TASMANIA

MRPA_07

Mineral resource potential assessments of selected areas of Southeastern Tasmania

OCTOBER 1990

TASMANIA DEPARTMENT OF MINES

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MINERAL RESOURCE POTENTIAL ASSESSMENTS OF SELECTED AREAS OF SOUTHEASTERN TASMANIA

DEPARTMENT OF RESOURCES AND ENERGY

DIVISION OF MINES AND MINERAL RESOURCES

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INTRODUCTION

Three areas in southeastern Tasmania have undergone preliminary assesssments for mineral resources at the request of the Mining Forum.

Details of methodology, definitions and conclusions are to be found in the previous volume of this series (*Mineral Resource potential assessments of selected areas in Central to Southern Tasmania*).

Area 1, Cape Surville

DATA
a) Geological Maps

Farmer, N. 1975. Tasmanian Geological Atlas 1: 250,000 Series. SK55-8 Hobart. *Tas. Dept. Mines.*

Gulline, A. B. 1982. Tasmanian Geological Atlas 1: 50,000 Series. Sheet 83 (8412N). Sorell. *Tas. Dept. Mines.*

Jennings, D. J. 1974. Granite Outcrops, Forestier Peninsular. *Tech. Rep. Dep. Mines Tasm.*

(b) Geological Summary (Fig. 1)

This area contains one of the few exposures of pre-Parmeener basement in Southeastern Tasmania, represented here by the Deep Glen Bay Adamellite of probable Devonian age. This is overlain by sediments of the Parmeener Supergroup (lower and upper), which make up the bulk of the area, and these are intruded and overlain by Jurassic dolerite.

(c) Geophysical Coverage

Gravity station coverage is in the reconnaissance category, with only one station in or near the area[1]. Aeromagnetic data was derived from relatively old data, flown at a spacing of about 400m, and is assessed as regional (Richardson, pers. comm.). The approximate1 km depth to granite contour, taken from Leaman (1980)[2] is shown on Fig. 2.

(d) Mineralisation

None known within, or immediately peripheral to, the area.

(e) Previous Mineral Exploration

None known

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[1]Richardson, R.G., & Leaman, D.E. 1987. TASGRAV-The Tasmanian gravity database. *Unpub. Rep. Dep. Mines Tasm.*1987/02.

[2]Leaman, D.E., Richardson, R.G., & Shirley, J. E., 1980. Tasmania - the gravity field and its interpretation. *Unpub. Rep. Dep. Mines Tasm.*1980/36.

ASSESSSMENT (Fig. 3)

(a) Quality of data

Most of the area has been mapped, relatively recently, at the satisfactory scale of 1: 50,000, except for a very small area in the south.

Gravity station coverage is in the reconnaissance category, and aeromagnetic data in the regional category.

Geochemical surveys are unknown.

(b) Applicable mineral resource models

Metallic Resources

1. Greisen-hosted tin-tungsten (Anchor style) in Deep Glen Bay Adamellite or unexposed equivalents.

2. Palaeoplacers of tin or gold in basal Parmeener Supergroup sediments.

3. Cygnet-style gold mineralisation (associated with Cretaceous intrusives) within lower Parmeener Supergroup sequences.

4. Uranium in sandstones of the Parmeener Supergroup (directly equivalent to deposits in South Africa).

The confidence level is low due to the lack of any known metallic mineralisation, or modern exploration for such, in the area. Depth to basement is poorly known.

Non-metallic and fuel resources

1. Coal in Parmeener Supergroup.

2. Limestone in Parmeener Supergroup.

3. Building stone in Deep Glen Bay Adamellite, Jurassic Dolerite and sandstones of the Parmeener Supergroup.

4. Construction materials.

5. Oil Shale in Parmeener Supergroup.

6. Brick clay in Parmeener Supergroup.

The confidence level is high for most of these commodities, despite the lack of any known exploration in the area, as most are known to occur in many similar areas throughout eastern Tasmania.

