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ROSSARDEN E.L. 28/78

TASMANIA

REPORT FOR THE SIX MONTHS ENDING

OCTOBER 6, 1979

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 August, 1979

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SUMMARY

E.L. 28/78 lies in north-eastern Tasmania surrounding the Aberfoyle and Storeys Creek Mines. In the north-western corner of the E.L. in the vicinity of Gipps Creek, a number of small tin-tungsten prospects occur, viz. the Long Tunnel Mines, Hayes Tungsten Prospect, Ben Lomond Tungsten Mine, Ben Lomond Tin Mine, Great Republic Mine and Rex Hill Mine. Of these, the latter three are held under lease to other parties. The remainder are assessed in this report. One of these, Hayes Tungsten Prospect, was mapped, sampled and drilled by A.T.N.L. in 1967-1968. It was proposed initially that the prospects in the Gipps Creek area may have potential for upgrading by photometric means.

The tin-tungsten mineralization of the Gipps Creek area occurs as fairly flat (20 to 50 degrees) easterly dipping quartz-tourmaline veins with greisen envelopes within the Ben Lomond Granite. Five creeks within the granite were mapped at 1:40000 scale and the area of the mineralization was mapped at 1:1000 scale. The Long Tunnel and Ben Lomond Tungsten Mines, and other workings known as Park & Bailey's Section, were channel sampled. Zones of sheeted quartz-tourmaline-cassiterite-wolframite veins with greisen envelopes up to 3 metres in thickness in altered granite are present. Veins are usually 5-10 cm in thickness carrying coarse cassiterite and wolframite. The present sampling yielded low values for Sn (average 360 ppm) and W (average 90 ppm), considerably lower than the previous sampling by A.T.N.L. (.22% W_3O_8 , .28% Sn). This is probably caused by the inclusion of greisen in the samples and the coarse grain size and spotty distribution of cassiterite and wolframite in the veins. Two samples in Park & Bailey's Section, which yielded assays of 1100 ppm and 1300 ppm over 1.2 m and 3.0 m, respectively, suggest that significant concentrations of cassiterite may be present in the wider greisen/sheeted vein zones.

Re-examination of core from the A.T.N.L. drilling indicated that the Hayes Tungsten Prospect veins were probably adequately tested, although unsampled cassiterite-bearing zones, and an aplitic rock apparently containing disseminated wolframite are present. The ore reserve

calculated from the A.T.N.L. sampling and drilling (206,500 tons, .27% CMU over a 48 inch veining width) may be slightly upgraded if greisen envelopes carrying cassiterite are present.

The best potential for an economic tin-tungsten deposit in the Gipps Creek area probably lies in the sheeted veins and their greisen envelopes such as those in Park & Bailey's Section.

INTRODUCTION

Exploration Licence E.L. 28/78 (Rossarden) was applied for by Aberfoyle Exploration Pty. Ltd. in October 1978 over the area surrounding the Aberfoyle and Storeys Creek Mines. The rationale for the area selection, apart from proximity to the operating mines, was the potential for tin-tungsten mineralized vein swarms in the Gipps Creek area, similar to Mt. Carbine in Queensland, which might be amenable to photometric upgrading.

A certain amount of previous work had been undertaken by Aberfoyle Tin N.L. (A.T.N.L.) in 1966-68 including diamond drilling, but the prospects had not been assessed as a group at any time in the past, except by government geologists.

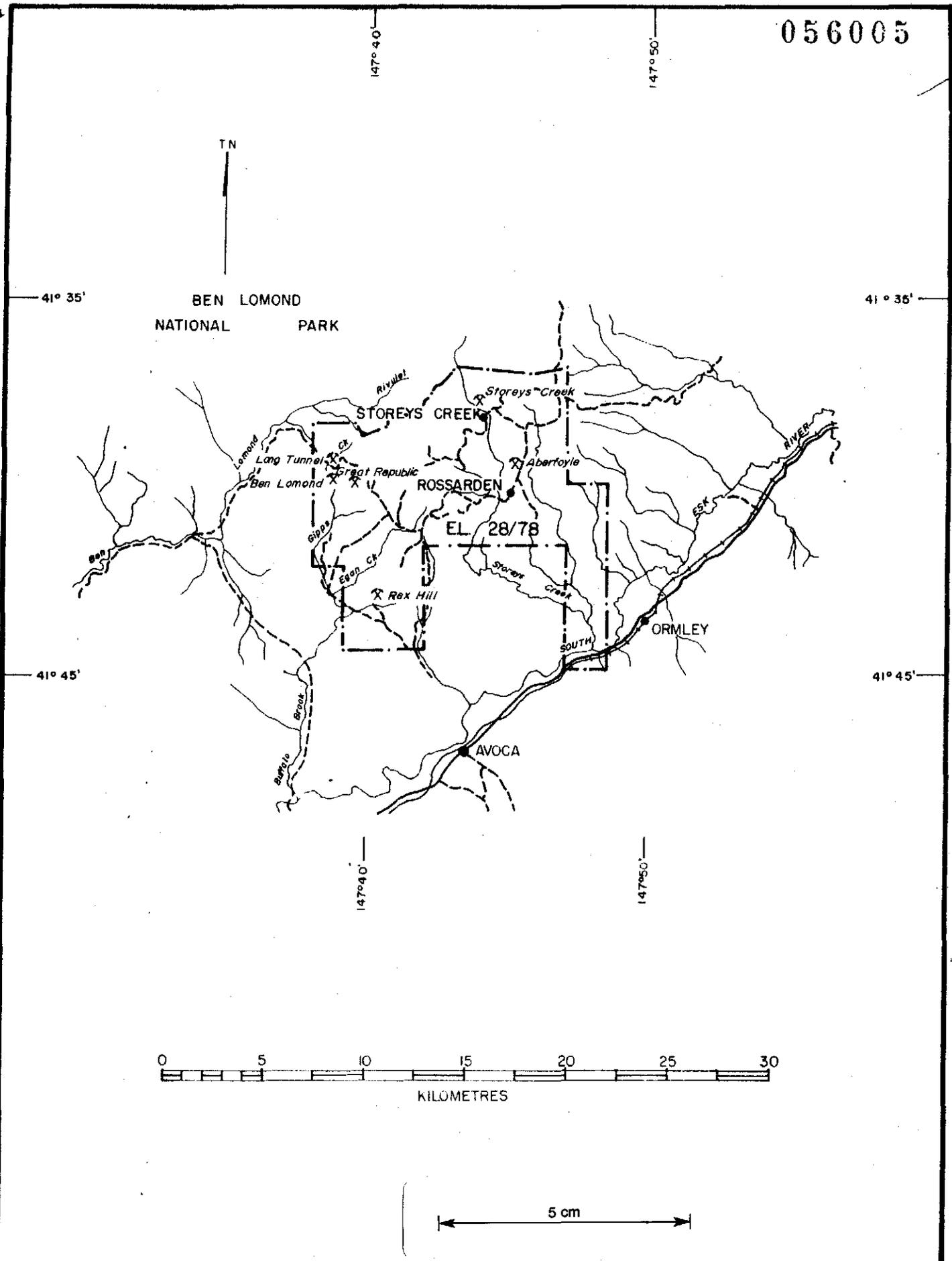
This report is an assessment of the tin-tungsten prospects in the Gipps Creek area of E.L. 28/78, undertaken at the request of Aberfoyle Exploration Pty. Ltd. The area of most specific interest surrounds the confluence of Gipps and Cradle Creeks.

