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GEOPHOTO MINERALS REPORT 1970/42

EXPLORATION TARGETS IN THE TEXINS DEVELOPMENT PERMIT
E.L.6/68 - NORTH EAST TASMANIA,
AS AT JULY 31ST, 1970.

I.

INTRODUCTION

The North East Tasmanian permits, reduced from 650 square miles, now cover an area of some 384 square miles, made up of Part I, 234 square miles and Part II, 150 square miles.

The metals actually mined from this region, which has Aberfoyle Mine type geology, are:

Tin	-	placer and hard rock (several very significant producers in the former cases).
Wolfram	-	lode.
Gold	-	lode.
Copper	-	disseminated and vein.

Other metals and minerals sought include:

Molybdenum	-	disseminated and vein.
Bismuth	-	disseminated and vein.
Zinc	-	fissure lode.
Lead	-	fissure lode.
Silver	-	fissure lode.
Beryllium	-	disseminated.
Uranium	-	
Thorium		(including monazite placers)

Non-metallics (such as kaolin clays, gemstones, (sapphires), piezoelectric quartz, phosphate) have been mined or recorded in the district, but have not been specifically sought by Texins Development Pty. Ltd.

Past producers of significance within the area are:

Anchor Mine (> 3,000 tons SnO_2 - lode).

Briseis Mine (> 10,000 tons SnO_2 - placer).

Arba Mine (> 1,000 tons SnO_2 - placer).

Wyniford Lead (Pioneer Mine, > 3,000 tons SnO_2 - placer),
re-established recently.

Endurance Mine (currently producing).

Dorset Dredging Operations (currently producing).

New Golden Gate (> 250,000 ozs. Au).

Other smaller mines include the Orieco Mine (Cu), Great Pyramid Mine (Sn), Pinnacles Mine (Sn).

The Aberfoyle Groups' Rossarden and Storey's Creek Mines lie to the south-west of the permit area in country of similar geologic character.

II.

EXPLORATION PROGRAM

The exploration carried out by Geophoto includes:

(1) Regional Scanning

- (a) Gamma Ray Spectrometer Survey (GRAMS)
- (b) Drainage geochemistry for Cu, Pb, Zn, Ag with some Co, Ni, Mo, Bi, As and Sn in special areas.
Digitising of this data has been done.
- (c) Geological scout and appraisal of whole area.

(2) Follow up and Detailing

Anomalies of all types from the above regional scan are being or have been steadily followed up by:

- (a) Ridge, spur and slope-toe soil and rock geochemistry;
- (b) Grid soil geochemistry;
- (c) Cobra rock-drill geochemistry scout, and to grids;
- (d) Ground geophysics (limited I.P. and S.P.);
- (e) Diamond drilling (limited).

(3) Types of Target

The types of target include old mining districts and extensions of prospects, and virgin GRAMS and stream sediment anomalies.

The scale of target being sought is:

- (a) Large tonnage (> 5,000,000 ton) open pit low grade Sn-Cu, Sn and Mo deposits (either in individual deposits or close spaced groups);
- (b) Moderate tonnage open pit low grade Sn-W-Bi-Mo deposits;
- (c) Large placer tin deposits (>10,000,000 yards at less than 80 ft. depth);
- (d) Placer tin; rich, pockety ground in recent streams to be worked by dragline or similar deposits;
- (e) Fissure lode Cu, Zn, Pb, Sn, Au.

Many companies and groups have in the past looked over and appraised the more obvious tin prospects throughout the permit, with most work being concentrated on the Anchor Mine environs, the Blue Tier workings, the Pinnacles and Great Pyramid Mines. Much of the work has been repetitive and merely a shallow gloss superposed on earlier appraisals, with little new data contributed. However, the

Mt. Lyell, E.Z. and B.H.P. companies have done some concentrated valuable work on some individual prospects. Much of the positive exploration data relate to the years 1907-1947 and it is not sure that all sampling was reliably controlled by technical staff. However, examined in conjunction with new, limited systematic programs, the old data should give an excellent idea of near surface character of the tin deposits.

The type of prospect that has greatest tonnage potential in the area does not, however, lend itself readily to easy surface prospecting or geophysics, and the high costs of analysis in the past did not encourage the close grid sampling that is the only reliable method of delineating possible areas of high interest.

The anticipated spottiness of values and near surface occurrence suggest that chief hardrock prospects for Sn, Mo, W etc. justifying exploration, must be large tonnage open pit type operations, but some vein ore possibilities (Aberfoyle Type) of base metal Sn, W, and Mo exist.

The Aberfoyle Group has recently optioned a small lease at Great Pyramid directly adjoining our ground, and commenced intensive hammer drill testing (to a grid) of the type necessary in this district.

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III. TARGET AREASHARD ROCK PROSPECTSA. BLUE TIER

This known mining district covers an area of 16 square miles. Geologically, the area consists of a young mineralizing granite (and associated apophyses and metasomatic zones) intruding older "porphyritic" granite. A block of country about the Anchor Mine was originally excluded from Texins permit. This one block has been extensively examined and tested in the past, most recently for International Mining Corporation, a recently floated Sydney company. In my view, it has been tested adequately with no reasonably large scale prospect remaining untested.

Other areas, however, have been much less extensively looked at for tin. Moreover, no real program for molybdenum, tungsten and bismuth has been mounted.

