Department of Resources and Energy
Bureau of Mineral Resources, Geology and Geophysics

Australian Petroleum Accumulations Report 1

Amadeus Basin, central Australia

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FOREWORD

The Bureau of Mineral Resources, Geology & Geophysics is presenting data on Australian petroleum accumulations in a new series of reports. Each report will characterise the petroleum from a sedimentary basin, and include notes on the basin's setting, stratigraphy, structure, traps, reservoir and source rocks, and petroleum characteristics, resources and production developments. The data presented are designed as a ready reference to Australian petroleum exploration and developments.

This report, the first in the series, summarises the data from 17 petroleum accumulations found to date in the Amadeus Basin, Northern Territory and Western Australia.

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ABSTRACT

Three economic (1 oil and gas/condensate, 1 gas/condensate, and 1 gas) and fourteen uneconomic (6 oil, 7 gas, and 1 oil/gas) petroleum accumulations have been discovered since 1963 in the Amadeus Basin of central Australia.

The petroleum in the Amadeus Basin mainly occupies the structural, fold-related traps within the Upper Proterozoic to Upper Ordovician marine to marginal marine clastic and evaporitic sequences. It is believed to be of algal/bacterial origin. The API gravity ranges from 18 to 54° for crude oils, and from 52 to 64° for condensates; gases are dry and wet.

The basin's estimated petroleum resources as at 31 December 1985 comprise 5.74 x $10^6 m^3$ of oil, 1.53 x $10^6 m^3$ of natural-gas liquids, and 14.93 x $10^9 m^3$ of sales gas.

Production from Mereenie (oil) and Palm Valley (gas/condensate) accumulations commenced during 1984. Up to 31 December 1985 the cumulative production from the basin stood at 156.3 x $10^3 m^3$ of oil and condensate, and 44.0 x $10^6 m^3$ of sales gas. The gas/condensate is transported 146 km to Alice Springs through a 20-cm-diameter pipeline; the oil is transported 269 km to Alice Springs through a 20-cm-pipeline, and from there by rail tankers to Adelaide refinery. As from February 1987 gas from Palm Valley will also be transported to Darwin via a 1537-km pipeline of 35.3 cm diameter.

INTRODUCTION

This report summarises information on the petroleum accumulations found in the Amadeus Basin up to 31 December 1985 (Fig.1). It describes the basin's setting, structure and traps, reservoir and source rocks, nature of petroleum, and petroleum resources and developments.

The objectives in summarising the available data are:

- to provide the capacity to understand the distribution and characteristics of petroleum accumulations in the Amadeus Basin;
- to provide assistance for exploration for additional reserves; and
- to enhance basic geological and geochemical research.

The data presented in this report were drawn from the continuing petroleum exploration and development programs in the Amadeus Basin in which the detailed assessments of individual accumulations have been released by the operators.

BASIN SUMMARY

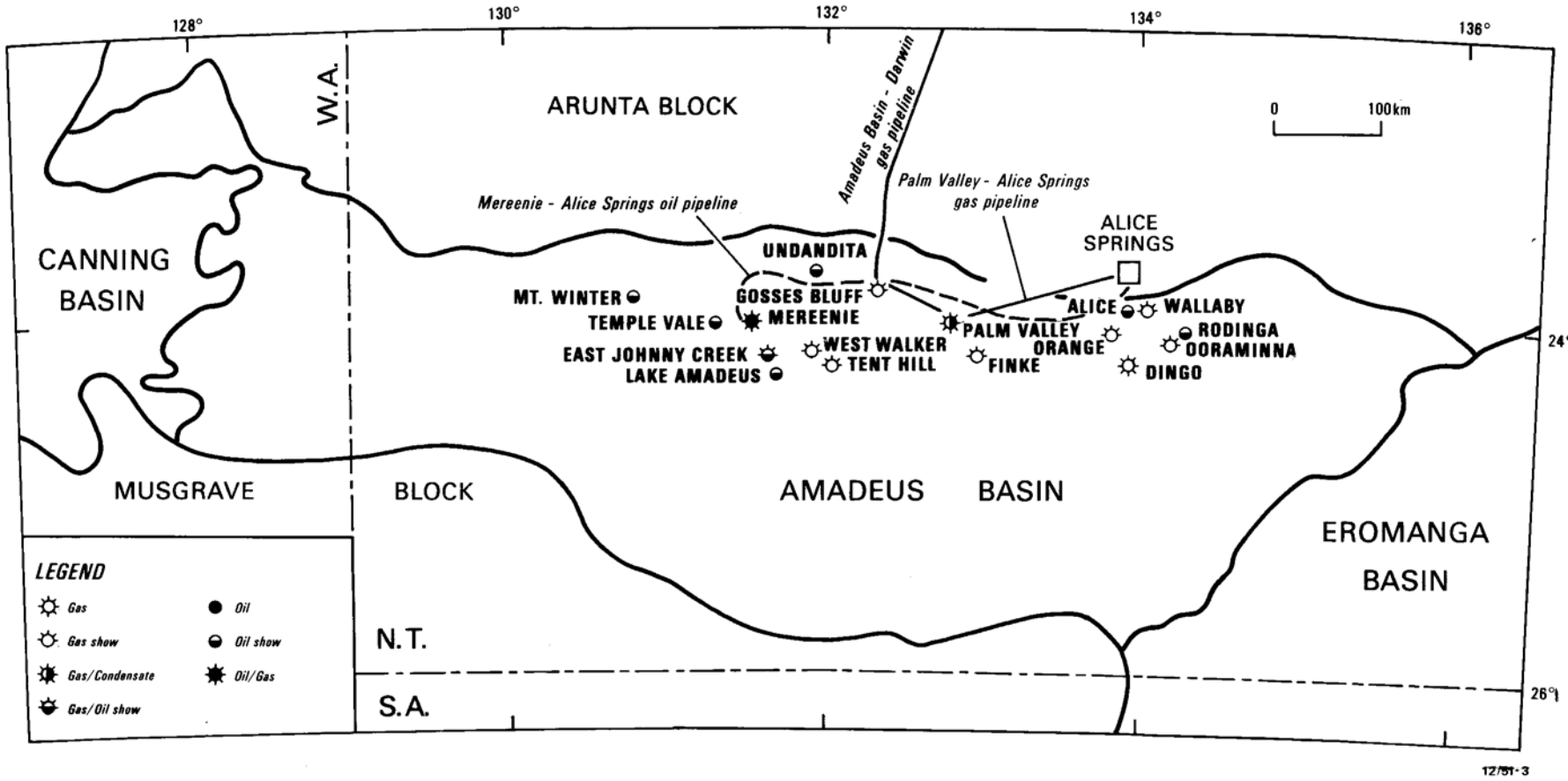
Setting and stratigraphy

The Amadeus Basin is an east-west-trending elongate downwarp covering about 170 000 km^2 of the southern part of the Northern Territory (Wells & others, 1970); a small portion of the basin also extends into Western Australia. The basin margins are well defined to the north and south by igneous and metamorphic rocks of the Precambrian Arunta and Musgrave Blocks. To the east and to the west, the basin margin is obscured by a cover of younger rocks.

The basin's major stratigraphic units and their thicknesses are shown in Plates 1 and 2. The stratigraphy reflects a basal Upper Proterozoic succession of shelf, lagoonal, continental, and shallow-marine sediments, including carbonates and evaporites, overlain by Cambrian-Ordovician marine sediments - all unconformably overlain by continental Devonian-Carboniferous sediments. In general the sedimentary succession thins westwards over an apparent basement arch, and merges with the Canning Basin sequence. The eastward extension of the basin is truncated and overlapped by Mesozoic sediments of the Eromanga Basin.

Petroleum accumulations

In the Amadeus Basin, petroleum occurs in both economic and uneconomic quantities. Crude oil was first discovered in 1963 in APl stratigraphic hole



NAME	Alice	Dingo	East Johnny Creek	Finke	Gosses Bluff	Lake Amadeus	Mereenie	Mt. Winter	Ooraminna	Orange	Palm Valley	Rodinga	Tempe Vale	Tent Hill	Undandita	Wallaby	West Walker
PLATE NUMBER	1	1	1	2	2	2	1	2	1	2	1	2	2	2	2	2	1
LOCALITY MAP NUMBER	5	3	6	16	9	8	1	13	4	10	2	11	15	17	14	12	7

Fig. 1 Index to petroleum accumulations, Amadeus Basin

(Barrie, 1964). Since then over 50 petroleum exploration wells have been drilled, resulting in the discovery of two major and one minor economic accumulations:

- Mereenie (oil and gas/condensate)
- Palm Valley (gas/condensate)
- Dingo (gas)

Further, there are another 14 uneconomic accumulations:

- Ooraminna (gas)
- Alice (oil)
- East Johnny Creek (oil, gas)
- West Walker (gas)
- Lake Amadeus (oil)
- Gosses Bluff (gas)
- Orange (gas)
- Rodinga (oil)
- Wallaby (gas)
- Mount Winter (oil)
- Undandita (oil)
- Tempe Vale (oil)
- Finke (gas)
- Tent Hill (gas)

Details of all the basin's petroleum accumulations are summarised in the 'Petroleum accumulations summaries' section of this report, and are graphically depicted in Plates 1 and 2.