Area 2. Tasman Peninsular

DATA

a) Geological Maps

Brill, K. G. & Hale, G. E. A. 1954. Geological map of the north-western end of Tasman Peninsular-revision. Pap. Proc. R. Soc. Tasm. 88. p. 279-284.

Farmer, N. 1975. Tasmanian Geological Atlas 1: 250,000 Series. SK55-8 Hobart. *Tas. Dept. Mines.*

Gulline, A. B. 1982. Tasmanian Geological Atlas 1: 50,000 Series. Sheet 83 (8412N). Sorell. *Tas. Dept. Mines.*

(b) Geological Summary (**Fig. 1**)

This area is mostly covered by by sediments of the Parmeener Supergroup (lower and upper), intruded and intercalated with Jurassic dolerite. Small areas of Tertiary basalt and Quaternary sediments also occur.

(c) Geophysical Coverage

Gravity station coverage is in the reconnaissance category[3]. Aeromagnetic data was derived from relatively old data, flown at a spacing of about 400m, and is assessed as regional (Richardson, pers. comm.). The approximate1 km depth to granite contour, taken from Leaman (1980)[4] is shown on Fig. 2.

(d) Mineralisation (**Fig.** 3)

There is no known metallic mineralisation within the area, but significant deposits of coal and building stone occur.

Permo-Triassic coal is known from several mines or prospects between Lime Bay and Nubeena, and MIRLOCH[5] refs. are: 83001, 83005, 89001, 89002, 89003, 89004, 83001(peripheral) and 89011.

Triassic sandstone has been quarried for building stone in several areas, including the following (MIRLOCH Refs): 83008 (peripheral), 89005, 89006 and 89007.

Brick clay has been mined at Port Arthur (89010) and, peripheral to the area, at Plunkett point (83007).

(e) Previous Mineral Exploration

None known

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[3]Richardson, R.G., & Leaman, D.E. 1987. TASGRAV-The Tasmanian gravity database. *Unpub. Rep. Dep. Mines* Tasm.1987/02.

[4]Leaman, D.E., Richardson, R.G., & Shirley, J. E., 1980. Tasmania - the gravity field and its interpretation. *Unpub. Rep. Dep. Mines Tasm.*1980/36.

[5]Richardson, R.G. 1989. Fortran programs for the implementation of MIRLOCH (Revision 2). *Unpub. Rep. Dep. Mines* Tasm.1989/26.

ASSESSSMENT (Fig. 3)

(a) Quality of data

Most of the area has been mapped at the unsatisfactory scale of 1: 250,000, except for a small area in the north-west, mapped at 1:50,000 for the Sorrel mapsheet.

Gravity station coverage is in the reconnaissance category, and aeromagnetic data in the regional category.

Geochemical surveys are unknown.

(b) Applicable mineral resource models

Metallic Resources

1. Greisen-hosted tin-tungsten (Anchor style) in Deep Glen Bay Adamellite or unexposed equivalents.

2. Palaeoplacers of tin or gold in basal Parmeener Supergroup sediments.

3. Cygnet-style gold mineralisation (associated with Cretaceous intrusives) within lower Parmeener Supergroup sequences.

4. Uranium in sandstones of the Parmeener Supergroup (directly equivalent to deposits in South Africa).

The confidence level is very low due to the lack of any known metallic mineralisation, or modern exploration for such, in the area, and the lack of detailed mapping. Depth to basement is poorly known.

Non-metallic and fuel resources

1. Coal in Parmeener Supergroup.

2. Limestone in Parmeener Supergroup.

3. Building stone in Jurassic Dolerite and sandstones of the Parmeener Supergroup.

4. Construction materials.

5. Oil Shale in Parmeener Supergroup.

6. Brick clay in Parmeener Supergroup.

The confidence level is high for most of these commodities, despite the lack of any known exploration in the area, as most are known to occur locally or in many similar areas throughout eastern Tasmania.