Prospects outside the Anchor are named and grouped as follows:

1. New Moon Mine - Hope Creek Area

This district was regarded by E.Z. Co. geologists (Lavers, 1962) as the only "tin granite" cupola of any significance that has only been partly exposed and presumably offering chances of shallower ground (of Anchor Type) at concealed contacts with the porphyritic granite.

Some work about the old mine (20 ft. deep irregular cuts of smallish dimensions, and a 45ft. shaft) has been done by Mt. Lyell and E.Z. Companies, with some tin values exceeding 0.2% outlined by both.

Our interest includes, not merely the tin prospects, but also molybdenum, as splashes of molybdenite are common in the mine, and our prospectors have located or relocated other areas in the vicinity along the Hope Creek. Bismuth is also reported in veins near Hope Creek.

Our detailed work to date involves a program of Cobra rock-drill holes and surface rock chip sampling. This was aimed as a check about the old workings (Drawing No. 1/137, 1 inch = 20 ft., attached). General prospecting in the vicinity was carried out. The future program will depend on analytical results now in progress.

The beryllium (phenacite or bertrandite) prospects of the New Moon Area seem to have been rejected by the E.Z. Company from one smallish sample of greisen from this area.

2. Frome River Workings

A group of prospects on the banks of the Frome River, and entering tributaries, are grouped as a project. These include the Spinks, Cream Creek, Hibernus Creek and F.B. Lode workings, each localised on an exposure of mineralising tin granite, intruding barren porphyritic adamellite.

Cobra and rock chip sampling have been done on the close environs of these workings (apart from the F.B. Lode, which was drilled many years ago, by the Tasmanian Department of Mines).

This work (Drawing 1/124) has as yet revealed nothing of high interest, except that some high copper and the usual sporadic Sn occur in places. At Spinks workings Cu to 1.2% is recorded (Appendix 2) and at Hibernus Creek (Appendix 3) an old Mines Department diamond drill hole gave a cupriferous intersection of about 66 feet corresponding with about 40 feet horizontal width. This intersection is by no means commercial but is interesting in view of the values at Spinks workings.

Hibernus Creek

The Log of the Mines Department Drill Hole (depressed 45° on a bearing 250° just west of Geophoto Point H7, Table I) west of the area mentioned, intersected a zone of Sn-Cu mineralisation from 86' 6" to 152' 0". Over five feet, (93' 5" to 98' 7") values ranged to 0.35% Sn and 0.8% Cu, but elsewhere were much less. However, this upper range in even one of the metals is the style of thing we are seeking for quarrying operations.

Water supply and main access for drilling and working are good or easily established in this Frome River district although costs will necessarily be incurred in setting up drill sites at individual prospects. Future testing of the Hibernus Creek Area should be of the following character:

- (1) Extended geological prospecting and rock-chip sampling for Sn and Cu about areas of "tin granite" in this district.
- (2) Exploratory drilling at Hibernus Creek -
HC DDH1 depressed 45° on a bearing 245° from near H7 (Drawing 1/124)
HC DDH2 depressed 45° on a bearing 065° from near H7.
- (3) Provided these show some results of interest
HC DDH3 and HC DDH4 can be placed at a site some 400 ft. south of H7 and drilled to similar attitudes.

Spinks Workings

At the Spinks Workings (Drawing 1/124) 11 of 20 rock samples about old workings gave values of better than 0.1% Cu and 4 of 20 gave better than 0.3% Cu, with a single peak 1.2% Cu. Tin values were generally low here, which seems to illustrate a district rule that where Sn and Cu occur in association, tin values drop in highly cupriferous metasomatic areas, and vice versa.

Further suggested exploration over the Spinks prospect district is:

- (1) Extend and close-up surface Cobra rock-drill and rock-chip sampling.
- (2) Diamond drill
SW DDH1 500 ft. at 45° depression and bearing 070° from point J12 (Drawing 1/124)
SW DDH2 a similar hole 400 ft. south of site SW DDH1.

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tin

The target here is an open cast/copper pit. These holes when logged and assayed should clearly indicate if density of fracturing, veining and replacement is encouraging enough to support continued exploration.

Cream Creek Workings

The results here, though based on wide spaced grid sampling, give no encouragement for further work, for either Sn or Cu. (Drawing 1/124, Appendix 3).

F.B. Lode

The old data on this prospect should be appraised in detail

3. Mt. Michael

A grid was established about the Mt. Michael Mine and limited preliminary sampling carried out to test this area. Results for Cu, Co, Pb, Zn, Ag, Bi and Mo on soil, rock, chip and Cobra samples were of no commercial interest (Geophoto Minerals Report 1969/34). Sn assays have yet to be done and future exploration would depend on these assays.

Other prospects (e.g. the Perennial) remain to be tested in the general area.

4. Liberator Mine and Extensions

The environs of the Liberator Mine (Geophoto Report 1969/13, 1969/34) has been gridded and tested for a number of elements other than tin. Samples are currently being run for tin, but results are not yet to hand.

Some interest in this prospect, and especially its environs, relates also to molybdenite, which is obvious in splashes. No Mo values of significance were achieved in older assays, but at that time the methods used by Sampey Laboratories for molybdenum assays were probably of dubious accuracy. These samples should be re-run, as molybdenite is a difficult mineral to sample and analyse at any time.

Interest also relates to the long (5,000 ft.) northern extensions of the "Liberator Fold" (Geophoto Report 1969/13), and more extensive chip sampling could be done thereon to scout its prospects.

