

MRPA_05

**MINERAL RESOURCES POTENTIAL
ASSESSMENTS OF SELECTED AREAS
IN THE GREAT WESTERN TIERS, TASMANIA**

DEPARTMENT OF RESOURCES AND ENERGY

DIVISION OF MINES AND MINERAL RESOURCES

OCTOBER 1990

CONTENTS

	PAGE
INTRODUCTION	2
DEFINITIONS	3
PRESENTATION	5
CONCLUSIONS	6
AREA 1. PINE RIVER AND CLARENCE LAGOON	8
AREA 2. SANDBANKS TIER AND MILLERS BLUFF	13
AREA 3. QUAMBY BLUFF AND WARNERS SUGAR LOAF	20
AREA 4. MOTHER CUMMING PEAK, SASSAFRAS CREEK AND LITTLE FISHER RIVER	25
AREA 5. BORRADAILE PLAINS AND ARM RIVER	34
BIBLIOGRAPHY	38
APPENDIX 1. GEOLOGICAL MAPPING PROGRAMS	39
APPENDIX 2. ASSESSMENT OF GEOPHYSICAL COVERAGE	42

LIST OF FIGURES

- Figure 1. Areas of mineral resource assessment, Great Western Tiers.
- Figure 2. Preliminary mineral resource potential zones, Great Western Tiers.
- Figure 3. Geological legend (1:½ M), Tasmania.
- Figure 4. Geological map (1:½ M), Great Western Tiers.
- Figure 5. Confidence levels of geological mapping, Great Western Tiers.
- Figure 6. Gravity station coverage, Great Western Tiers.
- Figure 7. Mineral and construction materials occurrences, Great Western Tiers.

INTRODUCTION

At the request of the Mining Forum, five selected areas of the Great Western Tiers and adjacent areas of the Central Plateau have been assessed for their mineral resource potential.

The assessments are preliminary. There have been no detailed synthesis or reinterpretation of the surveys carried out by mineral exploration companies nor have all relevant data from open file company reports been considered.

DEFINITIONS

A previous report by the Division entitled "Contrasting Approaches to the Assessment of Mineral Resource Potential" adopted preferred definitions of the various classes - high, moderate, low and unknown. These definitions are restated below.

A HIGH MINERAL RESOURCE POTENTIAL exists where the geological characteristics favourable for resource accumulation are known to be present, or where enough of these features are present to support the relevant genetic model and where there is evidence that mineralisation, not necessarily of economic size or grade, has taken place.

A MODERATE MINERAL RESOURCE POTENTIAL exists where the geological data suggest that the factors favourable for formation of a class of deposit are present or can be reasonably inferred, or where the geological features of the area show a reasonable degree of fit with those of the deposit class considered. There need not be evidence of mineralisation in the area.

A LOW MINERAL RESOURCE POTENTIAL exists where the geological conditions suggest that mineral concentrations are unlikely and that the relevant genetic model cannot be supported. As noted by Taylor and Steven (1983), this requires an element of positive knowledge.

A category of UNKNOWN MINERAL RESOURCE POTENTIAL is used in situations where either the geoscientific data base is inadequate to assess the likelihood of the resource accumulation, or the relevant deposit models are so poorly understood that a reasonable assessment cannot be made. This definition is not to be equated with low mineral resource potential, but takes into account a high degree of uncertainty or incompleteness in the available information.

It is important to remember that a mineral resource potential assessment is a product of the circumstances prevailing at any one time. As the available data, theoretical concepts, exploration techniques, metallurgical and mining practices, commodity prices and patterns of use all change with time, so will the assessments.

As in other branches of science, exploration concepts and ore genesis theories are at the mercy of future discoveries. Therefore it is essential to provide for periodic, if not continuing, resource assessments so that new, emerging information can be applied to all areas of Tasmania.

PRESENTATION

The format of the report follows that of a previous report by the Division "Mineral resource potential assessments of selected areas in Central to Southern Tasmania."

Each area (Figure 1) is treated separately under the headings "DATA" and "ASSESSMENT". In the data section, there are accounts of the geological (Figure 4), geophysical (Figure 6) and previous mineral exploration coverages as well as a geological summary and a list of the known mineral occurrences (Figure 7). The reports of previous mineral exploration are held in the OPEN FILE by the Division of Mines and Mineral Resources and form an invaluable data base of great importance for the State's mineral resources. The reports relevant to current exploration licences are held in confidence in the CLOSED FILE for a period of five years.

In the assessment section, the adequacy of the geological (Figure 5), geophysical (Figure 6) and geochemical coverage is reviewed, the applicable mineral resource models are listed and areas are assigned appropriate resource potential zones (Figure 2).

CONCLUSIONS

The zones of greatest mineral resource potential - the high and moderate category - correspond with the exposed pre-Permian basement near Borradaile Plains, Mole Creek and the little Den area near Lake River. In the former two areas, the potential is further enhanced by the presence of granite within some 4 km of the surface.

The zones which have substantial areas covered by dolerite are assigned an unknown classification due to lack of information.

The zones in which the Parmeener Supergroup representatives are exposed are assigned a low category for coal, oil shale and metallics (palaeoplacers), except where oil shale is known in the vicinity, and an unknown category for metallics in the basement.

An unknown category for petroleum has been assigned to all areas based on the assessment in Appendix 2 of the Division's report on Central and Southern Tasmania.

Construction materials and to some extent building stone are of locally high potential because they are commodities of convenience and accessibility.

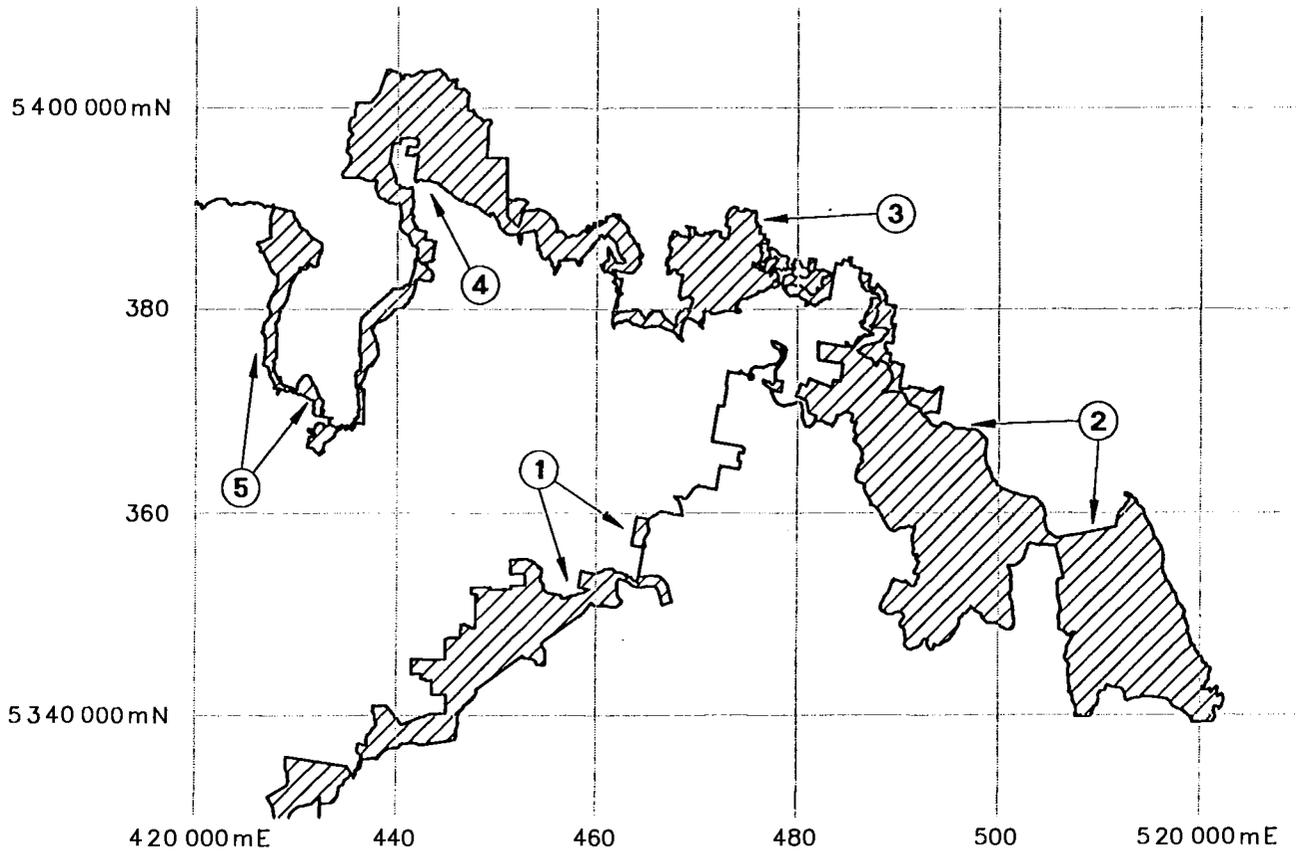
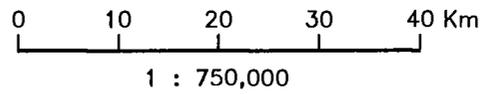
For all of the areas considered, geological and geophysical coverage is inadequate to achieve a level of confidence necessary for satisfactory resource potential assessment.

Appendix 1 lists the cost of upgrading the geological mapping to present-day 1:50,000 mapping standards.

Geophysical coverage is important in estimating subsurface depths to granite, the possible compositions of the basement and the thickness of the covering Parmeener Supergroup and Jurassic dolerite. The costs of acquiring the necessary information are estimated in Appendix 2.