LOCATION

E.L. 28/78 lies in north-eastern Tasmania, 50 kilometres east-south-east of Launceston. The Gipps Creek area lies in the north-eastern corner of the E.L. and is accessible by forestry tracks in conventional vehicles (Plate Ross 5).

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Aberfoyle Exploration Pty Ltd

Drawn:	
Traced:	JJB
Checked:	
Revised by:	Date:

NORTH EAST TASMANIA
ROSSARDEN E.L. 28/78

LOCATION PLAN

Location code:	
Date:	August 1979
Scale:	1:250,000
Plate No	ROSS 5

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TENURE

E.L. 28/78 is 100 square kilometres in area and was granted on May 6, 1979. It encloses Consolidated Lease M.L. 27 M/77 held by Aberfoyle Tin Ltd. over the Aberfoyle and Storeys Creek Mine areas. A number of small tenements in the Gipps Creek area over known prospects are held by various parties, most by D.E. Thomas and his associates. Of the prospects covered by small tenure, the Ben Lomond Tin Mine, the Great Republic and the North Republic Mines are the most important. Two small leases are held by R. Brinkman over the Rex Hill Tin Mine.

All small tenements in the Gipps Creek area are shown in Plate Ross 2.

HISTORY AND PREVIOUS WORK

Tin and tungsten mineralization was first reported in the Rossarden area by Thureau (1881) who described prospecting workings in the area of what later was to be the Ben Lomond Tin Mine. Thureau (1881) describes a vein "about one foot wide, highly metalliferous and fully one third of same is rich 'cassiterite' Veins of fluorspar of fine deep violet colour, arsenical and iron pyrites, occur regularly; also spots and nests of feldspar, radiating tourmaline and chlorite." Alluvial workings in the area are also mentioned. This style of mineralization with cassiterite and/or wolframite is typical of the Gipps Creek area. Although discovered previous to the quartz veins in sediments at Storeys Creek, prospecting interest in the Gipps Creek area has been intermittent, varying in intensity with the oscillations of the wolfram market.

Six mineralized showings of significance are present in the area from the north, as follows (Plates Ross 1, Ross 2):

- | | | |
|---------------------------|---|----------------------------|
| Long Tunnel Mine |) | Tin-tungsten deposits |
| Hayes Tungsten Prospect |) | |
| Ben Lomond Tungsten Mine) |) | |
| Ben Lomond Tin Mine |) | Predominantly tin deposits |
| Great Republic Mine |) | |
| Rex Hill Mine | - | Tin-base metal deposit |

Each deposit has been described in detail in government reports, viz. Montgomery (1891), Waller (1901), Scott (1928), Mackintosh Reid and Henderson (1929), Nye (1941), Blissett (1959). Very little new information has been added with each inspection, although the lease holders tended to change. Specific reports on the Rex Hill Mine, which was the major producer of the area, are found in Goodall (1909), Mackintosh Reid (1928), Hitchcock (1934), Nye (1934), Henderson (1935), Urquhart (1967) and Hall, Relph & Associates (1970). Apart from the efforts of prospectors, no significant exploration of the area took place until A.T.N.L. mapped and drilled the Hayes Tungsten Prospect in 1966-68, (Layden, 1966; Krummei, 1968), and mapped, under option from D.E. Hayes, the Great Republic Mine (O'Connor, 1972). The Aberfoyle interest in the area ceased in 1975 with relinquishment of its leases and no serious exploration or mining of the area has taken place since.

Table 1 summarizes the content of most of the references cited above.

GENERAL GEOLOGY

The tin-tungsten deposits of the Gipps Creek area occur within a fault-bound block of the Devonian Ben Lomond Granite approximately 15 kilometres in length and 3 kilometres in width elongate in a north-north-westerly direction. The granite intrudes folded Silurian sediments, mainly grey/black shales and quartzites of the Mathinna Group, and is overlain by flat lying Permian mudstones, sandstones and grits (Blissett, 1959). The faults bounding the granite are the Castle Carey Fault to the west and the Gipps Creek Fault to the east, which juxtapose younger rocks with the granite. These structures are normal faults, with throws of over 300 metres on the Castle Carey Fault and about 70 metres on the Gipps Creek fault (Henderson, 1946; Blissett, 1959).

In the present investigation, five creek sections and the Avoca-Rossarden Road along Castle Carey Creek were mapped at 1:40000 scale to examine the lithology and small scale structures within the granite and the Mathinna Group. The creeks mapped were Ben Lomond Rivulet, Vickory Creek, Gipps Creek, Buffalo Creek and Hercules Creek. The mapping is plotted on Plate Ross 1 at 1:50000 scale.

Granite Lithology

The granite, as previously described by Blissett (1959) occurs mainly as a massive, coarse, pink leucogranite composed of soda orthoclase, plagioclase, biotite and/or hornblende. Coarse potash feldspar phenocrysts are commonly present, up to 5 cm in length, rarely showing a preferred orientation. Aplitic dykes, usually flat lying, are occasionally observed and a finer grained phase with potash feldspar phenocrysts was mapped at the western end of the Buffalo Creek section. Similar fine grained granite, less spectacularly porphyritic occurs as rare inclusions within the coarse granite on the Avoca Road, and as dykes in the Mathinna Group, similar to the descriptions of Blissett (1959). It is not possible to generalize about the distribution of the granite phases from the current mapping, but Blissett observes that the granite becomes finer grained with tourmaline and muscovite occurring towards its margins and contacts with the Mathinna Group.

In the new cuttings along the Avoca Road, the feldspars of the granite are seen to be pervasively altered to pale green sericite-chlorite aggregates, which often define the zoning in plagioclase. Such alteration seems to pervade the whole granite, even affecting areas removed from showings of mineralization.

Small-scale Structures within the Granite

Fresh exposures of the granite exhibit an abundance of small scale structures in addition to jointing and those associated with mineralization.

The most common small-scale structures are quartz, chalcedony and quartz-pyrite fissures. As noted by most observers, these fissures, while varying in thickness and morphology, almost certainly post-date the mineralized structures of the area. In addition to clear cross-cutting relationships in continuous exposures, they have been described as passing from the granite into the overlying Permian by Waller (1901) at the Ben Lomond Tin Mine and may be related to the block faulting of the area. Pyrite is common in the Buffalo Creek and Gipps Creek sections, but rare in the Avoca Road cuttings and Hercules Creek. Chalcedony and quartz (occasionally zoned white to smoky) occur within the same fissures. In no instance, have these veins been found to carry tin or tungsten, although they may be of similar geometry to mineralized structures and have been commonly mined and prospected in error. Their sharp contacts, absence of both envelope alteration and minerals such as tourmaline or muscovite, are usually distinctive.

