Report on EL 25/78
Tasmania
for the period to 31 Dec 1979

79-1406

REPORT ON EXPLORATION LICENCE 25/78, TASMANIA FOR THE PERIOD TO DECEMBER 31, 1979

DRSG

FOR: MELEKATHARRA MINERALS N.L.

BY: COGAR MINING CONSULTANTS PTY. LTD.

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A. INTRODUCTION

This report summarises the work carried out concerning EL25/78 for the period to December 31, 1979. It consists of a review of the published information, field work, and data reduction and plotting.

The report should be considered as preliminary only due to the incomplete nature of the magnetic and gravity surveys. It is planned to finish off this work during the early part of 1980.

B. BACKGROUND INFORMATION

1. Location

The Licence is situated in the Freycinet Peninsula - Swansea - Bicheno region of eastern Tasmania. It comprises an area of approximately 1225 sq. km., lying astride latitude 42° south and longitude 148° east. This is shown in Figure 1, together with the known extent of the Tasmania Basin.

2. Resources

Reticulated electricity is available throughout the Licence area from the State grid. Reticulated water is generally restricted to the small villages and towns.

The Tasman Highway, which traverses the Licence, is a sealed, two-lane road of medium standard. It connects the licence to the State Capital, Hobart, to the south. No commercial air facilities are available between Hobart and either Swansea or Bicheno, the two main towns in this region. A light aircraft strip exists near Swansea.

No railway exists in this region. No medium to large port facilities are available closer than Hobart.

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3. Topography

Most of the northern and western parts of the Licence are extremely rugged with the lower, and flatter, ground generally restricted to the area around Moulting Lagoon, and the Swansea - Cranbrook region. The coastal part comprises open grassland and sand dunes. The steeper portions are mainly tree covered with cleared areas restricted to agricultural holdings.

C. GEOLOGY

1. Regional Geology

The Licence was chosen to occur within the Tasmania Basin, most of which is believed to be on-shore and which occupies an area of some 36,000 sq. km. The Basin disappears to the north, with apparent unconformity, beneath the Tertiary sediments of the Bass Basin. Its southern limits are not precisely known though it may continue south of Hobart.

The Tasmania Basin is a relatively shallow basin with its margins against the Precambrian, and early Palaeozoic sediments in the west, and against Devonian-Carboniferous granites and early Palaeozoic sediments in the east. It comprises both marine and non-marine sequences of Permian to Triassic age.

These have been grouped together and named the Parmeener Supergroup. There are two major subdivisions, one being two Permo-Carboniferous glaciomarine sequences which alternate with two freshwater sequences, and the other a Triassic sequence of fluviolacustrine sediments. These are set out in Figure 2.

The Basin is essentially flat-lying, and shallow, except where affected by Jurassic or Cainozoic faulting. Fairly extensive faulting, in the Tertiary, has produced three grabens at Midlands, Oyster Bay, and Derwent.

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2. Geology of EL25/78

The major part of the Licence is covered with Tertiary basalts, and related rock types. This is illustrated in the attached geological map (taken from the Oatlands 1:250,000 mapsheet SK - 55/6). From Bicheno south the Freycinet Peninsula is mainly comprised of Lower Carboniferous - Upper Devonian igneous rocks, dominantly adamellites and granites.

Some of the lower sequences of the Basin crop out on the northern Freycinet Peninsula, and around Moulting Lagoon. The St Pauls River, to the north west, has also exposed the Basin sequences where it has cut through the Tertiary cover. Other sedimentary Basin rocks are known from minor outcrops in the Swan River drainage north and south of Cranbrook and north of Swansea.

3. Geophysics

The have been two aeromagnetic surveys carried out in this region. One was a subsidised survey run by Esso, mainly offshore. Data quality is excellent but penetration was low due to the shallow magnetic basement interpreted to be Jurassic(?) dolerites intruded stratigraphically high in the Tasmania Basin sequence.

The second survey, by the BMR did not recover such excellent data and has not been published.

