

033001

OFFSHORE 117

OR-073

T/7P part-II*

FINAL REPORT

T/7P TASMANIA

by

ESSO EXPLORATION & PRODUCTION AUST. INC.

AUGUST 1971.

CONTENTS

	<u>Page</u>
<u>INTRODUCTION</u>	1
<u>EXPLORATION HISTORY</u>	1
<u>INTERPRETATION PARAMETERS</u>	1
BASEMENT	1
Aeromagnetic	1
Seismic	1
SEDIMENTARY SECTION	1
<u>DISCUSSION OF MAPS</u>	2
STRUCTURE OF ECONOMIC BASEMENT PLATE 1	2
STRUCTURE ON LOWER TERTIARY UNIT PLATE 2	2
ISOPACH LOWER TERTIARY UNIT PLATE 3	2
<u>STRUCTURE</u>	2
<u>CONCLUSIONS AND RECOMMENDATIONS</u>	2

LIST OF ILLUSTRATIONS

Figure 1	Orientation Map
2	Velocity Scan Data T70B-7 SP536
3	Composite Time-Depth Curve
Plate 1	Structure Contours on Economic Basement
2	Structure Contours on Lower Tertiary Unit
3	Isopach of Lower Tertiary Unit

INTRODUCTION

Exploration Licence 19/65 was granted to Esso on September 17, 1965.

Under the Petroleum (Submerged Lands) Acts (Commonwealth 1967-68 and Tasmania 1967) EL 19/65 became T/7P (offshore and EL 19/65 (enclosed waters), Esso was granted these permits under the new legislation on September 6, 1968. The licence T/7P covers 147 blocks and EL 19/65 an area of 60 square miles (Fig.1).

EXPLORATION HISTORY

An aeromagnetic survey was conducted in the area south of $40^{\circ} 45'$ by Aero Services Limited for Esso and E.Z. of Aust. in 1966 and 1967. An aeromagnetic survey of the area north of $40^{\circ} 30'$ was conducted by Aero Services for Magellan in 1968. The T69B Seismic Survey comprising 98.24 line miles was conducted by Western Geophysical Co. of America in the central part of T/7P for Esso in February, 1969. The T70B Seismic Survey of 60.79 line miles was shot by Western in the southern part of T/7P in January, 1970.

Several excursions have been made by Esso geologist to the Tasmania mainland and islands.

No seismic has been shot in the northern part of the licence and the area between $40^{\circ} 30'$ and $40^{\circ} 45'$ south has no aeromagnetic coverage.

Details of these various surveys are covered in the various annual and semi-annual reports.

INTERPRETATION PARAMETERSBASEMENTAeromagnetic

The interpretation made after the aeromagnetic survey in 1966-67 is considered to be in error in some instances. In the area south of $41^{\circ} 15'$, the magnetic intensity pattern was originally interpreted as indicating reasonably deep basement of moderate susceptibility and an overlying sedimentary section with some included magnetic material. This pattern is now interpreted to indicate shallow basement of low susceptibility similar to the granite basement onshore which is seen to have low susceptibility. Between $40^{\circ} 45'$ and $40^{\circ} 15'$ shallow high susceptibility basement is seen. There is no control between $40^{\circ} 30'$ and $40^{\circ} 45'$ but the northern part of the permit is interpreted to have shallow low susceptibility basement similar to the southern edge of the Gippsland Basin. In this area again the interpretation made by the contractor, was deep basement with magnetic material within the sedimentary section.

Seismic

Economic basement was indentified and mapped during the interpretation of the T69B Survey. The basement reflection mapped on T70B was correlated by character to that identified on T69B and by projecting to basement-outcrop along the east coast of Tasmania. The basement was seen to have an average refraction velocity of approx. 16,000 ft. per sec. The basement reflection is seen as a high amplitude, low frequency event, well defined over most of the survey area. Diffractions are common, caused by the irregular nature of the basement surface and by faulting in part.

SEDIMENTARY SECTION

Velocity scan data was difficult to interpret in the shallow basement areas but some interval velocity information was gleaned from scans on T69B-3 S.P.

INTERNET

595 and T70B-7 S.P. 536, both in deep water. (See Fig.2). Depth conversions were made using the composite time-depth curve (Fig. 3).

The sequence of Lower Tertiary sediments was correlated by character to the Lower Tertiary unit mapped in the Southern Gippsland Basin. The upper sequence boundary is a continuous high amplitude reflection with onlapping events above. This sequence onlaps basement to the west and apparent offlap is seen to the east. Interbedded continental sands, silts and shales grading to marginal marine clastics off the present shelfal area are indicated.

