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ANNUAL REPORT

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E.L. 41/71
(HENTY-YOLANDE AREA)

1974-75

MICROFILMED

BY:

N. W. Sheppard
The Mount Lyell Mining and Railway Co. Ltd.

DRAUGHTING: R. G. Wilson

Copies to: General Office
Mine Office (3)
Tas. Mines Department

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1. INTRODUCTION

Much of the years work was concentrated in the areas of the Basin Lake Grid, Madame Howard Plains Grid and extensions of the West Sedgwick Grid.

The Basin Lake Grid, consisting of 17 lines (total footage 135,900') was established in October 1974, over a sequence of intermediate porphyries, acid lavas and pyroclastics north of Basin Lake. The grid was surveyed with gradient array I.P. and ground magnetics, and mapped in detail during November and December 1974. The I.P. survey outlined thirty nine anomalous responses of which twenty one are considered to have major geophysical significance. Five of these primary anomalies coincide with two zones of disseminated pyrite mineralisation, one of which was inconclusively drilled by the previous licence holders (Pickands Mather & Co. Int.).

The Madame Howard Plains Grid, comprising 7 lines (total footage 21,000') was cut during December 1974 and also surveyed with gradient array I.P. and ground magnetics. The geology is represented by pyroclastics and minor shales with an acid porphyry body outcropping in the north and eastern part of the grid; a number of small baryte lodes can be seen in shallow old workings. One minor anomaly over 3 lines was defined by the I.P. survey.

Extensions to the West Sedgwick Grid, comprising 3 lines to the north and 7 lines to the south-west with a total length of 39,600', were pegged during December 1974, and surveyed with gradient array I.P. and ground magnetics, and mapped during January and February 1975. The I.P. survey delineated twenty two anomalies of which nine were considered to be of major geophysical importance, including one outlined over an outcrop of semi-massive pyrite. Geology in the areas surveyed is considered to be essentially similar to that encountered on the main grid, although outcrop over much of the northern extension is masked by glacial moraine.

A soil geochemistry programme was undertaken on the West Sedgwick Grid over I.P. anomalies defined in the 1973-74 survey. A number of coincident geochemical responses were discovered, these included Pb values of more than 600 ppm over several geophysical anomalies in the southern part of the grid.

Reconnaissance geological mapping and associated stream sediment sampling were also carried out, mainly along the Langdon River and its tributaries; this work has broadly confirmed the geology and structure postulated in previous years.

Expenditure during the year amounted to $43 607, bringing the total expenditure on E.L. 41/71 since 1971 to $87 206. A budget of $84 100 has been recommended for 1975-76.

The exploration programme proposed for the 1975-76 year consists of:

1. Completion of the regional mapping and stream sediment sampling programme.
2. Geophysical coverage and detailed geological mapping of an area west of the Basin Lake and West Sedgwick Grids to the West Coast Anticlinorium axis.
3. Detailed geophysics and soil geochemistry over the anomalies located on the Basin Lake, West Sedgwick extensions and Madame Howard Plains Grids.
4. A 4 or 5 hole drilling programme on the West Sedgwick Grid.

2. ACCESS

Part of the old Pickands Mather I.P. line cut parallel to the Cambrian Volcanics/Owen Conglomerate contact was re-cut to facilitate access between lines at the north-eastern end of the West Sedgwick Grid. Proposed walking tracks (2) to improve access to the Henty River, and a track along a tributary of the Langdon River were not cut. Work along the Langdon River during the summer has in the main obviated the need for the latter.

3. GEOLOGY

3.1 Introduction

Reconnaissance mapping was almost entirely confined to the Langdon River and its tributaries, with some work being carried out along the Murchison Highway north of the Loftus-Hills Memorial. Detailed mapping was undertaken over the Basin Lake Grid, Madame Howard Plains Grid, and extensions of the West Sedgwick Grid. In addition, the complex and in part weathered sequence in the south-east part of the West Sedgwick Grid necessitated some re-mapping. Overall this work has largely confirmed the geology and structure outlined in the 1973-74 annual report. Therefore the following description and discussion is confined to giving further details and amendments to previous descriptions.

A further twenty six samples from two suites of rocks were sent to Amdel for thin section descriptions (Whitehead, 1974b, 1975). The results have further helped to define and delineate geological units in the licence area, and have been incorporated into the stratigraphic terminology as shown in the geology maps and following description.

3.2 Henty-Yolande Greywackes

No mapping has been carried out in the past year in areas where rocks of this group outcrop. A thin section description is now available of a coarse grained magnetite-rich tuff (533, C53) from east of the Sisters Hills (see Section 4.1, 1972-73 annual report). The pyroclastic is composed largely of moderately well sorted and fairly closely packed crystals of felspar (probably mainly oligclase or andesine) with some pyroxene crystals, 5-10% opaque oxide grains (magnetite?) and occasional lithic and devitrified volcanic glass fragments, now represented by plagioclase and chlorite respectively. Fine grained plagioclase and chlorite form the matrix. The probable andesitic nature of the tuff suggests that it represents the most southerly known portion of the mixed sequence described below.

3.3 Dundas Group

Mapping along the Murchison Highway north of the Loftus-Hills Memorial, and several thin section descriptions of rocks from this traverse and the Henty River to the north-west, make it clear that this sequence is substantially different from the Henty-Yolande Greywackes to the south with which it interfingers? and has been previously grouped(?). The formation contains a variety of rock types and has some similarity with that described by Corbett (1974) from west of the Henty Fault and north-west of Henty Camp (E.L. 9/66).

Andesitic volcanics are probably dominant, and are represented by crystal and crystal lithic pyroclastics ranging from agglomerates to coarse grained tuffs and probably finer; (two partially weathered porphyritic lavas outcropping along the Murchison Highway may be andesites). A crystal tuff (74/187, P28) has been described as mottled in appearance and containing abundant loosely packed crystals of slightly sericitised plagioclase and a few fragments of andesitic volcanics. The groundmass comprises varying proportions of fine grained chlorite, plagioclase and a little quartz? and may have been in part originally vitric. By contrast a lapilli tuff (379/3, P26) from the Henty River, although also containing abundant plagioclase crystals, has a closely packed texture and includes numerous fragments of andesitic volcanics which exhibit a variety of textures. Some other fragments are slightly deformed and now composed of chlorite which has replaced vesicular volcanic glass, and a very few show some evidence of perlitic structure and may have been acidic. The groundmass consists of chlorite and cryptocrystalline quartz.

Basic rocks are also well represented, a small body of gabbro, two dolerite 'sills' and a basalt outcrop along the Murchison Highway, and some of these have been described by Solomon (1964, pp. 176-177). The dolerites may well be the faulted, northward continuation of an extensive sill of similar composition which outcrops to the south-east of the Loftus-Hills Memorial. Similar rocks are also found in the Henty River, and a coarse grained andesitic basalt or fine grained dolerite (376/1, P26) from this locality has been described as composed largely of intergrown prismatic plagioclase (andesine) crystals of random orientation, the interstices being filled by opaque oxides, small crystals of clinopyroxene and some fine grained chlorite of apparently primary origin.

Acid volcanics appear to form a minor part of the sequence, although several units of weathered and graded crystal tuffs exposed along the Murchison Highway may be of this composition. Two ignimbritic tuff units have been mapped, a sample of one shows a pale greenish-grey rock (74/189, P29) with a mottled and slightly streaky appearance. In thin section it now consists mainly of sericite and fine grained quartz with scattered grains of opaque oxide and leucoxene, a few apatite crystals and occasional shreds of muscovite. Variations in the proportions and grain size of the various minerals and lines of dark opaque minerals mark relict textures which show that the rock was formerly composed largely of vitreous material with some lithic fragments, felspar crystals and collapsed pumice. The boundaries between the former are generally no longer clearly defined, and they had almost certainly become welded before the rock recrystallised. A slightly sheared and recrystallised coarse grained crystal lithic tuff (369, P25) from the Henty River contains plagioclase crystals, both singly and in groups, and fragments of differing composition, some of which appear to have been andesitic in composition and texture. These are scattered through a recrystallised matrix consisting mainly of fine grained quartz and turbid potash felspar, with some patches containing plagioclase.

Argillaceous sediments form about 5% of the sequence, and comprise blue/grey and black, sometimes pyritic shales and siltstones which are usually located at the tops of the graded pyroclastic units. Normally less than 10' thick, their uppermost portions are often eroded and incorporated into the basal parts of the overlying pyroclastics.

3.4 Queenstown Pyroclastics

3.4.1 Acid Tuffs and Argillaceous Sediments

Mapping in the Langdon River area has confirmed that rocks typical of the Queenstown Pyroclastics extend from the Yolande River to the Tyndall track and northwards. Briefly, these are grey/green-fawn, fine-medium grained, occasionally coarse grained, predominantly crystal-(vitric?), tuffs, with minor argillaceous sediments. Occasional tuffs show ignimbritic textures. Both pyroclastics and sediments are sometimes siliceous or have been silicified, giving them a 'cherty' appearance.

