper Permian age. The relative abundance of both Striate pollens and acanthine pteridophyte spores indicates a P 3d age although the P 3d unit marker Veryhachium sp. 2 was not observed in the sample.

Cuttings 2340-50 feet, 2350-60 feet

Since Core 8 (2365-2375 feet) was probably cut from the Mantuan Productus Bed (Dickins, in Myers, 1964c), the cuttings immediately above, from 2340-50 feet and 2350-60 feet, were examined for Micrhystridium sp. 3, the marker fossil of the P3c horizon. None was found. The samples contained many Middle-Upper Triassic spores together with the following Permian forms.

Spores and Pollens

Calamospora diversiformis  
Granulatisporites micronodosus  
Acanthotriletes teretangulatus  
Anapiculatisporites ericianus  
A. inciratus  
Krseuselisporites apiculatus  
Dulhuntyispora parvithola  
Striatiti spp.

Microplankton

Veryhachium sp. 2

The presence of Veryhachium sp. 2 indicates that the sample belongs to unit P3d.

Cuttings 2365-70 feet, 2370-75 feet and 2375-80 feet

Because Micrhystridium sp. 3 was not observed in the cuttings interval immediately above the core (Core 8) containing the (?)Mantuan Productus Bed macrofossils, the cuttings listed above, whose labelled depths are within the cored interval, were examined on the assumption that a cuttings return lag had occurred. These samples contained typical P3 microfloras and abundant Micrhystridium sp. 3, the unit marker of the P3c horizon.

Core 9 2642-52 feet

Several specimens of Micrhystridium sp. 4 were found in the sample together with the following spores:-

Anapiculatisporites ericianus  
Baculatisporites sp.  
Striati spp. (common)  
Disacciti spp. (common)  
"Nuskoisporites" sp.  
" cf. Marsupipollenites sinuosus"

This assemblage is probably of P3b age because of the presence of A. ericianus, although the marker species Dulhuntyispora parvithola is apparently absent. A very similar assemblage occurs at the base of P3b in Kildare No. 1 (Evans, in Mines Administration Pty Ltd, 1963a). The "cf. M. sinuosus" compares closely with the problematic form in Pla, discussed in connection with the Westgrove Wells (Evans, in Mines Administration Pty Ltd, 1963b). This sample almost certainly is of Pla or basal Plb age.

#### Core 10 2896-2901 feet

Barren

#### Cuttings 2970-80 feet, Core 11 3170-85 feet, Cuttings 3340-50 feet

Core 11 contained only a few spores, including Laevigati spp. and Apiculati spp (granulate and rugulate). These forms, in the absence of "Nuskoisporites" spp. and striate pollens, indicate that Warrong Core 11 is older than the Joe Joe Formation of the Drummond Basin and is probably of Lower Carboniferous or Devonian age (see below). The cuttings from 2970-80 feet and 3340-50 feet were examined for spores which might confirm this age but none was found.

Because the assemblage from Warrong Core 11 consisted of only a few spores its age relative to other Australian Carboniferous and Devonian microfloras cannot be determined. It lacks both characteristic Lower Devonian forms and Middle and early Upper Devonian types such as those which have bifurcating spines and/or mesosporoids.

#### SUMMARY OF AGE DETERMINATIONS

##### Tooloombilla No.1 Well

Cuttings	1030 - 1040 feet	Jurassic	Unit J2
Cuttings	1040 - 1050 feet	Jurassic	Unit J2
Cuttings	1050 - 1060 feet	Jurassic	Unit J2
Cuttings	1060 feet	Jurassic	Unit J2

<u>Sample</u>	<u>Depth</u>	<u>Age</u>	<u>Palynological Unit</u>
Core 1	750 feet	Jurassic	Unit J2 - J3
Core 2	1060 feet	Jurassic	Unit J2
Core 3	1379 feet	Jurassic	Unit J1
Core 4	1430 feet	Jurassic	Unit J1
	1725 feet	Barren	