Above this thin sequence are low amplitude continuous events which generally dip gently to the east. There are some indications of channeling and slumping within the section. These are interpreted as Upper Tertiary-Quaternary marine sediments, calcarenite, calcareous mudstone and marl.

DISCUSSION OF MAPS

The following maps are included with this report:

1:250,000 scale	Structure Contours on Economic Basement	Plate 1
"	" Structure Contours on Lower Tertiary Unit	" 2
"	" Isopach of Lower Tertiary Unit	" 3

STRUCTURE ON ECONOMIC BASEMENT PLATE 1

Gentle easterly dip is seen to a maximum depth of approximately 3,600 feet subsea at the edge of the continental shelf. Faults interpreted as trending NNW-SSE in an en echelon pattern drop basement down to the east.

STRUCTURE ON LOWER TERTIARY UNIT PLATE 2

This unit seen on all lines except T70B-8 which is beyond the prograding edge of the sequence.

Areal extent is restricted to the south where the sequence is seen as a thin tongue. In the central area it extends beyond the shelf edge and is seen on the shallow fault blocks to the east.

ISOPACH LOWER TERTIARY UNIT PLATE 3

Generally less than 1,000 feet thick, this unit thickens to a maximum from the western up dip pinchout and then thins to the east. A very thin section only, if any, is expected in the area east of this seismic control i.e. the sequence is restricted to the shelf area and the shallow fault blocks.

STRUCTURE

Basement structure in this permit area while still somewhat conjectural since seismic control is widely spaced, suggests plate tectonics. Large down to the east faults are seen on the eastern extremities of two lines, however, some minor faulting is seen on other lines. Basement faulting in the S.E. Gippsland Basin is seen to trend NNW-SSE and a similar trend has been interpreted in this section of the east Tasmania margin.

No fold structures were seen in the sedimentary section above basement.

CONCLUSIONS AND RECOMMENDATIONS

The thin sedimentary section at water depths less than 1,000 feet and lack of folded structures lead to the conclusion that the hydrocarbon potential of this permit is low.

