

N.O. With the exception of Figs. 2 & 3 all work ^{Q32}
therein has been carried out on mineral leases

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GEOLOGICAL SURVEY AND SAMPLING PROGRAMME OF PARTS
OF EXPLORATION LICENCE 15/68 NEAR BRANXHOLM,
NORTH EASTERN TASMANIA

A report by David Groves,

March, 1972

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INTRODUCTION

The general geology of Exploration License 15/68 has previously been described in a report to R.B. Mining Pty Ltd by Solomon (1971). Recommendations from this study were for further investigation of the Ruby Flat, Bells Plains and Star of Peace areas, together with the area to the west of a line joining the Mammoth and Star of Peace prospects.

The present investigation, at the request of Mr B. Sowry of Ringarooma Mining Pty Ltd, has involved the following:

- a) a survey of the Ruby Flat area by J.D. New, plus a reconnaissance geological survey and sampling of kaolinised granite.
- b) a survey of lease 4SM/64 (5 acres) at the Star of Peace, held under option by Ringarooma Mining Pty Ltd, together with a geological survey of ground exposed by sluicing and a reconnaissance sampling programme.
- c) a survey of the Bells Plains area to locate existing prospecting trenches and costeans, plus a reconnaissance geological survey and some sampling.
- d) sampling of greisen lodes and enclosing altered granite at Bells Hill, using a survey plan of existing costeans and lodes prepared by K. Roche.

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- e) sampling of various greisen lodes exposed by costeaning to the west of the Mammoth and Star of Peace prospects.

The present surveys, geological investigations and sampling programmes were designed to delineate the areas within EL 15/68, which warrant further detailed investigation. The significance of the sampling programme in each area and the results of assays are discussed below, and recommendations are made for future work based on these results.

All assays were carried out under the direction of Mr H.K. Wellington at the Launceston Assay Laboratories of the Department of Mines.

STAR OF PEACE LEASE

The ground surrounding the old Star of Peace workings appeared to be promising because numerous tin-rich greisen boulders were present in irregular eluvial cover, and some of the granite was reported to be kaolinized and tin-bearing. Very few assays are available from greisens and granite in the area, apart from three results given by Jack (1966) and two results by Mr Reardon, which are given by Solomon (1971).

Since the report of Solomon, a small area to the south and east of the old workings has been sluiced by Mr L. Barnett and gives some indication of the potential of this area. It is difficult to gain an impression of the area to the east of the presently sluiced area (Figure 1), but it is probably significant that the tin from the eluvial deposits is decreasing markedly in this direction. The area west of the old workings has been bulldozed in a somewhat haphazard manner, and it is difficult to assess its potential, although greisen bodies do not appear large or continuous and kaolinized granite is not evident.

The sluiced area consists predominantly of biotite-muscovite granite which is kaolinized in a narrow zone

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around the old workings. The granite is cut by fractures, which are filled with quartz and kaolin possibly carrying minor cassiterite. The granite is remarkably fresh from about 60 feet east of the open cut. There are a number of irregular greisen bodies which pinch and swell rapidly along strike and trend mainly NW or WNW, although smaller bodies trend NE to ENE. Considering the concentration of greisen boulders in the eluvial cover, the frequency of greisen bodies is surprisingly low. This is probably due to the greater resistance to weathering of the greisen bodies which have been selectively concentrated during breakdown of the less resistant granite. Slates of the Mathinna Beds appear to overlie the granite in the far southeast corner of the sluiced area, and to the west and north of the old workings.

The distribution of cassiterite within the greisen is extremely irregular. It occurs as coarse-grained crystals in distinct pods or patches, but disseminated cassiterite is not abundant. This makes sampling very difficult, and the results difficult to interpret. Cassiterite also occurs as almost monomineralic pods within greisens and also within apparently unaltered granite, but these are widely scattered and cannot be considered as significant for the purposes of the

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sampling programme.

The sluiced area is about 300 ft long by 240 ft wide, but an approximate calculation indicates that it contains only about 100 tons of greisen per foot depth. Although this is extremely small and indicates little promise of an economic deposit, a small sampling programme was carried out to indicate the tin content of the greisen bodies (both as an indication for the present area and as an indication of possible variation in surrounding areas), and also of the surrounding granite (particularly the kaolinised granite) in the hope that this may carry disseminated cassiterite. The positions of samples are shown on Figure 1, and the results of assays are given in Table 1.

As expected, the tin content of the greisens is extremely variable, although most values are well below 1% Sn. This is in agreement with assays quoted by Scott (1928) of 0.43 and 0.63% Sn, and by Jack (1966) of 0.22, 0.49 and 0.58% Sn for greisens in the vicinity of the Star of Peace workings. The average assay value for greisen is 0.83% Sn. The altered and hard granite, which together represent about 5,000 tons per foot depth, assay only 0.01 to 0.05% Sn with a mean value of 0.03% Sn, and there appears to be no

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concentration in the kaolinized granite. On these assay values and approximate calculation of tonnages, the average grade of the sluiced area is about 0.05% Sn, which is about one quarter of a minimum economic grade. This calculated grade may be increased slightly by the occurrence of the cassiterite-rich pods that occur sporadically throughout the sluiced area.

Therefore the area can be considered too low grade to be considered as a low-grade open cut prospect, and the greisen bodies are too small and discontinuous to be worked individually, except by prospectors. It is therefore recommended that no further work be done on this area, particularly while it remains an isolated 5 acre lease, and the desirability of obtaining the adjacent ground is considerably reduced by the disappointing results of this survey.

AREA WEST OF MAMMOTH AND STAR OF PEACE PROSPECTS

Several greisen bodies crop out over a wide area west of a line joining the Mammoth and Star of Peace prospects (Figure 2). These greisen bodies are generally small, with maximum potential tonnages of 20,000 to 50,000 tons, but one irregular mass is 800 ft long and 200 ft wide, and contains a potential 1 million

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TABLE 1. Assay data on samples from the Star of Peace area (see Figure 1 for localities).

Sample No.	Sample Type	Sample Method	% Sn	% WO ₃
SP1	Greisen	Chip sample	0.50	< 0.01
SP2	"	"	0.77	< 0.01
SP3	"	"	3.3	< 0.01
SP4	"	"	0.37	< 0.01
SP5	"	"	0.55	< 0.01
SP6	"	"	0.92	< 0.01
SP7	"	"	1.2	< 0.01
SP8	"	"	0.33	< 0.01
SP9	"	"	0.21	< 0.01
SP10	"	"	0.38	0.02
SP11	Hard granite	"	0.03	ND
SP12	Kaolinized granite	Channel sample	<0.01	ND
SP13	"	"	0.05	ND
SP14	"	"	0.02	ND
SP15	Hard granite	Chip sample	0.04	ND

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tons of greisen to a depth of 200 ft below the surface.