To the east of the Langdon River between where it turns to the east, and the Yolande River, little is known of the geology because of either a cover of moraine or poor access due to thick vegetation. However to the north and north-west of Basin Lake the Langdon River provides a good section as far east as a large intermediate porphyry body.

It has proved difficult to fix a boundary between the Queenstown Pyroclastics and the volcanics of the Central Lava/Ignimbrite Belt along this river section as the rocks characteristic of the two sequences appear to interdigitate over a width of about two thirds of a mile. In order to draw a line the contact has been arbitrarily selected as the point of westernmost outcrop of acid lavas, which along the Langdon River occurs towards the western end of the gorge/waterfall section, almost immediately east of a felspar-quartz porphyry.

Two rather distinctive rock types, a mottled dark blue/pale grey, vitric-lithic lapilli tuff and a 'spotted' tuff, which occur sparsely throughout the Queenstown Pyroclastics and were detailed in last years annual report, have now been described in thin section. The vitric-lithic tuff (444, F428) is now composed mainly of sericite and microcrystalline cryptocrystalline quartz, with a few scattered fragments of quartz and plagioclase, some of which may be phenocrysts in the larger fragments. Patchy variations in colour suggest the former presence of fragments, boundaries vary from well defined to vague. The possible presence of volcanic shards is inferred by poorly defined relict textures. In places, very small flakes of mica show parallel orientation and appear to be of detrital rather than volcanic origin. The 'spotted' tuff (74/132, F427) is now composed mainly of a very fine grained intergrowth of microcrystalline-cryptocrystalline quartz and chlorite, with a few larger grains of quartz and plagioclase. Fine grained carbonate occurs throughout the rock as very small irregular aggregates and larger porous and spongy patches. The numerous 'spots' averaging 1-5 mm in size contain more chlorite and less sericite than the groundmass, and are oval and elongated parallel to a weak foliation as defined by the sericite. Their origin is obscure.

3.4.2 <u>Intermediate and Basic Volcanics</u>

The formations described in Sections 3.3.3, 3.3.6 and 3.5 of the 1973-74 annual report are now all considered to be extrusive in nature and spatially related. (The dolerite outcropping to the north of the Yolande River Porphyry is now believed to form part of the Dundas Group (3.3 of this report and 3.2 of the 1973-74 report).

Rocks belonging to this suite are now known to extend at least as far north as the Lake Margaret Tram pyrite lens, and outcrop mainly to the west of the Lake Margaret road where it runs north/south. The position of the western boundary of the sequence is not known with any certainty, but should be elucidated by mapping along and in the vicinity of the Lake Margaret Tramway.

A greenish-grey rock (73/13, F406) striking north-north-east cuts the Lake Margaret road about $\frac{3}{4}$ mile from its junction with the Murchison Highway. It has been extensively altered by either deuteric or hydrothermal solutions, but retains relict textures suggesting a basaltic rock. Remnants of plagioclase are intergrown in random orientation, but most of these have been replaced by turbid, potassic felspar, sericite and chlorite. Interstices contain varying proportions of unidentifiable turbid alteration products and chlorite with locally some leucoxene. There are also very numerous irregular patches of chlorite and a few of secondary? quartz.

At the southern end of the sequence a partly altered porphyritic basalt (501, F404) outcrops in a quarry near the Strahan/Queenstown/Zeehan road junction. This rock was described by Solomon (1964) as an augite-albite gabbro and was therefore placed (with reservations by the writer) in last years report in Section 3.5 (Basic Intrusives). It is a greenish/grey, fine-medium grained rock containing over 20% of fresh clinopyroxene phenocrysts which are scattered through a groundmass composed largely of intergrown, prismatic plagioclase crystals. These crystals now appear turbid and have been altered to potash felspar. Interstices contain chlorite, some secondary actinolite and carbonate, opaque oxides and traces of epidote.

3.5 Central Lava/Ignimbrite Belt

3.5.1 South of the Basin Lake Moraine

The only mapping carried out in this area in the past year has been some limited work in the south-eastern part of the West Sedgwick Grid. This has helped to place more accurately the boundary between the acid ignimbrites and minor lavas, and the andesitic volcanics of the Agglomerate Hill sequence. It has also shown that a succession of acid, altered and pyritic volcanics occurs in a narrow belt between the andesites of Agglomerate Hill and the Comstock Tuff volcanics outcropping on Zig-Zag Hill, but further work needs to be carried out to accurately define the limits and rock types of this belt.

A fine grained pale grey volcanic (74/171, F429) which was probably an ash-flow tuff was collected from just west of the boundary with the Comstock Tuffs. In hand specimen the rock has a fine streaky appearance which strongly resembles flow structure. The volcanic is now composed largely of sericite and quartz, but original textures are moderately well preserved and show that the rock contained numerous fragments of widely varying size which were probably largely volcanic glass. Material surrounding these fragments shows flow lines marked mainly by dark opaque material, and the general appearance suggests that some of them were deformed and rounded by viscous flow. Some of these fragments now contain concentrations of pyrite, locally up to 40%. The rock also originally contained a few harder fragments, now composed mainly of quartz and at least one crystal of phenocryst size.

A similarly recrystallised and pyritic volcanic (73/39, F408) has been described from a location just to the west of the West Coast Range, and south of the Basin Lake Moraine. This is a pale grey, weakly foliated rock now composed largely of a fine grained mosaic of quartz grains intergrown with varying concentrations of sericite. Scattered through this mosaic are very numerous lenticular to irregular patches of sericite and also a few quartz phenocrysts. A few of these patches show relict streakiness suggesting that they were probably fragments of pumice, others show traces of subrectangular shapes indicating former plagioclase phenocrysts. Pyrite grains occur in aggregates mainly in patches of sericite, a few apatite grains are also present. This lava? is part of a north-south striking zone of acid volcanics containing disseminated pyrite; these rocks are very similar to some of the volcanics encountered in the Prince Lyell and Cape Horn orebodies.

A pale pink-pinkish/grey acid volcanic (74/4, F415) outcrops on a ridge about ¼ mile north-west of Agglomerate Hill. Petrographically it is similar to the two specimens described above, being extensively replaced by rather turbid sericite which in places is intergrown with fine grained quartz. Numerous remnants of plagioclase now partly replaced by sericite, and with poorly defined boundaries, occur scattered through the sericite-quartz intergrowth; a very few zircon grains are also present. Original textures have not been preserved.

A 'quartz-felspar' porphyry which outcrops in the Yolande River south-south east of Basin Lake was tentatively included in the 'Upper Haulage Station' sequence (3.3.5 1973-74 annual report). However a thin section description of this fine grained, partly altered, grey rock (74/74, S237) suggests that it is of dacitic composition and either a pyroclastic or lava; it has therefore been grouped with the volcanics of the Central Lava/Ignimbrite Belt on the grounds of petrological similarity and strike continuity. This volcanic contains numerous plagioclase phenocrysts of varying sizes in a slightly turbid groundmass of very fine grained quartz and felspar intergrown with chlorite. The groundmass does not show any real evidence of relict textures. A few small grains, some replaced by chlorite and others by epidote, are also present. Most of the plagioclase crystals have been partly sericitised, and there are scattered irregular patches of secondary carbonate, also very small veinlets and patches of turbid fine grained epidote, throughout the rock.

3.5.2 North of the Basin Lake Moraine

A substantial proportion of the field seasons mapping has been carried out in this area, particularly on the Basin Lake Grid and along the Langdon River and some tributaries. This work has shown that the fairly well defined groupings recognizable to the south of the Yolande River, i.e. pyroclastics giving way eastwards to ignimbrites and these in turn to lavas, cannot be applied here. Instead there appears to be a mixed sequence comprising pyroclastics typical of the Queenstown Pyroclastics, ignimbrites, lavas and argillaceous sediments in approximately equal proportions (Map 3). The sequence is bounded to the west by rocks of the Queenstown Pyroclastics and to the east by either andesitic lavas and tuffs or a large intermediate porphyry body. It has a width of approximately 3,000' at the northern boundary of the licence area, decreasing to about half this figure about three quarters of a mile to the south due to a 'bulge' of intermediate porphyry. Further south it thickens again, and in the Langdon River has a width of over 4,000'.

The lavas differ from those in the Central Lava/Ignimbrite Belt to the south in that they are grey/green in colour as against pink, red and purple. Other differences include their amygdaloidal nature and the small insignificant appearance of the felspar phenocrysts in hand specimen. Lavas from the gorge/waterfall section of the Langdon River frequently contain scattered grains of pyrite.

