BP PETROLEUM DEVELOPMENT LTD.

PROPOSAL TO RELINQUISH PERMIT EPP-21, SOUTH AUSTRALIA

by

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APPROVED BY:

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ABSTRACT

Following the drilling of Duntroon-1 in Licence EPP-21, South Australia, BP and its partners have 60 days (effective from the well completion date, 5th March, 1986) in order to decide whether to retain or relinquish the acreage. If the permit is retained the group will be commited to the Year 4 work obligation of 1 well and 1000km of seismic data, to be completed by 28th June, 1986.

A complete re-evaluation of all known prospects and leads within EPP-21 has been undertaken in order to define any prospects worthy of drilling in Year 4. A number of prospects have been identified with recoverable oil reserves of 50-300 mmbbl, but the overall risk is prohibitively high (1 in 22 at best). As a result, it is recommended that EPP-21 is relinquished.

CONTENTS

LIST OF ILLUSTRATIONS

1. INTRODUCTION

1.1 Licence History

Exploration Licence EPP-21 was awarded by the Department of National Development and Energy on 29th June 1982 to Getty Oil Dev. Co. Ltd. (60% and operator), Ampol Exp. Ltd. (15%), Natomas Pet. Int. Inc. (15%) and Sovereign Oil Australia Ltd. (10%). South Australian Oil and Gas Corporation Pty. subsequently obtained a 20% holding in the permit from Getty, and Sovereign diluted their interest to 5%, so that licence interests became: Getty (43% and operator), Ampol (16%), Natomas (16%), Sovereign (5%) and SAOGC (20%). This consortium fulfilled all commitments on the permit up until the end of Year 2 by acquiring 3054km of new seismic data and by reprocessing 1000km of existing seismic data.

Previously the area corresponding to EPP-21 was part of a vast tract of Southern Margin acreage held by Shell from 1966 to 1975. The area was unlicensed from 1975 to 1982.

BP obtained the combined interests of Getty, Ampol and Sovereign (total = 64%), along with the operatorship of the permit,for c.A$750,000 in September 1984. Getty's withdrawal was influenced by Texaco following their takeover. Subsequent attempts by BP to farm-out a 21% interest in the licence proved unsuccessful. Current licencees, ratified by the Minister of Mines and Energy (the Designated Authority) on 8.1.85, are as follows:

BP Petroleum Development Ltd.	64%	Operator
South Australian Oil & Gas Corp. Pty. Ltd.	20%	
Diamond Shamrock Oil Co. Aust. Pty. Ltd. (formerly Natomas in this permit)	16%	

This group agreed to undertake the Year 3 work obligation of one well with a minimum expenditure of A$10 Million, but requested:

i) that the period for drilling the well be deferred to 30.1.86 (from end Year 3 deadline, 28.6.85);

ii) that permission be given to relinquish the permit within 60 days of completion of the well if it is unsuccessful.

The Designated Authority agreed to these requests, but emphasised that the deferred well must be spudded prior to 30.1.86 and further variation in permit conditions would only be considered under exceptional circumstances.

The recent drilling of well Duntroon-1 at a cost of c.A$11 million fulfilled the Year 3 work programme requirement. The Year 4 programme consists of a further well plus 1000km of seismic data to be completed by 28th June 1986.

1.2 Location

Permit EPP-21 has an area of 23,343km^2. It is located offshore South Australia to the west of Kangaroo Island and the south of the Eyre Peninsula (Fig. 1). There are no existing fields or pipelines in the area and the nearest market for hydrocarbons is Adelaide 300km to the east. The south western third of the permit area has water depths in excess of 1000m. The remainder of the permit lies mostly in water less than 200m deep.

The licence area includes a large proportion of the Duntroon Embayment. This is a major extensional basin developed in response to the break-up of Australia from Antarctica. Sedimentary-fill is believed to extend from the Late Jurassic to Recent. The basin is confined to the north by the Gawler Shield (Proterozoic) and is divided into three tectonically-distinct areas within the permit area: the Inner Basin, the Central High and the Outer Step-Faulted Zone (Fig. 2). The southern limit to the basin is only poorly defined and lies outside EPP-21 in very deep water.

1.3 Well Data

Three wells are of direct relevance to the evaluation of EPP-21.

BP has recently completed Duntroon-1 which tested a large horst (the Numbat Prospect) within the Outer Step-Faulted Zone. The results and significance of this well are discussed in Section 2.

Echidna-1 was drilled by Shell in 1972 on the Central High, in which the prospective Upper Cretaceous interval was proved to be absent. The well penetrated c.2500m of Lower Cretaceous mudstone (Madura Formation) directly below the Tertiary. The sequence had negligible reservoir or source potential, and no significant shows were recorded.

Platypus-1 was drilled by Shell in 1972 immediately after the completion of Echidna-1 and is located c.15km west of the present EPP-21 permit boundary. The target for the well was a fault-bounded structure in the Outer Step-Faulted Zone which proved to contain Platypus Formation sandstone overlain by Wigunda Formation mudstone. Subsequent remapping by Shell and by BP suggested that the well was drilled outside structural closure and this has been used to explain the absence of significant hydrocarbons in the well (Robertson & Hewitt, 1984 a & b). Shows were restricted to minor fluorescence and gas peaks associated with coal beds.

1.4 Seismic Data

EPP-21 is covered by a large amount of seismic data, shot by Shell in the late 1960's and early 1970's and by Getty in 1983 and 1984. The Inner Basin, Central High and Outer Step-Faulted Zone are covered by a dense seismic grid with a dip line spacing as low as 1km (Fig. 3). Elsewhere in EPP-21, i.e. The Gawler Shield and deep water areas, the seismic data coverage is sparse (Fig. 3).

As part of their Year 1 (1983) work commitment Getty shot a 2037km semi-regional seismic survey and reprocessed 1000km of old Shell seismic data, over the areas considered by them to be the most prospective. They had earlier defined these areas after completing a major geological and geophysical review which incorporated the interpretation of 6000km of Shell seismic data.

In Year 2 (1984) Getty shot a further 1017km of infill seismic resulting in a 1.25km x 5km grid over a number of leads. The data quality of both the 1983 and 1984 seismic is generally good and shows a significant improvement over the earlier Shell seismic data.

1.5 Previous Work

Detailed evaluation of EPP-21 was carried out by Getty (1984) and the results, in the form of a three volume report, were passed on to BP when they assumed operatorship of the permit. Getty's study includes discussion of the tectonic history and the stratigraphy of the Duntroon Embayment, plus description of potential traps, reservoirs, seals and source rocks in the basin. Geophysical interpretation identified a number of prospects and leads. Specialist studies instigated by Getty included pyrolysis and vitrinite reflectance analysis of key wells with subsequent thermal and maturity modelling (Amdel), geochemical analysis of bitumen strandings from the South Australian coast (Amdel) and a submarine hydrocarbon "sniffer" survey (Inter Ocean Systems of San Diego, California).

Geophysical work undertaken by BP has been restriced to remapping the Outer Step-Faulted Zone in the vicinity of the Numbat Prospect prior to drilling of Duntroon-1 (Robertson and Hewitt, 1984 a & b); and to remapping the prospects/leads described in this report (Section 3). In addition BP has critically analysed the geological content of the Getty Report, including geothermal and maturity modelling of Echidna-1 and Platypus-1, and is in broad agreement with their main conclusions. Geochemical

analysis of samples from Platypus-1 has been carried out by BP Sunbury (Lowe & Wise, 1980; Jackson, 1982), with further analysis as part of the Australasian Coals Project (Gibbons et al., 1985).

The exploration activity of Shell Development (Australia) on the southern margin of Australia between 1966-1977 was documented by Whyte (1978).

2. RESULTS OF WELL DUNTROON-1

2.1 Background

Recent well Duntroon-1 was drilled on a large tilted horst block (the Numbat Prospect) formed at the convergence of major W-E and NW-SE trending fault systems in the Outer Step-Faulted Zone of the Duntroon Embayment (Fig. 2). The structure is bound on the south and northeast sides by normal faults, and is dip closed to the west. Fault displacement occurred predominately within the early Late Cretaceous concomittant with the deposition of the Wigunda Formation.

