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GEOPHOTO MINERALS REPORT 1974/2

FINAL REPORT ON  
EXPLORATION ACTIVITIES WITHIN  
E.L.6/68, N.E. TASMANIA

Prepared by

GEOPHOTO RESOURCES CONSULTANTS

for

TEXINS DEVELOPMENT PTY. LIMITED

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March, 1974

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INTRODUCTION

The permit area, EL6/68, of 650 sq. ml. was originally granted to R.W. Leftwich on 23rd August, 1968 and subsequently transferred to the name of Texins Development Pty. Ltd. on 19th September, 1969.

The area extent was reduced systematically in the ensuing years (1970 - 2 reductions, 1971 - 1 reduction, 1972 - 2 reductions and 1973 - 1 addition) to be 228 sq. ml., in three separate parts, at the time of relinquishment of the permit on 23rd February, 1974.

The map A218 found in the appendix of this report illustrates the extent of these reductions and additions.

Further minor refinements were made to the boundaries of EL6/68, with the relinquishment of a number of small tracts of ground for mining purposes, to local miners and prospectors and larger companies holding neighbouring E.L.s.

All exploration activities conducted over EL6/68 were carried out by Geophoto Resources Consultants with the exception of certain geophysical and drilling programmes completed by outside contractors under the management of Geophoto Resources Consultants.

Both Texins Development Pty. Ltd. and Geophoto Resources Consultants are subsidiaries of Texas Instruments Incorporated.

Late 1970 saw negotiations with Australian Paper Manufacturers Ltd. which resulted in the latter entering into a joint venture agreement under which a subsidiary, A.P.M. Minerals Pty. Ltd., would earn a 50% interest over a four year period

between 1st January, 1971 and 1st January, 1975.

The terms of the exploration licence, EL6/68, covered exploration for all metallic minerals.

The geological environment over the area of EL6/68 with the associated mineralization restricted the metals sought to tin, tungsten, molybdenum, bismuth, copper, lead, zinc and gold. Minor uranium, thorium and beryllium occurrences also presented possible scope for exploration.

The original scale of targets for this area were outlined in Minerals Report 1970/42 as:-

1. Large tonnage (>5,000,000 tons) open pit low grade Sn-Cu, Sn and Mo deposits (either in individual deposits or close spaced groups).
2. Moderate tonnage open pit low grade Sn-W-Bi-Mo deposits.
3. Large placer tin deposits (>10,000,000 cubic yards at less than 80 ft. depth).
4. Placer tin - rich, pockety in recent streams, to be worked by dragline or similar methods.
5. Fissure lode Cu, Zn, Pb, Sn, Au deposits.

Through the five and a half years of the exploration programme modifications to this list have been made in the light of changing company policies and trends in the mining industry in Australia.

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The programme conducted over EL6/68 with the above objectives has incorporated "grass roots" regional exploration affording a blanket coverage of the area to unearth virgin prospects, together with detailed investigations of known mineral occurrences.

#### SITUATION, ACCESS AND PHYSIOGRAPHY

The situation of the permit area EL6/68 is best illustrated by a study of map A218 in the appendix.

Covering much of the North-Eastern corner of Tasmania, the area was served in the north by Brankholm, Derby, Winnaleah and Gladstone, all lying within the permit area, while the southern sections were served by St. Helens, St. Marys and Fingal, all located outside but close to the boundaries of EL6/68.

Smaller settlements, Mathinna, Pyengana, Weldborough, Herrick and Pioneer, lay within the confines of EL6/68, offering limited facilities.

Railheads were located at Herrick in the north and St. Marys in the south connecting, together with the main highways (the Tasman and the Esk respectively), the area to the rest of Tasmania, and Launceston and Hobart in particular.

Main road (sealed) access was good in the northern section (Herrick - Gladstone) and around the southern limits (Mathinna - Fingal - St. Marys - St. Helens) with a connecting sealed road cutting across the area (Herrick - Weldborough - Pyengana - St. Helens).

Forestry and logging tracks provided further four wheel drive access to many more remote areas, although large tracts of the centre and central north were basically inaccessible to

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vehicles through absence of tracks, steepness of terrain or density of vegetation - or a combination of the three.

The original permit area encompassed much of the N.E. Highlands a high dissected plateau, rising to a height of 1210m. (Mt. Victoria) but more generally lying between 650m. and 750m. above sea level.

Other high points within the area included Mt. Young (905m.), Mt. Littlechild (884m.) and Mt. Michael (880m.).

This high area covered the central sector of the permit with lower ranges (Loila Tier/Scamander Tier) to 270m. found along the eastern and southern limits.

The northern areas were characterised by low lying, undulating country of Tertiary and recent sediments, found around the South Mt. Cameron granitic mass which rises to a height of 550m.

The main drainage systems radiated from the high central section (the Blue Tier - Mathinna Plain axis) with the Ringarooma, Mussel Roe and Ansons Rivers draining to the north, the George and Scamander Rivers to the east and south-east and the South Esk system flowing towards the south-west.

The vegetation cover varied from locality to locality, the influence of height above sea level on the rainfall determining the type of vegetation. High areas with a corresponding high rainfall carried thick temperate rain forest and undergrowth while the lower areas although well timbered were generally free from thick undergrowth (except within the creeks and gullies) enabling easy movement. Certain areas to the north, valleys within the central section and around Mathinna had been cleared for farming activities.

MINING HISTORY

The mining history of the area encompassed by the permit EL6/68 has been checkered with periods resembling boom times but also with long periods of quiescence.

The late 19th century/early 20th century saw considerable mining and prospecting in the Mathinna Goldfield, the Scamander Mineral Field and the Blue Tier Tinfeld. Also in those days the secondary tin deposits of the Derby-Pioneer-Gladstone area were discovered and developed.

Numerous companies were floated to exploit the mineral wealth of this area, many never reaching full production before the "bubble burst" but many developing to become notable tin or gold producers of their day.

The earliest mining within the area was based on gold which was discovered in 1852 in the Mangana-Mathinna area. The gold, found in quartz reefs within a N.N.W. trending shear zone (56 miles in length) was exploited until 1920 by which time the gold fever had waned and the goldfields were left abandoned.

The goldfields of N.E. Tasmania produced over 527,000 fine ounces of gold with the most notable producer being the New Golden Gate Mine near Mathinna which yielded 254,000 fine ounces.

As activity on the goldfields declined, the miners and prospectors diversified their attention to other areas of N.E. Tasmania in their quest for undiscovered gold. Their reward was not gold but tin.

By the turn of the century, the towns of Moorina, Weldborough, Poimena, Lottah and Goulds Country were the centres of a

thriving tin mining industry based on both alluvial and hardrock tin discoveries, the latter often unearthed by the former.

The Blue Tier Tinfield saw mining operations through to 1951 although subsequent to 1935 these were limited in size.

No overall figure has been computed on the production from the numerous small mines which were developed on either low grade disseminated or high grade vein/dyke deposits, but the larger producer was the Anchor Mine which yielded 2,364 tons of metallic tin from over 3,000,000 tons of ore mined.

Large quantities of cassiterite were won from numerous small but very rich alluvial deposits over the Blue Tier. In excess of 1000 tons of tin concentrate were recovered from the restricted creek beds of the Hope Creek/Moon Creek area.

At the same time as the tin areas were being developed, there was considerable activity within the Scamander Mineral District. A complex zoning of the mineralization about a fine grained biotite-muscovite granite intrusive, similar in nature to the granite associated with the above mentioned tin mineralization, led to the discovery of a number of varied mineral associations. Most of these discoveries were rarely developed past the stage of a prospect although there was minor production of copper, silver, tungsten and tin within this mineral field from narrow, fissure type vein deposits. Only the Orieco Mine (85 tons of metallic copper), the Great Pyramid Mine (2.93 tons of metallic tin) and the various silver mines (10,000 + ozs of silver) appear to have attained a limited production stage.

By far the greatest money earner in the N.E. Tasmania mining history has been alluvial tin from mines located mainly in the Branxholm-Derby-Pioneer-Gladstone areas. Since 1882 N.E.

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Tasmania has produced in excess of 58,000 tons of tin concentrate from alluvial tin deposits. The deep leads of Tertiary age have produced much of this total with the Briseis Mine (>29,000 tons Sn conc.), the Pioneer Mine (>9000 tons Sn conc.) and the Endurance Mine (>4000 tons Sn conc.) being the greatest producers. The shallow river and/or marine terrace deposits along the Ringarooma River produced in excess of 2400 tons of tin concentrate through dredging operations.

Several mines are still producing on a small scale yielding around 400 tons of tin concentrate per annum.

At present the most notable metal producers in N.E. Tasmania are the Cominco Story's Creek and Aberfoyle Mines which lie approximately 12 miles to the south-west of the permit area, exploiting vein deposits of wolframite and cassiterite in a geological environment very similar to that which exists in the Scamander area. The past year has however, seen the Story's Creek Mine put on a care and maintenance basis due to the continued depressed state of the wolfram market.

#### EXPLORATION ACTIVITY

Exploration, as in the case of the mining, has seen it's ups and downs in the degree of activity.

In the early 20th century the scene was dominated by individual prospectors rather than larger companies. One exception was the Mt. Lyell Mining and Railway Co. which carried out a comprehensive evaluation of the Blue Tier Tinfield.

Between 1910 and the mid 1950's exploration activity was limited apart from a continued programme of investigation and evaluation carried out by the Mines Department, particularly

during the war years.

From 1956 through to today the area has seen a number of large, well known companies carry out comprehensive studies of the mineral potential of the area. The most notable of these have been the Rio Tinto Zinc Corp. (late 1950's/early 1960's - Alluvial Tin Areas and Scamander District), Electrolytic Zinc Co. (late 1950's/early 1960's - Scamander District and Blue Tier Tinfield), B.H.P. (1960's - Scamander District), Austminex (1960's - Blue Tier Tinfield and Scamander District), Utah Dev. Co. (mid 1960's - Alluvial Tin Areas) and Aberfoyle Dev. Co. (mid. 1960's - Blue Tier Tinfield).

During the period EL6/68 has been held by Texins, other companies (Paringa Mining Co., Scamander Mining Co., Blue Metal Industries, International Mining Corp. and Mineral Holdings) have held E.L's, S.P.L.s or mineral leases either adjacent to or included within the boundaries of EL6/68.

Reports on these early exploration programmes have yielded valuable data to assist in the present evaluation of the mineral potential of the area by Texins.

#### REGIONAL GEOLOGY

The geology of the area from a regional viewpoint has been expounded in a number of reports listed in the bibliography and in Geophoto Mineral Reports dealing with surveys conducted on a regional basis.