Area 3. Wellington Range

DATA

a) Geological Maps

Banks, M.R. *et al.* 1965. Geological map of Hobart 1:63,360, *in* Smith, E.M.; Williams, E. (ed.) *Geological excursions for the Australian and New Zealand Association for the Advancement of Science, Thirty-eighth congress, 16th-20th August, 1965*. Tas. Dept. Mines.

Farmer, N. 1975. Tasmanian Geological Atlas 1: 250,000 Series. SK55-8 Hobart. *Tas. Dept. Mines.*

Forsyth, S.M. & Bacon, C.A. 1987. Geology, stratigraphy, and petrography of the Mt. Lloyd coalfield. *Tas. Dept. Mines. Unpub. Rept.* 1987/10

Leaman, D.E. 1972. Tasmanian Geological Atlas 1: 50,000 Series. Sheet 82 (8312N). Hobart. *Tas. Dept. Mines.*

Sutherland, F.L. 1964. The geology of the Collinsvale area. *Pap. Proc. R. Soc. Tasm.* 98. p. 119-135.

(b) Geological Summary (Fig. 1)

The bulk of the area is covered by Jurassic dolerite, which intrudes and overlies sediments of the Parmeener Supergroup (lower and upper), including some possible coal measure equivalents. Small areas of Tertiary basalt and Quaternary alluvium also occur.

(c) Geophysical Coverage

Gravity station coverage is mostly in the reconnaissance category, with only small areas of regional coverage near the northern, southern and eastern boundaries of the area[6]. Aeromagnetic data was derived from relatively old data, flown at a spacing of about 400m, and is assessed as regional (Richardson, pers. comm.).

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[6]Richardson, R.G., & Leaman, D.E. 1987. TASGRAV-The Tasmanian gravity database. *Unpub. Rep. Dep. Mines Tasm.*1987/02.

(d) Mineralisation (Fig. 3)

No minerals are known to have been produced within the area, but coal, limestone, sandstone, limestone and clay have all been mined in peripheral areas and are almost certain to extend within the area of interest.

Coal has been mined intermittently near Mt. Lloyd, Berriedale and New Town, and the coal measures probably extend within the area of interest. Peripheral coal deposits include (MIRLOCH[7] Refs.): 81004, 81010, 82002, 82005 and 82006.

Triassic sandstone has been quarried for building stone at several localities peripheral to the area (82008, 82009, 82014, 82015, 82016 and 82018), and also occurs within the area of interest.

Permian limestone has been mined or prospected from several peripheral areas (including 82019, 82020, 82021, 82022), and would also occur within the area of interest.

Clays and shales of the Parmeener Supergroup have been mined and prospected for brickmaking in several peripheral areas (including 82024, 82025, 82027, 82028, 82029 and 82032), and would also extend within the area of interest.

Reports of gold and base metal mineralisation near Neika (? 82001) need confirmation.

(e) Previous Mineral Exploration

EL 26/79
This relatively large E.L. covered part of the Wellington Range, but no significant work was reported for the area of interest. Plans to explore inferred coal reserves in the Mt. Lloyd area in the exteme west were thwarted by logistical problems with isolation, terrain, dolerite cover and other factors.

El 30/80
This very large E.L. covered part of the Wellington Range, but no significant work was reported for the area of interest. Drilling and ground magnetic surveys were conducted at Lachlan, just north of this area. They indicated that little was known on the coal potential in SE Tasmania, but their studies on several widely spaced areas suggested that this part of Tasmania showed little encouragement for economically workable deposits.

E.L. 29/82
This area was applied for but not taken up.

EL1/85
This E.L. concentrated on the Mt. Lloyd Coal Field, and directly adjoined the area of interest. Three drillholes were completed and tests conducted, indicating inferred reserves of about 5 billion tonnes of saleable coal, some with relatively low ash. The lease was dropped due to overburden problems and poor geological control.