A sample (74/156, S238) taken from near the junction of the Tyndall track and the track to Leech Hill contains numerous small plagioclase phenocrysts, many of which have been extensively replaced by carbonate. The groundmass is composed predominantly of very fine grained sericite and some quartz with a few scattered patches of finer grained turbid felspar and occasionally chlorite, and also a few small aggregates of leucoxene. Most of the sericite shows a preferred orientation, and this defines a moderately strong orientation which the direction of orientation of the plagioclase phenocrysts is also parallel to. Numerous fine markings which strongly resemble flow lines can also be seen.

A very fine grained grey rock (74/193, S240) outcropping to the north of the swamp in the north-western part of the Basin Lake Grid has been identified as a tuff or tuffaceous sediment. It may originally have been composed largely of vitric material with scattered small crystals of quartz and felspar and lithic fragments, but it has been replaced mainly by very fine grained, turbid potash and plagioclase felspar and sericite. Patches of carbonate occur through the rock, and mostly appear to have replaced the crystal and lithic fragments.

To the east of the swamp, in the N.W. part of the grid, close to the eastern boundary of the sequence, there outcrops a distinctive lapilli tuff (74/158, S239) of possible ignimbritic origin. In hand specimen it is a fine grained grey rock with a fragmental texture defined mainly by variations in colour. The tuff contains numerous crystals and aggregates of plagioclase, and some fragments of a fine grained porphyritic volcanic, probably dacite. There are also deformed fragments and streaks of glassy material now composed largely of sericite, very fine grained quartz and in parts, felspar. Boundaries between these fragments are not clearly defined, and probably many became welded as the rock compacted. Pyroclastics very similar in appearance to this one can be seen in D.D.H. TYN. 2 a short distance to the north, and also outcropping about a mile to the south in about the same stratigraphical position, which suggests that this particular tuff could well be used as a marker horizon.

In a tributary of the Langdon River a few hundred feet to the north of the latter exposure, is an outcrop of a fine grained greenish-grey volcanic (75/7, S244) with a finely mottled appearance. It contains numerous crystals or phenocrysts of plagioclase and a few larger lithic? fragments composed of plagioclase with some interstitial quartz. Both crystals and fragments have been partly replaced by sericite and chlorite, and are surrounded by slightly turbid masses of extremely fine grained material which appears to be partly isotropic but which also contains a moderate amount of chlorite and some sericite. The composition and texture of this interstitial material is unusual, it shows patchy variations in colour and composition, but none of the usual textures found in vitric material in tuffaceous rocks, consequently it is uncertain as to whether the rock is a lava or tuff.

Several hundred yards north-west of this exposure is an outcrop of a fine grained grey and green, ignimbritic pyroclastic (75/11, S245) with patchy colouration and a streaky appearance. In thin section, crystals of partly sericitised plagioclase and a few grains of leucoxene and quartz are scattered through a slightly turbid matrix composed largely of flattened and drawn-out fragments. The boundaries between these fragments are not always clearly defined, but can be determined mainly by changes in composition and grain size. Some fragments are composed of fine grained quartz or felspar and chlorite, and others of cryptocrystalline material with some chlorite and sericite. A few have been almost entirely replaced by carbonate.

In previous annual reports mention has been made of a zone of disseminated pyrite in foliated and altered rock striking northward from Leech Hill towards the Tyndall track. This pyritic zone was originally considered to be part of the intermediate porphyry which surrounds it. However a thin section description from this zone suggests that at least part is acidic and pyroclastic in composition and origin. This particular rock (74/196, S242) is fine grained and greenish-grey with a mottled and streaky appearance. It has been recrystallised and extensively altered but relict textures show that it originally contained numerous corroded quartz crystals. The plagioclase crystals have been in general extensively replaced by quartz, whilst the fragments have been elongated in the direction of foliation, and the lithic variety partly altered to chlorite and carbonate with scattered grains of leucoxene. Interstices between the fragments contain a turbid mass composed of sericite, quartz and possibly some felspar.

Little can be deduced about the succession to the east of the intermediate porphyry and related rocks as the area is almost completely covered by alluvium, conglomerate scree or glacial moraine. However there are two outcrops about ½ mile east-south-east of Leech Hill on lines 60 and 66 of the Basin Lake

Grid, of an acid volcanic. This rock (75/2, S243) is fine grained and grey in colour, and contains numerous phenocrysts of plagioclase, a few of quartz and a few small patches of chlorite which may be altered mafic minerals. There are also some lithic fragments composed of medium grained plagioclase with interstitial chlorite, several of which have been elongated in a direction of the weak foliation. The matrix or groundmass is turbid and consists of small prismatic plagioclase crystals with interstitial chlorite, probably some potash felspar, and locally, sericite and a little secondary carbonate. Textures in some zones are similar to those found in acid lavas, and thus the rock is either a lava flow heavily contaminated with lithic fragments or a pyroclastic.

Approximately three quarters of a mile due south of these outcrops are several exposures of a foliated blue/grey/green volcanic which forms the core of a roche moutonnée, and is surrounded by moraine. In hand specimen this acid lava(?) appears to be in part auto-brecciated, whilst in other samples curving streaks of sericite divide the rock up into lenticular fragments.

3.5.3 Agglomerate Hill Andesitic Volcanics

This sequence is that described in part of Section 3.4.2 of the 1973-74 annual report under the heading of 'Andesitic Lavas and Pyroclastics'. Some remapping and sampling of the area around Agglomerate Hill has shown firstly, that the eastern boundary of the sequence lies just to the east of Agglomerate Hill and not against the Comstock Tuffs as previously believed, secondly, that whilst the core of the formation appears to be formed mostly if not entirely by lavas, towards the flanks at least, some ignimbrites and possibly even a few tuffs also occur. Finally the sequence seems to wedge out more sharply to the north than was previously considered to be the case, only a relatively thin sequence approximately 500'-700' wide and comprised mainly of tuffs, crossing a tributary of the West Queen River to link up with the Cockatoo Porphyry sequence to the north.

A representative of these tuffs is a pale greyish green coarse grained rock (74/20, F418) now composed predominantly of sericite intergrown with varying amounts of chlorite. Scattered through this mass there are patches containing minor amounts of fine grained epidote and numerous streaks comprising dark leucoxene. There is a marked foliation due mainly to sub-parallel orientation of much of the sericite and chlorite, and locally the sericitic material has recrystallised to fine grained muscovite. In general, relict textures are not well preserved, but what there are suggest the presence of former fragments, a few of which may have been vesicular, some appear to be elongated in the direction of foliation.

A very distinctive ignimbritic pyroclastic (74/31, F422), which outcrops a couple of hundred feet to the east of Agglomerate Hill, probably forms the easternmost part of the sequence. This tuff contains large sub-rounded pale coloured grains up to 1 cm in size, and some smaller, lenticular (compacted) pale coloured fragments in a very fine grained grey matrix. The large grains are very turbid and are now composed of granulated and recrystallised felspar which is now albite but was probably originally a more Ca-rich plagioclase. The matrix comprises fine grained chlorite and plagioclase and extremely fine grained leucoxene, probably with minor quartz; it displays a moderately strong foliation which curves round the albitic grains but which is clearly a result of compaction and recrystallisation under stress, and not a flow structure. Some slightly coarser grained muscovite occurs in pressure shadows against the larger felspar grains. The matrix also contains occasional lenticular patches composed mainly of fine grained muscovite and quartz (lithic? fragments) and sericite with minor quartz (flattened pumice? fragments).

The Cockatoo Porphyry to the north of the Agglomerate Hill Volcanics has in the past been considered to be a typical intermediate hornblende-felspar porphyry intrusive of fairly uniform texture. However remapping along line 84 of the West Sedgwick Grid has shown that some fawn, porphyritic volcanics which appear igneous but do not contain ferro-magnesian phenocrysts, also occur, these are almost certainly lavas. Also, about ¼ mile norht-north-west of Agglomerate Hill is an outcrop of dark grey/green crystal lithic tuffs which are graded and laminated in part. Finally the easternmost part of the porphyry on line 84 appears to be an acid differentiate as evidenced by the corroded nature of the ferro-magnesian phenocrysts and the presence of quartz phenocrysts; a similar rock type forming part of the Crown Hill Porphyry outcrops on the Lake Margaret road.

3.5.4 Howard Andesite Sequence

Much of the area of the Basin Lake Grid is occupied by the southern part of the Howard Andesites, a unit of intermediate rocks which occur over an extensive area between Newton Creek and Basin Lake. Exposure in the Howard Peneplain area is sporadic because of the thick rainforest cover and patchy veneer of moraine. To the north-east of Basin Lake and along the flanks of the West Coast Range, there is little or no exposure due to the presence of either alluvium or a thick moraine cover. Despite this the following divisions can be delineated. The central part of the sequence comprises a monotonous thickness of hornblende-felspar porphyries of intrusive? origin. Flanking this central core on the eastern side are scattered exposures of blue/grey-grey/green volcanics in which ferro-magnesian phenocrysts are absent or if present, sparse, corroded and altered; these rocks are probably lavas. Outcrop is very poor, but it is suspected that these andesitic lavas interdigitate with tuffs of the same composition, some argillaceous sediments and occasional acid lavas and pyroclastics. All these rock types have been found in holes drilled approximately along strike to the north (TYN. 1 and 3, HA 3) and south (Pickands Mather, BL 801 and 802).

