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MICROFILMEDABERFOYLE TIN DEVELOPMENT PARTNERSHIPBLUE TIER REPORT NO. 5 (A)

Review at the completion of the third
diamond drilling programme at the
Blue Tier, Anchor, Tin Prospect.

(at Lottah, Tasmania)

by

R.G. Taylor, Ph.D., B.Sc., D.I.C.
(Supervising Geologist)

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DIAGRAMS ACCOMPANYING REPORT (In Folder)

Scale				
1" - 40'	1.	BT - 001-G	Location Plan	
"	2.	BT - 050-G	Plan of No.1 Ore Zone	
"	3.	BT - 051-G	Plan of No.2 Ore Zone	
"	4.	BT - 052-G	" No.3 "	
"	5.	BT - 053-G	" No.4 "	
"	6.	BT - 054-G	" Orebody 35 "	
"	* 7.	BT - 030-G	Cross Section. 6100N. Geology	
"	* 8.	BT - 031-G	Cross Section. + Orebodies	
"	9.	BT - 032-G	" 5100N	
"	10.	BT - 033-G	" 5200N	
"	11.	BT - 034-G	" 5300N	
"	12.	BT - 035-G	" 5400N	
"	13.	BT - 036-G	" 5500N	
"	14.	BT - 037-G	" 5600N	
"	15.	BT - 038-G	" 5800N	
"	* 16.	BT - 039-G	" 6000N	
"	* 17.	BT - 040-G	Longitudinal Section 24400E	
"	18.	BT - 041-G	" 24600E	
"	19.	BT - 042-G	" 24800E	
"	20.	BT - 043-G	" 24900E	
"	21.	BT - 044-G	" 25000E	
"	22.	BT - 045-G	" 25100E	
"	23.	BT - 046-G	" 25300E	
"	24.	BT - 047-G	" 25500E	
"	25.	BT - 048-G	" 25700E	
"	* 26.	BT - 055-G	Subsurface contour map of contact between coarse and fine grained granites. Drilling Area.	
1" - 100'	* 27.	BT - 056-G	Ditto. Including Anchor Open Cut Area.	
"	* 28.	BT - 057-G	Contour Plans of Total Vertical Extent of the mineralised zone and total Greisen content.	
"	* 29.	BT - 058-G	Contour Isopach diagrams of total visual content of cassiterite, chalcopyrite and bornite.	
"	* 30.	BT - 059-G	Contour Isopach diagram of total visual content of fluorite and molybdenite.	
"	* 31.	BT - 060-G	Contour Isopach diagrams showing total vertical extent of visual distribution of chalcopyrite and cassiterite.	

* NOTE: ALL PLANS WITH REPORT 66-413
 * PLANS ARE MISSING.
 PLANS ARE MICROFILMED WITH THIS REPORT.

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1.

1. SYNOPSIS

Exploration at the Anchor Open cut reveals that an orebody extends N.E. of the present eastern face. The orebody is composed of 1-5 subhorizontal cassiterite bearing zones which fluctuate widely in width and tenor, associated minerals include chalcopyrite, bornite, fluorite and molybdenite. The mineralisation and geology of the deposit are discussed in detail.

Estimation of the ore reserves and a study of the mining economics indicate that the deposit contains neither the necessary tonnage or grade to render large ^{scale} ~~scale~~ mining operations feasible at current metal prices. Further exploration in the immediate vicinity seems unlikely to improve this situation.

