Northern Territory Government

InfoCentre

NT Minerals and Energy

Petroleum Exploration Reports

This file contains scanned images of reports submitted to the Northern Territory Government under Petroleum Legislation.

Bringing Forward Discovery

This information is made available to assist future petroleum explorers and may be distributed freely.

InfoCentre

Call:	+61 8 8999 6443
Click:	geoscience.info@nt.gov.au www.minerals.nt.gov.au
Visit:	3rd floor Centrepoint Building Smith Street Mall Darwin Northern Territory 0800

A09-093.indd

AIR PHOTO INTERPRETATION

AND RECONNAISSANCE GEOLOGY

NORTHERN NGALIA BASIN, NORTHERN TERRITORY

MAGELLAN PETROLEUM AUSTRALIA LIMITED OCTOBER, 1991

AIR PHOTO INTERPRETATION AND RECONNAISSANCE GEOLOGY NORTHERN NGALIA BASIN, NORTHERN TERRITORY

INTRODUCTION

A five-week surface geologic mapping programme was conducted in August and September, 1991 to investigate a large anticlinorium and other isolated outcrops in the north-central part of the Ngalia Basin (Enclosure 1). This mapping confirmed the presence of several large structures and the identification of certain key outcrops.

STRUCTURAL MAPPING

Reconnaissance geologic mapping along selected traverses and detailed air photo interpretation confirmed the presence of several large structures in the area south and west of Yuendumu. The Walbiri and Beantree anticlines are the largest and most prospective of these structures. The Walbiri anticline is an easterly-trending, tightly-folded anticline with two culminations having four-way dip closure. The fold is breached to the Ordovician Djagamara level. The Beantree anticline is a somewhat broader anticline which is easterly trending and closed in all directions. It is breached to the Ordovician Kerridy level. The Beantree anticline has seismic expression on reprocessed P.A.O.C. Line 1 (Enclosure 1).

Cambrian and Late Proterozoic strata are potentially prospective in these anticlines. Potential reservoirs are the Yuendumu Sandstone, the Ngalia Basin Arumbera equivalent, and the Walbiri Dolomite, if fractured. The top of the Yuendumu Sandstone is expected to lie at depths of 1300 to 1500 m in these anticlines. Shale in the Bloodwood Formation and impermeable sandstone in the Djagamara Formation should form effective seals.

Both anticlines have the potential to trap large accumulations of hydrocarbons. The western closure of the Walbiri anticline stretches for over 25 km; the Beantree anticline extends at least 8.5 km and possibly as much as 20 km. Both structures have a minimum vertical closure of 100 m. The eastern culmination of the Walbiri anticline and two other closed structures flank these prospects to the east and would have significant additional attraction following a successful test of Walbiri or Beantree anticline.

Despite their many attributes, the Walbiri and Beantree anticlines also have several problems. The Rinkabeena Shale, the probable source for the hydrocarbons, is present on the southern flank of Beantree anticline but is likely to be absent at Walbiri anticline. In outcrop north of Walbiri anticline, the Rinkabeena Shale is not present. Furthermore, the ability of the Rinkabeena Shale to source *commercial* accumulations of hydrocarbons is unproven. It produced only temporary flows of gas after being fully penetrated in Davis No. 1 and has a maximum measured T.O.C. of only 1.25% (Baarda and Buckingham, 1982; Wells and Moss, 1983). The reservoir potential of the Walbiri Dolomite and the Yuendumu Sandstone also is unproven. Finally, excessive well depths would be required to fully test the Walbiri and Beantree anticlines.

IDENTIFICATION OF SPECIFIC OUTCROPS

Two isolated outcrops in the north-central part of the basin were investigated to confirm the original BMR mapping. These outcrops are located east of P.A.O.C. Line 6, 5 km northeast of BMR Mt. Doreen No. 10 (Enclosure 2). The outcrops have particular importance because of their proximity to the Newhaven prospect.

Inspection of the outcrops showed that the original BMR mapping was correct. The outcrops are comprised of faulted and folded beds of Vaughan Springs Quartzite unconformably overlain by the Mt. Eclipse Sandstone.

P.919.