To the west of the central core and north-west of Leech Hill a similar sequence about 1,000' in width probably occurs. Quarter of a mile north-west of Leech Hill is an outcrop of a greyish green intermediate lapilli tuff or ignimbrite (74/194, S241). Originally this pyroclastic contained crystals of plagioclase and numerous small fragments which were probably vitreous. The plagioclase has been extensively replaced by sericite and carbonate. Interstices now contain very fine grained chlorite and felspar with some sericite and locally there are dark marks suggesting that this was vitreous material which was probably still soft when it was accumulated. Some zones show a streakiness suggestive of collapsed pumice.

To the south of the track to Leech Hill the intermediate porphyry extends westwards in a distinct bulge, almost to the Basin Lake Grid base-line; the abrupt change in direction of this boundary suggest that it may be fault controlled. South of line 36 the contact bends away in a south-easterly direction, the porphyry interfingering? with the mixed acid sequence. This same boundary may be picked out in the main tributary of the Langdon River, just to the west of the power-line.

Exposed to the west along this tributary is a sequence, approximately 1,000' in width, of andesitic lavas with some shales and siltstones, minor pyroclastics including an ignimbrite of acid? composition, and possibly a few acid lavas, comprising respectively about 60%, 20%, 5% and 15% of the formation. The andesitic lavas are blue/grey/green in colour, some contain occasional ferro-magnesian phenocrysts which are usually corroded, others are amygdaloidal. A few of the lavas are apparently aphanitic with a blotchy purple/grey or pale grey colouration and these may be acidic.

3.6 Comstock Tuff

No outcrops from this formation has been mapped during the past field season. However several exposures of volcanics and sediments believed to be part of this formation can be seen just to the north of the Basin Lake Grid and west of the Owen Conglomerate. The strike of these rocks suggest that they extend southwards into the licence area although masked by moraine and conglomerate scree, and this is partly confirmed by the magnetic data. The formation is estimated to have a maximum width of about 2,000' across the northern part of the Basin Lake Grid, southwards it is believed either to slowly wedge out or be faulted out.

A description is now available of the crystal tuff (73/45, F411) mentioned in the 1973-74 annual report, which outcrops at the eastern end of line 60 of the West Sedgwick Grid. It is composed of moderately closely packed crystals of plagioclase, some quartz and opaque grains and a few lithic and chloritic fragments. Many of the plagioclase crystals are veined and partially replaced by potash felspar, and some of the quartz grains show embayment and corrosion textures similar to that seen in phenocrysts in acid volcanics. The chlorite fragments have been deformed and possibly represent devitrified volcanic glass, whilst the lithic fragments are of acid volcanics. The rock is cemented by chlorite and some fine grained potash felspar with traces of epidote.

A grey ignimbritic tuff (74/2, F414) collected from the south-west slopes of Zig-Zag Hill and described in last years annual report as a lithic lapilli tuff, contains numerous fragments, elongated in the direction of foliation, which now consist largely of sericite but may have been composed mainly of volcanic glass. Boundaries between the fragments are not always clearly defined and many now merge with the very fine grained, largely turbid, sericitic matrix. The rock also contains some plagioclase and a few quartz crystal fragments, numerous small lenticular patches of clear fine grained quartz and some very small areas of chlorite.

3.7 Structure

The broad structure of the Mt. Read Volcanics in the licence area has been outlined in previous annual reports, and observations during the past year have basically confirmed it. Mapping along the Langdon River has only approximately located the position of the major anticlinal axis, due to a lack of exposure in the critical area. Work along the upper parts of the Langdon River and its main tributary, and in the south-west part of the Basin Lake Grid has shown that the volcanics and sediments in this area are all part of the eastern limb of this major fold.

4. GEOCHEMISTRY

4.1 Stream Sediment Geochemistry

4.1.1 Introduction

The stream sediment sampling programme continued in conjunction with geological mapping, with approximately 40 samples being collected and analyzed, mostly from the Langdon River and tributaries north of Basin Lake. Another 15 samples were collected from localities which had previously been sampled during the 1973-74 field season, in the West Sedgwick Grid area. Concurrently with the collection of the sediment samples, stream water pH was measured using indicator paper graduated in divisions of 0.5. All analyses carried out over the past field season have been collated and are listed in Appendix II.

4.1.2 Hydrous Iron/Manganese Oxides (HIMO)

The possible effects of HIMO scavenging were discussed in the 1973-74 annual report. A number of localities which were sampled last year were found to contain high Mn or Co values (or both when figures were available for both elements) associated with anomalous amounts of one or more of the base metals, suggesting that the latter values resulted from co-precipitation by HIMO and were not 'true' anomalies. In an attempt to eradicate the effects of HIMO scavenging, several of these localities were resampled this year taking particular care to only collect active sediment away from stream banks wherever possible. The results of this resampling programme were in nearly all cases a reduction in both Mn (and/or Co) and base metal values, sometimes by as much as half; however Mn was still present in quantities which suggested that it was enhancing the base metal figures. (In samples for which Co but no Mn values were previously available, resampling and subsequent analysis confirmed the previously stated positive correlation of the two elements). It seems probable that, most, if not all, anomalous base metal figures accompanied by greater than about 400 ppm Mn can thus be fairly confidently regarded as enhanced to some degree above their true value. However it is quite possible that a real anomaly may be concealed within the spurious HIMO shell, and therefore in deciding the true status of such an anomaly recourse must be had to other criteria, such as whether the anomaly is an isolated one or whether a dispersion train is present, and the geology and any known mineralisation of the immediate area.

4.1.3 <u>Threshold and Background</u>

Threshold and background values were calculated in the 1973-74 annual report using a method described by Hawkes and Webb (1962) for small populations. This procedure, and particularly the determination of threshold, (and other similar ones) has recently been criticized by Sinclair (1974) and Parslow (1974) who advocate the use of cumulative probability graphs. One of the major criticisms of the previous methods was the arbitrary selection of the upper 2½% of every data set as anomalous. In the present work this was found not to matter greatly with the Cu values which posses a fairly symmetrical Gaussian distribution; however the Pb and Zn populations are strongly positively skewed, and the 2½% cut-off occurs in the middle of a string of values. However the writer has decided at present to rely on subjective visual examination of histograms to choose threshold values and continue with the Hawkes and Webb method for the determination of background. The reasons for this are as follows. If the samples collected from north and immediately south of Basin Lake are excluded (these samples consist almost if not entirely of pink silt derived from the Owen Conglomerate), the data available amounts to less than 100 samples whereas construction of a probability graph normally requires a minimum of about 100 values. Then, a number of the samples that are left are obviously spurious HIMO anomalies, and these can be taken into account by a subjective analysis of the data. Using the above two methods therefore, background and threshold values for Cu, Pb and Zn have been determined as 15 ppm and 40 ppm, 25 ppm and 45 ppm, 20 ppm and 45 ppm, respectively.

4.1.4 Stream Water pH

Stream water pH has been measured at 48 localities and was found to be extremely constant, values of 5.5 and 6.0 being recorded in about 90% of cases. The only other reading obtained was 5.0 at 4 localities. These figures compare with values of 3.5 - 4.5 and 4.5 - 6.0 from the Comstock Creek and East Queen Rivers respectively, above the Comstock and Cape Horn orebodies. The pH of the streams below these orebodies drops to between 3.0 and 4.0 which suggests that no base metal values obtained to date will have to be corrected for the effect of pH, and following on from this, major or extensive outcropping or sub-outcropping mineralisation occurs in the vicinity of the localities sampled for stream pH.

4.1.5 Discussion of Anomalies

All Cu, Pb and Zn analyses obtained during the year have been plotted onto graphs against Mn as detailed in the 1973-74 annual report. Only one 'true' anomaly is considered to be of any great interest and is detailed below. However all anomalies have been indicated on the stream sediment sample maps (Maps 5 - 8). Anomalies (including HIMO enhanced ones) associated with I.P. anomalies located on the West Sedgwick Grid are discussed in Appendix V.

A Zn value of 115 ppm (H.Y. 187) was recorded from a stream just above its confluence with the Langdon River into which it flows from the east. This stream drains a largely unknown area probably comprised geologically of Queenstown Pyroclastics, tuffs and argillaceous sediments, with minor lavas and ignimbrites(?) which are structurally situated in a zone of potential economic interest (see Section 6.2.3).

