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SHEFFIELD - TASMANIA - E.L. 15/65

REPORT ON

PRELIMINARY GROUND GEOLOGICAL INSPECTIONS
OF ANOMALOUS AEROMAGNETIC FEATURES

by

W. S. CHESNUT.

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MICROFILMED

Melbourne.

April, 1967.

TABLE OF CONTENTS

	<u>PAGE</u>
SUMMARY	1
INTRODUCTION	3
GENERAL	4
ACTIVITIES	6
CONCLUSIONS	9
SHEFFIELD AREA GENERALIZED STRATIGRAPHIC COLUMN	14
GENERALIZED GEOLOGY OF THE AREA	16
ASSESSMENT OF UNEXPLAINED ANOMALIES	19
RECOMMENDATIONS	23
RESULTS OF GROUND RECONNAISSANCE	26

APPENDIX

SUMMARY TABLE OF THE ANOMALOUS
AEROMAGNETIC FEATURES IN THE SHEFFIELD
AREA.

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LIST OF PLANS -:

- Fig. 1 Locality sketch.
- Fig. 2 1" = 2 mile plan of area showing
aeromagnetic contours and anomalous
features.
- Fig. 3 1" = 4 mile plan of area showing
generalized geology.

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S U M M A R Y

A short programme of geological inspections of the ground location of the anomalous features indicated by an aeromagnetic survey of the area of the Companies Exploration Licence was carried out, with the object of determining which features could be "readily explained" by local surface lithology.

From an economic stand point the main result of this geological reconnaissance was that no major mineralization was located. A number of apparently minor sulphide occurrences were detected, but in only one case did the sulphide material show any relation to a magnetic anomaly.

The other result of the reconnaissance was the elimination of a majority of the features on the basis of the presence of basic volcanic rocks, which showed readily detectable magnetic susceptibility in the hand specimen.

Some features were not readily accessible from the ground and hence no evaluation could be made.

However, a large number of features which were examined could not be explained on the basis of the surface lithology and these features have been grouped in broad association in a general order of inferred importance for follow up work.

Recommendations for follow up ground geophysical surveys for further evaluation of five anomalous features have been made, viz anomalies 12, 22, 53, 64 and 28.

An unexpected result of the work was that the known Penguin Creek and Dial Range iron ore occurrences were not reflected in the Aeromagnetic patterns and ground inspection showed the limonitic and hematitic material to be non magnetic.

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BURNIE

PENGUIN

DEVONPORT

GEORGE TOWN

WILMOT RIVER

RIVER

TAMAR R.

SHEFFIELD

LAUNCESTON

FORTH

MERSLEY

Mole Creek

WESTBURY

LORINNA

E.L. 13/65 (1700.5M)

CRADLE MT *

GREAT LAKE

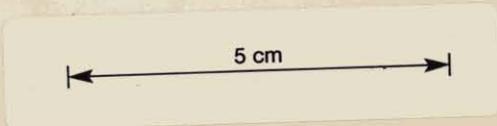
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LAKE ST CLAIR

SHEFFIELD EXPLORATION LICENCE

CENTRAL NORTHERN TASMANIA

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INTRODUCTION

The Company was granted Exploration Licence 15/65 on the 2nd July, 1965 over 1700 square miles in north central Tasmania, generally centered about the township of Sheffield - see fig. 1. opposite.

The area was regarded as being potentially favourable for the development of iron deposits of the magnetite type associated with granite - limestone contacts and sulphide ore deposits associated with granitic and ultra-basic rock suits.

The presence of some 60 old mining prospects covering iron, tin, tungsten, molybdenum, copper, lead and gold mineralization etc., appeared to enhance the possibility of there existing further buried deposits of similar ores.

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GENERAL

The preliminary office assessment included the assembling of all available information on the geology and mineral occurrences of the area with a view to selecting the most suitable exploration technique.

This assessment was simplified considerably by the availability of reliable geological maps covering almost three quarters of the area.

Since the location of iron deposits was a primary aim the use of the aero-magnetic reconnaissance technique was adopted.

It was appreciated that the use of this method would pose problems in interpretation, arising from the widespread occurrence of surface basalt and dolerite in the coastal areas and deeply dissected terrain in the inland areas.

The use of a helicopter for much of the flying programme was aimed at minimising the problem of Terrain variations.

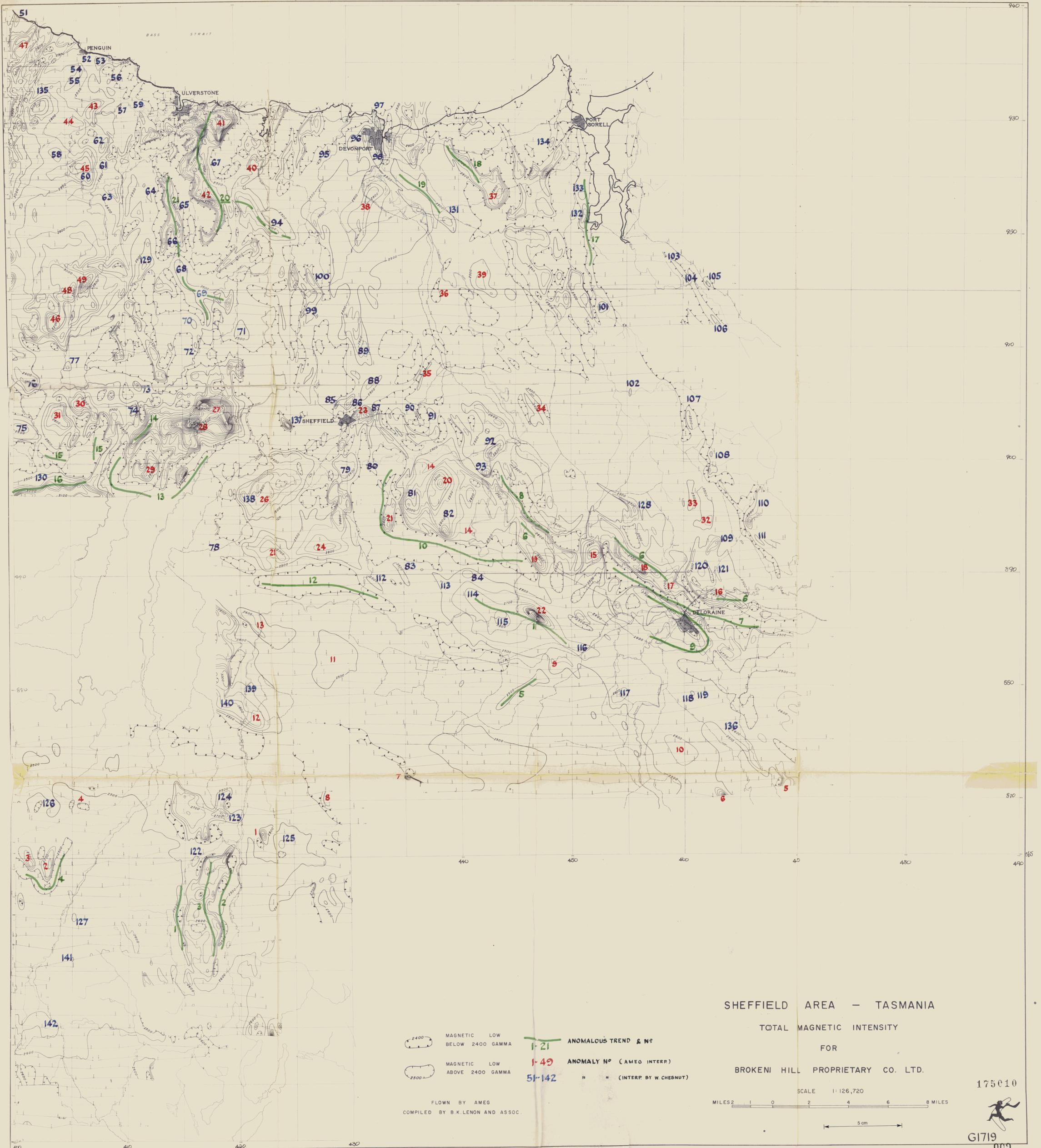
There being no method of overcoming the effects of the basalt and dolerite it was inferred that some form of consistent pattern might be associated with basalt and dolerite materials respectively, as distinct from the other rock types.

The results and interpretation of the aero magnetic survey are the subject of a separate report by the Contractors, A.M.E.G.

The contractors assessment of the survey indicated that no really major anomalous features (comparable with the anomalous associated with, for example, the Savage River magnetite deposits) were discernable from the results - plotted as figure 2 - and that although some degree of uniformity of magnetic contour patterns was relatable to surface basaltic areas, it was generally not possible to relate many magnetic features to the mapped geology.

Hence the contractor recommended that ground reconnaissance of selected anomalous features be carried out as a guide for further interpretation.