Most of these bodies have been prospected by costeaning and inspection of the greisens exposed in these costeans indicates that coarse-grained cassiterite is present in quartz veins, filling joints and fractures parallel to the length of the greisen bodies. Chip samples were taken across the greisen bodies that had potential tonnages of greater than 10,000 tons. The sample positions are indicated in Figure 2 and the assay results presented in Table 2.

Considering the small tonnage involved in each greisen body, the assay values obtained indicate that this area warrants little further interest. Inspection of enclosing granite (which is not kaolinised adjacent to the greisen bodies) indicates that it contains no significant cassiterite, and assays of granites elsewhere in the area confirm this impression. Samples CG 13, 14 and 15 are from the large irregular mass of greisen which may contain up to 1 million tons of greisen. Samples CG 13 and 14, which were taken from typical greisen from this lode, assayed only 0.12 or 0.08% Sn, respectively, but CG 15, taken from part of the greisen containing numerous quartz veins, assayed 0.36% Sn. In view of the relatively large

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TABLE 2. Assay data on samples from greisen bodies to the west of Mammoth and Star of Peace prospects (see Figure 2 for localities).

Sample No.	Sample Type	Sample Method	% Sn	Potential tonnage of greisen
CG6	Greisen	Chip sample	<0.01	
CG7	"	"	0.09	
CG8	"	"	0.23	
CG9	"	"	0.05	
CG10	"	"	0.25	
CG11	"	"	0.16	
CG12	"	"	0.35	
CG13	"	"	0.12	
CG14	"	"	0.08	
CG15	"	"	0.36	
CG16	"	"	0.37	
CG17	"	"	0.10	
CG18	"	"	0.02	
CG19	"	"	0.41	
CG20	"	"	0.26	

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TABLE 3. Assay data on samples from Bells Plains area
(see Figure 3 for localities).

Sample No.	Sample Type	Sample Method	%Sn
CG1	Weathered Granite	Channel sample	< 0.01
CG3	"	"	0.02
CG5	"	"	< 0.01
CG2	Greisen	Chip sample	< 0.01
CG4	"	"	0.05

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potential size of the greisen body and irregular nature of the assay values, it may be advisable to produce a survey map of the extent of this body and to take several more samples before completely suspending work on this part of the area.

BELLS PLAINS AREA

The Bells Plains area represents a large flat area with alluvium over granite bedrock. In the northern part of the area, the alluvial deposits form a continuous plain, but in the southern area there are possibly several separate leads. The alluvium has concentrated in a shallow basin surrounded by steep granite hills, containing mineralized greisen bodies, and is therefore obviously an important target for exploration.

Numerous trenches and back hoe pits have been cut into the alluvium by Mr Reardon and have been investigated during the present study, and a survey of the area produced by Mr J. New (Figure 3). These pits expose between 6 and 15 feet of alluvium consisting of clay, sand and cobbles and boulders of Mathinna Bed lithologies with rare boulders of granite, greisen and basalt. As pointed out by Solomon (1971), the low

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content of greisen boulders is disappointing, because these represent the main source of the cassiterite in alluvial deposits in the area. Where bedrock has been encountered in the pits it is weathered granite, apparently without any greisen, although an assessment of the pits is difficult because they are inevitably filled with water. The only clear indication of the nature of bedrock is provided by exposures at the New Hope area to the west of the main Bells Plains area. Here there are patchy greisen bodies in partly weathered or kaolinized granites, which are overlain by thin alluvium carrying coarse-grained, unrounded cassiterite crystals. Samples of weathered granite and greisen were taken from this area (Figure 3) and assay values are given in Table 3. The assays of these samples indicate that they contain no significant tin and this confirms previous assays of samples taken by Mr Reardon from the western part of this area which indicated only trace tin.

A survey was made of the Bells Plains area to locate existing pits, to determine the depth of alluvium in these pits, and to obtain some information on the cassiterite content of the alluvium. The position of pits and depth of alluvium have been

determined (Figure 3), but the flooding of the pits and the presence of abundant cobbles and boulders in the alluvium made an assessment of the tin grade at the base of the alluvium impossible. Panning of material believed to be from the base of the alluvium indicated traces of cassiterite, but decomposed granite from beneath the alluvium does not appear to contain cassit-
erite.

It is evident from the survey map of the Bells Plains area that the previous exploration by Mr Reardon has not tested the lateral extent and depth of alluvium, but has followed an approximately NW-trending line parallel to the probable pre-existing drainage system. It is clear that to properly test this area an adequate system of sampling the alluvium, involving screening of different grain-size fragments, in particular the cobbles and boulders of sandstone and slate, must be devised. It is recommended that screening and sampling equipment, such as that employed by the company at Waratah, be set up in this area, and that initially the material excavated from existing pits be sampled and assayed. Future exploration should involve setting up a series of NE-SW trending grid lines across the

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area, with systematic sampling of the alluvium by back hoe cuts, possibly preceded by percussion seismic work to determine the probable depth of alluvium. From this study any old channel beds in the alluvium can be found and tested, and the broad alluvial flat itself can be adequately tested. At present, the areas away from existing tracks, including old workings and test pits, are so overgrown that any systematic study is impossible. A series of NW-trending bulldozer cuts across the plain would provide access for the back hoe and seismic equipment, and would also provide useful information on the extent of the alluvium and previously worked ground. The present map provides a base for designing these grid lines for future work and combining this with sample data obtained from existing pits. The extent of the exploration programme, spacing of grid lines and of back hoe cuts will depend on the preliminary results obtained from existing pits and possibly one exploratory traverse across the flat in which seismic profiles and closely spaced back hoe pits were employed to determine variability in depth and cassiterite content of the alluvium.

Previous records on the Bells Plains workings

are rare, although Nye (1927) indicates that some alluvial wash contains 2 to 2.5 lbs SnO₂/cu. yd and that wash in the vicinity of the New Hope area contained several lbs SnO₂/cu. yd.

RUBY FLAT AREA

The Ruby Flat area (Figure 4) consists of irregularly kaolinized biotite-muscovite granite containing greisen dykes that are concentrated along two main zones and trend about 115° magnetic. Estimates by Solomon (1971) suggest that there are about 500,000 cu. yds of greisen to a depth of 100 ft in this area, and assays of samples taken by Jack (1962) and Mr Reardon indicate that tin grades are very variable (ranging from 0.18 to 0.93% Sn), but generally below 0.5% Sn. The greisen bodies have not been individually mapped during this investigation and have not been sampled.