5. Southern Cross - Mt. Marie

A dyke-like apophyse of "tin granite" ranging to 120 ft. in width occurs over a 5,000 ft. strike length from the Southern Cross Mine to north of the Marie Mine.

Cassiterite is known to be of sporadic occurrence in shoots.

Little work has been done by Geophoto, but because of the target length, some systematic surface testing is suggested.

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6. The following prospects are briefly discussed by Herd (Geophoto Minerals Report 1969/13). Nothing further has been done on these by way of systematic sampling, but old records justify some study, not only for Sn but for Mo and Cu.

6.1 Australia

6.2 Don

6.3 Summit

6.4 Duco

6.5 Crystal Hill

6.6 Miscellaneous outlying prospects

B. BALD HILL - STAR OF PEACE

This mineralised area west of Weldborough, is characterised by irregular and vein-like greisenous bodies carrying Sn with some Cu and As veins and weak Cu disseminations.

As such, it has similarities to the Blue Tier deposits but the past exploration has been much less.

Grids have been placed by Geophoto over several areas in the Bald Hill-Star of Peace district, the soil sampled systematically, and some rocks sampled. Trenches have been cut recently by other parties within the areas of our permits over more obvious mineralised veins in the district, and several leases have been pegged in the border areas. These recent applications have not been approved by the Department of Mines, pending survey as they partly appear to lie in our ground.

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Soil sampling shows high tin values ($>0.1\%$) in several grids, but best values are patchy as might be expected. Rock samples, chosen by the field party from trenches and obvious veins, show weak to high copper and tin values.

Separate reports 1970/24, 24A exist on the Geophoto work completed.

Several exploratory diamond drill holes are proposed to get a better idea of the general tenor of the ground on the several grids. Further drill holes can be programmed on the results of these. Suggested holes when all gridding is complete, are:-

(1)	SP	DDH	1	Grid D	300 ft.
(2)	SP	DDH	2	Grid D	300 ft.
(3)	SP	DDH	3	Grid A	300 ft.
(4)	SP	DDH	4	Grid B	300 ft.
(5)	SP	DDH	5	Grid B	300 ft.
(6)	SP	DDH	6	Grid C	300 ft.

C. CONSTABLE'S CREEK AREA

Attention to this area was given by a geological scout, which showed excellent "specimen ore" samples in a quartz-vein swarm in hornfelses, directly adjoining a small pluton (or outlying apophyse) from the main Blue Tier massif.

This pluton recorded a GRAMS anomaly for U, Th and K reflecting its late-phase, mineralised granitic character. Early grab samples recorded a high Bi content in some rocks associated with Wolfram, and molybdenum values of consequence were also obtained.

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Three exploratory diamond drill holes were put in this district but nothing of immediate commercial interest was located. The high assays of selected vein matter blasted from surface veins above DDH 1 and 2, were not encountered in the holes.

In all holes, molybdenite was visible in splashes in core in places, but assays showed no values of significance. A problem may have existed here in sample preparation but no molybdenum of commercial significance can be supposed.

The highest assays of any significance were from the 4ft. intersection of 0.2W% and 0.18% Bi at 250 ft. to 254 Ft. in DDH 3. However, a large shallow intersection between 23 ft. 2 ins. and 78 ft. 6 ins. in DDH 3 gave geochemically anomalous (0.05%) W, which may repay further attention by repeat check assays, and further exploratory penetration in this contact area.

A wide grid soil sampling program, completed since drilling, showed a zone of weak to moderate, anomalous molybdenum near wolfram veins along the eastern contact of the pluton near DDH 3. This anomaly contrasts with that over DDH 3. It is suggested that the high areas (topographically, as well as intrusion-wise) in this zone warrant at least one further 300 ft. exploratory hole.

Any further exploration should relate to finding buried cupola peaks in the vicinity, i.e. high spots where pneumatolytic activity and mineralisation can be presumed to be concentrated.

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D. WOLFRAM CREEK AREA (Geophoto Minerals Report 1969/4)

The area about and south of Constable's Creek includes quartz veins carrying wolfram. Recent exposures by bull-dozing in Wolfram Creek exposed some excellent wolfram values in one vein in what is now a lease held by Scamander Mining N.L.

This general area deserves systematic geologic prospecting and mapping. No diamond drilling is recommended before the results of such work is available. The scale of target expected is probably that of the Aberfoyle Mine.

