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GOLD FIELDS EXPLORATION PTY. LIMITED

417001

E.L. 9/66

TYNDALL AREA

AREA RETENTION AND WORK PROGRAM PROPOSALS FOR 1984/85

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SUMMARY

E.L. 9/66 is due to be reduced from 446 sq. km. to 125 sq. km on August 5th, 1984. Ten prospect areas have been selected for retention on the basis of their prospectivity for massive base metal-gold, moderate to high grade copper-gold and volcanic-hosted gold-only mineralization.

The retained areas are located in four separate blocks: 10 sq. km. at Selina, 16 sq. km. east and south of Mt. Read, 80 sq. km. north and south of Mt. Lyell and 19 sq. km. in the Garfield/Currie Valleys. The Buffer Zone around the Mt. Lyell Consolidated Mine Lease is now under application as mining leases and is therefore excluded from the proposed E.L.

Three years now remain before the E.L. must be relinquished. Exploration during the next two years must include reconnaissance drilling on all the prospects that justify it. The third year can then be reserved for detailed drilling to follow up mineralized intersections obtained in the previous two years.

Work proposed for 1984/85 comprises:

(1) Geologic mapping and 250m of diamond drilling at Read East.
(2) Data compilation and 700m of diamond drilling at White Spur.
(3) Geologic mapping and a small ground EM survey at Selina/Rolleston.
(4) Data compilation, limited mapping and 300m of diamond drilling at Basin Lake.
(5) Data compilation, mapping and sampling at West Sedgwick.
(6) Limited mapping and 250m of helicopter-supported diamond drilling at Beatrice.
(7) Dipole-dipole I.P. survey at North Huxley.
(8) Mapping and detailed sampling at South Huxley.
(9) 300m of helicopter-supported diamond drilling at Jukes Proprietary.

(10) Mapping and detailed sampling in the Garfield/Currie divide and upstream of the Flannigans Flat alluvial gold workings.

(11) Limited gridding, mapping, bedrock geochemistry and ground EM in the vicinity of the Snake Spur costean.

This program is expected to cost $389,100.

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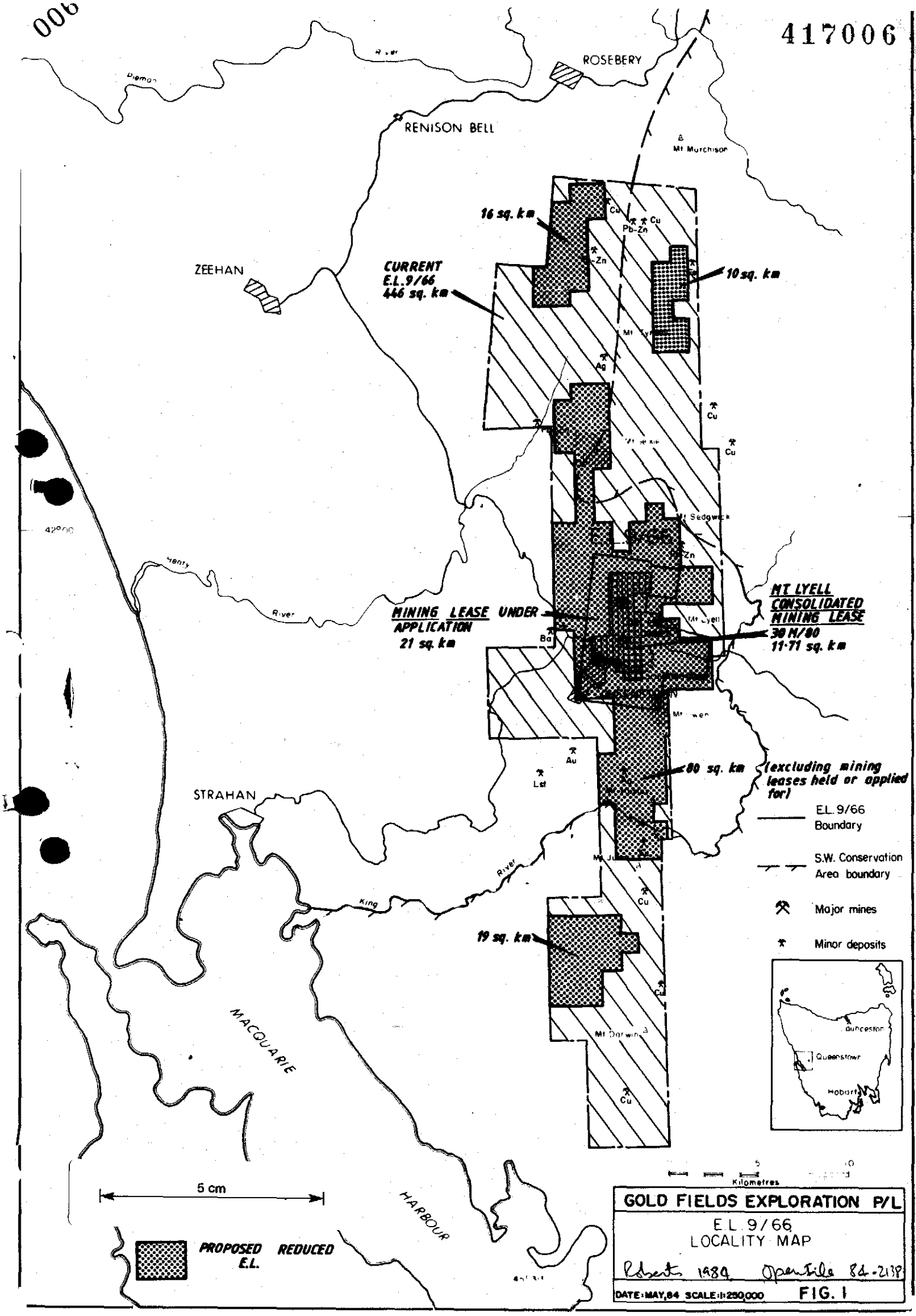
ROSEBERY
RENISON BELL
Mt Murchison
ZEEHAN
16 sq. km
CURRENT
E.L.9/66
446 sq. km
10 sq. km
Mt Lyell
Mt Sedgwick
Henty
River
MINING LEASE UNDER
APPLICATION
21 sq. km
MT LYELL
CONSOLIDATED
MINING LEASE
30 M/80
11·71 sq. km
80 sq. km
(excluding mining
leases held or applied
for)
STRAHAN
King
River
19 sq. km
MACQUARIE
HARBOUR
E.L. 9/66
Boundary
S.W. Conservation
Area boundary
Major mines
Minor deposits
Launceston
Queenstown
Hobart
5 cm
PROPOSED REDUCED
E.L.
Kilometres
GOLD FIELDS EXPLORATION P/L
E.L. 9/66
LOCALITY MAP
Roberts 1989 Open file 84-2138
DATE: MAY, 84 SCALE: 1:250,000
FIG. 1

1. INTRODUCTION

This report accompanies the 1983/84 Annual Report for E.L. 9/66, and should be read in conjunction with the latter. The two reports have been issued separately so that the Annual Report, which contains less sensitive information, can be placed on open file along with all other previous reports once E.L. 9/66 is reduced to 125 sq. km.

This report describes the conclusions obtained from the 1983/84 program, assesses the relative merits of all of the prospect areas on the E.L. and recommends:

(1) Which areas should be retained within the 125 sq. km. reduced E.L.

(2) How the E.L. should be explored during the next two years.

Areas are discussed below in order of geographical position, from north to south.

2. REVIEW OF PROSPECT AREAS

2.1 Read East

The recent work undertaken by Getty in 1983/84, together with the extensive, earlier work by Mt. Lyell, has indicated the following:

(1) There is potential here for a volcanogenic, massive sulfide deposit concealed beneath the glacials west of Howard's Road. The sericitized, pyritic schist east of the EM anomaly (and glacials) may represent footwall-

style alteration. The outcrop of chloritic pyritic schist west of the alteration may represent "host horizon" alteration. The EM anomaly is unlikely to reflect a sulfide orebody, however it may represent black shales associated with lead-zinc mineralization. Although base and precious metal contents of soils and rocks east of the EM anomaly are low, there is a suggestion of improving base metal values in soils on the eastern and southern fringes of the glacial cover.

(2) The area has been covered by a number of geophysical surveys. Although the techniques used were not ideal as ore search tools, there is sufficient information on which to base the siting of drillholes.

(3) The prospect has not been tested by drilling, and, given its encouraging geologic features, should be. The area should therefore be retained.

2.2 Henty Fault Zone

HFZ12 was primarily targetted at the gold-bearing, pyritic, cherty sediment encountered in HFZ10. Although it intersected a lithology which could probably be correlated with the HFZ10 intersection, the gold grade was very low. In addition, a very thin, massive sulfide intersection was obtained. HFZ12 therefore demonstrated that neither the massive sulfide nor the gold zone improve in thickness or grade towards the south.