No subsidised seismic surveys have been done. The BMR covered some offshore parts of the Basin in 1971 and 1972 but only single-stack recording was done. The interpretation of the data has never been done. It does not directly relate to EL25/78 in any event.

Not so

The BMR has run gravity surveys as part of its Australia wide coverage. Nothing has yet been published. The University of Tasmania, in the mid-1960's, carried out some regional gravity measurements in eastern Tasmania. This data has been accessed and forms part of the data

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review of this report.

ERTS imagery is available for eastern Tasmania, and has been studied as part of the data review of this report. The Oyster Bay graben may be clearly recognised, as well as a general NNE - SSW "grain" to the country, following the gravity anomaly contours, but quite different to the general NNW - SSE elongation of the Tasmania Basin itself.

D. DATA REVIEW

1. Magnetics

The surface magnetics survey has not yet been completed. Nor are the available readings sufficient to give a reliable picture, though they have been plotted in order to show what has been done. Since most of the readings were taken along the road system, they tend to align with such road system.

It is suggested that no interpretation be done until the survey has been completed, using a more uniform spacing. It is recommended that this be done in conjunction with the gravity survey as it is a simple matter to take the magnetic readings at the same time as the gravity readings and without any great additional cost.

2. Gravity

Data taken from the University of Tasmania surveys shows three distinct gravity features within the Licence. These are the "lows" to the north of Lake Leake and over Moulting lagoon, and the "high"between Lake Leake and Cranbrook.

General interpretation of the Bouguer Anomaly Map is that the crustal thickness increases from around 34 - 35 km. at the coast to 39 - 40 km. in the centre of Tasmania. The low at Moulting Lagoon may indicate a thickening of the sediments in this region of from 500 to 750 m., which is significant for oil potential if it can be allied to potential trap structures.

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Geological evidence for this is not available due to lack of detail surveys in the region, and complete lack of sub-surface information. On the other hand, the Oyster Bay Graben is known and there is the (indirect) evidence of the ERTS imagery. In the context of the generally thin nature of the Tasmania Basin sedimentary sequences, the Coles Bay - Bicheno - Swansea region is considered to be worthy of more detailed examination to see if the postulated thickening of the sediments is real.

Evidence is incomplete for a second, smaller trough which approximately follows the Swan River drainage. This is also worthy of more detailed examination.

The source of the large low north of Lake Leake probably lies outside the Licence. It is suggested that no further work be done on this until the other anomalies have been better defined, and tested. The gravity high to the east of Lake Leake is not the type of feature that can be considered prospective for oil within a sedimentary basin. It may be due to a thickening of the overlying volcanics, or to a basement high with rock densities higher than for the Permo-Triassic sediments.

E. RECOMMENDATIONS

As a first priority, it is recommended that the gravity survey be completed in the region generally bounded by Coles Bay - Swansea - Bicheno, and in the region north from Cranbrook along the Swan River and westwards to the St Pauls River. Field work to date suggests that most of this area is accessible without having to resort to a helicopter survey.

It is suggested that blow-ups of the available air photos be purchased and used to select the reading points at an approximate 1 km. x 1 km. spacing. Means of access to the reading points can be ascertained from the photos,

from the 1:100,000 topographic maps (Freycinet, St Pauls, Little Swanport, and Break O'Day), and from additional field inspections. Permissions of owners of private properties should be obtained, if necessary, prior to the commencement of any survey which departs from the public roads.

At the same time, magnetic readings can be taken at the gravity reading points to see if this information can assist in the structural interpretation of the Basin. Geological mapping at, say, the scale of 1:100,000 might be carried out in conjunction with the geophysical surveys to assist with the ultimate interpretation of such surveys.

Provided that the geophysical surveys indicate a sufficient thickness of potential resevoir rocks, with possible trap structures, then the next step recommended is to run on-shore seismic surveys to delineate potential drilling target(s). A full assessment of the earlier geophysics is recommended prior to the seismic work being contracted.