##### Crystalbrook No.1 Well

Cuttings	330 - 340 feet	Jurassic	Unit J2
Cuttings	340 - 350 feet	Jurassic	Unit J2
Cuttings	350 - 360 feet	Jurassic	Unit J2
Cuttings	360 - 370 feet	Jurassic	Unit J1-2

<u>Sample</u>	<u>Depth</u>	<u>Age</u>	<u>Palynological Unit</u>
Core 5	1555 feet	M-U Triassic	Unit Tr 3
Core 6	1684 feet	M-U Triassic	Unit Tr 3
Core 7	1967 feet	Barren	
Core 7	1975 feet	Barren	

Warrong No. 1 Well

<u>Sample</u>	<u>Depth</u>	<u>Age</u>	<u>Palynological Unit</u>
Core 1	553 feet	Barren	
Core 2	651 feet	Very low yield, age not determined	
Core 3	1189 feet	M-U Triassic	Unit Tr.3
Core 4	1426 feet	M-U Triassic	Unit Tr.3
Core 5	1699 feet	M-U Triassic	Unit Tr.3
Cuttings	1980-1990 feet	M-U Triassic	
Cuttings	2020-2030 feet	M-U Triassic	
Core 7	2172-2182 feet	Upper Permian	Unit P3d
Cuttings	2340-2350 feet	Upper Permian	Unit P3d
Cuttings	2350-2360 feet	Upper Permian	Unit P3d
Cuttings	2365-2370 feet	Upper Permian	Unit P3c
Cuttings	2370-2375 feet	Upper Permian	Unit P3c
Cuttings	2375-2380 feet	Upper Permian	Unit P3c
Core 9	2642-2652 feet	Upper Permian	Unit P3a or P3b
Core 10	2896-2901 feet	Barren	
Cuttings	2970-2980 feet	?pre-Permian	
Core 11	3170-3185 feet		Carboniferous or Devonian
Cuttings	3340-3350 feet		Carboniferous or Devonian

COMMENTS

The palynological and lithological units which are recognized in the Tooloombilla, Crystalbrook, and Warrong wells are correlated as in the accompanying Plate. In order to illustrate the differences between this sequence and the one in the Denison Trough, the sections of AFO Bandanna No.1 plus neighbouring outcrop at the southern end of Reid's Dome and Planet Warrimilla No.1 are also added. It is emphasised that the boundaries between the palynological units are placed within the intervals between fossiliferous samples. Previous studies have shown that the depths of occurrence of several of these boundaries correspond to certain lithological boundaries and their positions on the correlation chart are adjusted accordingly.

Basement

Tooloombilla No.1 entered granite porphyry at 1748 feet, and Crystalbrook No.1 entered quartzite with minor amounts of phyllite at 1998 feet, which Myers (1963b) referred to the Devonian Timbury Hills Formation. Both of these lithologies are regarded as basement to the overlying Palaeozoic and Mesozoic sequence. The Timbury Hills Formation dips at 60° in Crystalbrook No.1, core 8, 2030-35 feet.

A similar change in a north-south direction from sedimentary to igneous basement takes place across the southern end of the Denison Trough, where the granites are thought to be Lower Carboniferous in age, and to intrude the Devonian Timbury Hills Formation. The age of the Timbury Hills Formation has only been determined from psilopeltalean plant fossils in AFO Pickanjinnie No.2, east of the Roma ridge (Mary E. White, pers. comm.) and Leptophloem australe in AFO Purbrook No.1 on the eastern flank of the Denison Trough (Woods, in Mines Administration Pty Ltd 1963d). The steep dips usually encountered in this formation indicate that great thicknesses of section be included in this probably heterogenous unit, possibly of greatly varying age. The existence of the formation west of the Denison Trough is of both tectonic and sedimentological interest as it appears to have little in common with the Devonian rocks outcropping to the west of the trough and north of the Springsure Shelf, where they occupy part of the Drummond Basin.