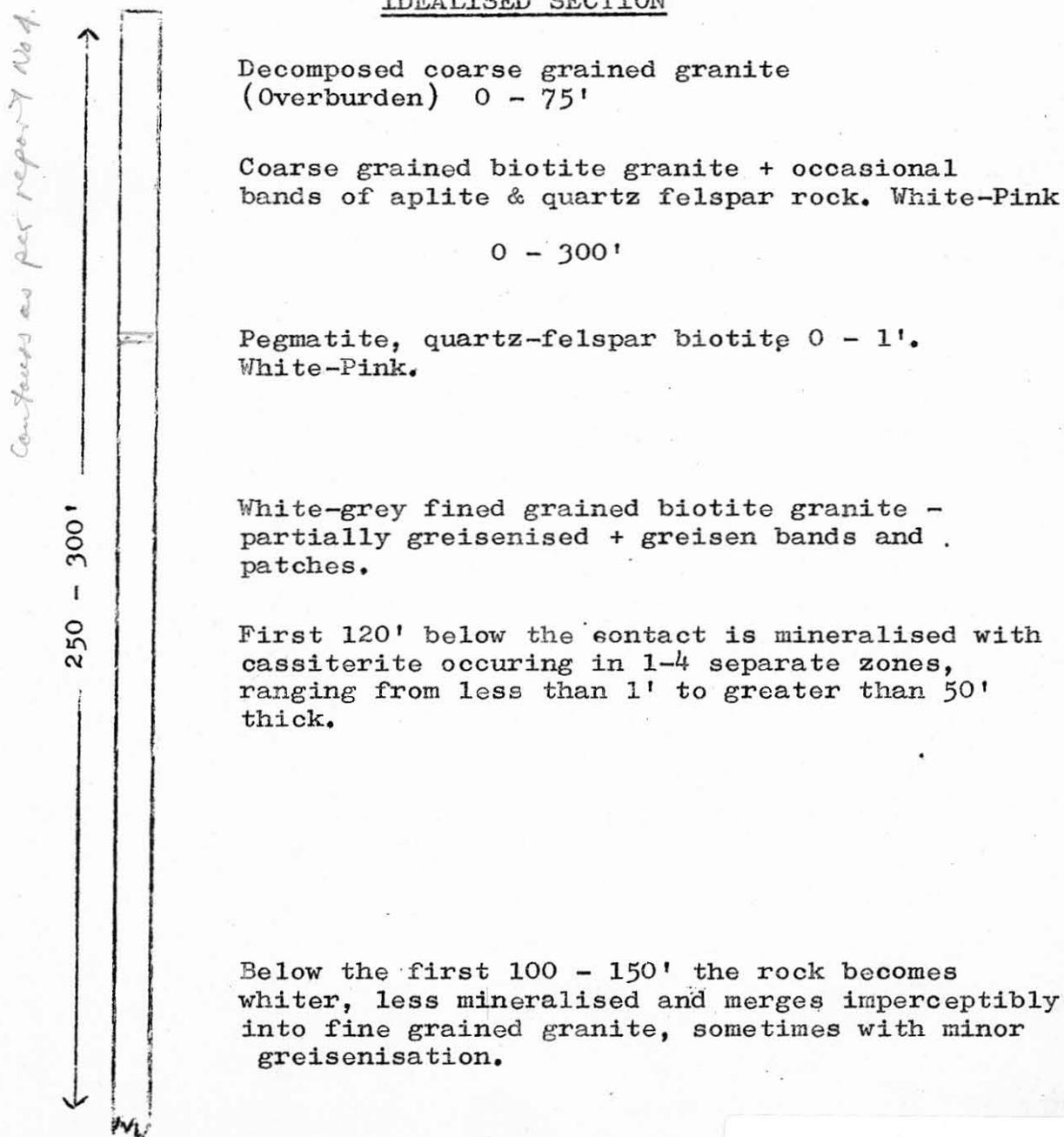
2. INTRODUCTION

Previous drilling and sampling around the eastern face of the Anchor mine indicated the presence of four flat lying cassiterite zones. The 1965/66 Programme was designed to search for extensions of these zones and was aimed to locate at least 2,000,000 tons of 1% ore. Drilling took the form of a primary grid and 27 holes were completed for a total footage of 7,649'11" (average per hole 273'). This brings the total footage drilled for all exploration at Blue Tier to 9,354'. (Fig. BT No.1)

3. GEOLOGY

(a) General Rock Types & Stratigraphy (Figs. BT Nos. 30-48)

IDEALISED SECTION



(a) General Rock Types & Stratigraphy (Continued)

The above idealised sequence holds true for most of the area, but there are several exceptions. In the southern margins the fine grained granite contains intercalations of coarse grained granite. In eastern regions the fine grained granite often exists as two separate units separated by a small zone of coarse granite.

(b) Structure

Spatial relationships between the two granite types are imperfectly known but it is generally held that the fine grained granite is intrusive into the coarser. The present drilling results indicate a similar conclusion, and to the south of the area, the finer grained granite appears to die out and interfinger into the coarser. Detailed contact relationships are shown on the transverse and longitudinal sections (Figs. BT Nos. 30-48), and also on a subsurface contour plan of the junction. (Fig. BT No. 55). To the N.W. the region is dominated by a minor flat topped domal structure with comparatively steep dipping eastern and southern flanks. Moving south the contact structure becomes confused as the area of interfingering is reached, whilst to the east the contact suddenly turns over and eventually outcrops at the surface. The western flanks of the dome grade gently downhill.

The surface outcrop of the granite contact appears to be elliptical in general form and drilling to the N.E. indicates that it dips steeply to the north and east, overturning again to the north (Inset A-B Fig. 55).

A similar contact contour diagram has been constructed embracing the whole area of the Anchor open cut (Fig. BT 56). This, however, has been plotted from rather limited information, and although the results indicate the general structure, they cannot be used for any detailed assessment. The general picture is of a regular downhill slope trending S-S.E. with a flat terrace developing in the N.E. corner of the open cut. This terrace contains the domal structure

(b) Structure (Continued)

mentioned above and extends to the S.W. becoming decreasingly pronounced and ultimately merging into the general downhill contour. To the south of the Anchor cut the contact between the two granites shows similar irregularities and intercalations to those seen in the south of the drilling area. To the N. and S of the Anchor open cut there are indications that the contact angle is slightly lower than elsewhere (see Fig. BT 56).

(c) Ore Bodies

Mineralisation occurs within the greisen and greisenised fine grained granite and if present is generally all contained within the first 120' below the contact with the coarse grained granite. Cassiterite is the only mineral of economic significance and occurs in association with minor amounts chalcopyrite, bornite, molybdenite, pyrite and fluorite. Cassiterite occurs in what appear to be intermittent flat lying zones, roughly parallelling the contact and ranging from a few inches to greater than 50' thick. In order to assess ore reserves a correlation of the cassiterite zones has been attempted. It must, however, be appreciated that correlation of zones between holes is a difficult and slightly dubious process, and, that the interpretations shown must be regarded with caution. Basically there appear to be 4-5 major ore zones; Nos. 1, 2, 3, 4 and orebody 35, and their attitudes are shown on the transverse and longitudinal sections. (Figs. BT 30-48 & Plans BT 50-54).

	<u>Width</u>	<u>Area</u> ^{sq. ft.}	<u>Cu. Feet</u>	<u>Tons</u>	<u>Grade % Sn.</u>
Orebody No. 1	4.8'	54,848	265,840	22,154	.51
<u>Notes</u> :	Minor zone; several small bodies of limited lateral and vertical extent. Rich in parts. Closed.				
Orebody No. 2	21.4'	395,556	8,472,016	693,679	.39
	Largest ore zone, wide lateral extent with vertical dimension ranging from 5-55'. Occasionally links to No.3 orebody. Closed along all boundaries, except possibly to the N.				

12 cups / hour

(c) Ore Bodies (Continued)

	Width	Area ^{sq} ft.	Cu. ft.	Tons.	Grade %Sn.
Orebody No. 3	15.8	358,520	5,654,540	479,559	.33
	Second largest zone; wide lateral extent with vertical dimensions ranging from 5-50'. Closed on all sides except possibly to the N.				
Orebody No. 4	10.5	139,788	1,474,890	122,902	.35
	Similar to ore zone 1 with low widths and low values.				
35 Orebody	151.0	50,400	7,612,000	634,334	0.22
	Unusual zone, almost solely represented by 255' of mineralisation in Hole No. 35. May link to portions of ore zone No. 4. Unusual in its large vertical extent and also in the fact that cassiterite and molybdenite are the only minerals present.				

(d) Distribution of Mineralisation

The detailed core logging has allowed a fairly comprehensive analysis of the various aspects of the mineral distribution (Figs BT 57-60) and the detailed interrelationships are compared upon Chart No. 1.