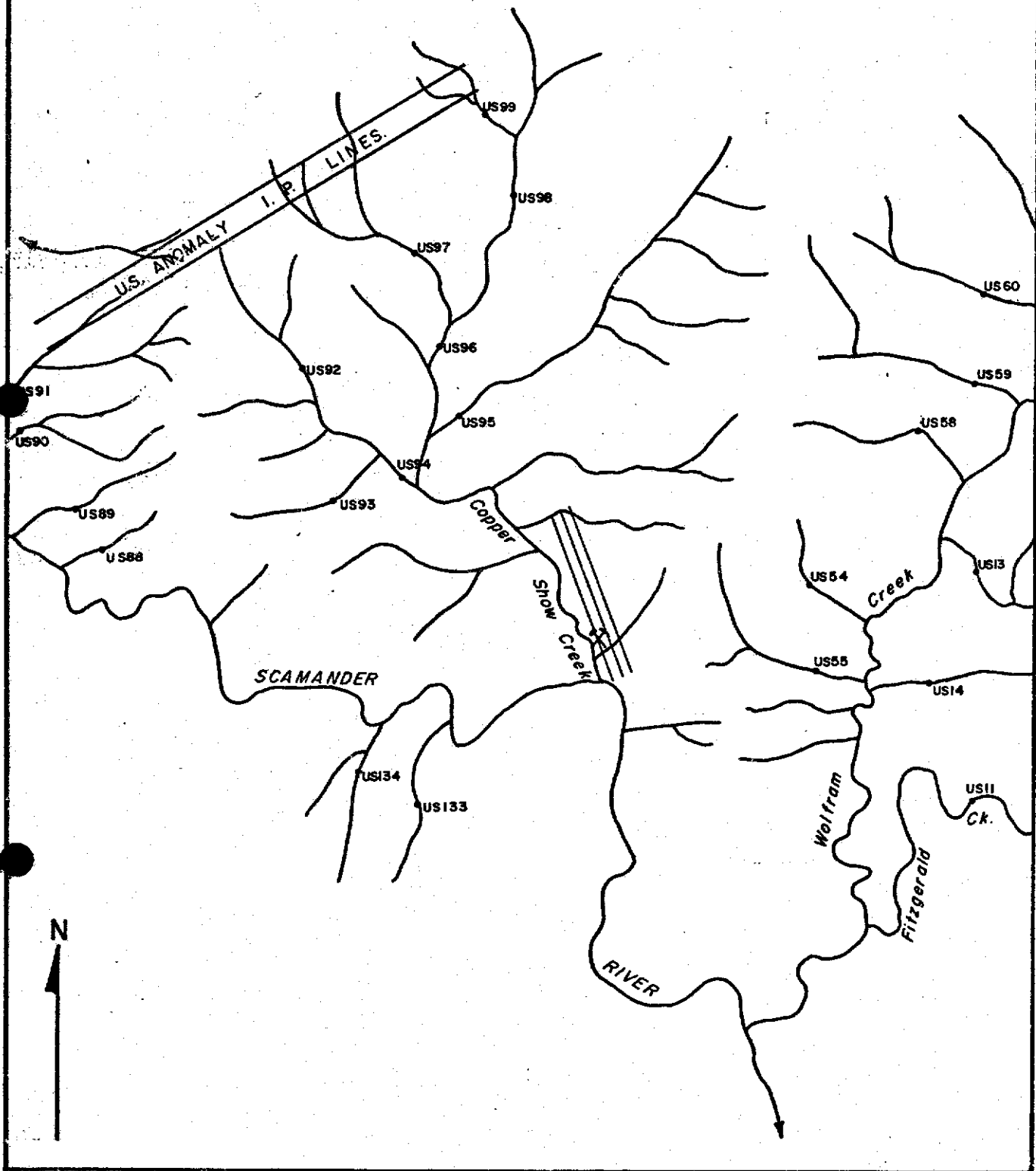
E. SCAMANDER ZINC PROSPECT

This area of zinc-lead lodes, anomalous zinc geochemistry and possible tin mineralisation is the subject of a separate memorandum report (Geophoto Minerals Report 1970/26). Base metal deposits of fissure lode type occur near granitic contacts and as such are expected to be of the rich, lensing, shoot type rather than lodes with large tonnage potential. Some may warrant limited surface testing and penetration.

However, the neighbouring stockwork tin deposits of Great Pyramid have offered enough attraction to the Aberfoyle Group to conduct a considerable hammer hole testing program. It is therefore necessary to consider stockwork deposits of this type in any exploration of the area.

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TEXINS DEVELOPMENT PTY. LTD.
E.L. 6/68 NORTH EAST TASMANIA
COPPER SHOW CREEK AREA
SAMPLE LOCATION MAP

SCALE : 1 : 25,000

5 cm

DRAWING NO. 1/128.

F. UPPER SCAMANDER ANOMALIES (Geophoto Minerals Reports 1970/1/1A/1B)

A virgin anomaly for copper of reasonably strong geochemical contrast in copper for this area was observed in stream sediment surveys. While the absolute Au values about the anomaly are by no means strong, a source has not yet been identified and soil gridding and limited I.P. traverses repeat the moderate anomalies evidenced by drainage geochemistry.

An attempt was made to penetrate beneath these anomalies with U.S. DDH 1, but after drilling problems, the hole was abandoned at 90 ft. without intersecting anything of economic consequence in the contact quartzites and shales. The target for this probing cannot be said to have been reached. The position of the area close to a granite contact has some geologic interest.

SHOW
Copper Falls Creek

Copper, arsenic, zinc-lead and silver veins partly tested by old workings, and old E.Z. Co. exploration, lie south of the Upper Scamander Anomaly (Drawing 1/128). Soil and rock geochemistry displays some anomaly in the northern extensions of old workings that could be considered for possible drilling. However, anticipated target size is not large.

G. MATHINNA GOLDFIELD (Geophoto Minerals Reports 1969/27, 1969/23)

Texins permits straddle this old field and adjoining auriferous country. At least one notable producer was located at Mathinna and Texins have retested (to check B.M.R. and Mines Department surveys)

01.
Coke?
dump-tails from this New Golden Mine, and this shows some spotty Au values of significance (Drawing No. 1/116 attached). Alluvial prospects include the possibilities of treating these old tails, but yardage is estimated by the Tasmanian Mines Department at about 420,000 tons sands and slimes and other residues assaying about 1 dwt. of Au per ton with associated arsenic of significance.

Attempts were made to scout auger various alluvial areas for gold, but hard and bouldery ground prevented effective penetration.