4.2 Soil Geochemistry

Soil sampling has been carried out over the thirty eight I.P. anomalies outlined on the West Sedgwick Grid in 1973-74. The samples were analysed for Cu, Pb, Zn, Co, Ni and Mn (see Section 5.1.2 annual report 1973-74) and the more significant results are listed in Appendix V.

Sampling was undertaken at 50' intervals over all anomalies, increasing to 25' intervals immediately over the four major responses. It was hoped that background could be established by sampling no more than 150' - 350' beyond the margins of the anomaly; the actual distance depending on the topography and position of any base of slope. However the analyses showed that for many of the I.P. anomalies either the background levels were very erratic or sampling was not carried far enough and consequently background could not be accurately calculated. In most instances the B horizon was selected for sampling, however in areas where moraine and conglomerate scree were present the B and C horizons were very poorly developed or completely absent. Consequently the A horizon had to be utilized for sampling in these cases (L. 00 750E - 1350E, L. 84 1050E - 1200E). Several sharp geochemical peaks were outlined but it is difficult to be sure whether they represent surface anomalies or anomalies in the solid rock beneath the drift cover. As in the B horizon sampling does not appear to have been carried out far enough away from the I.P. anomaly to be certain of the background levels. Very little soil cover was present over the moraine masked I.P. anomalies forming a zone at the eastern end of lines 00, 06, 12 and 18, and therefore samples tended to be a mixture of whatever was available. In order to overcome the problem of accurate background it is proposed to sample one or two lines in their entirety so that background concentrations over the various rock types may be determined. In future work, sampling the C rather than the B horizon in areas of rugged terrain may help to narrow the extent of the geochemical anomaly.

One unexpected result to emerge from the work is the relative abundance of Pb vis a vis that of Zn, as the usual relative solubilities of the two elements generally results in the reverse situation. Four possible explanations of this phenomenon are, firstly, that Pb is present in the rocks (and/or any mineralisation present) in much greater quantities than Zn. Secondly, the extensive firing of the area in the last 70 or so years (and the effects of the smelter in the southern part) may have resulted in the removal of Zn from the system through exposure to leaching. In this connection it may be remarked that the A horizon is very poorly developed over most of the area, probably as a consequence of firing and logging of the original rainforest vegetation and subsequent exposure of the topsoil to rapid erosion. Thirdly, in the high rainfall, cool temperate areas of the West Coast, the effect of humic acids is to reverse the normal solubilities of such minerals as galena and sphalerite, making the former much less stable than the latter (Baker, 1973). Lastly, if the soils were moderately acid, presumably Zn would behave in the same way as it does in stream-water of similar pH, and remain in solution.

5. GEOPHYSICS

5.1 Introduction

Reconnaissance induced polarization (I.P.) and ground magnetic surveys were carried out over the Basin Lake Grid, Madame Howard Plains Grid and extensions to the West Sedgwick Grid between November 1974 and January 1975 by Scintrex Pty. Ltd. The anomalies outlined on the Basin Lake Grid and West Sedgwick Grid extensions are detailed and discussed in conjunction with the geology in Appendices 3 and 4; those anomalies delineated on the Madame Howard Plains Grid are briefly discussed below.

5.2 Madame Howard Plains Grid

The Madame Howard Plains Grid comprises 7 lines (total footage 21,000'), a base-line near the eastern end and a walking track at the western end of the lines. The gradient array I.P. survey (Howland-Rose, 1975a) employed current dipoles spaced 3,000' or 4,000' apart with a potential dipole spread of 100'. Average resistivities in the area ranged from 1,000 ohm-m to 3,000 ohm-m, but extremes of 300 and 6,000 ohm-m were recorded, background chargeability was around 10 milliseconds; neither showed any correlation with rock type. The magnetic profiles were notable only for their extreme flatness, this lack of magnetic signature appears to be typical of the acid pyroclastics and lavas forming the Queenstown Pyroclastics and the Central Lava/Ignimbrite Belt.

Exposure is fairly good, particularly over the northern half of the grid which has recently been burnt. The rocks are frequently extensively weathered and/or altered. A felspar-quartz porphyry (the southern part of the Yolande River Porphyry) extends across the north-east part of the grid (an outcrop of the same is also present on the north-west corner of line 00) but appears to be abruptly cut off to the south by a fault which is postulated to run south-west from the Lake Margaret road turn-off. Occasional outcrops to the south may represent extremely weathered porphyry. The geology is otherwise represented by Queenstown Pyroclastics, which here comprise mainly coarse-fine grained tuffs (some of ignimbritic appearance) and shales; lithic-crystal lapilli tuffs are a fairly important component in the south-west part of the grid. Intermediate basic rocks are represented in the south-eastern portion of the grid by an andesitic lava, a possible dolerite and a spilite? these are all fairly limited in extent. Several small baryte diggings (see Section 4.6 annual report 1973-74) previously unknown to the writer have been located, also a number of quartz reefs. The strike in the area is predominantly S.S.E., but swings round to E.-W. forming a fold closure on line 36.

The I.P. survey outlined 7 minor anomalies and 1 moderate 10 millisecond response, depression in resistivity in all cases were minor (a maximum of 30%). Four of the anomalies, including the moderate response, form a line paralleling a creek in the north-west part of the grid and the lithological strike; rocks in the vicinity are pyroclastics and argillaceous sediments. The other minor anomalies are all apparently located within pyroclastics and argillaceous sediments adjacent to the N.E.-S.W. striking fault mentioned above.

5.3 Basin Lake Grid

The Basin Lake Grid consists of 17 lines (total footage 135,900'), a base-line down the western side of the grid and a sub-baseline at approximately 4,000'E. which extends from line 00 - line 66. The gradient array I.P. survey (Howland-Rose, 1974) outlined some forty anomalous responses of which twenty one are considered to have major geophysical significance. The survey employed current dipoles spaced 5,000' or 6,000' apart with the exception of lines 90 and 95/96 where the distance was 10,000'. Because of the length of the lines, lines 00 - 48 were divided into three blocks and lines 54 - 96 into two blocks for measurement purposes. The potential dipole used on all blocks was 100' with readings at 100' intervals and where necessary at 50' intervals. The chargeability background was about 12 milliseconds, with apparent resistivity varying from 1,000 ohm-m to 15,000 ohm-m, (background can be taken as between 3,000 and 5,000 ohm-m).

The chargeability results clearly indicate a number of distinct south-south-east trending zones of twice background located either side of the massive intermediate porphyry body. The strike extent of these zones varies between 2,000' and 3,000', and the width between 1,000' and 2,000'. Within these extensive haloes estimated to carry between ½% and 2% chargeable material, occur narrower horizons, the strike length of which varies from less than 600' to 1,500' and the width from 100' - 200'; these horizons are considered to contain 2% - 4% sulphides? The positions of the zones located on the eastern side of the grid is such that if originally connected they must subsequently have been offset by strike faulting.

In general the strike and location of the resistivity lows are coincident with the chargeability highs, however frequently the former extend further along strike than the latter, inferring that the host rocks for the chargeability highs, may, at least in part, be more conductive than the enclosing rocks. Resistivity highs were noted over background chargeability portions of the mixed acid volcanic sequence towards the western margin of the grid, and in the north-eastern corner where Comstock Tuffs sub-outcrop.

Three electrical soundings were taken to determine the thickness of the glacial cover. In the case of the soundings at line 60 6000E. and line 96 3500E., near surface and across strike inhomogenities precluded a meaningful interpretation of depth. Thus the suggested 25' - 30' thickness of moraine is believed to be too low by a factor of 2 - 3. Although the sounding at line 18 500E. was considered to be more reliable from a geophysical point of view, the indicated surface layer thickness of about 70' certainly does not apply to any superficial deposit, as a road section in the immediate vicinity shows a drift cover only 1' - 2' thick.

The strike of the magnetic data is on the whole the same as that for the chargeability and resistivity data. As with other surveys in the Mount Lyell area it is apparent that zones of high magnetism do not necessarily coincide with zones of greatest potential sulphide content. As was noted for similar rock types on the West Sedgwick Grid (Section 6.3 1973-74 annual report), the massive intermediate porphyry shows a higher, but erratic, magnetic profile compared with the acid and andesitic lavas and pyroclastics flanking it. However on lines 00 - 12 the magnetic profile over this body is extremely flat, the reason for this is not known. Similarly the Comstock Tuff rocks in the north-east of the grid are delineated by magnetic highs.

5.4 West Sedgwick Grid Extensions

Extensions to the West Sedgwick Grid comprise 3 lines to the north and 7 lines to the south-west (total footage 39,600') of the original grid. An imaginary base-line running parallel to the main base-line and south from where line 84 crosses the Lake Margaret road, has been used for the purpose of numbering along the lines in the latter area. The lines to the north of the main grid are connected by a sub-baseline running parallel to the main base-line and commencing at 3,000'E. on line 00.

