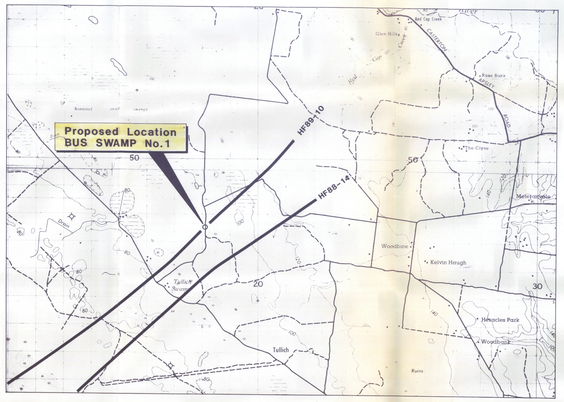
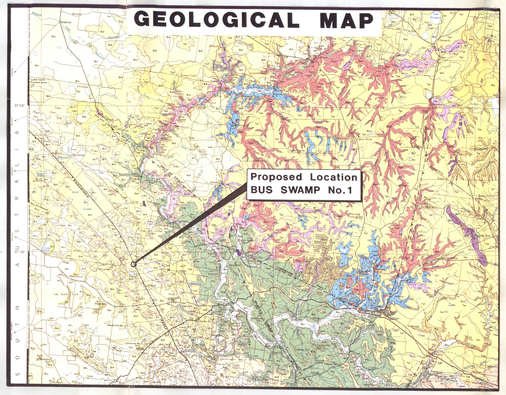
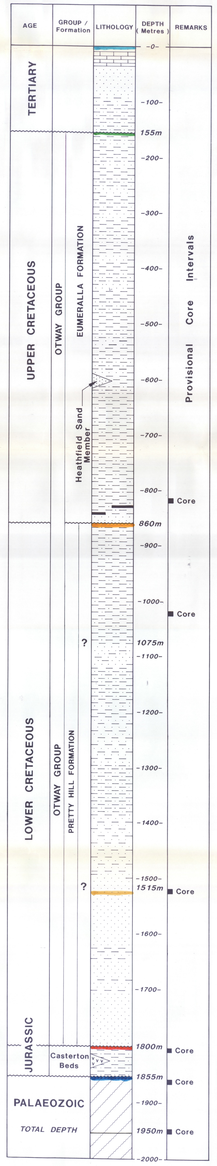
TOPOGRAPHIC LOCATION MAP