The quartz fissures usually dip steeply, tending to strike east-west and north-west/south-east, commonly within the same area, although without strong preferred orientation.

Pre-dating the quartz fissures are a variety of steeply dipping vein structures associated with the alteration of the granite. Such veins are usually thin (<1cm wide) and filled with pinite, chlorite or tourmaline. They are commonly sheeted, separated by intervals of 2 to 10 cm. These veins again exhibit no particular preferred orientation on a regional scale, although they may locally.

No attempt was made to map joints, except for the sheeted joints in Gipps Creek east. Casual observation shows their geometry to be complex and their morphology difficult to classify.

Pegmatites, as observed by Blissett (1959) are rare, composed of coarse crystals of quartz and potash feldspar with vughs filled with tourmaline, commonly surrounded by a tourmaline alteration envelope. Dips are usually flat.

Mathinna Group Lithology and Structure

The Mathinna Group sediments outcrop strongly in Vickory Creek. Here they are generally black to dark grey pyritic shales and siltstones, exhibiting strong slaty and crenulation cleavages. Chiastolite is occasionally observed and their dark colour may result from contact effects and presence of biotite.

? Quartz veins, usually of short strike length and relatively wide cross-section are fairly common, quartz float being widespread outside the creeks. Cleavage and bedding are difficult to separate in most outcrops, being sub-parallel in orientation, striking north to north-east, and dipping south-west.

ECONOMIC GEOLOGY

General

Recovered tin-tungsten production from the mines in the Gipps Creek area is insignificant compared with that from Aberfoyle and Storeys Creek, as shown in the following table (Blissett, 1959):

<u>Mine</u>	<u>Tin concen- trates (tons)</u>	<u>Wolfram concen- trates (tons)</u>	<u>Remarks</u>
Aberfoyle	11,000	3,500	From 1932
Storeys Creek	800	6,300	From 1899
Rex Hill	826	-	Also 20 tons galena
Great Republic	132	-	-
Ben Lomond	38	16	-
Hayes	-	-	-
Long Tunnel	-	-	-

Tin-tungsten mineralization throughout the area is associated with veining and alteration of the Ben Lomond Granite. With the possible exception of the Rex Hill Mine, mineralization is associated with usually flat dipping quartz fissures with greisen envelopes.

The fissures vary in width from 1 to 20 cms and in addition to quartz may also contain tourmaline, purple fluorite, pyrite, chalcopyrite, marmatite, cassiterite and wolframite. The greisen envelope may be absent or several metres in width. A wide greisen pipe was mined at the Great Republic Mine as described by Montgomery (1881), which contained 6% tin metal. The greisen is composed mainly of coarse white mica and quartz with pinite, talc, tourmaline, fluorite and sulphides. Topaz seems to be absent. Cassiterite is the ore characteristic of the Great Republic and Ben Lomond Tin Mines, while larger or equal volumes of wolframite are typical of the Long Tunnel Mine, the Ben Lomond Tungsten Mine and Hayes Tungsten Prospect.

The Rex Hill Mine has been described as a brecciated pipe by Nye (1941) and Urquhart (1969), however descriptions of the deeper workings by Mackintosh Reid (1928) and Henderson (1935) suggest a similar vein/greisen character to the other deposits. The brecciated structure visible in the open cut is associated with the galena/sphalerite production of the first years of operation (Montgomery, 1891). The account of Henderson (1935) leads to serious doubt whether the "pipe" has any depth potential and can legitimately be compared with the Carpathia pipes at Ardlethan, as suggested by Urquhart (1967).

Gipps Creek/Cradle Creek Area

The Gipps Creek/Cradle Creek area is the area of the Long Tunnel and Ben Lomond Tungsten Mines, the Hayes Tungsten Prospect and a number of other unnamed workings. The Hayes Tungsten Prospect was mapped and drilled by Aberfoyle in 1966-1968.

In the current assessment the area was mapped at 1:1000 scale and sampled. It is plotted with the previous mapping on Plates Ross 3 and Ross 4. The Long Tunnel Mine occurs approximately 800 metres north-north-east of the Hayes Tungsten Prospect and the Ben Lomond Tungsten Mine as shown in Plate Ross 1.

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1. Hayes Tungsten Prospect: This prospect is referred to by Montgomery (1891) as Gaunt & Bennell's Sections where unrounded highgrade quartz-wolfram pebbles were found in Ockle Gully (Plate Ross 3). Other references made by Waller (1901) and Mackintosh Reid & Henderson (1929) are difficult to locate on the plans available in the reports.

Layden (1966) mapped the prospect at 1:1200 scale with a plane table. Four major and several minor veins are present, the major veins being composed of quartz and tourmaline, small amounts of wolframite and cassiterite and minor sulphides. These veins are referred to as "W", "X", "Y" and "Z" as shown in Plate Ross 3. "X" and "Y" veins are subordinate in development to "W" and "Z" and join at the northern end of the system. The veins strike between 330 and 350 degrees and dip ~~west~~^{east} at between 30 and 55 degrees, with "Z" vein being the steepest. Strike lengths of the veins are "W" 170 metres, "X" 60 metres, "Y" 180 metres, "Z" 130 metres. Greisen envelopes are relatively poorly developed.

2. Ben Lomond Tungsten Mine: These workings occur on the south bank of Gipps Creek. Waller (1901) describes two veins "18 inches to 2 feet thick" dipping 20 degrees south, composed of quartz, tourmaline and wolfram. Similar descriptions are found in Mackintosh Reid & Henderson (1929), Nye (1941) and Blissett (1959) who suggest the dip is to the south-east, and possibly that the second vein is a faulted extension of the first.

The present mapping (Plate Ross 3) has shown that the area has been modified by sluicing operations since last described and that only one vein exposure is present. The vein exposed is <5cm in width dipping south as described by Waller composed of quartz and tourmaline with coarse aggregates of wolframite, a vugh-filling clay mineral (?dickite), and minor pyrite. The vein is enclosed in an envelope of quartz-muscovite-tourmaline greisen 20-30 cm thick which exhibits a vague foliation parallel to the vein walls. The surrounding granite is porphyritic, heavily altered with tourmaline and white mica.

Quartz-tourmaline rock is abundant as float, but its field relationships are uncertain. Considerable quantities of barren quartz waste is scattered about the site, suggesting the veins were considerably wider where mined and perhaps that wolframite occurrence was patchy. Mackintosh Reid & Henderson (1929) report a production of 16 tons of 72% concentrate.