Structure and petroleum traps

Structures evident in the Amadeus Basin are the result of directed north-south compressional forces (Wells & others, 1970). Fold structures are characterised by broad flat synclines and tight, commonly asymmetric anticlines. Cross-faulting appears minimal, and is generally related to thrust adjustment. Two major episodes of tectonic deformation have largely controlled development of the structures suitable for petroleum entrapment and preservation: the Late Proterozoic Petermann Ranges Orogeny and the Late Devonian to Early Carboniferous Alice Springs Orogeny.

Petroleum accumulations in the Amadeus Basin occupy structural/stratigraphic traps in rocks of Cambro-Ordovician and Proterozoic ages. The principal Cambro-Ordovician traps are aligned along a northwest or east-west trend. This trend appears to conform to the general strike of the basin's

palaeoslope across which major delta distributory channels flowed. The presence of petroleum is probably the result of the traps having intersected the southeast and southwest-trending delta distributory channels through which the petroleum fluids migrated. The nature of the traps suggests that the migration and trapping of the petroleum were probably initially controlled by lithofacies, but that localised secondary migration of the petroleum into anticlinal traps took place as a result of the formation of later structures.

The traps in the Proterozoic rocks are mainly anticlinal and display no directional alignment, unlike the traps in the overlying Cambro-Ordovician rocks. There is, however, evidence that the traps in the older rocks formed as the Proterozoic succession compacted differentially over pillows and lenses of tectonically mobile salt.

Petroleum-bearing rock units

The quality of petroleum-bearing rock units in the Amadeus Basin ranges from poor to moderate. Sedimentological studies suggest that the basin contains five different petroleum-bearing facies: distributory-channel sandstones, over-bank sheet sandstones, delta-front sheet sandstones, linear barrier sandstones, and shallow-marine deposits (Jackson & others, 1984). Most of the oil zones are confined to sandy nearshore facies, whereas the gas has been discovered in all five facies.

The Lower and Middle Ordovician Larapinta Group clastic rocks are proven petroleum-bearing units, and have been tested by the Mereenie and Palm Valley discoveries. These units consist of fine to coarse-grained nearshore and marine quartzose and feldspathic sandstones. The porosity (intergranular and in parts fracture-induced) of the Ordovician petroleum-bearing rock units is low to moderate, ranging from 4 per cent to 12 per cent (Kurylowicz & others, 1976). The porosity decreases regionally to the southwest, away from the Palm Valley area. Fracture porosity predominates in the Palm Valley area, whereas inter-granular porosity predominates to the east of Alice No. 1 and in the Mereenie area to the west. The fracture porosity in the major Cambro-Ordovician sandstone bodies has been evaluated from surface studies and wireline-log analysis; it is best developed along the northern basin margin. The cap rocks to the Cambro-Ordovician petroleum-bearing rock units comprise shale, siltstone, limestone, and impervious sandstone.

The quality of the Cambrian and Proterozoic petroleum-bearing rock units tested by drilling is poorer than that of the overlying Ordovician petroleum-bearing units. These older units comprise sandstone, siltstone, and carbonate with a porosity averaging less than 5 per cent. However, the distribution of wells that have tested these units is too sparse to conclude that their general reservoir quality is unfavourable. Cap rocks to the Cambrian and Proterozoic petroleum-bearing rock units are adequate, and consist of shale, siltstone, impervious sandstone, and carbonate.

Source rocks

The potential petroleum source rocks in the Amadeus Basin include siltstone, shale, carbonate, and evaporite units in Proterozoic and Cambro-Ordovician successions (Jackson & others, 1984).

Numerous source-rock studies of the Ordovician succession have established that the Horn Valley Siltstone, which averages up to 10 per cent of total organic matter, is the most important source that charged the Mereenie rock units with gas, condensate, and oil (Gorter, 1984). Lateral differences in organic facies of the Horn Valley Siltstone, and the timing of the petroleum trapping, possibly account for the occurrences of dry gas and condensate in the Palm Valley rock units.

The Cambrian succession appears to be organically lean. In general it contains gas-prone matter, but the few isolated samples from the Chandler Limestone and Tempe Formation indicate limited oil potential.

The Proterozoic fine-grained clastic carbonate and evaporite rocks contain mainly gas-prone matter. A small amount of oil-prone kerogen derived from the Pertatataka and Areyonga Formations and Gillen Member of the Bitter Springs Formation suggests some oil-source potential for the Proterozoic succession.

Nature of petroleum

The gravity of the Amadeus Basin oils ranges from 18 to 54^{o}API; condensate from 52 to 64^{o}API; and the gas composition from dry to wet, and with a notable variation in nitrogen content.

Oils discovered in the Pacoota Sandstone and Stairway Sandstone rock units of the Mereenie accumulations have a gravity ranging from 45 to 54^{o}API, and are highly paraffinic to paraffinic in composition (Table 1). The heavy oil discovered in APl stratigraphic hole (Barrie, 1964) has a gravity of 18^{o}API, and is interpreted to be a residual accumulation.

TABLE 1. ANALYTICAL DATA FOR OILS AND CONDENSATES FROM THE AMADEUS BASIN
(After Jackson & others, 1984)

Sample	Petroleum-bearing unit	°API	S %	δC_{pdb} °/°°	C_5-C_7 Hydrocarbons				C_{12} + Fraction			
					MCH / Tol	i-C_5 / n-C_5	IV	HV	Sat %	Arom %	ONS %	Pr / Ph
E. Mereenie No. 1 cond.	Pacoota (P1-P3)	61	0.07	-30.3	7.69	0.46	10.5	41.4	82.2	12.2	5.5	
E. Mereenie No. 3 oil	Pacoota (P1)	45	0.07		3.56	0.69	8.02	38.0	83.5	9.0	7.2	0.9
E. Mereenie No. 4 oil	Pacoota (P3)	47	0.07	-31.0					84.8	9.0	6.1	0.8
E. Mereenie No. 6 oil	Pacoota (P1)	49			6.88	0.75	7.28	35.3	79.6	7.9	12.4	1.5
E. Mereenie No. 8 oil	Pacoota (P1)	50			6.20	0.77	7.80	34.4				
E. Mereenie No. 10 oil	Stairway (Lower)	54			3.98	0.64	5.91	40.4	81.2	7.9	9.6	2.1

Table 1 (cont'd)

Sample	Petroleum-bearing unit	°API	S %	δC_{pdb} °/°°	C_5-C_7 Hydrocarbons MCH/Tol	$i\text{-}C_5/n\text{-}C_5$	IV	HV	C_{12} + Fraction Sat %	Arom %	ONS %	Pr/Ph
Palm Valley No. 1 cond.	USSst, Horn Valley & Pacoota (P1 & P2)	52	0.07	-28.9	0.72	0.61	12.6	22.2	89.1	2.0	8.8	
Palm Valley No. 2 cond.	LSSst, Horn Valley & Pacoota (P1)	64	0.03	-29.2	0.85	1.10	20.4	17.9	82.6	2.7	14.7	
Palm Valley No. 3 cond.	Pacoota (P1)	58	0.04	-29.9	0.90	1.20	18.5	19.7	86.8	5.2	8.0	
AP1 oil	Stairway (Lower)	18		-30.8					36.8	25.6	37.5	
Alice No. 1 oil	Jay Creek	43	0.2	-28.8					43.8	10.0	45.1	2.6

The columns headed 'IV' and 'HV' are the isoheptane and heptane values respectively as defined by Thompson (1983). 'MCH/Tol' is the methylcyclohexane to toluene ratio.

The above data are from McKirdy (1977), except for Alice No 1 oil show (McKirdy & others, 1983); and C_{12} + fractions from East Mereenie No. 6 and 10 and the Palm Valley accumulation gasoline-range hydrocarbons (Jackson & others, 1984). Where 'Sat' + 'Arom' + 'ONS' fractions total less than 100 per cent, the remainder is the asphaltene fraction.

TABLE 2. ANALYTICAL DATA FOR GASES FROM THE AMADEUS BASIN

(After Jackson & others, 1984)
('nd' is the abbreviation for 'none detected')

Accumulation /well	Petroleum-bearing unit	C_1 $C_1 - C_4$	$i\text{-}C_4$ $n\text{-}C_4$	$i\text{-}C_5$ $n\text{-}C_5$	N_2 Volume %	CO_2
Mereenie	Stairway	0.68	0.42	1.28	2.6	0.1
	Pacoota (P1)	0.80	0.36	0.78	7.9	0.2
	Pacoota (P3)	0.80	0.36	0.79	9.5	nd
	Pacoota (P4)	0.83	0.38	0.83	15.0	nd
Palm Valley No. 2	Pacoota (P1)	0.91	0.56	1.66	2.0	nd
		0.91	0.54	1.88	2.3	0.2
West Walker No.1	Pacoota (P1)	0.80	0.36	1.78	8.3	0.7
Dingo No. 1	Arumbera	0.96	0.66	4.67	9.5	nd
Ooraminna No.1	Areyonga	0.96	0.50			nd

The condensate in both the Mereenie and Palm Valley accumulations has a gravity ranging from 52 to 64^{o}API, and is ultraparaffinic to highly paraffinic. The sulphur content of oil and condensate alike is low (less than 0.1 per cent). Both Mereenie oil and Palm Valley condensate are supermature and of algal/bacterial origin.

Analytical data for oil from the Cambrian and Proterozoic successions are few.

The composition of gas from the Amadeus Basin varies considerably, and apparently reflects regional differences in source and maturity. Table 2 lists analytical data for gases recovered from a number of rock units.