In terms of total visual content the limits of mineralisation have been fairly well defined. Fluorite, chalcopyrite, bornite and molybdenite form virtually closed patterns, whilst cassiterite is only open in the northern regions. The general mineralisation trend appears to be N.E.--N.N.E. veering slightly to the north progressing northwards. This trend is well defined by the fairly regular patterns for total visual cassiterite molybdenite and greisen, and is also reflected to a lesser extent in the more diffuse patterns for chalcopyrite, bornite and fluorite. Within the limits of the mineralised area cassiterite, chalcopyrite and fluorite show a wide lateral distribution, whilst bornite and molybdenite occupy more **restricted** areas.

(d) Distribution of Mineralisation (Continued)

In terms of total visual content there seems only a very small degree of correlation between the peak developments of individual minerals. For instance cassiterite attains maximum development along the central axis of its N.E. trend, whilst chalcopyrite reaches several isolated peaks of development which bear little or no relationship to those of cassiterite. There is a similar lack of correlation for practically all the other mineral combinations with the exception of bornite which as might be expected varies in sympathy with chalcopyrite content. There is, however, a good general correlation between high cassiterite and high greisen content.

In terms of total vertical ^{range of} width of mineralisation, there is a similar inconsistent relationship between cassiterite and chalcopyrite maxima, with the pattern for cassiterite being the more regular. The chalcopyrite distribution pattern becomes interesting along its western margins in that the mineralisation becomes very weak and is dispersed over a large vertical range. This dispersion does not seem to occur in the case of cassiterite when the vertical range becomes smaller as the mineralisation weakens. (There is, however, some evidence suggesting that cassiterite becomes similarly dispersed to the extreme N.E.)

CHART NO 1

BLUE TIER ANCHOR PROJECT 1966

CROSS REFERENCE DIAGRAM TO SHC. THE INTER-RELATIONSHIPS OF THE VARIOUS ASPECTS OF THE MINERALISATION

(See Figs. BT 57-60)

R.G. Taylor
June 1966

<p><u>Total Greisen Content</u> (Fig. BT 57)</p> <p>Well defined pattern, with strong NNE trend. Two peaks of maximum development along central axis.</p>	<p><u>Total Vertical Extent of Visual Mineralisation</u> (Fig. BT 57)</p> <p>No well defined pattern. Mineral. widely dispersed on the E. margins but usually only in trace amounts. Significant min. is contained within the line showing trace. Two peaks with the major one showing a N.S. trend. Open to the north.</p>	<p><u>Total Footage of Visual SnO₂</u> (Fig BT 58)</p> <p>Well defined NE-NNE trend with maximum amounts along central axis. Trend may turn N.S at N extremity - unclosed. Two major peaks (i.e. N and S).</p>	<p><u>Total Footage, Visual Cpy</u> (Fig BT 58)</p> <p>Poorly defined pattern with several isolated peaks. Slight overall NE trend? Closed on all sides. (Bornite maxima follow cpy maxima).</p>	<p><u>Total Visual Footage of Fluorite</u> (Fig. BT 59)</p> <p>Maximum development seems to be in the N having a vague EW axis - appears to die out N. Two isolated peaks in S & SE.</p>	<p><u>Total Footage Visual Mo</u> (Fig. BT 59)</p> <p>Well defined symmetrical pattern with a NE trend. Small lateral extent.</p>	<p><u>Vertical Width of SnO₂ Zone</u> (Fig BT 60)</p> <p>Fairly well defined NE. trend becoming NS to the N. Width appears to increase to the NE. SnO₂ mineralisation appears dispersed where traces of SnO₂ occur over large vertical extents. Zone open to the north.</p>	<p><u>Total Vertical Width of Cpy Zone</u> (Fig. BT 60)</p> <p>Fairly well defined pattern with several peaks along a general NE trend. Along the W flank the cu mineralisation becomes less compact and dissipates to give large vertical extents of trace values. Zone is open to the N but appears to be closing quickly.</p>
<p>Lateral extents similar. Individual peaks show little or no correspondence. NNE trend of greisen not seen on mineralisation diagram.</p>	<p>Similar lateral extents, but poor correspondence in detail. Correlation better to the N where the N.S. maximum min. trend correlates approximately to the NNE-N.S SnO₂ trend.</p>	<p>Good general correspondence of lateral extents - poor in detail. To the north SnO₂ continues beyond cpy.</p>	<p>Poor correspondence, except in approx. lateral extents. SnO₂ continues to N. of the fluorite zone.</p>	<p>Mo less extensive. Similar NE trend. Mo axis corresponds closely to SnO₂ axis.</p>	<p>Mo content shows no correlation to high or low cu widths. Mo occurs mainly on NW flank of high cu widths. Similar NE trends.</p>		
<p>Good correspondence, greisen content closely parallels SnO₂. Similar NE trends. In detail maximum greisen does not always equal max. SnO₂ (i.e. Holes No. 35 & 12).</p>	<p>General correspondence between lateral extent of significant min. and cpy - except to the north. No detailed correspondence.</p>	<p>Poor correspondence, except in approx. lateral extents. SnO₂ continues to N. of the fluorite zone.</p>	<p>Mo less extensive - no detailed correspondence. Mo has more concentrated definition.</p>	<p>Vertical width of SnO₂ zone shows little relationship to total visual fluorite. Fluorite maxima occur in in both high and low SnO₂ widths.</p>	<p>Width of lateral Mo zone less extensive. Similar NE trends but axis of total Mo lies to the N of axis of SnO₂ maximum width.</p>		
<p>Good general correspondence of lateral extents except to the N where cpy dies out. Very little correspondence in detail, (i.e. maxima show no relationships).</p>	<p>Approximate correlation between general extents only. Fluorite doesn't extend as far to the N.</p>	<p>Maximum SnO₂ widths show good general correspondence to max. SnO₂ totals. Similar NE trend of maxima. Max. widths however, do not always correspond - especially in dissipated SnO₂ area to the NE.</p>	<p>Similar lateral extents, but width of SnO₂ zone shows no detailed relationships to total cpy. Cpy extends further north.</p>	<p>Not a very good correspondence SnO₂ continues N of the Cu. zone.</p>	<p>High Cu. width correlate to high total cpy except in the dissipated area. Naturally lateral extents are similar</p>		
<p>Approximate correspondence in lateral extents except in the N. Isolated fluorite patch in S.E shows no relation to greisen content.</p>	<p>Mo distribution occupies only a small area of the total mineralisation extent (i.e. just in NW corner).</p>	<p>High Cu. width correlate to high total cpy except in the dissipated area. Naturally lateral extents are similar</p>	<p>Cu widths not related to amount of fluorite content. Most fluorite occurs on the N flank of the high Cu. widths.</p>	<p>Width of Cu. zone bears little or no relationship to greisen content. Both occupy approximately similar lateral extents although the greisen continues N. beyond the Cu. limits. Conversely the W. Cu. dissipated mineralisation extends beyond the greisen limits.</p>	<p>Similar lateral extents with SnO₂ extending further N and generally less dispersed along the W flank. Cu peaks don't correlate very well with SnO₂ peaks.</p>		
<p>Mo less extensive but shows same general trend. N.E. Mo axis slightly to the N. of the greisen axis.</p>	<p>Good general correspondence of lateral extents. Naturally high SnO₂ widths compare to high mineralisation widths, but the reverse is not always so.</p>	<p>Similar lateral extents - both showing the dissipation effect along the western margin. The mineralisation extends further N & SE than the Cu. High Cu. widths equal high mineralisation widths but the reverse is not always true.</p>	<p>Similar lateral extents, but width of SnO₂ zone shows no detailed relationships to total cpy. Cpy extends further north.</p>	<p>Similar lateral extents, but width of SnO₂ zone shows no detailed relationships to total cpy. Cpy extends further north.</p>	<p>Similar lateral extents with SnO₂ extending further N and generally less dispersed along the W flank. Cu peaks don't correlate very well with SnO₂ peaks.</p>		
<p>Max. SnO₂ width trend is similar to that of max. greisen content. NE and generally high greisen equals high SnO₂ width, but reverse is not always true.</p>	<p>Similar lateral extents - both showing the dissipation effect along the western margin. The mineralisation extends further N & SE than the Cu. High Cu. widths equal high mineralisation widths but the reverse is not always true.</p>	<p>Similar lateral extents, but width of SnO₂ zone shows no detailed relationships to total cpy. Cpy extends further north.</p>	<p>Similar lateral extents, but width of SnO₂ zone shows no detailed relationships to total cpy. Cpy extends further north.</p>	<p>Similar lateral extents, but width of SnO₂ zone shows no detailed relationships to total cpy. Cpy extends further north.</p>	<p>Similar lateral extents with SnO₂ extending further N and generally less dispersed along the W flank. Cu peaks don't correlate very well with SnO₂ peaks.</p>		
<p>Width of Cu. zone bears little or no relationship to greisen content. Both occupy approximately similar lateral extents although the greisen continues N. beyond the Cu. limits. Conversely the W. Cu. dissipated mineralisation extends beyond the greisen limits.</p>	<p>Similar lateral extents - both showing the dissipation effect along the western margin. The mineralisation extends further N & SE than the Cu. High Cu. widths equal high mineralisation widths but the reverse is not always true.</p>	<p>Similar lateral extents, but width of SnO₂ zone shows no detailed relationships to total cpy. Cpy extends further north.</p>	<p>Similar lateral extents, but width of SnO₂ zone shows no detailed relationships to total cpy. Cpy extends further north.</p>	<p>Similar lateral extents, but width of SnO₂ zone shows no detailed relationships to total cpy. Cpy extends further north.</p>	<p>Similar lateral extents with SnO₂ extending further N and generally less dispersed along the W flank. Cu peaks don't correlate very well with SnO₂ peaks.</p>		