Eventually, a programme of deep drilling will be required to define the broad composition of the Pre-Permian basement particularly in areas which are covered by large expanses of cover sequences (specifically Areas 1 and 2 of this report) like the entire Central Plateau.

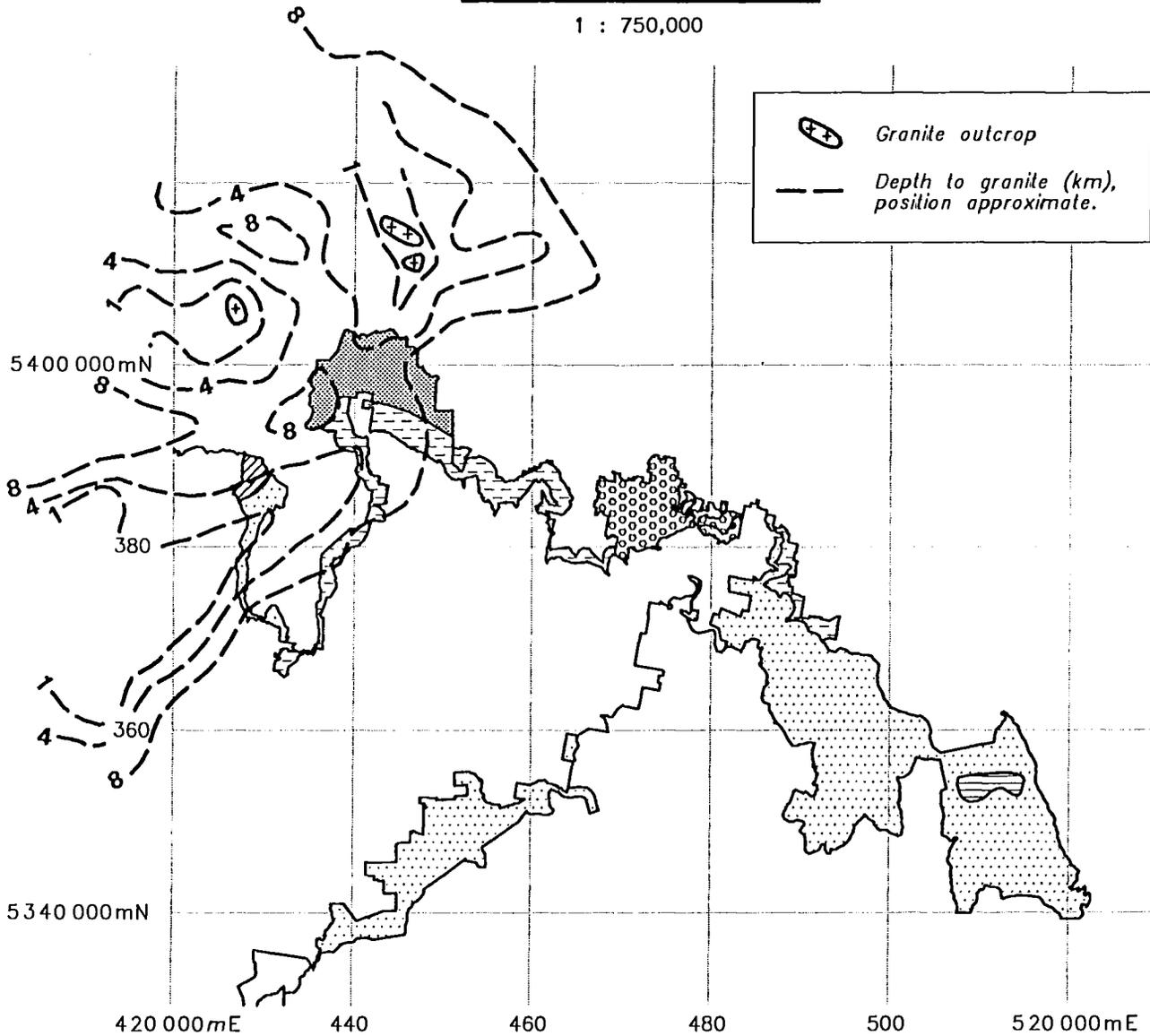
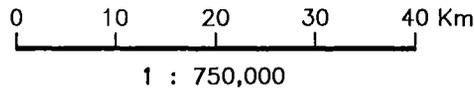
AREAS OF MINERAL RESOURCE ASSESSMENT GREAT WESTERN TIERS



1. *Pine River and Clarence Lagoon.*
2. *Sandbanks Tier and Millers Bluff.*
3. *Quamby Bluff and Warners Sugar Loaf.*
4. *Mother Cummings Peak, Sassafras Creek and Little Fisher River.*
5. *Borraddale Plains and Arm River.*

Figure 1.

PRELIMINARY MINERAL RESOURCE POTENTIAL ZONES GREAT WESTERN TIERS



Granite outcrop
 Depth to granite (km),
position approximate.

MINERAL RESOURCE POTENTIAL



Moderate for vein tin-tungsten and gold-molybdenum deposits; low for diamonds



Low for coal and oil shale, low for palaeoplacers and uranium, unknown for metallics in pre-Permian basement



Unknown for coal and oil shale; palaeoplacers and uranium, and metallics in pre-Permian basement



Moderate for oil shale, low for palaeoplacers, uranium and coal, unknown for metallics in pre-Permian basement



High for lead-zinc deposits and limestone, moderate for gold strobound and vein deposits, moderate for skarn, replacement and vein tin-tungsten deposits

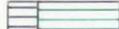
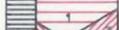
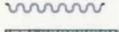


High for Cambrian base and precious metal deposits

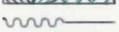
Petroleum potential of Great Western Tiers - unknown
 All areas locally high for construction materials and building stone

Figure 2.

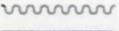
LEGEND - 1:500,000 TASMANIA, GEOLOGY

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

WESTERN TASMANIA

UPPER-MIDDLE DEVONIAN		Terrestrial cavern fillings (grid ref. 442 436)	EUGENANA BEDS
		Unconformity attributed to the Tabberabberan Orogeny.	
LOWER-DEVONIAN		Quartzite, sandstone, siltstone, and shale;] ELDON GROUP & CORRELATES;] SPERO BAY GROUP
SILURIAN		Devonian limestone-siltstone (1)	
ORDOVICIAN		Limestone sequence with siltstone in some areas.] JUNEE GROUP AND] CORRELATES
		Siliceous conglomerate, shallow water quartzose sandstone & siltstone.	
			
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		Micaceous quartzwacke turbidite sequences dominant (1); mudstone sequences dominant (2).	MATHINNA BEDS
TREMADOCIAN-CAMBRIAN(?)			

IGNEOUS ROCKS

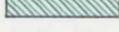
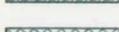
TERTIARY		Basalt and related rock types.		Granitic rocks.
CRETACEOUS		Syenite.		Coarser grained basic rocks
		Appinite.		Serpentinite, peridotite and associated rocks.
JURASSIC		Dolerite and related rock types.		Acid with intermediate volcanic and assoc. rocks.
				Basic-intermediate volcanic and associated rocks.
LOWER CARBONIFEROUS (?) - DEVONIAN		Dominantly adamellite-granite; biotite hypersthene-adamellite porphyry (1).		Granite.
		Dominantly granodiorite.		Dolerite.