More detailed descriptions on the geology of individual prospect areas are to be found within Geophoto Minerals Reports dealing with the details of exploration activities completed on

these prospects.

The oldest rocks within the permit area are the Mathinna Beds of Upper Silurian-Lower Devonian age, covering large sections of the southern half of EL6/68 with restricted outcrops found in the Derby and Gladstone areas in the north.

The Mathinna Beds comprise a thick sequence of thin bedded sandstones, siltstones and mudstones (shales).

In the Scamander area these rocks remain basically unaltered although massive quartzites are a common feature particularly close to mineralized areas, the silicification being related to the mineralization phase.

Sedimentation features suggest turbidity currents have played an important role in the deposition of this sequence of rocks in this area.

In the Mathinna area the Beds have been regionally metamorphosed to varying degrees with slate and quartzite the dominant rock types. Phyllites and phyllitic schists, less common, have been distinguished.

The Mathinna Beds have undergone folding during the Tabberabberan Orogeny resulting in a number of major fold axes upon which minor folding of smaller wavelength has been superimposed. The general trend of this folding over the whole area is N.W.-S.E. to N.-S.

N.W. - S.E. trending faults and associated shear zones are a common feature often associated with minor mineralization. Extensive fracturing of the individual rock units (beds) largely perpendicular to the bedding planes (tensional) has resulted in a characteristic feature of the Mathinna Beds, the "blocky" nature

of outcrop and also of the talus which covers the slopes of the steep terrain.

The most prominent structural feature within the Mathinna Beds is the 56 mile long, N.N.W. trending, shear zone (a complex series of en echelon faults) associated with the gold mineralization of the Mangana, Mathinna, Dams Rivulet, Alberton, Warrentinna and Forester Goldfields.

Post Tabberabberan (Upper Devonian) emplacement of a complex body of granitic intrusives remains the most spectacular and important (from the mineralization standpoint) phase in the geological history of this area.

The Blue Tier batholith, comprising a number of different petrological units (granodiorites, adamellites, granites), each emplaced by a dilation process in an orderly sequence and governed by pre-existing structures, covers approximately 60% of the original permit area.

The contact between these granitic rocks and the Mathinna Beds is sharp with only a narrow zone of thermal metamorphism often no more than 10's of metres.

The last major phase in the formation of the Blue Tier Batholith saw the emplacement of sheet like bodies of a biotite-muscovite granite characterised by the development of greisenization and tin mineralization.

These granites and vein/dyke systems associated with them have proved to be the main sources of tin mineralization within the Blue Tier area, and with the erosion of such, the material source for the major alluvial deposits to the north.

In the Scamander District there appears to be a close

association between granites of similar composition to above and the zoned sequence of mineralization evident in the area.

Subsequent to the emplacement of these granitic rocks, Permian arkosic sandstones and conglomerates of glacial origin were unconformably laid down upon the existing igneous and sedimentary units.

These horizontally bedded strata are today found over areas around Mt. Young in the central highland region, south of Mathinna around Tower Hill and at Mt. Littlechild on the Blue Tier.

The same localities (except Mt. Littlechild) carry remnants of a Jurassic dolerite sheet which once covered a much larger area.

Tertiary and Quaternary strata comprising muds, silts, sands, grits ("drift") and pebble washes of various origins (fluvial, estuarine, lacustrine and marine) cover large areas of low lying country north of Derby and Pioneer with similar areas also found in the lower reaches of the George and Scamander River systems.

Late Tertiary times also saw basaltic flows cover much of the Ringarooma Valley and probably large tracts of the highland areas, evident from the isolated outcrops lying unconformably upon Devonian granites and Permian strata in the Weldborough area and upon Mathinna Beds in the south in the Avenue River area.

#### MINERALIZATION

The permit area can be conveniently divided into four distinct areas based on consideration of the economic mineral associations, the nature of the deposit and geographic localities.

These are:-

1. Scamander Mineral District - variable mineralogy with zoning.
2. Blue Tier Batholith - cassiterite dominant.
3. Alluvial Tin Areas - cassiterite dominant.
4. Mathinna Goldfield - gold dominant.

The mineralization of these areas can be summarized as:-

1. Scamander Mineral District

This area is characterised by numerous hydrothermal quartz lodes found within both granitic and sedimentary rocks but generally of limited width and lateral extent. They carry a variable mineralogy in a distinctly zoned arrangement.

In the report "The Zoned Mineral Deposits of the Scamander-St. Helens District" - Geol. Survey Bulletin No. 53, D.I. Groves in a detailed study has divided the deposits of the area into five:-

- i. Wolframite-molybdenite deposits - within the contact zones of granites and metasediments as quartz or greisen veins carrying wolframite with varying amounts of molybdenite, cassiterite, bismuthinite, pyrite, chalcopyrite and arsenopyrite.
- ii. Cassiterite deposits - occurring as thin veins, with or without quartz, limonite or sulphides, in well fractured sandstone or quartzite hosts.

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- iii. Chalcopyrite - arsenopyrite - pyrite deposits - found in weakly mineralised fault zones whose surface expression are gossanous cappings of iron oxides/iron stained kaolin/ferruginous chert. Primary minerals also include sphalerite and galena with secondary chalcocite, covellite, hematite, limonite, cuprite, tenorite, malachite, azurite, chalcantite and a varied number of complex sulphates and arsenates.
  - iv. Galena (Ag-bearing) - sphalerite - arsenopyrite - pyrite deposits - quartz veins in fracture zones largely within a granodiorite porphyry. Typified by the presence of cerargyrite (silver chloride) and native silver in the oxidised zone. Other minerals include chalcopyrite, tetrahedrite, pyrrhotite, boulangerite and covellite.
  - v. Gold - silver - arsenopyrite deposits - occurring as thin quartz veins within biotite granodiorite or sandstones/quartzites of the Mathinna Beds. Common associated sulphides include chalcopyrite, galena, sphalerite, pyrite and covellite.

## 2. Blue Tier Batholith

Cassiterite is the chief economic mineral found within the Blue Tier Batholith associated with varying amounts of wolframite, scheelite, molybdenite, bismuthinite, chalcopyrite, sphalerite, galena, magnetite, fluorite and various secondary products. Beryllium, in the form of phenacite and bertrandite within greisens, has been investigated for in the past. Minor occurrences of monazite and torbernite have also been reported.

These mineral associations are found within three distinct

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types of deposit. These are:-

- i. "Floor" deposits - lenticular, greisenised bodies, occurring in gently domed structures within the roof of the sheet like masses of biotite-muscovite granite ("tin" granite), discussed in the previous section on the regional geology. Ascending mineral solutions have been impeded by the overlying intruded granodiorite/adamellites with a resultant alteral dispersion via horizontal fractures to form a series of mineralised "floors" with the intervening blocks of granite remaining basically unaltered. The thickness of these deposits rarely exceeds 50 m. below the roof.
- ii. Dyke deposits - dykes of pegmatite or greisenised "tin" granite extending to greater depths than the "floor" deposits and carrying short, narrow, irregular shaped ore shoots.
- iii. Vein deposits - rarely greater than 1m. in width but often of high grade. Found as quartz, quartz-greisen, mica-greisen veins. The associated minerals i.e. wolframite, molybdenite, chalcopyrite etc. are generally present as a higher % of the mineral content than commonly found in the "floor" or dyke deposits.

A fourth type of deposit found on the Blue Tier are the eluvial/alluvial deposits of cassiterite resultant from weathering of the above hard rock deposits.

### 3. Alluvial Tin Deposits

Once again cassiterite is the chief economic mineral with minor, but not economically significant, pyrite, marcasite,

sapphire, topaz, amethyst, zircon, ilmenite, rutile and monazite etc.

The source areas for the alluvial cassiterite lie in the high Blue Tier Batholith with its strong tin associations.

The alluvial deposits fall into three categories:-

- i. Headwater Leads - deep leads, with large catchment areas over tin-bearing rocks, now covered by thick sequences of Tertiary sediments and/or basalt,
- ii. Beheaded Leads - deep leads similar in most respects to the headwater type, but now left abandoned from their original sources by the present drainage system.
- iii. Shallow Alluvials - represented by marine shoreline terraces of Tertiary age or recent alluvial river terraces found along the present drainage courses.

#### 4. Mathinna Goldfield

The chief economic mineral of this area is free gold located in quartz veins associated with zones of intense shearing, the veins varying in width from 5cms. to 10m. and in length from 5m. to 300m.

Sulphide mineralization (overall average 1.5%) is generally present with pyrite dominant and minor arsenopyrite, chalcopyrite, galena, sphalerite and scorodite.

The mineralization is of a hydrothermal nature and generally thought to be related to the Upper Devonian granitic intrusives although not confirmed conclusively.

Shallow alluvial deposits with gold values found in basal washes also exist within the area.

EXPLORATION PROGRAMME (23rd August 1968 to 23rd February 1974)

This following section summarises Texins accomplishments over the five and a half years the permit EL6/68 was held, outlining very briefly the objectives, the work completed to achieve these objectives and the conclusions for each prospect and also for the area as a whole where the work was on a regional basis.

In doing so it gathers together into one volume for future reference a listing of every phase of exploration completed by Texins and although not discussing these in detail will refer the reader to those Geophoto Minerals Reports which do cover those particular phases of work.

The section will be subdivided into five, based on a regional grouping of the prospects similar to that dealt with in the above section on mineralization, plus a subdivision dealing with surveys conducted on a regional basis. The divisions are:-

1. Regional.
2. Scamander Mineral District.
3. Blue Tier Batholith.
4. Alluvial Tin Areas.
5. Mathinna Goldfield.

Each division will be further divided into the individual prospects. Prospect locations are found on maps A200 and A220.

1. Regional

Exploration on a regional basis fell into four separate

but interrelated parts:-

- a. Literature Research, Photogeology and Geological Reconnaissance.
- b. Gamma Ray Spectrometer Survey (GRAMS).
- c. Drainage Geochemistry.
- d. Digital Geofracture Analysis.

a. Literature Research, Photogeology and Geological Reconnaissance

A complete review of all published and unpublished reports pertaining to the permit area was made with particular reference to company reports on previous exploration programmes.

This work preceded scout geological reconnaissance over a number of broad areas included within EL6/68. Simultaneously photogeological work was conducted in the Brisbane office to produce base-maps and photogeological maps for future regional surveys and follow-up.

The findings were recorded in a number of reports, the recommendations of which formed the basis for a continued, detailed study of the potential of a varied selection of mineral occurrences.