One of the Contractors assessments was the apparent total lack of any relationship between anomalous aero-magnetic features and the many mineral prospects in the area - including the known iron deposits of the Dial Range province.



SHEFFIELD AREA - TASMANIA

TOTAL MAGNETIC INTENSITY

FOR

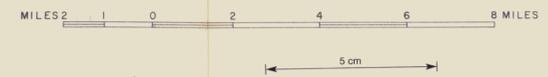
BROKEN HILL PROPRIETARY CO. LTD.

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-  MAGNETIC LOW BELOW 2400 GAMMA
-  MAGNETIC LOW ABOVE 2400 GAMMA
-  ANOMALOUS TREND & N°
-  ANOMALY N° (AMEG INTERR)
-  " " (INTERP. BY W. CHESNUT)

FLOWN BY AMEG
COMPILED BY B. K. LENON AND ASSOC.

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ACTIVITIES

This report covers the short programme of office re-interpretation and field reconnaissance of a number of minor and major anomalous magnetic features, together with detailed prospecting on and around areas of granitic and ultra basic rock suites and along some of the belts of Pre-Cambrian metamorphics, carried out by the writer during March and April, 1967.

During January, inspections of many of the old mineral prospects was carried out by Mr. Hollingworth and mention is made in the report of some of his findings.

The re-interpretation carried out by the writer was aimed at defining the many less intense aero-magnetic anomalous features indicated by the contractor's contour plot.

It was expected that definition and ground examination of some of these minor features would enable valid interpretations of some of the more prominent features and thus considerably narrow down the field of unexplained anomalous features, which would require more elaborate techniques for their causative explanation.

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In carrying out this interpretation no fixed background magnetic value was used; anomalous features were defined purely on the basis of the "steepening" of the contour gradient and hence range from a 40 to a 200 gamma increase over the local pattern.

The second stage involved the definition of all areas of surface basalt and dolerite (taken from existing geological maps) in order to select features which might be relatable to mapped surface lithology or alternatively readily checked by ground inspection.

This approach resulted in the definition of a considerable number of generally minor features - numbered 51 to 142 on fig. 2 many of which could be grouped as subsidiary features to major anomalies defined by the contractor. Another division can be made by the grouping of features, apparently related to similar lithological environments.

There still remained a broad spread of isolated features, some of which were of relatively high intensity.

Ground inspections were made of all readily accessible defined features, with a view to systematically eliminating features of less interest.

The technique adopted for the ground inspection involved examination of the outcrop and float lithology of the peak intensity area for each anomalous feature.

When no anomaly causing lithology was evident or outcrop was poor or the lithology environment appeared to be of interest, extension of reconnaissance to nearby areas was carried out, the aim primarily being to locate rocks which by simple testing with a hand magnet showed detectable magnetic susceptibilities (i.e. attraction of fragments to the magnet).

Where ever possible both fresh and weathered rock materials were checked by this method.

In areas which yielded rocks showing magnetic susceptibilities a suite of specimens was collected of both magnetic and non-magnetic types for further examination (Petrological).

It is mentioned that as a result of the re-interpretation a number of minor anomaly features were indicated as being in proximity to known mineral occurrences, although during subsequent ground inspections it was not possible to define positive relationships.

CONCLUSIONS

The major conclusions which become evident from this ground reconnaissance survey are that:-

1. The aeromagnetic survey did not detect any major anomalies which might be due to hidden magnetite bodies. Known iron ore occurrences at Penguin Creek and in the Dial Range did not give rise to anomalous magnetic patterns and hence it appears that the aero magnetic technique would not detect other similar hidden bodies of iron ore.
2. The greater proportion of the major and minor anomalous magnetic features have been shown to be related to basic eruptives and intrusives which do not show any signs of economic mineralization - although many of these rock types show occasional disseminated pyrite grains.
3. Two occurrences of mineralization warranting further work have been located. One of these consists of a minor magnetite sulphide occurrence near a granitic contact which has an associated major magnetic anomaly. This area shows a lithologically similar association with mineralized zone further west near Moina.
The other target is a zone of weak surface lead-copper - pyrite mineralization near an old mining prospect and possibly related to a minor magnetic anomaly.

A number of other minor occurrences of sulphide mineralization have been located but these are not considered to be of real significance.

4. A geological appraisal of the regional stratigraphy appears to show that the Cambrian units of this area represent a higher level in the time scale than the mineralized Lower Cambrian sediments of the West coast mining areas. The one possible exception, which requires further work to confirm, is a small area near Quamby.
5. As a result of this work, there are a number of magnetic features of both major and minor intensity for which no probable cause can be postulated. Many of these features occur in lithological and structural environments which could allow the existence of mineralization. Hence recommendations have been formulated for further evaluation of the more favourable targets. To aid selection of these targets the following list tabulates all the unexplained anomalous features, arranged in both groupings of features inferred as similar in source or on the same trend, and order of assessed importance for further follow up work.

(a) Anomaly 12 feature including east and west highs and anomaly 139 and 140 peaks. Selected on basis of minor magnetic sulphide showing associated with granite contact and comparison with mineralized area

to the west of our prospecting area.

(b) Anomaly 22 feature, including 116 and perhaps also 115 and 114. Selected on basis of intensity of magnetic feature; note that dip of source probably to north than contractor's interpretation of "to South". Features 84, 113 and perhaps also 83 and 112 may be associated with this source trend continued.

(c) Anomaly 53 feature and perhaps also the 54 - 55 feature. Selected on basis of co-linear association with weak mineralization and old mineral prospects. Anomaly 135 may also be associated with this group.

(d) Anomalies 67 and 94 of the trend 20 feature. Selected on basis of probable association of ultra basis with Pre-Cambrian meta-sediments. Some possibility that the trend 21 features (65 and 66) could also be related to a similar environment.

(e) Anomaly 27 - 28 feature. Selected on basis of magnetic intensity and association of a magnetic quartz - dolerite rock on the eastern margin and weak arsenopyrite mineralization on the western margin.

(f) Anomalies 127, 141 and 142; these form part of a group which were not inspected due to their

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virtually inaccessibility without a major effort. They are selected on the basis of their proximity to old mineral prospects (Tin wolfram, molybdenum and copper respectively) and the presence of granitic masses in the Pre Cambrian meta sediments. The other number anomalies of this group, 1, 2, 3, 4, and 126, also have not been inspected and are separated purely on the basis of their anomaly intensity and magnetic pattern, being similar to that associated with surface basalt.

(g) Anomalies 11 and 13; unexplained and appear due to a similar deep source; the intensity and linear shape of anomaly 13 appear to indicate that the source is dipping steeply north east, whereas 11 appears to be due to a deep broad cylindrical or pipe like source.

(h) Anomaly 99 appears to be the chief feature of this group of unexplained anomalies - on the basis of its association with a fault. Other features include 64, 91, 118 and 119, 56, 57 and 58, 51, 71 78, 100. There is no characteristic basis of selection for this group - it is purely a collection of unexplained features, all of which show some suitability as locations for mineralization.

(i) The anomalies 31, 75, 76 are the major features of this group which all show the common factor of

an unresolved association with the Roland (Owen) conglomerate and the unconformity at its base. Other members of the group are features 87, 52 and possibly 20 and 82.

(j) In this group are the main features associated with broad, low intensity, deep seated sources, occurring within the area viz anomalies 38, 39 and 139.

SHEFFIELD AREAGENERALIZED STRATIGRAPHIC COLUMN

Pre Cambrian: Not yet subdivided in detail apart from broad sub groupings in localized areas.

largely inferred, angular unconformity.

Cambrian: Overall succession not yet fully established broadly:-

Lobster Creek Volcanics

Cateena Group - sediments and eruptives

Barrington Chert

Beulah Formation

Motton Spillite

Radfords Creek Group - sediments and eruptives

Gog Range Greywacke

Minnow Keratophyre

Ultra basics intrude into the the Precambrian largely inferred, angular unconformity.

Ordovician: Gnonon Mudstone (localized)

Roland (Duncan, Owen) Conglomerate

Moina Sandstone

Gordon Limestone

Silurian: Only minor remnants.

Devonian: Only minor remnants.

Intrusion of Granitic rocks into Cambrian and Pre Cambrian.