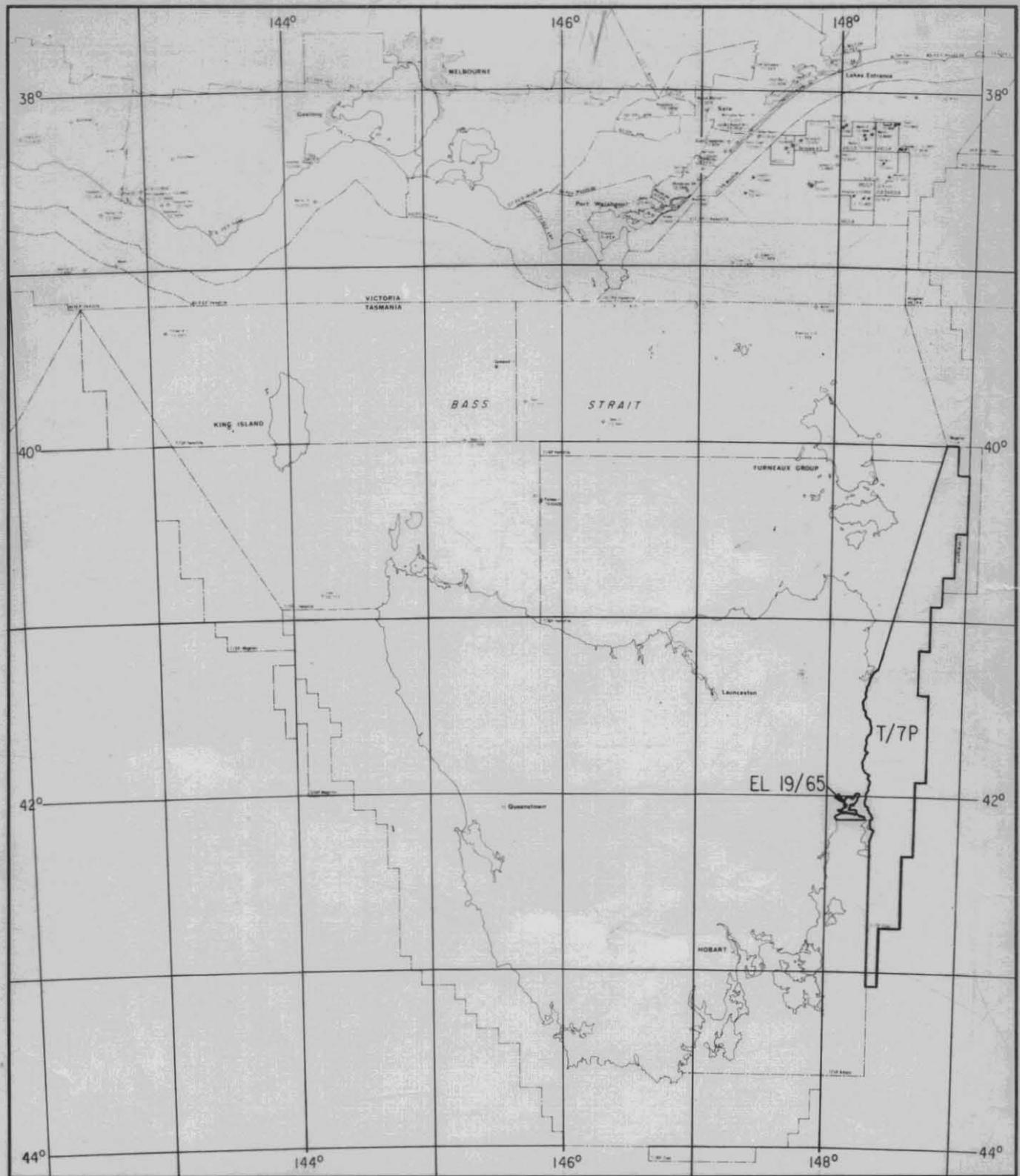
INTERPRETATIVE

033005

INTERPRETATIVE

T/7P part-II*

OFFSHORE



ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

TASMANIA LOCALITY MAP

5 cm



TO ACCOMPANY : FINAL REPORT T/7P FOR T.M.D.

DATE : OCT. 1971
FIGURE 1

OR-073

Dwg. 1432/OP/1

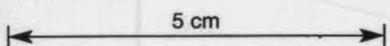
ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC

TASMANIA

T70B-7 SHOT POINT 536 G.S.I. VELOCITY SCAN ANALYSIS

AUTHOR: R.A BROTHERTON
TO ACCOMPANY: FINAL REPORT T/7P
FOR T.M.D.