3. Park & Bailey's Section: These workings occur to the north of the Ben Lomond Tungsten Mine, across Gipps Creek and 150 metres west of Hayes Tungsten Prospect. These prospects are described in some detail by Waller (1901) and Mackintosh Reid & Henderson (1929), but are again difficult to reconcile on the ground. The present mapping shows that this prospect probably consists of three main veins or zones, striking approximately 350 degrees and dipping easterly at 20 to 40 degrees, and occurring over a zone 30 to 50 metres in width. A strike length of about 250 metres is indicated. Coarse wolframite and slightly rarer cassiterite are present on the dumps and in the accessible workings. The workings are shallow with the lodes being mined by adit and underhand stopes.

Where exposed in shallow open cuts the mineralization is seen to be quartz-tourmaline-wolframite-cassiterite-sulphide veins, usually <10 cm in width surrounded by envelopes of quartz-muscovite-tourmaline greisen. Up to four veins may be seen in a zone 3 to 4 metres in width. The width of the greisen envelope seems to vary more rapidly than the vein and may pinch and swell from <5cm to >20cm over a few metres of strike length. The granite outside the envelopes is extensively altered to white mica and tourmaline.

To the east of Park and Bailey's workings, a further open cut with a few underlay shafts has been worked, striking 300 degrees and dipping 26 degrees north-east. A similar thin (5 cm) quartz-tourmaline vein with a greisen envelope is present.

4. Long Tunnel Mine: The Long Tunnel lies approximately 200 metres north, along the strike of the veins from Hayes Tungsten Prospect. This prospect was first described by Montgomery (1891), subsequently by Waller (1901), Mackintosh Reid & Henderson (1929) and Blissett (1959). The present workings consist of minor surface development of two short (<30 cm) quartz-tourmaline veins striking slightly east of north and dipping east at 40 to 50 degrees, separated from one another by about 150 metres, and four adits. One of these adits was over 150 metres in length (the 'Long Tunnel') with its portal in the bank of Gipps Creek as shown on Plate Ross 4. Montgomery (1891) reports that the eastern vein was "2 feet 3 inches" thick and that the adit did not reach the vein. The western vein is not described. All previous investigators comment that the long adit from Gipps Creek is parallel to the strike of the veins, hence not a reasonable test of the area, and that the worth of the prospect is similar to its original state in the 1880's.

A.T.N.L. SAMPLING AND DRILLING PROGRAMME

As stated above, the Hayes Tungsten Prospect was mapped, sampled and drilled by Aberfoyle in 1966-1968. The geology of the prospect is described in the foregoing section. Sampling of the veins, both underground and on the surface (Layden, 1966) was undertaken and a figure of 0.28% combined metals, weighted over a normal stoping width of "30 inches" was obtained. An average for Layden's samples is 0.22% W_3 and 0.25% Sn. No vein widths are given*, nor details of how these figures were arrived at, but an inferred ore reserve to the level of the deepest adit for the four veins is quoted as "72000 tons".

Layden (1966) recommended that a programme of exploratory development be undertaken, totalling 910 feet of advance in three stages to establish the grade.

* Krummei (1968) notes an average width of "12 inches", however.

In 1967-1968 four holes were diamond drilled to test Hayes Tungsten Prospect located as shown in Plate Ross 3. A total of 1610 feet were completed as follows:

GC S1 - 350 feet (-60 degrees)
GC S2 - 350 feet (-60 degrees)
GC S3 - 500 feet (vertical)
GC S4 - 400 feet (vertical)

Krummei (1969) states that interpretation of surface and drill hole information suggests that the four major quartz veins form two distinct groups consisting of the W, X, Y veins in the east and the Z vein in the west. Using all known assay and width data from surface and drilling, measuring vein areas on longitudinal sections by planimeter and correcting for dip, assuming a normal stoping width of "48 inches" and using a tonnage factor of 13.5 cubic ft/ton, an inferred ore reserve of 206,500 tons of 0.27% combined metal was calculated (Average 0.47% Sn, 0.35% WO_3 over vein width).

Krummei (1968) notes a leucocratic granite showing an increase in muscovite containing disseminated wolframite and marmatite in the lower portion of GC S4, and disseminations of molybdenite in "a 1 foot zone at 140 feet at the top contact of the wide granodiorite in GC S3".

No further work apart from completing the detailed mapping of the area and undertaking trace element geochemistry of the core is recommended.

Re-examination of Core

During the present assessment the core was re-examined by the writer and C.H. Young. A number of samples were collected for petrography and the following observations made:

1. The granite phase containing the disseminated wolframite is an aplitic rock, composed of albite, potash feldspar, quartz, muscovite and tourmaline. The wolframite occurs as isolated grains 1-2 mm in diameter usually associated with coarser muscovite or occasionally in quartz veins. It is <1% by volume. Similar rocks occur in the other cores, but without mineralization.

- 2. Cassiterite recognisable in hand specimen occurs in unsplit quartz-tourmaline veins in GC S1. Disseminated cassiterite was recognised in this section in tourmaline-bearing granite at 116'3" in GC S4.
- 3. Rocks described as hornblende- and pyroxene-bearing granodiorite in GC S3 are actually quartz-blue tourmaline rocks, gradational to an aplitic phase similar to that described above.
- 4. All granitic rocks in the core are altered to a larger or smaller extent. Tourmaline has replaced biotite as the ferromagnesian phase, although a phlogopitic mica may be present. Plagioclase is altered to sericite and/or chlorite with the more calcic zones the most affected. Addition of quartz, and the growth of muscovite and microstructural rearrangement of the feldspar seems to lead to the development of greisen, usually with an increasing volume of tourmaline, and fine cassiterite.
- 5. Greisen envelopes around quartz-tourmaline veins are composed of a muscovite-albite-tourmaline assemblage with occasional fluorite. Fluorite is a common late stage vein mineral associated with pyrite.

The above indicate further examination of the core, including sampling and some detailed petrography is warranted. The identification of the disseminated wolframite should be verified.

CURRENT SAMPLING PROGRAMME

Fourteen channel samples of the Ben Lomond, Long Tunnel Mines and Park & Bailey's Section were taken after completion of the 1:1000 scale mapping.

The samples were assayed for tin, tungsten, copper, lead, zinc, bismuth and molybdenum, and the results are presented in Table 2.

Tin and tungsten values in present samples are considerably lower than those reported by Layden (1966), averaging 360 ppm Sn and 90 ppm W.

The low results in absolute terms as well as in comparison with those of Layden are probably a reflection of:

- (i) the narrow intervals of actual vein material sampled, usually <10 cm;
- (ii) the coarse grainsize and uneven distribution of wolframite and cassiterite within the veins; and
- (iii) the channels including altered granite and greisen, whereas the samples of Layden (1966) were vein material only.

It is suggested that the low tungsten values relative to tin may be a result of concentration of the cassiterite and wolframite in different rocks, with a greater proportion of wolframite occurring in the veins, as opposed to the greisen envelope. Fine cassiterite can be observed in the altered granite and greisen in thin-section. Cassiterite in quartz from dump material tends to be coarse (> 1mm).