References

Geological Survey Explanatory Report, Sheet SK - 55/6, Oatlands, 1:250,000

The Geology of Tasmania; Journal of the Geological Society of Australia, Volume 9, Part 2, 1962

Summary of the Phanerozoic Sedimentary Basins of Australia and Adjacent Regions; BMR Record 1974/178

A Regional Gravity Survey of Eastern Tasmania; B. F. Cameron, University of Tasmania, 1967

Carboniferous and Permian Palynostratigraphy in Australia and Antarticara: a Review; Kemp E.M., Balme B.E., Helby R.A., Kyle R.J., Playford G., and Price P.L.

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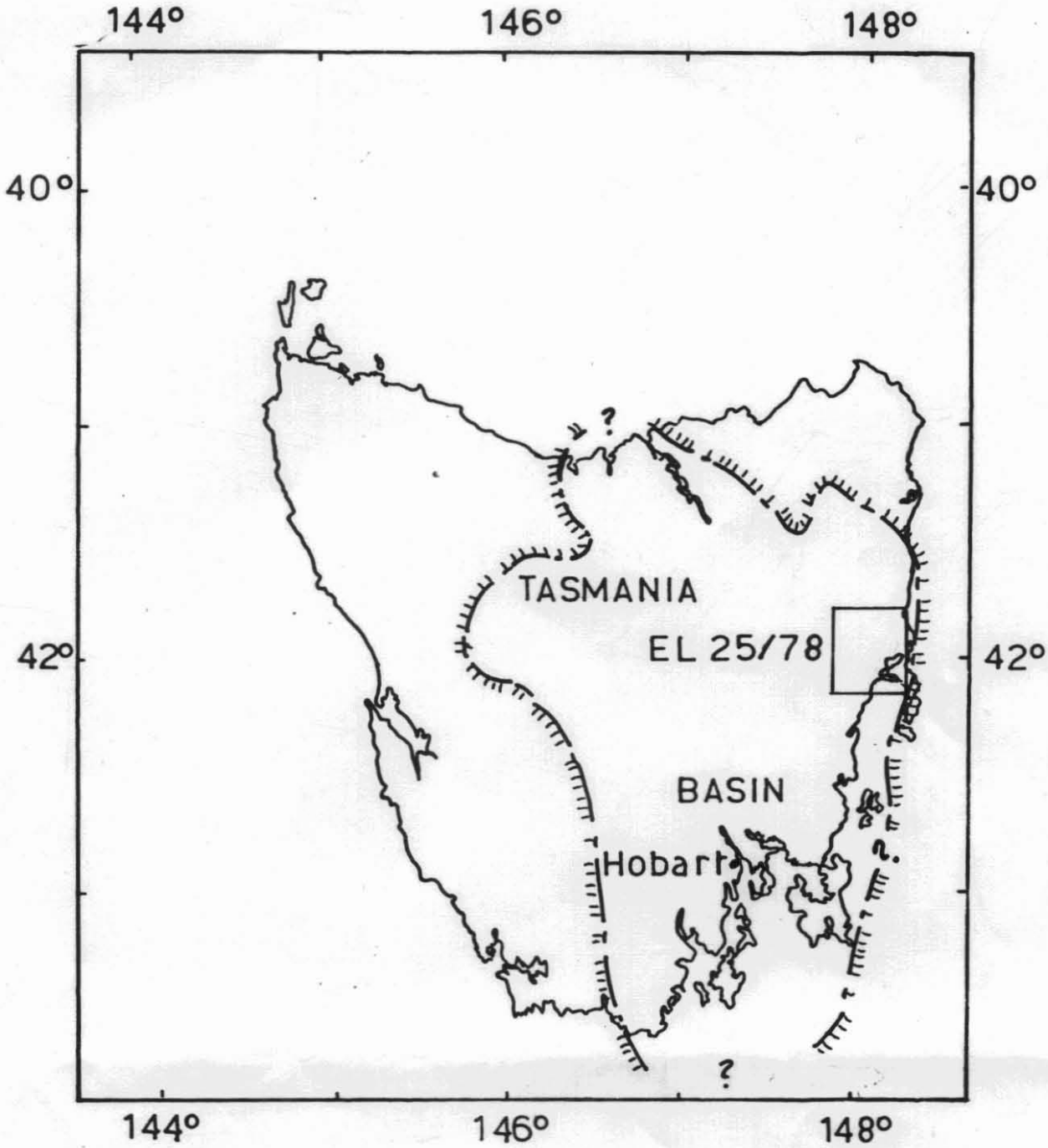
FIGURE 1