Figure 3

GEOLOGY - GREAT WESTERN TIERS

0 10 20 30 40 km

1 : 500,000

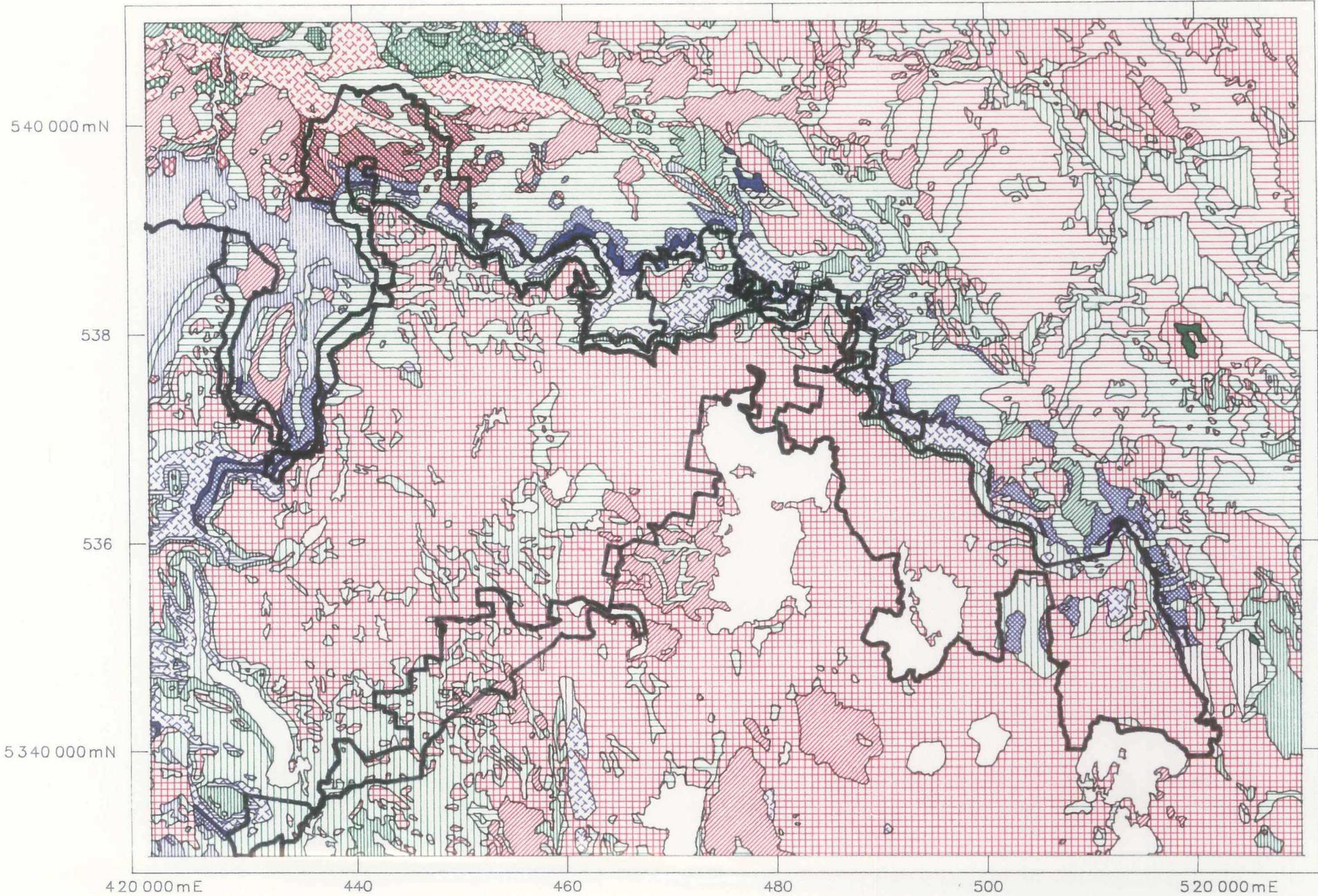
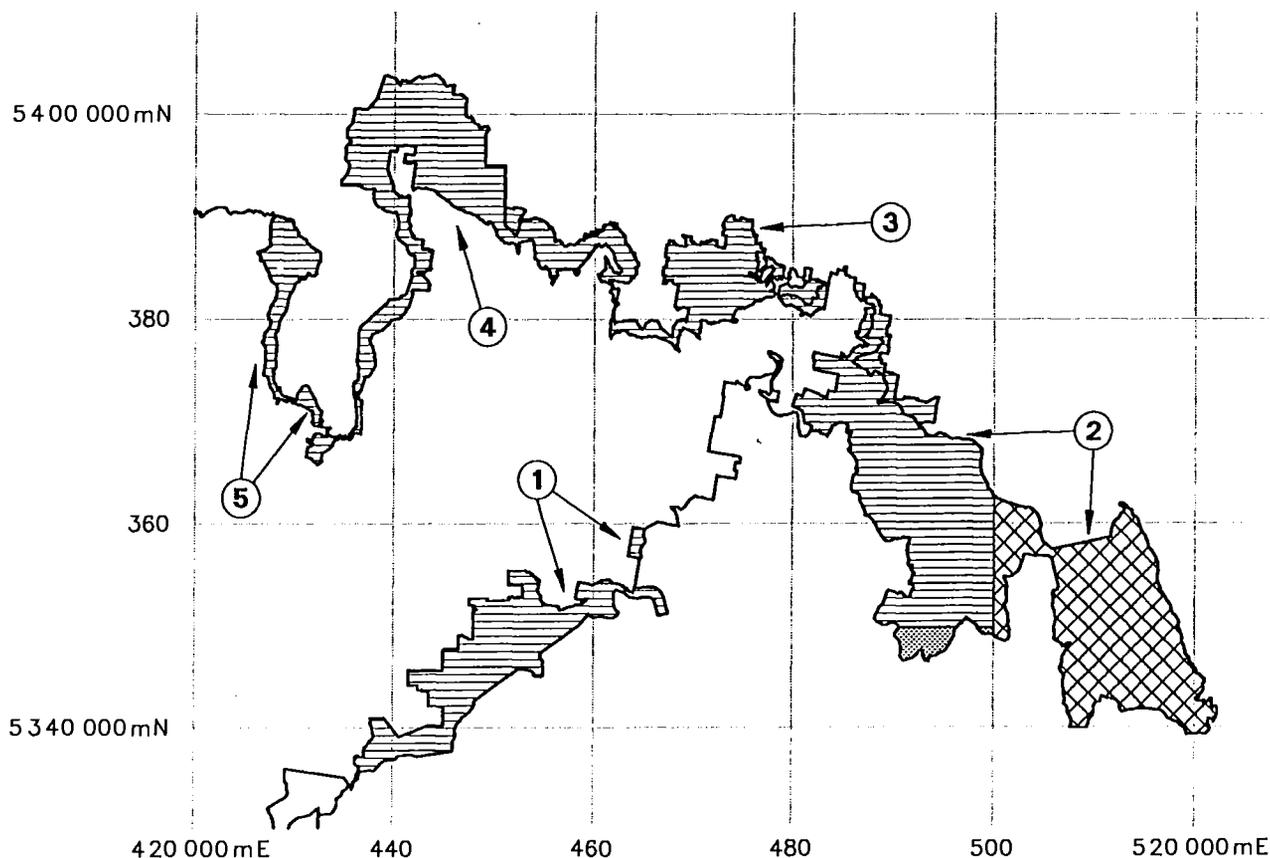
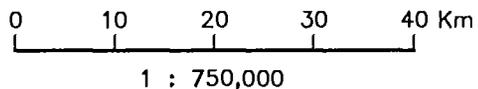


Figure 4

CONFIDENCE LEVELS OF GEOLOGICAL MAPPING IN AREAS OF MINERAL RESOURCE ASSESSMENT GREAT WESTERN TIERS



AREAS



Mapping of sufficiently detailed scale and currency for preliminary assessment.

1. Pine River and Clarence Lagoon.



Mapping on sufficiently detailed scale but too old for preliminary assessment. Acceptable with check traverses.

2. Sandbanks Tier and Millers Bluff.

3. Quamby Bluff and Warners Sugar Loaf.

4. Mother Cummings Peak, Sassafras Creek and Little Fisher River

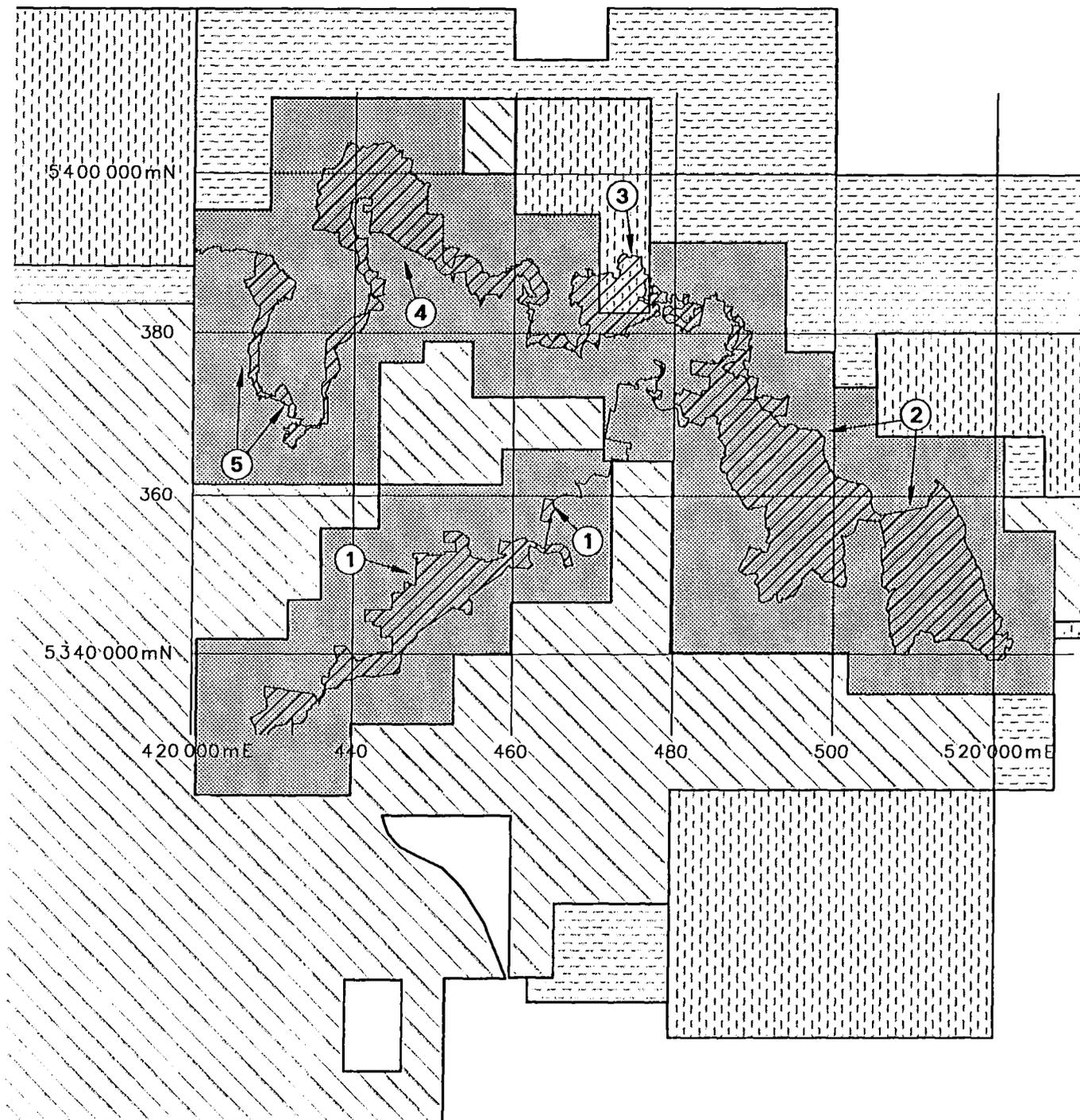
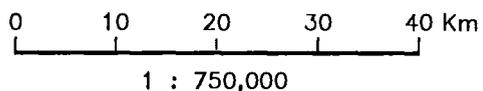


Reconnaissance information only, largely photointerpretation Mapping at 1 : 50000 scale required for preliminary assessment.