Examination of the logs of the northern two holes, HFZ5 and HFZ11 (neither of which intersected the massive sulfide) suggests that:

(1) The massive sulfide terminates against the fault just south of HFZ5, and

(2) The gold zone terminates against the fault between HFZ5 and HFZ11.

Clearly then, any remaining tonnage potential exists largely at depth beneath and to the south of HFZ5.

At this stage, the persistently thin widths of both the massive sulfide and gold zones are a deterrent to further exploration. However we do not fully understand the origin of this mineralization, which is certainly significant albeit subeconomic. Should further exploration on the E.L. highlight the attractiveness of pyritic cherty sediments as gold targets or should new ideas on the origin of this mineralization indicate some unrecognized potential, further drilling may well be justified. This area should therefore be retained.

2.3 White Spur

The geological mapping and sampling by Getty, together with the earlier Mt. Lyell exploration effort on this area has indicated the following:

(1) The Eastern White Spur area has definite potential for a concealed, volcanogenic massive sulfide deposit. The geologic similarities of this prospect with Rosebery, albeit on

a smaller scale, are quite striking. Encouraging features of the prospect include:

(a) Within E.L. 9/66, there are several kilometres of strike length of altered tuffaceous sediments which are probably correlatable with the Rosebery host horizon. Rock chip and soil geochemical results from these rocks indicate patchy base metal values over the northern kilometre of strike length. The patchiness of base metal values in soil samples may reflect the presence of thin glacial cover over much of this area.

(b) The possible host horizon is marked by a significant I.P. anomaly over 800m of the strike length.

(c) West of the possible host horizon, and north of Howards Road, the (?)footwall rocks are intensely leached, altered and foliated. Beneath the weathered zone, they may be pyritic. They bear a strong resemblance to rocks from the footwall zone exposed in the Rosebery open cut.

Eastern White Spur has only been tested by one drillhole. Given that the alteration extends over at least a kilometre of strike length, more drilling is justified. The area should therefore be retained.

(2) Getty's work has confirmed the Review Team's view of the Central and Western White Spur areas. The Central White Spur rocks are

weakly altered lavas and pyroclastics, and do not appear prospective. The Western White Spur rocks are dominantly sedimentary and appear to reflect open marine conditions unsuitable for the formation of a volcanogenic massive sulfide. These areas should therefore be relinquished.

2.4 Red Hills

More drilling has been carried out at Red Hills than on any other single prospect on the E.L. Only one, moderate mineralized intersection has been obtained, the 2.8m of massive sulfide intersected in RH5. Despite extensive efforts it has not been possible to duplicate or better this result.

The following comments are relevant:

(1) Although there are abundant traces of base metal sulfides within the basin rocks, alteration is relatively weak. It is possible that the mineralizing event(s) largely coincided with active volcanism and, as a result, the base metal sulfides precipitating on the sea floor were flooded by volcanic detritus. Although the presence of base metal sulfides had to be regarded as encouraging in the early stages of exploration, this idea may well explain why no significant massive sulfide has been found.

(2) RH16's failure to obtain a significant gold grade strongly suggests that the gold mineralization within the basin rocks tends to be too low in grade and too impersistent along strike

to be an attractive target for further exploration. There seems to be a number of low grade gold zones (0.5-3.5 g/t Au) within the basin rocks, but, without the presence of an accompanying massive sulfide, they are unlikely to attain a high enough grade to permit economic underground exploitation.

(3) The available geophysical evidence suggests that the Red Hills basin persists, in much weaker form, to the north of the drilled area. To the south, geological mapping in the vicinity of RH17 indicated that some basin rocks may extend under the Owen Conglomerate, however it seems likely that these rocks do not include the Red Hills host horizon.

(4) As at the Henty Fault Zone prospect, the nature and origin of the (low base metal) gold mineralization is not well understood. This is a possible reason for retaining the area, however the Henty Fault Zone prospect rates more highly than Red Hills because:

(a) Red Hills has been more extensively drill tested, and

(b) The only reason for retaining either prospect is the possibility of a change of ideas on their tonnage and grade potential. Much more ground has to be "sterilized" at Red Hills to achieve this aim than at Henty Fault Zone. All but two sq. km. of the latter area has to be retained anyway because it links Read East with White Spur.

In summary, although some potential remains untested on this prospect, it must rate fairly low on the list of priorities compared to other prospects on the E.L., which are clearly under-drilled by comparison with Red Hills. This area should therefore be relinquished.

2.5 Selina (Figure 2)

The drilling results at Selina were disappointing. The faulted Owen Conglomerate/Selina volcanics contact in LS9 and the intersection of granite in LS12 both emphasised the possibility that the Selina mineralized system is a structurally controlled, essentially barren pyrite system formed by the action of a circulating cell of hydrothermal fluids over a granitic heat source.

Twelve drillholes have now been completed at Selina without obtaining one significant, base metal-mineralized intersection. Clearly this must downgrade the prospectivity of this area by comparison with other, less drilled prospects on the E.L. Nevertheless, Selina does have some positive features:

(1) It is a large area of intense alteration. The pyrite mineralization is not well understood, and there is still time to develop new ideas which might focus interest on as yet unrecognized drilling targets.

(2) Low energy, possible basinal rocks have been identified in both the Eastern and Western Pyrite Zones. The southernmost hole in the Eastern Pyrite Zone, LS10, intersected chloritic, pyritic tuffs and shales. South of LS10,

the Eastern Pyrite Zone terminates abruptly at the margin of the Selina Anomaly Zone, a large area of elevated base metal-silver values in soils and rock chips, but poor I.P. response. This area may possibly contain a massive sulfide at depth, however the geological relationships are not well understood.

(3) The Western Pyrite Zone is characterized by relatively low levels of lead and zinc (around 100 and 300 ppm, respectively), but somewhat higher levels of copper (perhaps 500 ppm plus). It is possible that the Selina prospect is part of a copper-pyrite system akin to Mt. Lyell.

Two significant exploration possibilities are present in the Selina area:

(1) Massive base metal sulfides in the vicinity of the Selina Anomaly Zone.

(2) North Lyell-style, high grade copper-silver (-?gold) mineralization in the Rolleston area, between the southernmost Selina hole, LS3, and Lake Rolleston. This area is apparently covered by thick glacials; C.G.G. carried out resistivity soundings in this area in 1970-71 which suggested that the glacials are 50-100m thick. Such a thickness would probably have masked any mineralization from the I.P. technique used. Favourable features of the Rolleston area include:

(a) A general increase in copper values in the Western Pyrite Zone towards

the South (high copper values are generally associated with elevated silver values at Selina).

(b) The presence of a significant lineament/fault intersection between the major north-trending fault which marks the eastern margin of the Owen Conglomerate and a strong north-west trending fault/lineament which passes through the northern end of Lake Rolleston and between Lakes Selina and Westwood. By way of comparison the Lyell area is also characterized by the intersection of a number of major faults.

Part of the Selina area should be retained to permit investigation of the above two exploration targets.

2.6 West Tyndall

Getty's work in the Halls Rivulet area was primarily aimed at the tin potential of the Cambrian sediments outcropping between the two arms of the Henty Fault South of the Henty Fault Zone prospect.

Unfortunately Getty's program failed to obtain any real geologic or geochemical encouragement. Given the Review Team's negative assessment of this area in 1983, it is not regarded favourably and should be relinquished.

2.7 Henty River

This prospect lies on the west side of the Henty Fault in a sequence of volcanics and sediments,

which may be part of the Cambrian Dundas Group.

The prospect is located in the vicinity of several small adits in the Henty River Valley. Mineralization comprises galena and sphalerite in disseminations and veinlets within andesitic tuffs and agglomerates. Although traces of mineralization were obtained in all five of the drillholes, only one encountered a significant intersection. This was HR2, drilled in the immediate vicinity of the workings, and which included 12m (downhole) of 4.2% Pb, 1.8% Zn and 16 g/t Ag. Where assayed for, gold values were below the detection limit. Clearly there is no sign of economic mineralization in these drillholes; it is difficult to imagine a massive sulfide deposit developed in this geologic environment. The area should be relinquished.

2.8 Howards Anomaly (Figure 3)

The two holes completed at Howards in 1983/84 failed to intersect any encouraging mineralization. Nine holes have now been drilled in this area beneath geochemical and geophysical anomalies and none have obtained a significant mineralized intersection.

The prospective zones at Howards comprise a "sulfide zone" and a "silver zone". The silver zone lies east of and adjacent to the sulfide zone. Both strike north-south and extend from the Tyndall Mine in the north for at least 8 km into the Basin Lake area.

The sulfide zone is 200-400m wide and comprises tuffaceous sediments. These are predominantly

andesitic and are interpreted as being largely marine. The five holes completed to date in this zone have apparently tested the best geophysical and geochemical anomalies with very poor results.