The primary target for the well was Cenomanian sandstone of the Platypus Formation, which was predicted to occur at 2517m BRT and to be 440m thick at the well location. The source rock was anticipated to be coals/organic-rich mudstones within the Platypus Formation or in the underlying Madura Formation (Aptian-Albian). The expected seal was the Wigunda Formation mudstone (Cenomanian-Campanian). Prognosed stratigraphy was identical to Platypus-1.

Reserves for the Numbat Prospect were calculated using two cases invoking the presence and absence of a bottom seal (Robertson & Hewitt, 1984 a & b). Mean in-place estimates for the "Bottom Seal Case" were 712mmbbl of oil or 0.99 TCF of gas, and for the "No Bottom Seal Case" were 369mmbbl of oil or 0.52 TCF of gas. Overall risks were placed at 1 in 9 and 1 in 7 respectively.

2.2 Results

Duntroon-1 was spudded by the Zapata Arctic on 11.1.86 reaching a TD of 3510mBRT(DD) on 24.2.86. The sequence encountered by the well was virtually identical to the prognosis and depths to seismic horizons were well within the error bars identified prior to drilling. A single core was cut in the well from c.2751-2769mBRT(DD) within the Platypus Formation primary target.

The Platypus Formation was penetrated at 2467.5mBRT(LD) and has a thickness of 456m (Fig. 4). Shows were restricted to minor fluorescence associated with coals in this interval and in the Madura Formation. Background gas levels were very low (0.1%) with minor peaks coincident with the coals (max. 0.52%). Gas composition was essentially C1 with lesser C2, although traces of C3 were recorded in the coalier intervals.

The proportion of coal in the Platypus (456m) and Madura sequences (586.5m) is just 1% and 3% respectively (estimated from the density log). Average coal bed thickness is less than 0.5m. Comparison with Platypus-1 suggests that the coals may be approaching the oil generation threshold near the base of the well (equivalent to Ro = 0.7%; Getty, 1984).

Electric log analysis has shown that all intervals are water saturated, although potentially good reservoir sandstones were encountered in the Platypus, Potoroo and Pidinga Formations. Porosity values obtained from a density/neutron crossplot of the cleanest sandstone intervals in the Platypus Formation ranged from 13-27%. Heavy mud cake over the most porous intervals indicates reasonable permeability. Core analysis confirmed the results of the electric log interpretation: arithmetic mean porosity of 17% and permeability of 45mD were measured. Porosity values for sandstones in the Potoroo and Pidinga Formations were calculated at 20-30% from the sonic log.

The prognosed sealing potential of the Wigunda Formation was validated by the presence of a thick mudstone interval with only minor siltstone and sandstone interbeds.

2.3 Significance

Data obtained from Duntroon-1 are vital to the evaluation of further prospectivity in permit EPP-21. The well indicated the following:

i) that the sequence is consistent with the Getty/BP structural interpretation;

ii) the existence of reservoir quality sandstone in the Platypus Formation primary target and also within the Potoroo and Pidinga Formations;

iii) the likely sealing potential of the Wigunda Formation;

iv) the presence of coals in the Platypus and Madura Formations albeit in small proportions and in thin seams at the well location.

Given the above, it is concluded that the failure of Duntroon-1 is attributable to the absence of a significant source rock at the well location or in the downdip drainage area. The presence of a sealing fault between the downdip drainage area and reservoir is a possible, but less likely, explanation for the lack of hydrocarbons. Unfortunately, the quality of the seismic data and the quantity of the well data are insufficient to identify potential coal or organic-rich mudstone depo-centres. Certainly the results of Duntroon-1, when considered alongside those of Platypus-1 and Echidna-1, severely downgrade the hydrocarbon potential of the western sector of EPP-21 in the Central High and Outer Step-Faulted Zones of the Duntroon Embayment (see Section 3 for more detailed discussion).

3. REMANING PROSPECTIVITY

3.1 Summary of Prospectivity

Of the three tectonically distinct areas within EPP-21 only the the Inner Basin and Outer Step-Faulted Zone are considered to have any potential for the discovery of hydrocarbon accumulations. No prospects or leads have been identified in the Central High area due to the lack of a reservoir target.

In the Inner Basin and Outer Step-Faulted Zone, prospect identification and evaluation has been carried using Getty's 1983, 1984 and reprocessed Shell seismic data. This seismic database alone provides generally adequate cover over the prospective areas within the Duntroon Embayment. It is unlikely that any siginificant structure in these areas has been overlooked.

3.1.1 The Outer Step-Faulted Zone

Two wells, Platypus-1 and Duntroon-1, have been drilled in the Outer Step-Faulted Zone.

Three good quality sandstone reservoirs, the Pidinga, the Potoroo and the Platypus Formations are interpreted to be present over most of the Outer Step-Faulted Zone (Fig. 5). However, the only effective reservoir is the Platypus Formation, the remainder lack vertical seals.

Neither Platypus-1 nor Duntroon-1 proved the existence of any significant source rocks in this sub-basin, and none can be inferred from the seismic data either downdip or below the sequence tested by these wells.

Two prospects, Numbat South and Numbat Northeast, and five leads have been mapped at the Top Platypus Formation level

and are summarised in Table 1. No prospect or lead could be identified which showed any significant degree of independence of play type from the Numbat horst. The five leads mapped at Top Platypus Formation level have not been worked up to prospect status as the results from Duntroon-1 suggest that in addition to there being no source, the cross-fault seal upon which these structures are dependent will not be present due to the large thickness of the Platypus Formation sandstones.

3.1.2 The Inner Basin

Although the Inner Basin is covered by a variable grid (10km x 10km to 4km x 2km) of Getty's 1983 and 1984 seismic data, there are no wells to which this data can be tied. Identification of seismic reflectors is therefore dependent on correlating across the Central High from the Outer Step-Faulted Zone, or attempting a tie to Echidna-1 on the Central High. For the shallow events down to the Base Tertiary Unconformity this is perfectly satisfactory. However, for the pre-break-up horizons neither alternative works well. Thus a much lower degree of confidence is placed on the identification of events than in the Outer Step-Faulted Zone.

The detailed stratigraphy of the Inner Basin is unknown. Considering that deposition within the Inner Basin was strongly influenced by its confinement between the Central High and the Gawler Shield and its proximity to the area of sediment provenance, i.e. the Gawler Shield, significant differences in the pre-break-up stratigraphy are expected compared to the Outer Step-Faulted Zone (Fig. 5). The lack of data severely hampers the evaluation of the prospectivity.

Mapping at the probable Top Platypus and Inter Madura levels has identified a number of closed structures within

the Inner Basin. These prospects and leads are summarised in Table 1. The overall risk attached to each of these is high, because although they are independent of Numbat, little is known about the presence and quality of source and reservoir rocks.

3.2 Prospects and Leads Identified

Three independant interpretations, by Getty, BP and South Australia Oil and Gas (SAOG), which used as a database most or all of the available seismic data, has resulted in the identification of five prospects (Numbat, Koala, Cockatoo, Numbat South and Numbat Northeast) and eight leads. Table 1 illustrates the potential of these structures re-evaluated in the light of failure at Numbat. The pre-drill reserves and risks for Numbat are included for comparison.

The overall risk of finding hydrocarbons in the prospects and leads identified (Fig. 6 and Table 1) ranges from 1 in 22 to 1 in 44 and is significantly higher than for the Numbat Prospect (1 in 7 or 1 in 9). This is largely a result of the downgrading of the basin as a whole after Duntroon-1 failed to encounter any significant source rocks.

The re-evaluation of the four undrilled prospects is detailed below.

3.2.1 Cockatoo Prospect

The Cockatoo Prospect is located 30km northeast of Duntroon-1 and 55km south of the Australian mainland in 123m of water. There are no nearby discoveries or production facilities.

Shell initially identified and reported on the Cockatoo structure found in the northern part of the Inner Basin. It was subsequently remapped using Getty's 1983 and reprocessed Shell seismic data (approximately 2.5km x 5km grid) by Getty, SAOG and BP. Prior to the present report no reserves had been documented for Cockatoo.