5. Borradale Plains and Arm River

Figure 5.

**GRAVITY STATION COVERAGE (EXISTING AND REQUIRED).
AREAS OF MINERAL RESOURCE ASSESSMENT
GREAT WESTERN TIERS**



 Existing coverage of 1 station / sq.km.

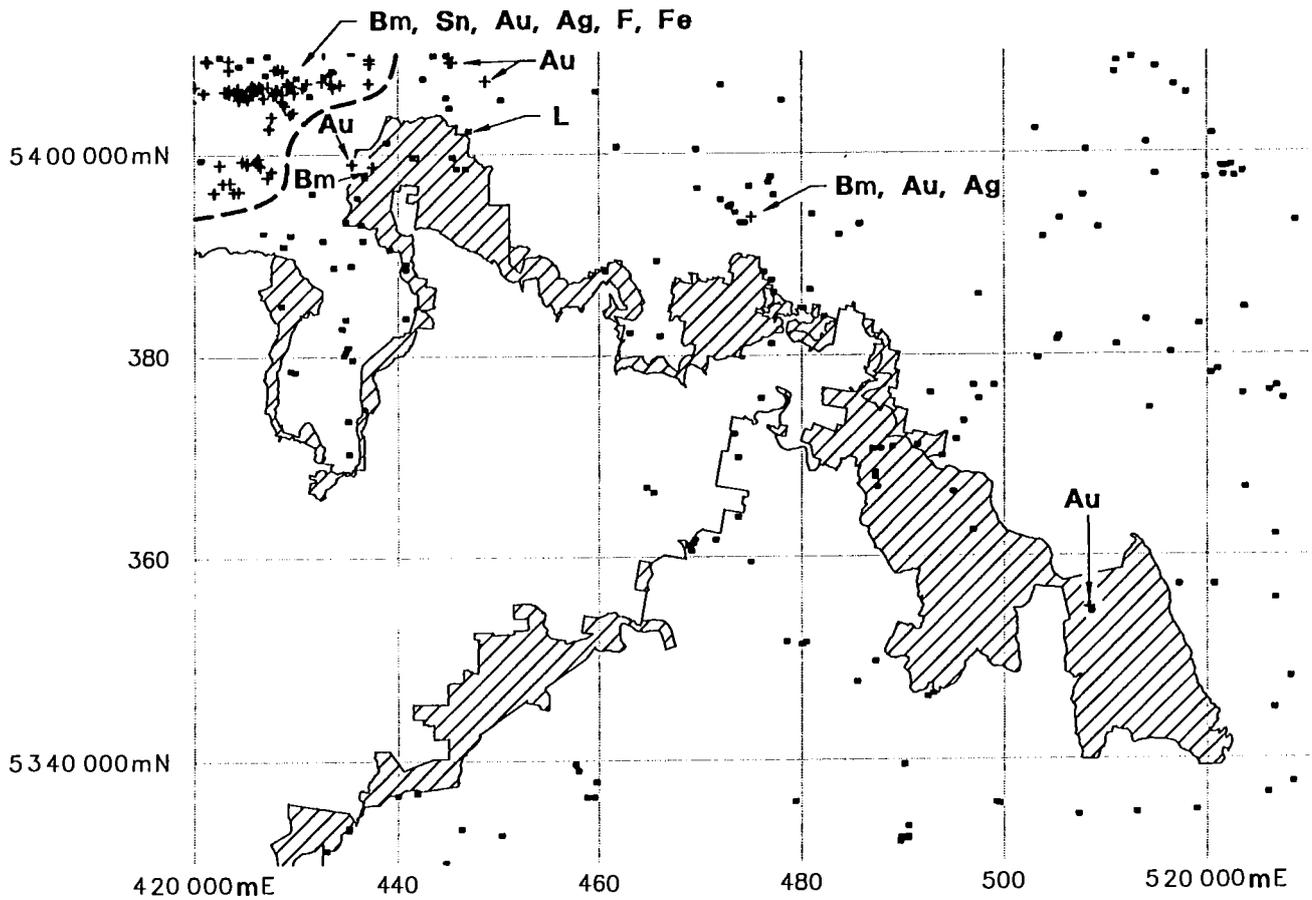
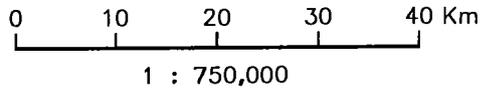
 Area for which additional cover required to give 1 station / sq. km.. Existing coverage of about 1 station / 50 sq.km. with less than 10% of area at close station spacing.

 Existing coverage of 1 station / 9 sq.km. or closer

 Area for which additional cover required to give 1 station / 9 sqkm. Existing coverage of about 1 station / 50 sq.km. with less than 10% of area at close station spacing.

Figure 6.

MINERAL AND CONSTRUCTION MATERIAL OCCURRENCES GREAT WESTERN TIERS



CROSSES (+) : METALLIC & INDUSTRIAL MINERALS	
Au : Gold (including placer)	Fe : Iron
Bm : Base Metals (Cu,Pb,Zn)	L : Limestone
Sn : Tin / Tungsten	F : Fluorite
Ag : Silver	
SQUARES (■) : CONSTRUCTION MATERIALS	

Figure 7.

AREA 1. PINE RIVER AND CLARENCE LAGOON

LOCATION

Situated between Lake St Clair and Great Lake, Central Plateau (Figure 1).

DATA

(a) Geological Maps

Blake, F., Everard, G.B., Voisey, A.H., Mckellar, J.B.A., 1956. Tasmanian Geological Atlas 1 mile to 1 inch Series, Zone 7, Sheet No. 53, Great Lake. Dep.Mines Tasm.

Gulline, A.B. and Forsyth, S.M. 1976. Tasmanian Geological Atlas 1:250 000 Series. SK55-6. Oatlands, Dep.Mines Tasm.

Corbett, K.D. and Brown, A.V. 1975. Geological Atlas of Tasmania 1:250 000 Series, Sheet SK55-5, Queenstown. Dep.Mines Tasm.

Gulline, A.B., Longman, M.J., Matthews, W.L. 1963. Tasmanian Geological Atlas 1 mile to 1 inch Series, Zone 7, sheet No. 59, St Clair. Dep.Mines Tasm.

Jennings, I.B., MacLeod, W.N., Burns, K.L., Jack, R.H., Matthews, W.L., Robinson, R.G., Threader, V.M. 1961. Tasmanian Geological Atlas 1 mile to 1 inch Series, Zone 7, Sheet No. 52, Du Cane. Dep.Mines Tasm.

The entire area is covered by 1 inch to 1 mile geological mapping published in the 1956 to 1963 period. The level of mapping at least in the eastern half of the Du Cane map sheet is restricted to photogeological methods (MacLeod and Threader, 1961).

The above mapping was compiled into the 1:250 000 sheets - Oatlands and Queenstown.

(b) Geological Summary

The bedrock is predominantly Jurassic dolerite with some Tertiary basalt protecting Triassic sandstones and shales (Ossa Formation) overlying the dolerite in the centre of the area (Figure 4).

In the south west of the area, near Lake St Clair, unconsolidated Quaternary deposits including glacial types up to 30 m thick obscure dolerite bedrock. (Gulline, 1965).

The dolerite thickness is not precisely known in the area but nearby (Lake St Clair) it can be as much as 400 m. The pre-Permian basement is of unknown composition and depth.

(c) Geophysical Coverage

Richardson, R.G., Leaman, D.E. 1987. Tasgrav - the Tasmanian gravity data base. Rep.Dep.Mines Tasm. 1987/02.

Few gravity stations have been measured within this area of interest. Gravity coverage on the surrounding area is based on stations about 7 km apart i.e. reconnaissance standard.

Aeromagnetic data is of reconnaissance standard with flight line spacing of 1.5 km by Bureau of Mineral Resources (BMR) in 1985.

(d) Mineralisation

No known occurrences of metallic minerals or coal.

Along the southern margin of the area and to the north east, dolerite, basalt and gravel have been extracted for road making materials (Figure 7). To the east near Mienna, a Tertiary basalt is currently being extracted for high quality ornamental, black stone.

(e) Previous mineral exploration

EL 25/79

This licence was issued for zeolites, bentonites, bauxites and related industrial minerals within Tertiary basalts. The licence area was just west of Great Lake and encroached marginally on Area 1. The licence was given up without any work being carried out.

EL 31/80

This was a large licence for coal, oil shale and petroleum stretching from Lake King William to Coles Bay. It covered most of Areas 1 and 2. Exploration led to the discovery and evaluation of the Woodbury coal deposits. Other than occasional rock sampling, there is no record of work being carried out in the above areas.

Reference: Wiltshire, M.J. 1980. EL 31/80, Tasmania, oil shale, coal and petroleum prospects for Victor Petroleum and Resources Ltd. Tasm.Dept.Mines TCR 81-1562A.

EL 1/88

This current licence covers a large part of eastern Tasmania including most of Areas 1, 2, 3 and 4. It is held by Conga Oil Pty Ltd to explore for petroleum.

EL 17/90

This is a licence application which covers most of the western half of Tasmania including all of Area 5 and parts of Areas 1 and 4. The application is by Conga Oil Pty Ltd to explore for petroleum.