An appraisal of the kaolinized granite has been the main object of this investigation because of the possibility of a combination of economic deposits of both kaolinite and cassiterite in the same area. Solomon (1971) suggested that the kaolinization was relatively shallow at the south-east end of the workings,

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but became deeper towards the north-west, culminating in the Royal Gordon workings which are reputed to be 60 feet deep in places. Closer examination of the area suggests that the distribution of kaolinization is more irregular than first thought, although zones of deep kaolinization are difficult to define because the area is thickly overgrown and there appear to be rapid changes from granite bedrock to zones of kaolinization, up to 40 ft deep (e.g. ESE of the Royal Gordon workings).

A series of auger holes was drilled in approximately N-S lines across the kaolinized granite under the direction of Mr Reardon (positions shown in Figure 4), but unfortunately no record appears to have been kept of the depth of the holes, and whether unkaolinized bedrock was hit in these holes. The samples from these holes were not assayed, although Mr Reardon did suggest that cassiterite in one line of holes appeared to decrease away from a prominent cassiterite-rich dyke. Unfortunately, no estimates of grade are available from this work.

The potential of the area and the methods of sampling depend, to some extent, on the origin of the

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kaolinization of the granite. If the kaolinization represents original hydrothermal alteration, there will be no definite depth restriction on the occurrence of kaolinized granite, and the tin content from any depth should be representative of the granite in that area. If the kaolinization simply represents a weathering profile, there may be limitations on the depth of weathering and possibly some concentration of cassiterite near the surface by selective removal of weathered granite. The irregular nature of the kaolinization, relatively sharp contacts of kaolinized and non-kaolinized granite, and approximate coincidence of deep kaolinization with occurrences of greisen dykes, suggests that the alteration may be a primary hydrothermal feature, although the occurrence of relatively shallow workings which have not penetrated the entire depth of kaolinization suggests that there has been some surface concentration of cassiterite during a superimposed weathering cycle. Apart from these shallow workings, more extensive workings appear to be restricted to zones of kaolinization along the two extensive zones of greisen dyke swarms (Figure 4).

Previous sampling of kaolinized granite by Jack (1962) indicated that it contained trace to nil tin

even adjacent to greisen dykes carrying cassiterite. Visual estimates of kaolin content of the kaolinized granite indicated about 30% kaolin (Solomon 1971), and two samples submitted to A.P.P.M. by Mr Reardon contained 18% and 50% filler grade.

The present investigation involved a survey of existing workings, costeans and auger holes (Figure 4), together with surface sampling of kaolinized granite on N-S traverses, and collection of a bulk sample of kaolinized granite for further testing. The present mapping indicates that the best estimate of the volume of kaolinized granite in the area covered by the present investigation is about 1.5 million cu. yds, although this figure is only approximate because the depth of kaolinization is not known accurately in many places. Kaolinized granite is also present outside the area shown in Figure 4, and this would increase the volume of kaolinized ground present.

The present sampling programme indicated that the kaolin content of the kaolinized granite is rather variable, and that the percentage material less than 20 microns varies from 7 to 37% with a mean value of 24% for the kaolinized granite, and is considerably lower for the weathered granite. The bulk sample

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collected has been sent to Mr Sowry of Ringarooma Mining Pty Ltd for further testing of the grade and quality of the kaolin, but the results of this study are not available at the present time.

The tin content of the kaolinized granite is low throughout the area, with most samples assaying less than 0.01% Sn (i.e. $< \frac{1}{3}$ lb Sn/cu. yd), and the maximum value recorded (from RF 30) being 0.04% Sn (i.e. about $\frac{1}{3}$ lb Sn/cu. yd). This is in general agreement with samples taken by Jack (1962). Available records from the Royal Gordon workings (e.g. Nye 1927) suggest that the grade was about 1 lb SnO₂/cu. yd, but that the cassiterite occurred in small veins and patches with only a little disseminated cassiterite present. If this is true of the remainder of the kaolinized granite, the samples taken may be too small to accurately indicate the tin grade of the granite, and further auger drilling and surface sampling will be unsatisfactory.

Whether further more detailed exploration work is carried out on the area will depend on the reported quality of the kaolin present. If it is of sufficient quality to encourage further work, it is recommended that the present N-S lines be extended and an additional

TABLE 4. Assay data on samples of kaolinized granite from Ruby Flat area (see Figure 4 for localities).

Sample No.	Sample Type	Depth of kaolinization	% Sn	% less than 20 μ
RF1	Weathered granite	<5 ft	<0.01	5
RF2	"	"	<0.01	3
RF3	"	"	0.01	4
RF4	"	"	<0.01	4
RF5	Kaolinized granite	>10 ft	0.02	19
RF6	"	"	0.01	26
RF7	"	"	<0.01	27
RF8	"	"	<0.01	22
RF9	"	"	<0.01	24
RF10	"	"	<0.01	29
RF11	"	>5 ft	<0.01	29
RF12	"	>10 ft	<0.01	26
RF13	"	"	<0.01	27
RF14	Weathered granite	<5 ft	<0.01	9
RF15	"	"	0.01	16
RF16	Kaolinized granite	>10 ft	<0.01	17
RF17	"	"	<0.01	20
RF18	"	"	<0.01	7
RF19	"	>5 ft	0.04	15
RF20	"	"	0.01	28
RF21	"	"	0.01	9
RF22	"	"	<0.01	26
RF23	"	"	<0.01	37
RF24	"	"	<0.01	35
RF25	"	"	<0.01	34
RF26	Weathered granite	<5 ft	<0.01	9
RF27	"	<5 ft	0.01	24
RF28	Kaolinized granite	>5 ft	<0.01	13
RF29	"	"	0.01	8
RF30	"	"	<0.01	27
RF31	"	"	<0.01	21
RF32	"	"	<0.01	21
RF33	"	"	<0.01	32
RF34	"	"	0.01	18

run to the WNW of the Royal Gordon workings. Auger drilling is probably the most economical method of determining the depth of kaolinized granite, and any possible changes in percentage and quality of kaolin with depth. Percussion seismic traverses could possibly be tried to determine whether the base of the kaolinized granite could be delineated by this method, and may indicate the most economical spacing of auger holes. If the distribution of cassiterite is patchy, the auger holes may intersect a too small volume to be a significant indication of tin grade. It will probably be advisable to run a test traverse in a zone of potential interest (e.g. ESE of the Royal Gordon workings) in which tin assays of samples from auger holes are compared with samples from a larger scale, possibly back hoe pits, from the same position. This would indicate unequivocally whether economic concentrations of cassiterite do occur in the kaolinized granite, as there is still considerable uncertainty from existing work.