The silver zone is 100-200m wide. It comprises erratic silver mineralization hosted by hematitic, chloritized, tuffaceous sediments and ignimbrites. The controls on the formation of this mineralization are not well understood, however the zone appears to have been effectively explored in the Howards area. Much of this section of E.L. 9/66 is covered with glacials which reduce the effectiveness of soil geochemistry drastically, however geochemistry worked well over the silver zone and apparently effectively outlined the best drilling targets. Unfortunately the results of the four holes drilled were poor with silver values over correlatable intervals averaging below 10 g/t Ag. Clearly such grades are uneconomic.

Although there are some geophysical anomalies in the sulfide zone which remain untested, Howards does not rate highly in comparison with other prospects on the E.L. No real encouragement has been obtained in either the sulfide or silver zones. An additional consideration in this area is the HEC's planned Lower Newton Dam which will flood most of the sulfide and silver zones. For all of these reasons, it is recommended that the Howards area should be relinquished,

2.9 Basin Lake (Figure 3)

The geologic setting of Basin Lake is similar to Howards with similar lithologies persisting through the area. In exploration terms, however, the areas differ in that:

(1) Less drilling has been carried out, seven holes, over a larger area, 5 km of strike length (cf. Howards, nine holes and 3 km).

(2) Geochemical exploration has been impeded by considerably more glacial cover than in the Howards area.

(3) A number of possible drilling targets remain untested within the area:

(a) Follow-up of BL4 massive bedded pyrite intersection. This was 3.3m thick (downhole) and included 1.7m of low base metals, 62 g/t Ag and a trace of Au. It may represent the edge of a volcanogenic massive sulfide. Massive pyrite is known to form a barren fringe to base metal-gold massive sulfide mineralization elsewhere in the Mt. Read Volcanics. In addition the hole intersected favourable epiclastic rocks hosting the mineralization.

(b) Bradshaws Road and Leech Hill pyrite zones. These are both areas of strong pyritic alteration which may represent footwall alteration to massive sulfide mineralization. Neither have been effectively tested by drilling, although a Mines Department stratigraphic hole currently in progress at Leech Hill will test that zone to some extent. The Bradshaws Road zone includes favourable fine grained lithologies which may host a massive sulfide.

(c) Southern end of Basin Lake sulfide zone. This lies under relatively thick glacials.

There appears to be a general increase in base metal values within the sulfide zone towards the south which suggests that the completed drillholes may all have been drilled at the northern fringes of a massive sulfide system which is centred underneath the glacials.

Given the above reasons, the Basin Lake area in the vicinity of the above drill targets requires further exploration and should be retained.

2.10 West Sedgwick (Figure 4)

The West Sedgwick area is difficult to assess. It appears that the geology is fairly complex and made more difficult to understand by the presence of widespread glacials, particularly under the volcanics' eastern contact with the Owen Conglomerate. Nevertheless, the area is characterized by several favourable features.

(1) In the eastern West Sedgwick area, there are significant zones of strongly altered, pyritic fine grained volcaniclastics, which could represent host horizon or footwall alteration to a massive sulfide deposit.

(2) In the western part of the area, there are a number of small alluvial and hard rock gold "shows". Although these are not intrinsically prospective, they may represent gold remobilized from economically significant mineralization containing very fine grained gold and hosted by acid intrusives, volcaniclastics or cherty tuffaceous sediments. This kind of target has not been pursued seriously on the E.L.

to date, however the Henty Fault Zone and Red Hills experiences certainly suggest that there is some potential here which should be investigated.

In summary, the West Sedgwick area requires further exploration and should be retained.

2.11 Mt. Sedgwick Aeromagnetic Anomaly (Figure 5)

This large, elliptical shaped anomaly lies north-east of Mt. Sedgwick and sits over the Owen Conglomerate. The most likely explanation for it is a large buried magnetite-bearing rhyolite dome. Geophysical modelling suggests that if this is the source of the anomaly, its top would be between 250 and 800m below the surface. Although copper-gold and volcanogenic massive sulfide mineralization may be associated with such a dome, it must be regarded as a low priority target because:

(1) The economic value of such mineralization at such depths is questionable. It would have to be both large and high in grade to justify exploitation. There is no indication to date of such grades and tonnages in the vicinity of other rhyolite domes within the Mt. Read Volcanics.

(2) Evaluation of such a target would be expensive and could not be undertaken without reducing or abandoning proposed work on other, more accessible prospects on the E.L.

For these reasons, exploration of this anomaly cannot be recommended, and the area should be relinquished.

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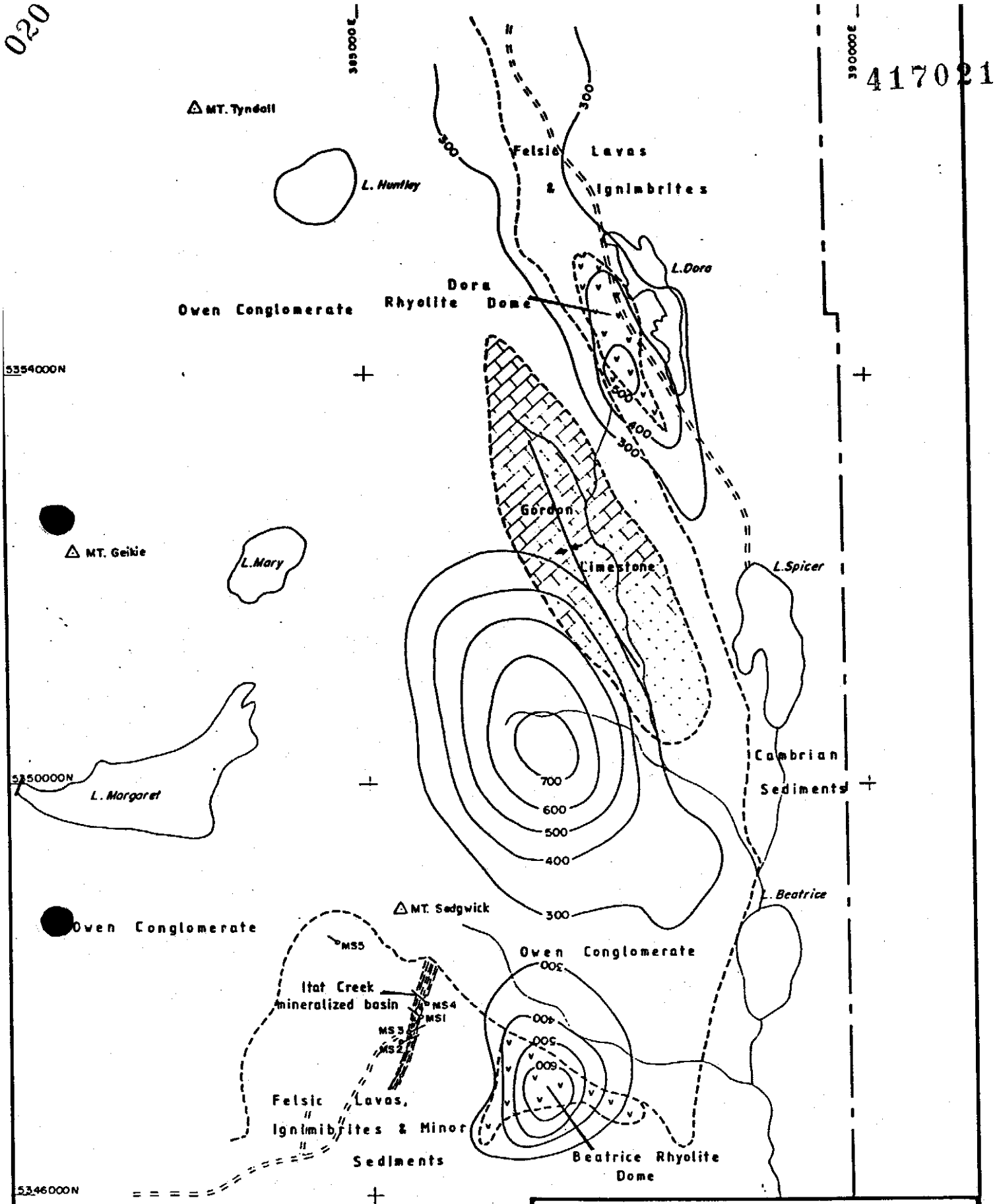


GOLD FIELDS EXPLORATION PTY. LIMITED

THE SEDGWICK

AEROMAGNETIC ANOMALY

magnetic contours n Tesla

SCALE 1:50000 800 0 800 1000 Metres

DRAWN BY : F.G.F.

DRAFTSMAN: S.J.F.

DATE : June,83

REVISIONS :

FILE NO.