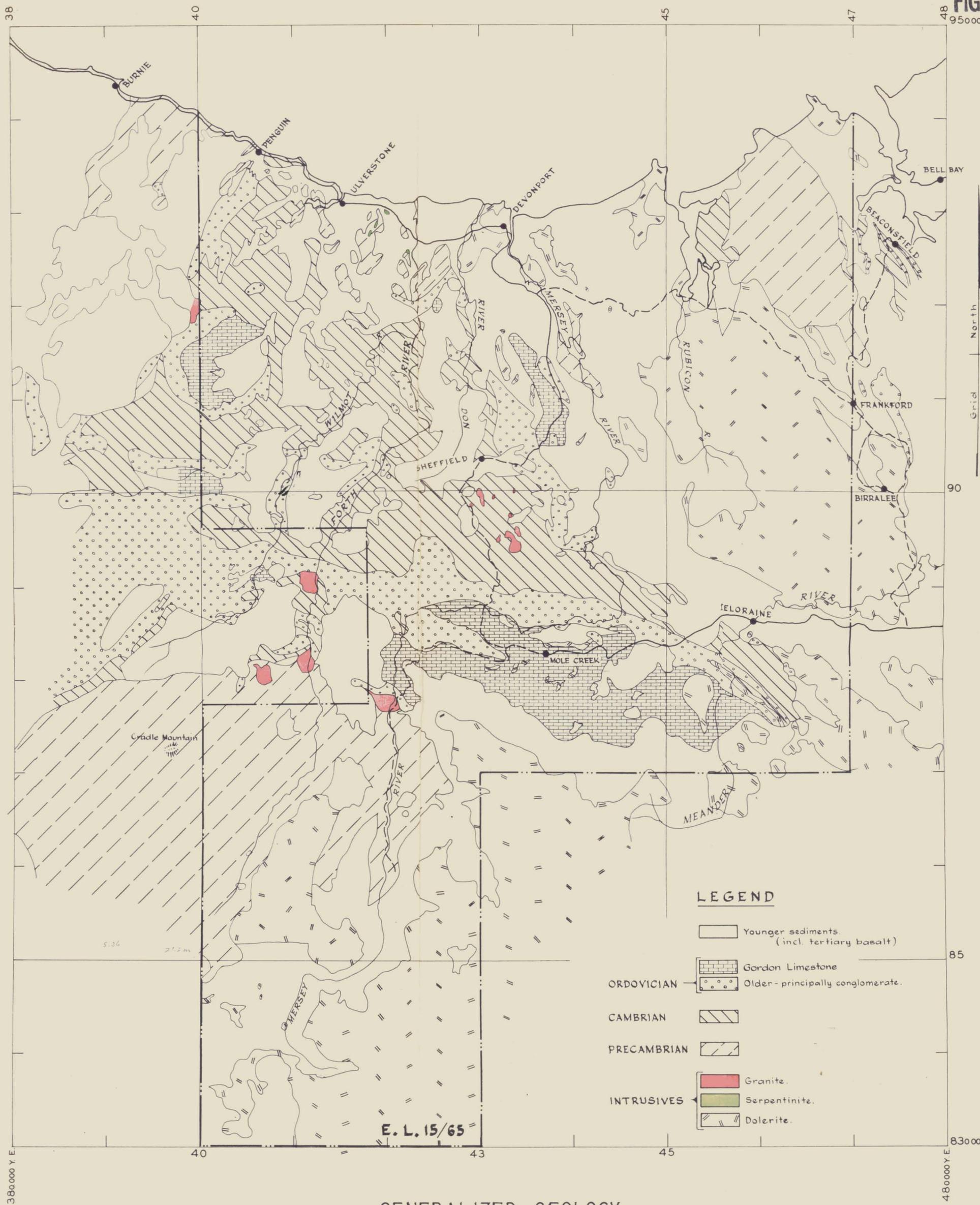
Permian: mudstones and glacials with minor coal seams.

Triassic: minor sandstone.

Jurassic: Extensive dolerite sills.

Tertiary: sands and gravels overlain by extensive basaltic volcanics.

Quaternary: Sand, gravels, glacial and fluvioglacial deposits, talus and alluvium.



GENERALIZED GEOLOGY
SHEFFIELD AREA - NTH. TASMANIA

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GENERALIZED GEOLOGY OF THE AREA.

To enable consideration of the implications and assessment suggested in this report the Geology of the area is outlined below, and a generalized geological map is shown as fig. 3.

As has been indicated, most of the area of the Exploration Licence has been mapped by members of the Tasmanian Geological Survey and the following notes and stratigraphic tables are taken from the published map sheets and accompanying explanatory reports for the Devonport, Sheffield and Middlesex 1 mile map series.

The stratigraphic column opposite indicates the broad succession which outcrops within the area of the Exploration Licence.

The various phyllitic and schistose slates, shales etc., and banded quartzites which comprise the Pre-Cambrian rocks in the area are different to correlate over any distance and have been variously subdivided on the basis of lithological and structural variations by the workers in local areas. Wells, for instance groups all such rocks as the Davey Group in the Golden Valley area while Burns uses

Upper or Rocky Cape Group

Lower or Ulverstone Metamorphics

Forth Metamorphics

for the units outcropping in the Devonport area. Jennings uses Dove Group

Fisher Group

Howell Group (Base)

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for units which outcrop in the Upper Messey and Forth rivers.

The succession of the Cambrian rocks is almost as difficult to determine, largely as a result of the abundance of, and widespread variations in types, the basic and intermediate eruptives.

The various lavas, breccias, tuffs and greywackes are locally intercalated with mudstone sandstone, and conglomerate lenses and once again the various workers have had to resort to the naming of local successions which are not readily correlatable in detail with adjoining successions. The stratigraphic succession outlined earlier is applicable in various degrees to most of the areas of Cambrian rock outcrop, although the differentiated sequence in the Golden Valley area is at present difficult to correlate with the adjoining Mole Creek (Middlesex) area.

- Viz Golden Valley succession Warner laminated siltstone
- Kentish spilite and volcanic breccia
- Scott quartz- Keratophyre
- Archer Sub-greywacke and greywacke
- Calstock slate and sub-greywacke
- (Base)

The Ordovician succession is readily differentiated into three distinct lithological units, which have a

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widespread distribution. The Moina sandstone group is probably the most varied of these units varying from massive ortho quartzites to thinly interbedded shale / siltstone/ sandstone sequences.

The abundant outcrops of the Jurassic sheet dolerites show remarkable uniformity in the hand specimen.

A major structural feature evident is the drop in elevation of their outcrop when travelling north from the Central Plateau, apparently due to tilting or faulting, downwards to the north.

The widespread occurrence of Tertiary, basaltic materials is probably the main feature of the geology of the area. Most of the major basalt remnants are considered to represent fillings in old stream valleys. The flooding of the coastal tertiary drainage system by flows of scoriaeous, columnar and banded basalts with intercalated breccia and tuffaceous horizons resulted in the development of a new drainage system north of the base of the highland plateau areas, largely resulting in the exposure of the present surface geology.

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ASSESSMENT OF UNEXPLAINED ANOMALIES

In the table comprising the appendix to this report all relevant information concerning each defined anomalous feature is summarized.

The notes below are an assessment of the various features which to date are not satisfactorily explained.

It is mentioned that a number of anomalous features, which the writer has not considered, on the basis of their position in areas of basalt and dolerite outcrop, are considered by the contractor to be due to sources other than the surface basalt viz anomalies 10, 15, 16, 17, 18, 30, 37.

Anomaly 1, not readily accessible; magnetic pattern shows similarity with basalt; possibly related to nearly mapped basalt.

Anomalies 2 & 3, not readily accessible; magnetic pattern shows similarity with basalt and topographic position on top of ridge appears to enhance this interpretation.

Anomaly 4, not readily accessible; Unusual linear magnetic pattern; unexplained.

Anomaly 11, broad low intensity feature indicates deep source; overlain by limestone; unexplained.

Anomaly 12, apparently associated with a magnetic granite contact dipping north east; requires follow up work.

Anomaly 13 linear low intensity feature, probably at depth; source appears to dip north east.

Anomaly 14. major circular feature, inferred as being due to exposed and buried Bellah Formation magnetic basic volcanics.

Anomaly 20. not satisfactorily explained; possibly merely part of 14, but association with nearly outcrop and inferred buried conglomerate pose doubts.

Anomaly 22. not explained, intensity of feature indicates further work required; note dip probably to north rather than contractors interpretation of "to south".

Anomaly 23. not explained; appears similar to 20.

Anomalies 27 & 28. not explained; intensity and size of feature appears to warrant further work despite presence of minor? magnetic quartz-dolerite on eastern margin.

General magnetic pattern shows strong resemblance to typical Beulah Formation pattern but intensity appears anomalously high.

Anomaly 31. not readily accessible; unexplained. One of a group apparently associated with massive Roland Conglomerate.

Anomaly 36. unusual pattern, apparently related to basalt and dolerite.

Anomalies 38 & 39. similar features; apparently due to deep seated source.

Anomaly 51. probably due to basalt, but possibility of sub soil source in the Pre-Cambrian metamorphics cannot definitely be discounted.

Anomaly 52. not explained; associated with Roland Conglomerate.