115010



EXTENT OF TASMANIA BASIN WITH REFERENCE TO EXPLORATION LICENCE 25/78

5 cm

008

115011

GENERAL STRATIGRAPHY

FIGURE 2

	Quaternary	Alluvials, sand, gravel, talus, Superficial.
	Tertiary	Non marine conglomerate, sands, sandstone, siltstone, claystone, up to 300 m.
Parmeener Supergroup	Triassic	Fluviolacustrine sandstone, conglomerate, siltstone, mudstone with carbonaceous sequences and coal seams. Up to 600 m.
	Permian	Tartarian freshwater sequence with some coal seams. Up to 100 m.
	Permian	Upper Artinskian to Kazanian upper glaciomarine sequence of pebbly mudstone, pebbly sandstone and limestone. Up to 350 m.
		Upper Artinskian freshwater sequence of deltaic conglomerate, cross bedded sandstone and coal. Up to 120 m.
		Upper Sakmarian to Lower Artkinsian lower glaciomarine sequence of pebbly marine and aqueoglacial mudstone, thin limestone and marine oil shale (Tasmanite). Up to 300 m.
		Lower Sakmarian non marine basal tillite and varved clays. Up to 580 m.
	Intrusives	A large area of the Tasmania Basin was intruded by extensive sills of dolerite, up to 450 m. thick, during Jurassic times. Exposures of these rocks now mask a large part of the sediments.