These early reports were:-

- Geophoto Minerals Report 1969/3 - The Prospects for Alluvial Tin between the Pioneer and Endurance Mines and near Moorina, N.E. Tasmania, EL6/68.
- Geophoto Minerals Report 1969/4 - Geology and Mineral Prospects of the Scamander District, N.E. Tasmania, EL6/68.

- Geophoto Minerals Report 1969/13 - Prospects and Investigation  
in the Blue Tier Tinfield of  
N.E. Tasmania.
- Geophoto Minerals Report 1969/23 - Geology and Mineralization of  
the Upper Avenue River Area,  
Scamander, N.E. Tasmania.
- Geophoto Minerals Report 1969/27 - An Appraisal of the Goldfields  
of N.E. Tasmania

b. Gamma Ray Spectrometer Survey (GRAMS)

An airborne radiometric survey was conducted over the whole permit area using a gamma ray spectrometer system, developed by subsidiaries of Texas Instruments, which records the aerial distributions of three radio-active isotopes, thallium 208, potassium 40 and bismuth 214. It was hoped a study of the data could be used to determine rock-type distributions and in so doing indicate areas of potential economic mineralization.

The survey met with moderate success in differentiating between the mineralizing "tin" granites of the Blue Tier Batholith and rock units not associated with mineralization. A number of anomalies were delineated for follow-up ground investigation including possible economic uranium occurrences.

Reports relating to this work include:-

- Geophoto Minerals Report 1969/35 - Gamma Ray Spectrometer Survey,  
N.E. Tasmania. (41/24)
- Geophoto Minerals Report 1970/2 - Summary of Digital Geophysical  
70-700 (41/28) and Geochemical Data Sheets at  
1:100,000 Scale, EL6/68, N.E.  
Tasmania.

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c. Drainage Geochemistry

This regional survey was restricted to areas comprising Palaeozoic rocks with the collection and analysis of wet active stream sediments, supplemented by dry stream sediments where the latter did not exist.

The objective was to define broad areas of above background metal values and by study of dispersion patterns, in localised areas where the sampling was more detailed, to determine the source areas.

A total of 1613 samples were recovered in this survey with analysis carried out by atomic absorption methods for Cu, Pb, Zn, Ag, Mo and Bi.

The objectives were basically achieved with zones of anomalous metal values outlined for more detailed follow-up work. Most zones corresponded to areas of known mineral occurrences although a number of virgin anomalies were located. Four such anomalies were designated the Upper Scamander Anomaly, the Bill's Marsh Anomaly, the Power Rivulet Anomaly and the Queen of Earth Anomaly, all subsequently covered by a more detailed, closely spaced, stream sediment geochemical programme.

The results of this programme of drainage geochemistry (broad regional and detailed) are included within reports:-

Geophoto Minerals Report 1969/6 - Stream Sediment Geochemistry of EL6/68, N.E. Tasmania.

Geophoto Minerals Report 1969/6c - Stream Sediment Geochemistry, St. Helens-Scamander Area, EL6/68, N.E. Tasmania.

- Geophoto Minerals Report 1969/6d - Stream Sediment Geochemistry,  
Mathinna-Avenue River, EL6/68,  
N.E. Tasmania.
- Geophoto Minerals Report 1970/2 - Summary of Digital Geophysical  
and Geochemical Data Sheets  
at 1:100,000 Scale, EL6/68,  
N.E. Tasmania.
- Geophoto Minerals Report 1974/1 - Summary of Geochemical Data-  
Various Prospects, EL6/68,  
N.E. Tasmania.

d. Digital Geofracture Analysis

An attempt was made to apply techniques used in the detection of buried reefs and anticlines in petroleum exploration, in the search for lode, stockwork and placer deposits in N.E. Tasmania. It was basically hoped to identify structurally anomalous areas within the complex composite granite batholith, buried cupolas beneath a cover of metasediments, shallow granite areas beneath the Cainozoic cover as a lead to placer channels and finally to distinguish structural patterns which may be relevant to the localisation of gold bearing veins in the Mathinna-Avenue River area.

The results of this work, not fully borne out by future exploratory work and field observations, are documented in:-

- Geophoto Minerals Report 1969/37 - Digital Fracture Analysis,  
EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1970/21 - Memorandum Report on Geofracture  
Analysis, Blue Tier, N.E.  
Tasmania.

2. Scamander Mineral Districta. Bill's Marsh Anomaly

A stream sediment anomaly located in the regional survey (samples SH37-SH47) was followed up with further closely spaced stream sediment sampling, BM1 - BM8 with analysis for Cu, Pb, Zn, Ag, Bi and Mo.

The results provided no further basis for extension of this work. These are tabulated in the appendix of:-

Geophoto Minerals Report 1969/6 - Stream Sediment Geochemistry of EL6/68, N.E. Tasmania.

b. Constables Creek

This prospect was the subject of an extensive investigation into the potential of mineralised (W,Mo,Bi,Sn) vein systems located in the contact zone of a denuded cupola of muscovite-biotite granite.

The exploration programme encompassed gridding, rock and soil geochemistry and geological mapping, culminating in the diamond drilling of 5 holes. The broad details can be summarised as:-

1. Gridding - 1600ft. baseline, 24,000ft. grid line.
2. Geological Mapping - 1in:200ft.
3. Rock Geochemistry - 136 (rock chip/cobra drill) samples - Mo, Bi, W, Sn, Cu, Pb, Zn, Ag.
4. Soil Geochemistry - 249 samples - Mo, Bi, W, Sn.
5. Diamond Drilling - 5 holes - total footage 1701ft. 4ins.  
- 1150ft. core/63 sludge samples  
assayed for Cu,As,Cd,Sb,Au,Mo,Bi,  
W,Sn,Li.

All data has been documented and evaluated in the following reports:-

- Geophoto Minerals Report 1969/4 - Geology and Mineral Prospects of the Scamander District, N.E. Tasmania.
- Geophoto Minerals Report 1969/34 - Memorandum Report on Progress of Rock and Soil Geochemistry on Restricted Targets, EL6/68, July, 1969.
- Geophoto Minerals Report 1970/3 - Memorandum Report on Constables Creek Drilling, St. Helens District, EL6/68.
- Geophoto Minerals Report 1970/10 - Diamond Drill Log, EL6/68, Completion Records C.C.D.D.H.1. Constables Creek.
- Geophoto Minerals Report 1970/12 - Diamond Drill Log, EL6/68, Completion Records of D.D.H.2, Constables Creek.
- Geophoto Minerals Report 1970/13 - Diamond Drill Log, EL6/68, Completion Records of C.C.D.D. H.3, Constables Creek.
- Geophoto Minerals Report 1970/42 - Exploration Targets in the Texins Dev. Permit EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1971/43 - Constables Creek Project Diamond Drilling, EL6/68, N.E. Tasmania.

Geophoto Minerals Report 1971/43A - Diamond Drill Logs - Constables  
Creek D.D.H.4 and D.D.H.5.

With the drilling of the five diamond drill holes it became obvious that the mineralization apparent at the surface did not extend to depth in order to present a target for continued exploratory drilling. The programme was terminated following the completion of D.D.H.5.

c. Copper Show Creek

This prospect, centred on an adit and shaft exposing a fissure lode carrying sulphide mineralisation, was investigated with a limited geochemical programme and geological appraisal. The geological environment was similar to that of the Upper Scamander Copper Anomaly (approx.  $\frac{3}{4}$  mile to N.W.) upon which a comprehensive evaluation was being conducted at the time.

The work programme on this prospect consisted of:-

1. Gridding - 7,200 ft. of grid line.
2. Geological Appraisal.
3. Detailed Stream Sediment Geochemistry - 50 samples (radius of 1 mile) - Cu, Pb, Zn, Ag, Mo, Bi, W, Sn.
4. Soil Geochemistry - 75 samples - Cu, Pb, Zn, Ag.
5. Rock Geochemistry - 13 samples - Cu, Pb, Zn, Ag, As.

The results of this investigation, concluding that this fissure type of occurrence would at the best yield only low tonnages of low grade, are documented in:-

Geophoto Minerals Report 1970/42 - Exploration Targets in the  
Texins Dev. Permit EL6/68,  
N.E. Tasmania.

025

Geophoto Minerals Report 1970/83 - Memorandum Report on Geochemical Sampling in the Copper Show Creek Prospect, EL6/68, N.E. Tasmania.

Geophoto Minerals Report 1974/1 - Summary of Geochemical Data- Various Prospects, EL6/68, N.E. Tasmania, (Map only).

d. Great Pyramid Prospect

Texin's Great Pyramid Prospect lay directly south of the Great Pyramid Tin Mine upon which the Paringa Mining Company was conducting an intensive rotary percussion and diamond drilling programme with strong indications that sufficient reserves of low grade tin ore had been proven to warrant open cut mining on these reserves.

Early rock geochemistry over the area included within EL6/68 suggested this mineralization may extend to the south from the mine area. Follow-up work included gridding, geological appraisal, costeaning and further rock-chip sampling.

The earlier promise however, was not realised and the prospect was subsequently abandoned, apart from a limited investigation into its sulphide potential.

A summary of the work programme completed is:-

1. Gridding - 2000 ft. base line, 11,000 ft. of grid line.
2. Geological Appraisal.
3. Preliminary Rock Geochemistry - 78 samples - Sn

4. 9 Costeans - Geological Mapping.  
     - Rock Geochemistry - 183 samples - Sn.
5. Rock Geochemistry - Above 261 samples - Cu, Zn, Ag.

Reports:-

Geophoto Minerals Report 1969/4 - Geology and Mineral Prospects  
of the Scamander District,  
N.E. Tasmania.

Geophoto Minerals Report 1970/98 - Memorandum Report on Tin  
Prospects in the Great  
Pyramid Area, Upper Scamander,  
EL6/68, N.E. Tasmania.

Geophoto Minerals Report 1971/18 - Interim Report on Geological  
Mapping and Rock Geochemistry  
in the Great Pyramid Mine  
Area, N.E. Tasmania, EL6/68.

Geophoto Minerals Report 1974/1 - Summary of Geochemical Data -  
Various Prospects, EL6/68,  
N.E. Tasmania.

e. Loila Tier

This prospect throughout the duration of EL6/68 was held  
under mineral leases to outside parties.

A review was made of past exploration programmes con-  
ducted over this prospect together with a field examination  
and very limited rock chip sampling (4 samples).