Anomaly 53. not explained; proximity to old Penguin and Neptune mine mineralization indicates further work required; Possibility of relation with sub-basaltic spilite

sequence (exposed on shore platform) not ruled out.

Anomalies 54 & 55. primarily part of the same feature; not explained, but source co-linear with old mine prospects; appears to warrant further interest.

Anomaly 56. probably related to basalt or mottled Spilite.

Anomaly 57. not explained; apparently only minor feature.

Anomaly 58. not readily accessible; not explained; rather unusual pattern; Proximity of group of old prospects may warrant further interest.

Anomaly 61. not explained; possibly related to poor outcrop of Mottled spilite.

Anomaly 64. possibly comparable with 62; unexplained association with Isandula fault trace; possibly related to basic volcanic phase of the Cateena mudstone.

Anomalies 65 & 66. not explained; part of trend 21 which is possibly comparable with trend 20, but less intense.

Anomaly 67. not explained, but appears likely to be due to sub-surface serpentine type source associated with Pre-Cambrian meta sediments of trend 20.

Anomalies 68 & 69. part of the same trend; not explained but plotted position indicates may be due to magnetic phase of Gog Range greywacke.

Anomaly 71. not explained; possibly comparable with 68 and 69.

Anomaly 75. not readily accessible; unexplained.

Anomaly 76. not explained; comparable with 31 and 75; association with massive conglomerate ridge near inferred unconformity.

Anomaly 78. incompletely defined on edge of area; plots near mapped outcrop of small patch of serpentine; could not be confirmed.

Anomaly 80. possibly comparable with 79 - magnetic granite.

027

Anomaly 82. probably comparable with 20.

Anomalies 83 & 84. not explained; possibly related to Gog Range greywacke.

Anomalies 85, 86, 87. comparable with 23.

Anomaly 91. not positively confirmed as due to magnetic siltstone phase of the massive Moins Sandstone.

Anomaly 94. comparable with 67, probably due to buried Ultra basic source associated with Pre-Cambrian meta sediments.

Anomaly 99. not explained; association with fault trace poses interesting environment.

Anomaly 100. not explained; possibly related to basalt.

Anomaly 112. not explained; possibly related to Gog Range greywacke.

Anomaly 113. possibly comparable with 112.

Anomalies 114, 115, 116. probably comparable with 22 but of much lower intensity.

Anomalies 118 & 119. unexplained.

Anomalies 126 & 127. not readily accessible; plotted position in Pre-Cambrian is main feature of interest.

Anomaly 131. comparable with 39 (trend 19) and probably also 38; apparently deep source.

Anomaly 134. not explained, possibly related to buried dolerite or basalt source.

Anomaly 135. possibly related to basalt, but intensity of feature suggests definite point (pipe) source. Possibly on same trend as 54 and 55.

Anomalies 141 & 142. not readily accessible; comparable with 126 and 127, but with added association of Birthday granite and old mining prospects.

RECOMMENDATIONS

The following recommendations for further work have been formulated as a result of the writers' reconnaissance programs.

(1) Ground Geophysical follow up work:

This involves initially carrying out a ground magnetometer survey of the selected features to define the form of the anomalous magnetic pattern so as to enable re-interpretation of shape, dip and nature of source.

This should be followed by ground E.M. or I.P. surveys to test for source character - metallic or non metallic, and also a gravity survey over any features which are not resolved, by the previously applied techniques.

From the various groupings outlined in the conclusions the chief anomalous feature of each group has been selected for this initial ground follow up. These features and a suggested initial approach are hence listed:

(a) Anomaly 12, in particular the portion east of the River. The steep, timbered slopes in this area will hinder the ease of operations.

(b) Anomaly 22, a grid survey of the feature is necessary to check the contractors interpretation. There are no problems of access or topography in this survey.

(c) The Penguin mineralization; initially a traverse along the shore platform from Penguin Beach to Tea Tree Point to check the northern continuity of anomaly 53. Thence infill traverses as required with possible intrusion to features 54 and 55.

(d) Anomaly 67 or 94; nearly identical features but 67 much more readily accessible. A Grid survey is required.

(e) Anomaly 28 of the 27 - 28 feature. Highly probable that magnetometer, E.M. and gravity surveys will still not enable satisfactory interpretation of this feature.

(2) Geological Mapping:

To enable correlation and application of results of the ground geophysical survey of anomaly 22, it is necessary that correlation mapping of the zone of interest in the North western corner of the Quamby 1 mile sheet should be carried out. This zone is about 2 miles wide between the limbs of an anticlinal ridge; some 10 miles long and takes in Anomalies 22, 116 and 118, 119. The object of the mapping being to enable lithological correlation with the adjoining middlesex sheet stratigraphy and hence the other anomalies of the trend 11 (group 2) association.

(3) Reconnaissance Inspections:

It is recommended that reconnaissance ground inspections

of the following features be carried out when a helicopter is available. These features are considered worthy of interest on the basis of their presence in Pre-Cambrian metasediments in an area which is known to contain occasional granitic outcrops and a number of old mineral prospects.

In probable order of interest these features are anomalies 127, 141, 142, 126, 4, 2, 3, and 1.

While it does not appear likely that use of a helicopter would assist location, further consideration should be given to ground inspections of anomalous features 58; 31 and 75; 84, 113 and 114.

(4) Geochemistry:

It does not appear feasible to suggest a Geochemical method of assessment for the anomalies selected above for initial evaluation. This arises largely from the small scale (local rather than regional) of the features involved, the terrain, and the variability of the lithology.

RESULTS OF GROUND RECONNAISSANCE

The primary result to become apparent from the ground inspections carried out by the writer is that many of both the major and minor anomalous magnetic features can be explained by the presence of basic and intermediate rock suites which show readily detectable magnetic susceptibilities. These susceptibilities appear sufficiently strong to account for the magnetic intensities present.

This then left a considerable number of anomalous features for which no geological explanation could be confirmed to account for the magnetic variations, these are discussed in a later section.

The other major feature which becomes apparent is that no evidence of major mineralization was located, although in a number of places sulphide mineralization of minor appearance was located.

The "major" occurrence of these, was near the contact of a Granite where a thin vein type massive sulphide bearing structure within the granite was found to be magnetic and possibly related to an anomaly feature, (12).

This occurrence could not be traced over any distance largely as a result of the extent of weathering in the granite and the steep soil covered hillside.

The main interest in this feature arises from a comparison with an area to the west near Lorinna (in

Mt. Lyell's exploration licence) in which a number of metallic mineral prospects have been worked in a stratigraphically similar environment. It was not possible to check whether a similar aeromagnetic pattern also existed in the Mt. Lyell area.

Another occurrence which appears to be of interest is at Penguin near an old mining prospect, north of an anomaly feature (53), which shows a maze of discontinuous, thin vein-like, mineralized structures containing disseminated and massive sulphides. Analysis of specimens from this area shows negligible copper and nickel contents, although an assay quoted in a Mines Department publication on the old mine shows values which would be of considerable interest, viz Ag 27ozs./ton; Cu 3.4%; Ni 2.5%; Lead 10.8%; Co. 0.8%. In some land specimens of vein material it is possible to detect green and blue copper staining and minor galena grains. Available results of samples of surface material assayed as under:-

<u>Sample No.</u>	<u>Description</u>	<u>Ne %</u>	<u>Cu %</u>
B 7031	Float sulphide boulder	.02	.12
2	Quartz sulphide vein	.01	.01
3	Gossanous Fe veins (North)	.01	.05
4	Gossanous Fe & Sulphide veins (West)	.03	.55
5	Gossanous Fe Veins (North East)	.01	.18
6	Sulphide vein (East)	<.01	.04
7	Sulphide & Copper stained material.	<.01	.35

A further sulphide occurrence of possible interest is a massive quartzite - arsenopyrite bed (?) exposed in a road cutting west of anomaly 28. Here a sequence of steeply south dipping massive to thin-bedded ferruginous pebbly and gritty sandstones and fissile shale/siltstone beds, contain a unit about 2 feet thick to quartzite with minor, fine chert fragments and variable pyrite (?) and arsenopyrite as fine grained mass.

Most of the other sulphide occurrences located were of the disseminated fine grains type, usually in a basic or intermediate host rock and appeared to be of little economic interest.

Not unexpectedly abundant fine veinlets facings and small augen type masses of magnetite were present in the various ultra-basic rock types inspected.

In considering the various rock types which show readily detectable magnetic susceptibilities the following notes are included for reference purposes.

The most common causative rock is undoubtedly Tertiary basalt; in the hand specimen it varies considerably in large scale by the variation in aero-magnetic contour patterns associated with the basalt.

Secondly are the dolerites of the Jurassic Sill system. These generally show much weather magnetic

034

attractions, frequently only just detectable.