Petroleum resources

Estimated petroleum resources for the Amadeus Basin as at 31 December 1985 comprised 5.74 x 10^6m^3 of oil; 1.53 x 10^6m^3 of natural-gas liquids; and 14.93 x 10^9m^3 of sales gas (BMR, 1986). Figure 2 depicts the basin's petroleum resources assessment trend from 1972 to 1985 (BMR, 1972-85). All resources listed in Figure 2, and in Plates 1 and 2, either have been provided to BMR by the Department of Mines and Energy, Northern Territory, or are BMR estimates.

Petroleum production developments

Petroleum has been produced from only two accumulations in the Amadeus Basin: Palm Valley and Mereenie.

The Palm Valley gas project was brought on stream in 1984, following installation of gathering, field treatment, and metering facilities. The delivery of gas/condensate from the accumulation into the Palm Valley-Alice Springs gas pipeline was initiated on 31 August 1984. The pipeline, over 146 km long, has an outside diameter of 20 cm. The gas is being sold to the Northern Territory Electricity Commission for use as fuel in the Alice Springs power plant. In August 1984 the Department of Mines and Energy, Northern Territory, announced plans for building of a gas pipeline from the Palm Valley accumulation to Darwin for electricity generation. The 1537-km pipeline from Palm Valley to Darwin will have an outside diameter of 35.5 cm, and is expected to be commissioned in February 1987.

Oil production from the Mereenie accumulation commenced in June 1984 at a rate of 238 m^3 per day (1500 bbl per day). Production started from the East Mereenie Pacoota Sandstone trap, and increased to 476 m^3 per day (3000 bbl per day) when the Mereenie Pacoota Sandstone trap was brought into production.

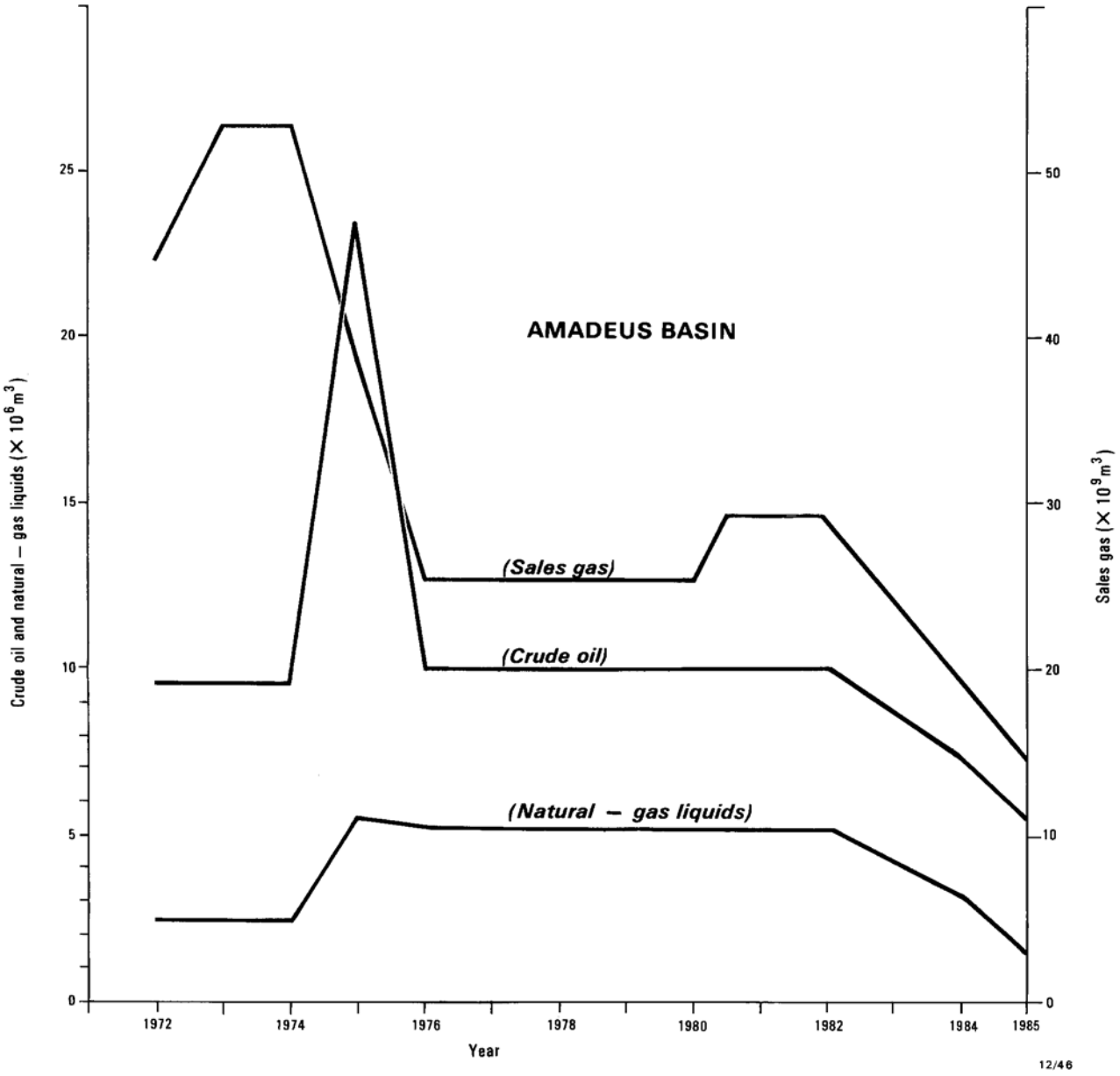


Fig. 2 Estimated initial petroleum resources in the Amadeus Basin, 1972–1985. (After BMR 1972–1985; BMR 1986)

Up to October 1985, the produced oil was transported from the accumulation's gathering facility to Alice Springs by road tankers, and then by rail tankers to Adelaide refinery. Since October 1985 the oil has been transported to Alice Springs via a 269-km pipeline of 20.3 cm diameter, and then by rail tankers to Adelaide refinery.

Up to 31 December 1985, the cumulative production from the basin stood at 156.3 x $10^3 m^3$ of oil and condensate, and 44.0 x $10^6 m^3$ of gas.

PETROLEUM ACCUMULATIONS SUMMARIES

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Mereenie*

COMPILATION DATE: *2/06/86*

OPERATOR: *Oilmin NL*

TYPE: *Oil; gas/condensate*

COMMERCIAL STATUS: *Economic and developed*

LOCATION: *Approximately 240 km west-southwest of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP178, L4; OP175, L5*

FIRST DISCOVERY WELL: *Mereenie No.1 (Pemberton & others, 1964)*
- latitude: *23º59'25"* longitude: *131º30'10"*
- discovery: *gas/condensate*
- date total depth reached: *February 1964*

SECOND DISCOVERY WELL: *East Mereenie No.2 (Benbow & others, 1964)*
- latitude: *24º02'42"* longitude: *131º38'58"*
- discovery: *oil*
- date total depth reached: *October 1964*

THIRD DISCOVERY WELL: *Mereenie No.6 (Oilmin, 1982)*
- latitude: *24º04'21"* longitude: *131º40'58"*
- discovery: *oil*
- date total depth reached: *May 1982*

NUMBER OF WELLS DRILLED: *22* exploration
14 development

STRUCTURE: *Anticline: northwest-southeast-trending, symmetrical, breached, eastward-plunging*
- areal closure: *98.4 sq.km*
- vertical closure: *427 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
4 traps
10 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *2* oil

DRIVE MECHANISM: *Gas expansion with possibly minor water drive*

PRODUCTION COMMENCED: *June 1984*

PRODUCTION INFRASTRUCTURE: *Oil is transported from the accumulation via a 269-km pipeline to Alice Springs then railed to Adelaide refinery*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Stairway Sandstone*

DISCOVERY WELL: *Mereenie No.1*

CONTENTS: *Gas/condensate*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *USSst*
PETROLEUM CONTENTS: *Gas/condensate*
PRODUCTION STATUS: *Dormant*
FORMATION: *Stairway Sandstone*
AGE: *Late Middle Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; streaks of siltstone and shale, and phosphate pellets are also present*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *738.3 m below rotary table (BRT)*
POROSITY: *Up to 8%*
PERMEABILITY: *5 md*
TEMPERATURE GRADIENT: *Normal (1.822 ºC/100m)*
PRESSURE GRADIENT: *Normal, 9789.8 Pascals/metre (Pa/m)*

PETROLEUM-BEARING UNIT 2: *LSSst*
PETROLEUM CONTENTS: *Gas/condensate*
PRODUCTION STATUS: *Dormant*
FORMATION: *Stairway Sandstone*
AGE: *Early Middle Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; streaks of siltstone and shale, rare phosphate and pyrite cement*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *955.5 m BRT*
POROSITY: *Up to 12%*
PERMEABILITY: *5 md*
TEMPERATURE GRADIENT: *Normal*
PRESSURE GRADIENT: *Abnormally high (10833.9 Pa/m)*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 2: *Pacoota Sandstone*

DISCOVERY WELL: *Mereenie No.1 gas/condensate; East Mereenie No.2 oil*

CONTENTS: *Gas/condensate, oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P1*
PETROLEUM CONTENTS: *Gas/condensate; oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; streaks of siltstone and shale, partly glauconitic, pyritic and phosphatic*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1267.3 m BRT*
POROSITY: *Up to 6%*
PERMEABILITY: *Up to 12 md, generally less than 1 md*
TEMPERATURE GRADIENT: *Normal*
PRESSURE GRADIENT: *Normal*