However, samples 219529 (1100 ppm) and 219530 (1300 ppm) from Park & Bailey's Section, taken over intervals of 1.2 and 3.0 metres, respectively, do indicate the presence of significant concentrations of cassiterite, presumably in greisen, over fairly wide intervals. Whether these values are a realistic representation of the potential tin content of the greisen envelopes can only be established by further sampling. Since mineralized greisen elsewhere* typically contains values of 0.2 to 0.3% tin a 48 inch mining width in these rocks, if the figures of Layden (1966) and Krummei (1968) are representative (i.e. 0.27% CMU, veins 12 inches average width) may be of higher grade if the greisen is included as ore.

* Lottah, Little Bygoo, etc.

Since the vein/greisen zones in Park & Bailey's Section is over 3 metres wide in places, potential for larger tonnages of mineralization than the generally insignificant vein widths is definitely present. Further sampling would be facilitated by a programme of back-hoe trenching to improve the quality of the exposures.

Copper, lead, zinc, bismuth and molybdenum were also determined for the channel samples. Results are generally low except for sample 219527 which assayed 3150 ppm bismuth. Further sampling should show if this sample is representative.

PHOTOMETRIC SORTING CONCEPT

The writer is not qualified to comment on whether photometric sorting is a viable upgrading technique on mineralization such as that at Gipps Creek. However, it is noted that the spectral characteristics of Mt. Carbine or Aberfoyle/Storeys Creek mineralization are likely to be significantly different from that at Gipps Creek since the host is a granite of rather heterogeneous texture, rather than a dark grey sediment.

Using the reported assays and vein widths of the Gipps Creek drill core (Krummei, 1968, Appendix), the total volume of all assayed quartz veins in the holes drilled is about 3%. The average grade weighted by length* of all quartz vein intersections is about 0.4% Sn, 0.3% WO_3 , or 0.7% combined. Assuming the vein volume is representative, the average metal content of a tonne of rock would be about 200 ppm CMU. This is considerably less than the 0.1% WO_3 quoted by Young (1978) for Mt. Carbine.

CONCLUSIONS

The major conclusions of the current assessment of the tin-tungsten prospects in the Gipps Creek area may be summarized as follows:

* Acknowledging the usual caveats.

1. Tin-tungsten mineralization occurs as quartz-tourmaline-cassiterite-wolframite veins, striking about 350 degrees and dipping 20 to 50 degrees east, enclosed in altered granite.
2. The veins are 1 to 20 cm in width with greisen envelopes up to 50 cm in width. Veins may occur as multiple sheets in greisen and altered granite zones up to 3 metres in width.
3. Channel samples of the veins and greisen envelopes yielded low values, averaging 360 ppm Sn and 90 ppm W, but samples from the sheeted veins on Park & Bailey's Section yielded values up to 1300 ppm Sn and 175 ppm W over intervals of up to 3 metres.
4. The sampling results for Sn and W are lower than previous sampling. This may have been caused by sampling of vein and greisen, rather than the veins alone, and the erratic distribution and coarse grainsize of the cassiterite and wolframite. Cassiterite is probably more common than wolframite in the greisen envelopes. The wide greisen zones observed indicate considerably more tonnage potential exists when the veins and their envelopes are considered as a unit. Depending upon the tin content of the vein selvages, the grade over a minimum mining width may be improved.
5. The A.T.N.L. drilling and sampling of Hayes Tungsten Prospect in 1968 adequately tested the area, but minor mineralization in form of quartz-tourmaline veins with visible cassiterite and a medium grained aplitic phase with disseminated wolframite remains to be sampled.
6. It is not known whether tin-tungsten-bearing quartz veins in a greisen/granite host can be upgraded by photometric means. However, based on the results of the past drilling of Hayes Tungsten Prospect, the volume of quartz (3%) and the metal content of the veins (0.7% CMU) is considerably less than that in the bulk mining operation at Mt. Carbine (10% quartz, 1% W₂O₃).

7. The sheeted veins and their greisen and altered granite host such as those on Park & Bailey's Section offer the best potential for discovery of an economic tin-tungsten deposit in the area mapped.

RECOMMENDATIONS

Based on the above, it is recommended that further work should be aimed initially at establishing the grade and size of the sheeted veins and greisen on Park & Bailey's Section. This can be accomplished by a limited programme of back hoe trenching, channel sampling, and percussion drilling. Such a programme should include resampling of core from the 1968 A.T.N.L. drilling programme, and detailed petrography to establish the significance of the disseminated wolframite in GC S4.

The locations proposed for four trenches totalling 250 metres are shown in Plate Ross 3.

WORK PROPOSED

Subsequent to the above report prepared by Dr. D. Ransom, further field evaluation of the Hayes Tungsten Prospect and Park and Bailey's Section was undertaken. It is considered that the sheeted quartz greisen veins and altered granite on Park and Bailey's Section may be related to the wolframite bearing aplitic granite observed in GS S4. Cross sections (Ross 6) were prepared which show the possible relationship between Park and Bailey's Section and the drill holes in the Hayes Tungsten Prospect. The aplitic (greisenised) granite in all drill holes (GS C1 - GS C4) will be assayed for Sn, WO_3 , MO_3 , Bi, Cu, Pb and Zn.

As recommended by Ransom, back hoe trenching and channel sampling will be conducted on Park and Bailey's Section.

Contingent on favourable assay results from both the core sampling and trenching the area will be further evaluated by drilling.

FINANCE

In the six months ending 6th October, 1979, the following expenditures were incurred:

Salaries and Wages	\$ 3,432.00
Contract geology	5,409.00
Accommodation and travel	506.00
Material	175.00
Vehicles	156.00
Communications	151.00
Tenure	16.00
Sundries	31.00
	<hr/>
	\$ 9,876.00
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ENDORSED: *C. H. Young*
 C.H. Young,
 Project Geologist, Tasmania.

ENDORSED: *K.R. Yates*
 K.R. Yates,
 Manager - Outside Exploration.

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to K. Yates.