Thirdly are the series of intermediate to basic eruptives grouped as the Beulah Formation. These are by far the most strongly magnetic of the Cambrian volcanics and give rise to strong well defined magnetic patterns, anomalies 24, 25, 26, 81 and 130. Almost all specimens collected from rocks of this formation show discernible magnetic attraction, the darker the fresh rock colour the stronger the attraction.

The other magnetic Cambrian eruptives include the Lobster Creek Volcanics (Anomalies 43, 44, 45 and 60), the Motton Spillite (63) and the Kentish Volcanics (anomaly 136).

A number of facies variants of the Gog Range Greywache were also shown to be magnetic (anomalies 88, 89 and 138), although generally the outcrop of this formation is not sufficiently bold or unweathered to be able to check many of the anomalous features which plot within its mapped area of outcrop.

The various outcrops of serpentine type rocks in the region of anomalies 40 and 41 show a generally strong magnetic attraction, depending simply on the amount of visible magnetite in the specimen.

The mapped micro-granite rocks of the area of anomalies 21, 79 and 80 show variable magnetic attractions, in places quite strong, but elsewhere not discernable. Once again the darker the fresh rock, generally the stronger, is its magnetic susceptibility. It is the writer's opinion that the range in rock types evident in the area of these features would tend to support their description as intermediate volcanics rather than an intrusive granite body.

The granite of anomaly 12 shows a detectable magnetic susceptibility along its northern margin only, possibly partly associated with the magnetic sulphide occurrence mentioned earlier. South from the northern outcrop of the contact zone the granite is not magnetic and this is confirmed by the shape of the anomaly. Interpretation of the form of the feature giving rise to this anomaly (12) indicates that it is a tabular body dipping gently North east and probably lies along the granite contact.

One rather surprising result of the magnetic survey was the lack of any anomalous magnetic features associated with the various known iron ore occurrences in the Penguin-Dial Range area. Ground inspections of some of these old mining prospects indicates that the iron material is massive to specular hematite, often high grade in the hand specimen, but showing no detectable magnetic susceptibility.

Mr. Hellingworth's prospecting inspections of a number of the old copper, lead and wolfram prospects in the area led him to the conclusion that they were of only small scale interest.

He did locate two near areas of sulphide mineralization, either of which showed signs of economic minerals. These two occurrences were a small band of pyrite on the southern margins of anomaly 24, near Minnow Creek Falls and a zone of weak arsenopyrite mineralization in the road cuttings between Upper Castra and Nietta, a short distance north of anomaly 30.

Both the writer and Mr. Hollingworth were largely unimpressed with the potential for Bauxite development on the weathered basalts throughout the area. Generally the only worthwhile exposures of the weathering profile of the basalt is visible in road cuttings and in remarkably few places were pisolitic or low iron laterites evident.

No samples were collected, hence at this stage it is probably not valid to completely eliminate the possibility of bauxite development.

A feature of the serpentines examined was their general poor outcrop and apparent lack of laterite soil profile development. The typical outcrop form consists of massive relatively fresh, small bluffs and masses protruding through red-brown clayey to sandy soils on the sides of steep ridges, underlying basalt cappings. There was no detectable sign of any nickeliferous laterites associated with the serpentines.

E.L.15/65 - SHEFFIELD AREA - SUMMARY OF ANOMALOUS AEROMAGNETIC FEATURES

Anomaly Number	Location Coordinates	Outline Contour	Contractors Interpretation	Accessibility	Field Location Topography	Elevation	Surface Lithology	Mapped Geology	Photo Reference	Remarks	Notes
1		2,600	Tabular mass or dyke of finite depth.	Thick timber and scrub.	Steep hillside	2,000-2,550		Tb psh	MR4/31	NL	Intensity of anomaly suggests other than surface basalt.
2		2,800	Compared to 1; i.e. probable basalt			3,200		pSf	MR7/117	NL	
3		2,800				2,800-3,100		pSf	MR7/117	NL	
4		2,560		Fisher group - expression			1,800-2,800		pSf	MR6/79	NL
5		2,860	Dolerite					Jd1		NL	
6		2,800	Dolerite					Jd1		NL	
7		3,500	Obscured by dolerite					Jd1		NL	
8		2,540	Obscured by dolerite					Jd1		NL	
9		2,600	Basalt.					Tb		NL	
10		2,640	Subsurface source; - 1,300'					Jd1		NL	
11		2,560	Similar to 10	Grazing	River flats	1,050	Limestone and alluvium	Og Og c	MR3/14		Road cutting to north shows massive silicified siltstones and sandstones.
12	419.9E; 876.6N 421.3E; 876.9N	2,840 2,860	Portion of large feature; not defined well enough to interpret.	Medium thick timber and bracken. Thick timber and scrub.	Steep hillside Steep hillslope	~ 1,300 1,600-2,000	Float only	Om/Ddogr c Om/Ddogr	MR4/34 MR4/34	SPEC 1 (west) of 139&140 SPEC 2 (east)	Includes sandstone, quartzite, mudstone, schists and grey tuff or igneous types in part magnetic. Granite itself magnetic in contact zone; associated quartzites and calc silicates?
13		2,640	Probably a horizontal on gentle north dipping tabular body; -350-400'	Thick scrub and timber with blown down basura	Steep sharp ridge crest	2,400-2,600'	Silicified sandstone and pebble conglomerate	Om	MR4/37		Conglomerate talus largely only on W to SW side; no real outcrop; general pinkish colour evident in all types; River section to west shows mudstone, siltstone.
14		2,500	Body resembling a vertical cylinder; features as for TR6.							Broad feature	Probably related to exposed and buried Beulah Formation volcanics.
15		2,800 TR6	Steeply dipping dyke like bodies, with susceptibilities ranging between 4,000 and 6,000 x 10 ⁻⁶ cgs. units and depths between 200 and 300 ft. subsurface; i.e. basic a system of fissures or folded tabular body; i.e. source other than surface basalt					Tb		NL	
16		2,800 TR6						Jd1		NL	
17		2,760 TR6						Tb		NL	
18		3,000 TR6						Tb		NL	
19		2,800 TR6		Light timber to grazing.	Ridge, creek and hillslope		Basalt lapping onto conglomerate ridge	Or/Tb	T381/144		Southern end of anomaly situated over ridge of conglomerate; northern end over basalt plateau; creek below roads runs E-W along probable contact.
20		3,180	Centre of anomaly 14.	Thick timber and bracken	Steep hillside and gully	600-800	Shales, siltstones and conglomerate.	Tb/Pbb/Or	MR2/14		Basalt to north of feature, conglomerate on east in creek.) Note that 3,000 contour trends with concealed displacement.
	437.7E; 896.4N	3,180		Medium timber and scrub	Northern end of ridge	700-800	No outcrop; float cobbles.	Or	MR2/14	(Southern part)	Presumable conglomerate displaced from above)