DATE: OCT. 1971
FIGURE 2

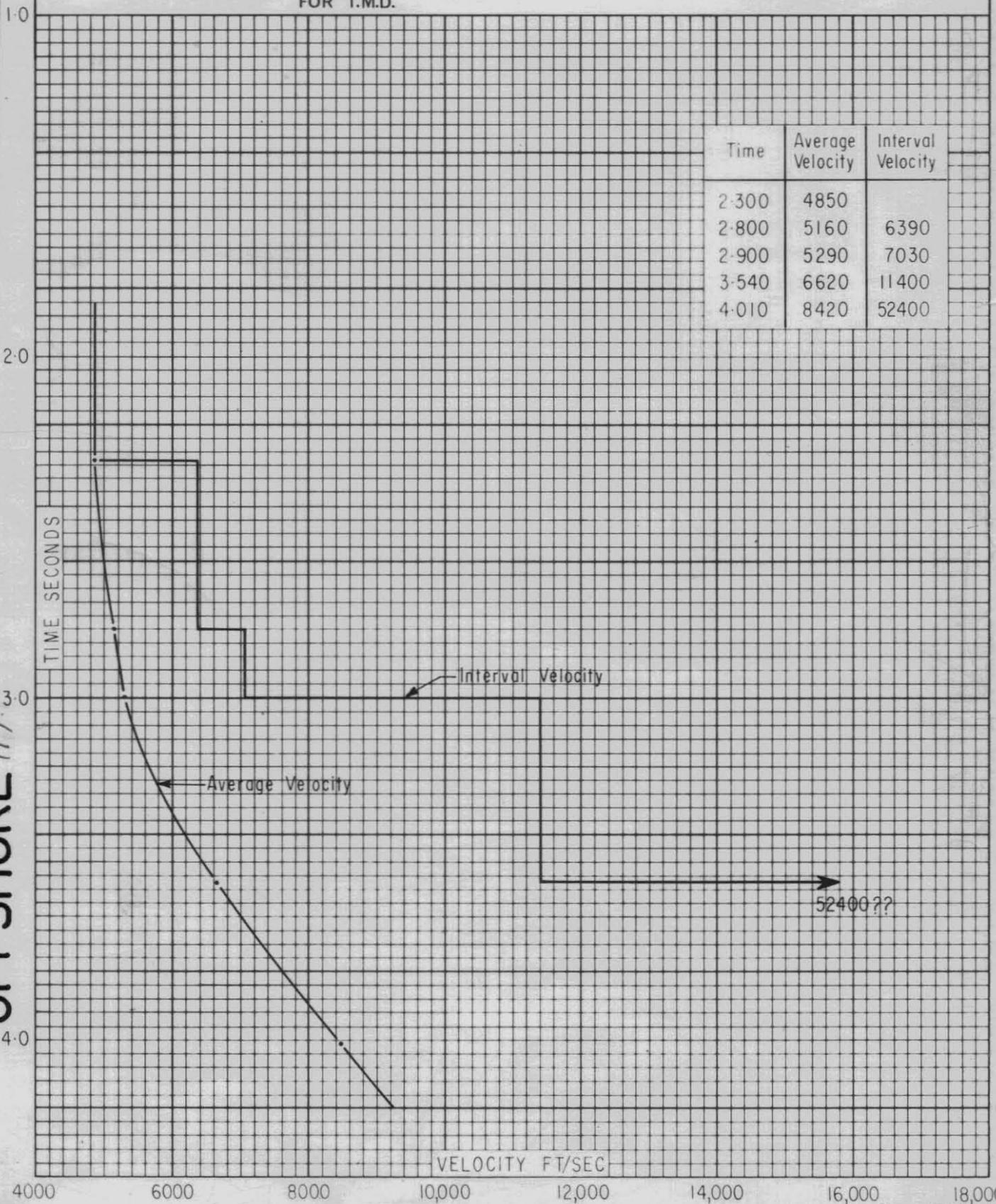


INTERPRETATIVE

T/7P part-II*

OFFSHORE 117

Time	Average Velocity	Interval Velocity
2.300	4850	
2.800	5160	6390
2.900	5290	7030
3.540	6620	11400
4.010	8420	52400



52400??

OR-073

Dwg. 1432/OP/2

OFFSHORE

TWO WAY TIME BELOW SEA LEVEL
(STATIC CORRECTED FOR TRAVEL TIME IN WATER)