(e) Control of Mineralisation

The strong association of the mineralisation with the contact between the two granites suggests that this feature must have exerted some influence over the deposition and distribution of mineralisation. This type of control is not uncommon and can be investigated here by comparing the subsurface contact contour diagram with the mineralisation diagrams :-

(Fig. BT 55-60).

1. Total Mineral Content

- A. Cassiterite
- i. N. Margins. Mineralisation open along the N. flanks of the domal structure.
 - ii. E. Margins. The limit of cassiterite distribution corresponds very closely with the axis of contact overturn.
 - iii. S. Margins. Cassiterite content declines on the steeper S. flanks of the dome just prior to the zone of granite interfingering.
 - iv. W. Margin. Content declines on the flat western flanks.
 - v. In detail the central cassiterite zone passes across the domal structure, and shows a small decrease in content directly beneath the dome. The N.E. trend of mineralisation does not correspond well with any obvious structural trend.

B. Chalcopyrite

Similar relationships to the above along the S & W domal flanks, but appearing to die out on the northern slopes. To the E the decrease in copper content relates to the axis of contact overturn but not as closely that for cassiterite. Detailed correspondence is not close but in general the dome and its immediate flanks relate to high cpy content. However, the southern centres of mineralisation show no obvious relation to contact structure.

1. Total Mineral Content (Continued)

- C. Fluorite Similar general relationships to the above but less well defined. The northern mineralisation is vaguely associated with the domal area and its flanks but the southern centres show no obvious relation to contact structure.
- D. Molybdenite The restricted lateral limits and central peak relate almost exactly to the site of the dome.
- E. Greisen Relationships are almost identical to those given for cassiterite above.

2. Total Vertical Range

A. Total Mineralisation

The S., W & N. flanks show similar relationships to those given for cassiterite above. The E. margin, however, differs in that beyond the axis of overturn the mineralisation becomes very weak, but is scattered over a large vertical extent. Detailed relationships are rather vague, but there is a general association of high min widths with the dome and its flanks.

B. Total Cassiterite

Almost identical to those given for cassiterite above. The extreme N.E. shows a tendency for trace mineralisation over large vertical widths.

C. Total Chalcopyrite

Similar relationships to those given for cpy above with the exception of the E. limits. Here, beyond the axis of overturn, there is a strong development of the scattered trace mineralisation occupying a large vertical range. In detail a high width peak corresponds well to the site of the dome.

2. Total Vertical Range (Continued)

From the above it appears that the shape of the contact has exerted a considerable influence upon the distribution of mineralisation :-

1. The Southern Zone of Granite interfingering :-

This corresponds with the limits for total mineral content for cassiterite, chalcopyrite (bornite), fluorite and greisen and also with the diminution of vertical range of all mineralisation.