PETROLEUM-BEARING UNIT 2: *P2*
PETROLEUM CONTENTS: *Gas/condensate; oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; streaks of siltstone and shale, partly glauconitic and phosphatic*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1349.0 m BRT*
POROSITY: *Up to 10%*
PERMEABILITY: *Up to 14 md, generally less than 2 md*
TEMPERATURE GRADIENT: *Normal*
PRESSURE GRADIENT: *Normal*

PETROLEUM-BEARING UNIT 3: *P3*
PETROLEUM CONTENTS: *Gas/oil show*
PRODUCTION STATUS: *Dormant*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; siltstone and shale streaks*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1415.8 m BRT*
POROSITY: *Up to 10%*
PERMEABILITY: *Up to 10 md, generally less than 2 md*
TEMPERATURE GRADIENT: *Normal*
PRESSURE GRADIENT: *Normal*

PETROLEUM-BEARING UNIT 4: *P4*
PETROLEUM CONTENTS: *Gas/oil show*
PRODUCTION STATUS: *Dormant*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; calcareous and irregularly bedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1499.6 m BRT*
POROSITY: *Up to 9%*
PERMEABILITY: *Up to 10 md, generally less than 2 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 3: *Stairway Sandstone (East Mereenie)*

DISCOVERY WELL: *East Mereenie No.2*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *LSSst*
PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Dormant*
FORMATION: *Stairway Sandstone*
AGE: *Middle Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; partly cemented by phosphate and pyrite*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1119.5 m BRT*
POROSITY: *Up to 10%*
PERMEABILITY: *Up to 10 md, generally less than 2 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 4: *Pacoota Sandstone (East Mereenie)*

DISCOVERY WELL: *East Mereenie No.2*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P1*
PETROLEUM CONTENTS: *Oil/gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural and stratigraphic*
LITHOLOGY: *Sandstone: marginal marine; glauconitic; interbedded with thin limestone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1452.6 m BRT*
POROSITY: *Up to 10%, average 7.6%*
PERMEABILITY: *Up to 78 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM-BEARING UNIT 2: *P2*
PETROLEUM CONTENTS: *Gas/oil*
PRODUCTION STATUS: *Dormant*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural and stratigraphic*
LITHOLOGY: *Sandstone: marginal marine; glauconitic and calcareous; interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1349.0 m BRT*
POROSITY: *Up to 7%*
PERMEABILITY: *Up to 5 md, generally less than 1 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM-BEARING UNIT 3: *P3*
PETROLEUM CONTENTS: *Oil/gas*
PRODUCTION STATUS: *Producing*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural and stratigraphic*
LITHOLOGY: *Sandstone: marginal marine; interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1415.8 m BRT*
POROSITY: *Up to 11%*
PERMEABILITY: *Up to 6 md, generally less than 3 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Palm Valley*

COMPILATION DATE: *2/06/86*

OPERATOR: *Magellan Petroleum (NT) Pty Ltd*

TYPE: *Gas/condensate*

COMMERCIAL STATUS: *Economic and developed*

LOCATION: *Approximately 125 km southwest of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP175, L3*

DISCOVERY WELL: *Palm Valley No.1 (Magellan, 1965)*
- latitude: *24º00'00"* longitude: *132º46'20"*
- discovery: *gas/condensate*
- date total depth reached: *May 1965*

NUMBER OF WELLS DRILLED: *6* exploration
3 development

STRUCTURE: *Anticline: symmetrical, east-west-trending, gently plunging to both east and west*
- areal closure: *312 sq.km*
- vertical closure: *305 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
3 traps
7 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *1* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *Gas expansion; ? water drive*

PRODUCTION COMMENCED: *August 1984*

PRODUCTION INFRASTRUCTURE: *Produced gas/condensate is being piped 146 km to Alice Springs via a 20-cm-diameter pipeline*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Stairway Sandstone*

DISCOVERY WELL: *Palm Valley No.1*

CONTENTS: *Gas/condensate*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *USSst*
PETROLEUM CONTENTS: *Gas/condensate*
PRODUCTION STATUS: *Dormant*
FORMATION: *Stairway Sandstone*
AGE: *Middle Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; lenses of shale and calcareous siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1317.0 m BRT*
POROSITY: *Up to 3.5%*
PERMEABILITY: *Generally low; usually less than 1 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Normal (9789.8 Pa/m)*

PETROLEUM-BEARING UNIT 2: *LSSst*
PETROLEUM CONTENTS: *Gas/condensate*
PRODUCTION STATUS: *Dormant*
FORMATION: *Stairway Sandstone*
AGE: *Middle Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; lenses of carbonaceous shale and calcareous siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1486.0 m BRT*
POROSITY: *Up to 5%*
PERMEABILITY: *Generally less than 1 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Normal (9789.9 Pa/m)*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 2: *Horn Valley Siltstone*

DISCOVERY WELL: *Palm Valley No.1*

CONTENTS: *Gas/condensate*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *HVSltst*
PETROLEUM CONTENTS: *Gas/condensate show*
PRODUCTION STATUS: *Nil*
FORMATION: *Horn Valley Siltstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marine; sandy; interbedded with fossiliferous limestone and carbonaceous shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1618.5 m BRT*
POROSITY: *Low, generally less than 2%*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 3: *Pacoota Sandstone*

DISCOVERY WELL: *Palm Valley No.1*

CONTENTS: *Gas/condensate*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P1*
PETROLEUM CONTENTS: *Gas/condensate*
PRODUCTION STATUS: *Producing*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1717.2 m BRT*
POROSITY: *Up to 5% (some fracture porosity has been observed)*
PERMEABILITY: *Low, generally less than 1 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *?Possibly overpressured (10133 Pa/m)*

PETROLEUM-BEARING UNIT 2: *P2*
PETROLEUM CONTENTS: *Gas/condensate*
PRODUCTION STATUS: *Dormant*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; fine to medium; in parts silty, glauconitic, and calcareous*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1792.8 m BRT*
POROSITY: *Less than 5% (mainly fracture porosity)*
PERMEABILITY: *Low, generally less than 1 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *?Possibly overpressured (10133 Pa/m)*

PETROLEUM-BEARING UNIT 3: *P3*
PETROLEUM CONTENTS: *Gas/condensate*
PRODUCTION STATUS: *Dormant*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; fine to coarse; interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1877.5 m BRT*
POROSITY: *Less than 5%*
PERMEABILITY: *Low*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *?Possibly overpressured (10100 Pa/m)*

PETROLEUM-BEARING UNIT 4: *P4*
PETROLEUM CONTENTS: *Gas/condensate*
PRODUCTION STATUS: *Dormant*
FORMATION: *Pacoota Sandstone*
AGE: *Late Cambrian*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; fine to medium; irregularly interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1953.9 m BRT*
POROSITY: *No intergranular porosity observed; < 5% (attributed to fractures)*
PERMEABILITY: *Very low*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *?Possibly overpressured (10000 Pa/m)*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Dingo*

COMPILATION DATE: *2/06/86*

OPERATOR: *Pancontinental Petroleum Ltd*

TYPE: *Gas*

COMMERCIAL STATUS: *Economic and undeveloped*

LOCATION: *Approximately 75 km south of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP175*

DISCOVERY WELL: *Dingo No.1 (Gorter & others, 1982a)*
- latitude: *24º13'26"* longitude: *133º53'46"*
- discovery: *gas*
- date total depth reached: *December 1981*

NUMBER OF WELLS DRILLED: *2* exploration
Nil development

STRUCTURE: *Anticline/dome trending slightly west of north*
- areal closure: *68.9 sq.km*
- vertical closure: *160 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Arumbera Sandstone*

DISCOVERY WELL: *Dingo No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Arumbera Sandstone*
PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Nil*
FORMATION: *Arumbera Sandstone*
AGE: *Late Proterozoic*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marine; interbedded with siltstone, minor shale, and dolomite*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2945.0 m below kelly bushing (BKB)*
POROSITY: *4-8%*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 2: *Julie Formation*

DISCOVERY WELL: *Dingo No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Julie Formation*
PETROLEUM CONTENTS: *Gas*
PRODUCTION STATUS: *Nil*
FORMATION: *Julie Formation*
AGE: *Late Proterozoic*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marine; calcareous; interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *3003.0 m BKB*
POROSITY: *Poor to moderate*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Ooraminna*

COMPILATION DATE: *5/12/84*

OPERATOR: *Exoil NL*

TYPE: *Gas show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 67 km southeast of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP43*

DISCOVERY WELL: *Ooraminna No.1 (Planalp & Pemberton, 1963)*
- latitude: *24º06'00"* longitude: *134º09'50"*
- discovery: *gas*
- date total depth reached: *June 1963*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: ?*Anticline poorly defined by surface mapping*
- areal closure: *Not determined*
- vertical closure: *304.8 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Areyonga Formation*

DISCOVERY WELL: *Ooraminna No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Areyonga Formation*
PETROLEUM CONTENTS: *Gas show*
PRODUCTION STATUS: *Nil*
FORMATION: *Areyonga Formation*
AGE: *Late Proterozoic*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Limestone: marine; brecciated and partly siliceous*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1138.0 m BKB*
POROSITY: *Less than 3%*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Alice*

COMPILATION DATE: *20/08/86*

OPERATOR: *Exoil (NT) Pty Ltd*

TYPE: *Oil show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 30 km south of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP43*