Hard rock and alluvial prospects remain essentially as stated in the older Geophoto reports. Gold is not easy to prospect for without thorough gridding and can only be checked out by what effectively is wildcat drilling. Hard rock gold is not the most attractive target in the present state of the gold market because it is fairly clear that fissure lodes with narrow underground stopes would be involved at Mathinna.

H. MISCELLANEOUS GRAMS AND GEOCHEMICAL ANOMALIES

Several GRAMS anomalies and weak to moderate digital geochemical anomalies occur in the permits (see Geophoto Minerals Report 1970/2).

All have been examined in terms of bedrock geology and some, not all, of these have been more closely reconnoitred by geologists and soil sampled, but no soil or rock anomalies of significance has resulted to date. From orientation with respect to Blue Tier secondary U occurrences it is apparent that these respond to the GRAMS so that those recommended in Geophoto Minerals Report 1970/2 should be followed up more intensely.

Geochemical contrast in granitic areas warrants some followup, particularly where GRAMS and digital geochemical anomalies correspond.

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I. PLACER PROSPECTS

These include:

A. Wyniford - Ringarooma Tin

Patchy, pebbly and bouldery ground of recent and older Quaternary occur in about 17 miles of present-day river-bed. Other companies such as B.M.I. are interested in the prospect of working this ground by drag-lines or mechanical shovels in similar fashion to gravel deposits, used for washed river aggregate for metropolitan markets. This ground obviously would not be responsive to continuous dredging or sluicing operation on a face because of its pockety and bouldery character.

Panning shows cassiterite is obviously present in quite rich values in pockets of smallish yardage. However, testing yardage and grade is a problem and it is probably a case where the working method is also the best prospecting method.

A survey for a rough estimate of yardage and values should be made because there is probably scope for testing moderate scale, low grade operations in the district.

B. Ringarooma Tin

The extensions and tributaries of old Tertiary leads and more recent Quaternary deposits, e.g.

- (1) Arba Lead environs;
- (2) Pioneer (Wyniford Lead) extensions and tributaries;
- (3) Eastern Leads and environs - deep ground and patchy near surface wash.

C. Gemstones

Gemstones (sapphires) and rock crystal are known for the surrounds of Mt. Cameron and whilst no deposits of quality have been recorded for many years, it is possible they have not been adequately tested.

D. Gold

Alluvial gold prospects exist (Geophoto Minerals Report 1969/27) but are not particularly attractive.

E. Tailings

Old tailings dumps are a possible, but not attractive, source of pre-worked alluvial yardage. Scope exists for both Sn and Au and monazite. Many of the better prospects are, however, held under lease.

GENERAL CONCLUSIONS

Texins permits cover a large area of the main mineral district of N.E. Tasmania having a spectrum of mineral targets notably Sn, W, Mo, Bi and Au. None of these metals is easily explored for and most demand intensive gridding and analytical work to back up geological scouting.

The hardrock targets that should be sought are large tonnage open cut Sn, Sn-Cu, Mo-Cu or W deposits. Of these, Sn offers best prospects, but will not be easily explored (because of its patchy habit of occurrence) except by systematic hammer

drilling or other penetration methods. This type of target includes vein swarms and dissemination or fracture filled stockworks in granite and country rock and the place to search is close to contacts of intrusives, exposed or buried.

The geochemistry of the younger intrusives appears right for Molybdenum associations but the intrusion history (particularly that relating to intrusion tectonics) may not be as adequate as some associated with North American economic occurrences. However in view of the scale of target sought, the market demand and price, the metals Mo and Cu should be explored for.

Aberfoyle Mine scale vein type operations are possible for Sn, W and Mo but these are difficult to prospect, except by wildcat drilling, to geologic and geochemical targets.

New approaches to placer mining and extraction may justify a look at all Sn alluvial prospects in this area. There are few prospective districts where abundant highstanding source rocks, access and water are so favourable for placer occurrence in Australia. The obvious "cream" has been extracted in the past but less obvious and marginal grade deposits may remain.

Base metal fissure lodes should not be ignored, but high hopes for tonnages exceeding 1,000,000 tons are not held.