FIG. 5

2.12 Beatrice (Figure 6)

The main focus of interest on this prospect has been the Itat Creek area, where lead and zinc sulfides are disseminated through a sequence of ignimbrites, ashes and shales. Four drillholes have tested this zone near the floor of Itat Creek and have revealed patchy but low grade (generally less than 1% Pb + Zn) values in this unit. Itat Creek itself coincides with a north-east trending structure known as the Itat Creek Shear which is localized within a black shale unit in the vicinity of the drillholes.

There has been some debate (e.g. Review Team's report) about the nature of the Sedgwick Porphyry, a body of rhyolitic quartz-feldspar-biotite porphyry which outcrops west of Itat Creek. If the Porphyry is intrusive, then much of the area's potential for base metal mineralization has already been tested as the porphyry was intersected at depth in the drillholes. If, however, it is extrusive - which seems more likely - there is considerable potential for massive sulfide mineralization. Evidence for the extrusive origin of the Sedgwick Porphyry includes:

(1) An intersection of black shale, underneath the Porphyry, in MS5 well to the west of Itat Creek (Figure 6). MS5 was targetted at an I.P. anomaly which extends from west of MS5 to Itat Creek. As the black shale was apparently the cause of the I.P. anomaly at MS5 it probably underlies the Porphyry throughout that area. As the Beatrice host horizon underlies the black shale at Itat Creek, it also probably underlies the Porphyry.

(2) Observed contacts in drillholes between the Porphyry and other lithologies show no evidence of hornfelsing.

Assuming that the Sedgwick Porphyry is extrusive, the host horizon could extend west from Itat Creek for at least 800m (Figure 6). Although the alteration at Itat Creek is relatively weak, the presence of widespread base metals and the large area of untested potential at Beatrice give considerable hope that a concealed massive sulfide could be present. This area should therefore be retained.

2.13 Huxley

Huxley can be divided into northern and southern sections. North Huxley has been partially covered by gridding, detailed geologic mapping and bedrock sampling. South Huxley is less explored, having been covered only by stream sediment sampling and reconnaissance mapping. Neither area has been tested by diamond drilling.

Evaluation of the North Huxley area has been hampered by unusually complex geology and the presence of widespread glacials. Tuffs and possible basin rocks are widely distributed within the gridded area, and are commonly chloritized and pyritic. Two prospective areas have been identified:

(1) Nasty Knob area. Lead-zinc bearing gossans hosted by altered fine grained pyroclastics outcrop east of Nasty Knob. These gossans carry up to 5% Pb +Zn and 31 g/t Ag. Although the primary mineralization could be volcanogenic, it may be related to the Owen Fault, against which it lies. Much of this fault contact

is concealed by glacials, however the available information suggests that similar lead-zinc mineralization could be present for 1.5 km along the fault. This potential cannot be assessed without the use of electrical geophysics.

(2) Island Ridge area. This section includes outcrops of altered sediments and pyroclastics carrying pyrite and low levels of base metal sulfides.

The North Huxley area is highly prospective for volcanogenic massive sulfide mineralization, however it is difficult to identify drilling targets on the basis of the current data.

The western part of South Huxley is prospective for gold mineralization. A number of anomalous gold values have been obtained in stream sediment samples from this area and there are several small workings. As with West Sedgwick, although the indications are quite limited, it is possible that an economically important, volcanic/sedimentary-hosted fine grained gold deposit could be present here. This possibility is definitely worth pursuing.

The eastern part of South Huxley includes the southern extensions of the North Huxley sequence. In general, the rocks here are less altered. Several unexplained lead anomalies have been identified in creeks draining the eastern slopes of Mt. Huxley. These are worth following up.

In summary, there is considerable potential for base metal-gold massive sulfide and gold-only mineralization in the Huxley area which is worthy

of further exploration. The area should therefore be retained.

2.14 Jukes Proprietary

The result of the latest drilling at Jukes is somewhat encouraging. Although copper and gold grades were subeconomic, the JP3 intersection indicated that a fairly large mineralized system was at work in this area. The chloritized zone persists for at least 300m along strike and 150m down dip with no diminution in width and patchy copper mineralization throughout. An orebody could be present in this area with one of three possible configurations:

(1) Extending both to the south and at depth. This assumes that the JP3 intersection was unrepresentative of the mineralized zone.

(2) In a horizontal "band" extending southwards from the workings and fitting above the JP3 intersection.

(3) In a steeply dipping body, plunging either to the south or vertically down from the JP3 intersection.

Of the above, the third possibility is preferred. If correct, it suggests that the mineralization is structurally controlled. It is possible that the copper-gold zone may widen (on the longitudinal projection) with depth; the strength and width of the alteration in JP3 is much greater than on the surface directly above that intersection. Thus, the most optimistic view of the Jukes mineralization is that it is the top of a large copper-

gold body which thickens and widens with depth. Such a body would be readily accessible by adits/declines as the top of the mineralization is 400m. above the nearby plain level.

In summary, significant ore potential remains at Jukes Proprietary, which can only be resolved by further drilling. The area should be retained.

2.15 Garfield

Three prospective areas were identified by this season's work:

(1) The pyritic schist zone in the Garfield/Currie divide.

(2) The Snake Spur costean and associated alteration along strike from it near the Owen-volcanics contact.

(3) The Flannigans Flat gold area.

The pyritic schist zone compares favourably in terms of size and intensity with other such zones in the Mt. Read Volcanics. Unfortunately the general level of base metals within it are low. This cannot be explained away by lack of exposure - the alteration occurs on the slopes of a ridge, the soils are apparently residual (R. Poltock, pers. comm.) and there are virtually no glacials. In addition, there is little evidence of intense leaching removing base metals from surface outcrops.

Only one working has been reported from the pyritic schist, a gold prospect described by T.B. Moore. This may have been an isolated occurrence as all

of the stream samples assayed for gold were below the detection limit, and the creeks show no sign of having been worked for coarse gold. Three possibilities remain:

(1) That this is a footwall alteration zone around massive sulfide mineralization, which is atypical in that base metal levels are depleted, compared with the other known zones (e.g. Rosebery, Que River) in the Mt. Read Volcanics.

(2) That the stream sediment sampling (which was incomplete), missed the gold zones, perhaps because active sediment was collected rather than trap site material.

(3) That the rock chip sampling of the zone was unrepresentative.

The Snake Spur costean area is poorly known because of the thickness of the vegetation and the presence of glacials on and adjacent to the Owen Conglomerate. This copper-gold mineralization could represent either Jukes Proprietary-style mineralization or footwall copper mineralization associated with a volcanogenic massive sulfide. Either way, the area is virtually unexplored and worthy of further work.

As with the other gold workings on the E.L., the Flannigan's Flat alluvials excite interest mainly because there is gold present. The alluvials themselves are not considered a particularly good target, however the source of the gold could be. Some work is required to determine whether a fine grained gold deposit could be present upstream from the workings.

In summary, three exploration possibilities are present in the Garfield. Of these, two are definitely worth further exploration, the third, the pyritic schist zone, is probably worthy of some further work because the alteration there is so strong and the area is so little known. The ground covering these three prospects should be retained.

2.16 Jukes-Darwin Ridge

This area has been difficult to assess. In its favour are the many small, alluvial gold workings on the ridge and around its flanks. Application of the same reasons used for the West Sedgwick and Huxley areas would suggest retention of this area. There are, however, several arguments against this:

(1) The alluvial gold can be explained by the widespread, patchily auriferous hematite-magnetite-quartz veins and the small, sub-economic copper-gold deposits.

(2) The results of this season's sampling were poor everywhere, except in the immediate vicinity of the gold-bearing floater obtained by the Review Team near the summit of Mt. Darwin.

(3) This is a relatively large area to retain, especially as it must be linked to the Garfield so that only the statutory four areas are held.

This is the "borderline" area of the E.L. Retention of it must mean dropping some other prospect. Reluctantly, therefore, this area is recommended for relinquishment.

2.17 Clark Valley

The Clark Valley has been covered by ground geologic, geochemical and geophysical surveys. The geochemical results were disappointing with low base metals throughout. The I.P. Survey revealed a number of strong linear I.P. anomalies which probably reflect pyritic black shales. There is some encouraging geology here in that the volcanics are dominantly marine, contain possible basin rocks and are locally moderately altered. Nevertheless, the discouraging geochemical results have strongly downgraded the prospectivity of this area for massive base metal mineralization.

There are several, very small gold workings in the Clark Valley, however the size of the area that would have to be retained to test the gold potential is a strong argument against retention.

In summary, although the Clark Valley contains some encouraging features, the general level of mineralization there seems very weak. The area should therefore be relinquished.

3. AREA REDUCTION PROPOSAL

E.L. 9/66 must be reduced from 446 sq. km. to 125 sq. km. by August 5th, 1984. According to Mines Department regulations, the reduced E.L. cannot be divided into more than four parts, and each must have a minimum area of 10 sq. km.