Before pursuing any further exploration, the possible value of the kaolin and cassiterite in the ground should be calculated. This is impossible at the present time because the quality of the kaolin is not

known by the author. I feel that a reasonable maximum volume of kaolinized granite that could be expected would be 2 million cu. yds. The cassiterite content of the granite is unlikely to be as high as 1 lb SnO₂/cu. yd because this appears to be the grade of ground which has been selectively mined at a previous time. A maximum possible value for the kaolinized granite would in my opinion be about ½ lb SnO₂/cu. yd. Rough calculations based on a 24% filler grade for the kaolinized granite indicate that the value of cassiterite would only be about 5% that of the kaolin, and it is therefore suggested that the exploration work be concentrated on estimation of tonnage of kaolin present, provided the quality proves to be satisfactory. It appears very unlikely, from present results, that a concentration of tin will be proven which is, itself, an economic proposition without the kaolin.

BELLS HILL PROSPECT

Considerable costeaning and clearing has been carried out over the surface, in the vicinity of the old Bells Hill workings by Mr Reardon, and these costeans have been surveyed by Mr K. Roche (Figure 5).

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However, to date, no systematic sampling has been carried out over the lodes exposed during this exploration work.

Some reconnaissance sampling was carried out during this investigation (a) to determine the course of future exploration on the lease and (b) to determine the potential of closely spaced greisen bodies as bulk low-grade deposits in this area, because Bells Hill represents the only locality where such occurrences are well-exposed and surveyed. Sampling is again difficult at the surface because, in most cases, the cassiterite is not disseminated through the greisen bodies, but occurs with quartz on joints and fractures parallel to the length of the lodes. During costeaning, blocks from the lodes have been dispersed from their original position and it is therefore difficult to determine the true thickness of the lodes exposed in many of the costeans. Therefore, any tonnage calculations presented are only approximate.

Previous sampling of the lodes at the surface and underground (e.g. Reid, 1925; Cundy, 1925; Keid 1944) indicated that tin values were erratic and sampling not reproducible, due to combination of original variations and difficulty in sampling, due to concentrations of

cassiterite along joints. During the present work, chip sampling was employed across the lodes to minimise variation due to sampling, but this was difficult in places, due to the fragmentary nature of the exposure at the surface and in costeans, and therefore assays should only be considered an approximation to actual tin concentrations present.

The Main Lode can be traced over a surface length of about 1,500 feet and appears to have an average width of about 10 feet. It has been proven by underground workings to extend for at least 180 feet below surface outcrop on the top of the ridge. It therefore has an apparent tonnage of about 200,000 tons, but this could be greater if the lode extended below the present workings. Assays of surface samples (Table 5) are variable, but have an average value of about 0.57% Sn over the 600 ft strike length sampled. This value is slightly greater than assays from the old workings (e.g. Reid 1925), where parts of the lode contained as little as 0.05% Sn.

A prominent greisen lode south of the Main Lode (samples BH5, BH6 and BH7) has a strike length of about 500 ft, and an average width of about 15 feet.

TABLE 5. Assay data on samples from the Bells Hill Prospect (sample positions shown in Figure 5).

Sample No.	Sample Type	Rock type	Type of lode	% Sn	% WO ₃
BH8	Chip sample	Greisen	Main Lode	0.14	<0.01
BH9	"	"	"	0.15	<0.01
BH11	"	"	"	0.83	0.01
BH13	"	"	"	0.35	<0.01
BH14	"	"	"	1.3	<0.01
BH15	"	"	"	0.39	0.01
BH23	"	"	"	0.83	0.01
BH5	"	"	Large lode south of Main Lode	0.60	0.02
BH6	"	"	"	0.23	<0.01
BH7	"	"	"	0.69	0.01
BH12	"	"	NE-trending lode	2.2	0.01
BH16	"	"	"	1.0	<0.01
BH20	"	"	"	1.2	0.01
BH3	"	"	Small subsidiary lodes	0.26	<0.01
BH4	"	"	"	0.23	<0.01
BH10	"	"	"	0.78	<0.01
BH17	"	"	"	0.32	<0.01
BH19	"	"	"	0.86	0.01
BH22	"	"	"	0.42	<0.01
BH21	"	"	"	0.64	<0.01
BH24	"	"	"	0.76	<0.01
BH25	"	"	"	0.44	<0.01
BH1	Channel sample	Weathered granite	Granite between lodes	0.01	<0.01
BH2	"	"	"	0.01	<0.01
BH18	"	"	"	0.02	<0.01
BH26	"	"	"	0.02	<0.01
BH27	"	"	"	<0.01	<0.01

If it extended to 200 ft depth it would contain approximately 100,000 tons of greisen. Surface samples indicate a mean tin content of about 0.5% Sn.

A prominent lode about 350 to 400 feet north of the Main Lode has not been sampled during this investigation, but can be traced over a strike length of at least 600 feet at an average width of about 10 feet. If it extended to a depth of 200 feet, it would also contain approximately 100,000 tons of greisen. It carries cassiterite on joint surfaces but disseminated cassiterite is rare.

A smaller NE-trending greisen lode appears to cut across the Main Lode about 250 feet east of its western extremity. This lode contains abundant disseminated cassiterite, together with cassiterite on joint faces. This is shown by consistently high assays of samples from this lode (BH12, BH16, BH20) which have an average value of 1.5% Sn. This lode has a strike length of about 300 ft, a mean width of 5 ft and, if it extended to 200 ft, would contain about 20,000 tons of greisen.

The reconnaissance survey therefore indicates that there may be about 400,000 tons of greisen in the form of four separate lodges if they all extended to 200 feet below the surface, and surface sampling indicates that

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the average grade may be in excess of 0.5% Sn in the sections of lode sampled in this investigation.

It is obviously more desirable to have larger, lower-grade deposits which can be worked from the surface by open cut. To test this possibility, the largest and most promising costean (A-B) was systematically sampled, together with costean C-D and a "typical" section through a cluster of greisen veins (samples BH1, 2, 3, 4).

A generalized log of costean A-B is presented, together with assays of samples from the costean. Section 1 from this costean consists of a zone 190 feet wide, averaging approximately 0.2% Sn, while section 2 consists of a zone 140 feet wide, averaging approximately 0.25% Sn. There is some uncertainty, due to difficulty in measuring widths of lodes and the possibility that small lodes may have been missed. These sections are promising as they are above the minimum grade worked in the Anchor Mine during its operation, and about the same grade as small open cut mines worked at Walwa in Victoria. However, it should be again stressed that this section was chosen because it looked the most promising, and should not be regarded as typical.