DISCOVERY WELL: *Alice No.1 (Exoil, 1963)*
- latitude: *23º54'47"* longitude: *133º58'00"*
- discovery: *oil*
- date total depth reached: *September 1963*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline poorly defined by surface mapping*
- areal closure: *0.83 sq.km*
- vertical closure: *42.67 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Goyder Formation*

DISCOVERY WELL: *Alice No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Goyder Formation*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Goyder Formation*
AGE: *Late Cambrian*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Limestone: marine; calcareous; interbedded with minor siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *915.6 m BRT*
POROSITY: *Not determined*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 2: *Jay Creek Limestone*

DISCOVERY WELL: *Alice No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Jay Creek Lst*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Jay Creek Limestone*
AGE: *Middle Cambrian*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marine; calcareous; interbedded with siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1770 m BRT*
POROSITY: *Not determined*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *East Johnny Creek*

COMPILATION DATE: *3/06/86*

OPERATOR: *Exoil (NT) Pty Ltd*

TYPE: *Oil and gas show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 220 km southwest of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP43*

DISCOVERY WELL: *East Johnny Creek No.1 (McTaggart & Benbow, 1965)*
- latitude: *24°11'00"* longitude: *131°37'55"*
- discovery: *oil*
- date total depth reached: *May 1965*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: poorly defined by surface mapping; part of the Johnny Creek Anticlinorium*
- areal closure: *Not determined*
- vertical closure: *Not determined*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
3 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Pacoota Sandstone*

DISCOVERY WELL: *East Johnny Creek No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P1*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; glauconitic in parts; interbedded with pyritic silty shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *106.0 m BKB*
POROSITY: *Not determined*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM-BEARING UNIT 2: *P4*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Pacoota Sandstone*
AGE: *Late Cambrian*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; interbedded with minor siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *329.0 m BKB*
POROSITY: *Not determined*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 2: *Upper Goyder Formation*

DISCOVERY WELL: *East Johnny Creek No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Upper Goyder Formation*
PETROLEUM CONTENTS: *Gas show*
PRODUCTION STATUS: *Nil*
FORMATION: *Goyder Formation*
AGE: *Late Cambrian*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marine; calcareous, glauconitic, and pyritic; interbedded with minor siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *393.0 m BKB*
POROSITY: *Not determined*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *West Walker*

COMPILATION DATE: *7/12/84*

OPERATOR: *Pancontinental Petroleum Ltd*

TYPE: *Gas show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 222 km west of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP175*

DISCOVERY WELL: *West Walker No.1 (Gorter & others, 1982c)*
- latitude: *24°10'21"* longitude: *131°54'24"*
- discovery: *gas*
- date total depth reached: *June 1982*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: ?*Anticline: poorly defined closure on top of Pacoota Sandstone along the plunging nose of the Walker Creek Anticline*
- areal closure: *38.1 sq.km*
- vertical closure: *60.0 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Pacoota Sandstone*

DISCOVERY WELL: *West Walker No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P1*
PETROLEUM CONTENTS: *Gas show*
PRODUCTION STATUS: *Nil*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; calcareous, glauconitic and pyritic; in parts interbedded with micaceous siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1431.0 m BKB*
POROSITY: *Poor, generally less than 5.0%*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Lake Amadeus*

COMPILATION DATE: *3/06/86*

OPERATOR: *Bureau of Mineral Resources*

TYPE: *Oil show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 220 km west of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP178*

DISCOVERY WELL: *API (Barrie, 1964); renamed to Lake Amadeus No.1*
- latitude: *24°17'00"* longitude: *131°41'00"*
- discovery: *oil*
- date total depth reached: *August 1963*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: eastern end of Johnny Creek Anticlinorium*
- areal closure: *Not determined*
- vertical closure: *Not determined*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Stairway Sandstone*

DISCOVERY WELL: *Lake Amadeus No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *LSSst*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Stairway Sandstone*
AGE: *Early Middle Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; silicified; interbedded with thin sandy siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *198.12 m BKB*
POROSITY: *Moderate, generally less than 8%*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Gosses Bluff*

COMPILATION DATE: *3/06/86*

OPERATOR: *Exoil (NT) Pty Ltd*

TYPE: *Gas show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 60 km northwest of Palm Valley, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP43*

DISCOVERY WELL: *Gosses Bluff No.1 (Pemberton & Planalp, 1965)*
- latitude: *23º49'00"* longitude: *132º18'00"*
- discovery: *gas*
- date total depth reached: *March 1965*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: symmetrical, gently dipping, underlying a meteorite depression*
- areal closure: *Not determined*
- vertical closure: *Not determined*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Stairway Sandstone*

DISCOVERY WELL: *Gosses Bluff No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *LSSst*
PETROLEUM CONTENTS: *Gas show*
PRODUCTION STATUS: *Nil*
FORMATION: *Stairway Sandstone*
AGE: *Middle Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; interbedded with calcareous shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *330.7 m BRT*
POROSITY: *Not determined*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Orange*

COMPILATION DATE: *3/06/86*

OPERATOR: *Magellan Petroleum (NT) Pty Ltd*

TYPE: *Gas show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 40 km south of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP43*

DISCOVERY WELL: *Orange No.1 (Magellan, 1967)*
- latitude: *24º02'34"* longitude: *133º46'32"*
- discovery: *gas*
- date total depth reached: *October 1966*

NUMBER OF WELLS DRILLED: *2* exploration
Nil development

STRUCTURE: *Anticline: a large seismically defined structure plunging east-west*
- areal closure: *25.3 sq.km*
- vertical closure: *274.3 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Chandler Limestone*

DISCOVERY WELL: *Orange No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Chandler Limestone*
PETROLEUM CONTENTS: *Gas show*
PRODUCTION STATUS: *Nil*
FORMATION: *Chandler Limestone*
AGE: *Early Cambrian?*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Siltstone: marine; minor pyritic and silty shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *2286.0 m BKB*
POROSITY: *Not determined*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Rodinga*

COMPILATION DATE: *3/06/86*

OPERATOR: *Bureau of Mineral Resources*

TYPE: *Oil show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 70 km southeast of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP43*

DISCOVERY WELL: *Rodinga No.1A (Felton, 1981)*
- latitude: *24º02'00"* longitude: *134º15'00"*
- discovery: *oil*
- date total depth reached: *September 1980*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: poorly defined, located on the southern flank of the east-northeast-trending Mount Burrell Anticlinorium*
- areal closure: *Not determined*
- vertical closure: *Not determined*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Chandler Limestone*

DISCOVERY WELL: *Rodinga No.1A*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Chandler Limestone*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Chandler Limestone*
AGE: *Early Cambrian*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Limestone: marine; interbedded with siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *133.0 m BRT*
POROSITY: *Good, up to 24%*
PERMEABILITY: *Low, less than 10 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Wallaby*

COMPILATION DATE: *3/06/86*

OPERATOR: *Pancontinental Petroleum Ltd*

TYPE: *Gas show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 28 km east of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP175*

DISCOVERY WELL: *Wallaby No.1 (Gorter & others, 1982d)*
- latitude: *23º55'00"* longitude: *134º01'00"*
- discovery: *gas*
- date total depth reached: *August 1981*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: east-northeast-trending, bounded to the north by a reverse fault*
- areal closure: *4.5 sq.km*
- vertical closure: *250 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Giles Creek Dolomite*

DISCOVERY WELL: *Wallaby No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Giles Creek Dolomite*
PETROLEUM CONTENTS: *Gas show*
PRODUCTION STATUS: *Nil*
FORMATION: *Giles Creek Dolomite*
AGE: *Middle Cambrian*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Dolomite: marine; interbedded with minor calcareous siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1473.4 m BKB*
POROSITY: *Not determined*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 2: *Arumbera Sandstone*

DISCOVERY WELL: *Wallaby No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Arumbera Sandstone*
PETROLEUM CONTENTS: *Gas show*
PRODUCTION STATUS: *Nil*
FORMATION: *Arumbera Sandstone*
AGE: *Early Cambrian*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Limestone: marine; interbedded with minor dolomite and siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1905.0 m BKB*
POROSITY: *Moderate, generally less than 9%*
PERMEABILITY: *Poor to moderate, less than 27 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Mount Winter*

COMPILATION DATE: *3/06/86*

OPERATOR: *Pancontinental Petroleum Ltd*

TYPE: *Oil show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 65 km west of Mereenie accumulation, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP178*

DISCOVERY WELL: *Mount Winter No.1 (Gorter & others, 1982b)*
- latitude: *23°51'57"* longitude: *130°47'41"*
- discovery: *oil*
- date total depth reached: *February 1982*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: trending east-west and bounded by parallel faults*
- areal closure: *1.6 sq.km*
- vertical closure: *Not determined*

SUBDIVISION OF PETROLEUM ACCUMULATION:
2 traps
2 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Stairway Sandstone*

DISCOVERY WELL: *Mount Winter No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *LSSst*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Stairway Sandstone*
AGE: *Early Middle Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; streaks of siltstone and shale; rare phosphate and pyrite cement*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *137.0 m BKB*
POROSITY: *Not determined*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 2: *Bitter Springs Formation*

DISCOVERY WELL: *Mount Winter No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *'Johnny Creek beds'*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Bitter Springs Formation*
AGE: *Late Proterozoic*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Calcarenite: marine; agglomeration of limestone, dolomite and minor sandstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1683.0 m BKB*
POROSITY: *Not determined*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Undandita*