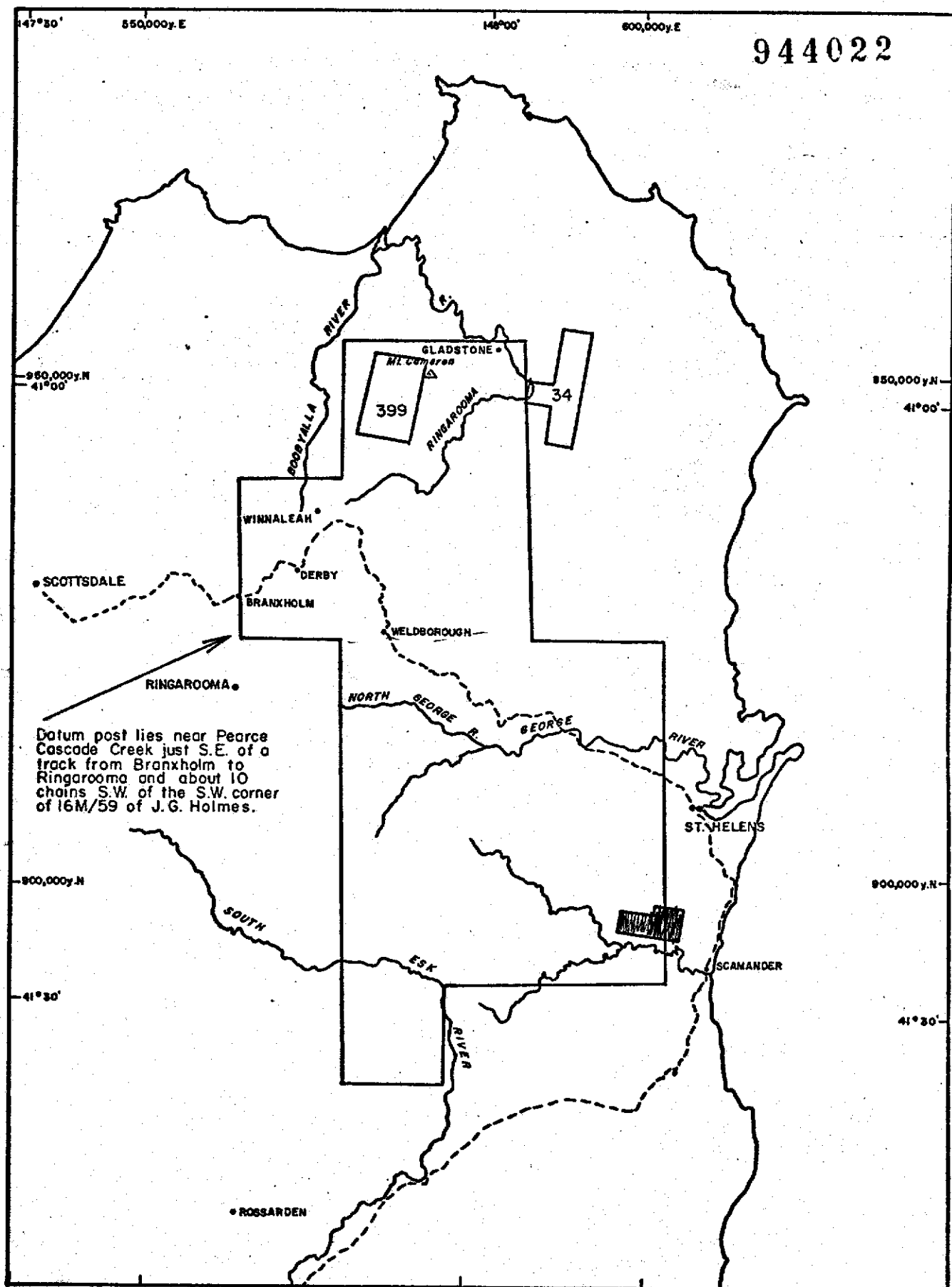
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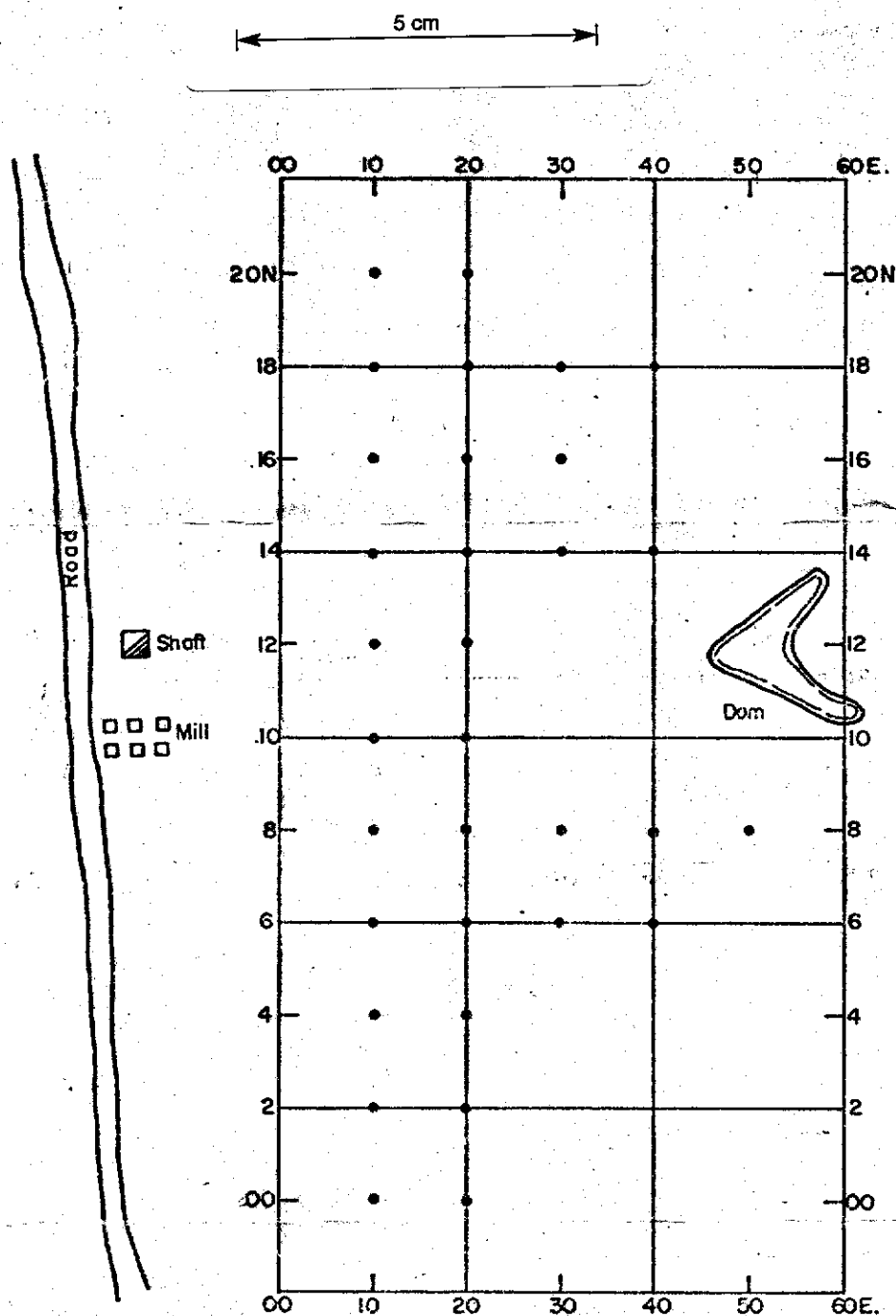
Drawings