INTERPRETATIVE

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

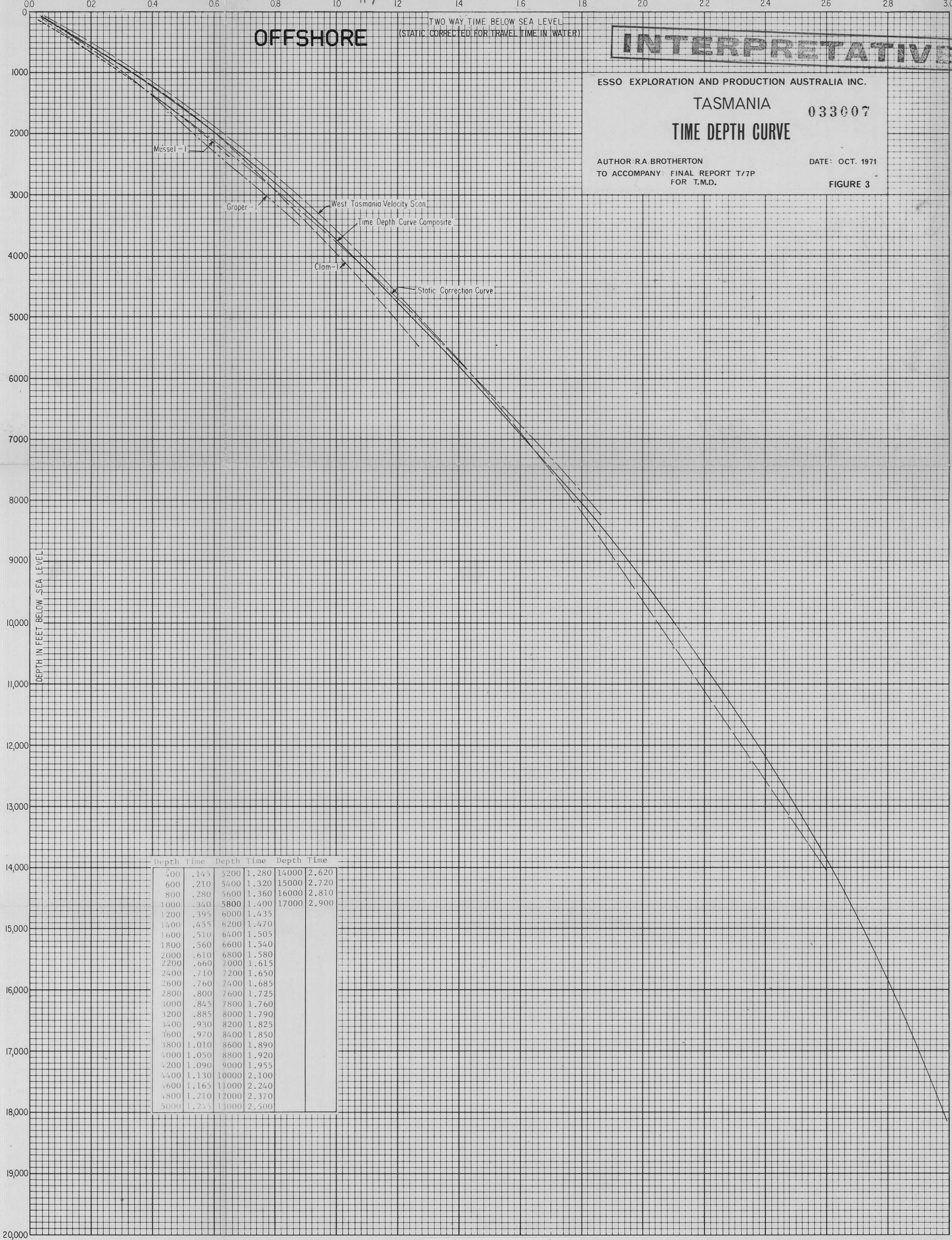
TASMANIA 033007

TIME DEPTH CURVE

AUTHOR: R.A. BROTHERTON
TO ACCOMPANY: FINAL REPORT T/7P
FOR T.M.D.

DATE: OCT. 1971

FIGURE 3



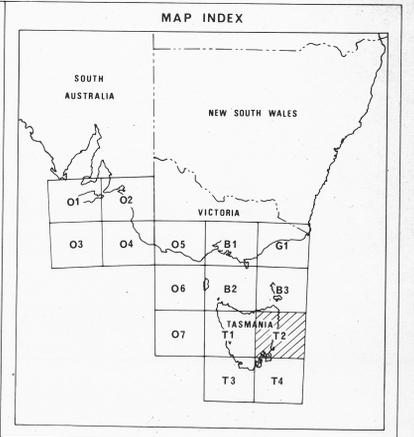
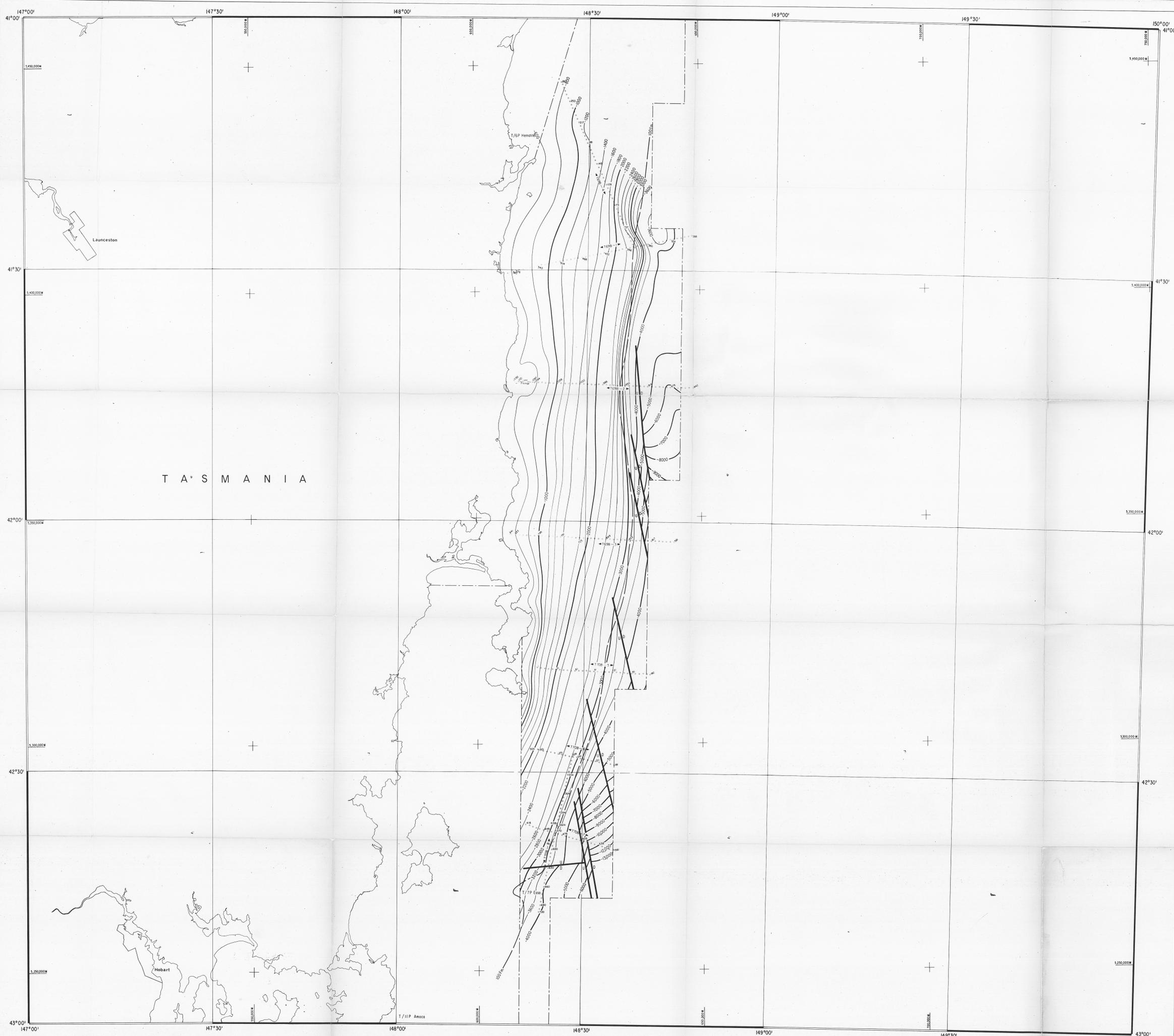
Depth	Time	Depth	Time	Depth	Time
400	.145	5200	1.280	14000	2.620
600	.210	5400	1.320	15000	2.720
800	.280	5600	1.360	16000	2.810
1000	.340	5800	1.400	17000	2.900
1200	.395	6000	1.435		
1400	.455	6200	1.470		
1600	.510	6400	1.505		
1800	.560	6600	1.540		
2000	.610	6800	1.580		
2200	.660	7000	1.615		
2400	.710	7200	1.650		
2600	.760	7400	1.685		
2800	.800	7600	1.725		
3000	.845	7800	1.760		
3200	.885	8000	1.790		
3400	.930	8200	1.825		
3600	.970	8400	1.850		
3800	1.010	8600	1.890		
4000	1.050	8800	1.920		
4200	1.090	9000	1.955		
4400	1.130	10000	2.100		
4600	1.165	11000	2.240		
4800	1.210	12000	2.370		
5000	1.245	13000	2.500		