Geophysical mapping at the Inter Madura Formation level (Encl. 1) best illustrates the Cockatoo Prospect. It is a fault dependant structure within the footwalls of two separate tilted fault blocks, formed during the Late Cretaceous.

It is not suggested that the Inner Madura Formation represents the top of any particular reservoir, because as discussed earlier the presence of source, reservoir or seal in the Inner Basin cannot be predicted with any certainty . However, given the parallel nature of all the pre-break-up events if any reservoir/seal combination exists, its gross volume within closure will be approximately equal to that defined by the Inter Madura Formation map.

Cockatoo Prospect Risks -

Source	: Presence - Possible, Maturity - Possible	.3
Trap	: Presence - Certain, Effectiveness - Possible	.45
Reservoir	: Presence - Possible, Communication - Possible	.3

Overall Risk: 0.040 or 1 in 25

Cockatoo Prospect Parameters -

	MIN	ML	MAX
Area (km^2)	5.8	14.4	31.2
Depth to Crest (m)		1145	
Closing Contour (msec)	1200	1240	1300
Vertical Closure (msec)		170	
Reservoir Thickness (m)		170+	
Bulk Rock Volume ($m^3 \times 10^6$)	202	780	2740
Degree of Fill	1	1	1
N/G Ratio	0.3	0.5	0.7
Porosity	0.1	0.15	0.20
1-SW	0.6	0.7	0.8
FVF	1.2	1.5	1.8
Prim & Sec Rec Factor	0.3	0.4	0.5

Cockatoo Prospect Reserves -

	95%	MEAN	5%
Oil in Place (mmbbl)	90	270	550
Prim & Sec Recovery (mmbbl)	30	110	220

3.2.2 Koala Prospect

The Koala Prospect is located 86km southeast of Duntroon-1 and 110km south of the Australian mainland in 130m of water. There are no nearby discoveries or production facilities.

Like Cockatoo, Shell initially identified and reported on the Koala structure found in the southern part of the Inner Basin. Similarly, it was subsequently remapped using Getty's 1983 and 1984 seismic data (1.25km x 3km grid) by Getty, SAOG and BP. SAOG who have looked at the Koala Prospect in some detail calculate it to have 106mmbbl of recoverable oil (50% value) at a risk of 1 in 18.

The structure was defined by geophysical mapping at the Top Platypus level (Encl. 2). It consists of two separate tilted fault blocks similar to Cockatoo and is likewise fault dependant. The structure was formed during the Late Cretaceous when major movement occurred along its NW-SE trending bounding faults. Minor movements on these faults continued well into the Tertiary.

As is the case with all prospects and leads in the Inner Basin, the distribution or quality of potential sources, reservoirs or seals cannot be predicted. Again however, the pre-break-up events are parallel and the gross volume within closure of any reservoir/seal combination will be approximately equal to that defined by the Top Platypus Formation map.

Koala Prospect Risks -

Source	: Presence - Possible, Maturity - Possible	.3
Trap	: Presence - Probable, Effectiveness - Possible	.35
Reservoir:	Presence - Possible, Communication - Possible	.3

Overall Risk: 0.031 or 1 in 32

Koala Prospect Parameters -

	MIN	ML	MAX
Area (km^2)	1.2	3.6	11.6
Depth to Crest (m)		1415	
Closing Contour (msec)	1200	1250	1350
Vertical Closure (msec)		184	
Reservoir Thickness (m)		184+	
Bulk Rock Volume ($m^3 \times 10^6$)	97	268	1314
Degree of Fill	1	1	1
N/G Ratio	0.3	0.5	0.7
Porosity	0.1	0.15	0.2
1-SW	0.6	0.7	0.8
FVF	1.2	1.5	1.8
Prim & Sec Rec Factor	0.3	0.4	0.5

Koala Prospect Reserves -

	95%	MEAN	5%
Oil in Place (mmbbl)	40	120	250
Prim & Sec Recovery (mmbbl)	20	50	100

3.2.3 Numbat South Prospect

The Numbat South Prospect is located 7km south of Duntroon-1 and 83km south of the Australian mainland in 165m of water. There are no nearby discoveries or production facilities.

Numbat South is one of two prospects in the Outer Step-Faulted Zone close to Numbat. It was initially mapped by BP using Getty's 1983 and 1984 seismic data. However, prior to this report no reserves had been calculated for Numbat South.

Numbat South is an elongate, fault dependant structure, comprising a hanging wall tilted fault block between two southwest hading faults. These formed during the Late Cretaceous. The prospect is defined at the Platypus Formation reservoir level (Encl. 3). The Wigunda Formation which overlies the Platypus Formation provides the vertical seal and the lateral seal across the southern bounding fault. Lateral seal across the northern bounding fault is provided by the Madura Formation which underlies the Platypus Formation.

Both wells drilled in the Outer Step-Faulted Zone proved the presence of the Platypus Formation. This shallow marine/deltaic sandstone was 502m thick at Platypus-1 and 456m thick at Duntroon-1. In both of these wells the Top Platypus seismic event is a strong reflection. This can be mapped over most of the Outer Step-Faulted Zone including the Numbat South area and increases our confidence in the likely presence of the reservoir.

Results of the geochemical analysis of samples from the Echidna-1, Platypus-1 and Duntroon-1 wells conclude that there is no significant source interval in the pre-break-up, Cretaceous sequence.

Numbat South Prospect Risks -

Source	: Presence - Unlikely, Maturity - Possible	.17
Trap	: Presence - Probable, Effectiveness - Possible	.35
Reservoir	: Presence - Certain, Communication - Probable	.6

Overall Risk: 0.036 or 1 in 28

Numbat South Prospect Parameters -

	MIN	ML	MAX
Area (km^2)	6.8	16.7	20.4
Depth to Crest (m)		4380	
Closing Contour (msec)	3000	3150	3200
Vertical Closure (msec)		550	
Reservoir Thickness (m)		550+	
Bulk Rock Volume ($m^3 \times 10^6$)	730	3880	5580
Degree of Fill	1	1	1
N/G Ratio	0.3	0.5	0.7
Porosity	0.1	0.15	0.2
1-SW	0.6	0.7	0.8
FVF	1.2	1.5	1.8
Prim & Sec Rec Factor	0.3	0.4	0.5

Numbat South Prospect Reserves -

	95%	MEAN	5%
Oil in Place (mmbbl)	320	750	1270
Prim & Sec Recovery (mmbbl)	120	300	510

3.2.4 Numbat Northeast Prospect

The Numbat Northeast Prospect is located 12km northeast of Duntroon-1 and 65km south of the Australian mainland in 125m of water. There are no nearby discoveries or production facilities.

Numbat Northeast is the second of two prospects identified by BP in the vicinity of Numbat. Reserves for Numbat Northeast had not been calculated prior to this report.

Numbat Northeast is a large NW-SE trending fault dependent structure, located in the hanging wall of the fault that forms the northeast margin of the Outer Step-Faulted Zone. Although minor movement along this bounding fault continued well into the Tertiary, the principle movement and trap formation took place in the Late Cretaceous. The map of the Platypus Formation reservoir is presented in Encl. 4. The Wigunda Formation which overlies the Platypus Formation provides the vertical seal. Horizon identification north of the bounding fault and therefore the evaluation of the lateral cross-fault seal cannot be made with confidence. If, as Encl. 4 suggests, throw on the bounding fault is small (SP1400, seismic line D83-30), then there is unlikely to be any lateral seal.

The Platypus Formation reservoir is predicted to be present in the prospect (Section 3.2.3). The major uncertainty is the presence of a source rock (Section 3.2.3).