Results from costean C-D are far less promising with section 1 consisting of 267 feet averaging 0.07% Sn, and section 2 109 feet averaging 0.12% Sn. This section, however, was chosen because it represented the longest exposure south of the main lode, and this was also the section in costean A-B which was deleted to raise the average grade. The section including samples BH1, 2, 3, and 4 was most disappointing, with the best possible section being 14 feet averaging 0.12% Sn.

It was hoped, when the sampling programme commenced, that the granite between the greisen lodes may contain sufficient cassiterite to provide a high enough background tin content to allow "dilution" of the greisens over a reasonable width, but all assays of weathered granite have proved disappointing. Most assays of greisen are lower than might have been expected because visual estimates are strongly influenced by the spectacular occurrences of cassiterite crystals on joint faces.

It is apparent from this preliminary sampling programme that the larger individual lodes have some potential for conventional lode mining, but they are relatively small and low-grade. Preliminary sampling across a number of subparallel lodes, including the Main

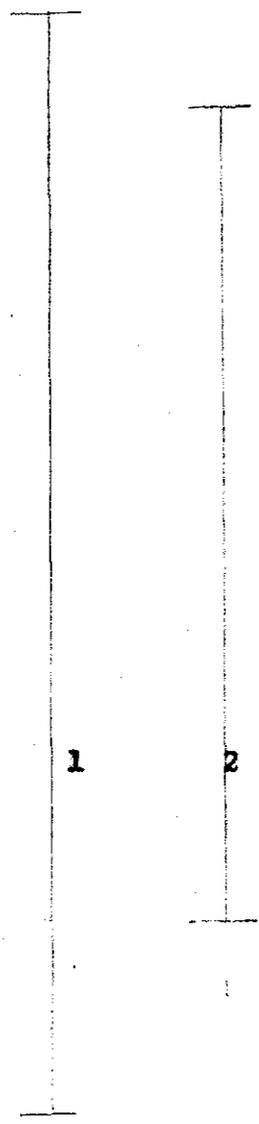
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23a.

Generalized log of costean A - B (Figure 5)

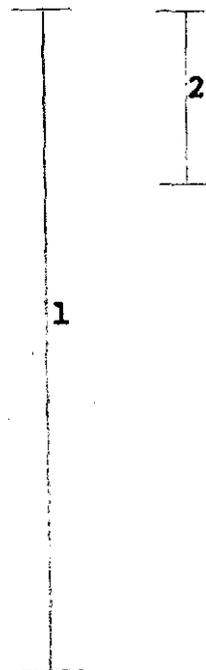
<u>A.</u>		<u>% Sn</u>
30'	granite	<0.02
2'	greisen	0.86
25'	granite	<0.02
6'	greisen	1.20
8'	granite	<0.02
2'	greisen	0.86
10'	granite	<0.02
0.5'	greisen	0.86
15'	granite	<0.02
8'	greisen	0.64
20'	granite	<0.02
3'	greisen	0.42
10'	granite	<0.02
3'	greisen	0.42
8'	granite	<0.02
1'	greisen	0.42
10'	granite	<0.02
12+'	greisen (Main Lode)	0.83
15'	granite	<0.02
5'	greisen	0.76
15'	granite	<0.02
0.75'	greisen	0.76
10'	granite	<0.02
2'	greisen	0.76
50'	granite	<0.02
3'	greisen	0.44
100'	granite with minor greisens	>0.02



B.

Generalized log of costean C - D (Figure 5)

<u>C.</u>		<u>% Sn</u>
15'	granite	<0.02
12'+	greisen (Main Lode)	0.39
75'	granite	<0.02
5'	greisen	1.0
10'	granite	<0.02
2'	greisen	1.0
100'	granite	<0.02
2'	greisen	0.32
20'	granite	<0.02
3'	greisen	0.32
8'	granite	<0.02
2'	greisen	0.32
10'	granite	<0.02
3'	greisen	0.32
30'	granite	<0.02
3'	greisen	?
30'	granite	<0.02

D.

Lode, suggests that, in general, the greisen/granite ratios and the tin content of the greisens are too low for consideration as a bulk low-grade deposit of moderate dimensions, but further sampling is obviously required to verify this. The results of this sampling programme are disappointing from an exploration viewpoint, as they do indicate that economic bulk low-grade deposits, comprising groups of sub-parallel greisen lodes, are unlikely to occur in the remaining area, as the Bells Hill prospect appeared the most promising potential area for such deposits.

CONCLUSIONS AND RECOMMENDATIONS

Mapping and sampling of the sluiced area of the Star of Peace lease indicates that it has little potential. Greisen bodies are small and discontinuous, and the granite does not contain significant concentrations of tin. Other parts of the lease are difficult to assess because of rubble cover, but do not appear to contain significant greisen lodes or disseminations in granites. If there appears no possibility of attaining an exploration license over the surrounding area in the near future, it is recommended that the option on the lease is not renewed.

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Mapping and sampling of greisen bodies west of a line joining the Mammoth and Star of Peace prospects indicates that they are too small and too low-grade to warrant further exploration. Some additional sampling should be carried out on the large greisen mass that occurs about equidistant from the Mammoth and Star of Peace and has already been sampled (CG13, 14, 15), to attain a more accurate indication of its grade before exploration is curtailed in this general area.

The Bells Plains area is a prime target for future systematic exploration involving possible seismic surveys and systematic sampling by back hoe along a series of NE-SW grid lines across the flat. It is essential that adequate screening and sampling equipment be set up in the area, as samples are difficult to process because of abundant cobbles and boulders. It is believed that the company has set up similar equipment for the Waratah project. Alluvium from existing back hoe pits should initially be processed and assayed as a preliminary guide to the potential grade of alluvium in the area. Seismic traverses across the flat may be used to indicate the depth of alluvium and to plan the most economical spacing of the exploration back hoe pits.

Mapping and sampling of the Ruby Flat area has indicated the possibility of up to 2 million cu. yds of kaolinized granite averaging 24% material less than 20 microns. A bulk sample of this kaolinized granite has been sent for testing, but the results are not known by the author. Tin assays on surface samples are disappointing, but it is possible that these may not be representative if cassiterite is occurring in small veins and patches in the granite. The potential value of the kaolin is far greater than that of the cassiterite, and future work will depend on the quality of the bulk sample presently being sampled and the possibility of a market. If this kaolin is of sufficient quality to warrant further exploration it is recommended that the N-S traverses be extended, and auger drilling employed to determine the depth of kaolinized ground. Percussion seismic work should also be tried to determine whether the depth of kaolinized granite can be determined by this method. If sampling for tin is considered, larger samples must be taken, possible with a back hoe.