009

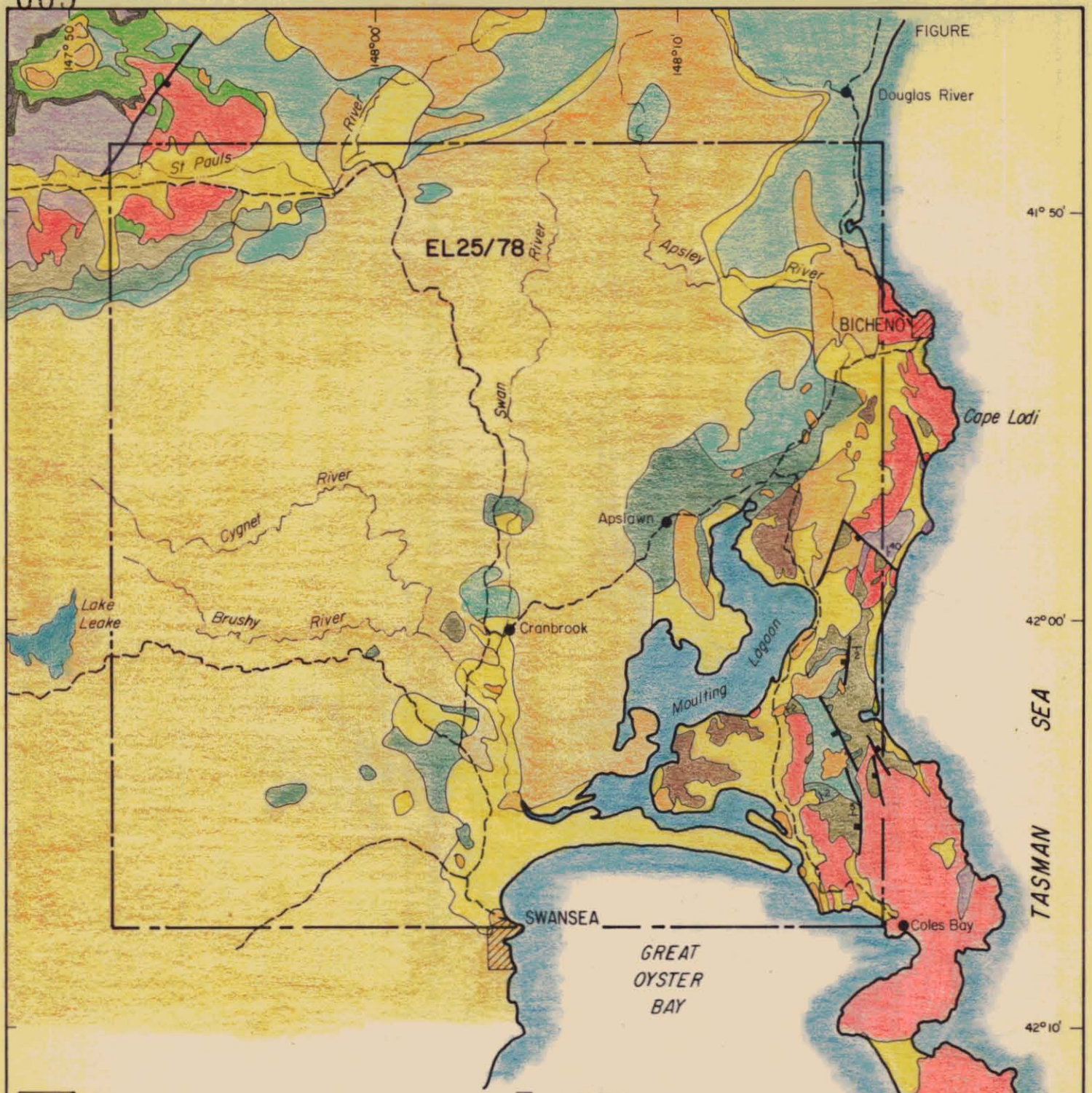
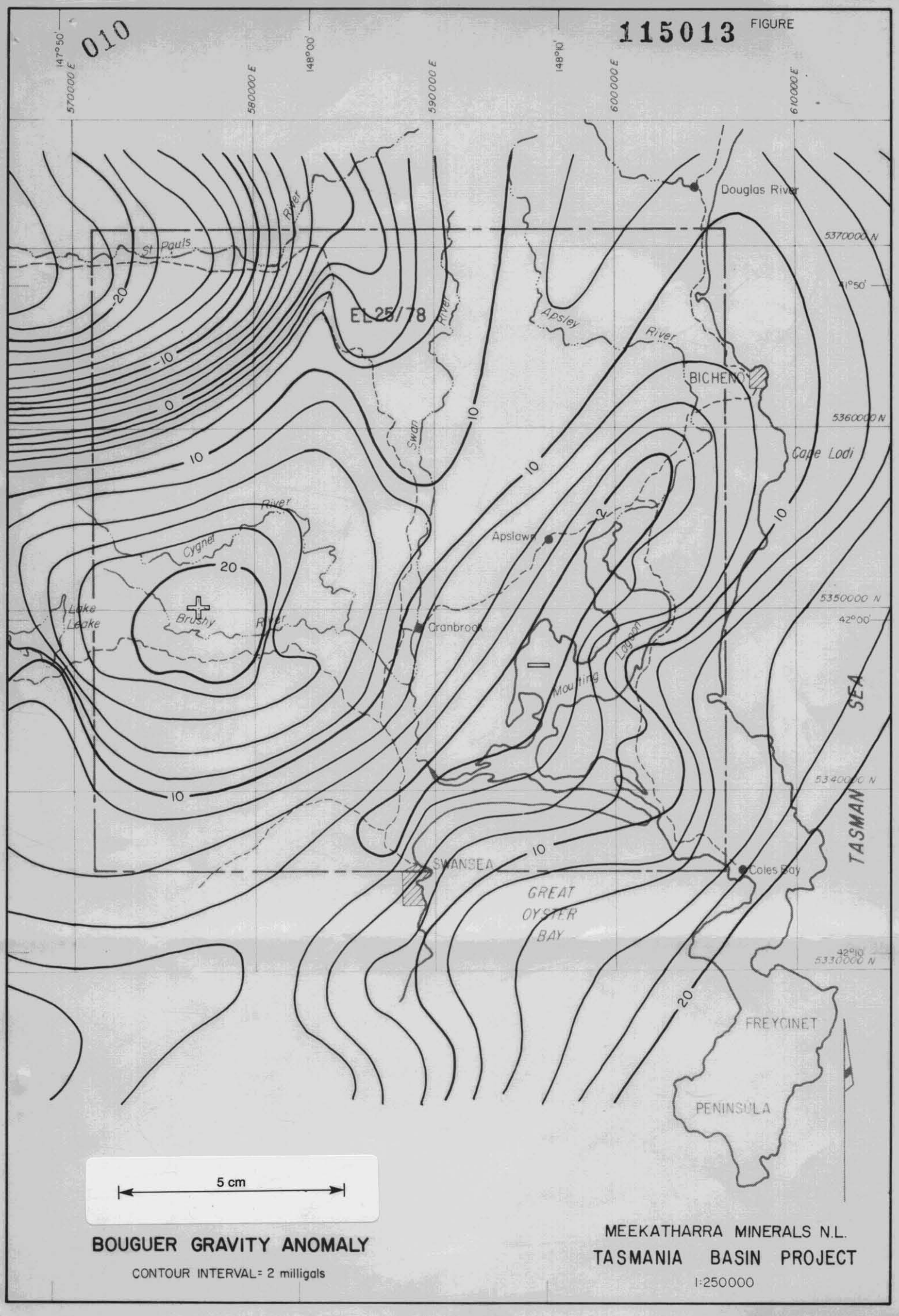