2. The Eastern Axis of Contact overturn

This axis marks the limits for total mineral content for all minerals. In terms of the vertical range of mineralisation the axis also marks an area of minimum cassiterite width. It appears, however, to have a different effect upon chalcopyrite and east of the axis chalcopyrite occupies a large vertical range but only occurs in trace values.

3. The Northern Flanks of the Dome

These appear to mark the northern limits for total mineral content for all minerals, with the exception of cassiterite (& possibly molybdenite). A similar situation is seen in terms of total vertical range with the exception of the extreme N.E. area where cassiterite becomes disseminated in trace amounts over a wide vertical extent.

4. The Western Flanks of the Dome

This area marks limit of all mineralisation both in terms of total content and vertical range.

5. The Dome

The actual dome appears to have acted as a direct Locus for molybdenite mineralisation and both the dome and its flanks correlate in general with areas of high mineral content and vertical range. It must, however, be noted that areas of high chalcopyrite and fluorite concentrations occur which show little or no relationship to the dome; also, the general N.E. trend of mineralisation is not obviously related to the trend of the domal structure.

6. Overall Relation to Contact Structure

If the position of mineralisation is considered in relation to the regional structure of the contact (Fig. BT 56) it appears to occupy the southern extremities of a zone of contact flattening, cutting out to the south at the zone of granite interfingering and to the east at the axis of overturn.

2. Total Vertical Range (Continued)

7. Contact Structure & Mineralisation at the Anchor Mine.

The information here is somewhat limited but the southern limits again appear to be a zone of granite interfingering. Some areas showing relationships between the cut and possible changes of contact attitude, but the construction of contact contours is not accurate enough for definite interpretation.

4. ORE RESERVES AND MINING ECONOMICS

The following calculations are subject to the same qualifications and format as Report No. 4, and computation of reserves is based upon plan projection of the ore zones from cross and longitudinal sections (Plans BT 50-54). The reserves are classified as indicated (Aust.I.M.M. Proc.174, 1955) and details are given in Appendix 1.

<u>SUMMARY OF ORE RESERVE CALCULATIONS</u>		<u>Tons</u>	<u>Grade % Sn.</u>
Ore :	Containing more than 0.4% Sn.	425,434	0.64
	" between 0.1 & 0.4% Sn.	<u>1,538,321</u>	<u>0.23</u>
	Total	1,963,755	0.32
Overburden - Decomposed & solid	granite	4,257,998	Nil
Waste	Barren material between ore zones	<u>1,566,730</u>	Nil
		<u>5,824,728</u>	

Limits taken as those of Ore Zone 2 + Orebody 35

Theoretical Ratios

Ratio Overburden & waste to high grade ore (0.64)

$$5,824,728/425,435 = 13.7 : 1$$

Ratio Overburden & waste to total ore

$$5,824,728/1,963,755 = 3.0 : 1$$

Assuming a dilution factor of 15% for any mining operations and the extraction of only high grade ore, calculated tonnage and grade must be adjusted.

	<u>Tons</u>	<u>Grade</u>
Ore		
Containing more than 0.4% Sn.	425,434	0.64
Plus 15% diluting material	<u>63,815</u>	<u>Nil</u>
Diluted Ore.	489,249	0.55

Ratio Overburden & waste to diluted high grade ore (0.55)

$$5,824,728/489,249 = 11.9 : 1$$

COMPARISON AND SUMMARY
TABLE

	<u>Report No</u>	<u>*Indicated Tonnage</u>	<u>Grade % Sn.</u>	<u>Poten-tial Tons/Sq.ft.</u>	<u>Ratio : Overburden + Waste : Ore</u>
Higher Grade Ore	No 3 21.6.65	108,176	1.055	1.29	8.6 : 1
	No 4 10.1.66	337,577	0.662	1.33	8.1 : 1
	No 5A 20.6.66	425,434	0.64	0.95	13.7 : 1
Higher Grade Ore + 15% dilution	No 3	124,400	0.9818	1.48	7.4 : 1
	No 4	388,217	0.5720	1.52	7.0 : 1
	No 5A	489,249	0.5540	1.1	11.9 : 1
Total Tin bearing granite	No 3	238,102	0.606	2.80	3.9 : 1
	No 4	871,673	0.410	3.44	3.1 : 1
	No 5A	1,963,755	0.32	4.40	3.0 : 1

* Beneath a surface area of Rep. No 3 84,168
No 4 253,792
No 5A 445,956

This is the surface area covered by the largest ore zone No 2 which embraces zones 1, 3 & 4, (+ the surface area of orebody 35 in Rep. No 5A). Actual surface area considered in this report is approximately 1,289,700'.

If it is assumed that Sn recovery is 60%, the recovered grade of the diluted 0.554% ore will be 0.3324%. At a tin price of £E 1,200 for tin metal contained in concentrates, this represents a recovered value of approximately £4.12.0. per ton.

Mason & Morton (Report No. 3) estimate comparative costs for open cut and underground mining operations and utilising their figures the following feasibility study is presented.

Open Cut

1 ton ore plus 11.9 tons overburden and waste mined @ 10/- per ton	£6. 9. 0.
1 ton ore treated @ £1.5.0.	1. 5. 0.
Administration etc.	<u>12. 0.</u>
Total mining & treatment per ton	£8. 6. 0.
Value per ton ore	£4.12. 0.
∴ not feasible.	

? The above costs do not take into account any adjustment for battery considerations, which could well add at least a further £2 to the cost.

Underground

1 ton ore mined @ £3.10.0. per ton	£3.10. 0.
1 ton ore milled & treated @ £1.10.0.	1.10. 0.
Administration & Miscellaneous	<u>12. 0.</u>
Total mining & treatment per ton	£5.12. 0.
Value of ore per ton	£4.12. 0.

Comparative figures of recovered value per ton

Report No 3 21.6.65	£7.10. 0.
Report No 4 10.1.66	£4.15. 0.
Report No5A 20.6.66	£4.12. 0.

Clearly with such costs obtaining neither method of extraction would prove economical at the present time.

5. DISCUSSION

The above results repeat and confirm the conclusions of Report No 4, and the following table indicates the marked deterioration in returns per square ft. explored by the recent drilling.