A survey of the Bells Hill prospect has indicated that the four main lodes may contain in excess of 400,000 tons of greisen to a depth of 200 feet, although this is only a rough estimate, as the true width of

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lodes in the costeans is very difficult to determine. Surface sampling has indicated that tin values are patchy, but average values over the strike lengths sampled are in excess of 0.5% Sn. Samples were also taken to determine whether the numerous subparallel greisen lodes exposed in this area could be considered as a potential bulk low-grade deposit. In the most promising costean across these lodes there is a zone, including the Main Lode, 140 feet wide, which averages 0.25% Sn, but sampling of another costean indicated that the potentially most promising zone, 109 feet wide, has an average assay of only 0.12% Sn. A further zone of small subparallel greisen lodes was also tested, but the best intersection was only 14 feet wide, averaging 0.12% Sn. The implications of this preliminary sampling to regional exploration for bulk low-grade deposits in this area are not encouraging, as Bells Hill appears to represent the greatest concentration of greisen lodes in the area. On a more local scale, further sampling is warranted, both of the major lodes and of the numerous smaller lodes between them, as the results from costean A-B are reasonably promising.

It is recommended that future exploration be concentrated on the Bells Plains area and at Ruby Flat (dependent on testing of the kaolinite), and that further

0.35

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systematic sampling be carried out at Bells Hill. Other areas do not appear to warrant any major exploration programmes, although minor additional sampling, as suggested above, is required.

D. J. Groves

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LIST OF MAPS:

- FIGURE 1: LOCALITY STAR OF PEACE MINE.
- FIGURE 2: SAMPLING MAMMOTH-STAR OF PEACE AREA.
- FIGURE 3: LOCALITY BELLS FLAT.
- FIGURE 4: LOCALITY RUBY FLAT.
- FIGURE 5: SURFACE PLAN-BELLS HILL.

- + ANOTHER FIGURE 1-NO TITLE.

STAR OF PEACE MINE

Mag: N

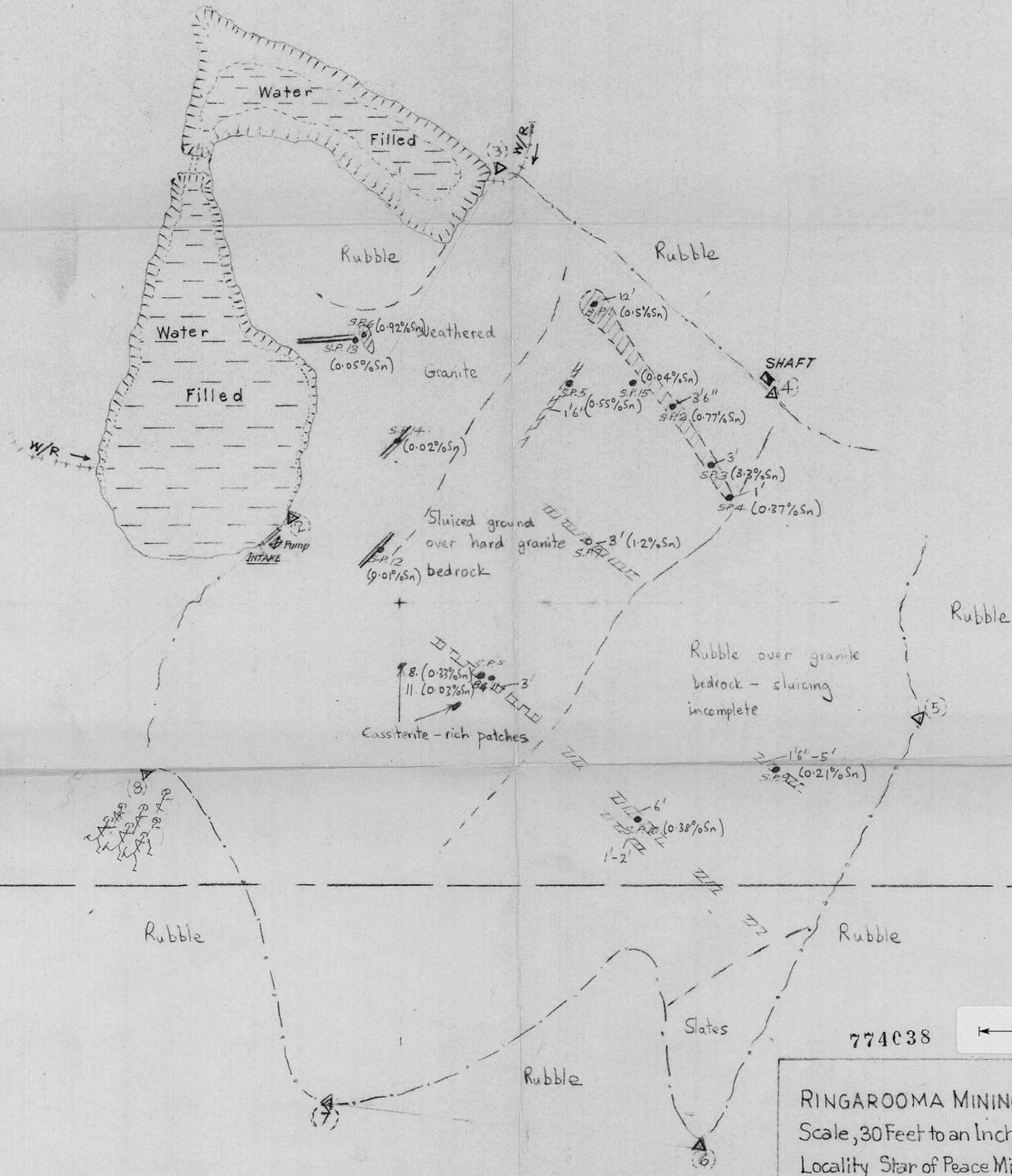
LEGEND

- - - Approximate geological boundary
- 3' Greisen lode (width shown)
- SP1 Location of sample
- || Channel sample

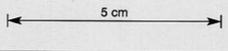
45 M
64

L. M. Bennett

5 AC.



774038



RINGAROOMA MINING PTY. LTD.
Scale, 30 Feet to an Inch
Locality Star of Peace Mine, Branxholme

DATE 27.1.72
JDN.

72-855.

1 mile S of Paris Dam.