- 1/116 Mathinna area AU-Bearing tails
- 1/124 Frome river project Rock & soil geochemistry
- 1/137 New Moon mine area Chip sample points

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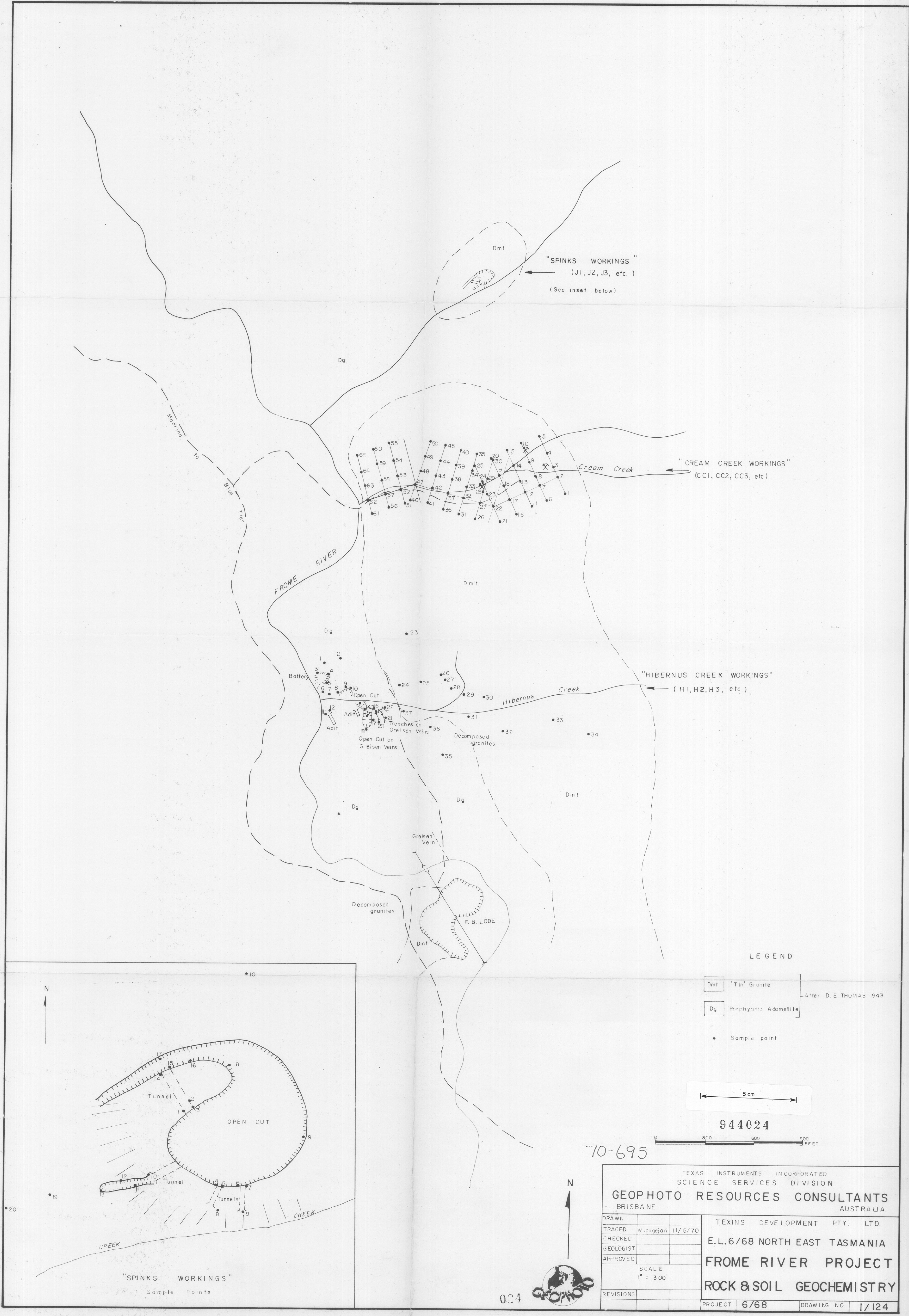
TEXINS DEVELOPMENT PTY. LTD.
 E.L. 6/68 NORTH EAST TASMANIA
 MATHINNA AREA
 AU - BEARING TAILS

SCALE: 1 inch = 400 feet.