FIGURE
Douglas River
147° 50'
148° 00'
148° 10'
41° 50'
42° 00'
42° 10'
St Pauls River
EL25/78
Swan River
Apsley River
BICHENO
Cape Lodi
Cygnet River
Apsley
Lake Leake
Brushy River
Cranbrook
Moulting Lagoon
SEA
TASMAN
SWANSEA
Coles Bay
GREAT OYSTER BAY
FREYCINET PENINSULA
Alluvium, sand, gravel and talus
Marine limestone
Basalt and related igneous rock types
Fluvio-lacustrine sequences of sandstone, siltstone, mudstone
Fluvio-lacustrine sequences of sandstone, siltstone, mudstone with carbonaceous sequences indicated
Upper glacio-marine, pebbly mudstone, sandstone and limestone
Fresh water sequence with some coal measures
Lower glacio-marine, pebbly mudstone, sandstone, minor limestone, Tasmanite oil shale and basal tillite
Micaceous quartzwacke turbidite sequences dominant
Basalt and related rock types
Dolerite and related rock types
Dominantly adamellite-granite; biotite-hypersthene-adamellite porphyry
HOLOCENE
TERTIARY
TRIASSIC
PERMIAN
UPPER CARBONIFEROUS
LOWER DEVONIAN – TREMADOCIAN – CAMBRIAN
TERTIARY
JURASSIC
LOWER CARBONIFEROUS – UPPER DEVONIAN
Fault with relative downthrown side indicated
Generalised strike and dip of beds
115012
MEEKATHARRA MINERALS N.L.
TASMANIA BASIN PROJECT
1:250000
5 cm