COMPILATION DATE: *3/06/86*

OPERATOR: *Pancontinental Petroleum Ltd*

TYPE: *Oil show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 235 km west of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP178*

DISCOVERY WELL: *Undandita No.1A (Gorter & others, 1983)*
- latitude: *23º42'00"* longitude: *131º55'00"*
- discovery: *oil*
- date total depth reached: *January 1983*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: thrust-faulted growth structure*
- areal closure: *Not determined*
- vertical closure: *Not determined*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Unnamed fault zone*

DISCOVERY WELL: *Undandita No.1A*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Unnamed arkose fault zone*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Unnamed arkosic marl*
AGE: *Late Cambrian*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Brecciated arkosic marl grading in parts to dolomitic sandstone and siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *755.0 m BKB*
POROSITY: *6.9 to 22.9%*
PERMEABILITY: *0.14 to 439.0 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Tempe Vale*

COMPILATION DATE: *4/06/86*

OPERATOR: *Pancontinental Petroleum Ltd*

TYPE: *Oil show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 260 km southwest of Alice Springs, and 15 km southwest of the Mereenie accumulation, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP175*

DISCOVERY WELL: *Tempe Vale No.1 (Marsden & others, 1983)*
- latitude: *24º00'00"* longitude: *131º18'00"*
- discovery: *oil*
- date total depth reached: *April 1983*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: northwest-southeast trending, fault-dissected, seismically defined*
- areal closure: *15.5 sq.km*
- vertical closure: *Not determined*

SUBDIVISION OF PETROLEUM ACCUMULATION:
3 traps
4 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Stairway Sandstone*

DISCOVERY WELL: *Tempe Vale No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *MSSst*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Stairway Sandstone*
AGE: *Middle Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marine; silty sandstone with lenses of dolomite and minor rudaceous phosphate debris*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *290.7 m BKB*
POROSITY: *Poor, generally less than 4%*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 2: *Pacoota Sandstone*

DISCOVERY WELL: *Tempe Vale No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *P1*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; massive sandstone interbedded with minor shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *460.85 m BKB*
POROSITY: *Moderate, 9.8 to 17.0%*
PERMEABILITY: *Moderate, 9.8 to 33.0 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM-BEARING UNIT 2: *P3*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Pacoota Sandstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Sandstone: marginal marine; glauconitic; interbedded with siltstone and pyritic shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *546.0 m BKB*
POROSITY: *Generally low, maximum 10%*
PERMEABILITY: *Moderate, up to 92 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 3: *Goyder Formation*

DISCOVERY WELL: *Tempe Vale No.1*

CONTENTS: *Oil*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Goyder Formation*
PETROLEUM CONTENTS: *Oil show*
PRODUCTION STATUS: *Nil*
FORMATION: *Goyder Formation*
AGE: *Late Cambrian*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Dolomite: marine; interbedded with calcareous sandstone and siltstone*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *789.0 m BKB*
POROSITY: *Moderate, up to 13%*
PERMEABILITY: *Moderate, up to 33 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Finke*

COMPILATION DATE: *4/06/86*

OPERATOR: *Pancontinental Petroleum Ltd*

TYPE: *Gas show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 110 km southwest of Alice Springs, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP175*

DISCOVERY WELL: *Finke No.1 (Gorter, 1983)*
- latitude: *24º10'00"* longitude: *132º55'05"*
- discovery: *gas*
- date total depth reached: *May 1983*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline poorly defined by surface mapping*
- areal closure: *Not determined*
- vertical closure: *Not determined*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Bitter Springs Formation*

DISCOVERY WELL: *Finke No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *Bitter Springs Formation*
PETROLEUM CONTENTS: *Gas show*
PRODUCTION STATUS: *Nil*
FORMATION: *Bitter Springs Formation*
AGE: *Late Proterozoic*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Dolomite: marine; interbedded with calcareous siltstone and shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *253.0 m BKB*
POROSITY: *Poor, generally less than 5%*
PERMEABILITY: *Poor, generally less than 6 md*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

ACCUMULATION: *Tent Hill*

COMPILATION DATE: *4/06/86*

OPERATOR: *Pancontinental Petroleum Ltd*

TYPE: *Gas show*

COMMERCIAL STATUS: *Uneconomic and undeveloped*

LOCATION: *Approximately 195 km west of Alice Springs, and 15 km southeast of West Walker gas accumulation, NT*

STATE: *Northern Territory*

PETROLEUM TITLE(S): *OP175*

DISCOVERY WELL: *Tent Hill No.1 (Marsden & Schroder, 1984)*
- latitude: *24º13'45"* longitude: *132º02'30"*
- discovery: *gas*
- date total depth reached: *August 1983*

NUMBER OF WELLS DRILLED: *1* exploration
Nil development

STRUCTURE: *Anticline: east-west-trending, fault-bounded*
- areal closure: *16.6 sq.km*
- vertical closure: *100.0 m*

SUBDIVISION OF PETROLEUM ACCUMULATION:
1 traps
1 petroleum-bearing units

NUMBER AND TYPE OF PRODUCING ZONES:
- *Nil* gas *Nil* gas/condensate
- *Nil* gas/oil *Nil* oil

DRIVE MECHANISM: *?*

PRODUCTION COMMENCED: *Nil*

PRODUCTION INFRASTRUCTURE: *Nil*

PETROLEUM ACCUMULATIONS SUMMARY SHEET

TRAP

TRAP 1: *Horn Valley Siltstone*

DISCOVERY WELL: *Tent Hill No.1*

CONTENTS: *Gas*

PETROLEUM-BEARING UNIT(S)

PETROLEUM-BEARING UNIT 1: *HVSlst*
PETROLEUM CONTENTS: *Gas show*
PRODUCTION STATUS: *Nil*
FORMATION: *Horn Valley Siltstone*
AGE: *Early Ordovician*
TRAPPING MECHANISM: *Structural*
LITHOLOGY: *Siltstone: marine; interbedded with calcareous and carbonaceous shale*
DEPTH TO TOP OF PETROLEUM-BEARING UNIT : *1091.83 m BKB*
POROSITY: *Poor, 3.2 to 6.4%*
PERMEABILITY: *Not determined*
TEMPERATURE GRADIENT: *Not determined*
PRESSURE GRADIENT: *Not determined*

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REFERENCES

All well completion reports referred to in this report are available from the Department of Mines and Energy, Northern Territory.

BARRIE, J., 1964 - Phosphate drilling, Amadeus Basin. Bureau of Mineral Resources, Australia, Record 1964/195.

BENBOW, D.D., LAWSON, W., & PLANALP, R.N., 1964 - Well completion report, East Mereenie No. 2 well. Exoil (NT) Pty Ltd (unpublished).

BROWN, A.R., 1973 - A detailed seismic study of Gosses Bluff, Northern Territory. Bureau of Mineral Resources, Australia, Report 163.

BMR 1972-1985 - Petroleum reserves. The Petroleum Newsletter 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92 & 96.

BMR, 1986 - Australia's identified petroleum resources as at 31 December 1985. Petroleum & Minerals Resource & Industry Information.

ELLIS, M.H., MORRISON, G.R., & NGUYEN, L.H., in preparation - Mereenie Field, Amadeus Basin, NT. Estimated recoverable petroleum reserves. Bureau of Mineral Resources, Australia, Record (in confidence).

EXOIL, 1963 - Well completion report, Alice No. 1 well. Exoil (NT) Pty Ltd (unpublished)

FELTON, E.A., 1981 - Well completion report for BMR Rodinga Nos. 1,2,2A and 3, Amadeus Basin, NT. Bureau of Mineral Resources, Australia, Record 1981/68.

GORTER, J.D., 1984 - Source potential of the Horn Valley Siltstone, Amadeus Basin. APEA Journal 24(1) 66-90.

GORTER, J.D., BELLIS, C.J., DEE, C.N. & SCHRODER, R.J., 1982a - Dingo No.1 well completion report. Pancontinental Petroleum Ltd, Report 27 (unpublished).

GORTER, J.D., FENTON, G.G., DEE, C.N., & SCHRODER, R.J., 1982b - Mt Winter No. 1 well completion report. Pancontinental Petroleum Ltd, Report 31 (unpublished).

GORTER, J.D., FENTON, G.G., & SCHRODER, R.J., 1982c - West Walker No. 1 well completion report. Pancontinental Petroleum Ltd, Report 38 (unpublished).

GORTER, J.D, MANN, C.W., & SCHRODER, R.J., 1982d - Wallaby No. 1 well completion report. Pancontinental Petroleum Ltd, Report 9 (unpublished).

GORTER, J.D., FENTON, G.G., MARSDEN, G.R., & SCHRODER, R.J., 1983 - Undandita No. 1 and 1A well completion reports. Pancontinental Petroleum Ltd, Report 94 (unpublished).

GORTER, J.D., 1983 - Finke No. 1 well completion report. Pancontinental Petroleum Ltd, Report 96 (unpublished).

JACKSON, K.S, McKIRDY, D.M., & DECKELMAN, J.A., 1984 - Hydrocarbon generation in the Amadeus Basin, central Australia. APEA Journal, 24(1), 42-65.

KURYLOWICZ, L.E., & OZIMIC, S., 1975 - Estimated recoverable petroleum reserves in the Palm Valley Field, Amadeus Basin, central Australia. Bureau of Mineral Resources Australia Record 1975/117.