The following comments are relevant:

(1) Areas are recommended for retention if they are prospective for massive base metal-gold sulfide, moderate to high grade copper-silver-gold or volcanic-hosted gold-only mineralization. Given that economic examples of the first two are already known within the Mt. Read Volcanics, they are given a greater priority than the gold-only areas.

(2) The proposed E.L. boundaries all lie along one kilometre graticules of the Australian Map Grid, with the exception of a few areas which abut the old E.L. boundary.

(3) It is assumed that the "Buffer Zone" around the Mt. Lyell Consolidated Mining Lease will not be part of the reduced E.L., as it is currently under application for Mining Leases by Mt. Lyell.

(4) The proposed reduced E.L. comprises four areas of 10,16, 19 and 80 sq. km. (Figure 7).

4. PROPOSED WORK PROGRAM 1984-86 (Figure 7)

Three years now remain before E.L. 9/66 must be relinquished. The two year plan which follows is based on the need to complete reconnaissance drilling on all of the prospective areas by the end of the second year. Exploration during the third year should then be confined to detailed drilling to follow up mineralized intersections obtained in the previous two years.

4.1 Read East

4.1.1 1984/85

This prospect is now at the drilling stage. The ground geophysical and geochemical data

is adequate although it should be compiled onto standard sheets. Some mapping is required before a detailed drilling proposal can be made. One drillhole of approximately 250m is recommended. It should be drilled with ground support in November/December, 1984. If possible the drillhole should be surveyed with downhole EM equipment to test for mineralization around the hole.

4.1.2 1985/86

If some encouraging alteration or mineralization is obtained from the first hole, more drilling should be undertaken in 1984/85.

4.2 White Spur

4.2.1 1984/85

A two hole drilling program, totalling 700m, is proposed for this area in 1984/85. Some data compilation is required prior to making a drilling proposal. The drilling should be carried out with ground support in October/November, 1984. If possible, the holes should be surveyed with downhole EM equipment to test for "near misses".

4.2.2 1985/86

If encouraging mineralization is obtained during this program, it should be followed up with further drilling in 1985/86.

4.3 Selina

4.3.1 1984/85

(1) Geologic mapping should be undertaken around the Selina Anomaly Zone to determine its potential for volcanogenic massive sulfides.

(2) A 5-10 line km, deep-looking ground EM survey should be carried out around the northern shores of Lake Rolleston to test for high grade copper-precious metals mineralization beneath the glacials. This work should be undertaken with helicopter support in January, 1985.

4.3.2 1985/86

Should encouragement be obtained in either of the two areas, drilling should be carried out to test any targets during the summer of 1985/86.

4.4 Basin Lake

4.4.1 1984/85

(1) A considerable amount of data has been accumulated on this area over the years. It should be compiled onto standard sheets. During the course of this work, soem check mapping may be required. This work should identify drilling targets for both the 1984/85 and 1985/86 seasons.

(2) One drillhole should be completed to follow up the BL4 massive sulfide intersection. A 300m hole is suggested to be carried out with ground support in January-March, 1985.

(3) The Howards silver zone probably persists into the Basin Lake area under glacials. A small research program is suggested on this target type to assess if other such zones host orebodies elsewhere, and, if so, what means are available to search for them.

4.4.2 1985/86

The 1984/85 work is expected to generate a number of drilling targets, which should be tested during 1985/86.

4.5 West Sedgwick

4.5.1 1984/85

A program of data compilation and mapping is proposed for 1984/85. The mapping should involve rock chip sampling of all prospective lithologies for gold mineralization.

4.5.2 1985/86

Should the 1984/85 work generate drill targets, these should be tested in 1985/86.

4.6 Beatrice

4.6.1 1984/85

This area requires further drilling, however, before it is carried out, some mapping and reinterpretation of the data is required. This work should identify the best place for a drillhole west of Itat Creek. This hole should be drilled with helicopter support in January-March and is expected to be 250m long. As at Read East and White Spur, downhole EM is recommended.

4.6.2 1985/86

If the 1984/85 drilling reveals that the Beatrice host horizon does persist under the Sedgwick porphyry west of Itat Creek, further drilling will probably be necessary in 1985/86.

4.7 Huxley

4.7.1 1984/85

(1) North Huxley. Minor extensions to the grid are proposed both to the north and south; these should be bedrock sampled. Selected parts of the new grid should then be covered by dipole-dipole IP to test for lead-zinc mineralization. A total of 15 line km. of I.P. is proposed, to be carried out in December-January.

(2) South Huxley. Further stream sediment and rock chip sampling, and mapping

is required in this area to test its gold potential. This work should be carried out also in December-January, possibly in several stages, if follow-up work is required.

4.7.2 1985/86

It is hoped that work in both the North and South Huxley areas will generate drilling targets. These should be tested in 1985/86.

4.8 Jukes Proprietary

4.8.1 1984/85

The best remaining potential for a medium tonnage of economic copper-gold mineralization can be tested with one drillhole, 300m long, targetted half way between the JP3 and Z142003 intersections (Figure 8). This hole should be drilled in 1984/85 so that the future of this prospect is settled as early as possible. The HEC's tunnel to the King River power station passes directly under Jukes and could have a significant influence on any possible mining operation in this area.

4.8.2 1985/86

Further drilling is only anticipated on this prospect if ore grade mineralization is intersected in 1984/85.

4.9 Garfield

4.9.1 1984/85

A program of comprehensive rock chip sampling and stream sediment coverage is proposed for the pyritic schist zone in the Garfield/Currie divide. Stream samples should be obtained from trap sites and must be large (10 kg.) so that they can be submitted for cyanidation. This technique extracts all the gold from stream samples and should settle the question of whether any gold is being shed from the pyritic schist zone. It is proposed that this work be undertaken in November, using helicopter support into one or more fly camps. In this way, if significantly encouraging results are obtained, there will be time to reorganize the summer work to allow for more detailed ground surveys in January/February.

(2) Mapping, rock chip and stream sediment sampling should be carried out in the Flannigans area to check for the source of the alluvial gold. This should be undertaken in summer with helicopter support.

(3) Gridding should be carried out in the vicinity of the Snake Spur costean over the Owen Conglomerate-volcanics contact area. Lines should be 200m apart and cover approximately 1.5 km of the contact. The grids should be bedrock sampled where glacials are absent and covered by ground EM. All of this program should be carried out in January-February, 1985.

4.9.2 1985/86

It is hoped that drilling targets will be generated at one or more of these prospects in 1984/85. These should be tested, with helicopter support in January-March, 1986.

In summary, the 1984/85 program comprises 1800m of diamond drilling, three geophysical surveys over about 30 line km of grid and a number of small mapping and stream sediment sampling programs. This work is expected to cost $389,000 (Appendix 1). The planned sequence of exploration is illustrated on Table 1.

The 1985/86 program is expected to be very largely drilling. Although it is impossible to predict which prospects will be drilled during that year, it is anticipated that around 3000 to 3500m of drilling will be carried out. This is expected to cost about the same amount as this year's program (i.e. approximately $400,000).

TABLE 1 - SCHEDULE OF WORK, E.L. 9/66, 1984/85

PROSPECT	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE
READ EAST	--Compilation----		-----Mapping -------		Drill Proposal	Drilling (250m)				---------Reporting-------		
WHITE SPUR	--Compilation----		Drill Proposal	Drilling (700m)						---------Reporting-------		
SELINA	--Compilation--------					Gridding Rolleston	---------- Mapping Anomaly Zone * -------- EM survey *					
BASIN LAKE	--Compilation/check--- mapping			Drill Proposal				Drilling (300m)				Drill recommendations
WEST SEDGWICK	--Compilation---						-----Mapping---					Drill recommendations
BEATRICE			Mapping/drillcore examination		Drill Proposal		Drilling (250m) *			---------Reporting ----------		
JUKES PTY.							Drilling (250m) *			---------Reporting----------		
HUXLEY					Gridding, bedrock sampling		I.P. survey, stream sed. * sampling, mapping			---------Reporting----------		
GARFIELD			Stream sed. rock chip sampling * Garfield/Flannigans(?)				Snake Spur grid- ding *	Snake Spur E.M. * Follow-up sampling Garfield/ Flannigans *		-------Reporting----------		