EL1/88
This E.L., held by Conga Oil Pty. Ltd., is current and all reports are on closed file. Details of the oil exploration are provided in the appendix.

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[7]Richardson, R.G. 1989. Fortran programs for the implementation of MIRLOCH (Revision 2). *Unpub. Rep. Dep. Mines Tasm.*1989/26.

ASSESSSMENT (Fig. 3)

(a) Quality of data

Most of the area has been mapped at the satisfactory scale of 1: 50,000, but this is now rather dated (>18yrs.)[8]. A small area in the west, around Mt. Lloyd, has been mapped at 1:25,000[9].

Gravity station coverage is in the reconnaissance category, and aeromagnetic data in the regional category.

No geochemical surveys in the area are known.

(b) Applicable mineral resource models

Metallic Resources

1. Cygnet-style gold mineralisation (associated with Cretaceous intrusives) within Parmeener Supergroup sequences.

2. Base metal sulphides and gold in unexposed subsurface Cambrian sequences (these Mt. Read-type sequences were intersected in the Glenorchy borehole).

3. Uranium in sandstones of the Parmeener Supergroup (directly equivalent to deposits in South Africa).

The confidence level is low due to lack of any known metallic mineralisation or exploration within or close to the area.

Non-metallic and fuel resources

1. Coal in Parmeener Supergroup.

2. Limestone in Parmeener Supergroup.

3. Building stone in Jurassic Dolerite and sandstones of the Parmeener Supergroup.

4.Construction materials.

5. Oil Shale in Parmeener Supergroup.

6. Brick clay in Parmeener Supergroup (Triassic mudstones).

7. Petroleum in Subsurface Ordovician sequences.

The confidence level is high to very high for most of these commodities (except petroleum and oil shale), despite the lack of any known formal exploration in the area, as most are known to occur locally.

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[8]Leaman, D.E. 1972. Tasmanian Geological Atlas 1: 50,000 Series. Sheet 82 (8312N). Hobart. Tas. Dept. Mines.

[9]Forsyth, S.M. & Bacon, C.A. 1987. Geology, stratigraphy, and petrography of the Mt. Lloyd coalfield. Tas. Dept. Mines. Unpub. Rept. 1987/10