Numbat Northeast Prospect Risks -

Source : Presence - Unlikely, Maturity - Possible .17
Trap : Presence - Possible, Effectiveness - Possible .3
Reservoir: Presence - Certain, Communication - Probable .6
Overall Risk: 0.031 or 1 in 33

Numbat Northeast Prospect Parameters -

	MIN	ML	MAX
Area (km^2)	7.2	28.2	41.8
Depth to Crest (m)		1490	
Closing Contour (msec)	1250	1350	1400
Vertical Closure (msec)		320	
Reservoir Thickness (m)		320+	
Bulk Rock Volume ($m^3 \times 10^6$)	490	3160	5950
Degree of Fill	1	1	1
N/G Ratio	0.3	0.5	0.7
Porosity	0.1	0.15	0.2
1-SW	0.6	0.7	0.8
FVF	1.2	1.5	1.8
Prim & Sec Rec Factor	0.3	0.4	0.5

Numbat Northeast Prospect Reserves -

	95%	MEAN	5%
Oil in Place (mmbbl)	280	710	1250
Prim & Sec Recovery (mmbbl)	110	290	510

4. CONCLUSIONS

Within EPP-21, no prospects have been identified with levels of risk and reserves such that drilling could be warranted in the near future.

However, there is still significant potential for the discovery of such a prospect within the Inner Basin of the Duntroon Embayment. Here prospect risks are prohibitively high, because the detailed stratigraphy is unknown.

Within the Outer Step-Faulted Zone no prospect was identified which showed any significant degree of independence from the failed Numbat horst.

5. RECOMMENDATIONS

Entry into Year 4 carries a work programme commitment that comprises the drilling of one well and the acquisition of 1000km of seismic data. Taking into consideration this work programme, the absence of any prospect worthy of drilling and the unknown petroleum potential of the Inner Basin it is recommended that:

i) permit EPP-21 is relinquished prior to entry into Year 4;

ii) evaluation of the Inner Basin within the Duntroon Embayment is continued, with a view to reducing prospect risk. If this proves possible re-acquisition of acreage within the Duntroon Embayment should be considered.

6. REFERENCES

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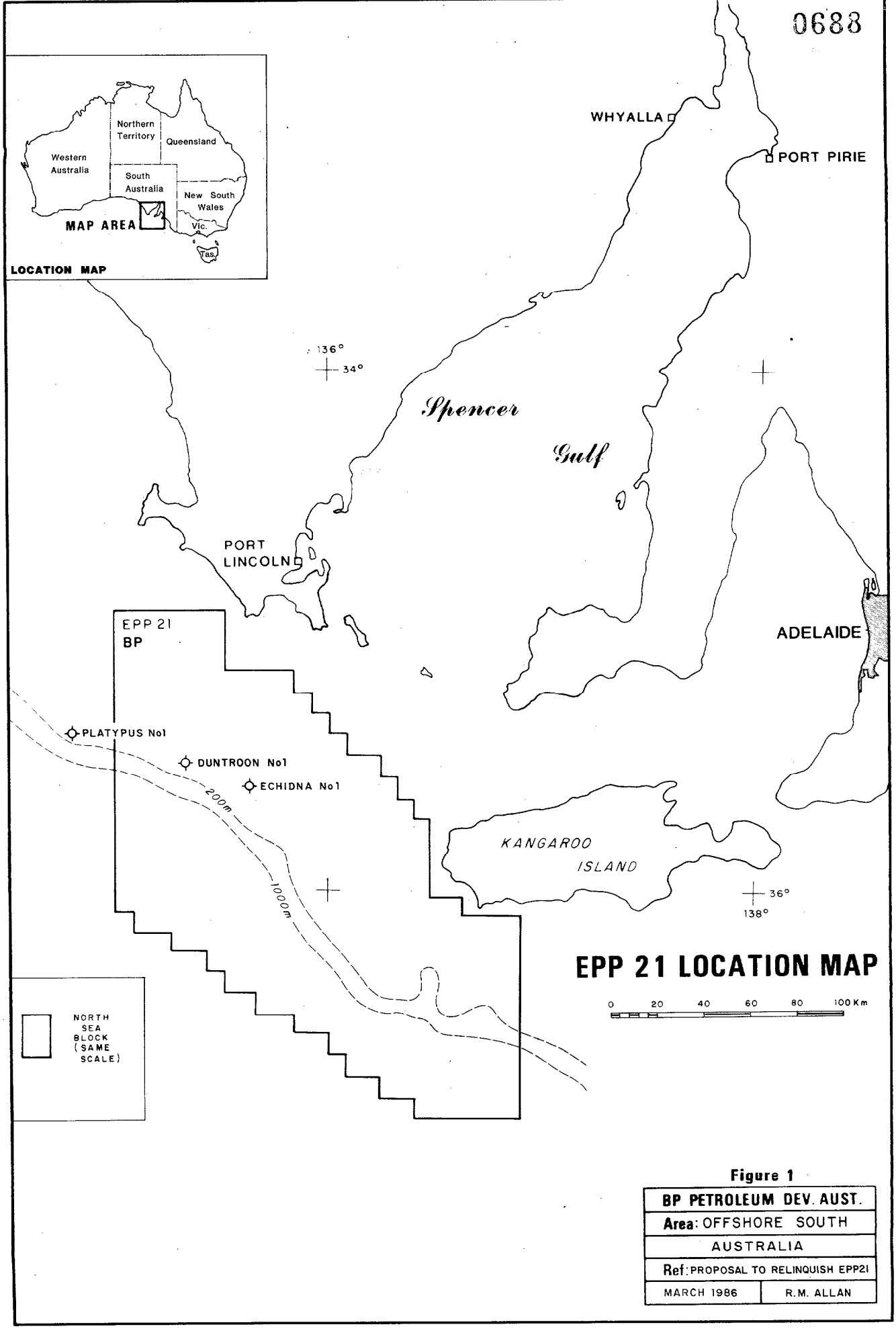
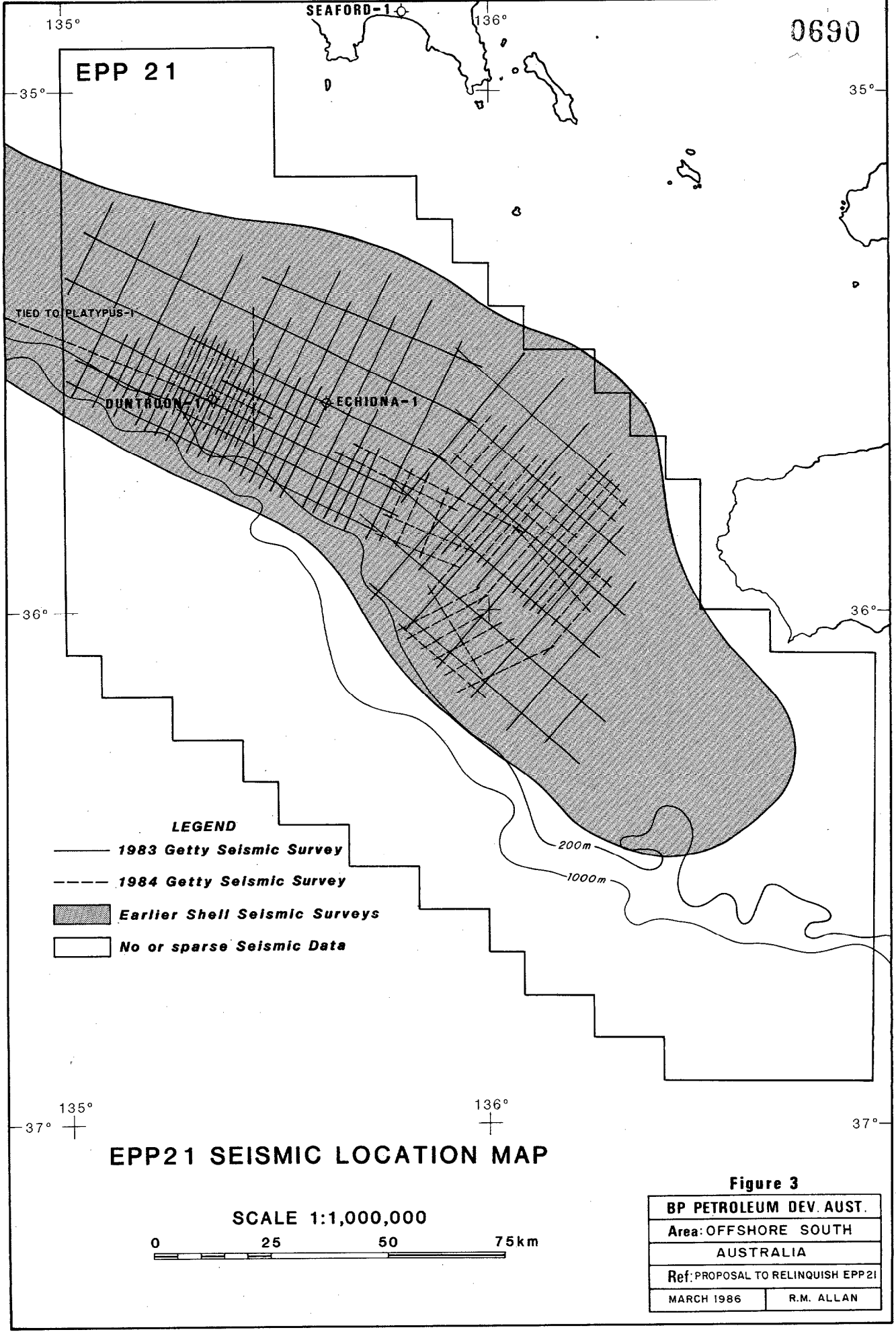