* Helicopter - supported work

GOLD FIELDS EXPLORATION PTY. LIMITED

APPENDIX I

1984/85 PROPOSED BUDGET

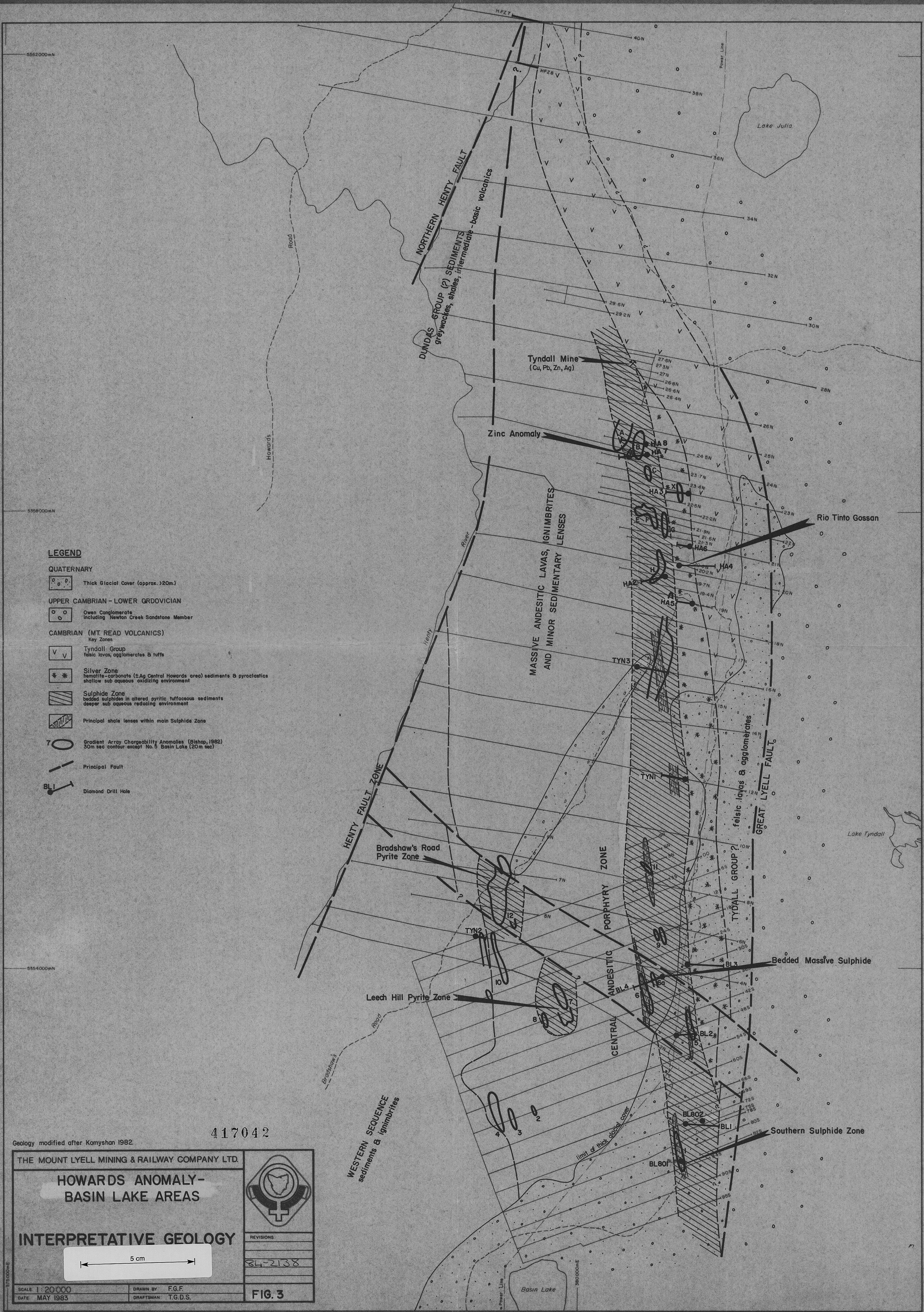
03

417040

1984/85 PROPOSED BUDGET

			$
1.	GEOLOGY		92,900
	Salaries	50,900	
	On Costs (30%)	15,300	
	Transport/Miscellaneous	4,400	
	Outside Contractors	13,900	
	Travel	2,900	
	Stores	5,500	
2.	GEOPHYSICS		48,300
	Outside Contractors	42,400	
	Transport	5,900	
3.	GEOCHEMISTRY		31,700
	Outside Contractors	8,900	
	Analysis	10,500	
	Stores	500	
	Transport	11,800	
4.	DRILLING		159,600
	Outside Contractors	99,000	
	Stores	5,900	
	Analysis	7,500	
	Transport	47,200	
5.	LAND ACQUISITION		3,100
	Miscellaneous		
6.	SITE PREPARATION		18,200
	Outside Contractors	12,300	
	Transport	5,900	
7.	SURVEYING		1,700
	Outside Contractors	1,700	
8.	INDIRECT M.V.E.		10,000
9.	ADMINISTRATION CHARGES		23,600
		TOTAL :	389,100


386000mE
388000mE
390000mE
5366000mN
5364000mN
5362000mN
5360000mN
5358000mN
248 N
240 N
232 N
224 N
216 N
208 N
200 N
192 N
184 N
176 N
168 N
160 N
152 N
144 N
148 N
136 N
132 N
128 N
124 N
120 N
116 N
112 N
108 N
104 N
96 N
88 N
80 N
72 N
64 N
56 N
48 N
40 N
32 N
24 N
16 N
8 N
00
8 S
16 S
24 S
32 S
40 S
48 S
56 S
64 S
72 S
80 S
88 S
96 S
EASTERN PYRITE ZONE
WESTERN PYRITE ZONE
altered siliceous pyritic tuffaceous sediment band 5-40m wide
CAMBRIAN SEDIMENTS
OWEN CONGLOMERATE
WHITECLIFF HILLS
RIVER
small (<20cm) bands of massive pyrite in altered tuffaceous sediment
ANTHONY
SELINA VOLCANICS
PROPOSED HEC ANTHONY DAM
altered cherty tuffaceous sediments
DORA CONGLOMERATE
MT SELINA
altered mineralized lavas
LAKE SELINA
MT SELINA ANOMALY ZONE (Pb-Zn)
altered ignimbrites
PROPOSED HYDRO LAKE
LAKE SELINA WORKING
LS1
LS2
LS3
LS4
LS5
LS6
LS7
LS8
Glacial Cover
altered mineralized ignimbrites and volcaniclastic sediments
costeans
py, gn, cp
ROLLESTON CAMP
weak IP and magnetic response beneath glacials
LAKE ROLLESTON
altered ignimbrites and tuffaceous sediments
NORTH DORA ADIT
BI TRENCH
WALFORD PEAK
E.L. 9/66
LEGEND
Geological Boundary - Definite
Geological Boundary - Uncertain
Fault
Fault inferred
Boundary of Glacial Cover
Shoreline of proposed hydro lake
IP Anomalies
North of 104N : Gradient Array Anomalies as defined by 30m.sec. contour.
South of 104N : Pole-Dipole Anomalies as defined by 25m.sec. contour.
Pb Isotope Rock Sample Location
x 1172 Rock Samples taken by 1983 Review Team
5 cm
417041
Geology: from 1983 Review Team observations and modifications of earlier Mt Lyell Co. mapping.
GOLD FIELDS EXPLORATION PTY. LIMITED
E.L. 9/66
SELINA
040
INTERPRETATIVE GEOLOGY SHOWING MINERALIZED ZONES
DRAWN BY : J.G.P.
DRAFTSMAN : T.G.D.S.
DATE : June '83
REVISIONS :
84-2138
FILE NO.
SCALE 1: 10000
200 0 200 400
METRES
FIG. 2


LEGEND
QUATERNARY
Thick Glacial Cover (approx. >20m.)
UPPER CAMBRIAN - LOWER ORDOVICIAN
Owen Conglomerate including Newton Creek Sandstone Member
CAMBRIAN (MT. READ VOLCANICS)
Key Zones
Tyndall Group felsic lavas, agglomerates & tuffs
Silver Zone hematite-carbonate (±Ag Central Howards area) sediments & pyroclastics shallow sub aqueous oxidizing environment
Sulphide Zone bedded sulphides in altered pyritic tuffaceous sediments deeper sub aqueous reducing environment
Principal shale lenses within main Sulphide Zone
Gradient Array Chargeability Anomalies (Bishop, 1982) 30m sec contour except No. 5 Basin Lake (20m sec)
Principal Fault
BL1
Diamond Drill Hole
5362000mN
5358000mN
5354000mN
375000mE
380000mE
NORTHERN HENTY FAULT
DUNDAS GROUP (?) SEDIMENTS
greywackes, shales, intermediate-basic volcanics
Howards Road
Henty River
Lake Julia
Lake Tyndall
Basin Lake
Power Line
HFZ7
HFZ8
40N
38N
36N
34N
32N
30N
29·6N
29·2N
28N
Tyndall Mine
(Cu, Pb, Zn, Ag)
Zinc Anomaly
HA8
HA7
HA3
HA6
HA4
HA2
HA5
Rio Tinto Gossan
MASSIVE ANDESITIC LAVAS, IGNIMBRITES AND MINOR SEDIMENTARY LENSES
TYN3
TYN1
TYN2
HENTY FAULT ZONE
Bradshaw's Road Pyrite Zone
Leech Hill Pyrite Zone
Bradshaw's Road
CENTRAL ANDESITIC PORPHYRY ZONE
felsic lavas & agglomerates
TYDALL GROUP ?
GREAT LYELL FAULT
Bedded Massive Sulphide
BL1
BL2
BL3
BL4
BL801
BL802
Southern Sulphide Zone
limit of thick glacial cover
WESTERN SEQUENCE
sediments & ignimbrites

Geology modified after Komyshan 1982.

