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T/1P, T/9A

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T/1P, T/9A Part 5.

With Compliments
from



PROGRESS REPORT
EAST GIPPSLAND PROSPECT
INTEGRATION OF ESSO
TRADE DATA

May, 1970

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PROGRESS REPORT
EAST GIPPSLAND PROSPECT
INTEGRATION OF ESSO TRADE DATA

INTRODUCTION

This report will describe the results of attempts to integrate the Esso trade data with our East Gippsland data. The attached sketch map shows the area being considered. The objectives for consummating the trade and integrating the data were:

- 1) To establish presence or absence of closure in Esso land for several anticlinal and fault trap leads interpreted in the Magellan East Gippsland Marine Seismic Survey.
- 2) To determine the indications on seismic sections of geologic phenomena which cause or influence oil and gas accumulation in the Gippsland fields (Marlin, Halibut, Kingfish, Tuna, Flounder etc.). Thereafter, to use this knowledge in the search for potential traps in Magellan permits.

STATUS

A time map (enclosed Sheet I) of the approximate top of the Latrobe Valley Coal Measures (LVCM) has been completed relating Esso's and Magellan's seismic lines along the western permit boundary of VIC P/4 and T/1P. These data negate the probability

of anticlinal structural traps in VIC P/4 by lack of critical west or south west dip on trade lines.

One area of possible fault trapping was found roughly paralleling line M30B between Lines G69A-287 and M12B. Relief on the erosional surface (Top of LVCM) within fault closed contours may be about 150 ms (a maximum of 750 feet) covering an area of eight to ten square miles. About six to eight miles of the possible fault trap is in VIC P/4. This lead was numbered Feature IV on Enclosure 3 of the East Gippsland Final Report.

The second potential hydrocarbon trap delineated by the study was labeled Feature III on the cited enclosure. The trapping mechanism here is a possible pre-Miocene channel cutting out the LVCM reservoir rocks on the western flank of a north east trending nose.

The closed area inferred is roughly bordered by Lines M8B to M10B and M28B to the permits western border. As much as 500 feet of vertical closure may exist over a maximum of 14 square miles.

The reliability of these possible traps is questionable because of the following reasons:

Feature IV

- 1) The fault alignment may be different than shown. Where the fault crosses the pertinent lines several different correlations are possible.
- 2) The sealing of the trap depends on the rocks in juxtaposition across

- the fault face and on the upper extent of the effective faulting being limited to Oligocene sedimentation. These factors cannot be defined on the data.
- 3) The strong reflection mapped as Top LVCM would probably have to be a sealing lithology as it is monoclinal and may be continuous across the fault trap.
 - 4) In contrast to the above factors, the presence of the north east flanking channel is not necessary to the trap. If present, it upgrades the possible source quantity, assuming it is filled with marine sediments. If absent, it increases the possible reservoir thickness and areal extent of the trap.

Feature III

- 1) The inferred channel is a necessity to complete this postulated trap. Unfortunately, the channel evidence is not of textbook clarity. In appearance it differs from the known submarine canyon (along the northeast flank of Halibut) by being fault controlled, and by not showing definite cutting of a strong reflection band. Whereas the Esso-BHP channel probably has 2,000 feet of relief the Feature III canyon would have a maximum relief of about 800 feet. In

addition, the interpreted channel is overlain by a continuous band of reflection energy. This event shows only a small amount of sag as it crosses the channel. However, in both known and postulated channels, there is evidence of deeper penetration of seismic energy in the channel "window".

- 2) The trap potential increases if we assume the strong energy band heretofore picked as "near Top of LVCM" is instead a post-Eocene marine member in this area. Interval velocity plots in the area support this interpretation as they show a velocity inversion at the strong reflection level. This inversion could be ascribed to lower velocity Oligocene or Lower Miocene shales, marls and mudstones. Southwest of the channel no inversion is evident.

FUTURE WORK

- 1) Time integration of the trade data is not satisfactory because Esso "eased in" replacement statics for more than 300 feet of water. This means that in no place will Magellan's data tie Esso's on a time basis. Depth conversions will eliminate this problem.
-