EPP 21 LOCATION MAP

Figure 1

BP PETROLEUM DEV. AUST.	
Area: OFFSHORE SOUTH AUSTRALIA	
Ref: PROPOSAL TO RELINQUISH EPP21	
MARCH 1986	R.M. ALLAN



EPP21 SEISMIC LOCATION MAP

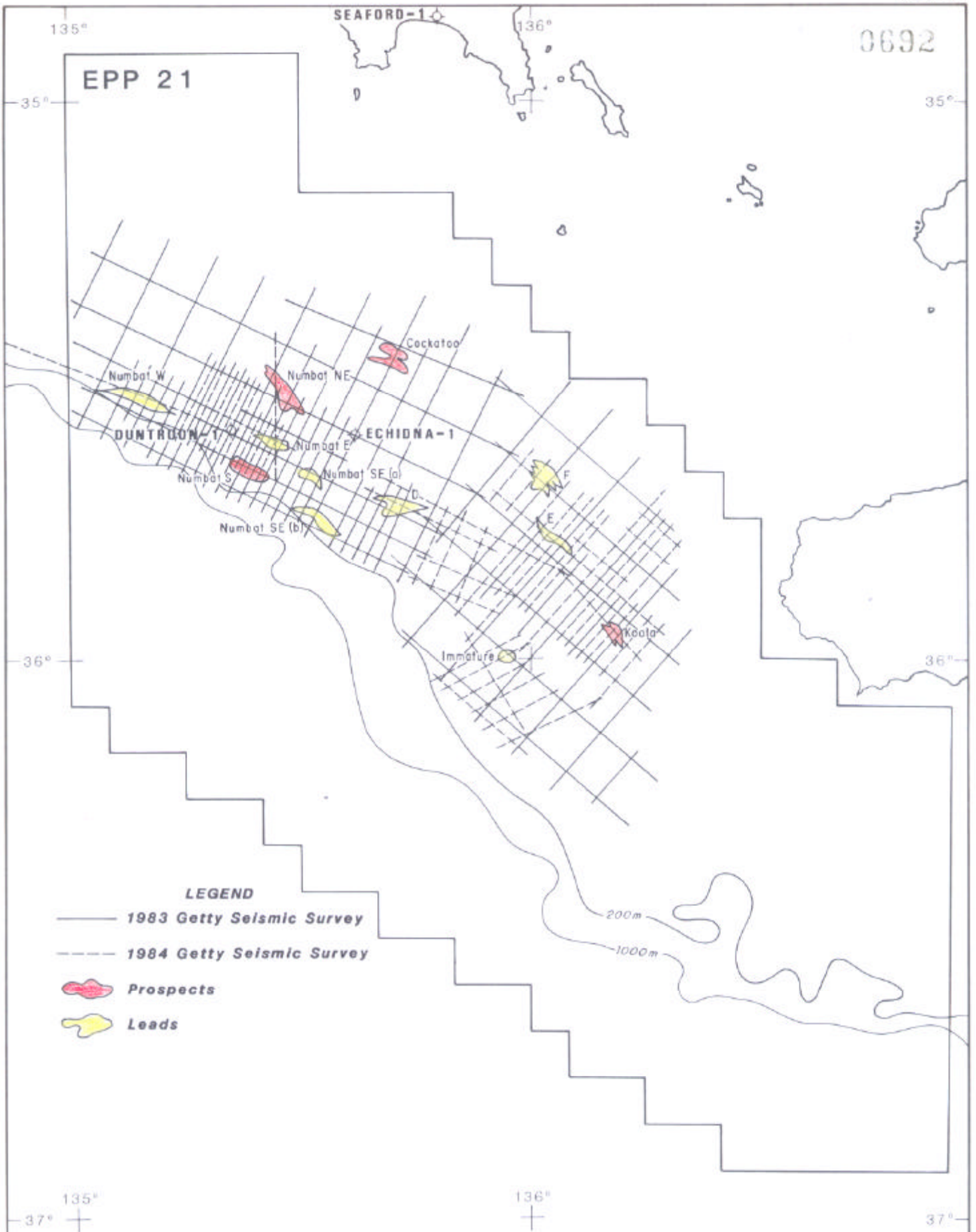
SCALE 1:1,000,000

0 25 50 75km

Figure 3

BP PETROLEUM DEV. AUST.	
Area: OFFSHORE SOUTH AUSTRALIA	
Ref: PROPOSAL TO RELINQUISH EPP21	
MARCH 1986	R.M. ALLAN

Fig. 5 is missing, presumed lost.