5 cm

OR-073

DWG. 1432/OP/3

T/7P part-II*



- LEGEND**
- 50 Seismic shot point
 - Fault, D downthrown side
 - - - Petroleum Tenement Boundary
 - 100 Ft. Water depth 100 Fathoms

T A S M A N I A

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

TASMANIA
TASMANIA

STRUCTURE MAP ON
ECONOMIC BASEMENT

033008

INTERPRETATIVE

CONTOUR INTERVAL 200', 400', 1000' DATUM: SEA LEVEL

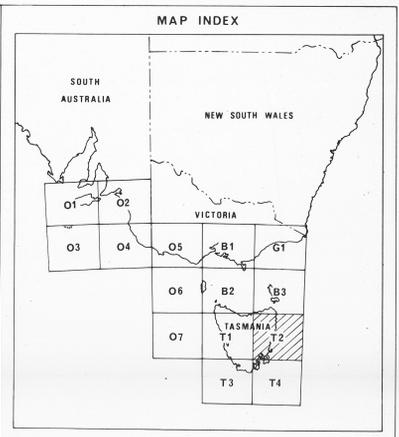
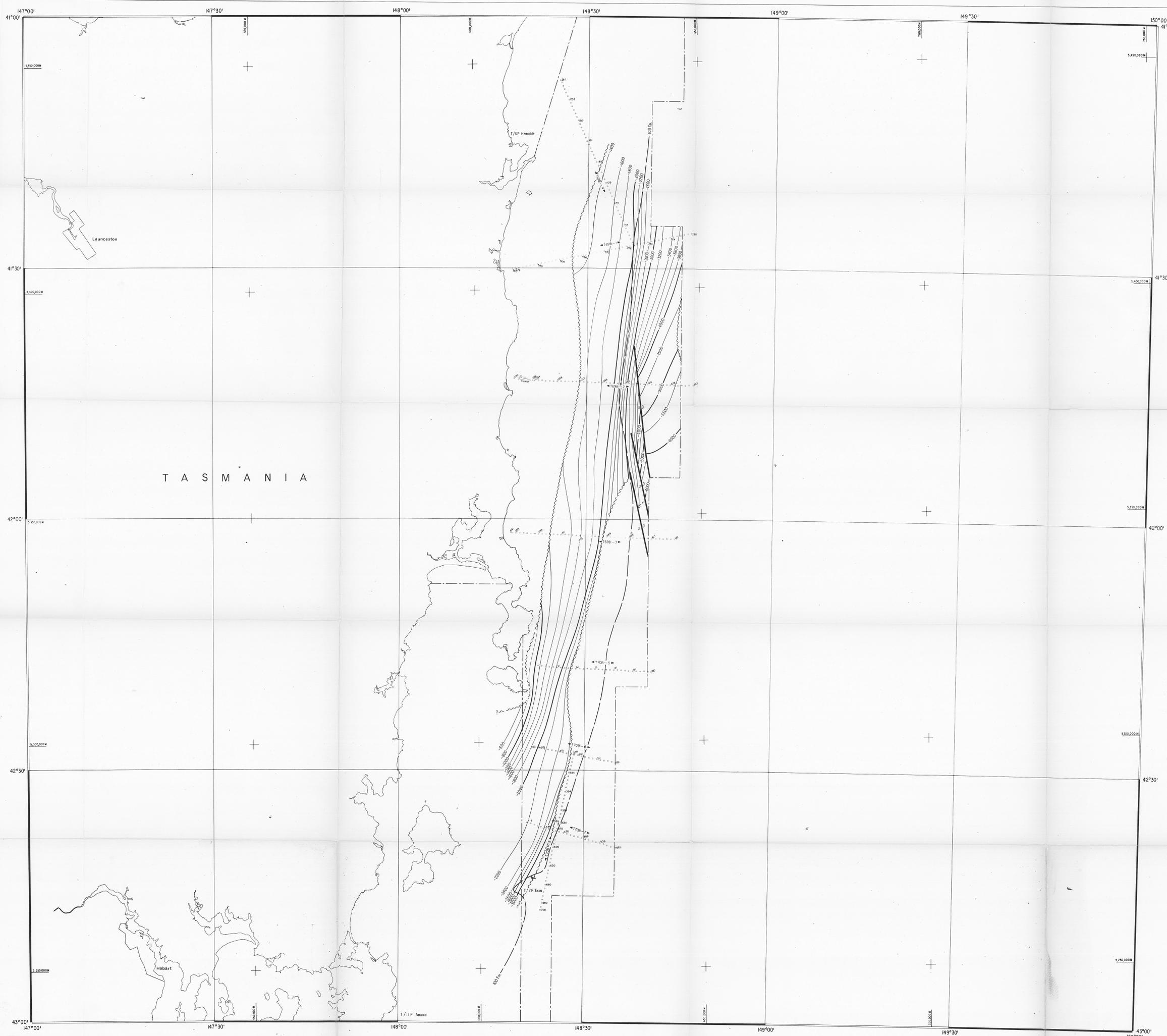


AUTHOR: R.A. BROTHERTON DRAFTED BY: B.H. BARKEN
TO ACCOMPANY: FINAL REPORT T/7P FOR T.M.D. DATE: OCT. 1971

SHEET PLATE 1

T/7P part-II* OFFSHORE 117

PROJECTION: A.M.G. ZONE 55 DWG: 1432/02/A 02-023



LEGEND

- Seismic shot point
- U — Fault, 'U' downthrown side
- — — Petroleum Tenement Boundary
- ~ ~ ~ Limit of Lower Tertiary
- — — 100 Fm. Water depth 100 Fathoms