417042

THE MOUNT LYELL MINING & RAILWAY COMPANY LTD.

HOWARDS ANOMALY-
BASIN LAKE AREAS

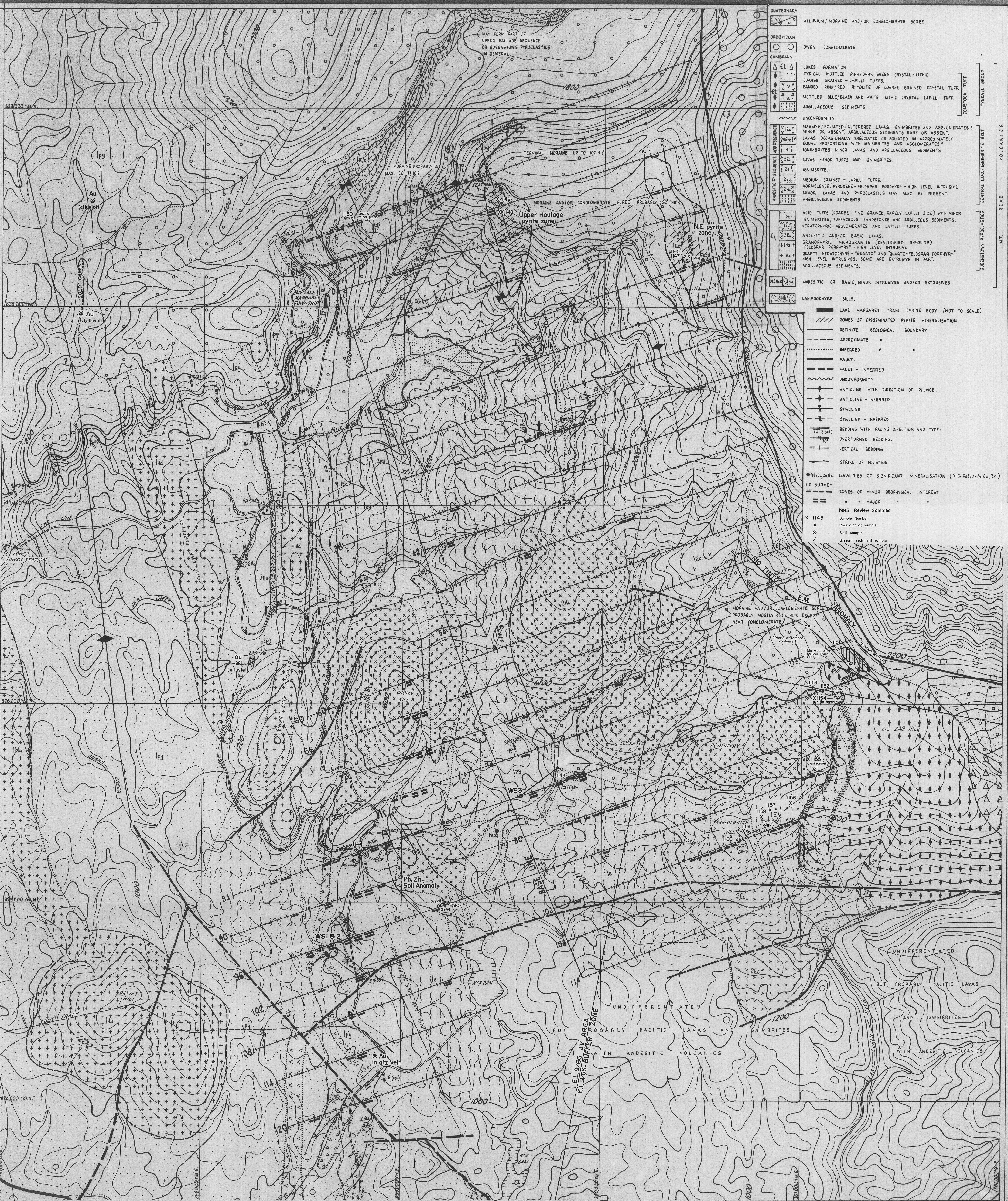
INTERPRETATIVE GEOLOGY

REVISIONS

84-2138

SCALE 1:20000
DATE MAY 1983
DRAWN BY F.G.F.
DRAFTSMAN T.G.D.S.

FIG. 3



417043

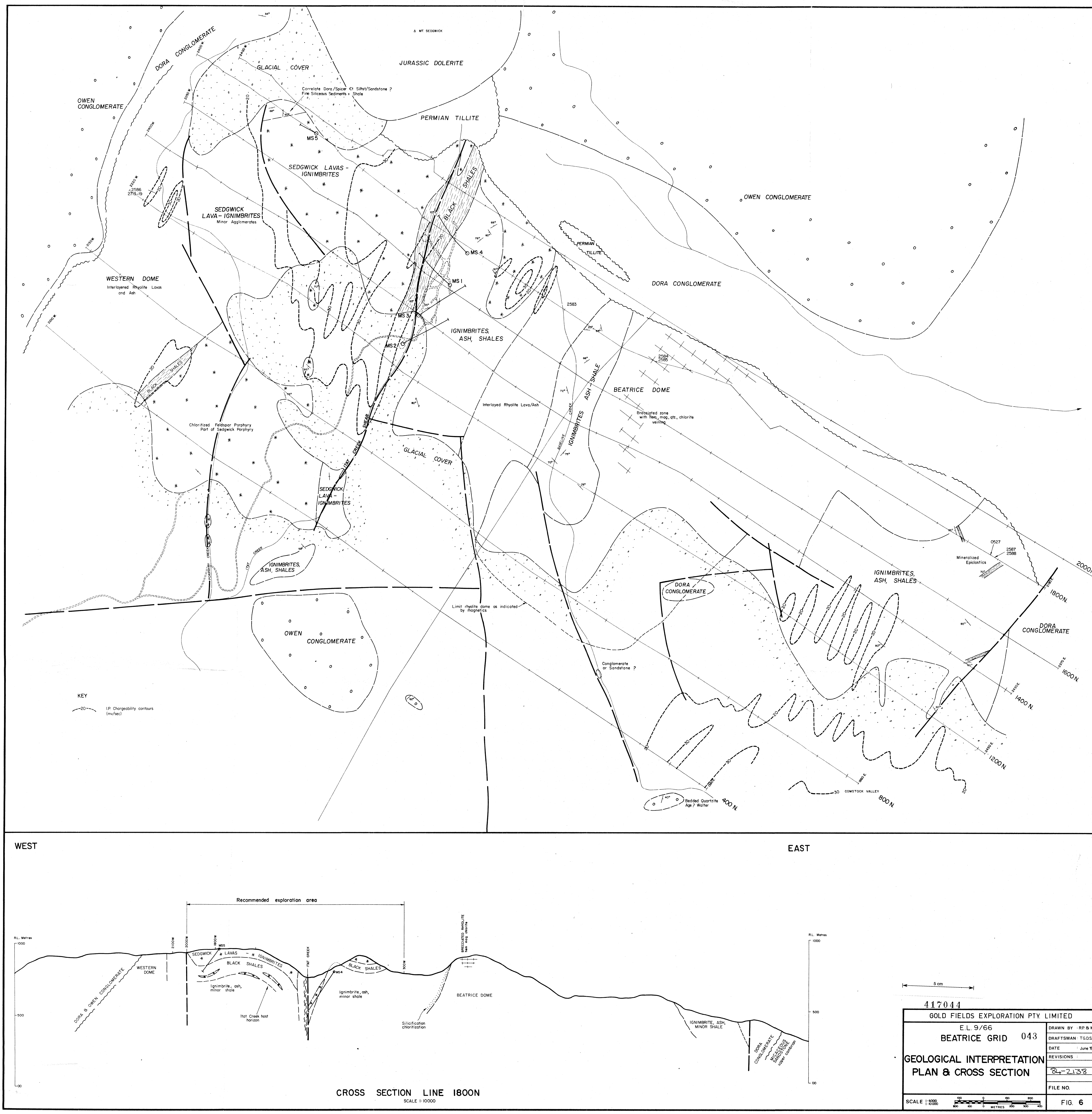
THE MOUNT LYELL M. & R. COY. LTD.
GEOLOGICAL DEPARTMENT