	<u>Sq. Ft.</u>	<u>Tons</u>	<u>Grade</u>
Designed Target (August 1965) Position at January 1966	1,351,000	2,000,000	0.9 to 1.0% Sn.
	258,509	337,577 or (388,217)	0.662% 0.572% diluted)
Position at end of programme (20.6.66)	1,289,700	425,430 or (489,249)	0.64% 0.55% diluted)

Thus the results have fallen short of the original objective, both in terms of tonnage and grade. The rapid unfavourable change in returns per sq.ft. explored has to a large extent been caused by the failure to locate ore along the western and southern flanks of the grid; coupled with the poor results obtained from the scout holes along the northern edge of the old Anchor cut. However, on the credit side the lateral limits of the orebody have been well defined upon all sides except northwards. The general N.E. trend of the cassiterite mineralisation is unclosed to the north, but there are no indications of any improvement in grade and the overburden in this area increases considerably. (300' in Hole No. 35).

These factors give little incentive to recommend any further exploration of the immediate N.E. Anchor zone at the present time. The western extension of the Anchor mine remains untested but here again there is considerable overburden and it seems probable that mineralisation will be analagous to that already explored.

In terms of total ore it must be noted that the exploration located 1,963,755 tons at .32% Sn. Had this occurred near the surface and in a slightly more concentrated form it may have provided an economic mining proposition. This raises the possibility of similar ore bodies occurring on the Blue Tier but occupying more favourable positions.

Many of the larger orebodies within the Blue Tier area, i.e. Don, Australia, Liberator, Summit, Mt. Micheal etc. appear to be of a similar though smaller nature to the Anchor and superficially do not appear capable of providing either the tonnage or grade requirements for large scale operations. However, despite the unpromising outlook, it is considered that at least a few of these orebodies should be scout tested prior to abandoning the mineral lease. Without supplying details at this stage it is suggested that a final 1,000 - 1,500' of drilling be devoted to this purpose.

6. CONCLUSIONS AND RECOMMENDATIONS

The ore bearing zone to the east of the Anchor open cut has now been explored fairly systematically, and it is considered that the results constitute a representative sample of its characteristics. Within the zone 1-5 subhorizontal ore zones are present, which fluctuate widely in width and tenor. Their distribution and erratic cassiterite content render extraction an extremely difficult proposition, and a study of the economic factors involved indicates that within the area explored there is not sufficient tonnage or grade to render either large scale open cutting or underground mining operations

feasible at current metal prices. Thus, no further exploration is recommended in the immediate vicinity of the Anchor mine. However, it is suggested that a limited amount of scout drilling be carried out around some of the analagous orebodies in the area, to thoroughly test the lease prior to abandonment. Details of this work are not yet finalised but a drilling footage (diamond and/or air blasted) of 1-1,500' is envisaged.

R.G. Taylor
21.6.66.

036

APPENDIX 1.ABERFOYLE TIN DEVELOPMENT PARTNERSHIP

Blue Tier Tonnage Calculations (Additional
to those of Report No. 4 10.1.66)

<u>Class</u>	<u>Zone Block</u>	<u>Width</u>	<u>Area Sq. ft.</u>	<u>Cu. Ft.</u>	<u>Tons</u>	<u>Grade % Sn.</u>	<u>Tonnage x Grade</u>
A	1 - 5	5	6,592	32,960	2,747	0.59	1,620.73
B	1 - 6	5	6,880	34,400	2,867	0.17	487.39
B	1 - 7	5	6,880	34,400	2,867	0.38	1,089.46
B	1 - 8	5	6,880	34,400	2,867	0.15	430.05
Total B1		5	20,640	103,200	8,601	0.23	2,006.90
Totals A+B		5	27,232	136,160	11,348	0.32	3,627.63
A	2 - 2	30	7,200	216,000	18,000	0.40	7,200.00
A	2 -17	20	25,858	517,160	43,096	0.62	26,719.52
A	2 - 1	30	7,312	219,360	18,280	0.44	8,043.10
Total A2		24	39,370	952,520	79,376	0.53	41,962.62
B	2 -18	5	27,824	139,120	11,593	0.13	1,274.23
B	2 -19	5	15,072	75,360	6,280	0.15	942.00
B	2 -20	35	30,368	1,062,880	88,573	0.19	16,829.25
B	2 -20	35	3,200	112,000	9,333	0.19	1,773.27
B	2 - 8	20	4,448	88,960	7,413	0.29	2,149.77
B	2 -21	14	20,264	283,696	23,641	0.28	6,619.48
B	2-12	20	1,218	23,360	2,030	0.15	304.50
Totals B2		17.4	102,394	1,786,376	148,863	0.20	29,892.50
Totals A+B2		19.3	141,764	2,738,896	228,239	0.31	71,855.10
A	2A- 3	5	6,880	34,400	2,867	1.20	3,440.40
B	2A- 4	5	6,880	34,400	2,867	0.23	659.41
Totals A+B 2A		5	13,760	68,800	5,734	0.72	4,099.81
A	3 -17	5	6,880	34,400	2,867	0.95	2,723.65
B	3 - 7	10	960	9,960	830	0.15	124.50
B	3 -11	15	13,218	198,270	16,522	0.23	3,800.06
B	3 -12	35	12,096	423,360	35,280	0.24	8,467.20
B	3 -14	10	29,184	291,840	23,320	0.33	8,025.60
B	3 -15	20	29,520	590,400	49,200	0.28	13,776.00
B	3 -16	5	16,646	83,230	6,938	0.18	1,248.84
B	3 -18	5	22,400	112,000	9,333	0.45	4,199.85
		5	22,400	112,000	9,333	0.40	3,733.20
		5	22,400	112,000	9,333	0.35	2,266.55
		5	22,400	112,000	9,333	0.15	1,399.95
B	3 -15	20	3,040	60,800	5,066	0.28	1,418.48
Totals B3		10.8	194,264	2,105,860	175,488	0.28	48,460.23
Totals A+B3		10.6	201,144	2,140,260	178,355	0.29	51,183.88