Brief mention of these activities are made in:-

- Geophoto Minerals Report 1969/4 - Geology and Mineral Prospects of the Scamander District, N.E. Tasmania.
- Geophoto Minerals Report 1970/14 - Preliminary Investigation, Wolfram Creek Area, EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1974/1 - Summary of Geochemical Data- Various Prospects, EL6/68, N.E. Tasmania.

f. Lutwyche Prospect

A reconnaissance of the general Wolfram Creek area located significant wolframite/molybdenite mineralization associated with joint controlled vein systems within old workings of the Lutwyche Prospect.

Follow-up work was recommended, this taking the form of a preliminary geological appraisal and preliminary rock geochemistry.

Strong similarities between the prospect area and the situation of the Aberfoyle/Story's Creek Mines, prompted continued exploration which led to a diamond drilling programme.

A summary of the work completed is:-

1. Geological Appraisal.
2. Preliminary Rock Geochemistry - 57 samples - Sn, W, Mo, Bi.
3. Gridding - 2400 ft. of base line, 26,200 ft. of grid line.
4. Soil Geochemistry - 275 samples - Sn, W, Mo, Bi.
5. Detailed Geological Mapping.

- 028
6. Diamond Drilling - 4 holes - total footage 2780 ft.  
 - 486 ft. 3 ins. core assayed for  
 Cu, Mo, Bi, W, Sn.

The results of this diamond drilling failed to establish mineralisation of grade or width to support a mining operation. With these results and the depressed state of the wolfram prices at this stage, it was considered the Lutwyche Prospect did not warrant further exploratory drilling. All details of the work completed on this prospect are fully documented in reports:-

- Geophoto Minerals Report 1970/74 - Preliminary Investigation,  
 Wolfram Creek Area, EL6/68,  
 N.E. Tasmania.
- Geophoto Minerals Report 1970/82 - Memorandum Report on the  
 Lutwyche Prospect, Wolfram  
 Creek Area, EL6/68, N.E.  
 Tasmania.
- Geophoto Minerals Report 1971/21 - Geologic Report on Lutwyche  
 Prospect in EL6/68, N.E.  
 Tasmania
- Geophoto Minerals Report 1972/25 - Report on Diamond Drilling  
 on the Lutwyche Prospect,  
 EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1974/1 - Summary of Geochemical Data -  
 Various Prospects, EL6/68,  
 N.E. Tasmania.

g. North Scamander Lead/Zinc Prospect

Early stream sediment geochemistry with follow-up rock and soil sampling revealed an anomalous zone of Pb/Zn values

in the vicinity of the old North Scamander Mine/Prospect. This same prospect had been the subject of a comprehensive exploration programme in the early 1960's carried out by the Electrolytic Zinc Co.

Texins exploration programme included detailed mapping of the area, soil geochemistry and a reconnaissance V.L.F. survey.

The basic details of the programme were:-

1. Preliminary soil and rock geochemistry - 42 samples - Cu, Pb, Zn, Ag.
2. Gridding @ 5000 ft. base line, 80,000 ft. grid line.
3. Soil Geochemistry - 826 samples - Cu, Pb, Zn, Ag.
4. Detailed Geological Mapping.
5. Reconnaissance V.L.F. Survey - 4 Lines (total line coverage 11,700 ft.).
6. Rock Geochemistry - 68 samples - Cu, Pb, Zn, Ag.

The findings were that the area held limited economic potential but with only a low-medium grade, small tonnage type deposit feasible. The final conclusion was that no basis existed on which to mount further exploration.

Details of the exploration completed by Texins are included in:-

Geophoto Minerals Report 1969/4 - Geology and Mineral Prospects of the Scamander District, N.E. Tasmania.

Geophoto Minerals Report 1969/23 - Geology and Mineralization of the Upper Avenue River Area, Scamander, N.E. Tasmania.

030

Geophoto Minerals Report 1970/26 - Memorandum Report on the Scamander Lead - Zinc Anomaly, N.E. Tasmania.

Geophoto Minerals Report 1970/42 - Exploration Targets in the Texins Dev. Permit, EL6/68, N.E. Tasmania.

Geophoto Minerals Report 1973/12 - Geological Investigation of the North Scamander Pb/Zn Prospect, EL6/68, N.E. Tasmania.

h. Pinnacles Tin Prospect

This prospect area carries similarities to that of the Great Pyramid Tin Mine and as such came under consideration for limited testing.

However, exploration, in the form of gridding (9000 ft) and soil geochemistry (90 samples - Cu, Pb, Zn, Ag, Mo, Bi, W, Sn), was found to have encroached onto ground then held by the Scamander Mining Co. and follow-up was not pursued.

Mention of these activities are included in:-

Geophoto Minerals Report 1969/4 - Geology and Mineral Prospects of the Scamander District, N.E. Tasmania.

Geophoto Minerals Report 1974/1 - Summary of Geochemical Data - Various Prospects, EL6/68, N.E. Tasmania.

031

i. Power Rivulet Anomaly

As stated in the section on the regional drainage geochemical programme, anomalous values in a number of metals were recorded in the catchment area of the Power Rivulet (SH series of samples).

However, subsequent detailed stream sampling failed to define an anomaly of comparable value.

The geochemical data (P1 - P66 Sampey Lab. Sheets 2065/12,13,24) is tabulated in the appendix of:-

Geophoto Minerals Report 1969/6 - Stream Sediment Geochemistry of EL6/68, N.E. Tasmania.

j. Queen of Earth Anomaly

A stream sediment copper anomaly was located in the regional survey (samples US103 - US116) centred about a number of old gold prospects in the Brilliant Creek/Queen of Earth Creek area (upper reaches of the Scamander River).

Subsequent work included detailed stream sediment geochemistry (samples AB1 - 20 and Q43 - 57 - Cu, Pb, Zn, Ag, Mo, Bi) and limited soil sampling (57 samples - Cu, Pb, Zn, Ag).

No follow-up was considered warranted on the results of this work, the latter covered by reports:-

Geophoto Minerals Report 1969/6 - Stream Sediment Geochemistry of EL6/68, N.E. Tasmania.

Geophoto Minerals Report 1969/23 - Geology and Mineralization of the U. Avenue River Area, Scamander, N.E. Tasmania.

Geophoto Minerals Report 1974/1 - Summary of Geochemical Data -  
Various Prospects, EL6/68,  
N.E. Tasmania.

k. Silver Echo Prospect

This old prospect, peculiar to the Scamander area because of its pyrrhotite-pyrite-chalcopyrite association, was subjected to a limited programme of rock and soil geochemistry.

No results of significance were recorded in this work and the prospect deemed unworthy of further work.

The work completed included:-

1. Geological Appraisal.
2. Soil geochemistry - 20 samples - Cu, Pb, Zn, Ag, Co, Ni.
3. Rock geochemistry - 20 samples Cu, Sn.

Results of this work are found in:-

Geophoto Minerals Report 1969/4 - Geology and Mineral Deposits of the Scamander District, N.E. Tasmania.

Geophoto Minerals Report 1974/1 - Summary of Geochemical Data - Various Prospects, EL6/68, N.E. Tasmania.

1. Upper Scamander Copper Anomaly

The position of the Upper Scamander Anomaly was originally established in the regional stream sediment geochemical programme as a zone of anomalous copper values.

Subsequent detailed stream sediment and soil geochemistry further delineated its limits while an I.P. survey indicated weak but distinct anomalies.

Following scout geological work over the prospect area, two exploratory drill holes (the first abandoned after 90 feet) were drilled to test the anomaly at depth.

With the results from this drilling proving to be inconclusive, the prospect, somewhat downgraded, was further tested by an extended I.P. survey. The results of this work again failed to furnish any significant, strong anomalies to warrant further drilling, and the prospect was abandoned as such.

A summary of the programme is as follows:-

1. Detailed stream sediment geochemistry - 141 samples (AB21 - 161) - Cu, Pb, Zn, Ag, Mo, Bi.
2. Gridding - 45,600 ft. of grid line.
3. Soil Geochemistry - 558 samples - Cu, Pb, Zn, Ag.
4. Preliminary I.P. Survey - total line coverage 7000 ft.
5. Scout Geology.
6. Diamond Drilling - 2 holes - total footage 774 ft.  
- 258 ft. 3 ins. core/17 sludge samples assayed for Cu, Pb, Zn, Ag, Co, Ni, Cd, Sn.
7. I.P. Survey - total line coverage 12,200 ft.

Details of the exploration are included in reports:-

Geophoto Minerals Report 1970/1 - Upper Scamander Anomalies, EL6/68 including I.P. Results by Austral Exploration Services.

- U34
- Geophoto Minerals Report 1970/1A - Rock and Soil Geochemistry,  
Upper Scamander Anomalies  
EL6/68.
- Geophoto Minerals Report 1970/1B - Geologic Follow-up of the  
Upper Scamander Anomaly,  
EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1970/1C - Diamond Drilling Record,  
D.D.H. No. 1 Upper Scamander  
Anomaly EL6/68.
- Geophoto Minerals Report 1970/42 - Exploration Targets in Texins  
Dev. Permit EL6/68, N.E.  
Tasmania.
- Geophoto Minerals Report 1971/44 - EL6/68 - N.E. Tasmania, Pre-  
liminary Diamond Drilling,  
Upper Scamander Anomaly.
- Geophoto Minerals Report 1971/44A -Diamond Drilling Record -  
D.D.H.2, Upper Scamander  
Anomaly, EL6/68, N.E.  
Tasmania.
- Geophoto Minerals Report 1972/6 - Induced Polarization Survey,  
Upper Scamander Anomaly,  
EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1974/1 - Summary of Geochemical Data -  
Various Prospects EL6/68,  
N.E. Tasmania.

035

m. Wolfram Creek Prospect

The broad Wolfram Creek area was initially looked at on a regional basis with a geological reconnaissance, limited rock geochemistry and detailed stream sediment geochemistry.

This work delineated zones for more detailed follow-up work, the latter taking the form of detailed geological mapping, soil geochemistry and cobra rock drilling/geochemistry.

No results of significance were established in this work to warrant continued exploration.

Broad details of the work completed were:-

1. Regional Reconnaissance.
2. Detailed Stream Sediment Geochemistry - 119 samples - Cu, Pb, Zn, Ag, Mo, Bi, W, Sn.
3. Rock Geochemistry - 12 samples - Mo, Bi, W, Sn.
4. Gridding - Base line 1600 ft., Grid line 21,600 ft.
5. Detailed Geological Mapping.
6. Soil Geochemistry - 225 samples - Mo, Bi, W, Sn.
7. Cobra Rock Drilling - 21 samples - Mo, Bi, W, Sn.

Reports include:-

Geophoto Minerals Report 1969/4 - Geology and Mineral Deposits of the Scamander District - N.E. Tasmania.

