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PRELIMINARY REPORT

SOUTHEAST GIPPSLAND BASIN AREA

for

OTHER EXPLORATION N.L.

by

AL SABITAY CONSULTANTS

PERTH, WESTERN AUSTRALIA

MAY, 1981

T/13 P Part 5.

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INTRODUCTION

The objectives of this preliminary report are as follows:

- 1) Identify the top of the Latrobe Coal Measures (LCM) and basement to determine where and to what extent this sequence occurs in the prospect area. The LCM could contain reservoir sandstones where present in a hydrocarbon trap.
- 2) Map the top of the LCM to establish the locations of potential hydrocarbon traps.
- 3) Study the seismic sections from the Flinders 1980 survey to derive recommendations for further computer processing which may improve the data for stratigraphic and structural interpretation.
- 4) Prepare a proposed seismic programme to delineate leads found in 2) above for developing possible drilling locations.

PRELIMINARY RESULTS

An attempt was made to carry the top of LCM well picks from Hapaku No. 1 and Kingfish No.1 to the prospect area. This effort failed because the available seismic lines crossed large submarine canyons where continuity on the LCM seismic event was lost.

However, certain reflection characteristics of the area are known which permit reasonable confidence in jump correlating the top LCM seismic event in better record quality areas. Firstly, the overlying Oligocene and Miocene section is marine, argillaceous or carbonate and thin-bedded which produces low amplitude, high frequency reflections as a rule. The LCM

sequence is thicker bedded and contains coals, shales and sands normally yielding higher amplitude, lower frequency events which contrast strongly with the overlying sequences.

Secondly, the top of the LCM is normally an erosional unconformity and soetimes an angular unconformity.

Thirdly, tuffs of Miocene age frequently occur in the area and can be identified by their mounded appearance, overlying drape, magnetic (high) anomaly and velocity (high) anomaly. It was assumed that the tuffs are restricted in age to post-LCM and therefore the LCM horizon should be found below any evidence of tuffs.

The interpretation presented on the enclosed maps is based on these criteria and closed seismic loops where available.

In the deeper water parts of the permit (greater than 200m) the LCM event appears to be a conformable horizon and underlain by lower amplitude, higher frequency reflections. The geologic explanation for this apparent character change is presently unknown.

The enclosed maps portray a complexly faulted area which has as its most challenging aspect an interpreted system of strike-slip faults. The presence of LCM reservoir rocks is indicated for the largest part of the surveyed area (see Horizon Subcrop on Sheets 2 and 3). Overlying or internal shales will be required to complete the indicated hydrocarbon traps. In some cases lateral juxtaposition with impermeable rocks (basement?) is required to furnish landward seal.

In the south, where the newly acquired Flinders survey data is the only seismic data available, a considerable amount of new data is required to delineate the highly speculative structural leads shown. Complete integration of all available data is needed to delineate the leads shown on the northernmost sheet (1 of 3). Further processing of the Flinders survey data may permit determination of basement. Especially required are reduction of multiples. The use of higher moveout velocities may improve stacking and clarify diffractions as well as reduce multiples. The effects of lateral velocity changes are a detriment to good stacking results.

These lateral velocity anomalies are expected from foreset bedding and slump faulting in the post-LCM section. With noticeable present day submarine canyons in evidence, we should also expect fossil canyons and accompanying lateral velocity anomalies and possibly permeability barriers at trap sites in some instances.

RECOMMENDATIONS

- 1) Shoot proposed seismic programme with towed magnetometer.
- 2) Reprocess selected Flinders seismic data after trial runs of various computer routines on line 80 F-1:
 - a) Multiple attenuation such as GSI's DEMULT.
 - b) Closely spaced DEMULT velocity analyses (.5 km?)
 - c) Downward continuation (Digicon) processes to compensate for lateral velocity variations.
- 3) A detailed study of all the velocity analyses should be carried through the average velocity mapping stage. Thereafter, all maps should be constructed in depth to minimize the effects of water bottom depth variations.



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- LEGEND
-  Normal fault
 -  Possible strike slip fault
 -  Horizon subcrop
 -  200m Water depth

 OTTER EXPLORATION N.L.		
S.E. GIPPSLAND BASIN AREA		
T13P		
TIME STRUCTURE		
Latrobe Coal Measures		
<i>T13P Part 5</i>		
Contour interval: 50ms.	Scale: 1:100,000	
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