010

115013 FIGURE



BOUGUER GRAVITY ANOMALY

CONTOUR INTERVAL = 2 milligals

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TASMANIA BASIN PROJECT

1:250000

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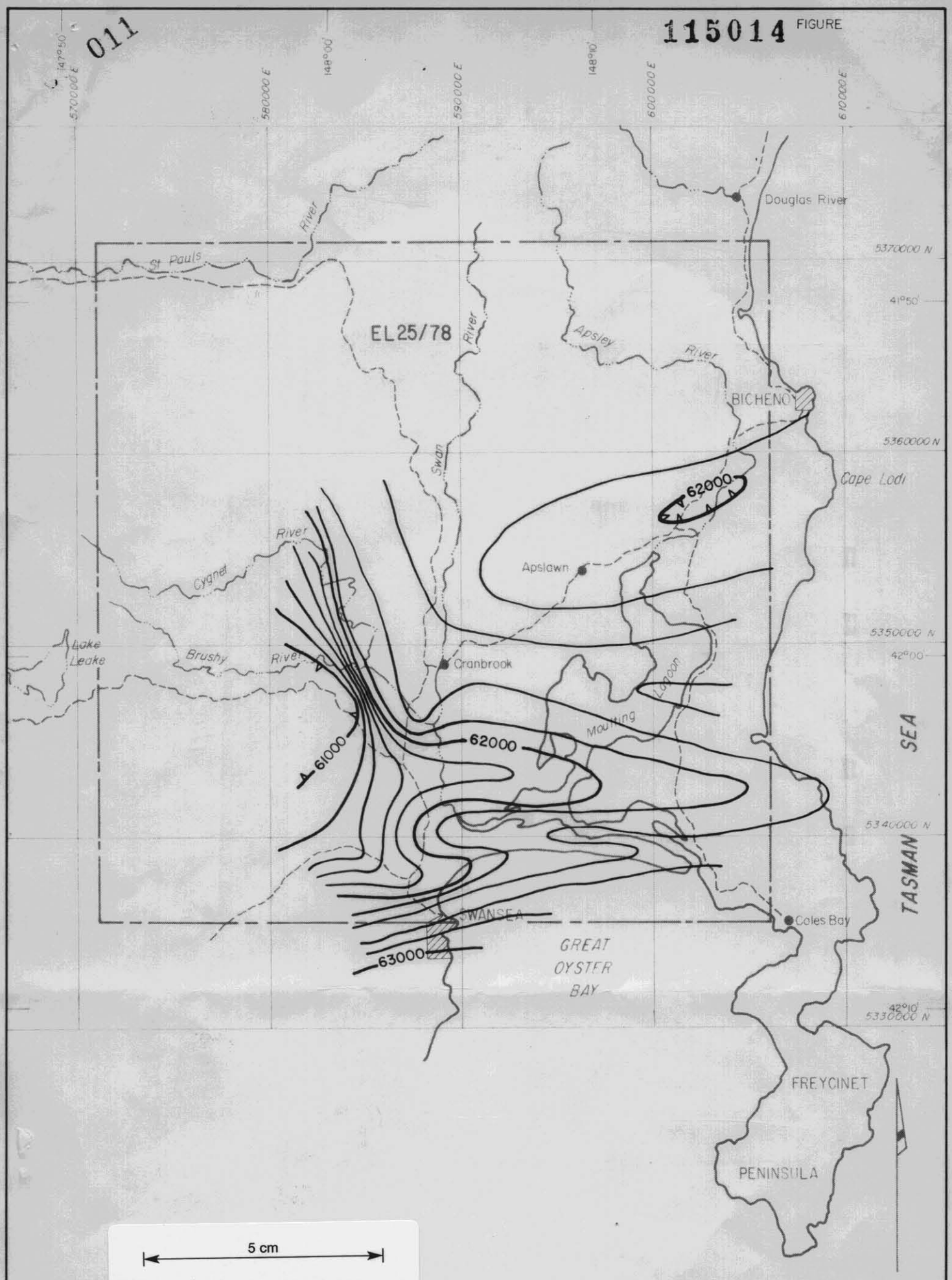
115014 FIGURE



MAGNETIC INTENSITY – SURFACE SURVEY

CONTOUR INTERVAL = 200 gammas

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