ENCLOSURE 1

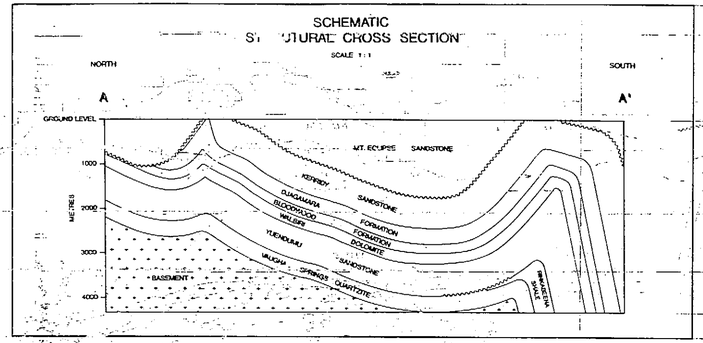
MAGELLAN PETROLEUM AUSTRALIA LIMITED

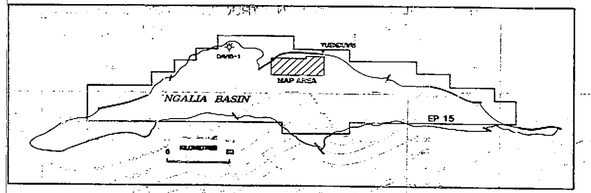
AIR PHOTO INTERPRETATION AND RECONNAISSANCE GEOLOGY

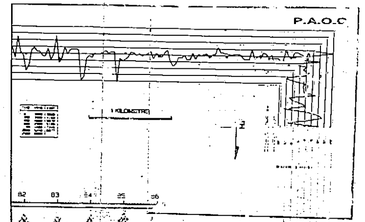
NORTHERN NGALIA BASIN
NORTHERN TERRITORY