GEOLOGY - SOUTHEASTERN TASMANIA

0 10 20 30 40 km

1 : 500,000

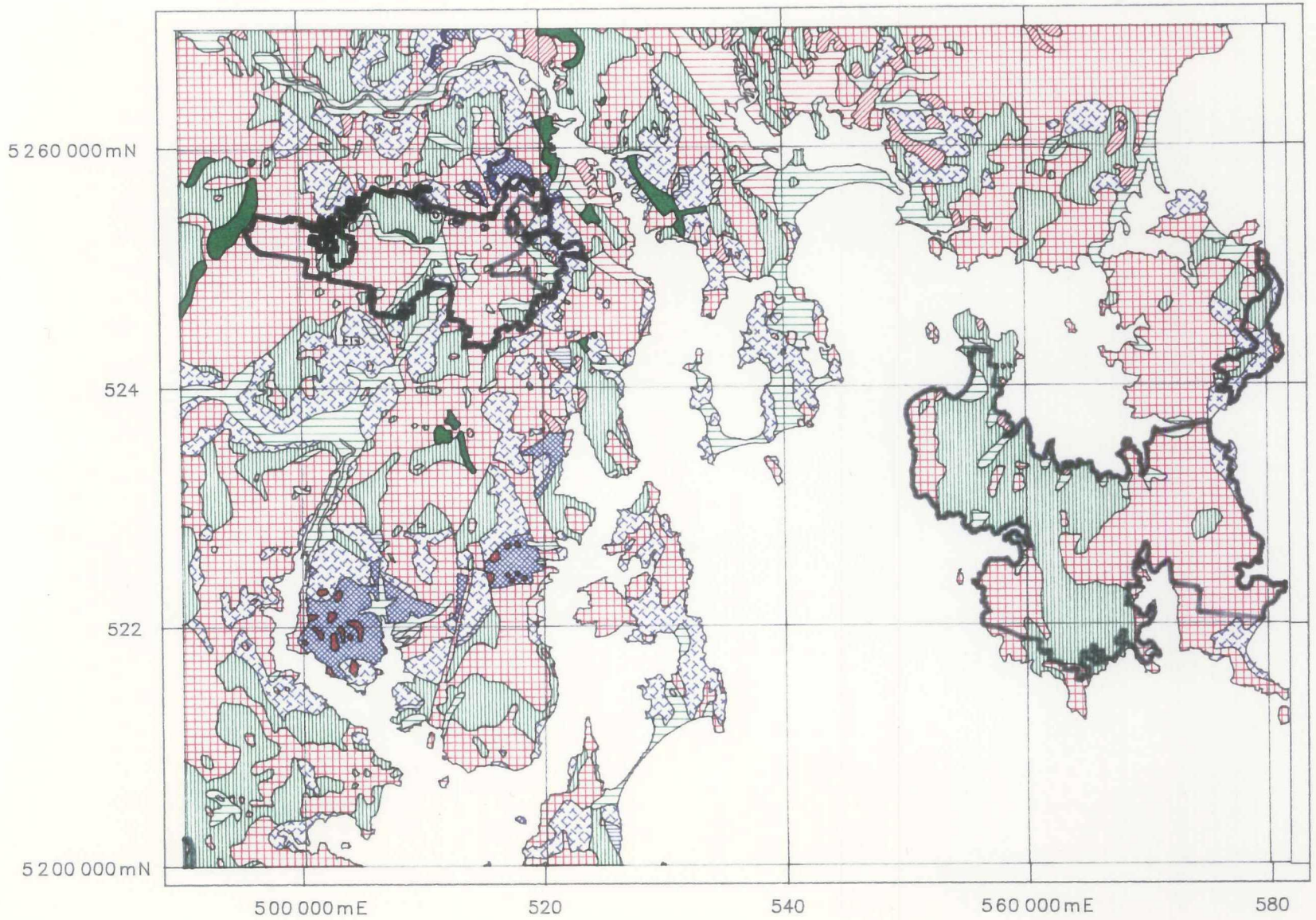
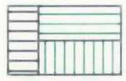


Figure 1

LEGEND - 1:500,000 TASMANIA, GEOLOGY



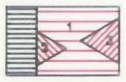
HOLOCENE

Alluvium, sand, gravel and talus.

PLEISTOCENE

Till, fluvioglacial, periglacial, and associated deposits.

Erosional surface.



TERTIARY

Non-marine sequences (1); marine limestone (2); basalt and related igneous rock types (3).

Low angle unconformity.

TRIASSIC
PERMIAN
UPPER CARBONIFEROUS

Fluvio-lacustrine sequences of sandstone, siltstone, mudstone (1) with carbonaceous sequences indicated (2). Fresh water sequence with some coal measures. — UPPER PARMEENER SUPER GROUP

Upper glacio-marine sequence of pebbly mudstone, pebbly sandstone and limestone. Fresh water sequence with some coal measures.

Lower glacio-marine sequence of pebbly mudstone, pebbly sandstone, minor limestone, Tasmanite oil shale and basal tillite. — LOWER

WESTERN TASMANIA

UPPER-MIDDLE DEVONIAN

Terrestrial cavern fillings (grid ref. 442 436) — EUGENANA BEDS

Unconformity attributed to the Tabberabberan Orogeny.

LOWER-DEVONIAN SILURIAN

Quartzite, sandstone, siltstone, and shale; Devonian limestone-siltstone (1) — ELDON GROUP & CORRELATES; SPERO BAY GROUP

ORDOVICIAN

Limestone sequence with siltstone in some areas.