The gradient array I.P. survey (Howland-Rose, 1975b) over the northern sub-grid utilized current dipoles spaced 3,000' or 4,000' apart and measurements were undertaken over three separate blocks. Background chargeability ranged between 10 and 12 milliseconds, and although the resistivities varied from 300 ohm-m to 50,000 ohm-m the normal background was between 2,000 and 5,000 ohm-m. Six significant anomalies were delineated, of which one was considered to be of primary geophysical importance.

Current dipoles used during the I.P. survey (Howland-Rose, 1975b) on the south-western sub-grid were spaced as for the northern sub-grid with two blocks being used for measurements. The chargeability background was within the range recorded for the northern sub-grid; however less than 600 ohm-m to greater than 8,000 ohm-m was recorded for background resistivity, but the normal variation was between 1,000 ohm-m and 4,000 ohm-m. Sixteen anomalies of interest were outlined, half of which were of particular geophysical importance.

The magnetic data was of low amplitude, as could be expected from the acid and intermediate tuffs and lavas present, and cannot be used in the delineation of rock units. Neither was any correlation with the I.P. anomalies apparent. Power-lines and the Lake Margaret pipe-line caused appreciable distortions in the profiles.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Reconnaissance Exploration

The reconnaissance mapping carried out since the licence area was acquired by Mount Lyell should be continued in conjunction with the stream sediment and pH sampling programme. The major area still remaining to be mapped is that to the north and north-west of the Henty River.

6.2 Detailed Exploration

6.2.1 West Sedgwick Extensions, Madame Howard Plains Grid, Basin Lake Grid

The I.P. surveys undertaken in 1974-75 have outlined a large number of anomalies (see Appendices 3 and 4, Maps 3 - 4, and Section 5 of this report for details), thirty of which are regarded as of major geophysical significance. It is recommended that all the anomalies be soil sampled at 50' intervals (25' intervals over the core of the major anomalies) and the samples analysed for Cu, Pb, Zn and Mn. When the results of this programme have been evaluated in conjunction with the geological and geophysical data, a diamond drilling programme may be recommended.

6.2.2 West Sedgwick Grid

The results of the soil geochemical, geophysical and geological programmes carried out to date (for details see Appendix 5) indicate that drilling is warranted at three localities.

(a) Line 102S. coincident geophysical and geochemical anomalies between 3650E. and 4050E. (anomaly 16, Appendix 5) occur over altered, foliated and mineralised acid lavas beneath the Tyndall Group. A diamond drill hole is recommended, collared at 102S., 3100E., drilling eastwards to the base of the Tyndall Group. Length approximately 1,200'.

(b) Line 84S. coincident geophysical and geochemical anomalies between 225E. and 380E. (anomaly 12, Appendix 5) over a sequence of shales and pyroclastics should be tested by a 700' diamond drill hole, collared at 00.

(c) Line 84S. a coincident geophysical and geochemical anomaly between 1050E. and 1200E. (anomaly 13, Appendix 5) over moraine covered acid volcanics should be tested by a 1,000' drill hole, collared at 800E.

Two zones in the north-east part of the grid contain disseminated sulphides and should each be tested by one hole. Suggested drill hole locations and data are : line 6N., collared at 400W., drilling east, length of hole about 800'; and line 12S., collared at 5200E., drilling east to conglomerate, length of hole about 1,500'.

Two anomalies of primary geophysical importance at line 42 550E. and line 48 1650E. did not respond to geochemical sampling. To determine the authenticity of these 'shallow' gradient array I.P. anomalies it is suggested that they be re-sampled taking the C rather than the B horizon, and that detailed pole-dipole or dipole-dipole I.P. be undertaken over them.

6.2.3 Proposed Extensions to the Basin Lake and West Sedgwick Grids

Recent work on the Rosebery massive sulphides (Braithwaite, 1974) indicates that the deposits are located within a sequence similar to the Queenstown Pyroclastics and approximately one mile west of a major anticlinal axis. The orebodies are overlain by a thick sequence of ignimbritic pyroclastics, which again can be compared to the ignimbrite portion of the Central Lava/Ignimbrite Belt and the flanking eastern margin of the Queenstown Pyroclastics. The western contact of the Mt. Black Volcanics is located about ½ mile east of the Rosebery mine, the description of these volcanics suggests that a similar sequence of rocks in a similar stratigraphic position north of Queenstown would be the intermediate lavas and hornblende-felspar porphyry intrusives. This comparison suggest that the sequences of highest economic potential for Rosebery type deposits in the Henty-Yolande licence area are the Queenstown Pyroclastics east of the major anticlinal axis together with the ignimbritic portion of the Central Lava/Ignimbrite Belt to the east.

Parts of these sequences are already covered by the Basin Lake and West Sedgwick Grids, and it is proposed to cover the remainder by extending these grids as far west as the anticlinal axis mentioned above. The grids to be surveyed with gradient array I.P., ground magnetics and mapped in detail.

The area between the two grids probably consists of similar rocks. However, the deep moraine cover (up to 200') may preclude the use of any ground geophysical method at the present time.

6.3 Access

To improve access to the Henty River for mapping purposes, the cutting of two tracks is recommended.

Access to the two drill sites on line 84 of the West Sedgwick Grid can best be achieved by up-grading an overgrown four-wheel drive track which leaves the Lake Margaret road where line 84 crosses it. An extension of about 500' will be necessary to reach the proposed drill site at 800E. The drill site located at line 102 3100E. can either be reached by prolonging the above extension up a west-north-west trending spur of Agglomerate Hill, or by improving the track up the east side of Zig-Zag Hill and constructing an extension down the fairly gentle south-west slopes.

6.4 Staffing

To complete the work outlined, one geologist and one field assistant will be required for most of the year, supplemented by additional staff for specific assignments, as required.

6.5 Budget

A total budget of $84 100 for E.L. 41/71 has been recommended for 1975-76. This comprises:

Item	Cost
Salaries (geologist and field assistants)	$20 500
Outside Services (bulldozing, etc.)	$ 4 900
Geophysics	$ 4 900
Diamond Drilling	$48 800
Materials	$ 2 200
General Costs	$ 2 800
	$84 100

AMENDED EXPLORATION PROGRAMME

Due to a reduction in finance available for exploration, the work programme and budget for 1975-76 have been modified as follows:

Exploration Programme

1. Basin Lake Grid - Detailed geochemistry of geophysical anomalies in order to outline drilling targets.

2. West Sedgwick Grid - Completion of detailed geochemistry of geophysical anomalies in order to outline drilling targets.

3. Madame Howard Grid - Detailed geochemistry of geophysical anomalies in order to outline drilling targets.

4. West of Zeehan Highway/Tyndall Track - Reconnaissance geological mapping and geochemical sampling to outline any areas requiring more detailed work.

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APPX 1

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THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED

BUDGET 1975 - 76

HENTY-YOLANDE PROSPECT

PERIOD NO:	1	2	3	4	5	6	7	8	9	10	11	12	13	
Salaries	360	359	115	300	300	300	300	300	1750	1750	1750	1250	1250	10000
Materials			4		100				100	100	100	200	100	800
Outside Services						1000	1000							2000
Diamond Drilling														
Geophysics														
Geology														
General Costs		219							200	200	200	100	100	1000
Hire of Equipment														
TOTAL COST HENTY-YOLANDE PROSPECT	360	578	119	300	400	1300	1300	300	2050	2050	2050	1550	1450	13800

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APPENDIX 2 526036

STREAM SEDIMENT VALUES

1972-73 and 1973-74 Field Seasons

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											A			
Sample No.	Cu	Pb	Zn	Co	Ni	Mn	Sn	pH	Cu	Pb	Zn	Co	Ni	Mn
HY 1	25	65	20	5	5	5	5							
2	15	30	15	5	5	5	5							
3	30	15	45	5	5	55	5							
4	30	5	10	NS	5	NS	NS							
5	115	30	25	5	5	50	5							
6	65	5	20	NS	5	NS	NS							
7	20	5	15	5	5	45	5							
8	20	5	40	5	10	280	5							
9	15	5	50	NS	25	NS	5							
10	10	5	25	NS	5	NS	NS							
20	5	5	10	5	5	5	5							
21	5	5	15	5	5	10	5							
22	15	5	20	5	5	25	5							
23	35	5	25	5	15	165	5							
24	10	5	15	5	5	140	5							
25	5	5	15	5	5	85	5							
26	5	5	20	5	5	5	5							
27	5	5	20	5	5	35	5							
28	15	15	30	5	30	55	5							
29	5	5	15	5	5	25	5							
30	5	5	20	5	5	35	5							
31	5	5	15	5	5	25	5							
32	5	5	20	5	5	15	5							
33	5	5	25	5	5	80	5							
40	5	5	25	5	5	10	5							
50	15	20	55	5	5	305	5							
60	40	50	60	5	20	155	5							
61	25	40	25	5	10	100	5							
62	50	90	110	25	15	1500	10							
63	25	45	10	5	5	190	5							
64/5	25	25	45	5	5	85	5							
66	15	205	15	105	5	7800	5							
67	15	50	15	50	5	2950	5							
70	25	25	20	5	5	NS	NS							
71	20	15	20	5	5	NS	NS							
72	35	15	20	5	5	NS	NS							
73	85	50	35	5	5	80	5							
74	35	50	25	5	5	NS	NS							
[illegible]	20	15	15	5	5	NS	NS							