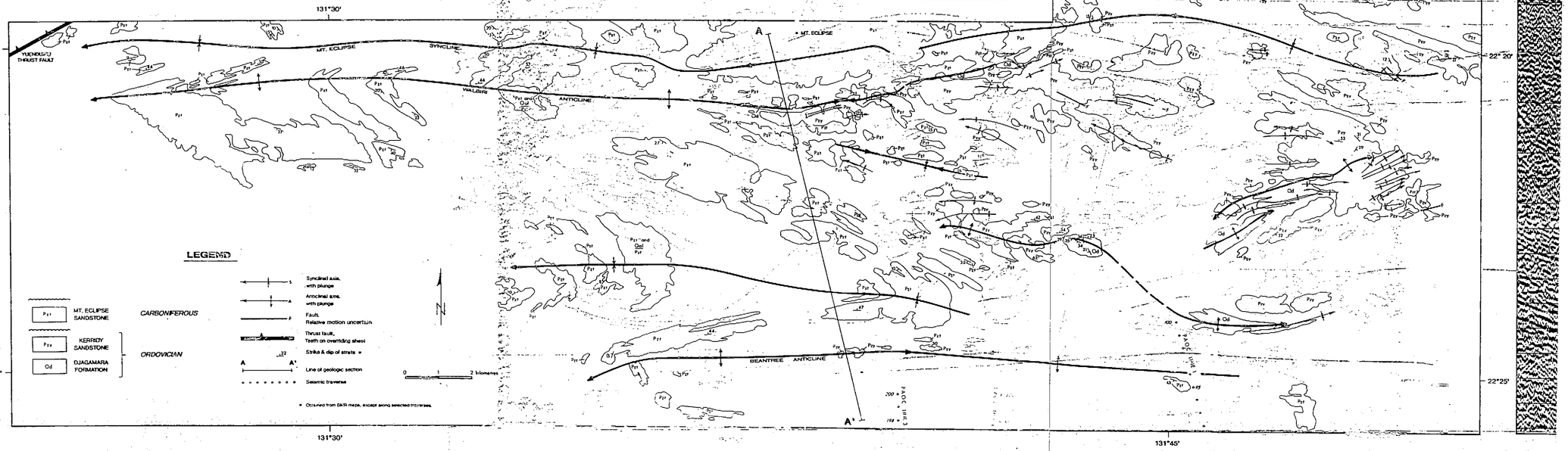
October 1991

SCHEMATIC
STRUCTURAL CROSS SECTION
SCALE 1 : 1

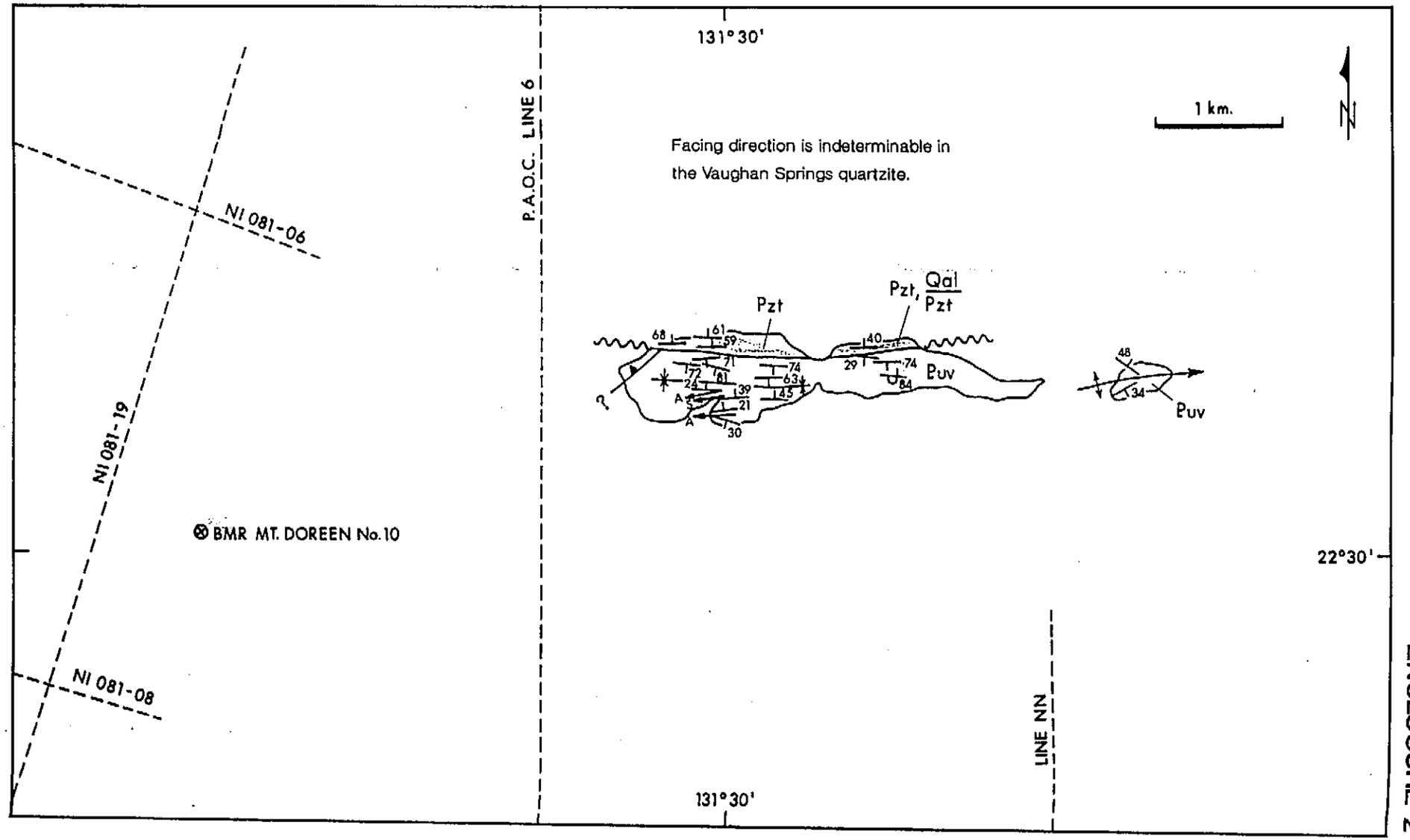








ISOLATED OUTCOPS NORTH – CENTRAL NGALIA BASIN



ENCLOSURE 2