Geophoto Minerals Report 1970/74 - Preliminary Investigation, Wolfram Creek Area, N.E. Tasmania, EL6/68.

036

Geophoto Minerals Report 1972/24 - Memorandum Report on Geological and Geochemical Investigations on the Wolfram Creek Prospect, EL6/68, N.E. Tasmania.

### 3. Blue Tier Batholith

This section is more conveniently divided into a further five subdivisions, all of which cover exploration conducted over the granitic areas which comprise the Blue Tier Batholith.

These are:-

- a. Blue Tier Tinfield - within a radius of  $2\frac{1}{2}$  miles of the Poimena Township.
- b. Frome River Project Area - similar geologically to the Blue Tier Tinfield but located away to the north-west.
- c. Pyengana GRAMS Anomalies.
- d. Bald Hill - Star of Peace Area - southwest of Weldborough.
- e. Main Creek Area.

#### a. Blue Tier Tinfield

The chief criterion for an investigation into the mineralised potential of this area was the checkered history of tin mining it had experienced over the past 80 years.

Following an appraisal of the area as a whole (Geophoto Minerals Report 1969/13), a number of prospects were singled out for more detailed work to ascertain grade/tonnage parameters

which would have a bearing on the type of mining feasible, if any.

i. Australia Mine/Summit Mine Area

A programme of geological mapping supplemented by rock chip and cobra rock drill dust geochemistry was conducted over this prospect to basically check the results of previous exploration programmes, particularly that of the Mt. Lyell Mining and Railway Company.

The work indicated subeconomic values providing only limited scope for continued exploration. The work completed included:-

1. Gridding - 2,200 ft. base line, 11,000 ft. of grid line.
2. Geological Appraisal.
3. Rock Geochemistry - 102 samples - Sn, W, Mo, Bi, Cu, Pb, Zn, Ag, Ni, Co.
4. Cobra Rock Drilling - 108 holes to 5 ft. depth - 108 samples - Sn.

Results of this work are recorded in:-

Geophoto Minerals Report 1970/95 - Progress Report on Prospects on the Blue Tier Tinfield EL6/68, N.E. Tasmania.

Geophoto Minerals Report 1971/17 - Interim Report on Investigations in the Australia Mine/Summit Mine Area, N.E. Tasmania, EL6/68.

038

ii. Liberator Mine

A limited programme of cobra rock drilling (16 holes to 5 ft. depth) was completed on this prospect following gridding of the area.

The drill dust samples were analysed for Cu, Pb, Zn, Ag, Co, Ni, Bi, Mo, with the results listed and commented upon in reports:-

Geophoto Minerals Report 1969/34 - Memorandum Report on Progress of Rock and Soil Geochemistry on Restricted Targets, EL6/68.

Geophoto Minerals Report 1970/42 - Exploration Targets in the  
70-695 Texins Dev. Permit EL6/68, N.E. Tasmania.

iii. Moon Mine

A similar programme of testing as that conducted on the Australia Mine area, was completed on this prospect with similar designs.

Again the grades indicated were low although some scope for extended exploration from a geological basis existed.

The work programme included:-

1. Gridding - 600ft. baseline, 3,500 ft. of grid line.
2. Geological Appraisal.
3. Rock Geochemistry - 50 samples - Mo, Sn.
4. Cobra Rock Drilling - 20 holes to 5 ft. depth - 20 samples - Mo, Sn.

Discussion and presentation of the results are included in:-

- Geophoto Minerals Report 1970/42 - Exploration Targets in the Texins Dev. Permit, EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1970/44 - Memorandum Report on the New Moon Mine Project, Blue Tier, EL6/68.
- Geophoto Minerals Report 1970/95 - Progress Report on Prospects on the Blue Tier Tinfield, EL6/68, N.E. Tasmania.

iv. Mt. Michael Mine

Simultaneously, with the programme being conducted on the Liberator Mine, the Mt. Michael Mine was tested by rock (20 samples) and soil (18 samples) geochemistry and limited cobra rock drilling (5 holes to 5 ft.) following gridding of the area.

The samples were analysed for Cu, Pb, Zn, Ag, Bi, Mo, Co, Ni and the results listed in:-

- Geophoto Minerals Report 1969/34 - Memorandum Report on Progress of Rock and Soil Geochemistry on Restricted Targets, EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1970/42 - Exploration Targets in the Texins Dev. Permit, EL6/68 N.E. Tasmania.

v. Vein Deposits (Hope Creek, Gough's, Lottah Mine)

A geological appraisal of the vein deposits of the area was made. Although often of high grade with a complex mineralogy, the vein widths and densities were insufficient to support a mining operation.

Forty rock chip samples were recovered in the work and analysed for Cu, Pb, Zn, Ag, Co, Ni, Mo, Bi, W, Sn, F.

Results of this work are found in:-

Geophoto Minerals Report 1970/95 - Progress Report on Prospects on the Blue Tier Tinfield, EL6/68, N.E. Tasmania.

Geophoto Minerals Report 1974/1 - Summary of Geochemical Data - Various Prospects, EL6/68, N.E. Tasmania.

vi. Other Prospects

Plans were formulated for exploration on other prospects within the general area, i.e. Crystal Hill, Duco, Perennial, Southern Cross, Marie Mines etc.

However, with the results of the work summarised above, no basis could be found for extending the programme to these new prospect areas.

A complete review of all data (Texins and other parties) was made, in 1973 with the final conclusion being that the possibilities of proving an economically exploitable tin deposit, on the then present indications, were poor. The

report recommended no further work:-

Geophoto Minerals Report 1973/10 - Status of the Blue Tier  
Tinfield, EL6/68.

b. Frome River Project Area

The main workings within this area, the F.B. Lode, the Hibernus Creek and Cream Creek Workings, were initially the subject of a geological appraisal and rock geochemical programme.

Interesting copper values suggested further work was required to fully evaluate the mineral potential of the area as a whole and the Cream Creek Mine (formerly known as the Spinks Workings) in particular.

Detailed geological mapping, rock and soil geochemistry and cobra rock drilling followed. A summary of the work completed is:-

1. Geological Reconnaissance.
2. Rock Geochemistry - 122 samples - Sn, Cu.
3. Gridding - 1000 ft. base line, 9,600 ft. of grid line.
4. Detailed Geological Mapping.
5. Soil Geochemistry - 107 samples - Cu, Pb, Zn, Mo, Bi, Sn.
6. Cobra Rock Drilling - 56 holes to 5 ft. depth - Cu, Pb, Zn, Mo, Bi, Sn.

Evaluation and presentation of the results of this work, with the final conclusion that the grades and tonnage to support an open cut mining operation at Cream Creek do not exist, are found in:-

Geophoto Minerals Report 1970/42 - Exploration Targets in the  
Texins Dev. Permit EL6/68,  
N.E. Tasmania.

Geophoto Minerals Report 1972/28 - Geochemical and Geological  
Investigation of the Cream  
Creek Project, Frome River  
Project, Blue Tier, EL6/68,  
N.E. Tasmania.

c. Pyengana GRAMS Anomalies

A number of anomalies which evolved from the processing  
of data gathered in the airborne radiometric survey were ground  
checked involving a geological reconnaissance, a scintillometer  
survey and rock geochemistry (38 samples analysed for U and Th).

Brief comment on these activities are found in:-

Geophoto Minerals Report 1970/42 - Exploration Targets in the  
Texins Dev. Permit EL6/68,  
N.E. Tasmania.

Geophoto Minerals Report 1974/1 - Summary of Geochemical Data -  
Various Prospects, EL6/68,  
N.E. Tasmania.

Also included under this subsection can be the radioactive  
occurrence reported near Gladstone within Cainozoic sediments.  
This prospect was likewise ground checked by a scintillometer  
survey and rock geochemistry (19 samples analysed for U and Th).

Reports dealing with aspects of this work are:-

- Geophoto Minerals Report 1969/2 - Radioactive Occurrence,  
Gladstone, Tasmania.
- Geophoto Minerals Report 1974/1 - Summary of Geochemical Data -  
Various Prospects, EL6/68,  
N.E. Tasmania.

d. Bald Hill - Star of Peace Area

This area lying to the south-west of Weldborough although geologically similar to the Blue Tier Tinfield, had not in the past been subjected to the same intensity of mining and exploration activity.

The area was investigated by Texins with the view to proving deposits of Sn, Sn-Cu or Cu-Mo in either small, rich fissure lodes or large, low grade disseminated or stockwork bodies.

Considerable work was completed over 7 grid area, the broad details of which are summarised as:-

1. Geological Reconnaissance.
2. Stream Sediment Geochemistry - 29 samples - As, Cu, Pb, Zn, Ag, Sn, Mo, Bi, W.
3. Rock Geochemistry - 58 samples - Cu, Pb, Zn, Ag, As, Mo, Bi, W, Sn.
4. Gridding (7 grids A-G) - total 7400 ft. of baseline, 78,200 ft. of grid line.
5. Geological Mapping.
6. Soil Geochemistry - 1000 samples - Cu, Pb, Zn, Ag, Co, Ni, W, Mo, Bi, Sn.
7. Rock Geochemistry - 134 samples - Cu, Pb, Zn, Ag, Mo, Bi, W, Sn.
8. Diamond Drilling - 4 holes - total footage 1393 ft 10 ins.  
- 532 ft./20 sludge samples assayed

for Cu, Pb, Zn, Ag, Co, Ni, Mo,  
Bi, W, Sn, F, Cd, Sb.

With the culmination of the programme in diamond drilling, the results failed to realise the initial potential placed in these prospects with no consistency in grade being maintained with depth. No basis existed for a continued exploration programme.

The details of this work are presented in reports:-

- Geophoto Minerals Report 1970/24 - Memorandum Report on the Bald Hills Project, Upper Cascade River, EL6/68.
- Geophoto Minerals Report 1970/24A- Analyses from Grids A,B,C,D, E and F, Bald Hill Project, EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1970/42 - Exploration Targets in the Texins Dev. Permit EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1971/31 - Diamond Drilling on the Rattler Hill Prospect, Bald Hill, EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1971/31A- Diamond Drilling Records for Bald Hill D.D.H.1, D.D.H.2 and D.D.H.3, Rattler Hill, Bald Hill, EL6/68.
- Geophoto Minerals Report 1971/51 - Diamond Drilling - Grid D, Bald Hill, EL6/68, N.E. Tasmania.

045

Geophoto Minerals Report 1974/1 - Summary of Geochemical Data -  
Various Prospects, EL6/68,  
N.E. Tasmania.