DRAWING NO. 1/116

REP. NO. 1970/42





LEGEND

- Dmt Tin Granite
- Dg Porphyritic Adamellite
- Sample point

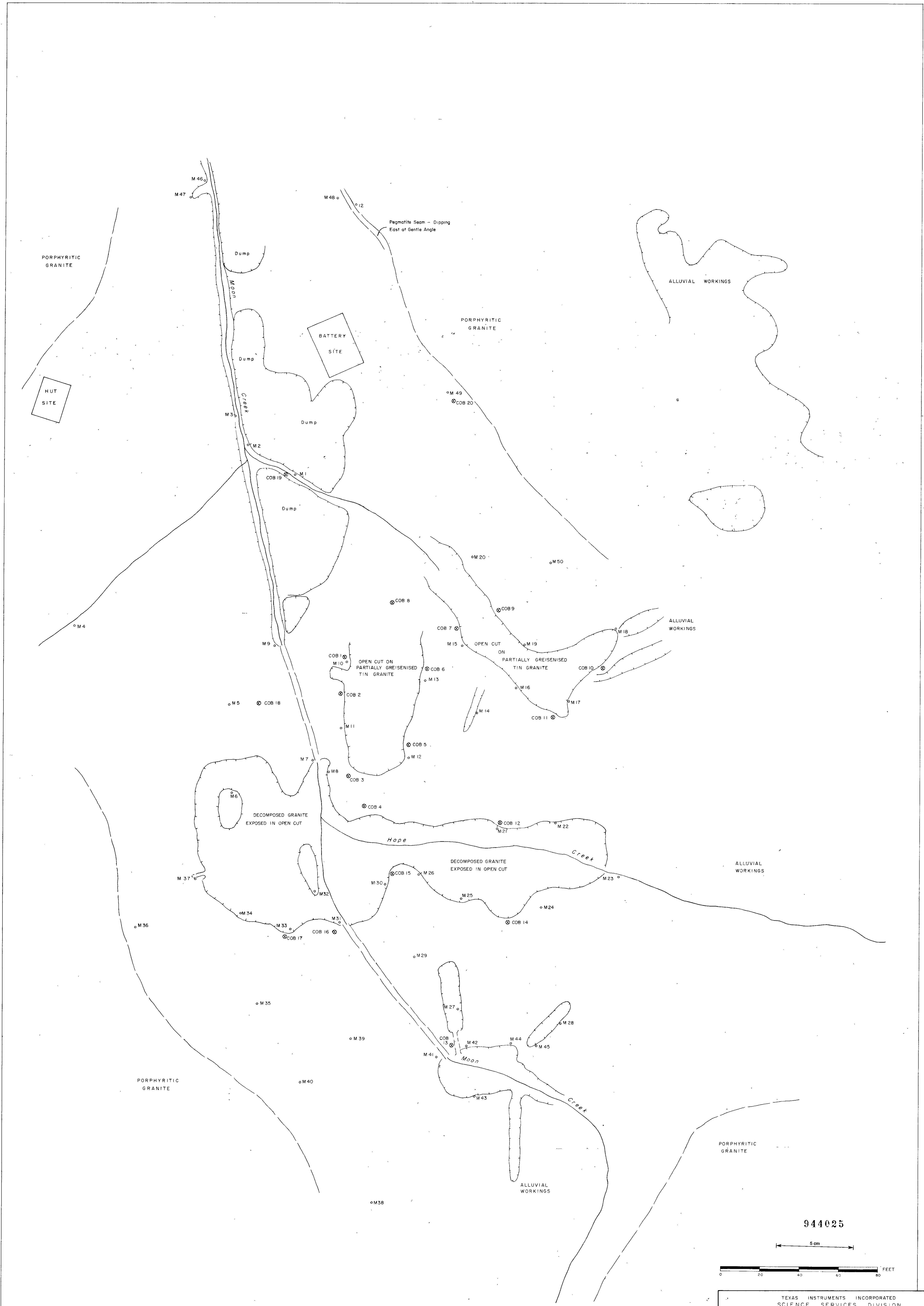
After D.E. THOMAS 1943

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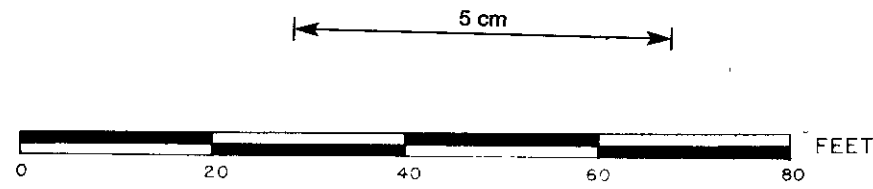
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TEXAS INSTRUMENTS INCORPORATED SCIENCE SERVICES DIVISION GEOPHOTO RESOURCES CONSULTANTS BRISBANE, AUSTRALIA			
DRAWN		TEXINS DEVELOPMENT PTY. LTD.	
TRACED		E.L.6/68 NORTH EAST TASMANIA	
CHECKED		FROME RIVER PROJECT	
GEOLOGIST		ROCK & SOIL GEOCHEMISTRY	
APPROVED		PROJECT 6/68	
SCALE 1" = 300'		DRAWING NO. 1/124	
REVISIONS			



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TRACED	B PACEY	EL. 6/68 N.E. TASMANIA	
CHECKED		NEW MOON MINE AREA	
GEOLOGIST		COBRA HOLES AND ROCK	
APPROVED		CHIP SAMPLE POINTS	
SCALE		023	
1" = 20'			
REVISIONS		PROJECT	DRAWING NO 1/137

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