Sample No.	Cu	Pb	Zn	Co	Ni	Mn	Sn	pH	Cu	Pb	A Zn	Co	Ni	Mn
HY 76	40	55	155	15	5	475	5							
77	55	90	110	25	15	NS	NS							
78	10	20	50	5	5	20	5							
79	45	70	95	35	15	1380	5							
80	10	15	30	5	5	NS	NS							
81	10	5	20	5	5	NS	NS							
82	5	15	10	5	5	10	5							
83	10	20	10	5	5	5	5							
84	20	40	30	5	10	NS	NS	5.5	5	20	20	5	5	35
85	25	50	45	5	5	NS	NS							
(162) 86	55	70	105	15	10	NS	NS	6.0	~~30~~	~~50~~	~~55~~	~~10~~	~~5~~	~~485~~
87	85	115	160	30	20	NS	NS							
88	15	20	40	5	5	NS	NS	5.0	5	10	5	5	5	5
89	15	30	80	5	5	NS	NS							
90	25	25	5	5	5	NS	NS	5.0	5	5	5	5	5	5
91	35	55	60	20	10	NS	NS	5.0	30	50	50	15	10	900
92	55	80	110	25	25	NS	NS	5.5	35	80	90	25	10	705
93	15	30	30	5	5	NS	NS	5.5	10	10	5	5	5	10
94	230	110	20	5	5	NS	NS	5.5	25	70	40	5	5	40
95	10	25	10	5	5	NS	NS		5	5	5	5	5	[illegible]
96	10	10	10	5	5	NS	NS							
97	10	15	5	5	5	NS	NS	5.5	5	5	5	5	5	5
98	20	40	35	10	5	NS	NS	5.0	10	15	10	5	5	70
99	10	15	5	5	5	NS	NS							
100	65	90	85	25	10	NS	NS							
101	10	45	15	10	5	NS	NS							
102	15	35	10	5	5	NS	NS							
103	15	30	10	5	5	NS	NS							
104	145	75	85	25	10	NS	NS							
105	50	80	60	15	10	NS	NS							
106	25	50	20	5	5	NS	NS							
107	45	60	30	15	5	NS	NS							
108	30	60	15	5	5	NS	NS							
(154) 110	45	55	155	20	20	1330	5	6.0	~~40~~	~~70~~	~~100~~	~~25~~	~~10~~	~~910~~
111	45	75	75	25	15	1500	5	6.0	30	90	55	30	10	1300
112	15	55	20	15	10	990	5							
113	5	5	5	5	5	10	5							
114	25	30	60	10	10	540	5	5.5	25	35	55	10	10	300
115	15	30	25	10	5	800	5							
116	20	60	10	5	5	80	5							
117	15	25	25	5	10	80	5							
118	10	15	10	5	5	10	5							

041

526038

	Sample No.	Cu	Pb	Zn	Co	Ni	Mn	Sn	pH	Cu (A)	Pb (A)	Zn (A)	Co (A)	Ni (A)	Mn (A)
	HY 119	35	25	15	5	5	50	5							
	120	35	60	55	10	5	430	5	5.5	20	45	45	10	5	335
	121	15	30	20	5	5	40	5							
	122	15	10	15	5	5	5	5							
	123	25	65	65	5	5	425	5							
	124	20	75	30	5	5	305	5							
	125	25	50	55	5	10	340	5							
	126	15	40	15	5	5	35	5							
	127	40	75	70	10	15	570	5							
	128	15	25	25	5	5	170	5							
	129	10	45	15	5	5	400	5							
	130	10	25	25	5	5	60	5							
	131	15	45	25	5	5	135	5							
	132	10	45	10	5	5	185	5							
	133	20	70	35	5	5	175	5							
	134	10	25	30	5	10	90	5							
	135	10	20	10	5	5	125	5							
	136	15	40	5	5	5	5	5							
	137	20	25	5	5	5	5	5							
	138	30	25	45	5	5	10	5							
	139	30	55	115	15	15	555	5							
	140	25	45	70	10	10	480	5							
	141	20	20	20	5	5	40	5							
	142	10	10	10	5	5	5	5							
	143	20	30	40	5	15	90	5							
	144	10	15	15	5	5	25	5							
	145	10	15	30	5	5	20	5							
	146	10	15	20	5	5	20	5							
	147	5	10	5	5	5	5	5							
	148	15	20	10	5	5	220	5							
	149	5	5	10	5	5	5	5							
362	150 ✓	5	35	5	5	5	5		5.5						
364	151 ✓	5	5	5	5	5	5		5.5						
365	152 ✓	20	55	25	10	5	510		6.0						
284	153 ✓	20	60	30	10	5	535		6.0						
286	(110A) 154 ✓	40	70	100	25	10	910		6.0						
353	155 ✓	5	10	5	5	5	5		5.5						
363	156 ✓	5	10	10	5	5	5		6.0						
	157	5	10	5	5	5	5		5.5						
361	158 ✓	5	10	5	5	5	5		6.0						
360	159 ✓	5	10	5	5	5	5		6.0						
359	160 ✓	5	10	5	5	5	5		6.0						
304	161 ✓	30	25	65	20	10	430		5.5						

042

526039

	Sample No.	Cu	Pb	Zn	Co	Ni	Mn	Sn	pH	Cu	Pb	Zn (A)	Co	Ni	Mn
	HY (86) 162	30	50	55	10	5	485		6.0						
308	163	20	70	25	5	5	30		5.5						
350	164	5	10	5	5	5	5		5.5						
358	165	5	10	5	5	5	5		5.5						
357	166	5	10	5	5	5	5		6.0						
356	167	5	10	15	5	5	5		5.5						
348	168	5	10	25	10	5	10		5.5						
346	169	5	10	15	5	5	10		6.0						
355	170	5	30	15	5	5	10		6.0						
354	171	5	10	10	5	5	10		5.5						
349	172	5	15	15	5	5	10		5.5						
341	173	5	10	10	5	5	10		5.5						
342	174	5	10	5	5	5	10		5.5						
347	175	5	10	5	5	5	10		5.5						
345	176	5	25	5	5	5	10		5.5						
	177														
	178														
343	179	10	10	10	5	10	5		6.0						
344	180	5	10	15	5	10	5		5.5						
340	181	5	10	20	5	10	5		5.5						
	182	10	10	20	5	10	35		5.5						
334	183	5	10	10	5	10	20		6.0						
337	184	10	20	15	5	10	180		5.5						
339	185	5	10	30	5	10	15		5.5						
338	186	5	10	15	5	10	10		6.0						
336	187	15	20	115	10	10	300		6.0						

Map (End of pocket.

Thin Section - Sample Locations

GIS 23226- 23368

APPENDIX 3

BASIN LAKE GRID

I.P. Anomaly Location	Geology	Geophysics
1. Line 00 2200E.-3600E. Peaks at 2550E. and 3150E.	Black shales, acid fine grained vitric tuffs, ignimbrites and other pyroclastics, passing east into andesitic pyroclastics. East margin of anomaly coincides approximately with western boundary of intermediate hornblende-felspar porphyry.	Secondary. A broad zone of twice background chargeability and 50% of background resistivity. 2 peaks of 20 and 25 milliseconds, maximum depths to source 200', width of source less than 100'. Anomaly open to the north and south. For dipole-dipole response see line 4N. 7E. - 11E. (Hallof, 1967).
	This anomaly was recently drilled (TYN.2) on the intersecting 'Zone A' grid (line 4N. 1160'W) revealing geology essentially as above and minor pyritic mineralisation in the shales.	
2. Line 06 2100E.-3000E. Peak at 2250E.	As line 00 2200E. - 3600E. Anomaly is the southward continuation of the same.	Secondary. A broad zone of twice background chargeability, with a distinct peak coincident with a 60% decrease in resistivity with less than 50', depth less than 100'.
3. Line 12 2350E.-3600E. Peak at 2450E.	As line 00 2200E. - 3600E. Anomaly is the southward continuation of the same.	Primary. A broad zone of twice background chargeability, with a peak, width less than 100', depth 100' on the eastern margin of an 85% decrease in resistivity. For dipole-dipole response see line 2N. 12E. - 15E. (Hallof, 1967).
4. Line 12 1800E.	A black shale outcrops approximately along strike 800' to the south.	Secondary. Anomaly is situated on the western margin of the above decrease in resistivity, width and depth both about 150'.
5. Line 18 1600E.-3500E. Peaks at 1725E., 2150E.-2350E., 3300E.	Probably as line 00 2200E. - 3600E. Black shale outcrops approximately along strike 300' to the north of the peak at 1725E.	Primary. A broad zone of twice background chargeability with an average reduction in resistivity of 50% - 70%. Several peaks, the most significant of which at 1725E., coincides with markedly reduced resistivity and has a maximum depth to source of about 160'. Anomaly form suggests a sharp western, and gradational eastern, contact.
6. Line 24 1200E.-3000E.	Probably as line 00 2200E. - 3600E.	Tertiary. Chargeabilities 50% - 70% above background, resistivity somewhat below background. Southern end of western portion of zone.

