

Frontier Exploration Offsetting the Gippsland Basin

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Introduction

The Gippsland Basin area lies some 350kms south and east of Melbourne, Victoria, in the Eastern Bass Strait offshore south-eastern Australia. It is one of Australia's most prolific hydrocarbon producing provinces, with over six billion BOE of reserves discovered since the 1960's. The majority of the producing fields in the basin are located in less than 200m of water, in the shelfal area of the Gippsland. The present paper aims to describe the interpretation and evaluation study performed by PanCanadian Energy in support of bidding round submissions made in May, 2001. The two bid round blocks, V00-3 and V00-4, were subsequently awarded to PanCanadian Energy in October, 2001 as permits VIC/P48 and VIC/P49 respectively.

Overview of Gippsland Basin Exploration

Initial exploration in the Gippsland Basin started in the late 1960's and this focussed on large four-way dip-closures at the Top Latrobe Group level. These mid-Tertiary reservoirs are sealed by the thick, regional marls of the Oligocene aged Lakes Entrance Formation. Subsequently, attention was given to deeper (late Cretaceous to early Tertiary), mid-Latrobe levels with intra-Latrobe seals forming the traps. Both phases of exploration resulted in significant reserves being found, with the Top Latrobe play being the most successful. Figure 1 shows the distribution of fields in the Gippsland Basin and Figure 2 shows the generalised basin stratigraphy.

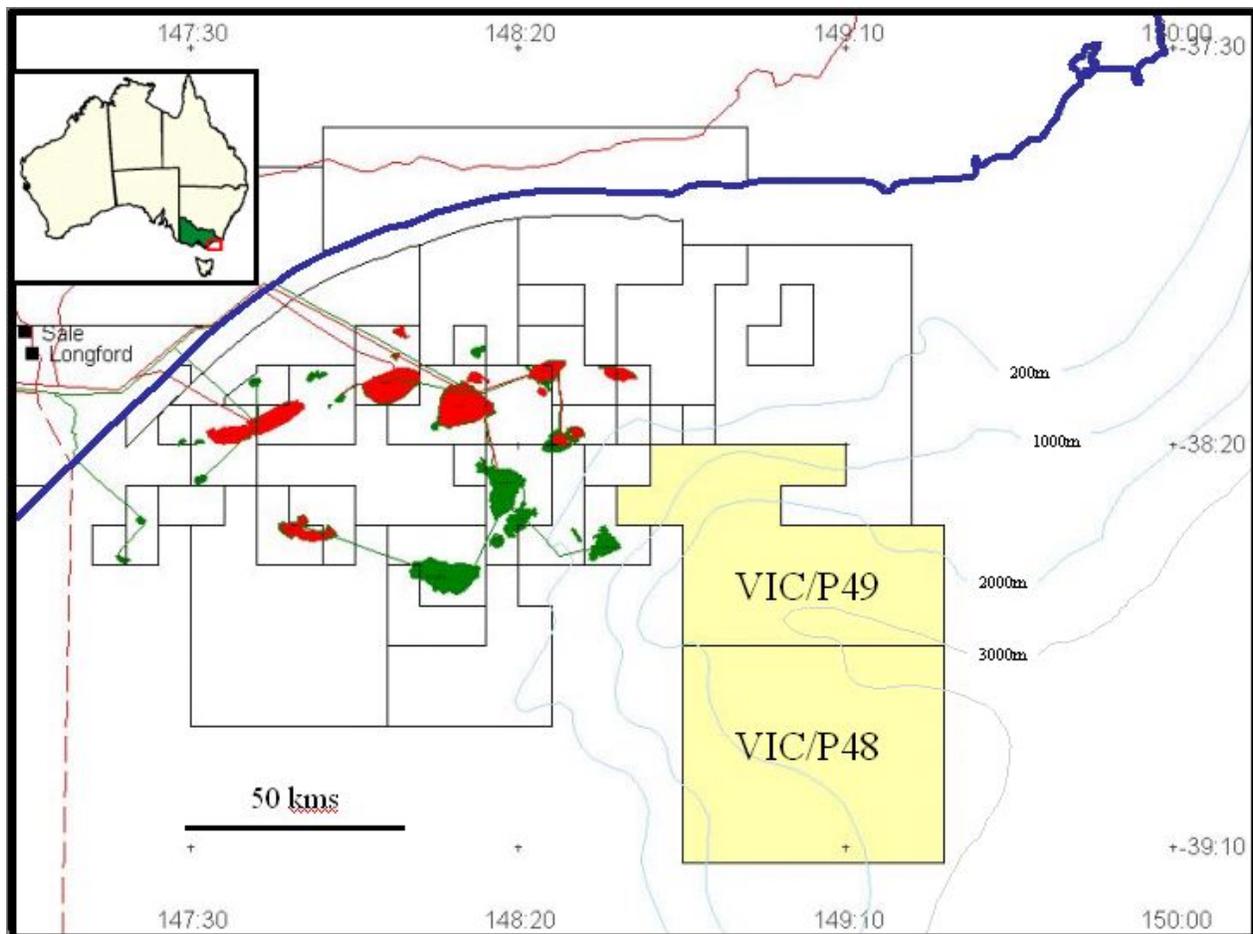


Figure 1: Oil and Gas Fields of the Offshore Gippsland Basin, Southeastern Australia