GEOLOGICAL MAP

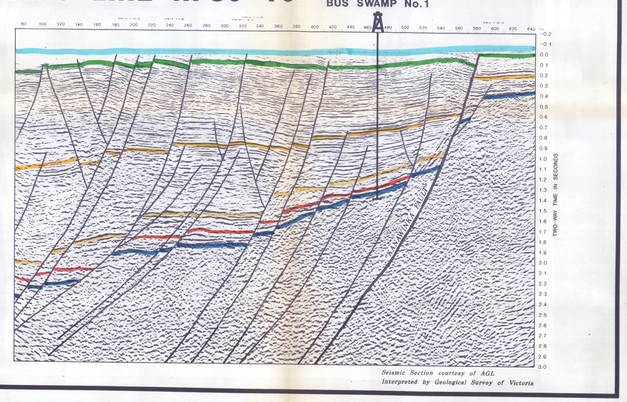


STRATIGRAPHIC COLUMN



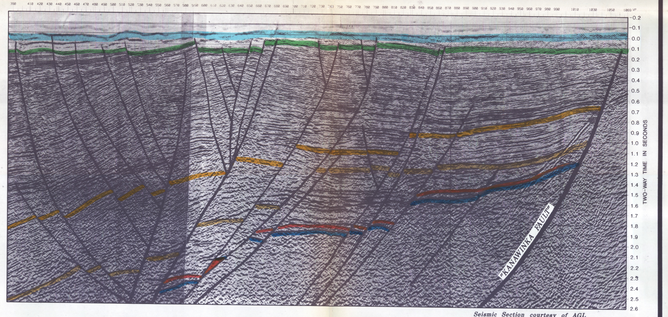
SCALE 1 : 2,500

SEISMIC LINE HF89-10



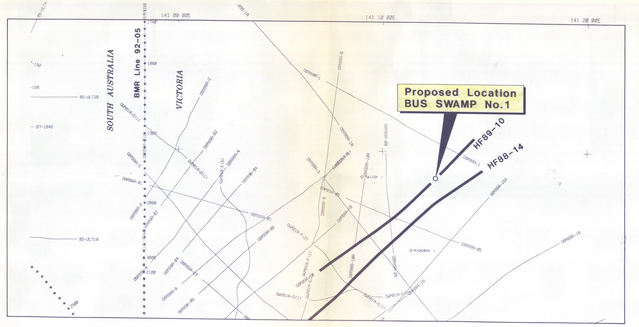
Seismic Section courtesy of AGL
Interpreted by Geological Survey of Victoria

SEISMIC LINE HF88-14



Seismic Section courtesy of AGL
Interpreted by Geological Survey of Victoria

SEISMIC LINE LOCATION MAP



GEOLOGICAL SURVEY OF VICTORIA
- BASIN STUDIES BRANCH -

BUS SWAMP No.1
STRATIGRAPHIC WELL

LOCATION : LAT.: 37°31'18" LONG.: 141°12'00"
TOTAL DEPTH : 1950 metres
ELEVATION : GL: 88 metres KB: 92.3 metres
CLASSIFICATION : STRATIGRAPHIC
SEISMIC CONTROL : LINE HF89-10 SP.470
NEARBY SIGNIFICANT WELLS :
TULLICH No.1 6 KMS WEST
McEACHERN No.1 6 KMS SSW
SAWPIT No.1 35 KMS NNW
NEARBY FACILITIES :
CASTERTON 17 KMS NW
PENOLA 37 KMS ESE
MT.GAMBIER 52 KMS NE

JUSTIFICATION

The proposed Bus Swamp #1 stratigraphic well is to be sited on the northern margin of the south eastern portion of the Penola Trough, in the vicinity of the Kanawinka Fault. The well is designed to penetrate the Otway Group sediments and terminate in Palaeozoic basement rocks. The well will serve both research and exploration purposes by providing improved modeling of the structure and stratigraphy of the Penola Trough and its basement rocks and also the Otway Basin as a whole.

The northern margin of the Penola Trough is defined in part by the Kanawinka Fault. To the south of the Penola Trough the Kanawinka Fault has a more southerly trend and is up to 20 kilometres wide. Along the flank of the trough the fault is more south westerly trending and shows observable on seismic data in excess of 1200metres. The fault is believed to be active and probably has undergone a number of movements, some of which are reversal, during the Cretaceous and possibly younger. These movements have significant implications on the deposition of the Otway Group sediments.

The well is sited so as to be tied to the recent BMR deep seismic across the trough, which will further enhance potential structural interpretations. Data from the well will have significant bearing on the resolution of ambiguities which currently exist in the basin stratigraphy. Resolving the Otway Basin stratigraphy is one of the aims of the National Geoscience Mapping Accord (NGMA) project.

OBJECTIVES

1: Delineate the basement and define its velocity.

Defining lithological parameters and seismic velocity of the basement rocks penetrated in this area will enable their true, rather than assumed, values to be used for seismic interpretation. This will considerably improve the precision of seismic and gravity modelling in both the Penola Trough and the remainder of the basin.

2: Evaluate the nature of the basement.

In July 1992 near Penola, in South Australia the Sawpit 1 exploration well encountered a significant column of liquid hydrocarbons in fractured basement rocks. This has raised the basement potential, making it important to determine the extent of basement fracturing.

3: Testing Gravity Modelling.

Recent techniques in exploration combine gravity modelling with seismic data. Currently there is insufficient geological information to control modelling. Data acquired from the well will be significant for this this purpose. The proposed location will be tied to the deep seismic sections recorded as part of the NGMA. These sections have also had gravity data acquired along them.

4: Casterton Formation.

The proposed well will determine the presence or absence of the Casterton Beds. There is a need to evaluate the source rock potential of the Formation in the light of the Katnook and Sawpit hydrocarbon occurrences. Biomarker data from the well, in addition to data from BADME, will enable the determination of the link between these rocks and known hydrocarbon occurrences. Elsewhere in the basin a basaltic volcanic unit is encountered in this formation. Penetration of volcanics at this location will assist interpretation in velocity corrections for other strata, and aid interpretation of GSV/BMR airborne magnetic data.