HENTY - YOLANDE E.L. 41/71
WEST SEDGWICK GRID
GEOLOGICAL MAP SHOWING
MAIN ANOMALIES

042

DRAWN.	N.W.S. & F.G.F.
TRACED.	T.G.D.S.
CHECKED.	
DATE.	MAY 1982
SCALE.	1:6000
84-2138	
FIG. 4	

5 cm



MT SEDGWICK
DORA CONGLOMERATE
OWEN CONGLOMERATE
GLACIAL COVER
JURASSIC DOLERITE
Correlate Dora/Spicer Ct Siltst/Sandstone ?
Fine Siliceous Sediments + Shale
PERMIAN TILLITE
MS 5
SEDGWICK LAVAS - IGNIMBRITES
BLACK SHALES
SEDGWICK LAVA - IGNIMBRITES
Minor Agglomerates
OWEN CONGLOMERATE
MS 4
PERMIAN TILLITE
WESTERN DOME
Interlayered Rhyolite Lavas and Ash
MS 1
DORA CONGLOMERATE
MS 3
IGNIMBRITES, ASH, SHALES
MS 2
BLACK SHALES
IGNIMBRITES ASH SHALE
BEATRICE DOME
Brecciated zone with hem, mag, qtz, chlorite veining
Interlayed Rhyolite Lava/Ash
Chloritized Feldspar Porphyry
Part of Sedgwick Porphyry
ITAT CREEK SHEAR
GLACIAL COVER
SEDGWICK LAVA - IGNIMBRITES
IGNIMBRITES, ASH, SHALES
Mineralized Epiclastics
2000 N
IGNIMBRITES, ASH, SHALES
1800 N
DORA CONGLOMERATE
Limit rhyolite dome as indicated by magnetics
DORA CONGLOMERATE
OWEN CONGLOMERATE
1600 N
1400 N
Conglomerate or Sandstone ?
KEY
I.P. Chargeability contours (mv/sec)
1200 N
COMSTOCK VALLEY
Bedded Quartzite Age? Walter
400 N
800 N
WEST
EAST
Recommended exploration area
R.L. Metres
SEDGWICK LAVAS IGNIMBRITES
WESTERN DOME
BLACK SHALES
BLACK SHALES
BRECCIATED RHYOLITE hem mag chlorite
DORA & OWEN CONGLOMERATE
Ignimbrite, ash, minor shale
Itat Creek host horizon
Ignimbrite, ash, minor shale
BEATRICE DOME
Silicification chloritization
IGNIMBRITE, ASH, MINOR SHALE
DORA CONGLOMERATE
MICACEOUS SANDSTONE upper contact
CROSS SECTION LINE 1800N
SCALE 1:10000
5 cm

417044

GOLD FIELDS EXPLORATION PTY. LIMITED

E.L. 9/66

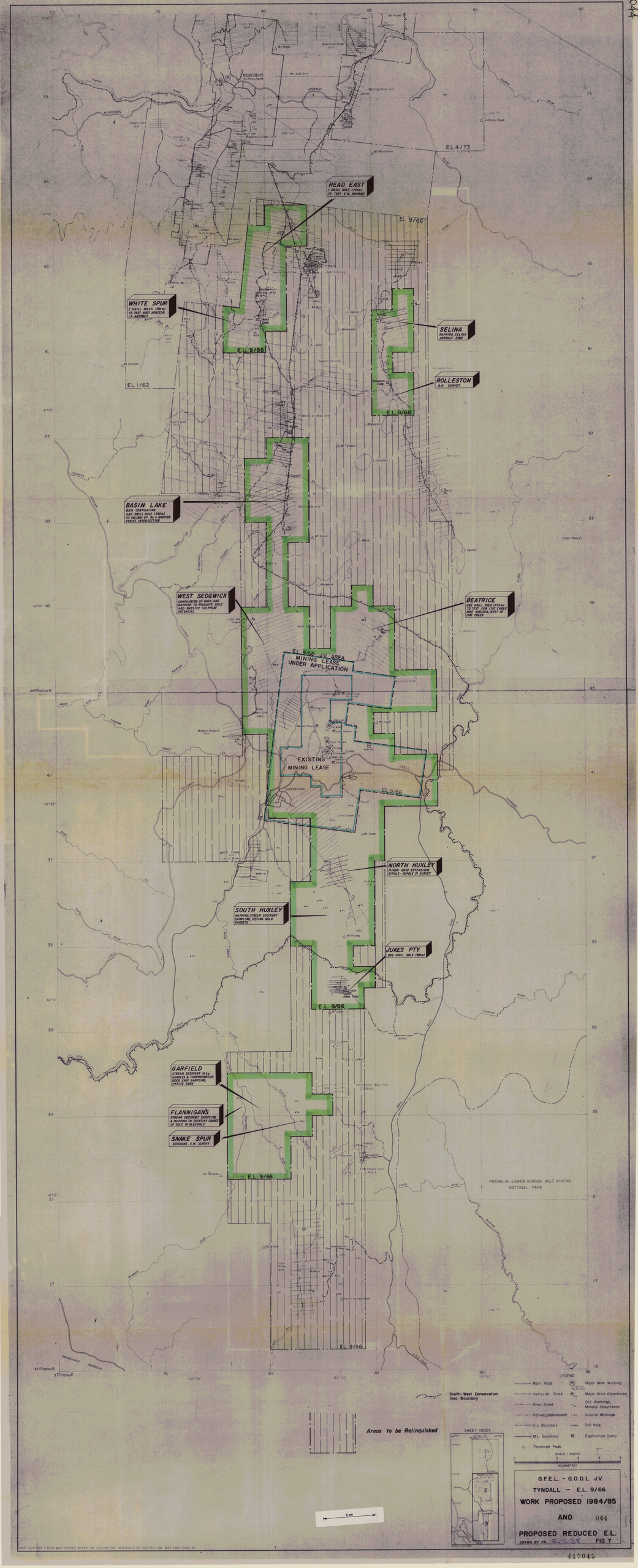
BEATRICE GRID 043

GEOLOGICAL INTERPRETATION PLAN & CROSS SECTION

DRAWN BY : R.P. & M.H.
DRAFTSMAN : T.G.D.S.
DATE : June '83
REVISIONS :
84-2138
FILE NO.

SCALE 1:6000 1:10000 METRES

FIG. 6



G.F.E.L. - G.O.D.L J.V.

TYNDALL — E.L. 9/66

WORK PROPOSED 1984/85

AND 044

PROPOSED REDUCED E.L.

DRAWN BY P.R. 26-2-85 FIG. 7

SOUTH

NORTH

5,330 800mN | 5,330 900mN | 5,331 000mN | 5,331 100mN

800mR.L.

700mR.L.

600mR.L.

500mR.L.

Au Cu Pb Zn Ag Sn WO_3

6m @ 0·16, 485, 20, 100, 1, 20, 170

8m @ 0·76, 720, 40, 130, 2, 10, 330

9m @ 0·30, 850, 20, 130, 2, 20, 90

4m @ 0·15, 850, 20, 90, 1, 30, 180

16m @ 0·21, 890, 20, 100, 1, 10, 350

12m @ 0·20, 465, 30, 100, 1, 10, 40

11m @ 3·37, 1370, 30, 100, 3, 10, 90

7m @ 0·13, 1150, 10, 160, 1, 10, 70

14m @ 0·09, 1020, 40, 80, 1, 10, 60

15m @ 0·04, 850, 30, 110, 1, 30, 60

20m @ 0·70, 930, 30, 120, 1, 10, 90

9m @ 0·74% Cu
0·8 g/t Au

No. 1 ADIT

14m @ 1·03 % Cu
1·2 g/t Au

EAST X CUT proj. 7m @ 1·42% Cu
1·0 g/t Au

2m @ 1·4 % Cu
0·8 g/t Au

12m @ 1·15% Cu
0·8 g/t Au

No. 3 ADIT

JP2 9m @ 1·55% Cu
1·56g/t Au

WEST WALL H'WALL DRIVE
16m @ 1·68% Cu
1·4 g/t Au

WEST X-CUT
5m @ 1·70% Cu
1·6 g/t Au

No. 2 ADIT

N.B. This adit is driven in the lavas to the North West.

JP 1 intersection with mineralised zone – barren

JP3 9 m @ 0·65% Cu
0·08g/t Au

Z142003 5m @ 0·59% Cu
<0·5g/t Au

N.B. Position approximate

JP1 2m @ 0·41% Cu
<0·1 g/t Au

N.B. This intersection is not the major mineralised zone.

O PROPOSED DRILLHOLE

POTENTIALLY MINERALISED ZONE
(2% Cu equivalent cut-off grade)

Proposed H.E.C. tunnel at 220 m R.L.

5 cm

NOTE: All thicknesses shown are horizontal.

417046

GOLD FIELDS EXPLORATION PTY LIMITED

JUKES PTY.

LONGITUDINAL PROJECTION OF MINERALISATION IN CHLORITIC VOLCANICLASTICS

DRAWN BY	A.J.C.
DRAFTSMAN	T.G.D.S.
DATE	MAY '83
REVISIONS	
	84-2138
FILE NO.	

SCALE 1:1000 — 20 10 0 10 20 30 40 METRES

FIG. 8