Assessment

(a) Quality of data

The entire area is covered by 1 inch to 1 mile geological mapping on a sufficiently detailed scale for preliminary assessment but it is more than 20 years old and at least part of it is restricted to photogeological methods (Figure 5).

Gravity station coverage is of reconnaissance standard only and is not adequate for the precise determination of subsurface structures of shallow to moderate depth (Figure 6).

Aeromagnetic data is also only of reconnaissance standard.

There is no record of geochemical exploration.

(b) Mineral Resource Models

Metallic Resources

1. Palaeoplacers (tin, gold, chromite, platinum group elements) in basal Parmeener Supergroup sediments.
2. Uranium in sandstones of the Parmeener Supergroup (equivalent to deposits in S. Africa).
3. Metallic deposits in pre-Permian basement.

Potential is unknown due to lack of any known metallic minerals in the area and the dolerite cover. Depth and composition of the pre-Permian basement is poorly known (Figure 2).

Non-metallic and Fuel Resources

1. Coal and oil shale in Parmeener Supergroup.
2. Petroleum sourced in Ordovician carbonates.
3. Construction materials.
4. Building and ornamental stone in Tertiary basalt and Jurassic dolerite.
5. Zeolites, clays and bauxites in Tertiary basalt.

Potential is unknown for coal, oil shale, petroleum, zeolites, clay and bauxite but high for construction materials, building and ornamental stone (Figure 2).

AREA 2. SANDBANKS TIER AND MILLERS BLUFF

LOCATION

East of Great Lake, covering Arthurs Lake and north of Lake Sorell, Great Western Tier (Figure 1).

DATA

(a) Geological Maps

Barton, C.M., Bravo, A.P., Gulline, A.B., Longman, M.J., Marshall, B., Matthews, W.L., Moore, W.R., Naqvi, I.H., Pike, G.P., 1969. Tasmanian Geological Atlas 1 mile to 1 inch Series, Zone 7, Sheet No. 46 (8214N), Quamby. Dep.Mines Tasm.

Blake, F., Everard, G.B., Voisey, A.H., Mckellar, J.B.A., 1956. Tasmanian Geological Atlas 1 mile to 1 inch Series, Zone 7, Sheet No. 53, Great Lake, Dep.Mines Tasm.

Forsyth, S.M., 1986. Tasmanian Geological Atlas 1:50 000 Series, Sheet No. 61 (8313N), Interlaken. Dep.Mines Tasm.

Gulline, A.B. and Forsyth, S.M. 1976. Tasmanian Geological Atlas 1:250 000 Series. SK55-6. Oatlands. Dep.Mines Tasm.

Matthews, W.L., 1974. Tasmanian Geological Atlas 1:50 000 Series, Sheet No. 54 (8314S), Lake River. Dep.Mines Tasm.

McClenaghan, M.P. and Baillie, P.W. 1974. Tasmanian Geological Atlas 1:250 000 Series, Sheet SK55-4, Launceston. Dep.Mines Tasm.

The western part of the area is covered by 1 inch to 1 mile geological mapping published between 1956 and 1969. The eastern part of the area has 1:50 000 mapping published between 1974 and 1986.

The above information (apart from Interlaken 1986) was used in compiling the 1:250 000 sheets - Oatlands and Launceston.

(b) Geological Summary

Throughout the whole area, the bedrock is largely Jurassic dolerite. However, the northern fringes of the area encroach on the underlying Parmeener Supergroup formations exposed on the scarp face of the Great Western Tiers (Figure 4).

In the western part of the area, the northern boundary includes Triassic formations and also encroaches onto underlying Permian formations between Dry Bluff and Billop Bluff.

In the eastern part of the area, the northern boundary encroaches on underlying Triassic and Permian formations. Drainage dissection of dolerite has exposed two areas of underlying Permian sediments near Stevensons Lookout, the western area revealing Cambrian volcanics below the Permian.

Throughout the area, the high relief of the dolerite produces talus deposits which obscure the underlying Parmeener Supergroup rocks particularly the Triassic.

The dolerite thickness is variable throughout the area. On the plateau of the Great Western Tiers, the thickness is about 200 m (Pike, 1973) or 400 to 500 m maximum thickness if the highest peaks are considered. To the east, dissection has reduced the thickness to the point where in places the dolerite is absent having been removed completely by erosion.

(c) Geophysical Coverage

Reference as for Area 1.

Gravity station coverage approaches regional in the south of the area. Elsewhere the coverage is of a reconnaissance nature only.

Aeromagnetic data is of reconnaissance standard (see Area 1).

(d) Mineralisation

From Tasm. Dep. Mines data base MIRLOCH. Reference numbers relate to MIRLOCH.

54001 508,400 m E 5,355,000 m N. Little Den (Lake River) Goldfield. Alluvial gold occurrence.

54002 508,400 m E 5,355,000 m N Faulkners Adit. Gold veins in Cambrian volcanic rocks (Mt. Read Volcanics correlates).

In the north of the area near Poatina, dolerite and Permian mudstone have been extracted for road making materials. Also Permian siltstone has been used for the same purpose in the Lake River area (Figure 7).

Mineralisation and construction materials are known in the following localities peripheral to Area 2.

Unlisted 501,100 m E 5,365,500 m N. The Glen, Sulphides in Cambrian limestone. Adits.

Unlisted 516,800 m E 5,358,400 m N near Bicton, Permian limestone used for mortar production.

Unlisted 515,700 m E 5,366,200 m N NW of Bicton, Triassic sandstone quarried for building stone.

(e) Previous mineral exploration

EL 17/79

This licence was composed of 4 parts - one of which (Golden Valley and Bracknell) occupied the northern portions of Areas 2, 3 and 4. The subject of the licence was mainly oil shale exploration.

Apart from some limited channel sampling, no new work was carried out.

Reference: Glazebrook, C. 1980. Tasmanian oil shale prospects. Final Report for Petro Quest Pty Ltd. Tasm.Dept.Mines TCR 80-1449.

EL 31/79

The purpose of this licence application was to cover Cambrian rocks for all metallic minerals including gold. The licence encroached on Area 2 including the Little Den goldfield. The application was withdrawn due to difficulties with private land owners.

EL 31/80

This was a large licence for coal, oil shale and petroleum stretching from Lake King William to Coles Bay. It covered most of Areas 1 and 2. Exploration led to the discovery and evaluation of the Woodbury coal deposits. Other than occasional rock sampling, there is no record of work being carried out in the above areas.

Reference: Wiltshire, M.J. 1980. EL 31/80, Tasmania, oil shale, coal and petroleum prospects for Victor Petroleum and Resources Ltd. Tasm.Dep.Mines TCR 81-1562A.

EL 43/80

The intention of this licence was to prospect for coal, oil shale and oil in parts of Areas 2, 3, 4 and 5. The application was lodged by North West Bay Co. Pty Ltd and eventually withdrawn before issue.

EL 65/80

This licence covered part of Areas 2. The target was gold and base metal mineralisation related to Cambrian volcanic-derived sediments. Geochemical exploration - bulk leach, stream sediment and rock chip sampling - failed to locate any significant anomalies.

Reference: Carter, D.N. 1985. EL 65/80 - O'Connors Peak. Relinquishment report. Billiton Aust.Tasm.Dep.Mines TCR 85-2462.

EL 40/82

This licence, which encroached onto the northern margins of Areas 2 and 3, was for coal exploration. Field activities consisted of geological traverses along roads. It was concluded that both the Permian and Triassic sequences had zero coal potential.

Reference: Summons, T.G. 1984. Bracknell EL 40/82. Exploration report for the year ending 12th August, 1984. CRA Exploration Pty Ltd. Tasm.Dep.Mines TCR 84-2199.

EL 42/82

This licence covered part of Area 2 and was taken out for coal, oil and shale. Data evaluation and numerous road traverses indicated that the Permian and Triassic sequences had very low potential for coal.

Reference: Summons, T.G. 1984. O'Connors Peak EL 42/82. First and final report. CRA Exploration Pty Ltd. Tasm.Dep.Mines TCR 84-2167.

EL 1/88

This current licence covers a large part of eastern Tasmania including most of Areas 1, 2, 3 and 4. It is held by Conga Oil Pty Ltd to explore for petroleum.

Assessment

(a) Quality of data

Most of the area has been geologically mapped at the acceptable scale of 1:50,000 or the equivalent 1 inch to 1 mile but, with the exception of Interlaken, all maps are over or close to twenty years old (Figure 5).

About 5% of the area, at the southern end of Arthurs Lake, has not been mapped at scale other than 1:250,000.

Gravity station coverage and aeromagnetic data is hardly better than reconnaissance standard and is not adequate for the precise determination of subsurface structures of shallow to moderate depth. (Figure 6).

Geochemical exploration has occurred on the northern fringes of the area but has not been attempted within the bulk of this area.

(b) Mineral Resource Models

Metallic Resources

1. Base and precious metal deposits in Cambrian volcanic and associated sediments (possible Mt Read correlates).
2. Palaeoplacers in basal Parmeener Supergroup sediments.
3. Uranium in sandstones of the Parmeener Supergroup.

Potential is low to unknown for palaeoplacers and uranium due to lack of known occurrences in the area and the covering dolerite. Potential is locally high for Cambrian metallic deposits. Exploration has taken place but has been restricted due to difficulties with private land owners. Precise depth and composition of basement is poorly known. (Figure 2).

Non-metallic and Fuel Resources

1. Coal and oil shale in Parmeener Supergroup.
2. Petroleum sourced in Ordovician Carbonates.
3. Construction materials e.g. dolerite and Permian mudstone and siltstone.
4. Limestone in Permian sediments.