Further attention was given to this area in an evaluation of its potential as an eluvial tin deposit. Details of this work are included under the section on alluvial tin deposits.

e. Main Creek Area

Copper anomalies located in this area in the original drainage geochemical programme were checked by further detailed stream sediment geochemistry (10 samples - Cu, Pb, Ag, Co, Ni, Sn, W, Mo, Bi), supplementing the earlier work. This re-established the limits of the anomaly for a geological reconnaissance of the area.

No mineralisation of economic significance was located and the presence of remnants of a Tertiary basaltic cover was thought to be the source of the anomalous copper values.

This phase of work also included an evaluation of vein systems within decomposed granites/adamellites in the Weldborough area which in the past have been worked as residual tin deposits.

Soil (13 samples - Mo, Bi, W, Sn) and rock (14 samples - Sn, Mo, Bi, W) geochemistry were included in this appraisal, details of which are found:-

Geophoto Minerals Report 1970/94 - Report on Anomalies in the  
Main Creek Area, EL6/68,  
N.E. Tasmania.

4. Alluvial Tin Areas (Map A200)

The overall programme for the alluvial tin areas, as it was formulated and evolved, is summarised in a series of status reports:-

Geophoto Minerals Report 1969/3 - The Prospects for Alluvial Tin Between the Pioneer and Endurance Mines and near Moorina, N.E. Tasmania, EL6/68.

Geophoto Minerals Report 1970/42 - Exploration Targets in the Texins Dev. Permit EL6/68, N.E. Tasmania, July, 1970.

Geophoto Minerals Report 1973/9 - The Status of Prospects within the Alluvial Tin Programme EL6/68, N.E. Tasmania, March 1973.

Geophoto Minerals Report 1973/14 - The Status of the Alluvial Tin Programme, EL6/68, N.E. Tasmania - November, 1973.

The ultimate target was to prove at least 2,000,000 cu. yds. of average 1 lb/cu. yd. SnO<sub>2</sub> grade, to be exploited by a simple hydraulic tin washing plant moving from prospect to prospect if necessary.

Details of programmes conducted on the individual prospects with this end in mind, are included in the above reports and in the following:-

Geophoto Minerals Report 1969/33 - Memorandum Report - Scout Boring Rig and Preliminary Procedures for Sampling, EL6/68, N.E. Tasmania.

- 047
- Geophoto Minerals Report 1969/54 - Proposals on the Eastern Leads Tin Prospects EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1971/28 - Report on Percussion Drilling on the Eastern Leads Alluvial Tin Prospect in the South Mt. Cameron Area, EL6/68.
- Geophoto Minerals Report 1972/23 - Bald Hill Eluvial Tin Prospect, EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1973/7 - Evaluation of the Alluvial Tin Potential of the Dorset Flats, Pioneer, EL6/68, N. E. Tasmania.
- Geophoto Minerals Report 1973/8 - Percussion (Churn) Drilling on the Swains Creek Alluvial Tin Area, EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1973/11 - Evaluation of the Wyniford River Alluvial Tin Prospect, EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1973/13 - Percussion Drilling - Ringarooma River, EL6/68, N.E. Tasmania.
- Geophoto Minerals Report 1974/1 - Summary of Geochemical Data - Various Prospects, EL6/68, N.E. Tasmania.

A breakdown of the work completed on these prospects and the basic findings can be summarised as:-

i. Bald Hill Eluvial Tin Prospect

Type of Deposit - Eluvial/Alluvial

Field Work Completed - 307 Backhoe Holes - 386 samples assayed for Sn.

- 114 Hand dug Holes - 114 samples assayed for Sn.

- 4 Costeans - 13 channel samples assayed for Sn.

Findings - Approximately 131,000 cu. yds. grading in excess of \$1.00/cu. yd.

- Approximately 104,000 cu. yds. grading 50c to \$1.00/cu. yd.

Report - Geophoto Minerals Report 1972/23.

ii. Derby Flat

Type of Deposit - Shallow River Terrace/Deep Lead (Arba Lead).

Field Work Completed - 43 Auger Drill Holes - 78 samples assayed for Sn.

Findings - Negative

Report - Geophoto Minerals Report 1974/1

iii. Dorset Flat

Type of Deposit - Recent Alluvial Terrace of Ringaroona River.

Field Work Completed - Geological Reconnaissance.

- Gridding - 7 lines, 23,800 feet of grid line.

- 13 Backhoe Holes - 22 samples assayed for Sn.

- J49
- 46 Rotary Percussion Holes - 251 samples assayed for Sn.
  - 212 Percussion (Churn) Drill Holes - 1220 samples recovered  
1189 samples assayed for Sn.  
99 samples assayed for Au.
- Findings - 154,100 cu. yds. grading 0.95 lbs/cu. yd. SnO<sub>2</sub>  
(206,300 cu. yds. - overburden)  
or  
364,900 cu. yds. grading 0.60 lbs/cu. yds. SnO<sub>2</sub>  
(375,600 cu. yds. - overburden)  
or  
710,000 cu. yds. grading 0.50 lbs/cu. yd. SnO<sub>2</sub>  
(630,000 cu. yds. - overburden)
- Report - Geophoto Minerals Report 1973/7.

iv. Eastern Leads

Type of Deposit - Deep Lead

Field Work Completed - Geological Reconnaissance.

- 101 Auger Drill Holes - 172 samples assayed for Sn.
- 16 Percussion (Churn) Drill Holes - 409 samples assayed for Sn.
- Surveying - approximately 22,000 feet of line.
- Seismic Survey - ground coverage 690 metres.

Findings - Limits of Lead Established.

- Grade of Basal Washes Low.
- Limited Scope for Further Drilling.

Reports - Geophoto Minerals Reports 1969/33, 1969/54, 1971/28, 1973/14.

v. Echo Lead

Type of Deposit - Deep Lead

Field Work Completed - Geological Reconnaissance.

- Channel Sampling - 13 samples assayed for Sn.

Findings - Negative

Reports - Geophoto Minerals Reports 1973/9, 1973/14.

vi. Ringarooma River

Type of Deposit - Recent Alluvials along present river course.

Field Work Completed - Reconnaissance.

- 22 surface samples (top 2 feet) assayed for Sn.
- 33 Percussion (Churn) Drill Holes - 250 samples assayed for Sn.  
47 samples assayed for Au.

Findings - Grades falling off in value downstream.

- High Values on one line, upstream.
- Overall yardages insufficient to support dredge or hydraulic mining (<2,000,000 cu. yds.).

Report - Geophoto Minerals Report 1973/13.

vii. Shallow Marine/River Terraces, South Mt. Cameron

Type of Deposit - Shallow marine/river terrace.

Field Work Completed - Seismic Survey - 400 metres.

Findings - Not sampled.

Report - Geophoto Minerals Report 1973/14

viii. Swains Creek Area

Type of Deposit - Shallow Tertiary marine/estuarine/lacustrine.

Field Work Completed - 99 Percussion (Churn) Drill Holes -

457 samples recovered

445 samples assayed for Sn.

Findings - 122,750 cu. yds. grading 0.87 lbs/cu. yd. SnO<sub>2</sub>.

(96,000 cu. yds. - overburden)

or

223,750 cu. yds. - grading 0.65 lbs/cu. yd. SnO<sub>2</sub>.

(96,000 cu. yds. - overburden)

Report - Geophoto Minerals Report 1973/8

ix. Wyniford River

Type of Deposit - Recent/Tertiary River Gravels

Field Work Completed - Reconnaissance

- Preliminary sampling 9 samples assayed for Sn.

- 172 Backhoe Holes - 300 samples assayed for Sn.

Findings - Quaternary - 460,200 cu. yds. grading 0.54 lbs/cu. yd. SnO<sub>2</sub> indicated only

or

145,700 cu. yds. grading 1.03 lbs/cu. yd. SnO<sub>2</sub> indicated only.

Tertiary - Between 31,000 and 45,000 cu. yds. grading 1.28 to 1.65 lbs/cu. yd. SnO<sub>2</sub>, indicated only

- Only 55% of total prospect area tested and 95 of the 172 holes failed to reach granite basement. Therefore can reasonably expect yardages in excess of 400,000 cu. tds. grading 1 lb/cu. yd. SnO<sub>2</sub> or more.
- More work required to fully test.

Reports - Geophoto Minerals Report 1973/9, 1973/11.

x. Other Prospects

Areas held under option or upon which options could be negotiated, were inspected, occasionally with limited sampling.

Included in these were:-

- a. Black Creek (L. Barnett) - reconnaissance/appraisal.
- b. Pearce Cascade Creek (D. Mullins) - reconnaissance/appraisal.
- c. South Mt. Cameron Leases (R. Lawry) - geological scout.  
- limited channel sampling (31).
- d. Star Hill (R. Lawry) - reconnaissance/appraisal.
- e. Amber Hill (R. Lawry) - reconnaissance/appraisal.
- f. Fly-by-Night Creek (R. Lawry) - reconnaissance.  
- Channel sampling (53 samples assayed for Sn)

Details of this work are included in Geophoto Minerals Reports 1973/9, 1973/14.

Gemstone leases near South Mt. Cameron within EL6/68 also came under consideration with the drilling of eight holes. No significant results were gained from this work.

In November 1973, a complete review was made of a) the status of the individual prospects within the alluvial tin programme, and b) how far along the road to the target of 2,000,000 cu. yds. grading 1 lb/cu. yd. SnO<sub>2</sub>, the programme had progressed. At this point of time it was assessed that the target had not been reached and, although there were distinct possibilities that it could be attained, the expenditure required to extend the programme to achieve the target of 2,000,000 cu. yds. would

not be rewarded by the gains to be had from a mining venture based on it. It was decided to terminate the programme.

5. Mathinna Goldfield

Following the initial literature research, geological reconnaissance (Geophoto Minerals Report 1969/27) and stream sediment geochemistry, this area commanded very little attention until mid-1972 when a comprehensive evaluation of the hard rock and alluvial potential was embarked upon.

Up to this time activity had been restricted to the drilling of the old tailings dumps near the New Golden Gate Mine and the alluvials of the Dans Rivulet. This work - 20 auger drill holes with 17 samples assayed for gold - is briefly discussed in:-

Geophoto Minerals Report 1970/42 - Exploration Targets in the  
70-695 Texins Dev. Permit EL6/68,  
N.E. Tasmania.

Geophoto Minerals Report 1974/2 - Summary of Geochemical Data -  
74-995 Various Prospects, EL6/68  
N.E. Tasmania.

The latter half of 1972, and into 1973, saw a considerable volume of work completed.