EPP21 PROSPECT & LEAD LOCATION MAP

SCALE 1:1,000,000

0 25 50 75km

Figure 6

BP PETROLEUM DEV AUST
Area: OFFSHORE SOUTH AUSTRALIA
Ref: PROPOSAL TO RELINQUISH EPP 21

PROSPECT AND LEAD SUMMARY

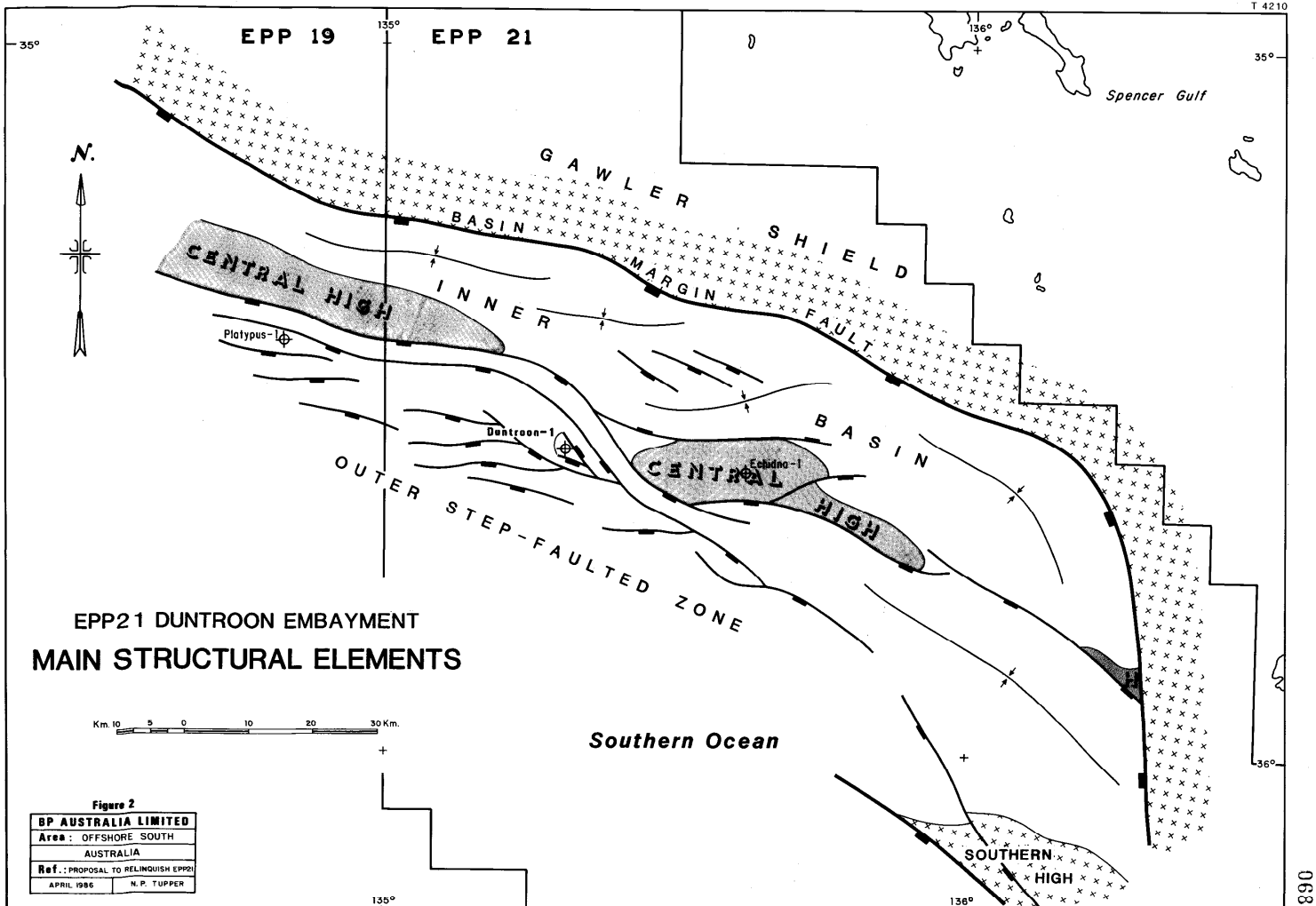
T 4215

		Water Depth (m)	Prospect / Lead Summary	Area (Km^2)	Depth to Crest (m)	Vertical Closure (m)	Bulk Rock Volume* ($m^3 \times 10^6$)	RESERVES (mmbbl Recover. Oil) Min.	ML	Max.	RISK Sou.	Res.	Trap	Overall	Risked Reserves	CRITICAL FACTORS
OUTER STEP-FAULTED ZONE	**PROSPECTS**															
	NUMBAT SOUTH	165	Hanging Wall Fault Block at Top Platypus Fm	16.7	4380	550	3880	120	300	510	.17	.60	.35	1 in 28	10.7	Presence of Source and Trap
	NUMBAT NE	125	Hanging Wall Fault Block at Top Platypus Fm	28.2	1490	320	3160	110	290	510	.17	.60	.30	1 in 33	8.5	Presence of Source and Trap
	LEADS															
	NUMBAT SE (a)	145	Footwall Fault Block at Top Platypus Fm	9.7	3130	275	1100	-	100	-	.17	.60	.45	1 in 22	4.5	Presence and Maturity of Source
	NUMBAT SE (b)	160	Hanging Wall Fault Block at Top Platypus Fm	17.4	5270	370	2080	-	180	-	.17	.60	.25	1 in 39	4.6	Presence of Source and Cross-Fault Seal
	NUMBAT EAST	135	Footwall Fault Block at Top Platypus Fm	10.4	1930	425	1590	-	140	-	.17	.60	.25	1 in 39	3.6	Presence of Source and Cross-Fault Seal
	NUMBAT WEST	145	Hanging Wall Fault Block at Top Platypus Fm	19.9	3750	275	1850	-	160	-	.17	.60	.25	1 in 39	4.1	Presence of Source and Cross-Fault Seal
	D	130	Footwall Fault Block at Top Platypus Fm	13.7	2830	540	2710	-	240	-	.17	.60	.25	1 in 39	6.2	Presence of Source and Cross-Fault Seal
INNER BASIN	**PROSPECTS**															
	KOALA	133	Footwall Fault Blocks at prob. Top Platypus Fm	3.6	1415	184	268	20	50	100	.30	.30	.35	1 in 32	1.5	Presence of Source, Seal and Reservoir
	COCKATOO	125	Footwall Fault Blocks at prob. Inter Madura Fm	14.4	1145	170	780	30	110	220	.30	.30	.45	1 in 25	4.5	Presence of Source, Seal and Reservoir
	LEADS															
	E	117	Footwall Fault Block at near Top Platypus Fm	13.3	1330	300	1680	-	150	-	.30	.30	.25	1 in 44	3.4	Presence of Source, Seal, Reservoir and Trap
	F	130	Footwall Fault Blocks at near Top Platypus Fm	19.6	1280	440	2510	-	220	-	.30	.30	.25	1 in 44	5	Presence of Source, Seal and poor Struct. Control
	IMMATURE	137	4 Way Dip Closure over Diapir at nr T. Platypus Fm	c.6	c.2160	c.240	c.500	-	45	-	.30	.30	.35	1 in 32	1.4	Presence of Source, Seal and poor Struct. Control
								Bottom Seal Case								
	NUMBAT	141	Footwall Fault Block at Top Platypus Fm	16.3	2440	665	1450	114	225	403	.60	.60	.30	1 in 9	25	Maturity of Source and Cross-Fault Seal
				7.4		335	1180	65	107	170	.60	.60	.40	1 in 7	15	
								No Bottom Seal Case								

* Gross Volume within Closure

TABLE 1

0684



EPP21 DUNTROON EMBAYMENT

MAIN STRUCTURAL ELEMENTS

Figure 2

BP AUSTRALIA LIMITED	
Area : OFFSHORE SOUTH AUSTRALIA	
Ref. : PROPOSAL TO RELINQUISH EPP21	
APRIL 1986	N.P. TUPPER

0683

WELL : DUNTROON -1

SUMMARIZED WELL LOG

Spudded : 11 Jan. 1986
Completed : 5 Mar. 1986

SCALE 1:10,000

STATUS: Plugged and Abandoned Dry Well

Location : 135°20'59·83"E 35°35'27·04"S

AGE	FORMATION	LOG DEPTH ft & m	GRAPHIC LOG	CORES	SHOWS	DESCRIPTION	CASING	TESTS	ELECTRIC LOGS	REMARKS	DEPOS-ITIONAL ENVIR-ONMENT
TERTIARY	Nullarbor Limestone Formation	250				SEA LEVEL 26·84m SEA BED 170·84m FIRST RETURNS 247m LST: wh-bf-yel brn, m hd-hd,blky, fria, occ sandy, abund foss debris,- occ rexln, unconsol to loosely cem, pkst-grst	30" 238m		GR		
		500									
		750				LST: wh-crm, occ lt gy, hd consol, frm-blky, f-m xln grns, well cem, pkst-grst, argil mtx, glauc, some skeletal debris, cherty	20" 839m				
		1000							DIL-SLS-SP-GR-CAL		
		1250				LST: lt gy-grn gy, occ gy wh, frm-hd, microxln med-well consol, pred f-m grns in calc/dol cem, micritic, argil, pkst-grst, glaus, occ sndy					
	Wilson's Bluff Fm. 1423·6										
		1500				LST: lt gy-brn gy, sft-frm, blky, mass, dol, argil, glauc, wkst-pkst	13 3/8" 1511m				
	Pidinga Sst. Fm. 1630·0										
		1750				SST: qtzose, lse, clr qtz grns, occ transluc, yel-brn, f-vc, pred m-c, ang-well rnd, pred sub ang-subrnd, mod sort, pr calc cem, grnst, tr chlorite, tr glauc, m-gd vis por MDST: dk-m gy-grn gy, sft frm, silty, non calc, sl swelling, grdg to siltst			DIL-BHC-SP-GR-CAL SHDT-GR-AMS SLS-GR CST-GR		
	Potoroo Fm. 1836·0										
		2000									
	Wigunda Fm. 2156·0					SST: qtzose, clr qtz grns, vf-crs, pred m-crs, ang-subrnd, poor sort, grnst, well-loosely cem dol cem, tr pyr, tr glauc, poor to fair vis por MDST: m dk gy-grn gy, sft, occ frm, non calc, loc sndy, carb silty,	9 5/8" 2325m				
		2250									
LATE CRETACEOUS	Platypus Formation 2467·5					SLTST: lt-m brn gy, frn-occ mod hd, blky-occ subfis non-sl calc, carb, grdg to mdst					
		2500									
		2750				SST: qtzose, lt gy, fria, vf-occ crs, dom f-m qtz grns, ang-subrnd, pr-mod srtd, tr-com calc and sil cem, grns, argil carb pr-fr vis por COAL: blk, hd, brit, pyr					
									DIL-BHC-GR-SP-CAL LDT-CNL-NGT-AMS SHDT-AMS-GR CST-GR		
EARLY CRETACEOUS	Madura Formation 2923·5	3000				SLTST: lt gy-m dk brn gy, frm-mod hd, blky-occ subfis, non-sl calc, carb, sndy SST: qtzose, lt-m gy, brn gy, fria-mod hd, vf to f qtz grns, sub-rnd, mod srtd, tr-com calc and sil cem, grnst, carb, mic, fair vis, por					
		3250				COAL: blk, hd, brit					
		3500				T.D. DRILLER 3510m BRT T.D. LOGGER 3515·6m BRT					