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<u>Class</u>	<u>Zone Block</u>	<u>Width</u>	<u>Area Sq.Ft.</u>	<u>Cu.Ft.</u>	<u>Tons</u>	<u>Grade % Sn.</u>	<u>Tonnage x Grade</u>
B	4 -12	10	6,880	68,800	5,738	0.25	1,434.50
B	4 -13	5	6,880	34,400	2,867	0.27	774.09
B	4 -14	5	6,880	34,400	2,867	0.17	487.39
B	4 -15	15	15,200	228,000	19,000	0.16	3,040.00
B	4 -16	5	8,640	43,200	3,600	0.31	1,116.00
<u>Totals B4</u>		9.2	44,480	408,800	34,072	0.20	6,851.98
B	35- 1	255	29,440	7,507,200	625,600	0.22	137,632.00
B	35- 2	5	14,080	70,400	5,867	0.10	586.60
B	35- 3	5	6,880	34,400	2,867	0.21	286.70
		151.0	50,400	7,612,000	634,334	0.22	138,505.30
<u>Totals Group A</u>							
	1	5	6,592	32,960	2,747	0.59	1,620.73
	2	24	39,370	952,520	79,376	0.53	41,962.62
	2A	5	6,880	34,400	2,867	1.20	3,440.40
	3	5	6,880	34,400	2,867	0.95	2,723.65
		17.7	59,722	1,054,280	87,857	0.57	49,747.40
<u>Totals Group B</u>							
	1	5	20,640	103,200	8,601	0.23	2,006.90
	2	17.4	102,394	1,786,376	148,863	0.20	29,892.50
	2A	5	6,880	34,400	2,867	0.23	659.41
	3	10.8	194,264	2,105,860	175,488	0.28	48,460.23
	4	9.2	44,480	408,800	34,072	0.20	6,851.98
	35	151.0	50,400	7,612,000	634,334	0.22	138,505.30
		28.7	419,058	12,050,636	1,004,225	0.23	226,376.32
<u>Total Additional Tonnage</u>							
		27.5	478,780	13,104,916	1,092,082	0.25	276,123.72

038

<u>Class</u>	<u>Zone Block</u>	<u>Width</u>	<u>Area Sq.Ft.</u>	<u>Cu.Ft.</u>	<u>Tons</u>	<u>Grade % Sn.</u>	<u>Tonnage x Grade</u>
Total Programme Group A @ Jan 10.							
1966 +		21.4	186,496	3,998,960	337,577	0.66	223,855
Additional		17.7	59,722	1,054,280	87,857	0.57	49,747
		20.5	246,218	5,053,240	425,434	0.64	273,602
Group B @ Jan 10							
1966 +		17.8	360,540	6,408,930	534,096	0.23	123,929
Additional		28.7	419,058	12,050,636	1,004,225	0.23	226,376
		23.7	779,598	18,459,566	1,538,321	0.23	350,305
Grand Total A + B							
		22.9	1,025,816	23,512,806	1,963,755	0.32	623,907

Overburden calculated from lateral extent of Ore Zone 2 (which approx. embraces all other ore zones) + 35 orebody

137	445,956	51,095,972	4,257,998
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Total Ore Zone (i.e. ore+waste) calculated to the lateral limits as above (i.e. No.2 & 35 orebodies)

95	445,956	42,365,820	3,530,485
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Total Surface Area under consideration Approx. 1,282,700

Tonnage Factor
= 12

Q33/10 66-423

ABERFOYLE TIN DEVELOPMENT PARTNERSHIP
ANALYSIS OF EXPENDITURE ON BLUE TIER PROSPECT
FOR MONTH ENDING *MAY 31* 1966

216022

039

A/C.
NO.

M/E

Cumulative
Expenditure

	\$	¢	\$	¢
1. Technical Salaries and Wages	425		4201	
3. Sampling			70	
4. Wages	341		5975	
5. Outside Technical Services			1819	
6. Geological Mapping			127	
7. Travelling - Accomodation	350		4086	
8. " " Advance				
11. Contact Drilling			68073	
12. Bulldozing				
13. Assaying and Sampling			1679	
15. Ore Dressing Investigation				
16. Dredge Option Payments				
21. Drafting	28		805	
22. Plant Maintenance			50	
23. Motor Vehicle Expenses			600	
24. Stores			2648	
25. Freight			2721	
26. Plant Hire			376	
27. Surveying			63	
28. Power			27	
31. Expenditure on leases, deposits, rents			659	
32. Rates			9	
33. Road Construction				
34. Heliport Construction				
35. Imprest Account Suspense				
36. Airborne Magnetometer survey				
37. H.O. Overhead - Admin. & Secretarial			1951	
42. Printing & Stationery			692	
43. Communications			250	
44. General Expenses	7		278	
45. Legal Expenses			5	
46. Insurance			13	
47. Bank Charges			29	
48. Group Tax				
49. Pay Roll Tax			216	
65. Sundry Debtors				
50. Bonus Payments				
51. Management Fees			488	
55. Audit Fees			20	
59. Superannuation			19	
71. Plant and Equipment			2211	
72. Plant Motor Vehicle				
73. Furniture - Fittings				
70. Lease Option Payments				
	1155		102235	

I hereby declare that, to the best of my knowledge, the following represents a true and reasonable apportionment of the expenditure on Blue Tier Area EL 3/63 to May 31, 1966. *J.R. Law*

ABERFOYLE TIN DEVELOPMENT PARTNERSHIP

BLUE TIER PLANS

216023

040

Anchor Mine	B.T. 100 - B.T. 149
Summit Mine	B.T. 150 - B.T. 199
Don Mine	B.T. 200 - B.T. 249
Liberator Mine	B.T. 250 - B.T. 299
Duco Mine	B.T. 300 - B.T. 349
Southern Cross Mine	B.T. 350 - B.T. 399
Mt. Marie Mine	B.T. 400 - B.T. 449
Michael Mine	B.T. 450 - B.T. 499
Moon Mine	B.T. 500 - B.T. 549
Lottah Mine	B.T. 550 - B.T. 599
Regional Plans	B.T. 600 - B.T. 649
Miscellaneous Mines	B.T. 650 - B.T. 699
Australia Mine	B.T. 700 - B.T. 749