Signed: *D.M. Ransom*
D.M. Ransom
Consultant Geologist

BEN LOMOND
NATIONAL PARK

E.L. 28/78

Stores Creek Mine (W)
Stores Creek
Aberfoyle Mine (Sn,W)
Rossarden

Mangana

Fingal

Avoca

Ormiey

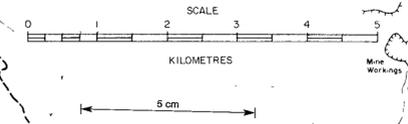
ST Pauls Dome

LEGEND

QUATERNARY	Q1	Dolerite talus
	Qra	Alluvium
TERTIARY	Tg	Gravels
TRIASSIC	Tr	Sandstone + shales Coals in upper part
	Pp	Prospect Creek Mudstone
	Pm	Mistletoe Sandstone
PERMIAN	Pb	Burnt Gully Limestone
	Pc	Castle Carey Mudstone
	Pa	Aberfoyle Formation - grits, conglomerates, pebbly mudstones.
SILURIAN	Sm	Mothina Group - quartzites, siltstones, slates & tuffs
JURASSIC	Jd1	Dolerite
DEVONIAN	Dg	Ben Lomond Granite - granite & microgranites

	Geological boundary
	Fault
	Dip of veins
	Dip of cleavage
	Dip of bedding
	Apite dyke

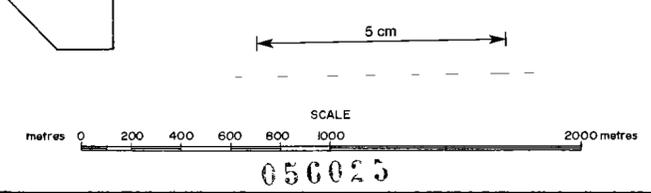
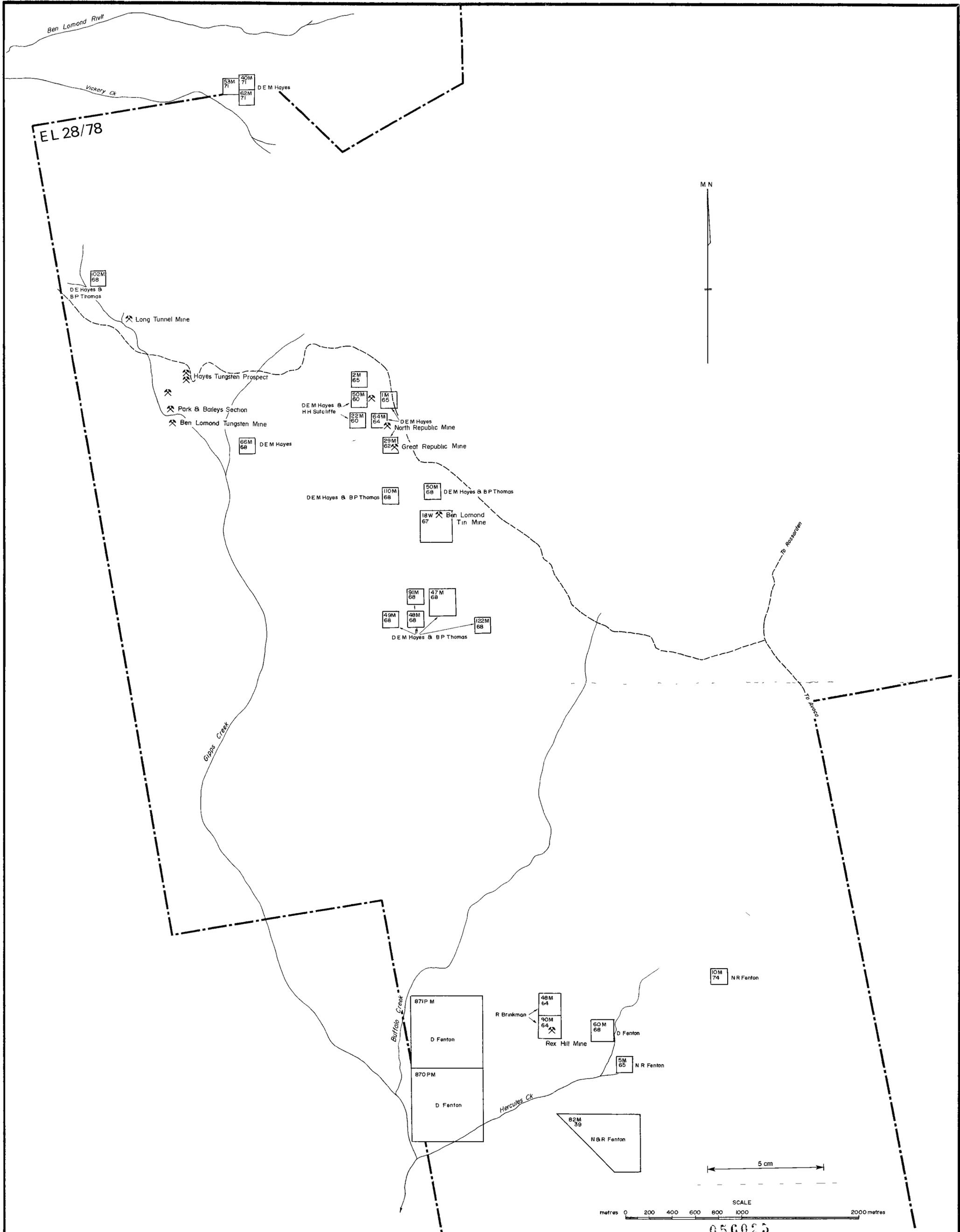
	Quartz/chalcedony
	Chert
	Tourmaline
	Green
	Sheeted



056024 **Aberfoyle Exploration**

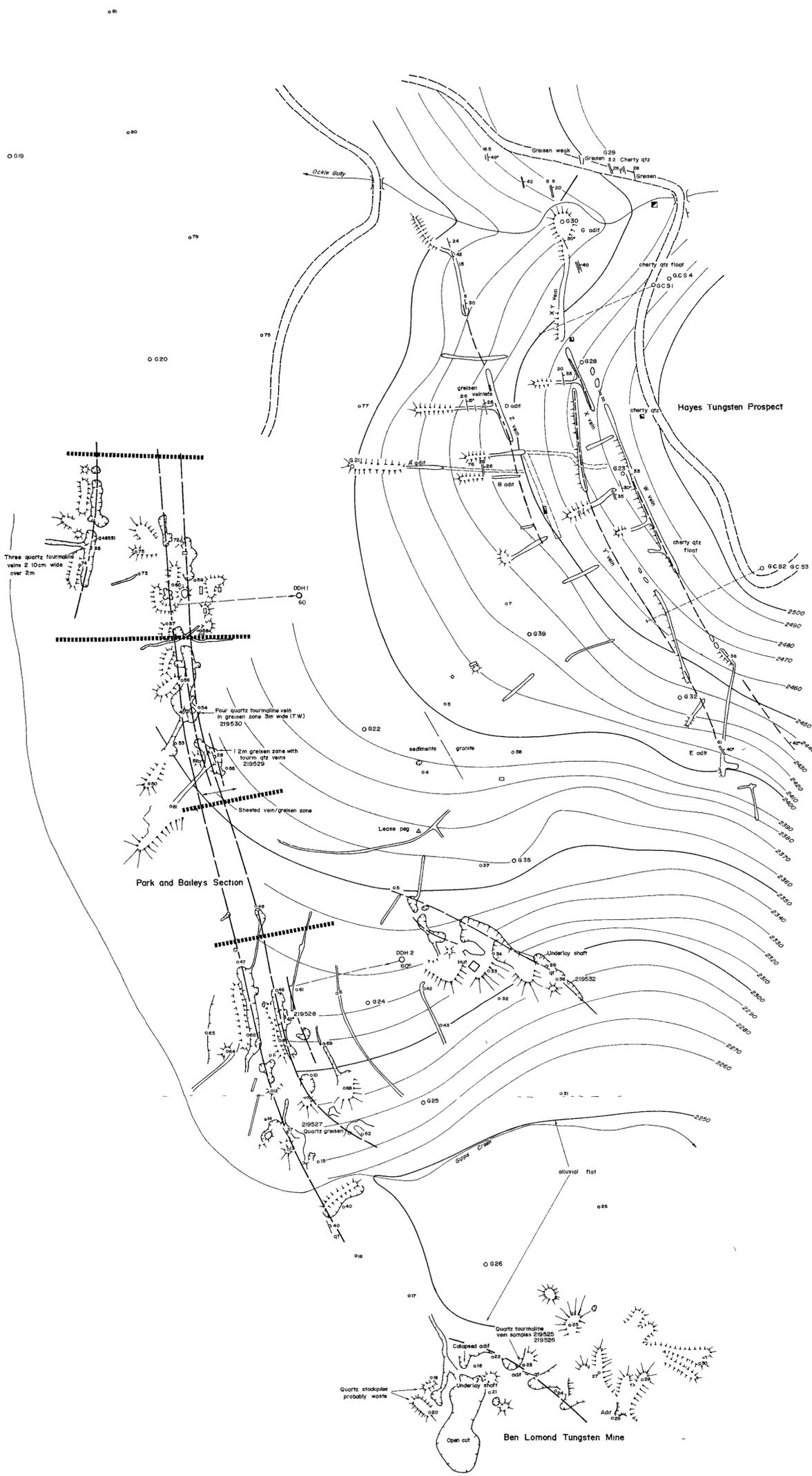
Geology	NORTH EAST TASMANIA	Location code
Drawn	ROSSARDEN E.L.28/78	Date July, 1979
Traced	R J E, JJB	Scale 1:50,000
Checked		Plate No
Revised by		ROSS 1