4202

Anomaly Number	Location Coordinates	Outline Contour	Contractors Interpretation	Accessibility	Field Location Topography	Elevation	Surface Lithology	Mapped Geology	Photo Reference	Remarks	Notes
21		2,500	Dove Granita?	Grazing	Rolling hills and creeks	800-1,200	Acid to Intermediate igneous - in part magnetic when fresh	Dgr	MR2/14	SPEC	Generally fine grained and appearing more as crystal tuff types; northern peak of anomaly centred over hill, southern higher peak over higher hill.
22		3,500 trend 11	Dyke like body; -200'; dipping 83°s; 6% magnetite by volume.	Light timber and gorse	Rolling hill	800-1,000	Poor outcrop; abundant float	NM Middlesex. Wells. ? Egg or Ea	MR1A/60		Float includes grey siltstone to north; series of tuffs or greywackes and possibly also a lava on anomaly itself. Abundant white massive vein Qtz; Dip north.
23		2,900	Similar to anomaly 14	Grazing	Base of ridge and soil flats	900	No outcrop on soil flat, conglomerate to north.	Ts/Or	MR3/8	cf 86,87	
24		2,800	Single feature outlined by 2,500 contour; horizontal or	Thick timber and bauera scrub	Steep hillside to vertical cliff.	1,000-2,400	Beulah F'mation - basic volcanics.	Om/Or/Qt Egg	MR3/12	SPEC	Note distinctive green and lilac breccia, purple porphyrite type and Qtz-epidote type; largely obscured by conglomerate talus - hence unmapped
25		2,700		Gentle north dipping tabular mass (sill) 300-600 ft. subsurface.	Cleared over lower slopes. Very thick upper slopes.	Steep hillside to vertical cliff.	1,500-3,000	Probable Beulah F'mation basic volcanics.	Gmk/Qt/Or	MR4/39	SPEC
26	421.6E;897.7N	2,880	Similar to 24 and 25	Grazing	High level rolling hills	1,200-1,300	Beulah F'mation:- Aug-dol.	Tb/Qt Gbf	MR4/40	SPEC C	
	423.0E;898.0N	2,840		Semi cleared to light timber.	Steep hillside and flats.	700-1,000	Beulah F'mation:- Aug-dol.	Ga Gbf	MR4/40	SPEC E	
27	417.0E;905.0N	4,000	Similar to 14	Grazing.	Gentle undulating	~ 800	No outcrop; basaltic soil	Egg Or	MR5/57		Spur on southern margin shows abundant conglomerate float.
	419.0E;903.5N	4,000		Timber and bracken	Steep hill-slope.	250-600	Magnetic quartz - dolerite	Gdl with Om/Or	MR4/42	SPEC	Fine to medium grained greenish blue grey with green (serpentine type) slickensides.
28		4,000	Part of 27; 150-250' subsurface 7% magnetite by volume	Grazing, Wilnot township outcrops.	Flat	800	Poor outcrop, yellow, red, brown weathered greywacke(?)	Gra Egg	MR5/57	SPEC	Gorge to west shows steeply dipping conglomerates (?) with a quartz-arsenopyrite bed. N.B. bear in mind possibility that these due to concealed Beulah Formation.
29		2,680	Part of 27 or due to presence of thick basalts					Tb		NL	
30		2,800	Part of the same? possibly comparable to 14 and 27					Tb		NL	
31		2,800	Source between 150 and 200 ft. subsurface with low basic susceptibility.	Thick scrub and timber.	Hill top	2,100-2,200		Or/Om Gmk	MR6/89	NL	c.f. 75, 76; similar structural arrangement.
32		2,600	Near surface-? dolerite				Dolerite	NM	T380/38		
33		2,500	Near surface-? dolerite				Dolerite	NM	T380/38		
34		2,500	Related to dolerite and basalt in vicinity of anomalies.				Dolerite	NM	T381/147		
35		2,500						Tb Pbb Om		NL	
36		2,460		Light timber	Gentle hillslope	150-250	Dolerite over Permian?	Pbb	MR2/19	(West)	Float indicates conglomerate and quartzite round)really dolerite margins. Float conglomerate on ridge; micaceous units in river and low slopes. } due to the lot of 220 between
		2,440		timber and bracken	ridge and river flats	50-200	Permian float over P8	P8	MR2/19	(East)	Float conglomerate on ridge; micaceous units in river and low slopes

4203

175040

Anomaly Number	Location Coordinates	Outline Contour	Contractors Interpretation	Field Accessibility	Location Topography	Elevation	Surface Lithology	Mapped Geology	Photo Reference	Remarks	Notes
37		2,800 Trend 18	Similar to 14; depth of -150-200 and basic susceptibility.					Tb		NL	
38	431.1E;920.5N	2,800	-600'; low basic character. i.e. deep basement	Orehard and light scrub.	Hillslope	150	No outcrop	Pm	MR3/4		Ridge shows sandy soil with minor quartz pebble float.
	432.5E;923.5N	2,800		Orehard and golf course.	River flat	25	No outcrop	Ga Pk	MR3/4		
39		2,580 Trend 19		Light to medium timber.	Undulating	250-550	No outcrop	Tb/Pbb	MR1N/14		Basaltic soil forms hills to east; conglomerate (Permian) floater to west possibly underlain by P? siltstone and orthoquartzite types.
40		2,700	Interpretation shows low basic character not comparable with serpentine	Bracken and timber scrub.	Top and steep side of hill	200-450	Basalt overlying serpentine and schists.	Tb Ga/Pgs	DRB/26 (MR4/48)	SPEC	Serpentine shows variations but most types are magnetic.
41		3,400 Trend 20	-300-400'; ultra basic character.	Thick scrub and bracken.	Steep hillside	100-300	Basalt overlying serpentine and mica schists	Tb Ga/Pgs	DRB/26	SPEC	Schistose sediments dip steeply west and trend about N-S. Variety of types mostly magnetic: - Olivine-magnetite; Norite? Gabbro; Hydrous Serpentine etc.
42		3,000 Trend 20	Less intense than 41	Grazing to crop land.	Undulating	600-700	Basalt overlying? Schists and quartzites	Tb	MR5/52	cf 67	Trend 20 which runs north to 67, roughly follows strike of near vertical micaceous schists and quartzite types which are largely overlain by thin Ts veneer.
43	907.1E;930.5N	2,820	Note coincidence with Lobster Creek volcanics	Thick bracken	Hill top	300		G1-Tb	DRA/44	NL	
	907.5E;931.4N	2,860		Thick bracken	Hill top	550		G1-Tb	DRA/44	NL	
44		2,860		Thick bracken and scrub	Hilly	400		G1	DRA/44	NL	
45	(406.1E 926.1N)	3,120		Rain Forest	Creek off S.E. Point of basalt ridge.	200-400'	Basaltic soil overlying intermediate lavas.	G1	MR6/95		esp. a porphyry type.
46		3,200	Basalt hill 400 ft. high.					Tb		NL	
47		3,000						Tb		NL	
48		3,200	Remarkable coincidence with edge of basalt.					Tb		NL	
49		3,100						Tb		NL	
50	(THIS NUMBER NOT USED)										
51	(401.0E 939.1N)	2,700		Grazing	Hillslope	50-100	No outcrop; basaltic soil	Tb Pm	DRA/46		Section on sea platform to north shows near vertical ENE striking, thinly bedded quartzites and micaceous and graphic shales with Qtz. veins; also boulders of conglomerate.
52	(406.9E 936.3N)	2,600		Public reserve	Small headland	0	Massive conglomerate with ironstone pebbles.	Odd	DRA/44		
53	(408.1E 934.5N)	2,760		Grazing	Hillslope	50-100	No outcrop; basaltic soil.	T Land-slide.	DRA/44	Neptune & Penguin mines lie to W & E of feature	Between anomaly and coast minor outcrops of massive? black hornfels type meta seds; Possible related to buried Cambrian spilites continuous with coastal section.
54	(406.4E 934.5N)	2,720		Light scrub (Rubbish tip)	Rolling hills	~ 300	No outcrop; float of gritty conglomerate and micaceous shales.	Ts Odd	DRA/44		Also some fragments of sandy hematite; similar rock suite encountered on hillside above Devon Consuls old Cu mine and Fe cut.

Anomaly Number.	Location Coordinates	Outline Contour	Contractors Interpretation	Field Accessibility	Location Topography	Elevation	Surface Lithology	Mapped Geology	Photo Reference	Remarks	Notes
55	(905.6E 933.5N)	2,720		Grazing	Flat ridge top	450	Loose basalt pebbles and soil and mudstone types.	Tb Odm	DRA/44	Devon conuls to N Marsden's Hill to S (Both for Fe and Cu?)	
56	(409.5E 933.7N)	2,500		Semi-cleared	Spur slope	150	Red brown basaltic soil overlying finely banded mudstones.	Tb Eb/Gm	DRA/44		Excellent exposure of finely banded mudstone types in new road cutting on southern margin; abundant minor faulting and folding; strike NE and dip west.
57	(409.8E 931.4N)	2,500		Thick scrub.	Mainly south bank of Leven River	50-150	North bank of river shows mudstones, cherts, tuffs and grits.	Ga Eb fgc	DRA/43		Strike of sediments about perpendicular to that of anomaly axis trend.
58	(404.2E 927.3N)	2,940		Very thick scrub and timber.	Steep hill slope.	~1,000		Eb-Gc	MR7/100	NL	Cuttings in track to NW and E show mudstones, sandstones and lava types.
59	(411.8E 930.5N)	2,500		Light scrub	Steep ridge slope to Leven River	100-300	Basalt overlying mudstone and sandstone sequence.	Tb Pgr	DRA/43		Railway cutting shows shales sandstones etc. dipping south about 30°, with basalt flow remnant overlapping down face of spur to river.
60	(407.0E 925.0N)	3,000		Scrub	Spur, to SW from Basaltic soil	~400	No outcrop	Gl	MR6/95		
61	(408.5E 926.2N)	2,640		Light Scrub	Hollow, north of ridge spur	400	No outcrop, red brown soil	Gc	MR6/95		Grits mudstones and conglomerate float on west bank of creek to west.
62	(408.4E 927.8N)	2,800		Cleared to light scrub	Hillside, below and W of basaltic soil.	~400	No outcrop; minor basaltic float pebbles	Gm	MR6/95		Gravel pit on high level shows a mudstone/shale lithology.
63	(409.2E 923.8N)	2,740		Farm	High ridge	800	Basic lava - Motton Spill-ite	Gm	MR6/95		Ridge parallels anomaly axis trend. Note that Leven Hill peak to SE is at least 300 ft. higher, of same material but does not registrar.
64	(412.3E 923.3N)	2,500		Scrub	Ridge	300	Mudstones and weathered volcanics?	Gc	MR5/52		On Isandula fault trace.
65	(414.0E 923.0N)	2,760	Weaker feature but comparable with trend 20 (VB) with a high basic character.	Grazing	Western edge of basalt ridge	450	No outcrop; basaltic soil and float	T landslide	MR5/52	100' below crest	
66	(414.5E 920.3N)	2,780		Grazing edge of Basalt ridge.	Western edge of Basalt ridge.	600	No outcrop; basaltic soil and float.	T landslide	MR5/52	cf 65	
67	(417.1E 925.7N)	2,800	Trend 20	Light bracken	Northern end of ridge.	300-400	Micaceous shales and sandstones with brown white qtz. float.	Pgfs	DRB/26	cf 94	Dip of sediments steep and strike is parallel to anomaly axis trend. Good outcrop in road cutting; no magnetics.
68	(415.1E 916.5N)	2,580		Thick Pinus radiata plantation	Hillslope	850-950	No outcrop	Gfa Ggg	MR5/54		Same trend.
69	(416.9E 914.8N)	2,560		Scrub and timber	Hillslope	600-800		Ggg	MR5/54	NL	
70	(416.1E 912.0N)	2,500		Thick bracken to light timber	Narrow low ridge with steep sides	~800	Basaltic soil and float	Tb Ggg	MR5/54		
71	(420.2E 911.3N)	2,560		Grazing and crop	Flat with creeks.	~800	No outcrop; float of mudstones and shales.	Ggg/Gbc	MR4/44		