Over the hard-rock gold prospects, the purpose of this work was to determine the most suitable exploration tools to be subsequently used in a broad survey to locate undiscovered mineralized lodes and extensions of known lodes in the Mathinna area.

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Work, including geological mapping, geochemistry and geophysics over two test areas, however failed to establish any reliable techniques to detect such lode systems. Completed work included:-

1. Reconnaissance Geology.
2. Reconnaissance V.L.F. Survey - 9 lines, 15.3 km. line coverage.
3. Gridding (3 grids) - total 3450 m. base line, 16,785 m. grid line.
4. Detailed Geological Mapping.
5. Soil Geochemistry - 753 samples - Cu, Ni, Co, Pb, Zn, Ag, As, Hg, Sb, Mn.
6. Rock Geochemistry - 15 samples - Cu, Ni, Co, Pb, Zn, Ag, As, Au, Mn.
7. V.L.F. Survey - total line coverage 3510 m.
8. I.P. Survey - total line coverage 4050 m.
9. 2 Costeans - 200 rock chip samples.

At this time it was decided that the prospect of discovering new gold bearing lodes were slim in the absence of reliable surface prospecting techniques. Expensive "wild cat" exploratory drilling appeared the only answer but the possible returns, based on production figures from past mining activities, were not significant enough to warrant such a programme of drilling. No further work was recommended on these hard-rock gold prospects.

The alluvial gold prospects covered areas of shallow alluvials found to the east and west of the Mathinna township within Long Gully Creek and Black Horse Gully and, further to the north, the thicker alluvial cover within the valley of the Dans Rivulet.

The work completed can be summarised as:-

Long Gully Creek

1. 16 Backhoe Pits (2 lines) - 98 samples recovered  
- 98 samples assayed for Au.

Black Horse Gully

1. 184 Backhoe Pits (10 lines) - 553 samples recovered  
- 517 samples assayed for Au.
2. 3 Percussion (Churn) Drill Holes - 15 samples recovered.  
- 11 samples assayed for Au.

Dans Rivulet

1. Seismic Survey - 2360 m. of traverse.
2. 9 Backhoe Pits (2 lines) - 27 samples recovered  
- 27 samples assayed for Au.
3. 18 Percussion (Churn) Drill Holes - 97 samples recovered.  
- 78 samples assayed for Au.

Early promise of workable yardages in Black Horse Gully did not materialise with subsequent testing, high grades found only close to bedrock and thus presenting only a limited yardage. No values of significance were recorded in Long Gully Creek or the Dans Rivulet to supplement the yardages of Black Horse Gully.

Full details of the work programme completed on both the hard-rock and alluvial gold prospects in 1972/73 are documented in:-

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Geophoto Minerals Report 1972/16 - Progress Report on Mineral Exploration in the Mathinna - Tower Hill Goldfields EL6/68, N.E. Tasmania.

Geophoto Minerals Report 1973/15 - Final Report on the Mathinna Lode and Alluvial Gold Prospects, EL6/68, N.E. Tasmania.

### CONCLUSIONS AND RECOMMENDATIONS

The section above outlines briefly what were the aims of the Texins involvement in EL6/68, what was accomplished in hard facts and figures to achieve the objectives and broadly what were the general conclusions for each region and prospect within the overall programme.

It is considered the work programme completed between 23rd August, 1968 and 23rd February, 1974 within the permit area EL6/68 has adequately covered every avenue from which a viable mining venture, of the type the programme was designed to define, could eventuate.

The original 650 sq. ml. permit area was systematically reduced with the progressive elimination of unproductive areas and increasing attention paid to those areas which continued to yield results which maintained their status as holding mineral potential.

The net result, however, has been disappointing with no prospect attaining the status of a significant find and demanding an intense drilling programme as the next step to further evaluate it, in order to block out possible ore reserves.

The alluvial gold and tin prospects commanded considerable

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drilling and/or pitting but in these cases, this was essential to give a true appraisal of the grades and yardages where patchy mineral distributions are a common feature.

The alluvial tin prospects, in fact, offered the only prospects of a limited cash inflow. Small yardages (approximately 800,000 cu. yds.) of economically exploitable grade were proven or strongly indicated which could support a small tin washing plant over a 5-6 year life span but the returns were not sufficient to create interest for companies of Texins and A.P.M.'s standing.

Two such areas, which provided some scope either from the standpoint of proven ore reserves or indicated large yardages of low grade which, with low cost mining methods coupled with high metal prices, could in the future present an attractive proposition (although at the moment not economic), were covered by mining leases to maintain the companies' interest in them. These were the Dorset Flats (100 hectares - 1 mineral lease) and the Ringarooma River (107 hectares - 2 mineral leases) which were pegged prior to the release of the exploration licence permit.

The hard rock prospects of the Blue Tier area, the Scamander Mineral District and the Mathinna Goldfield all failed to realise any mineral potential originally placed in them.

The low grade of the tin lodes of the Blue Tier area continues to render these lodes unenconomic based on mining costs and metal prices existing at present.

The many and varied mineralized lodes of the Scamander District proved narrow and inconsistent in dimension and of generally low grade, again offering no scope for continued exploration.

The work completed on the Mathinna Goldfield was aimed initially at establishing reliable techniques (geochemical/geophysical/geological) to be used to locate gold bearing lodes in a broad survey of the area as a whole. These were not forthcoming and it was considered inadvisable to commit a large expenditure on a basically "wild-cat" drilling programme.

In February 1974, the status of the permit area EL6/68 was reassessed with a complete review made of all data on hand. This failed to produce any sound basis for continued exploration along new avenues of approach either for the region as a whole or any prospect in particular.

It was concluded that further expenditure on the permit area EL6/68 was not warranted and that the licence be allowed to expire on 23rd February, 1974.

APPENDIX I

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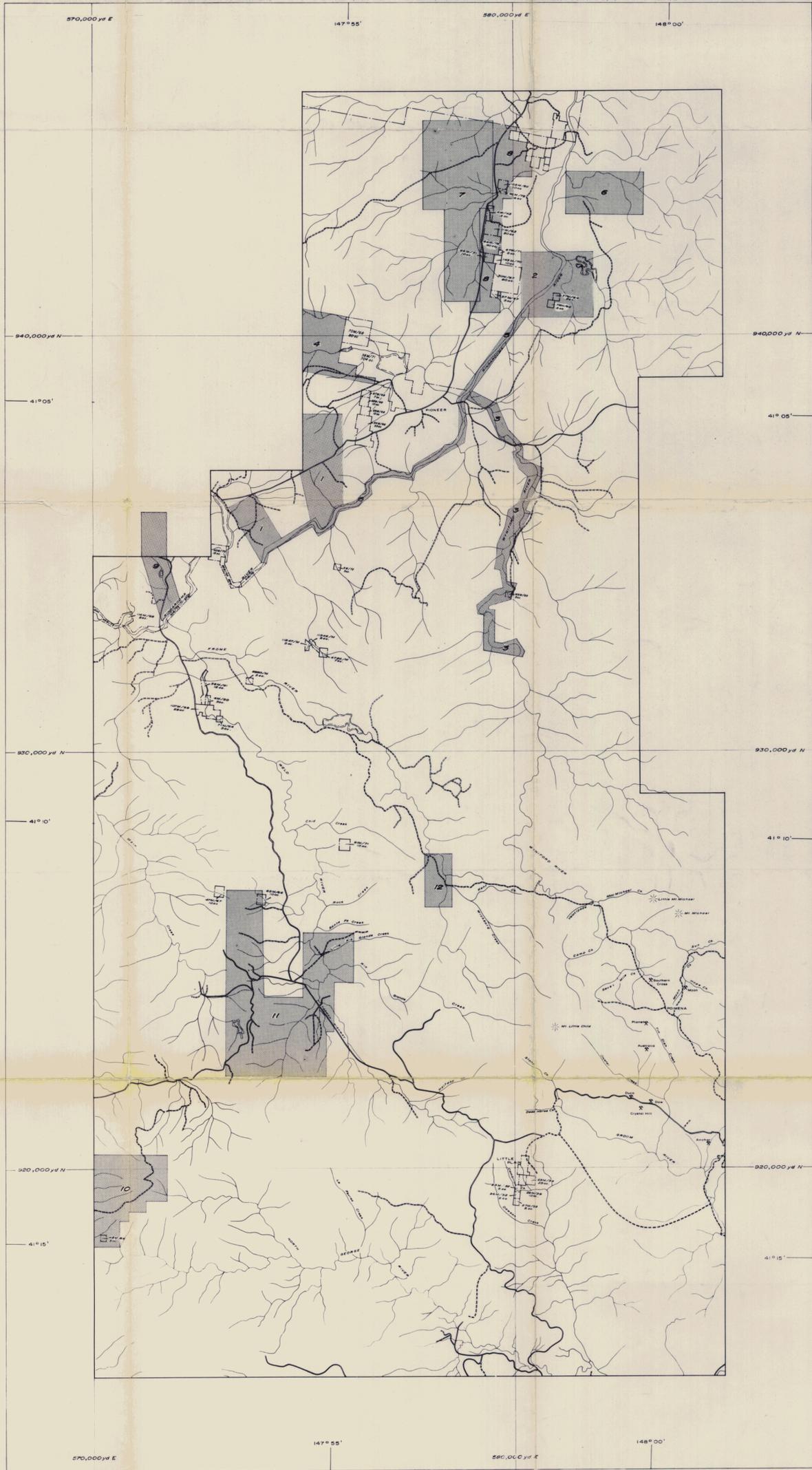
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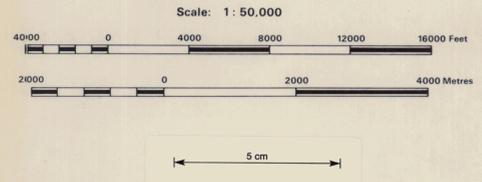
**APPENDIX II**



**LEGEND**

- Boundary of EL 6/68 - April '73.
- - - Mineral Lease boundary excluded from EL 6/68.
- Watercourse
- Road
- Vehicle track

PROSPECT AREAS	
1	Possible Deep Lead
2	Dorset Flat
3	Wynford River
4	Planer Lead (Extensions)
5	Ringarooma River
6	Swains Creek
7	Eastern Leads
8	Shallow Marine/River Terraces
9	Echo Lead
10	Bald Hill (Eluvial)
11	Weldborough (Alluvial/Eluvial/Residual)
12	Emu Flat