After BLISSETT & GULLINE (1959) 2828



Aberfoyle Exploration Pty Ltd		
Geology	NORTH EAST TASMANIA ROSSARDEN EL 28/78 2829 GIPPS CREEK AREA - TENURE	Location code
Drawn		Date August 1979
Traced R K Y		Scale 1:20,000
Checked		Plate No
Revised by Date		ROSS 2

80-1470



- Track
 - Creek
 - Trench
 - Diggings
 - Dump
 - Shaft
 - Survey station (CEL 1968)
 - Width of quartz veins and angle of dip
 - Contour line 10 feet intervals
 - Drill holes
 - Survey points (DMR 1979)
 - Dip of quartz vein
 - Interpreted extent of quartz veins/greisen envelopes
 - Granite coarse grained occasionally porphyritic widespread alteration to sericite/chlorite rare sediment inclusions
- Mapping by C E Layden (plane table) 1968 and D M Ransom (chain and compass) 1979
- Proposed back hoe trenches
 - Proposed diamond drill holes

PROPOSED DIAMOND DRILLING

Hole N	Dip	Azimuth	Declination	Total Depth
1	-50°	266	60	100m
2	60°	257	60	100m

GEOCHEMISTRY Channel samples (p.p.m.)

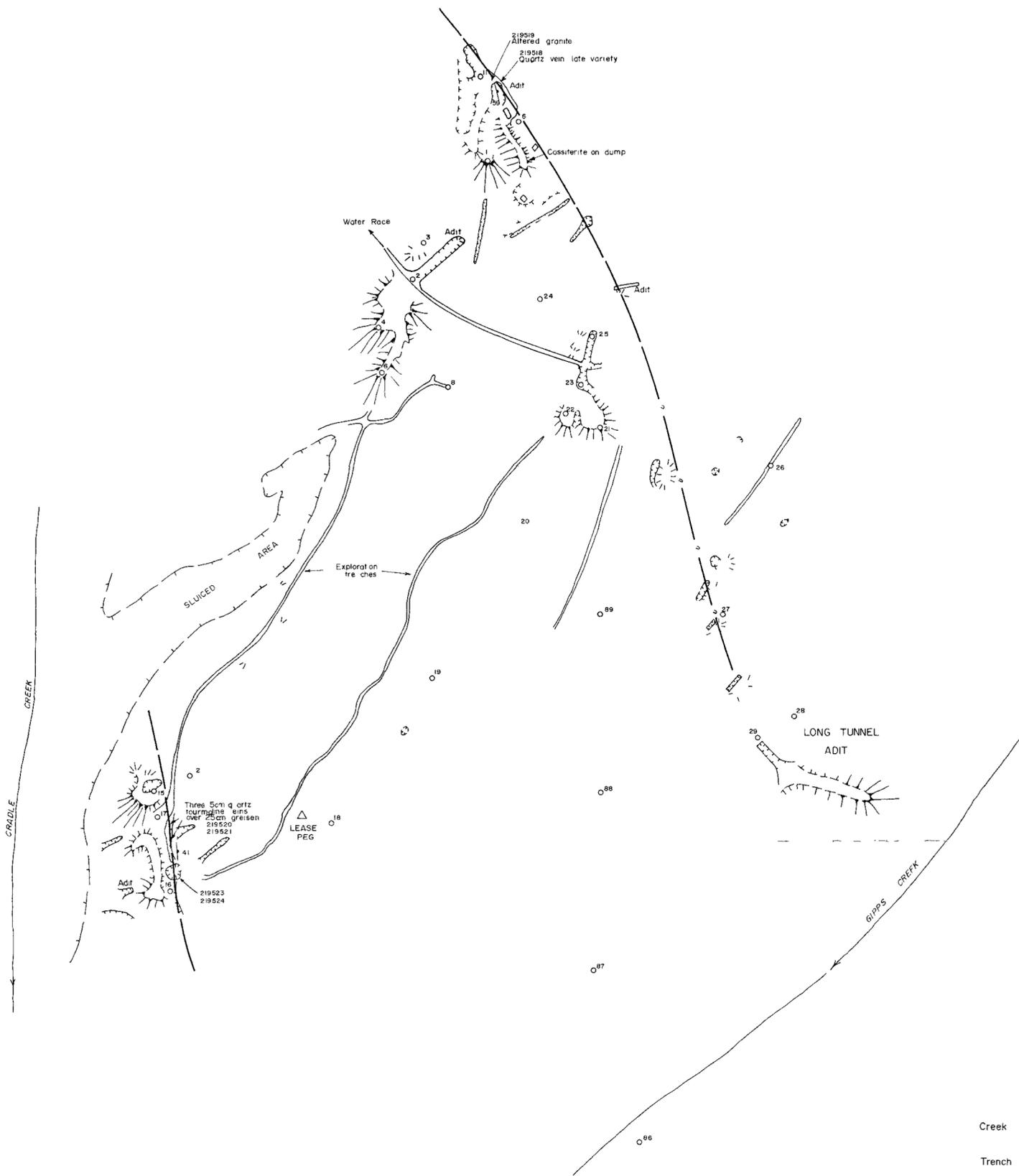
Sample N°	Interval (cm)	Sn	W	Cu	Pb	Zn	Bi	Mo
219525	15	240	46	95	20	30	18	<4
219526	80	185	65	125	25	30	10	<4
219527	40	380	110	80	25	45	3150	28
219528	60	560	340	15	20	20	44	<4
219529	120	1100	175	40	35	30	24	<4
219530	300	1300	110	45	25	40	36	<4
219531	50	145	145	15	15	35	22	<4
219532	50	240	175	60	25	25	200	20