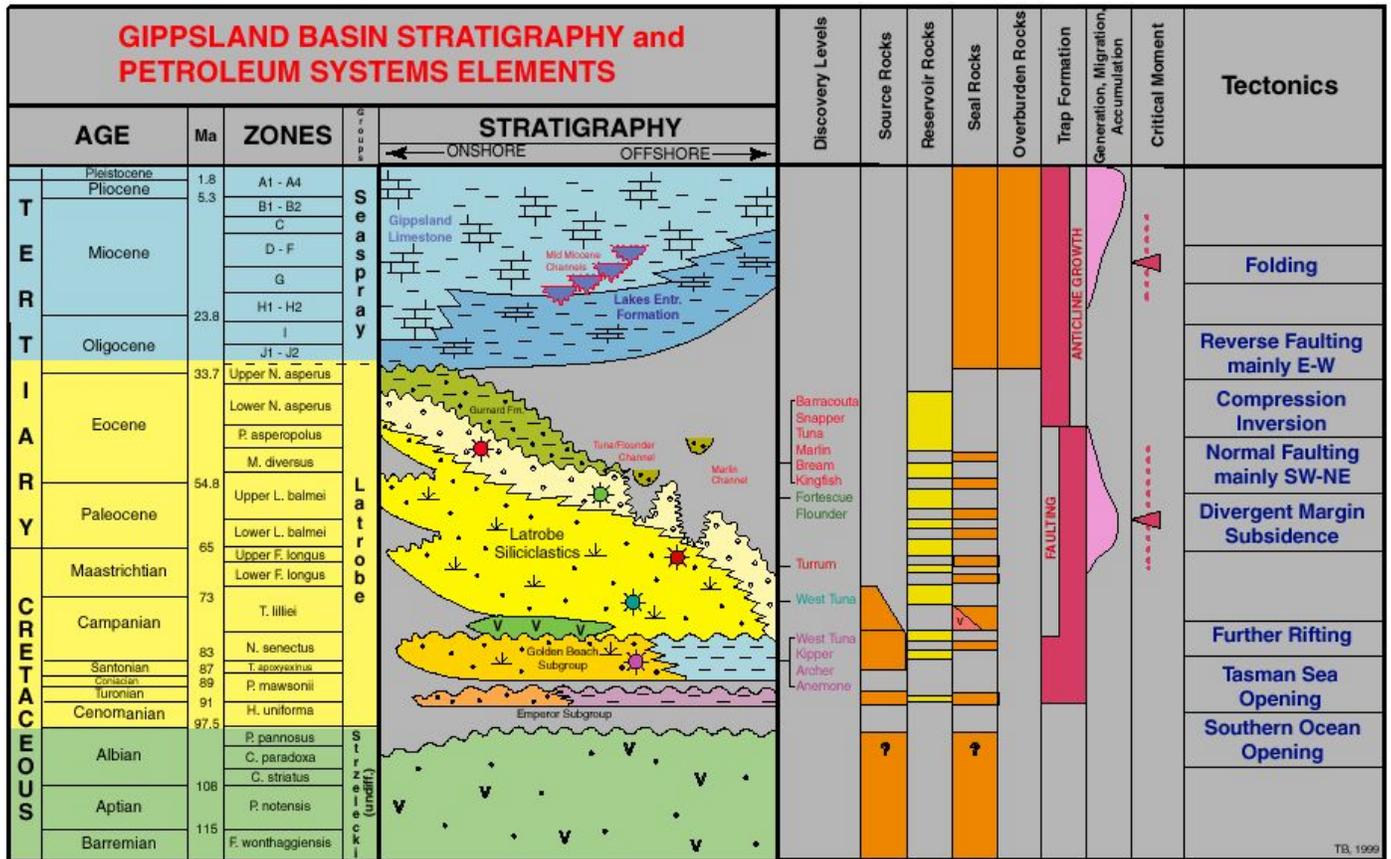


Figure 2: Gippsland Basin stratigraphy (after Smith et al.)

Evaluation Studies

PanCanadian Energy plans to test the concept of extending the productive area to deeper waters east and down-dip of the Gippsland fields. A data set including a 1999 regional seismic survey, as well as old potential fields data, were utilised to evaluate the area. Several horizons were correlated from well-to-seismic ties in the shelfal area and then mapped over both permits. This resulted in the identification of a number of potentially large structural and stratigraphic leads. An analysis of the potential fields data, coupled with the surface seismic data and regional structural models from the literature, allowed an integrated interpretation to be made of the overall basin architecture, as well as identifying possible volcanic intrusive bodies observed in the seismic data. This work formed the technical support for the bids made for acreage in May 2001. The company was subsequently awarded two permits in October 2001 for a period of six years under Australia's work programme bidding system. The awards were made on the basis of a commitment seismic work programme over the two permits, and evaluation studies to assess the petroleum reserves potential in the primary three-year term. Drilling is optional.

Acquisition of 709.6kms of 2-D infill data was completed in January 2002 and the data were processed in Calgary. Prospectivity assessment will include integrating the new seismic data with the existing data set to produce regional, as well as prospect scale, maps. The new potential fields data that was acquired with the most recent seismic data will be modelled to assess the presence of, and associated risks with, volcanic rocks in the subsurface. In addition, quantitative interpretation of the new seismic data will be performed to evaluate potential lithology and fluid effects. The seismic interpretation will also be integrated with recent oil source work to further delineate the leads that were identified prior to bidding. Completion of this work is expected in 2002.

References

Smith, M.A., Bernecker, T., Liberman, N., Moore, D.H., Wong, D., 2000, Petroleum Prospectivity of the Deep Water Gazettal Areas V00-3 and V00-4, Southeastern Gippsland Basin, Victoria, Australia. Department of Natural Resources and Environment, Victoria State Government, VIMP Report 65, April, 2000.