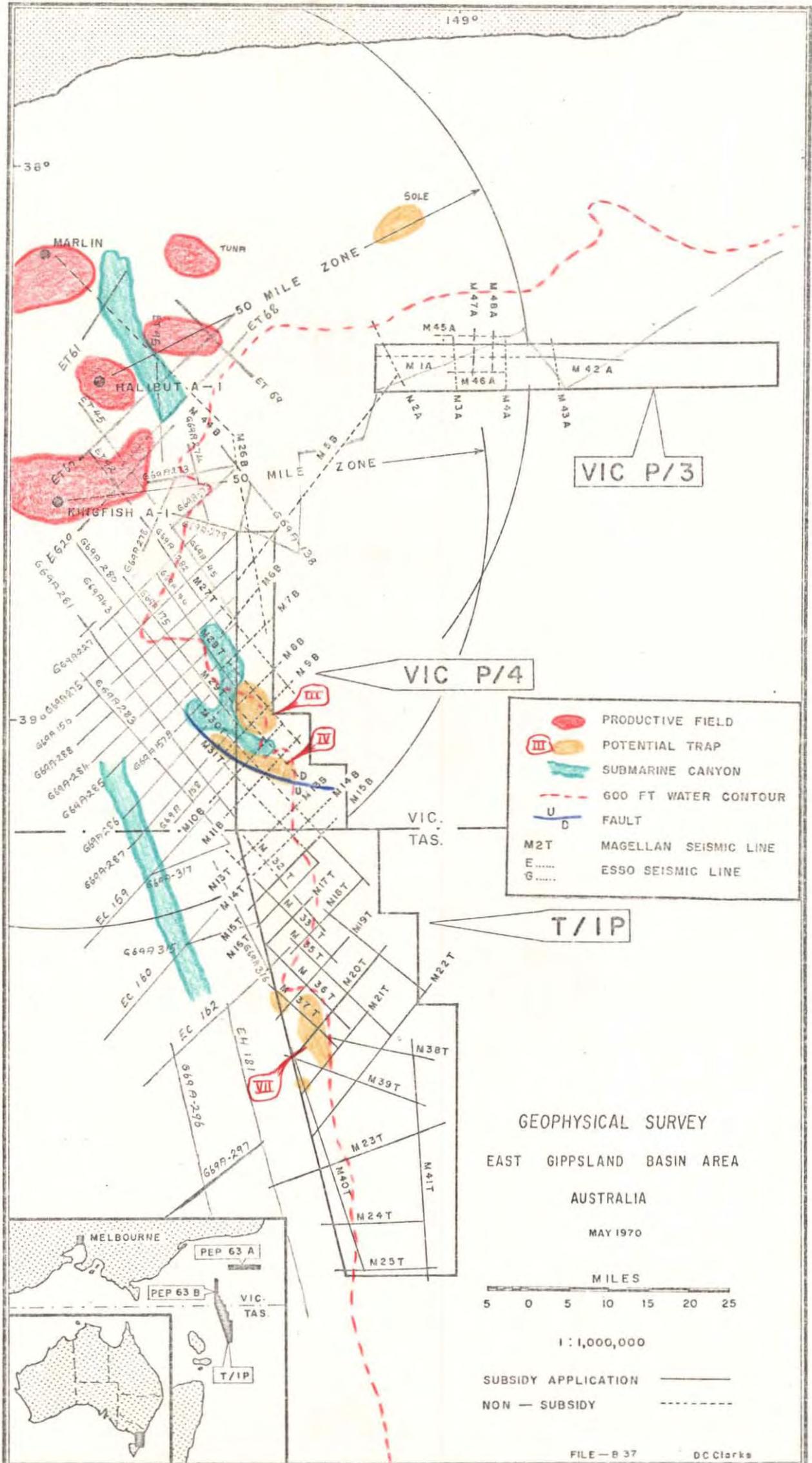
- 2) Other horizons could be mapped to clarify the potential traps:
 - a) Basement
 - b) Intermediate between Basement and LVCM
 - c) Approximate Top OligoceneIsopachs of the a - b interval and c - Top LVCM interval should be mapped.

- 3) The additional data west of Feature VII in T/1P suggests that the structure may be much larger than previously postulated. As additional data becomes available in this area it should be incorporated.

Enclosure: Sheet I -
Integrated Time Map
Top Latrobe Complex

A handwritten signature in cursive script, appearing to read "A. Sabitay".

Fig 1



5 cm

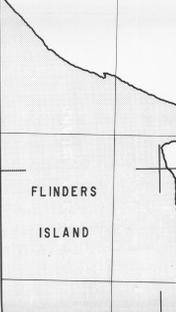


NOTES:
 1) DISCREPANCY BETWEEN ESSO AND MAGELLAN METHODS OF APPLYING REPLACEMENT STATUS HAS NOT BEEN CORRECTED. THEREFORE ESSO LINES DO NOT BRACKET THE SEISMIC MAGELLAN WORK WITH INCREASING DISCREPANCY AS WATER DEPTH IN STIPPLED AREAS ARE POTENTIAL HYDROCARBON TRAP LEADS.

CONTOURS IN VICINITY OF LINES 31, 32, 33 & 34 FROM LATEST DEPTH MAP OF NON-INTEGRATED MAGELLAN WORK

LATEST WORK WEST OF THIS LINE NOT INCLUDED (LINES M28-538 & 543)

VICTORIA
 TASMANIA



AUSTRALIAN TRANSVERSE MERCATOR PROJECTION 10,000 YARD GRID

ZONE 8



SCALE 1:100,000

SHOT POINTS

- MAGELLAN PETROLEUM AUSTRALIA LTD. DECEMBER 1960-MARCH 1962
- ESSO EXPLORATION & PRODUCTION AUSTRALIA INC.
- SHELL DEVELOPMENT (AUSTRALIA) PTY. LTD.
- MAGELLAN PETROLEUM AUSTRALIA LIMITED SEPTEMBER 1960

MAGELLAN PETROLEUM AUSTRALIA LTD.

MARINE SEISMIC SURVEY

EAST GIPPSLAND BASIN AREA

INTEGRATED TIME MAP

TOP LATROBE COMPLEX

(PRELIMINARY RESULTS ONLY)

073010

CONTOUR INTERNAL 050 FEET
 AUTHOR & DRAFTER: DRAFTED BY DCL/CLAKE
 DATE: JULY 1970
 PLATE: TP2
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 SHEET: I