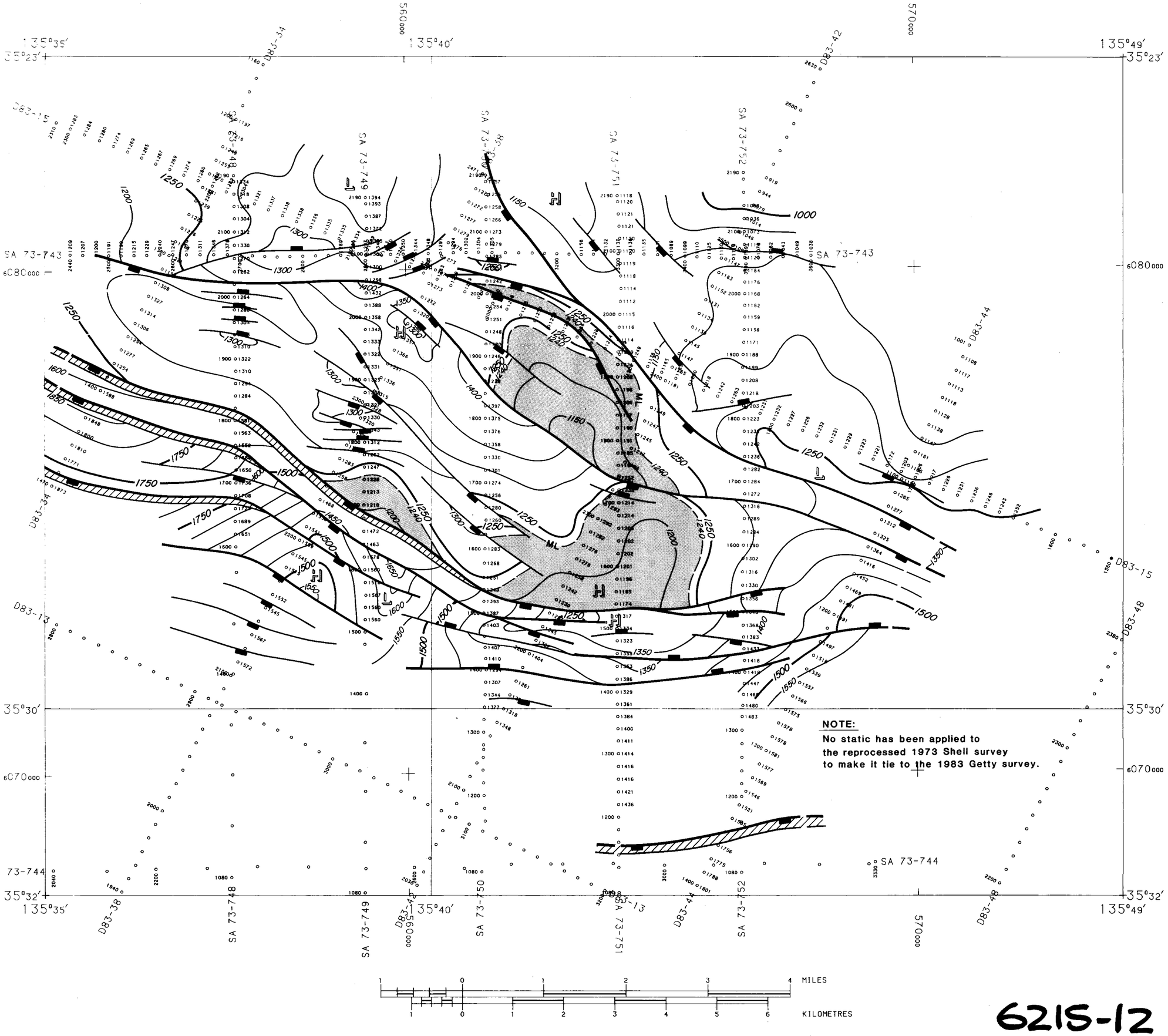
BASED ON TS 2810

Provisional: Formation tops picked from wireline logs.

Figure 4

BP PETROLEUM DEV. LTD.	
Area OFFSHORE SOUTH AUSTRALIA	
Ref PROPOSAL TO RELINQUISH EPP 21	
MARCH 1986	G. TEMPLETON

6215-11



Most Likely (ML) Area of Closure.

PROJECTION: AUSTRALIAN MAP GRID
ZONE: 53
GRID UNIT: INTERNATIONAL METRE
SPHEROID: AUSTRALIAN NATIONAL
GEODETIC DATUM: AUSTRALIAN GEODETIC