Q32/29

2603

FIGURE 1

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- Granite
- Mathinna Beds
- Greisen lode
- CG8 Sample position
- Lease boundary

Scale 1" = 20 chains

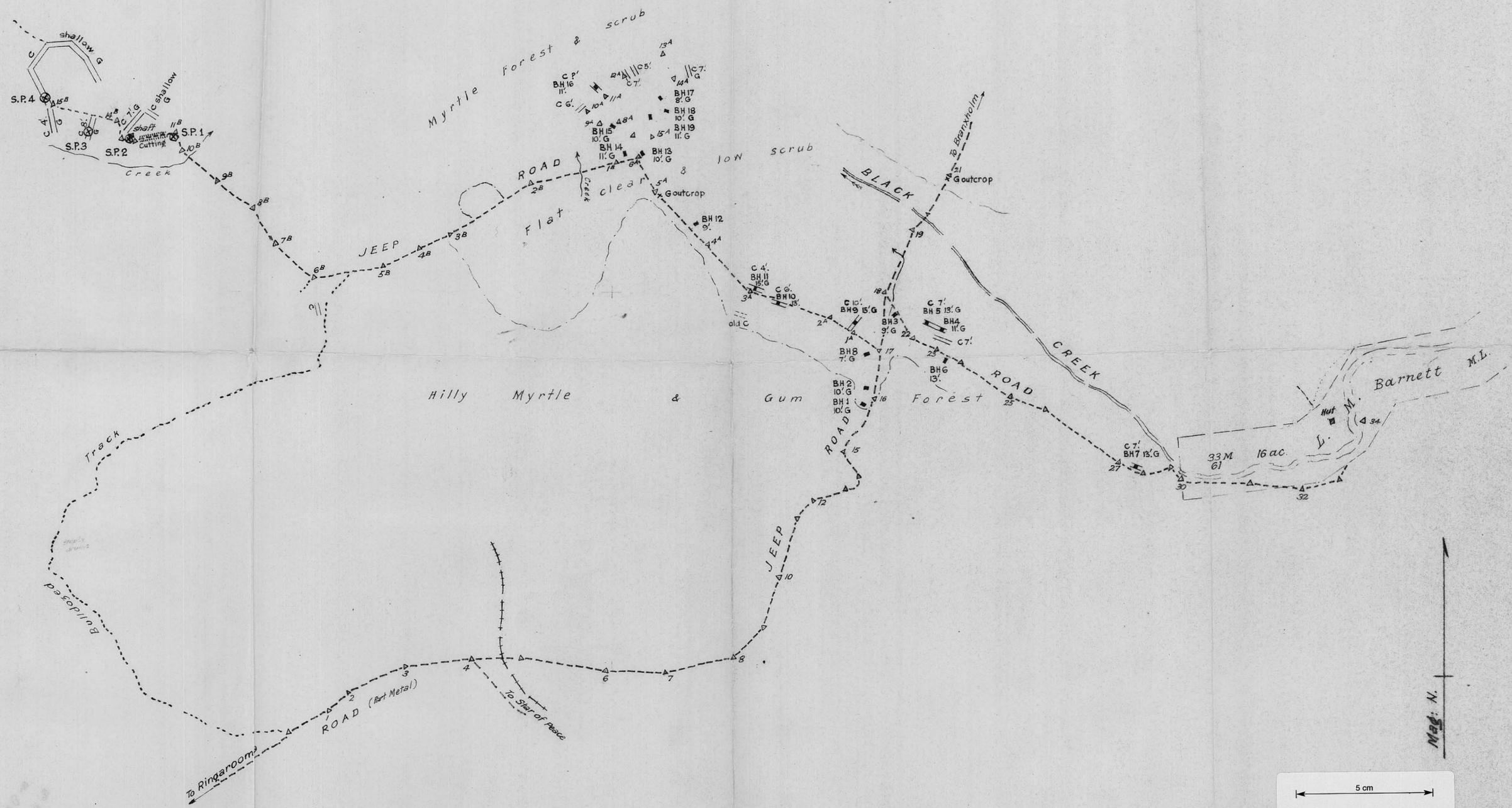
5 cm

SAMPLING MAMMOTH-STAR OF PEACE AREA

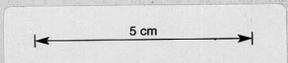
FIGURE 2

LEGEND

- △ 12, 4^A & 6^B Traverse Stations
- × G outcrop Granite outcrop
- BH 4 10' G Backhoe No 4 10' depth to Granite
- C 5' Costean 5' depth
- ⊗ S.P.1 Sample Prospect
- - - - - Approx. boundary of flats



1 mile W of Bell's Hill.



774040
72-855

RINGAROOMA MINING PTY. LTD.
Scale, 300 Feet to an Inch
Locality Bells Flat, Ringarooma
E.L. 15/68 TAS.
J.D.N. Date Jan. 72 2610

LEGEND.

--- Cleared Line.

- - - - - Costean.

==== Dozer Track & Roads.

B' Lode direction & Width.

-BHI Sample position.

Note :- 1. Contours Approx. Drawn.
2. Nominal RL of 1000.00 chosen.