Siliceous conglomerate, shallow water quartzose sandstone & siltstone. — JUNEE GROUP AND CORRELATES

CAMBRIAN

Middle-Upper Cambrian fossiliferous usually greywacke turbidite sequences (1); acid with intermediate volcanic and associated rocks dominant (2), basic-intermediate volcanic and associated rocks dominant (3); probably Cambrian unfossiliferous usually greywacke turbidite sequences (4); probably Cambrian unfossiliferous orthoquartzite sequence (5). — INCLUDING DUNDAS GROUP (fossiliferous); MT READ VOLCANICS AND OTHER FORMATIONS

Usually unconformity attributed to Cambrian movements; occasionally unconformity e.g. parts of western Tasmania

PRECAMBRIAN

Comparatively unmetamorphosed sequences. Orthoquartzite-mudstone sequences (1); quartzwacke turbidite successions (2); dolomite (3); basalt lava (4).

Metamorphic rocks of dominantly metaquartzite and pelitic sequences, amphibolite indicated (1).

EASTERN TASMANIA

Unconformity attributed to the Tabberabberan Orogeny.

LOWER DEVONIAN TREMADOCIAN-CAMBRIAN(?)

Micaceous quartzwacke turbidite sequences dominant (1); mudstone sequences dominant (2). — MATHINNA BEDS

IGNEOUS ROCKS

TERTIARY

Basalt and related rock types.

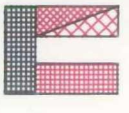
CRETACEOUS

Syenite.

Appinite.

JURASSIC

Dolerite and related rock types.

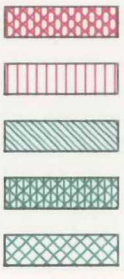


LOWER CARBONIFEROUS (?)-DEVONIAN

Dominantly adamellite-granite; biotite hypersthene-adamellite porphyry (1).

Dominantly granodiorite.

CAMBRIAN



Granitic rocks.

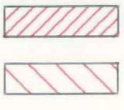
Coarser grained basic rocks

Serpentinite, peridotite and associated rocks.

Acid with intermediate volcanic and assoc. rocks.

Basic-intermediate volcanic and associated rocks.