(?)Lower Carboniferous

Warrong No. 1, core 11, which yielded a pre-Joe Joe Formation (i.e. pre-Unit C1) assemblage, was cut from a sequence of undifferentiated, multicoloured, shale, arkose, tuff, sandstone and conglomerate. The subhorizontal attitude, lack of induration and lithology of this unit indicate that it is younger than the Timbury Hills Formation of Crystalbrook No. 1. The Leptophloem australe at Purbrook (Woods, loc. cit.) indicates that folding which affected the formation did not take place before the Upper Devonian. It may thence be deduced that the Warrong section is probably Lower Carboniferous in age. As the outcropping Telemon Formation of the Drummond Basin has also yielded Leptophloem australe (White, 1962), the Warrong section is probably younger than the Telemon Formation, and could be correlated with sections within the Mount Hall Conglomerate, Raymond Sandstone or Ducabrook Formation. G. Mollan (pers. comm.) has noted the similarity between Warrong No. 1, core 12, 3540-43 feet, and the Mount Hall Conglomerate, and between Warrong No. 1, core 11, 3170-85 feet and the Raymond Sandstone.

The postulated unconformity between the Timbury Hills Formation and the (?)Carboniferous of Warrong No. 1, may compare with the disconformity noted by Mollan et al. (1964) between the Telemon Formation and the Mount Hall Conglomerate.

Permian

The swarm of Micrhystridium sp. 3, which characterizes Unit P3c, occurs at the base of shales and tuffs in Warrong No. 1 which may be correlated and compared with the "Black Alley Shale"\*. It is underlain by (a) fossiliferous sandstones and shales with a few pebbles of quartz and quartzite (2369-2550 feet), (b) sandstone, interbedded with tuff and shale (2550-2584 feet), and (c) conglomeratic sandstone, interbedded with tuff, shale and siltstone (2584-2782 feet) (Myers, 1964c).

This section cannot be satisfactorily interpreted from the fossil evidence alone. The conglomeratic sandstone (c) included core 9 from which a basal P3b or possibly P3a assemblage was extracted. The base of P3b occurs towards the top of the outcropping Aldebaran Sandstone on Reid's Dome and within a conglomeratic sandstone in the Warrinilla - Westgrove - Kildare - Glentullock region (Evans in Cundill, 1963, and Mines Administration Pty Ltd 1963a), to which Warrong No. 1, 2584-2782 feet may be related. Tissot (1963) referred to this conglomeratic unit as Q1. It progressively overlaps the marine unit P, and the non-marine, coal-bearing unit N (= "undivided freshwater sediments"), to directly rest on the Timbury Hills Formation in a north-south direction through Westgrove - Kildare - Glentullock - Killoran, on the southern margin of the Denison Trough. However, Cundill & Myers (1964) considered that at Warrinilla it represented a lower portion of the Aldebaran Sandstone, and Mollan et al. (1964) included it within a broad unit, which elsewhere included the Aldebaran Sandstone and Ingelara Formation. Further clarification of the extent and definition of P3a is required.

The overlying calcareous, tuffaceous sandstones and shales in Warrong No. 1 could represent Tissot's unit Q2, which appears to include the Ingelara Formation, Catherine Sandstone and Peawaddy Formation in Reid's Dome.

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\* "Black Alley Shale" is a new formal name proposed by G. Mollan and now approved for the lower Bandanna Formation.

Whether or not all of this outcrop sequence is represented in Warrong No.1 cannot be determined.

The position of Warrong No.1 relative to the Springsure Shelf invites comparison between the well section and outcrops on the shelf. The Permian below P3c at Warrong may correlate with all or part of the Colinlea Sandstone and Peawaddy Formation. At least the top 150 feet of the Colinlea Sandstone is of P3b age, probably low in that unit. The remaining 300 feet of the formation is not dated by palynology, but could be in a stratigraphically comparable position to the basal Permian conglomeratic sandstone at Warrong.