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

TASMANIA
TASMANIA

8 km

STRUCTURE MAP ON LOWER TERTIARY

INTERPRETATIVE

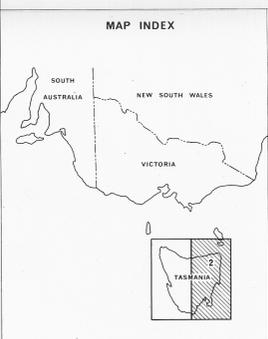
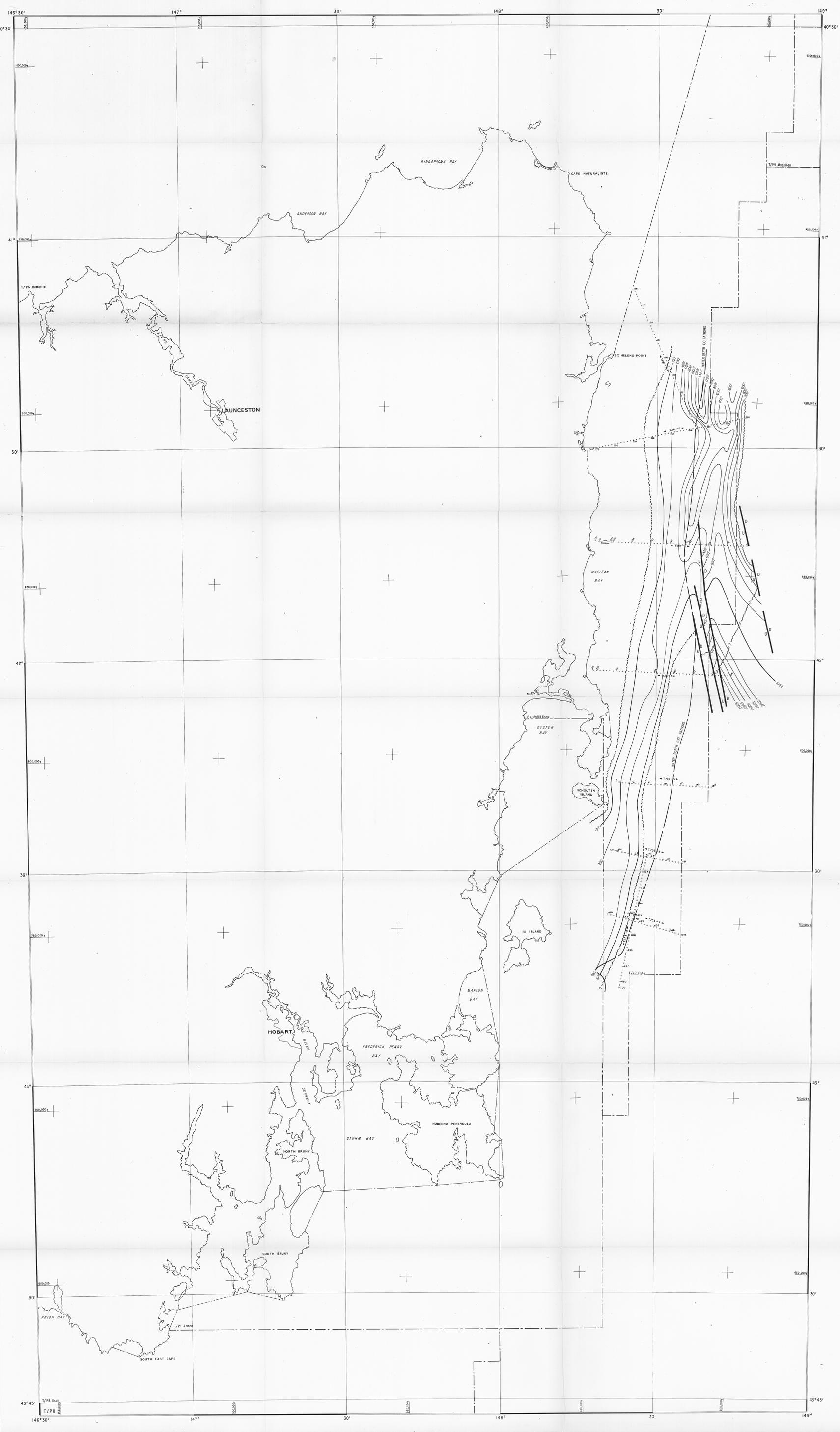
CONTOUR INTERVAL 200, 500, 1000' DATUM SEA LEVEL

SCALE: 1:250,000



AUTHOR R.BROTHERTON DRAFTED BY B.H.BAKKEN
TO ACCOMPANY FINAL REPORT T/TP FOR TMD. DATE: OCT 1971

SHEET PLATE 2



ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

TASMANIA

EASTERN PORTION

Scale 1:250,000

ISOPACH LOWER TERTIARY UNIT

INTERPRETATIVE

033010

CONTOUR INTERVAL 100/200/300 DATUM: SEA LEVEL

Scale 1:250,000

MILES

AUTHOR: R. BROTHERTON DRAFTED BY: DATE: OCT. 1971

TO ACCOMPANY: FINAL REPORT T/TP FOR T.M.D. DATE: OCT. 1971

PLATE 3

DWG 452/07/6