5. Building stone in Triassic sandstone and Jurassic dolerite.

Potential is low to unknown for coal and oil shale and unknown for petroleum but high for construction materials, building stone and limestone (Figure 2).

AREA 3. QUAMBY BLUFF AND WARNERS SUGAR LOAF

LOCATION

North-facing slopes of Great Western Tiers (just north of Great Lake) from Drys Bluff to Bastion Bluff taking in the outliers of Warners Sugar Loaf and Quamby Bluff (Figure 1).

DATA

(a) Geological Maps

Barton, G.M., Bravo, A.P., Gulline, A.B., Longman, M.J., Marshall, B. Matthews, W.L., Moore, W.R., Naqvi, I.H., Pike, G.P., 1969. Tasmanian Geological Atlas 1 mile to 1 inch Series, Zone 7, Sheet No. 46 (8214N), Quamby. Dep.Mines Tasm.

McClenaghan, M.P. and Baillie, P.W. 1974. Tasmanian Geological Atlas 1:250 000 Series, Sheet SK55-4, Launceston. Dep.Mines Tasm.

The area is covered by 1 inch to 1 mile geological mapping published in 1969 and compiled into the Launceston 1:250 000 sheet in 1974.

(b) Geological Summary

The bedrock of this area is predominantly Parmeener Supergroup with both Triassic and Permian sediments represented. These rocks are covered by Jurassic dolerite and partially obscured by dolerite talus on the face of the Great Western Tiers scarp from Bastion Bluff to Drys Bluff and also on the two outliers of Warners Sugar Loaf and Quamby Bluff (Figure 4).

Lower Palaeozoic rocks including Cambrian sediments with contained volcanic material are exposed in a north west trending belt ending at Golden Valley just north of this area.

Structural consideration suggest that these rocks could be present 300 to 500 m below the Permian bedrock surface in this area and that Ordovician limestone or conglomerate could be the most likely representatives.

(c) Geophysical Coverage

Reference as for Area 1.

Gravity station coverage approaches regional in about 50% of the area (about 1 km apart). The remainder is reconnaissance in data coverage. Good regional coverage is present to the north of the area.

Aeromagnetic data is of reconnaissance standard (see Area 1).

(d) Mineralisation

There are no known occurrences of metallic minerals or coal in the area.

Some 4 km north of Quamby Bluff, a mineralised area occurs in Cambrian basic igneous rocks (possible Mt Read Volcanic correlates).

46001 475,000 m E 5,393,700 m N Kentish Hill. Copper in Cambrian basic volcanics (Figure 7).

Unlisted 477,000 m E 5,391,500 m N Golden Valley. Permian oil shale 1.5 m thick.

Within a few kilometres of the margins of the area, dolerite and Permian mudstone have been extracted for road making materials.

(e) Previous mineral exploration

EL 15/75

This licence is adjacent to the northern boundary of Area 3. Limited soil and auger sampling recorded weak base metal anomalies over the Kentish Hill copper prospect. Previous exploration was summarised in the report showing that the malachite-veined basic lava (Cambrian) had been drilled previously by six holes with copper values up to 0.4%. Exploration was not continued.

Reference: McGregor-Dawson, J.L. 1975. Interim Report - Quamby, Tasmania. EL 15/75 Union Oil Development Corp. Tasm.Dep.Mines TCR 75-1144.

EL 17/76

This licence covers Cambrian sequences in the Deloraine area and only marginally encroaches on Area 3. The targets were volcanogenic massive sulphide deposits - both Cyprus type and Rosebery type - and skarns (e.g. Moina). Regional exploration eventually led into several prospects which were further tested : Kentish Hill (copper), Lobster Rivulet - Punches Terror (tin-tungsten), Beefeater Hill (silver-copper-cobalt) and Native Top (gold). All work failed to indicate economic mineralisation and the licence was relinquished.

Reference: Weste, G. 1979. EL 17/76 Quamby, Tasmania. Final report covering all exploration from November 1978 to July 1979. Comalco Ltd. Tasm.Dep.Mines TCR 79-1326.

EL 17/79

This licence was composed of 4 parts - one of which (Golden Valley and Bracknell) occupied the northern portions of Areas 2, 3 and 4. The subject of the licence was mainly oil shale exploration.

Apart from some limited channel sampling, no new work was carried out.

Reference: Glazebrook, C. 1980. Tasmanian oil shale prospects. Final Report for Petro Quest Pty Ltd. Tasm.Dep.Mines TCR 80-1449.

EL 40/82

This licence, which encroached onto the northern margins of Areas 2 and 3, was for coal exploration. Field activities consisted of geological traverses along roads. It was concluded that both the Permian and Triassic sequences had zero coal potential.

Reference: Summons, T.G. 1984. Bracknell EL 40/82. Exploration report for the year ending 12th August, 1984. CRA Exploration Pty Ltd. Tasm.Dep.Mines TCR 84-2199.

EL 43/80

The intention of this licence was to prospect for coal, oil shale and oil in parts of Areas 2, 3, 4 and 5. The application was lodged by North West Bay Co. Pty Ltd and eventually withdrawn before issue.

EL 41/82

This licence application covered part of Areas 3 and 4 and was for coal, oil and shale. Before issue, the application was withdrawn.

EL 1/88

This current licence covers a large part of eastern Tasmania including most of Areas 1, 2, 3 and 4. It is held by Conga Oil Pty Ltd to explore for petroleum.

Assessment

(a) Quality of data

The entire area is covered by 1 inch to 1 mile geological mapping on a sufficiently detailed scale for preliminary assessment but the mapping is more than 20 years old (Figure 5).

Gravity station coverage is adequate over about 50% of the area but is only of reconnaissance standard over the remainder (Figure 6). Aeromagnetic data is only of reconnaissance standard over the entire area.

Some geochemical exploration took place over the Lower Palaeozoic rocks to the north but not in the area itself.

(b) Mineral Resource Models

Metallic Resources

1. Base and precious metal deposits in Cambrian volcanic and associated sediments (possible Mt Read correlates).
2. Base (Irish-style and Mississippi Valley-style) and precious metal (Carlin-style) deposits associated with Gordon limestone.
3. Palaeoplacers in basal Parmeener Supergroup sediments.
4. Uranium in sandstones of the Parmeener Supergroup.

Potential is low for palaeoplacers and uranium and unknown for other metallics because of lack of knowledge of the composition and precise depth of pre-Permian basement. Because of cover sequences, no exploration has been carried out in this area (Figure 2).

Non-metallic and Fuel Resources

1. Coal and oil shale in Parmeener Supergroup.
2. Petroleum sourced in Ordovician carbonates.
3. Construction materials e.g. dolerite and Permian mudstone.
4. Building stones in Jurassic dolerite and Triassic sandstones.

Potential is low for coal and unknown for petroleum but moderate for oil shale, and high for construction materials and building stone (Figure 2).

AREA 4. MOTHER CUMMINGS PEAK, SASSAFRAS CREEK AND LITTLE FISHER RIVER

LOCATION

North-facing slopes of Great Western Tiers from Mother Cummings Peak to Western Bluff then south along west-facing slopes to Little Fisher River, Clummer Bluff and Howells Bluff along the Mersey River Valley (Figure 1).

DATA

(a) Geological Maps

Barton, G.M., Bravo, A.P., Gulline, A.B., Longman, M.J., Marshall, B. Matthews, W.L., Moore, W.R., Naqvi, I.H., Pike, G.P., 1969. Tasmanian Geological Atlas 1 mile to 1 inch Series, Zone 7, Sheet No. 46 (8214N), Quamby. Dep.Mines Tasm.

Corbett, K.D. and Brown, A.V. 1975. Tasmanian Geological Atlas 1:250 000 Series, Sheet SK55-5, Queenstown. Dep.Mines Tasm.

Jennings, I.B. and Burns, K.L., 1958. Tasmanian Geological Atlas 1 mile to 1 inch Series, Zone 7, Sheet No. 45, Middlesex. Dep.Mines Tasm.

Jennings, I.B., MacLeod, W.N., Burns, K.L., Jack, R.H., Matthews, W.L., Robinson, R.G., Threader, V.M. 1961. Tasmanian Geological Atlas 1 mile to 1 inch Series, Zone 7, Sheet No. 52, Du Cane. Dep.Mines Tasm.

McClenaghan, M.P. and Baillie, P.W. 1974. Tasmanian Geological Atlas 1:250 000 Series, Sheet SK55-4, Launceston. Dep.Mines Tasm.

Williams, E. and Turner, N.J., 1973. Tasmanian Geological Atlas 1:250 000 Series, Sheet SK55-3, Burnie. Dep.Mines Tasm.

The area is covered by 1 inch to 1 mile geological mapping published in the period 1958 to 1969 and compiled into the Launceston, Burnie and Queenstown 1:250 000 sheets.

(b) Geological Summary

The area follows the line of the Great Western Tiers, the scarp face of which exposes Triassic and Permian sediments, as far as Western Bluff. From there, the southern extension of the area follows the same sedimentary horizons as they are exposed in the highest slopes of the Mersey Valley. Scree and talus derived from the capping Jurassic dolerite covers a substantial proportion of the stratigraphy (Figure 4).

To the north, the area departs from the Tiers and covers folded Lower Palaeozoic rocks composed of Ordovician conglomerate, limestone and sandstone and other sediments of the Eldon Group (Silurian).

As the area extends into the Mersey Valley, progressively older rocks are exposed (the Cambrian Dove granite) or are present (Precambrian metasediments) under up to 400 m of Permo Triassic sediments.

Devonian to Carboniferous granites occur within 4 km of the surface in the north and west of the area.