Anomaly Number	Location Coordinates	Outline Contour	Contractors Interpretation	Field Accessibility	Location Topography	Elevation	Surface Lithology	Mapped Geology	Photo Reference	Remarks	Notes
72	(416.2E 910.3N)	2,500				600-800		Tb Egg	MR5/54	NL of 70	
73	(411.0E 906.7N)	2,600		Cleared to light scrub and timber	Hillslope	1,200	Basalt overlying a quartz-porphry or crystal tuff?	Emk	MR6/89		
74	(410.9E 904.3N)	2,700		Rain forest	Steep hillslope	400-500	Basalt largely obscured	Or/Om Egg	MR6/89 (MR5/57)		River bed below basalt shows fine to coarse grained tuffs (greywacke), siltstones and black hornfels types dipping steeply south and striking E-W. Occasional float conglomerate.
75	(400.5E 903.2N)	2,640		Difficult	Crest of ridge with steep sides	2,200		Or Egg	MR7/107	NL	Note that anomaly axis trend is parallel to ridge which is mapped as a strike structure.
76	(400.8E 907.5N)	2,700		Thick rain forest.	Crest of steep ridge.	2,000	Massive pebbly sandstone to sandy conglomerate on ridge.	Or/Om Egg	MR7/105	cf 75&31	Shows decomposed greywacke? on southern side and massive pink saccharoidal sandstone on north side; dips steep; ridge is strike feature.
77	(404.8E 908.5N)	2,500		Cleared	Slope below plateau edge	1,500-1,700	Basaltic soil and float.	Tb E	MR6/90		Non-magnetic; texture indicates material may not be Tertiary.
78	(417.5E 892.5N)	2,500	Incipient	Scrub	Creek	1,200	No outcrop to substantiate mapped serpentine.	Es	MR4/39	SPEC	Road cuttings show fissile shale and siltstone sequence with chlorite films. Float on creek bank totally different and show green acid tuff and grey basic tuff which is magnetic..
79	(429.7E 899.2N)	2,680		Grazing to light timber	Hillside	700-900	Fine to medium grained intrusive with abundant ferromags. Magnetic	Dgr	MR3/9	SPEC	Outcrop indicates a near bedded intrusive? whitish grey to dark green-blue-grey colour; some show minor disseminated sulphide grains; intermediate rock types.
80	(432.1E 899.6N)	2,420		Timber and light scrub.	River flats	550	Poor outcrop; float of intrusive (above), basalt and greywacke.	Qra Egg	MR2/15	SPEC	When fresh both micro-diorite intrusive and basalt are magnetic; no fresh greywacke located.
81	(435.4E 896.2N)	3,000		Semi cleared to crop lands	High level undulating hills and creeks.	900-1,000	Beulah Formation- basic volcanics	Ebf	MR2/14	SPEC cf 24;25; 26;130	Intermediate to basic eruptives, mostly magnetic; minor mudstones on western side of anomaly.
82	(938.6E 893.7N)	3,000		Light timber and bracken	Steep ridge	700-900	No outcrop; conglomerate talus over mudstone.	Or Ebf	MR2/14	cf 20	Ridge presumed to be conglomerate; same ridge as anomaly 20 features and trend probably continuous.
83	(434.9E 890.0N)	2,520		Timber and scrub	Steep hillside	1,200-1,600	Micaceous shales and float tuff, shale and conglomerate.	Emk/E/Egg	MR2/12		Micaceous shales, multicoloured, on eastern side; no magnetic materials located.
84	(440.7E 890.1N)	2,660			Sharp ridge crest and slope	600-1,100		Emk/Egg	MR1N/21	NL of 83	
85	(429.2E 905.0N)	2,600		Grazing	Flat, between ridge and valley.	800	No outcrop; basaltic soil	Ts	MR3/8		
86	(430.8E 904.0N)	2,800		Semi cleared	Soil flats	900	No outcrop; brown soil flats.	Ts	MR3/8	Eastern part of 23.	
87	(432.8E 904.0N)	2,600		Medium thick timber and scrub.	Straddles ridge valley and hillside.	900-1,100	Ridge of sandy conglomerate flats show dark soil.	Or/Om	MR2/16	Western part of 23	Railway cutting to east of anomaly shows massive tuffaceous S/S. Note that anomaly axis trend does not follow strike of stratigraphy.
88	(432.1E 906.6N)	2,600		Cleared to light timber	Hillslope, steep to gentle	1,100-1,200	Greywacke-magnetic when fresh	Qt Egg Or	MR2/16	SPEC	Probable faulted outlier of conglomerate forms low ridge system; float greywacke only on south eastern margin; trend of anomaly axis follow conglomerate.
89	(431.6E 910.1N)	2,640		Semi cleared	Hillside	~ 900	Greywacke-magnetic and massive non magnetic basalt.	Egg Or	MR3/7	SPEC	Main ridge composed of conglomerate and quartzitic sandstone; thin bedded greywacke on lower western slopes; massive non magnetic augite-olivine-ilmenite basalt on flats.

Anomaly Number	Location Coordinates	Outline Contour	Contractors Interpretation	Field Accessibility	Location Topography	Elevation	Surface Lithology	Mapped Geology	Photo Reference	Remarks	Notes
90	(436.4E 904.0N)	2,500		Thick FC Pinus radiata plantation.	Valley	550-650	Massive basalt on eastern margin	Qt Om	MR2/16		Hillslope below basalt shows float of silicified S/s to quartzites with grit bands, dip probably NE. Anomaly axis follows creek.
91	(438.0E 902.5N)	2,540		Medium timber and scrub.	Hill top and valley side.	650-850	No outcrop; gritty to tuffaceous silty sandstone.	Om	MR2/16		Float only, up to boulder size; generally pink in weathered state; occasional specimens magnetic.
92	(443.1E 900.8N)	2,800		Cleared.	River flats	200	Minor outcrop shows dolerite at NE end	Qra	MR1N/18		Probably in contact with shales and conglomerates (Permian) which outcrop in road cutting to north.
93	(442.3E 898.8N)	2,700		Semi cleared	Hillside to river	200-400	Basalt - non magnetic	Tb/Qt/Qra	MR1N/18		
94	(423.0E 920.1N)	2,720		Thick scrub and timber.	East and west sides of Forth River Valley.	50-400	Phyllitic and schistose shales and sandstone types.	Qa P&F's Od	MR4/47	Cf 67	Main outcrop in river bed; sediments show steep dip and strike parallel to anomaly axis trend.
95	(428.5E 927.1N)	2,500		Cleared, behind houses.	Rolling knolls on ridge	200	Basaltic knolls	Tb Pk	DRB/24		
96	(430.5E 928.0N)	2,580		Timber mill storage yard.	Plateau top	200	Dolerite	Jd	DRB/23		
97	(432.8E 929.6N)	2,620		Oval and Military Establishment	Low flats	25	Basalt/Dolerite float	Qa	DRB/23		
98	(433.3E 927.1N)	2,560		Concrete wharf	River bank	10	No visible outcrop	Qa	DRB/23		
99	(426.8E 912.8N)	2,540		Crop land	North flowing valley.	~800	No outcrop; red brown soil with float	EggF&b	MR3/6	SPEC	Float includes basalt, siltstone and mudstone types and porous limonitic reef or shear zone quartz; some manganese staining and disseminated crystals of magnetite in siltstones.
100	(426.9E 915.9N)	2,600		Semi cleared	Valley.	600-650	Basalt, mudstones sandstones and conglomerates	Td Od	MR3/6		Basalt on east side; mudstones sandstone etc. on west and south; mudstones and silicified gritty sandstone to conglomerate in centre.
101	(452.7E 913.5N)	2,500			Nearly flat		Dolerite knolls with Tb soil	NM	T380/8		
102	(455.2E 905.8N)	2,500					Dolerite	NM	T380/10		
103	(458.3E 918.0N)	2,400					Dolerite apparently overlying Permian sandy silts and congl.	NM	T380/43		On hills to NW of anomaly float and outcrop indicate thin banded siltstone and quartz veined leached siliceous sandstone and multicoloured micaceous shales - 67
104	(460.7E 916.5N)	2,460					Dolerite	NM	T380/43		
105	(462.2E 915.4N)	2,500					Dolerite	NM	T380/43		
106	(463.1E 912.0N)	2,500		Light timber to grazing	Spur and flats		Dolerite spur running down to black soil flats	NM	T380/42		
107	(460.4E 903.7N)	2,500			Ridge system with steep slopes		Dolerite	NM	T380/39		
108	(462.5E 900.4N)	2,480					Dolerite	NM	T380/39		
109	(462.6E 892.4N)	2,700					Dolerite	NM	T380/36		