PRECAMBRIAN



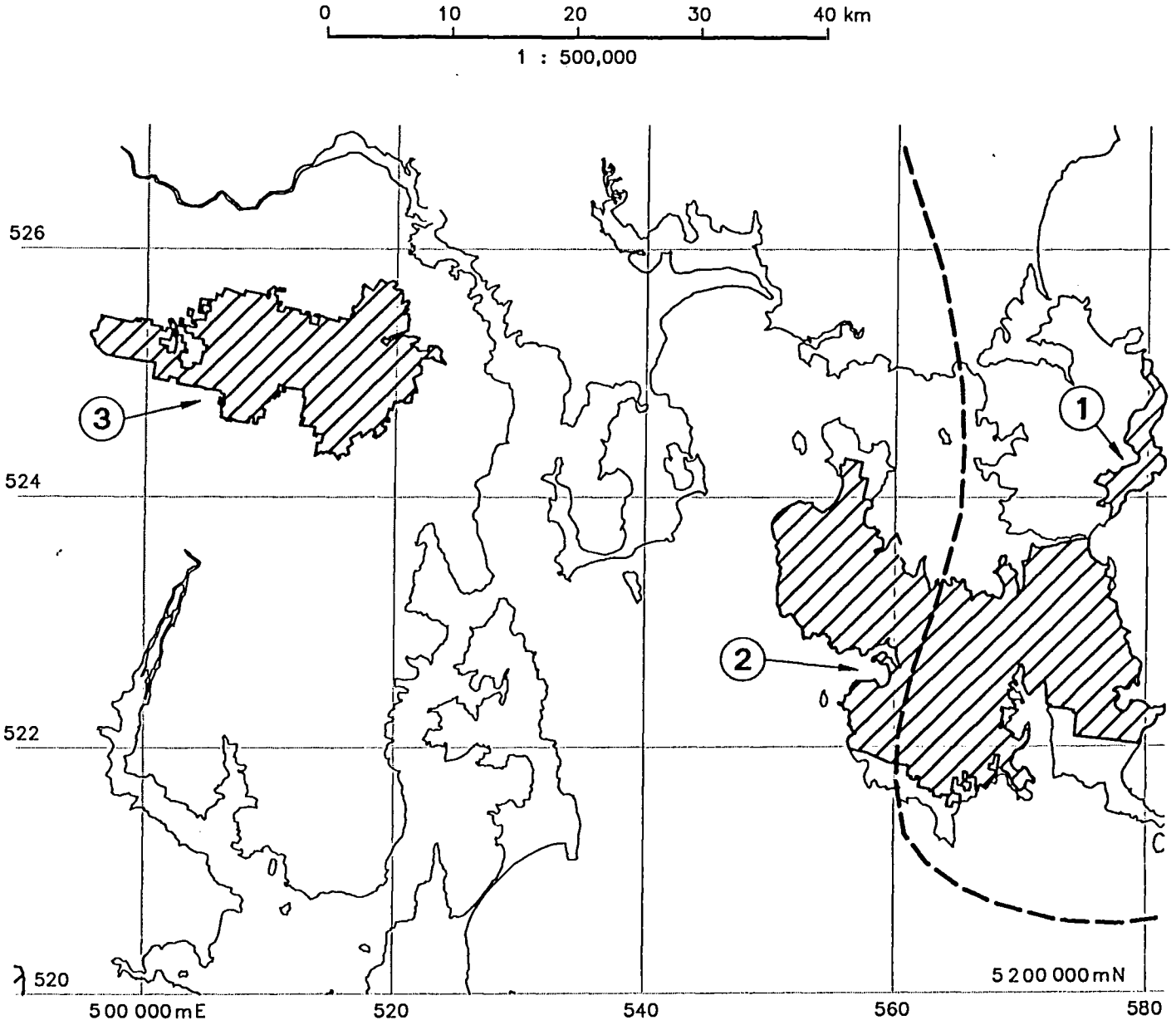
Granite.

Dolerite.

Figure 1a.