Enclosure 1

BP AUSTRALIA LIMITED

SOUTHERN MARGINS

EPP-21

COCKATOO PROSPECT

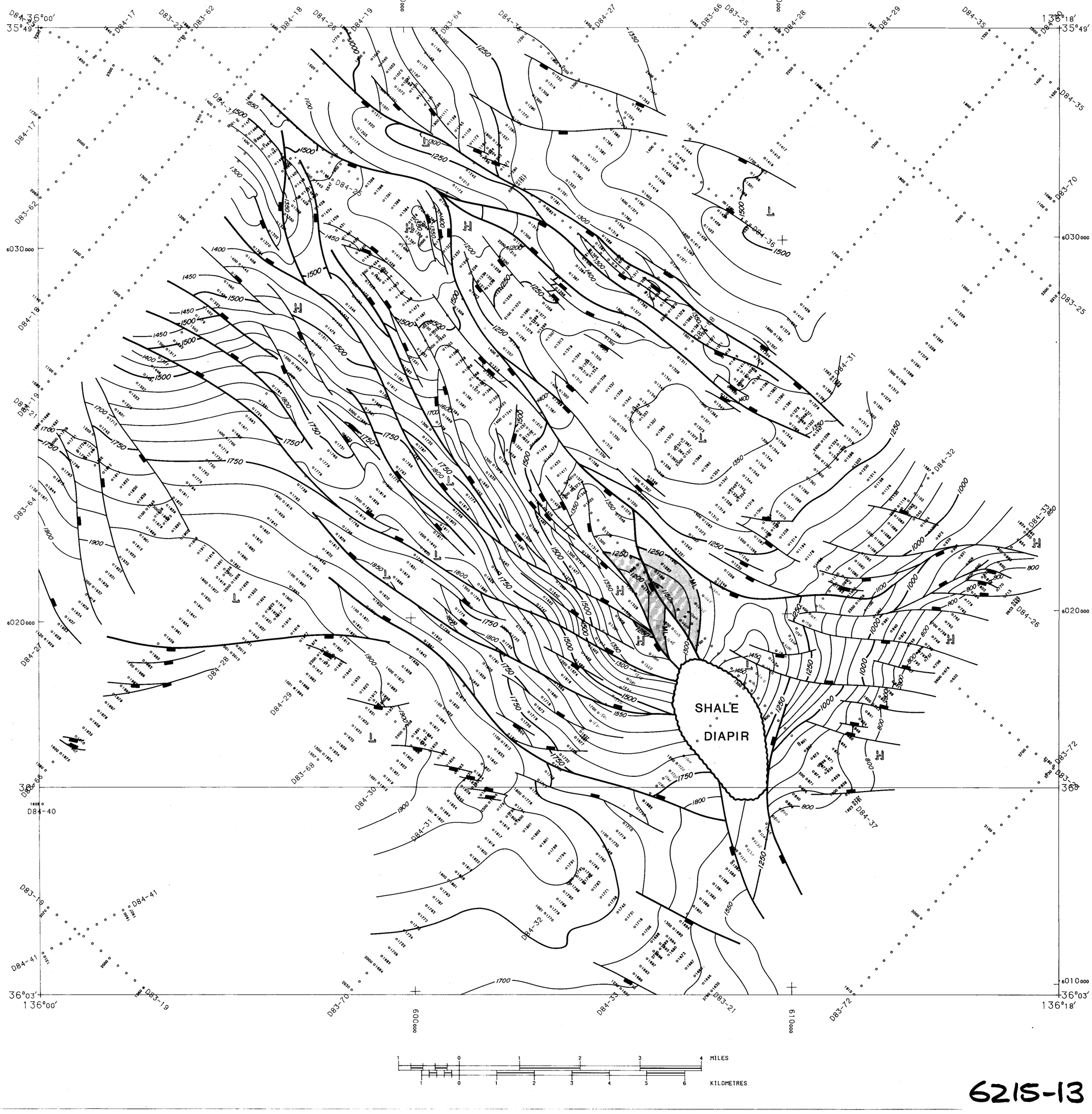
TWT TO INTER MADURA FORMATION

Contour Interval = 50 msec

SCALE 1:50000	DATUM MSL
AUTHOR RM ALLAN	DATE FEB-1986
REF: PROPOSAL TO RELINQUISH EPP21	DRAWING NO. T 4212

6215-12

KOALA



Most Likely (ML) Area of Closure.

PROJECTION: AUSTRALIAN MAP GRID
ZONE: 53
GRID UNIT: INTERNATIONAL METRE
SPHEROID: AUSTRALIAN NATIONAL
GEODETIC DATUM: AUSTRALIAN GEODETIC

Enclosure 2

BP AUSTRALIA LIMITED

SUOTHERN MARGINS

EPP-21

KOALA PROSPECT

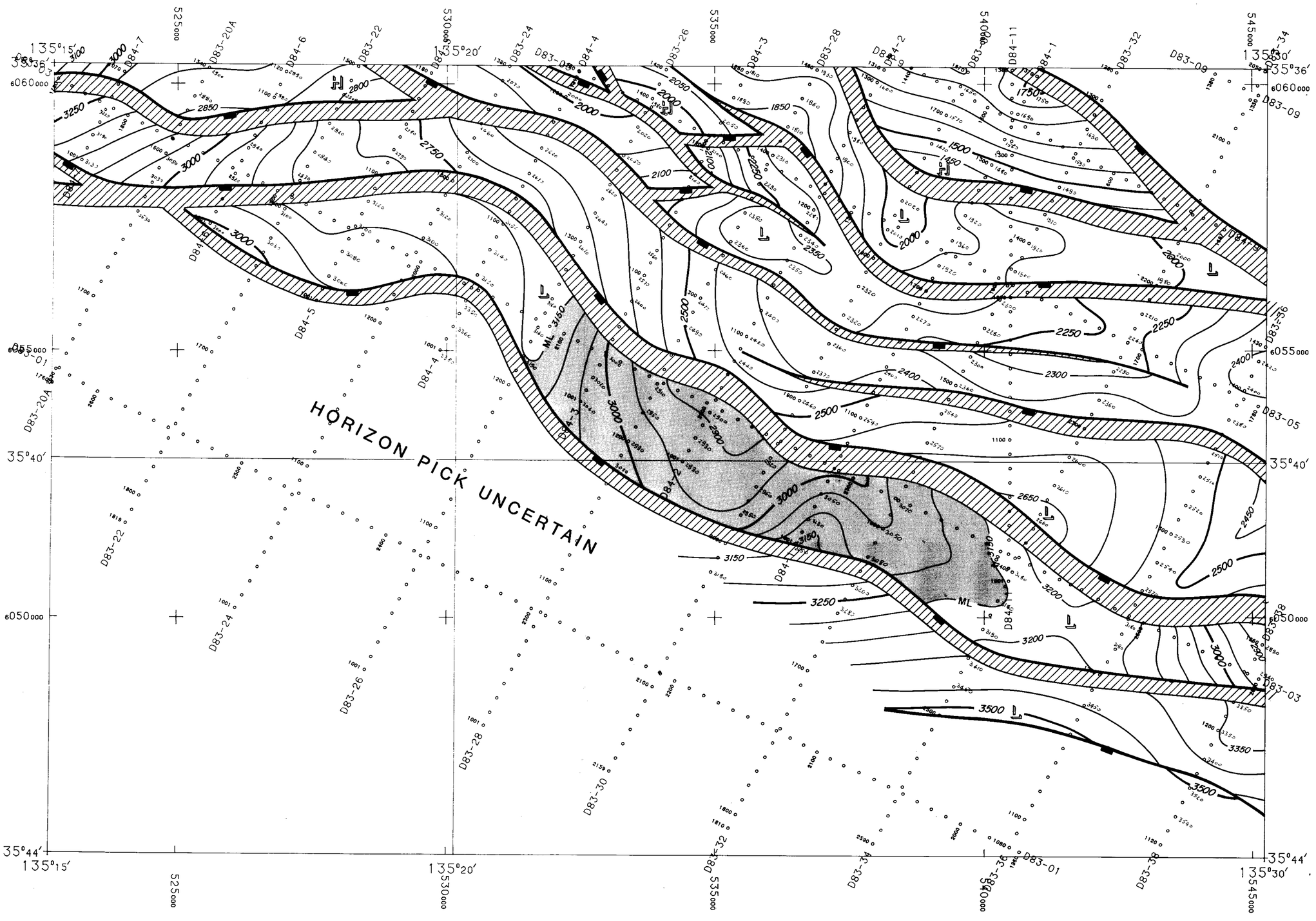
TWT TO TOP PLATYPUS FORMATION

Contour Interval = 50 msec

SCALE 1:50000	DATUM MSL
AUTHOR RM ALLAN	DATE FEB-1986
REF: PROPOSAL TO RELINQUISH EPP21	DRAWING NO. T4214

6215-13

NUMBAT SOUTH



1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 6 KILOMETRES

Most Likely (ML) Area of Closure.

PROJECTION: AUSTRALIAN MAP GRID
ZONE: 53
GRID UNIT: INTERNATIONAL METRE
SPHEROID: AUSTRALIAN NATIONAL
GEODETIC DATUM: AUSTRALIAN GEODETIC

Enclosure 3

BP AUSTRALIA LIMITED

SOUTHERN MARGINS

EPP-21

NUMBAT SOUTH PROSPECT

TWT TO TOP PLATYPUS FORMATION

Contour Interval = 50 msec

SCALE 1:50000	DATUM MSL
AUTHOR RM ALLAN	DATE DEC-1985
REF: PROPOSAL TO RELINQUISH EPP21	DRAWING NO. T 4211

6215-14

NUMBAT NORTHEAST

HORIZON PROBABLY ABSENT

HORIZON PICK UNCERTAIN

HORIZON SUBCROPS BASE TERTIARY UNCONFORMITY

HORIZON SUBCROPS BASE TERTIARY UNCONFORMITY

1350 ML

Most Likely (ML) Area of Closure.

PROJECTION: AUSTRALIAN MAP GRID
ZONE: 53
GRID UNIT: INTERNATIONAL METRE
SPHEROID: AUSTRALIAN NATIONAL
GEODETIC DATUM: AUSTRALIAN GEODETIC

Enclosure 4

BP AUSTRALIA LIMITED

SOUTHERN MARGINS

EPP-21

NUMBAT NE PROSPECT

TWT TO TOP PLATYPUS FORMATION

Contour Interval = 50 msec

SCALE 1:50000		DATUM	MSL
AUTHOR	RM ALLAN	DATE	DEC-1985
REF: PROPOSAL TO RELINQUISH EPP21		DRAWING NO.	T4213

6215-15