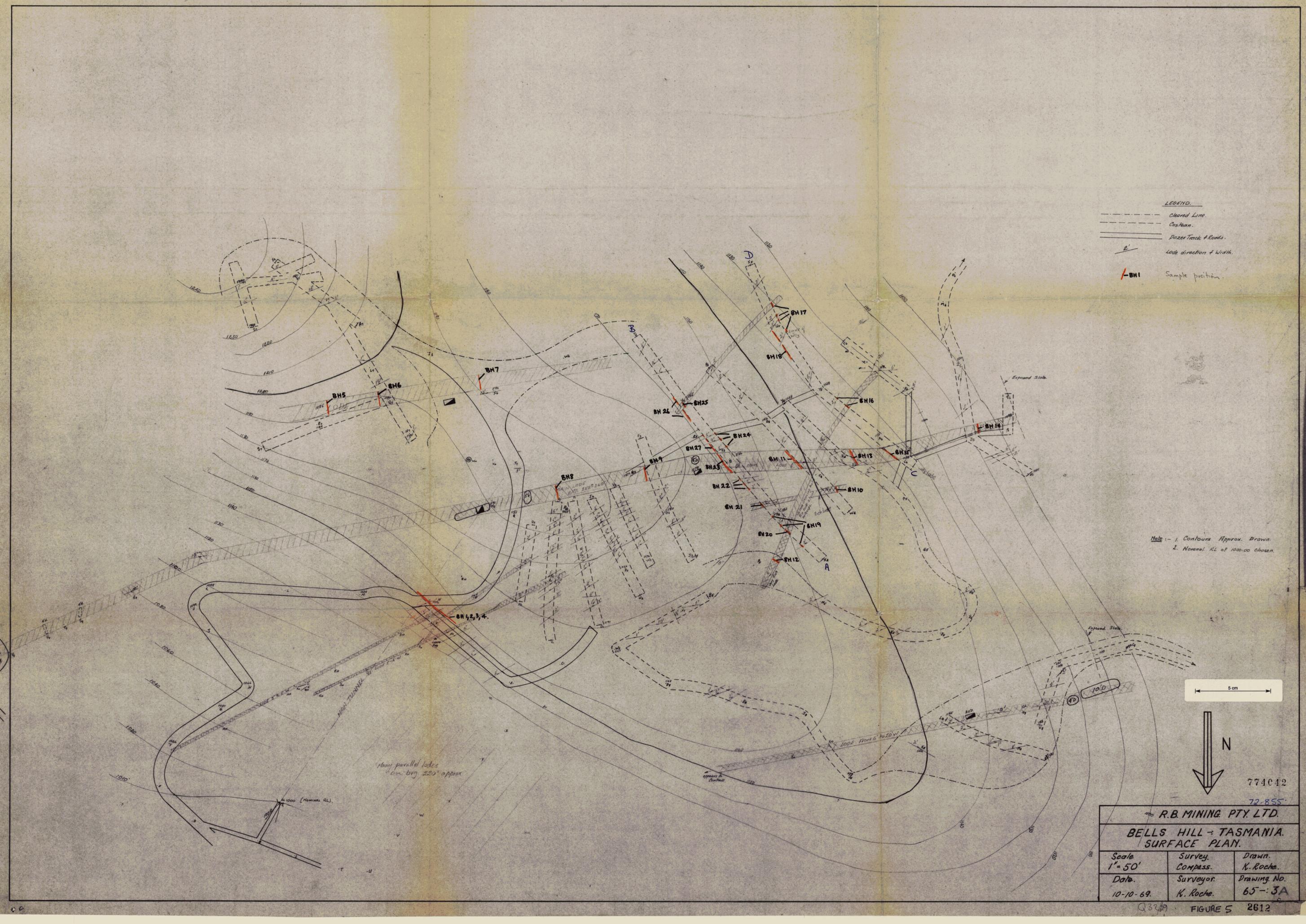
5 cm



774042
72-855

R.B. MINING PTY. LTD.		
BELLS HILL - TASMANIA. SURFACE PLAN.		
Scale 1" = 50'	Survey. Compass.	Drawn. K. Roche.
Date. 10-10-69.	Surveyor. K. Roche.	Drawing No. 65-3A

Q3219 FIGURE 5 2612



- Alluvial or alluvial material carrying cassiterite
- Basalt
- Mathinna Beds
- Biotite muscovite granite and granite porphyry
- Kaolinised granite - worked to depths of up to 15 feet
- Kaolinised granite - worked to depths of 20-40 feet
- Greisen lodes
- Water race
- Roads
- Lease boundary
- Lease applied for
- Basalt scree

SCALE: 20 chains = 1 inch.

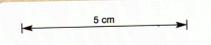
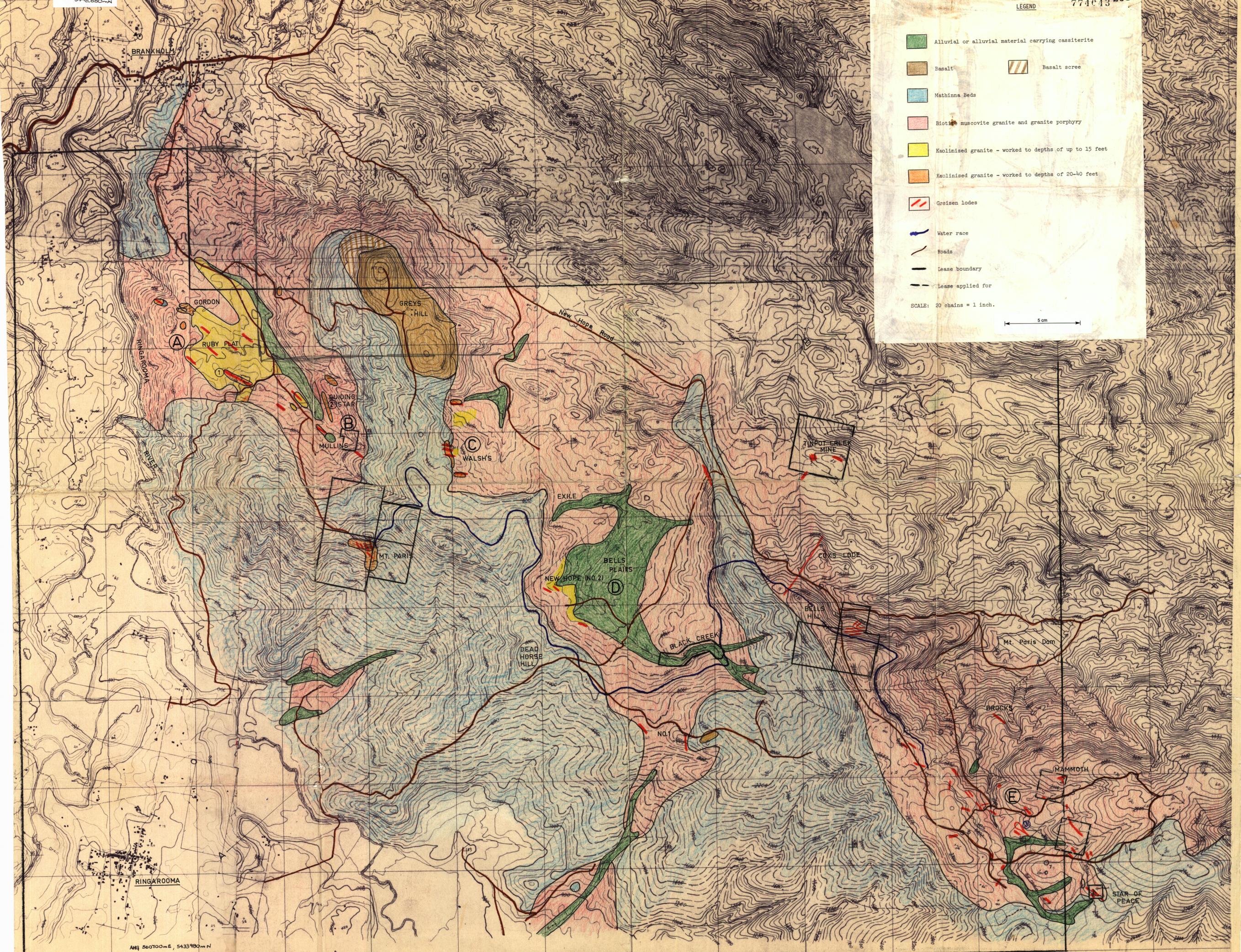


FIGURE 1