(c) Geophysical Coverage

Reference as for Area 1.

Gravity station coverage is regional in the north of the area near Mole Creek. Elsewhere it is reconnaissance in spacing only.

Aeromagnetic data is of reconnaissance standard (see Area 1). Also most of area is contained in a 1966 helicopter-borne survey (Zarzavatjian, P.A.) on east-west lines nominally $\frac{1}{4}$ to $\frac{1}{2}$ miles apart. Because the survey is 25 years old, the data has been assessed as reconnaissance rather than detailed. The extreme northern tip of the area was covered by a Tasmanian Department of Mines (TDM) survey in 1985 at the standard regional line spacing of 500 m.

(d) Mineralisation

Reference: Tasm.Dep.Mines MIRLOCH data base.

45016 435,500 m E 5,399,000 m N. Mersey River. Alluvial gold occurrence. ✗

45022 437,530 m E 5,398,760 m N. Wattle Valley prospect. Disseminated lead and zinc in limestone (Figure 7). ✗

Unlisted 440,000 m E 5,397,000 m N. Mayberry prospect. Disseminated lead and zinc in limestone. ✗

Minor occurrences of impure Permian coal in seams up to 15 cm thick have been recorded in Marakoopa Creek.

There are a number of construction material sites throughout the area. In the north, Moina sandstone (Ordovician) and Eldon Group sandstone (Silurian) have been extracted for road making materials. In the south, Permian siltstone and Jurassic dolerite have been used for a similar purpose.

Peripheral occurrences

37046 445,200 m E 5,409,100 m N. Star of the West, Gold in veins and disseminated in Cambrian porphyry. ✓

37051 445,300 m E 5,409,100 m N. Start of the East. Mineralisation as above. ✗

37109 445,100 m E 5,409,100 m N. Unnamed. Gold in veins in Cambrian rocks. ✗

37111 448,600 m E 5,407,200 m N. Gregory Road. Gabbros and tomalites with associated quartz tourmaline veins and anomalous gold. ✗

- 37112 445,000 m E 5,409,600 m N. Minnow River. Alluvial gold. X
- Unlisted 447,000 m E 5,402,300 m N. Quarry in Ordovician Limestone. X
Crushed aggregate.
- Unlisted 459,700 m E 5,393,500 m N. Gibsons Sugarloaf. Disused quarry in X
Ordovician limestone. Used for agriculture.

Adjacent to the southern part of the area, in the Mersey Valley, Precambrian quartzite, schist and conglomerate have been used to produce gravel, crushed aggregate and other road making materials.

(e) Previous mineral exploration

EL 19/69

This licence was concerned with exploration for limestone in the northern part of Area 4 to the west of Mole Creek. Records are incomplete but it appears that the current quarry being operated near Den Plains (ML 96M/71) by Mole Creek Limestone Pty Ltd was developed from the above licence.

EL 7/74

This licence encroached on the western part of Area 4 in the Liena area. The targets were tin/tungsten skarns and Mississippi Valley-type lead/zinc mineralisation in Gordon Limestone.

Two aeromagnetic anomalies were investigated by geochemical sampling. The northern one recorded anomalous results (up to 810 ppm Pb, 280 ppm Zn) but was abandoned as it was partially coincident with the Croesus Cave State Reserve.

Geochemical and geophysical exploration of an extremely anomalous soil sample (4100 ppm Pb, 2050 ppm Zn) in Gordon limestone culminated in drill testing of the Wattle Valley grid. Two holes were completed but as the base metal contents were low the ground was given up.

Reference: Wright, R.G. 1984. EL 7/74 - Moina. Report on area relinquished on 18.7.84. Billiton Australia. Report No. 08.2269 Tasm.Dep. Mines TCR 84-2211.

EL 13/74

This licence covered the northern part of Area 4 and was aimed at exploring the Ordovician limestone for Carlin-type gold mineralisation. Geochemical surveys detected lead/zinc anomalies only at Mayberry. These were attributed to brecciated limestone and were not pursued.

Reference: Cummings, A.J. 1975. Tasmania Gold Project, Mole Creek Area. EL 13/74. Final Report Cygnatrex Pty Ltd. Tasm.Dep.Mines TCR 75-1087.

SPL 792

This licence was applied for over the Little Fisher River vicinity which covers the southern extension of Area 4. The licence was not issued.

EL 17/79

This licence was composed of 4 parts - one of which (Golden Valley and Bracknell) occupied the northern portions of Areas 2, 3 and 4. The subject of the licence was mainly oil shale exploration.

Apart from some limited channel sampling, no new work was carried out.

Reference: Glazebrook, C. 1980. Tasmanian oil shale prospects. Final Report for Petro Quest Pty Ltd. Tasm.Dep.Mines TCR 80-1449.

EL 2/80

This licence covers part of Area 4 and was taken out to examine the potential for carbonate-hosted lead, zinc and silver deposits. Exploration led into the Mayberry prospect where previous soil anomalies were confirmed and investigated further by power auger drilling. The results were considered not to be of economic interest.

Reference: Jones, P.A. 1981. Relinquishment report, Deloraine. EL 2/80.
Amoco Minerals Australia Co. Tasm.Dep.Mines TCR 81-1572.

EL 28/80

The ground covered by this licence was considered prospective for tin, tungsten, molybdenum and gold/silver mineralisation, related to granite intrusion into Precambrian metasediments. The licence covers most of Area 5 and the southern extension of Area 4.

Regional stream sediment geochemistry turned up two areas of interest at Sardine Creek and in tributaries of the Cambell River. Follow up investigation downgraded these areas.

Reference: Ruxton, P.A. 1982. Progress report. Exploration Licence 28/80 - Borradaile Plains. Shell Co. of Australia Ltd.
Tasm.Dep.Mines TCR 82-1803.

EL 43/80

The intention of this licence was to prospect for coal, oil shale and oil in parts of Areas 2, 3, 4 and 5. The application was lodged by North West Bay Co. Pty Ltd and eventually withdrawn before issue.

EL 41/82

This licence application covered part of Areas 3 and 4 and was for coal, oil and shale. Before issue, the application was withdrawn.

EL 43/81

This licence covered the northern part of Area 4. The Mayberry prospect was further investigated by geophysics followed up by percussion drilling in the search for carbonate - hosted lead-zinc deposits. No mineralisation was seen in the drilling and analytical results were uniformly low.

Reference: Smyth, W.D. 1983. Relinquishment report EL 43/81 - Mole Creek. Shell Co. of Australia Tasm.Dep.Mines TCR 83-2038.

EL 40/84

This licence covered the northern part of Area 4 and was taken out to explore for gold deposits similar to the Tasmania Mine at Beaconsfield. The only work performed prior to relinquishment was regional mapping.

Reference: Shannon, C.H. 1986. Relinquishment report EL 40/84 - Deloraine. Savage Resources Ltd. Tasm.Dep.Mines TCR 86-2564.

EL 9/89

This licence is almost wholly within the northern part of Area 4. The programme was designed to test the Gordon limestone for gold and base-metal deposits. Exploration produced nothing more than low level geochemical anomalies and the area was dropped.

Reference: Ellis, P.D. 1990. Relinquishment report. EL 9/89 Mole Creek Tasmania. Placer Exploration Ltd. Tasm.Dep.Mines. TCR 90-3144.

EL 1/88

This current licence covers a large part of eastern Tasmania including most of Areas 1, 2, 3 and 4. It is held by Conga Oil Pty Ltd to explore for petroleum.

EL 17/90

This is a licence application which covers most of the western half of Tasmania including all of Area 5 and parts of Areas 1 and 4. The application is by Conga Oil Pty Ltd to explore for petroleum.

Assessment

(a) Quality of data

The entire area is covered by 1 inch to 1 mile geological mapping on a sufficiently detailed scale for preliminary assessment but the mapping is more than 20 years old (Figure 5).

Gravity station coverage approaches regional standard only in the north of the area. Mostly it is of reconnaissance standard (Figure 6).

Aeromagnetic surveys are adequate only in the extreme north of the area. Elsewhere they have been assessed as reconnaissance.

A number of geochemical surveys have been conducted in the Lower Palaeozoic and older rocks in the north and west of the area.

(b) Mineral Resource Models

Metallic Resources

1. Carbonate-hosted lead-zinc deposits in Gordon Limestone.
2. Carbonate-hosted gold deposits in Gordon limestone.
3. Vein, shear or fault-related gold deposits in Ordovician conglomerates and sandstones.
4. Skarn and replacement tin/tungsten deposits in Ordovician carbonate.
5. Vein-related tin/tungsten or gold, silver, molybdenum deposits in siliceous rocks from Precambrian to Ordovician in age.
6. Palaeoplacers in basal Parmeener Supergroup sediments.
7. Uranium in sandstones of Parmeener Supergroup.

Potential is low for palaeoplacers and uranium due to lack of known occurrences in area. Potential is high for lead, zinc deposits and moderate for the other mineral resource models listed above (Figure 2).

Non-metallic or Fuel Resources

1. Limestone in Ordovician sediments.

2. Coal and oil shale in Parmeener Supergroup.
3. Petroleum sourced in Ordovician carbonates.
4. Construction materials in sandstones, siltstones, dolerite, quartzites, schists and conglomerates.
5. Building stone in Triassic sandstone and Jurassic dolerite.

Potential is low for coal, oil shale and unknown for petroleum but high for limestone, construction materials and building stone (Figure 2).

AREA 5. BORRADAILE PLAINS AND ARM RIVER

LOCATION

Western slopes of Arm river valley from Borradaile Plains to Mt. Pillinger (Figure 1).