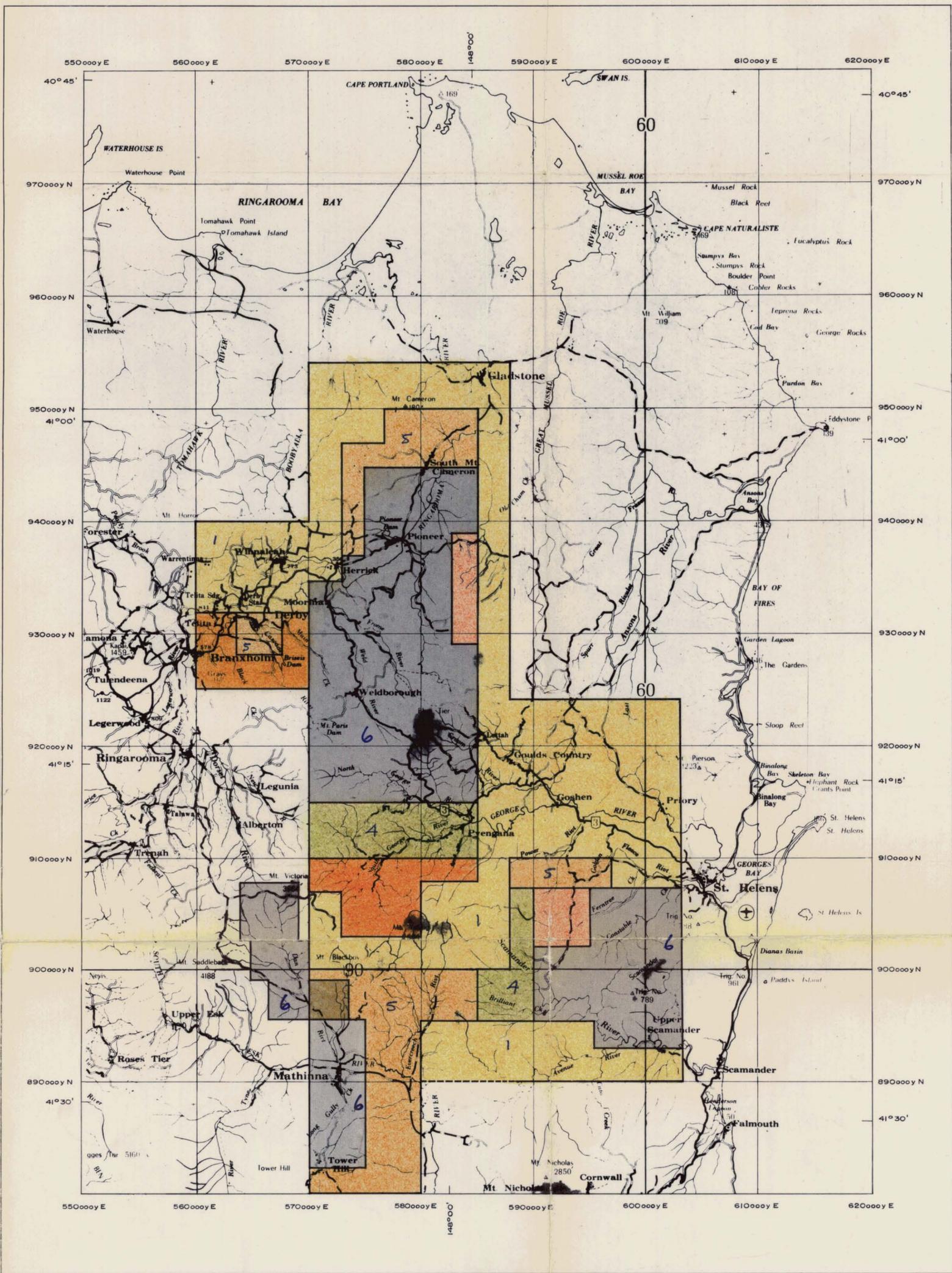


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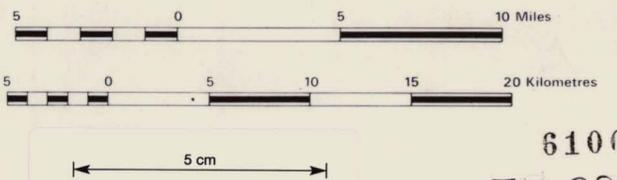
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**Alluvial Tin Prospect - Locations**  
 (STATUS REPORT - 22ND MARCH 1973)  
 2037

PROJECT	6/68	AUTHOR	I. Martimore	DATE	Nov. 1973	DWG. NO.	A 200
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Scale: 1:250,000



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EXPLORATION LICENCE 6/68 - 23.8.68		
	Extensions and reductions to area	Date
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2		23.8.70
3		23.8.71
4		23.2.72
5		23.8.72
6		23.2.73

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**GEOPHOTO RESOURCES**

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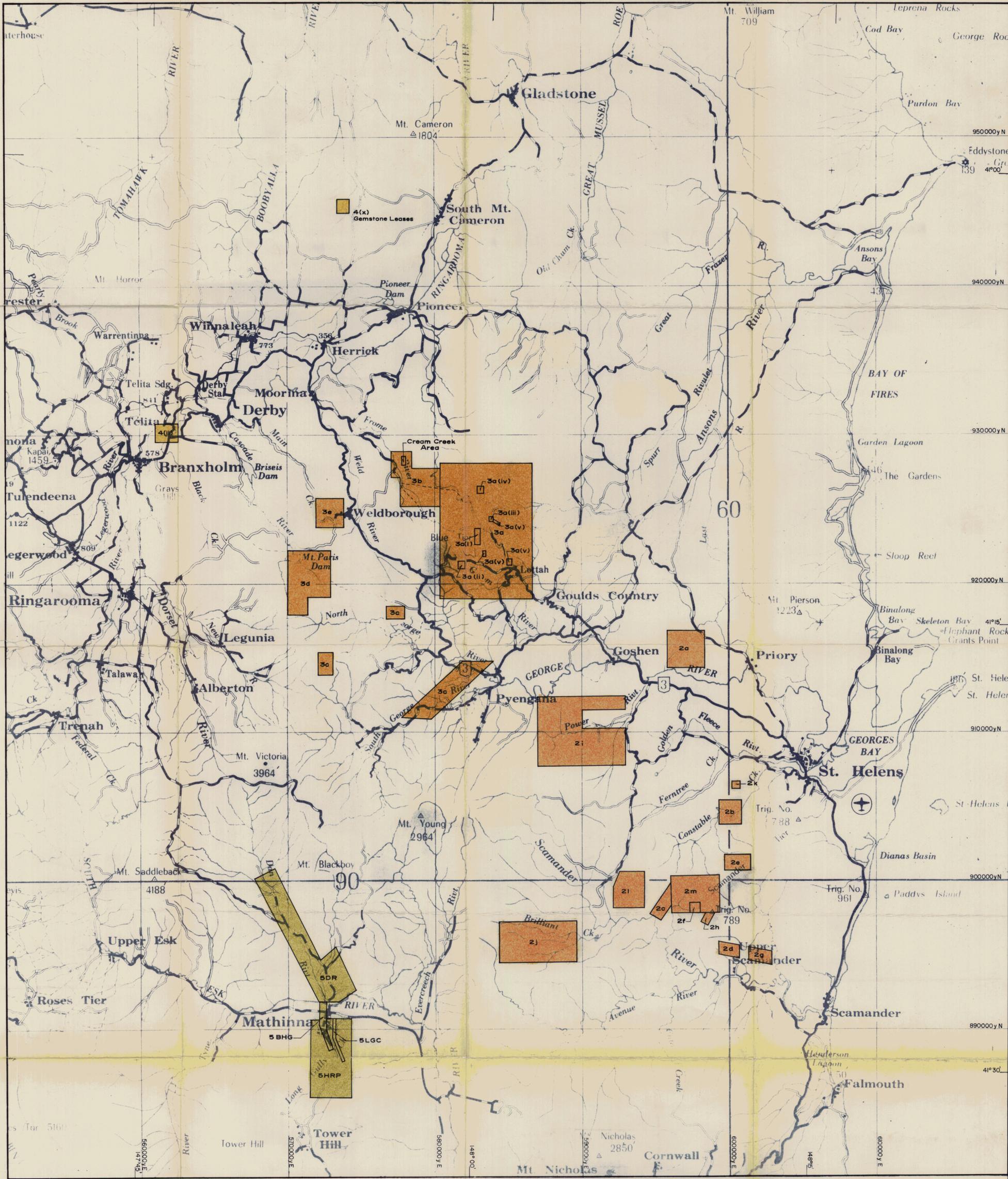
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**EL.6/68 NORTH EAST TASMANIA**

EXTENSIONS AND REDUCTIONS  
TO AREA HELD UNDER 2036  
EXPLORATION LICENCE 6/68

PROJECT	6/68	AUTHOR	—	DATE	DEC. 1973	DWG. NO.	A218
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1974/2



**SCAMANDER MINERAL DISTRICT PROSPECTS**

- 2a Bill's Marsh Anomaly
- 2b Constables Creek
- 2c Copper Show Creek
- 2d Great Pyramid Prospect
- 2e Lalla Tier
- 2f Lutwyche Prospect
- 2g North Scamander Lead/Zinc Prospect
- 2h Pinnacles Tin Prospect
- 2i Power Rivulet Anomaly
- 2j Queen of Earth Anomaly
- 2k Silver Echo Prospect
- 2l Upper Scamander Copper Anomaly
- 2m Wolfram Creek Prospect

**BLUE TIER BATHOLITH PROSPECTS**

- 3a Blue Tier Tinfield
- 3a(i) Australia Mine/Summit Mine Area
- 3a(ii) Liberator Mine
- 3a(iii) Moon Mine
- 3a(iv) Mt Michael Mine
- 3a(v) Vein Deposits (Hose Creek, Goughs/Lottah Mine)
- 3b Frome River Project Area
- 3c Pyengana Grains Anomalies
- 3d Bala Hill - Star of Peace Area
- 3e Mann Creek Area

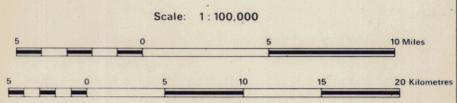
**ALLUVIAL TIN AREAS**

- 4(i) Derby Flat
- 4(x) Gemstone Leases

(For 4 (i), (ii), (iv), (v), (vi), (vii), (ix) - see map 4200)

**MATHINNA GOLDFIELD**

- 5HRP Hard Rock Gold Prospect Area
- 5BHG Black Horse Gully Creek
- 5LGC Long Gully Creek
- 5DR Dans Rivulet



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**PROSPECT LOCATIONS**

2038

PROJECT 6/68 AUTHOR I. Mortimore DATE April, 1974 DWG. NO. A-220