5: Pretty Hill Formation.

Mocamboro 11 and Warrabarunah 2 confirmed the reservoir potential of this formation. It is generally regarded as a poor source rock, however recently acquired data in the area indicate that it may be a fair source rock, and even the more shaly units of the Formation has good source rock potential. A comprehensive suite of geochemical analyses is planned to fully evaluate this formation.

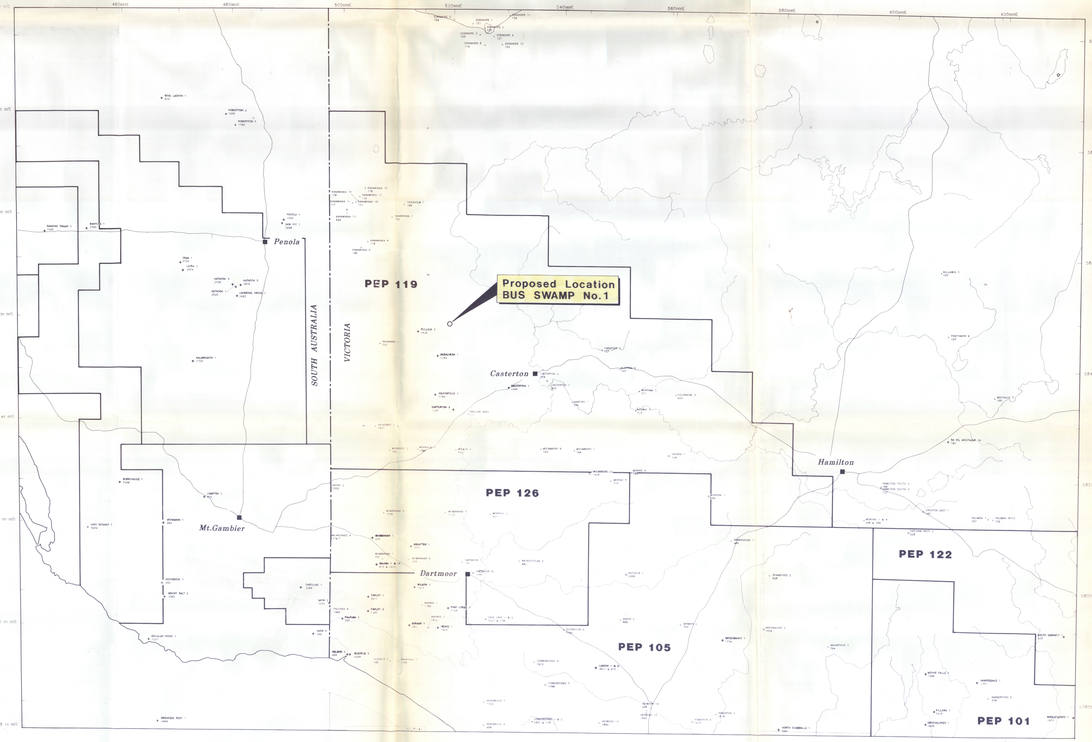
6: Eumeralla Formation.

The stratigraphy and known source rock potential of the Eumeralla Formation will be enhanced and upgraded by the data from this well. A reservoir sand at the base of the formation has been identified in the South Australian area of the Penola Trough. This unit in addition to possible intra formational sands will be investigated in this well.

SUMMARY

The drilling of this stratigraphic well has the potential to enhance exploration prospectivity in the Penola Trough and contribute significantly to the better understanding of the Otway Basin. The well is a pressing need for accurate seismic velocity data for the complete lithological section in this region. The potential benefits of new geological information are diverse and the well will provide much needed clarification of the structural and stratigraphic history of an area that is becoming highly prospective to onshore hydrocarbon explorers. The well will also be a significant contribution by Victoria to the joint GSV/BMR-SADME NGMA project.

WESTERN OTWAY BASIN WELL LOCATIONS



GEOLOGICAL SURVEY OF VICTORIA
- BASIN STUDIES BRANCH -

BUS SWAMP No.1
MONTAGE

Author : A.Tabassi / C.Menhennitt
Seismic Interpretation : A.Tabassi

Drawn By : G.S. of VIC.
Date : October, 1992

PETROLEUM DIVISION 09 NOV 1992