The existence of P3d microplankton in the "Black Alley Shale" at Warrong and the succeeding P4 with the "Aubrey Coal Measures"\*\* conforms with the succession in the Denison Trough, although both lithological units are thinner at Warrong than in the trough.

#### Triassic

The Triassic is identified in the Warrong, Crystalbrook and Tooloombilla wells, although only palynological Unit Tr3 could be recognized. Other samples in what Myers (*loci cit.*) considered to be Triassic were barren, or, in the case of cuttings from Warrong No.1, probably masked by cavings. Myers' formational determinations are accepted here. If this is correct, Unit Tr3 extends downwards into the Clematis Sandstone, a fact which previously could only be surmised (Evans, 1964).

The progressive southerly decrease in the thickness of Triassic apparent in the section appears to be due to overlap of the Rowan Formation by the Clematis Sandstone and by progressively deeper erosion at the pre-Precipice Sandstone unconformity.

#### Jurassic

Warrong No.1 was spudded into the top of the Precipice Sandstone, and cliffs of the Boxvale Sandstone Member of the Evergreen Formation occur immediately south of the well-site. Only 74 feet of the basal Precipice Sandstone were logged with wire line tools in the well. Both the Precipice Sandstone and Boxvale Sandstone Member are identifiable in the Crystalbrook and Tooloombilla wells.

Core 3, 1379 feet and SWC 1430 feet in Tooloombilla No.1 confirm a Unit J1 age for the Precipice Sandstone in the region! It is unfortunate that cores 1 and 2 in Warrong No.1, from the top of the Moclayember Formation failed to produce spores which might have helped determine whether Unit Tr3 extends to the top of that formation in the same way as in the Mimosa Syncline (Evans, 1964).

Recognition of the three divisions of the Evergreen Formation with the Boxvale Sandstone as central member in the Crystalbrook and Tooloombilla wells, and the occurrence of the basal Unit J2 acritarch swarm at the top of the Boxvale Sandstone Member in AAO Arbroath No.1 (Evans, in Mines Administration Pty Ltd, 1963c) led to a check for the acritarchs at Crystalbrook and Tooloombilla. The acritarch swarm on the north-eastern flank of the Surat Basin was proved to occur in direct association with the oolite member of the Evergreen Formation (Jensen et al., 1964; Evans, 1964). G. Mollan (pers. comm.) pointed out that the "oolites" occur within the

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\* New name proposed by G. Mollan for Upper Bandanna Formation.

"Westgrove Ironstone Member"\*\* which occurs above the Boxvale Sandstone Member across the Eddystone 1:250,000 Sheet area. Well-site geologists have recognized "oolites" in a marker band which coincides with the base of Unit J2 in a great number of the Associated Group wells south and east of the Planet "farmout" area. Myers (1964a, b) did not record "oolites" or pellets from above the Boxvale Sandstone Tooloombilla No. 1 or Crystalbrook No. 1.

However, Myers noted traces of siderite which could represent the "Westgrove Ironstone Member" in both wells. The siderite in Crystalbrook No. 1 was noted at 350-360 feet, co-incident with the maximum count of acritarchs (Table 2). Siderite occurred at 1060 feet in Tooloombilla No. 1 in association with rare acritarchs. (The low count in this instance could be due to either a lower concentration in the rock at this point, or to dilution of the samples by cavings from higher up the hole. The associated spore assemblages indicate that some dilution did take place. For the moment, only the presence of the acritarchs is significant; however, regional studies of this horizon might show that Tooloombilla was very close to the western shore-line). The siderite and acritarchs occurred immediately above a coal-bearing sandstone which Myers termed the Boxvale Sandstone Member. However, they occurred above a fine-grained, well sorted, sub-rounded sandstone with coals in Crystalbrook No. 1, which Myers preferred to exclude from the Boxvale Sandstone. This upper sandstone is separated from Myers' Boxvale Sandstone by 15 feet of shale. It is possible that this upper sandstone should also be included in the Boxvale Sandstone Member and the 15 feet of shale regarded as a brief intercalation. The fact that this intercalation is represented only by cuttings makes it impossible to check whether it bears acritarchs.