KURYLOWICZ, L.E., OZIMIC, S., McKIRDY,D.M., KANTSLER, A.J., & COOK, A.C., 1976 - Reservoir and source rock potential of the Larapinta Group, Amadeus Basin, central Australia. APEA Journal, 16(1), 49-66.

McKIRDY, D.M., 1977 - The diagenesis of microbial organic matter: a geochemical classification and its use in evaluating the hydrocarbon-generating potential of Proterozoic and lower Palaeozoic sediments, Amadeus Basin, central Australia. PhD Thesis, Australian National University (unpublished).

McKIRDY, D.M., ALDRIDGE, A.K., & YPMA, P.J.M., 1983 - A geochemical comparison of some crude oils from pre-Ordovician carbonate rocks. In BJOROY, M., & others (Editors) - ADVANCES IN ORGANIC GEOCHEMISTRY 1981. Wiley, Chichester 99-107.

McTAGGART, N.R., & BENBOW, D.D., 1965 - East Johnny Creek No. 1 well completion report. Exoil (NT) Pty Ltd (unpublished).

MAGELLAN, 1965 - Palm Valley No. 1 well completion report. Magellan Petroleum (NT) Pty Ltd (unpublished).

MAGELLAN, 1967 - Orange No. 1 well completion report. Magellan Petroleum (NT) Pty Ltd (unpublished).

MARSDEN, G.R., FENTON, G.G., SCHRODER, R.J., & GORTER, J.D., 1983 - Tempe Vale No. 1 well completion report. Pancontinental Petroleum Ltd, Report 95 (unpublished).

MARSDEN, G.R., & SCHRODER, R.J., 1984 - Tent Hill No. 1 well completion report. Pancontinental Petroleum Ltd, Report 97 (unpublished).

OILMIN, 1982 - East Mereenie No. 6 well completion report. Oilmin NL (unpublished)

PEMBERTON, R.L., CHAMBERS, S.S., PLANALP, R.N., & WEBB, E.A., 1964 - Mereenie No. 1 well completion report. Exoil (NT) Pty Ltd (unpublished).

PEMBERTON, R.L., & PLANALP, R.N., 1965 - Gosses Bluff No. 1 well completion report. Exoil (NT) Pty Ltd (unpublished).

PLANALP, R.N., & PEMBERTON, R.L., 1963 - Ooraminna No. 1 well completion report. Exoil NL (unpublished).

THOMPSON, K.F.M., 1983 - Classification and thermal history of petroleum based on light hydrocarbons. Geochimica et Cosmochimica Acta, 47, 303-316.

WELLS, A.T., FORMAN, D.J., RANFORD, L.C., & COOK, P.J., 1970 - Geology of the Amadeus Basin. Bureau of Mineral Resources, Australia, Bulletin 100.

GLOSSARY

Accumulation: a general term representing all petroleum finds irrespective of their commercial potential. An accumulation may comprise a single or multiple petroleum traps all grouped on, or related to, the same individual geological structure and/or stratigraphic position.

Condensate: a liquid mixture consisting of pentanes and heavier hydrocarbons that are recoverable from a gas well through a surface-separating facility.

Crude oil: a mixture of hydrocarbons that existed in the liquid phase in underground rock formations, and remains liquid at atmospheric pressure after passing through a surface-separating facility.

Economic accumulation: a petroleum accumulation which has been declared commercial by the operator or by the designated authority (the State departments of mines).

Liquid petroleum gas (LPG): a liquid mixture consisting of all the propane and butane that are recoverable from a gas well through a surface-separating facility.

Natural gas: a mixture of hydrocarbons and non-hydrocarbons which exist as a gas in underground rock formations.

Natural-gas liquids: a liquid mixture of LPG and condensate.

Petroleum: a gaseous and/or liquid mixture of a great many hydrocarbons and hydrocarbon compounds occurring naturally in rocks.

Petroleum-bearing unit: an interval, containing petroleum, that can be distinguished on one or more characters (e.g., lithology, stratigraphic zone, etc.).

Sales gas: a mixture of methane and ethane and up to 3 per cent of carbon dioxide.

Trap: any geologic condition (structural or stratigraphic, or both) which prevents the vertical or lateral movements of gaseous or liquid petroleum.

Uneconomic accumulation: a petroleum accumulation (generally a show only) that is deemed by the operator or by the designated authority to be volumetrically insignificant and most probably non-recoverable.

DEPARTMENT OF RESOURCES AND ENERGY
COMPILED BY: S. OZIMIC, L. PAIN & V.L. PASSMORE IN CO-OPERATION WITH MAGELLAN PETROLEUM (NT) PTY LTD, OILMIN NL, PANCONTINENTAL PETROLEUM LTD, AND NORTHERN TERRITORY DEPARTMENT OF MINES AND ENERGY (JUNE 1986)
DRAWN BY: D.A. LAWRY & J.M. JENKINS

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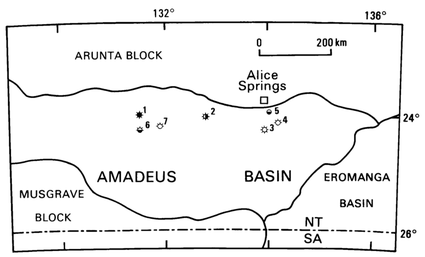
AUSTRALIAN PETROLEUM ACCUMULATIONS

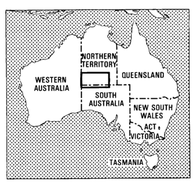
AMADEUS BASIN

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

STATUS	ECONOMIC AND DEVELOPED		ECONOMIC AND UNDEVELOPED	UNECONOMIC AND UNDEVELOPED			
LOCALITY MAP NUMBER	1	2	3	4	5	6	7
ACCUMULATION	MEREENIE	PALM VALLEY	DINGO	*OORAMINNA	ALICE	EAST JOHNNY CREEK	WEST WALKER
TRAP	Stairway Sandstone; Pacoota Sandstone; East Mereenie Stairway Sst; East Mereenie Pacoota Sst	Stairway Sandstone; Horn Valley Siltstone; Pacoota Sandstone	Arumbera Sandstone; Julie Formation	Areyonga Formation	Goyder Formation; Jay Creek Limestone	Pacoota Sandstone; Upper Goyder Formation	Pacoota Sandstone
PETROLEUM – BEARING UNIT	USSst; LSSst; P1; P2; P3; P4; LSSst; P1; P2; P3; USSst; LSSst; HVSlst; P1; P2; P3; P4; Arumbera Sst; Julie Fm; Areyonga Fm; Goyder Fm; Jay Creek Lst; P1; P4; U Goyder Fm; P1						
PETROLEUM CONTENT	Gas/Condensate; Oil/Gas; Gas; Gas-oil show; Gas show; Oil show; Gas/Condensate show						

LOCALITY MAP





STRATIGRAPHY

(After Wells & others, 1970)

SYSTEM	SERIES	FORMATION	MAX THICKNESS m
CARBONIFEROUS	LOWER	PERTNJARA GROUP	3658
DEVONIAN	UPPER / MIDDLE / LOWER	MEREENIE SANDSTONE	975
SILURIAN	UPPER	CARMICHAEL SST	91
ORDOVICIAN	UPPER	STOKES SLTST / ✱ STAIRWAY SST	810 549
	MIDDLE	HORN VALLEY SLTST	427
	LOWER	✱ PACOOTA SST	914
CAMBRIAN	UPPER	GOYDER FM	488
	MIDDLE	PETERMANN SST; DECEPTION FM; ILLARA SST; TEMPE FM; JAY CREEK LS; HUGH RIVER SH; SHANNON FM 701; GILES CREEK DOL 396; CHANDLER LST	
	LOWER	CHANDLER LST 140; TODD RIVER DOL 152; ENINTA SST; ARUMBERA SANDSTONE 855	
PRE-CAMBRIAN	PROTEROZOIC LOW	JULIE FM / PERITATAKA FM	610–1829
		AREYONGA FM	396
		BITTER SPRINGS FM 'JOHNNY CK. BEDS'	914
		HEAVITREE QUARTZITE	457
		ARUNTA COMPLEX	

LARAPINTA GROUP; PERTATORTA GROUP

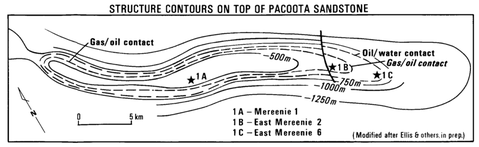
✱ SUBDIVISIONS OF:

STAIRWAY SANDSTONE: Upper (USSst) Middle (MSSst) Lower (LSSst)

PACOOTA SANDSTONE: P1 (Upper) P2, P3 (Middle) P4 (Lower)

STRUCTURES * (OORAMINNA STRUCTURE MAP NOT AVAILABLE)

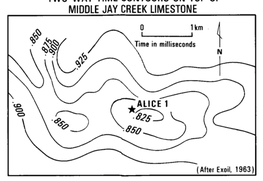
MEREENIE
STRUCTURE CONTOURS ON TOP OF PACOOTA SANDSTONE