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Aberfoyle Exploration

Geology C.E.L. DMR	NORTH EAST TASMANIA ROSSARDEN E.L. 28/78 2830 GEOLOGY, WORKINGS HAYES TUNGSTEN PROSPECT AREA	Location code
Drawn DMR		Date August 1979
Traced RKY		Scale 1:1000
Checked		Plate N° ROSS 3
Revised by Date		

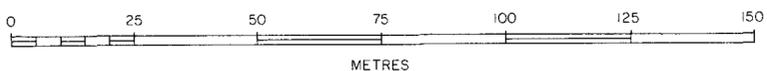


- Creek
- Trench
- Diggings
- Dump
- Survey points
- Dip of quartz vein
- Interpreted extent of quartzveins/
greisen envelopes
- Granite coarse grained occasionally porphyritic
widespread alteration to sericite / chlorite

GEOCHEMISTRY Channel samples (ppm)

Sample N	Interval (cm)	Sn	W	Cu	Pb	Zn	Bi	Mo
219518	30	10	<10	65	30	30	<4	6
219519	55	24	20	30	20	40	<4	<4
219520	25	220	30	105	25	35	32	<4
219521	30	410	40	120	20	45	16	4
219523	150	14	10	20	40	20	4	23
219524	80	190	45	75	20	40	26	<4

Mapping by chain & compass traverse



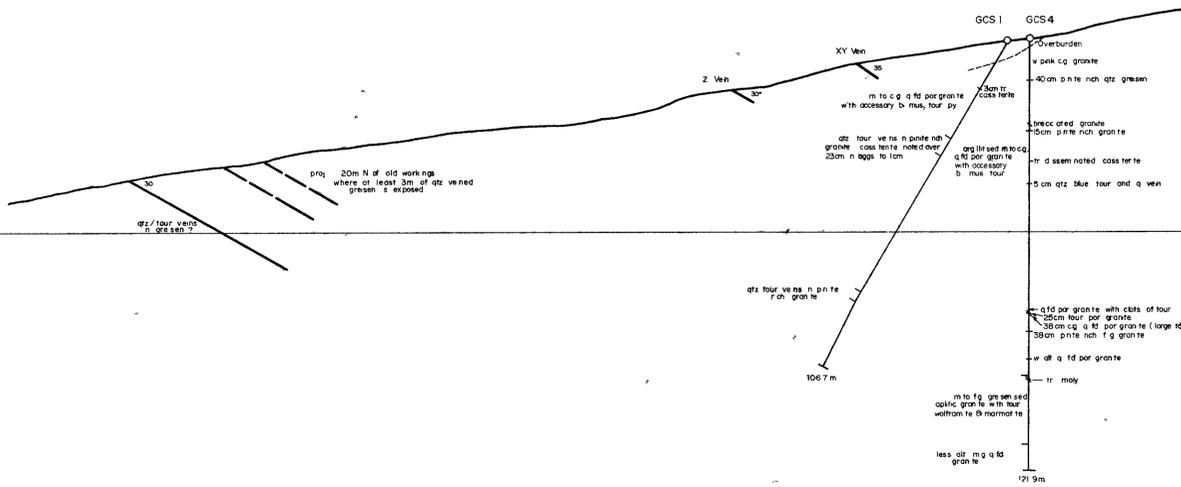
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Aberfoyle Exploration Pty Ltd		NORTH EAST TASMANIA ROSSARDEN E L 28/78	2831	Location code
Geology	DMR	GEOLOGY, WORKINGS LONG TUNNEL AREA		Date
Drawn	DMR			AUGUST 1979
Traced	JJB			Scale
Checked				1:1000
Revised by	Date	MAPPING BY D M RANSOM (Chain and Compass)		Plate N ^o
				ROSS 4

80-1470

SW

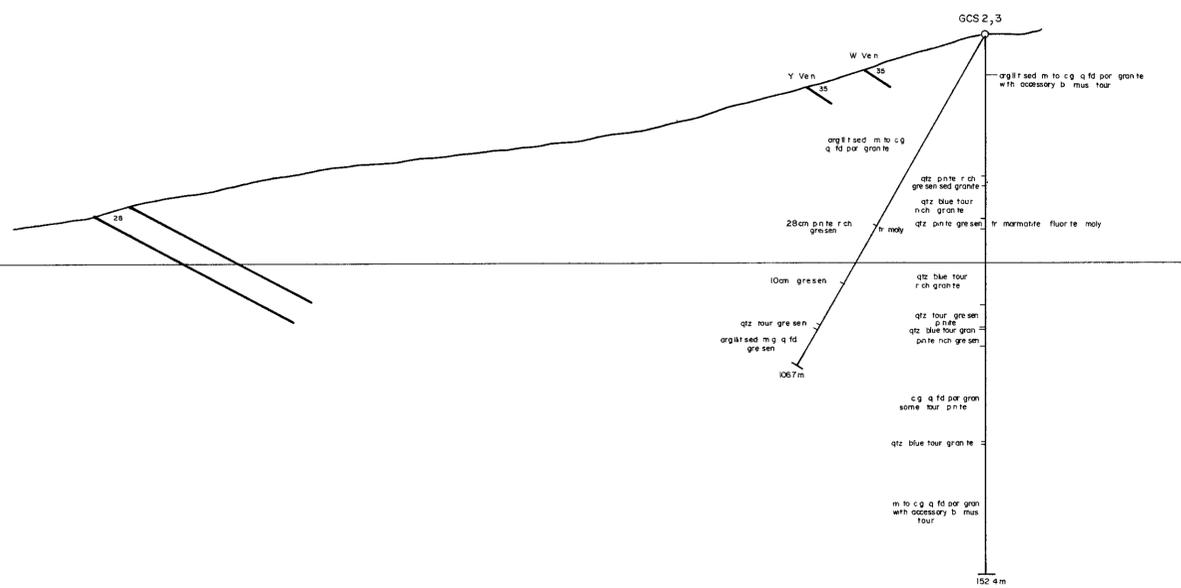
NE



700 m

SW

NE



700 m

056028



Aberfoyle Exploration Pty Ltd		
Geology	C H Y	NORTH EAST TASMANIA 2832
Drawn	R J E	ROSSARDEN EL 28/78
Traced	R J E	GIPPS CREEK AREA
Checked		SECTIONS LOOKING NW
Revised by	Date	
Location code	2832	
Date	October, 1979	
Scale	1:1000	
Plate No	Ross 6	

80-1470