Anomaly Number	Location Coordinates	Outline Contour	Contractors Interpretation	Field Accessibility	Location Topography	Elevation	Surface Lithology	Mapped Geology	Photo Reference	Remarks	Notes
110	(465.8E 895.4N)	2,600		Timbered	Relatively flat.		Dolerite	NM	T380/66		
111	(466.7E 892.8N)	2,500					Dolerite in part covered by basaltic soil.	NM	T380/66		
112	(432.5E 889.1N)	2,540		Light timber	Steep ridge slope.	2,000-2,400	No outcrop but abundant float of volcanics	Egg/Ev/Gmk	MR2/12		Acid to basic crystal tuff to lava types; no magnetic specimens located. Note green tuff/lava type - semi serpentinized.
113	(438.4E 889.5N)	2,500 Trend 11			Steep hill-slope	800-1,100		Egg	MR1N/21	NL	
114	(441.4E 888.1N)	2,760 Trend 11			Crest of sharp ridge.	2,400		Or	MR1N/21	NL	
115	(443.7E 886.0N)	2,800 Trend 11		Light timber on south to thick scrub on north	Straddling Mersey River gorge	400-1,200	Massive, flat bedded quartzites	Om +	MR1N/21		Excellent section in vertical gorge wells; dip steepens on eastern margin.
116	(450.8E 883.3N)	2,680 Trend 11		Grazing	Gentle slopes		Float of silicified S/s, greywacke, basalt and dolerite.	NM Middle? Wells Egg or Ga	T381/142		Also some limonitic gossanous material; some of the limonite and basalt is magnetic; gravel quarry to SE indicates bedded quartzitic sandstones.
117	(460.7E 879.3N)	2,680		Grazing	Plateau		Basalt	NM	T380/17		The 2,560 contour roughly defines edge of plateau remnant.
118	(460.7E 879.3N)	2,620		Light timber and bracken to light rain forest	Creek and both banks		Minor outcrop shows thin bedded near vertical siltstones.	Gw Wells	T380/33	}	Siltstones in part micaceous and/or tuffaceous, with minor quartzite and massive white quartz.
119	(461.7E 879.5N)	2,580		Light timber	Undulating hills and creek		Slates.	Wells GwFet	T380/33		No real outcrop; blue grey slate to north east and reddish thin bedded micaceous slates on SW side; minor massive white quartz throughout.
120	(461.6E 890.1N)	2,620					Dolerite	NM	T380/36		
121	(462.9E 890.1N)	2,620					Dolerite	NM	T380/36		
122	(416.0E 864.7N)	2,540		Medium timber with baeura and gorse.	Steep hillsides and creek	1,800-2,000	No outcrop, some basalt float appears local	Of-Qt pof	MR5/67		Float boulders of quartzites, silicified mudstones, dolerite and basalt.
123	(418.4E 868.9N)	2,800				2,800	Basaltic soil and gravel	Qg	MR4/31		
124	(418.6E 870.5N)	Inferred 2,670				2,800		Qg	MR4/31	NL cf123	
125	(424.0E 866.1N)	2,620		Light timber	Gentle hillslope	1,850	Talus? largely dolerite.	Qg poh	MR4/31		Centred over a patch of glacial moraine deposited on southern side of hill of massive quartzites and schistose shale.
126	(403.0E 869.9N)	2,580				3,300		pof	MR7/116	NL	
127	(405.2E 859.6N)	2,640				2,200-2,400		pof	MR6/75 (MR7/119)	NL	
128	(455.6E 895.5N)	2,700		Light timber	Ridge system		Dolerite	NM	T380/13		
129	(411.8E 917.3N)	2,700		Thick F.C. Pinus Radiata plantation.	Hillslope	500-800	Basaltic soil	Egg	MR5/54		With float boulders of basalt, weathered tuff (greywacke) and a medium grained intrusive basalt/dolerite.

Anomaly Number	Location Coordinates	Outline Contour	Contractors Interpretation	Field Accessibility	Location Topography	Elevation	Surface Lithology	Mapped Geology	Photo Reference	Remarks	Notes
130		3,100 Trend 16		Semi cleared to rain scrub.	Undulating hills and valleys.	1,750-2,100	Magnetic Beulah F'mation basic volcanics.	6	MR6/87 (MR7/109)	SPEC	No continuous outcrop, in places overlain by boulder (conglomerate or gravel) float; minor silicified sandstone and siltstone also evident.
131	(439.1E 920.9N)	2,620 Trend 19		Cleared, Latrobe Flat outskirts.		50	No outcrop-grey sandy soil.	Ps			
132	(451.2E 921.6N)	2,500		Grazing to light timber	Low knolls above gentle slope.		Dolerite knolls protruding through Tsands	NM	T381/152		On east bank of Rubicon River to east of anomaly, outcrops of west dipping sandstones and shales (Permian?)
133	(451.0E 923.3N)	2,500					Dolerite knolls protruding through Tsands	NM	T381/152		
134	(448.3E 928.0N)	2,500		Medium to light timber and bracken	Gentle ridge		No outcrop; Tertiary sand		T381/153		
135	(402.6E 931.5N)	3,100		Cleared to very thick timber	Steep hillslope	350-650	Basaltic soil overlying conglomerate and other sediments	Tb Odd 6	DRA/44	Badger mine is 1/4 mile north.	Conglomerate outcrops under basalt on western side and as massive bluff to the east. S/S and siltstone types with some Fe material outcrop poorly in deep valley of Ferndene Creek.
136	(465.2E 875.1N)	2,640		Cleared	Creek flats		Dolerite and also possibly Kentish Volcanics - both magnetic	Wells Jd/6wck	T380/72		Part of a system of anomalies which roughly follow Kentish Volcanics trend and also inferred ring dyke dolerite feeder.
137	(424.8E 903.2N)	2,400		Cleared	Gently undulating	1,000	Basaltic soil and talus in creek hollow.	Qt/Tb	MR3/8		Basalt hills to SE and NW.
138	(420.3E 897.2N)	2,800		Grazing to crop	High level undulating hills.	1,400	Medium to coarse grained tuff-float-magnetic	6gg	MR4/40		To west of anomaly have abundant micaceous shale and siltstone float.
139	(420.8E 880.2N)	2,660		Thick timber and scrub	Steep hillside	1,050-1,250		Og	MR4/34	NL cf12.	River section shows massive bedded grey limestone.
140	(418.6E 878.8N)	2,860		Thick timber and scrub	Steep hillslope	2,100-2,350	Float only	Om	MR4/34	cf12	Including basalt and granite at western end, quartzites siltstones and mudstone to east. No magnetic materials.
141	(405.0E 856.0N)	2,600			Steep hillside	2,700-2,900		Pbc/Pwt p6	MR6/75 (CPR1/92)	NL	
142	(402.8E 850.2N)	2,640			Stradling deep creek.	2,700-2,800		p6	CPR2/37	NL	Near old Mt. Pelion Copper Mine.

Stratigraphic symbols taken from the respective published 1 mile map sheets.

Photo Reference { CPR2/92 = Central Pateau Run 2, photo 92.
{ DRA/42 = Devonport Run A, photo 42
{ MR6/59 = Mersey Run 6, photo 59.

Note: NL = ground location not reached - generally not readily accessible.
NM = Stratigraphy not yet mapped by Mines Department.
SPEC = Suite of specimens collected, usually of magnetic materials.