Figure 2

PROSPECTIVITY SUMMARY OF AREAS OF INTEREST SOUTHEASTERN TASMANIA



A. PROSPECTIVITY FOR METALLIC RESOURCES:

AREA 1: *Low for tin, gold and uranium.*

AREA 2: *Low for gold and uranium.*

AREA 3: *Low for gold, uranium and base metals.*

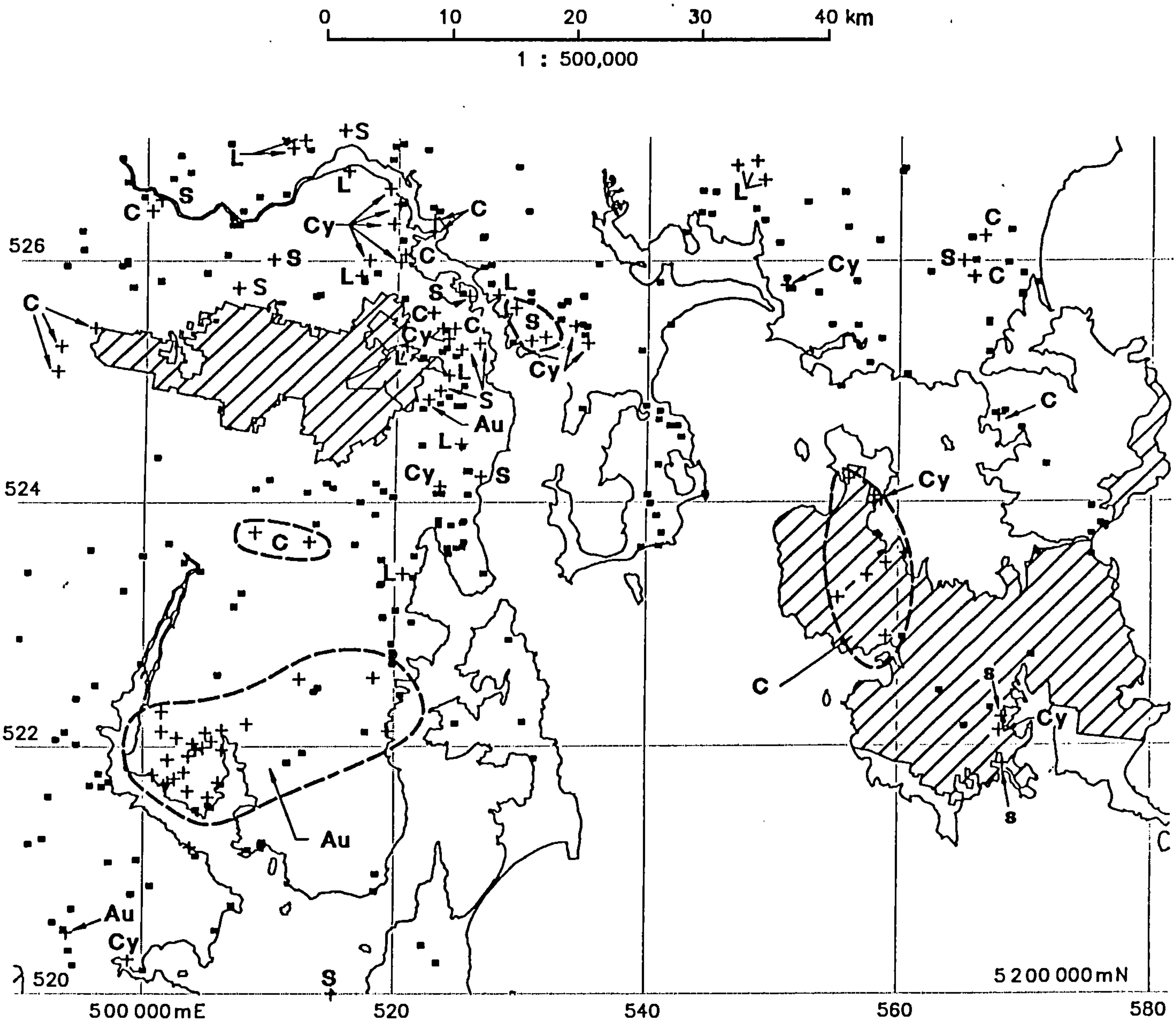
B. PROSPECTIVITY FOR NON-METALLIC RESOURCES, BUILDING AND CONSTRUCTION MATERIALS AND FUELS:

ALL AREAS: *Moderate to high*

——— *Approximate position of 1Km depth to granite. (shallowing to N.E.)*

Figure 3

MINERAL OCCURRENCES AND CONSTRUCTION MATERIAL WORKINGS SOUTHEASTERN TASMANIA



CROSSES (+) : METALLIC & INDUSTRIAL MINERALS

Au	:	*Gold (mostly placer)*	**Fe**	:	*Iron formations*
Bm	:	*Base Metals (Cu,Pb,Zn,Ba)*	**L**	:	*Limestone*
Sn	:	*Tin / Tungsten*	**Si**	:	*Silica*
PGM	:	*Platinum-Group Minerals ± Cr,Au,Ni,Cu, Asbestos*	**C**	:	*Coal*
Cy	:	*Clay*	**S**	:	*Sandstone*

SQUARES (▪) : CONSTRUCTION MATERIALS