One specimen of an acritarch, Micrhystridium sp. was detected in the residue from Tooloombilla No. 1, core 1, from the Hutton Sandstone. In view of its association with several recycled Permian pollen and spores, it may also have been derived. However, rare acritarchs were recorded from towards the top of the Hutton Sandstone in AAO 1 (Roma) (Evans, 1962), and it is equally possible that the Tooloombilla specimen is Jurassic (Unit J3) in age.

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\* "Westgrove Ironstone Member": new name proposed for this marker horizon by G. Mollan.

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PLATE : PALYNOLOGICAL CORRELATION OF TOOLOOMBILLA, CRYSTALBROOK, WARRONG, BANDANNA & WARRINILLA WELLS

**TOOLOOMBILLA**  
**No.1**

**CRYSTALBROOK**  
**No.1**

WARRONG  
No.1

**BANDANNA**  
**No.1**  
**& OUTCROP**

WARRINILLA  
No. 1

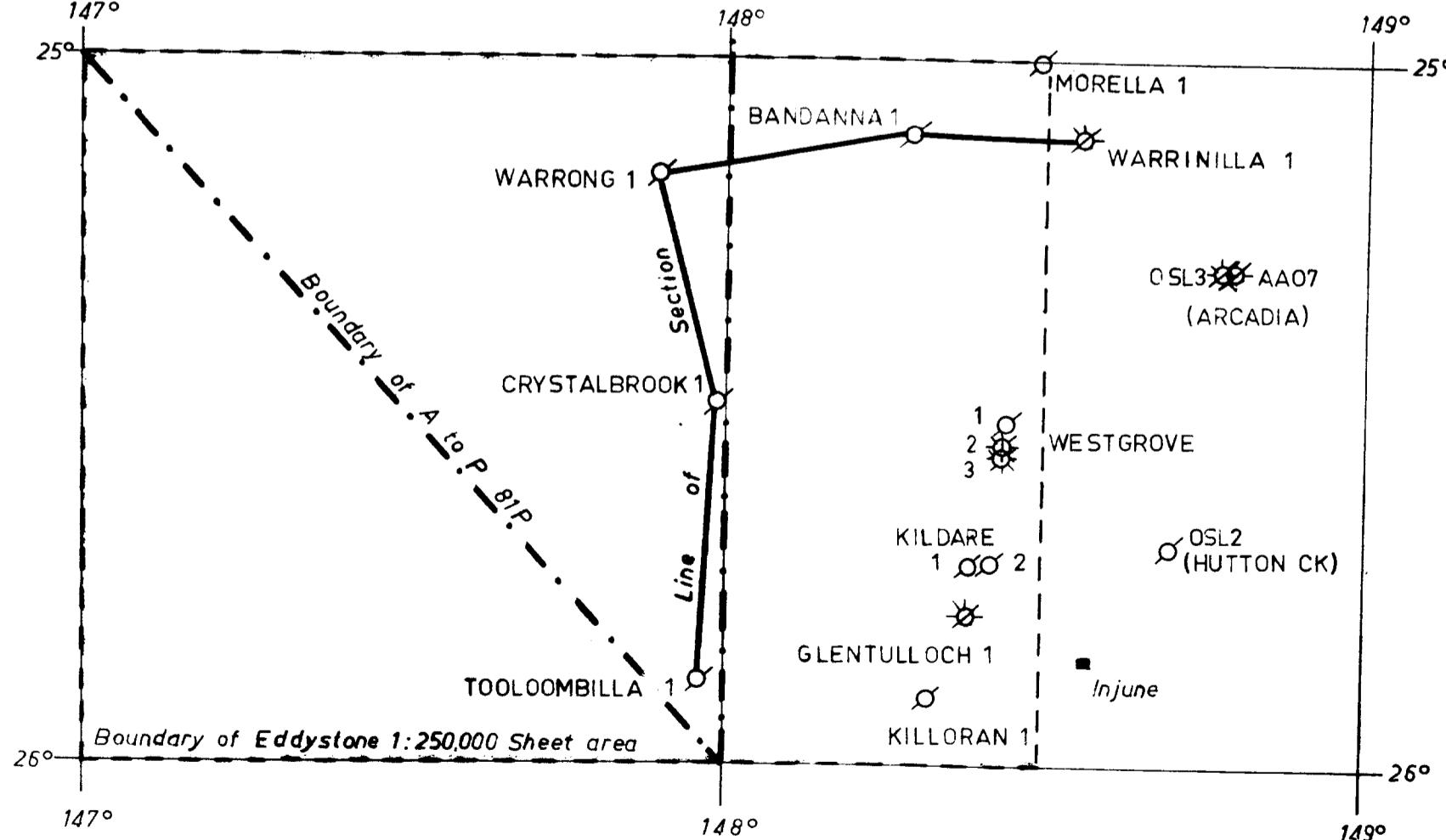
This geological cross-section diagram illustrates the stratigraphy and correlation of various formations across a horizontal distance of approximately 100 miles, divided into four segments by asterisks. The vertical axis represents depth in feet, ranging from 1755 to 3574 feet.