DATA

(a) Geological Maps

Corbett, K.D. and Brown, A.V. 1975. Tasmanian Geological Atlas of 1:250 000 Series, Sheet SK55-5, Queenstown. Dep.Mines Tasm.

Jennings, I.B. and Burns, K.L., 1958. Tasmanian Geological Atlas 1 mile to 1 inch Series, Zone 7, Sheet No. 45, Middlesex. Dep.Mines Tasm.

Jennings, I.B., MacLeod, W.N., Burns, K.L., Jack, R.H., Matthews, W.L., Robinson, R.G., Threader, V.M. 1961. Tasmanian Geological Atlas 1 mile to 1 inch Series, Zone 7, Sheet No. 52, Du Cane. Dep.Mines Tasm.

Williams, E. and Turner, N.J., 1973. Tasmanian Geological Atlas 1:250 000 Series, Sheet SK55-3, Burnie. Dep.Mines Tasm.

The area is covered by 1 inch to 1 mile geological mapping published between 1958 and 1961 and compiled into the 1:250 000 sheets - Burnie and Queenstown.

(b) Geological Summary

Geologically, the area lies on Jurassic dolerite and dolerite scree and talus covering Permian stratigraphy and Precambrian metasediments in the south. The dolerite has been stripped off in the north where Precambrian metasediments are exposed except where covered by Tertiary basalt at Borradaile Plains (Figure 4).

From the topography, the dolerite thickness is estimated as up to 200 m and the basalt thickness as up to 50 m.

Devonian to Carboniferous granites occur within 4 km of the surface throughout most of the area.

(c) Geophysical Coverage

Reference as for Area 1.

Gravity station coverage is of reconnaissance standard only.

Aeromagnetic data is of reconnaissance standard (see Area 1). Also most of this area was included in the 1966 regional survey of Zarzavatjian (see Area 4).

(d) Mineralisation

Unlisted 430,200 m E 5,388,600 m N. McCoy's Prospect. Tungsten mineralisation in quartz veins in Precambrian quartzite.

No coal occurrences are known in this area.

Construction materials have been extracted adjacent to the area in the north and east. These include gravels and aggregates (some for concrete) derived from Precambrian quartzites and schists mainly for road making materials. One quartzite site is within the area just to the west of Borradaile Plains (Figure 7).

(e) Previous mineral exploration

EL 28/80

The ground covered by this licence was considered prospective for tin, tungsten, molybdenum and gold/silver mineralisation, related to granite intrusion into Precambrian metasediments. The licence covers most of Area 5 and the southern extension of Area 4.

Regional stream sediment geochemistry turned up two areas of interest at Sardine Creek and in tributaries of the Cambell River. Follow up investigation downgraded these areas.

Reference: Ruxton, P.A. 1982. Progress report. Exploration Licence 28/80 - Borradaile Plains. Shell Co. of Australia Ltd. Tasm.Dep.Mines TCR 82-1803.

EL 43/80

The intention of this licence was to prospect for coal, oil shale and oil in parts of Areas 2, 3, 4 and 5. The application was lodged by North West Bay Co. Pty Ltd and eventually withdrawn before issue.

EL 48/82

This licence covered most of Area 5. It was selected to test for diamondiferous kimberlite pipes. Stream sediment samples collected by a previous company were further processed to identify indicator minerals. None were found and the licence was relinquished.

Reference: Charchalis, N. 1987. Relinquishment report. EL 48/82. Borradaile Plains. Base Resources Ltd. Tasm.Dep.Mines TCR 88-2766.

EL 17/90

This is a licence application which covers most of the western half of Tasmania including all of Area 5 and parts of Areas 1 and 4. The application is by Conga Oil Pty Ltd to explore for petroleum.

Assessment

(a) Quality of data

The entire area is covered by 1 inch to 1 mile geological mapping on a sufficiently detailed scale for preliminary assessment but the mapping is more than 20 years old (Figure 5).

Gravity and aeromagnetic coverage is of reconnaissance standard only (Figure 6).

Limited geochemical exploration has taken place.

(b) Mineral Resource Models

Metallic Resources

1. Vein-related tin/tungsten mineralisation or gold, silver, molybdenum deposits in siliceous Precambrian rocks.
2. Palaeoplacers in basal Parmeener Supergroup sediments.
3. Diamonds in placers or in kimberlite intrusions.

Potential is low for palaeoplacers and diamonds, and moderate for the vein related deposits (Figure 2).

Non-metallic or Fuel Resources

1. Coal and oil shale in Parmeener Supergroup.
2. Petroleum sourced in Ordovician carbonates.
3. Construction materials in Precambrian quartzites and schists.
4. Building stone in Jurassic dolerite and Tertiary basalt.
5. Zeolites, clays and bauxites in Tertiary basalt.

Potential is low for all of the above except for construction materials where it is locally high and for petroleum where it is unknown (Figure 2).

BIBLIOGRAPHY

- Forsyth, S.M. 1989. Geological atlas 1:50,000 series. Sheet 61 (8313 N). Interlaken. Explan.Rep.Geol.Surv.Tasm.
- Gulline, A.B. 1965. Geological atlas 1 Mile series sheet 59 (8113 N) St. Clair. Explan.Rep.Geol.Surv.Tasm.
- Hughes, T.D. 1957. Limestones in Tasmania. Geol.Surv.Tasm.Mines.Resour. 10: 1-291.
- Jennings, I.B. 1963. Geological atlas 1 Mile series. Sheet 45 (8114 N). Middlesex Explan.Rep.Geol.Surv.Tasm.
- Jennings, I.B., Noldart, A.J. and Williams, E. 1967. Geological mineral resources of Tasmania. Bull.Geol.Surv.Tasm 50.
- MacLeod, W.N., Jack, R.H. and Threder, V.M. 1961. Geological atlas 1 Mile series. Sheet 52 (8114 S). Du Cane. Explan.Rep.Geol.Surv.Tasm.
- Matthews, W.L. 1990. Geological atlas 1:50,000 series. Sheet 54 (8314 S). Lake River. Explan.Rep.Geol.Surv.Tasm.
- Pike, G.P. 1973. Geological atlas 1 Mile series. Sheet 46 (8219 N). Quamby. Explan.Rep.Geol.Surv.Tasm.
- Richardson, R.G. and Leaman, D.E. 1987. Tasgrav - the Tasmanian gravity data base. Unpubl.Rep.Dep.Mines Tasm. 1987/02.
- Tyalor, R.B. and Steven, T.A. 1983. Definition of mineral resource potential. Econ.Geol. 78, 1268-1270.

All references to OPEN FILE exploration reports held by the Division of Mines and Mineral Resources are given in the text.

APPENDIX 1

GEOLOGICAL MAPPING PROGRAMS

COST OF UPGRADING COVERAGE (See Figure 5)

GEOLOGICAL MAPPING PROGRAMS

Estimated costs of geological mapping programmes have been prepared and are displayed in the accompanying table for each area.

The costs have been arrived at in the following way -

1. Costs are based on \$300/skm which is the standard geological survey cost for 1:50 000 scale mapping including field work, laboratory work and map productions.
2. The costs for each area are those required to update the geological mapping at the 1:50 000 scale believed to be sufficient for preliminary assessment of these areas. As far as costs are concerned, traverse mapping has been treated at the same rate as 1:50 000 scale mapping as the location and definition of basement rocks enclosed in dolerite or Parmeener Group rocks is required.

TABLE

Area No.	Total (skm)	Mapping (skm) Required	Cost (\$)
1	188	188	56,400
2	560	309	92,700
3	98	98	29,400
4	257	257	77,100
5	44	44	13,200
	<hr/>	<hr/>	<hr/>
TOTAL	1147	896	268,000

APPENDIX 2

ASSESSMENT OF GEOPHYSICAL COVERAGE OF SELECTED AREAS IN THE
GREAT WESTERN TIERS (See Fig. 6).

GEOPHYSICAL COVERAGE - EXISTING AND REQUIRED

The reliable determination of subsurface structures of shallow to medium depth requires certain minimum levels of gravity station and aeromagnetic coverage. Structural aspects of particular interest here are:

- (1) the depth of granite below the surface;
- (2) the thickness of Jurassic dolerite and Parmeener Supergroup overlying basement.

GRAVITY COVERAGE

Determination of shallow structures requires a coverage of 1 station/sq.km within the area of interest and for a distance of 5 km in all directions around the area.

Determination of deep structures requires a coverage of 1 station/9 sq.km for a distance of 40 km in all directions around the area of interest.

The requirements for satisfactory coverage are:

- (i) 1 station/square km in the area indicated in Figure 6. This will provide an acceptable regional cover within the areas.
- (ii) 1 station/9 square km in the area indicated in Figure 6, i.e. from 395 E (west of area shown in Figure 6) and across to the east. This provides a semi-regional coverage and allows a structural interpretation within the areas of interest.

Area (i) 4920 sq.km = 4920 stations

(ii) 6269 sq.km = 697 stations

Using an average total cost (labour, transport etc.) of \$150/station and weighting this by 30% for the remoteness of the area and, rugged topography makes a total cost of \$1,095,315.

AEROMAGNETIC COVERAGE

To provide an adequate coverage would require data from 395 E to 580 E and from 53260 north to 5400 N with a flight line spacing of 500 m, a tie line spacing of 5000 m and a terrain clearance of 150 m nominal. This would only be a rough regional coverage - use of a helicopter would be necessary for a good coverage.

This is 59570 line km

assume \$18/line km + 25% for standby charges

\$1,340,325

COSTING SUMMARY

Gravity	1,095,315
Aeromagnetics	1,340,325
Further processing	120,000
Interpretation	<u>150,000</u>
	\$2,705,640

as at 31 August 1990