No.	Subject	Date	Scale	By
B.T. 100	<u>Anchor Mine</u>			
B.T. 100	Plan of Anchor Mine	30.4.43	1" = 100'	D.E. Thomas, D.Sc., Govt. Geologist.
B.T. 101	Blue Tier Report-Anchor Section	26.7.36	1" = 100'	T.R. Anderson
B.T. 102	Blue Tier Report-Anchor Section	20.5.35	1" = 1ch	T.R. Anderson
B.T. 103	Northern Section Anchor Mine showing proposed drill sites	30.4.43	1" = 100'	D.E. Thomas
B.T. 104	Blue Tier Report Assay Plan (Anchor Mine)	20.7.35	1" = 40'	T.R. Anderson
	<u>Summit Mine</u>			
B.T. 150	Details of Surface Sampling (No. 10 Sheet)	1907	1" = 50'	Mt. L. M. & R. Co.
	<u>Don Mine</u>			
B.T. 200	No. 6 sheet Details of Sur- face Sampling (Don Mine, Gaunts Shaft)	1907	1" = 50'	Mt. L. M. & R. Co.
B.T. 201	Assay Plan of Don Workings	1907	1" = 30'	Mt. L. M. & R. Co.

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No.	Subject	Date	Scale	By
	<u>Liberator Mine</u>			
B. T. 250	Plan of Liberator Mine	30.4.43	1" = 30'	D. C. Thomas, D.Sc.
	<u>Duco Mine</u>			
B. T. 300	Details of Surface Sampling	1907	1" = 50'	Mt. L. M. & R. Co.
	<u>Southern Cross Mine</u>			
B. T. 350	Plan showing Surface Prospecting Vicinity Haley's Lease (Sheet 1, Southern Cross Mine)	1907	1" = 50'	Mt. L. M. & R. Co.
B. T. 351	Details of Surface Sampling (No. 12 sheet)	1907	1" = 50'	Mt. L. M. & R. Co.
B. T. 352	Longitudinal Section of Haley's Lode with Cross-Sections at each Bore (No. 2 sheet)	1907	1" = 30'	Mt. L. M. & R. Co.
B. T. 353	Longitudinal Section of Haley's Lease Lode with Cross Section at each Bore	1907	1" = 30'	Mt. L. M. & R. Co.
	<u>Mt. Marie Mine</u>			
B. T. 400	Haley's Lease (Sheet No. 2)	1907	1" = 50'	Mt. L. M. & R. Co.
B. T. 401	Details of Surface Sampling (No. 13 sheet)	1907	1" = 50'	Mt. L. M. & R. Co.
B. T. 402	Longitudinal Section of Haley's Lode with Cross Section at each Bore (No. 3 sheet)	1907	1" = 30'	Mt. L. M. & R. Co.
	<u>Michael Mine</u>			
B. T. 450	Plan of Boring-Michael Mine 1935		1" = 40'	
	<u>Moon Mine</u>			
B. T. 500	Plan showing Surface Prospecting Vicinity of Moon Section	1907	1" = 50'	Mt. L. M. & R. Co.
B. T. 501	Details of Surface Sampling (No. 15 sheet)	1907	1" = 50'	Mt. L. M. & R. Co.
B. T. 502	Bores on Moon Lode(Sections)	1907	1" = 30'	Mt. L. M. & R. Co. .../3

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No.	Subject	Date	Scale	By
	<u>Lottah Mine</u>			
B. T. 550	Sampling in No. 2 Adit Lottah Mine	5.2.57	1" = 1ch	Terence D. Hughes
	<u>Blue Tier Regional Plans</u>			
B. T. 600	Production Chart		1" = 20ch	
B. T. 601	Geological Sketch Plan of Blue Tier Tinfield to show known occurrences of Tin Granite	4.3.43	1" = 1 mile	D. E. Thomas D.Sc., Govt. Geologist(Tas)
B. T. 602	Plan of Blue Tier Tin Area showing value contours (Michael, Moon, Southern Cross, Ethel, Australia, Duco).		1" = 400'	Mt. L. M. & R. Co.
B. T. 603	General Plan of works (No. 17 sheet Duco, Don, Australia, Summit, Ethel, Mines)		1" = 200'	Mt. L. M. & R. Co.
B. T. 604	Showing Positions of Bore Holes and Trenches (No. 18 sheet. Planet, Southern Cross, Marie Mines)		1" = 200'	Mt. L. M. & R. Co.
B. T. 605	No. 19 sheet General Plan of Works(Perrenial Mine, Michael Mine)	1907	1" = 200'	Mt. L. M. & R. Co.
B. T. 606	Blue Tier Tin Mines Vicinity of Lottah	21.5.43	Various	D. E. Thomas, D.Sc., Govt. Geologist.
B. T. 607	Bores on Australia and Crystal Hill sections (No. 5 sheet) Summit, Australia, Gaunt's, Crystal Hill, Duco, Don.	1907	1" = 30'	Mt. L. M. & R. Co.
	<u>Miscellaneous Mines.</u>			
B. T. 650	Haley's Lease Sheet No. 3	1907	1" = 50'	Mt. L. M. & R. Co.
B. T. 651	Plan of Workings Chintooks Tin Mining Syndicate (Kent Workings)	16.2.43	1" = 200'	D. E. Thomas, D.Sc.
B. T. 652	Plan of Amalgamated Tin Mines Syhdicate(Cambrian)	30.4.43	1" = 60'	D. E. Thomas, D.Sc.
B. T. 653	Details of Surface Sampling	1907	1" = 50'	Mt. L. M. & R. Co.
B. T. 654	Details of Surface Sampl- ing (No. 14 sheet)	1907	1" = 50'	Mt. L. M. & R. Co.

No.	Subject.	Date	Scale	By
<u>Mines Miscellaneous (Cont'd)</u>				
B.T.655	Sampling of Old Workings - Cream Creek Sections of Bores - Cream Creek and Vicinity	1907	1" = 30'	Mt. L. M. & R. Co.
B.T.656	Bores on Ethel Lode	20.7.35	1" = 4 ^{ch}	T.R. Anderson
<u>Australia Mine</u>				
B.T.700	Assay Plan Australia Mine	1907	1" = 50'	Mt. L. M. & R. Co.
B.T.701	Details of Surface Sampl- ing (Sheet 9)	1907	1" = 50'	Mt. L. M. & R. Co.