**Key Features and Formations:**

- Top Left Segment (0-22.5 Miles):** Shows the Injune Ck Beds, Hutton Sandstone, Boxvale Sandstone Member, and Precipice Sandstone. A vertical scale bar indicates 1000 feet.
- Middle Segment (22.5-28.5 Miles):** Shows the Evergreen Formation, Moolayember Formation, Clematis Sandstone, and Rewan Formation. A vertical scale bar indicates 1000 feet.
- Bottom Segment (28.5-35.5 Miles):** Shows the Tr 3, P4, P3d, P3c, P3b, P3a-b, P1c - 2, and "undivided freshw. sediments". A vertical scale bar indicates 1000 feet.
- Right Segment (35.5-53 Miles):** Shows the Peawaddy Fm. 8, Ingelara Fm., Aldebaran Sst. & Cattle Ck Fm., and the Outcrop section. The Outcrop section includes the Brack Alley C.M. and Rewan Fm. A vertical scale bar indicates 1000 feet.
- Bottom Right Segment (53-70 Miles):** Shows the Tr 1, P4, P3d, P3c, P3b, and P3a-b. A vertical scale bar indicates 1000 feet.
- Geological Symbols:** SP (Sandstone) and SN (Shale) are used to label rock types. Dashed lines represent unconformities or contacts. Question marks indicate uncertain thicknesses or correlations.
- Vertical Scale Bars:** Vertical scale bars are present at 1000-foot intervals in the middle and bottom segments, and at 1000-foot intervals in the right segment.

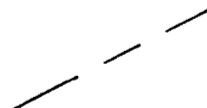
LOCATION OF SECTION & RELATED WELLS

Scale - 1:1,000,000



#### REFERENCE

	Conglomerate	
	Sandstone	
	Siltstone & Shale	
	Coal	
	Limestone	
	Calcareous Tuff	
	Granite	
	Metamorphics	
	Core & Outcrop	
	Sidewall Core	
	Cuttings	
	Ø Barren	
		examined
		palynomorphs

-  Lithological or e-log  
 boundary or correlation marker.

 Palynological boundary.

 Acritarch swarm.

 Unconformity.

 Abandoned dry hole.

 " with a show of gas.

 Gas well, suspended.