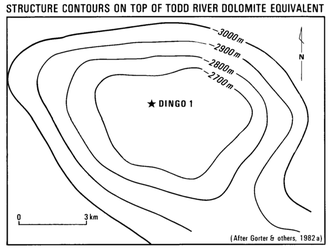
★ *Discovery well*

Fault

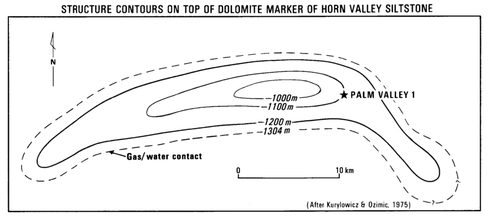
ALICE
TWO-WAY TIME CONTOURS ON TOP OF MIDDLE JAY CREEK LIMESTONE



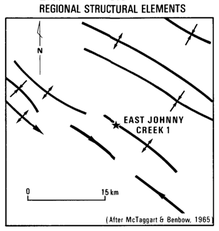
DINGO
STRUCTURE CONTOURS ON TOP OF TODD RIVER DOLOMITE EQUIVALENT



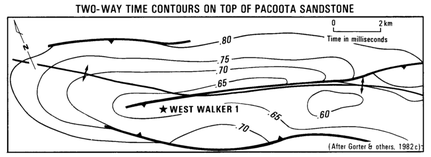
PALM VALLEY
STRUCTURE CONTOURS ON TOP OF DOLOMITE MARKER OF HORN VALLEY SILTSTONE



EAST JOHNNY CREEK
REGIONAL STRUCTURAL ELEMENTS



WEST WALKER
TWO-WAY TIME CONTOURS ON TOP OF PACOOTA SANDSTONE



ESTIMATED PETROLEUM RESOURCES

RECOVERABLE RESOURCES	as of	31	12	85
Gas (Sales)	14.39 X 10^9 m^3			
LPG	1.16 X 10^6 m^3			
Condensate	0.37 X 10^6 m^3			
Oil	5.74 X 10^6 m^3			
CUMULATIVE PRODUCTION	as of	31	12	85
Gas (Sales)	44 X 10^6 m^3			
LPG				
Oil/Condensate	156.3 X 10^3 m^3			

Comments

Oil production from Mereenie accumulation (Pacoota Sandstone, East Mereenie Trap) started in June 1984.

Gas production from Palm Valley accumulation started in August 1984

DEPARTMENT OF RESOURCES AND ENERGY

COMPILED BY: S. OZIMIC, L. PAIN & V.L. PASSMORE IN CO-OPERATION WITH MAGELLAN PETROLEUM (NT PTY LTD, OILMIN NL, PANCONTINENTAL PETROLEUM LTD, AND NORTHERN TERRITORY DEPARTMENT OF MINES AND ENERGY (JUNE 1986)

DRAWN BY: D.A. LAWRY & J.M. JENKINS

BIBLIOGRAPHIC CITATION: OZIMIC, S., PASSMORE, V.L., PAIN, L., & LAVERING, I. H., 1986 — Amadeus Basin, central Australia. *Bureau of Mineral Resources, Australia, Australian Petroleum Accumulations Report 1*.

AUSTRALIAN PETROLEUM ACCUMULATIONS

AMADEUS BASIN

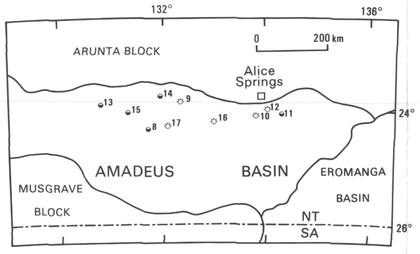
BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

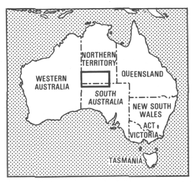
STATUS: UNECONOMIC AND UNDEVELOPED

LOCALITY MAP NUMBER	ACCUMULATION	TRAP	PETROLEUM-BEARING UNIT
8	* LAKE AMADEUS	Stairway Sandstone	LSSst
9	GOSSES BLUFF	Stairway Sandstone	LSSst
10	ORANGE	Chandler Limestone	Chandler Lst
11	*RODINGA	Chandler Limestone	Chandler Lst
12	WALLABY	Giles Creek Dolomite	Giles Creek Dol
		Arumbera Sandstone	Arumbera Sst
13	MT WINTER	Stairway Sandstone	LSSst
		Bitter Springs Formation	'Johnny Creek beds'
14	UNDANDITA	Unnamed fault zone	Unnamed arkose
15	TEMPE VALE	Stairway Sandstone	MSSst
		Pacoota Sandstone	P1
			P3
		Goyder Formation	Goyder Fm
16	*FINKE	Bitter Springs Formation	Bitter Springs Fm
17	TENT HILL	Horn Valley Siltstone	HVSlst

PETROLEUM CONTENT: ◒ Oil show ☼ Gas show

LOCALITY MAP





STRATIGRAPHY

(After Wells & others, 1970)

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DEVONIAN	UPPER		
	MIDDLE		
	LOWER	MEREENIE SANDSTONE	975
SILURIAN	UPPER		
ORDOVICIAN	UPPER	CARMICHAEL SST	91
	MIDDLE	LARAPINTA GP: STOKES SLTST; * STAIRWAY SST	610 549
	LOWER	LARAPINTA GP: HORN VALLEY SLTST	427
		* PACOOTA SST	914
CAMBRIAN	UPPER	GOYDER FM	488
	MIDDLE	PERTATARAKA GP: PETERMANN SS; DECEPTION FM; ILLARA SST; TEMPE FM; CHANDLER LST	SHANNON FM 701; GILES CREEK DOL 396; CHANDLER LST 140; TODD RIVER DOL 152
	LOWER	PERTATARAKA GP: CHANDLER LST; ENINTA SST	ARUMBERA SANDSTONE 853
PRE-CAMBRIAN	PROTEROZOIC EON	?OLIVE PK FM; PERTATARAKA FM; AREYONGA FM; BITTER SPRINGS FM, "JOHNNY CK. BEDS"; HEAVITREE QUARTZITE; ARUNTA COMPLEX	610–1829; 396; 914; 457

* SUBDIVISIONS OF:

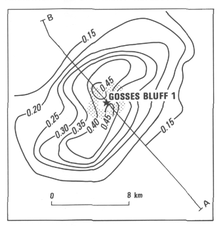
STAIRWAY SANDSTONE: Upper (USSst); Middle (MSSst); Lower (LSSst)

PACOOTA SANDSTONE: P1 (Upper); P2, P3 (Middle); P4 (Lower)

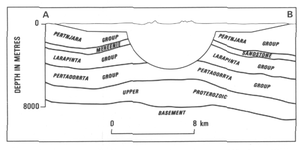
STRUCTURES

GOSSES BLUFF

REFLECTION TIME INTERVAL BETWEEN BITTER SPRINGS FORMATION AND BASEMENT REFLECTIONS



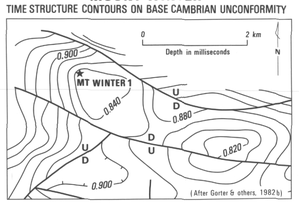
PROBABLE CROSS-SECTION THROUGH GOSSES BLUFF, TRAVERSE A/B



(After Brown, 1973)

MOUNT WINTER

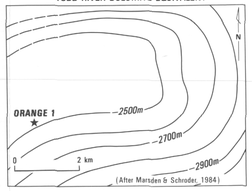
TIME STRUCTURE CONTOURS ON BASE CAMBRIAN UNCONFORMITY



(After Gorter & others, 1982b)

ORANGE

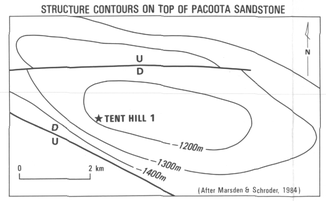
STRUCTURE CONTOURS ON TOP OF TODD RIVER DOLOMITE EQUIVALENT



(After Marsden & Schroder, 1984)

TENT HILL

STRUCTURE CONTOURS ON TOP OF PACOOTA SANDSTONE



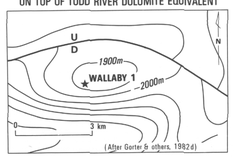
(After Marsden & Schroder, 1984)

★ *Discovery well*

— *Fault*

WALLABY

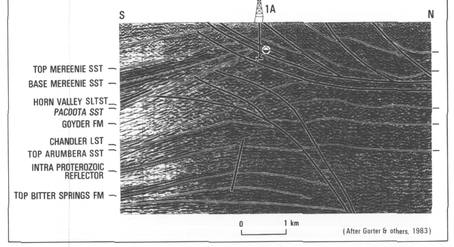
STRUCTURE CONTOURS ON TOP OF TODD RIVER DOLOMITE EQUIVALENT



(After Gorter & others, 1982d)

UNDANDITA

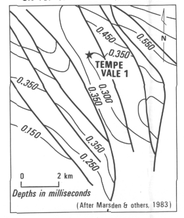
SEISMIC LINE P82—U16 THROUGH UNDANDITA 1A



(After Gorter & others, 1983)

TEMPE VALE

TIME STRUCTURE CONTOURS ON TOP OF PACOOTA SANDSTONE



(After Marsden & others, 1983)

* *(STRUCTURE MAPS NOT AVAILABLE)*

ESTIMATED PETROLEUM RESOURCES

RECOVERABLE RESOURCES	as of	31	12	85
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LPG	$1.16 \times 10^6 m^3$			
Condensate	$0.37 \times 10^6 m^3$			
Oil	$5.74 \times 10^6 m^3$			
CUMULATIVE PRODUCTION	as of	31	12	85
Gas (Sales)	$44 \times 10^6 m^3$			
LPG				
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