526041

I.P. Anomaly Location	Geology	Geophysics
7. Line 24 3200E.-3700E. Peak at 3650E.	Foliated and altered acid and intermediate pyroclastics and lavas? containing disseminated pyrite over a width of 500'+. Chip sample across zone assayed 5.8% pyrite, 175 ppm Cu, 75 ppm Pb, 400 ppm Zn.	Primary. Chargeabilities 2½ times background. 45 millisecond peak, width 50' - 100', maximum depth 100' - 150', coincident with about 65% reduction in resistivity. Anomaly lies immediately west of a resistive rock unit (intermediate porphyry?).
8. Line 30 3060E., 3550E., 3800E.	As line 30 3200E. - 3700E.	Primary. 15 - 20 millisecond anomaly at 3060E., depth 120', width 100' or less. Primary/Secondary. Peaks about 100' wide, depths 100' - 150' at 3550E. and 3800E., the latter appears to correlate with the peak at 3650E. on line 24. Zone dies out to the south.
9. Line 48 650E.-1000E.	Acid ignimbrites and other pyroclastics, and argillaceous sediments. Western contact of intermediate porphyry at about 1200E.	35 millisecond response comprising 2 peaks, one at 775E., width 150' - 200', depth 200', of primary interest; the other at 1000E., 50'? wide, depth 100', of secondary interest. Resistivity is reduced by about 65%.
10. Line 48 700E.-1800E.	As above.	A zone of anomalous magnetism, containing 1,000+ gamma peaks at 1250E. and 1450E.
11. Line 54 745E.-920E., 1200E.	Acid ignimbrites and other pyroclastics, and argillaceous sediments. Near questionated western boundary (1200E.?) of sequence comprising andesitic lavas with minor argillaceous sediments and acid pyroclastics?	Primary. 20 millisecond anomaly associated with a 60% depression in resistivity, 100' wide at a maximum depth of 150', centred at 825E., correlates with anomaly at line 48 775E.; L/M ratio infers a coarse grained source. Primary. 30 millisecond anomaly at 1200E., 100' wide, depth 100', probably dips east and correlates? with anomaly at line 48 1000E.
12. Line 54 1825E.	No exposure in the area, but possibly the andesitic lava sequence mentioned above.	Primary. About 25 millisecond anomaly, minor reduction in resistivity, width a minimum of 150'?, dips east?, depth 100'.

I.P. Anomaly Location	Geology	Geophysics
13. Line 00 7350E.	Alluvial cover, very little exposure. Probably an andesitic lava and intrusive porphyry sequence, with minor argillaceous sediments? akin to that seen in TYN. 3? along strike to the north. Comstock Tuff contact is situated 300' - 500'? to the east.	Primary. 30 millisecond anomaly, maximum depth 100', maximum width 150', very slight decrease in resistivity. Geophysics indicates the inferred non-conductive sulphide source to be contained within a disseminated halo, the whole within a resistive rock unit. For dipole-dipole response see line 10N. 36E. - 37E. (Hallof, 1967, 1968).
14. Line 03N. 7400E.	As line 00 7350E.	Primary. Anomaly probably correlates with that at line 00 7350E., width 50' - 75', depth 200', open to the north.
15. Line 03S. 7100E.	As line 00 7350E.	Secondary. A response of about 10 millisecond, depth 100', width 25' - 50'?, and coinciding with a 30% reduction in resistivity, probably correlates with that at line 00 7350E., but has been shifted west by faulting?
16. Line 18 5800E.-7350E. Peaks at 6575E., 6750E.-7250E. with sub-peaks at 7000E. and 7160E.	As line 00 7350E.	8 - 10 millisecond response between 5800E. and 7350E. marks the northern extremity of an extensive chargeability anomaly characteristic of a broad disseminated halo. Secondary. 10 millisecond anomaly at 6575E., width 50', maximum depth 100'. Primary. 20 millisecond anomaly with two peaks at 7000E. and 7160E., width 140'? and 180'?, depth 100'? and 200'? respectively. No significant conduction. For dipole-dipole response see line 6N. 44E. - 47E. (Hallof, 1967, 1968).
17. Line 24 6200E.-7300E.	As line 00 7350E.	Secondary. Zone of high chargeability. 7000E. - 7300E. represents the southern extremity of the most anomalous portion of the response at line 18 5800E. - 7250E. Response at 6200E. - 6900E. represents the northern extremity of a 2,500' long anomaly.

I.P. Anomaly Location	Geology	Geophysics
18. Line 30 6000E.-6650E. Peaks at 6100E., 6550E.	As line 00 7350E.	Primary. 25 millisecond response at 6100E., width 100', depth 140', is coincident with a sharp change in resistivity from 8000 ohm-m at 5900 - 500 ohm-m at 6250E. Chargeability over the resistivity low remains about twice background, suggesting some interconnection between sulphides. Secondary. 20 millisecond anomaly at 6550E., 150' wide, maximum depth 200'. Geophysics suggests a disseminated halo surrounding sulphides with some conduction. For dipole-dipole response see line 4N. 51E. - 58E. (Hallof, 1967, 1968).
19. Line 36 5950E.-6600E. Major peak at 6150E., minor ones at 6350E., 6500E.	As line 00 7350E.	Primary. A 42 millisecond response at 6150E., width 100' - 150', depth 100', coincident with a resistivity low of 1,000 ohm-m which although in absolute terms is high, represents a ten times increase in conductivity compared with the flanks of the anomaly. A broad chargeability high surrounds this peak and may represent a halo of disseminated sulphides.
20. Line 42 5900E.-6600E.	As line 00 7350E. In addition, glacial moraine of unknown but probable limited thickness (less than 50') extends over the eastern half of the anomaly; also the solid sequence may include acid lavas and pyroclastics.	Primary/Secondary. A 10 - 12 millisecond anomaly, width 700', depth at western and eastern margins 100' and 150' respectively. Some reduction in resistivity. This anomalous zone is seen in a weakened form on line 48, south of which it dies out.
21. Line 42 7130E.	Geology unknown, as area is covered by a substantial thickness (50'+?) of glacial moraine. Probably close to the contact of the Comstock Tuffs.	Primary. A 15 millisecond anomaly, width unknown, depth 200' with a coincident 50% reduction in resistivity. Its contacts with the enclosing rock are gradational.
22. Line 48 7000E.	As line 42 7130E.	Primary. Anomaly almost identical in form and magnitude, both in resistivity and chargeability, to that seen at line 42 7130E. Width 150'+, depth less than 200'.
23. Line 54 7000E.	As line 42 7130E.	Secondary. A 10 millisecond anomaly. depth 150', width 100'; very slight depression in resistivity, possibly dips east.

I.P. Anomaly Location	Geology	Geophysics
24. Line 72 5600E.	Area covered by substantial thickness of glacial moraine (about 50' - 150'). Two vertical holes drilled for Pickands Mather, one through chlorite and chlorite-sericite schist, the other through pyritiferous black shales and thin carbonate beds, then into acid? lavas and finally into andesitic lavas and/or intermediate porphyry.	Primary. 20 millisecond anomaly, maximum depth 200' or less, width 100', relatively minor depression in resistivity. For details of dipole-dipole and Turam surveys carried out for Pickands Mather, see Howland-Rose (1970) and Wuerch (1971).
25. Line 78 5470E.	As line 72 5600E.	Primary. 25 millisecond anomaly, depth 200'? maximum width 200'? accompanied by a 60% decrease in resistivity.
26. Line 84 5200E.	As line 72 5600E.	Primary. 25 millisecond anomaly, maximum depth 200', width 100'? dips west? 50% decrease in resistivity.

APPENDIX 4

526045

WEST SEDGWICK GRID EXTENSION (NORTHERN SUB-GRID)

I.P. Anomaly Location	Geology	Geophysics
Line 6N. 2900W.-2200W.	Acid lavas and ignimbrites with very minor argillaceous sediments.	Secondary. Chargeabilities of about twice normal background, depth 100', resistivities are high. The eastern end of the response is distorted by a pipe-line.
Line 12N. 3000W.-1800W. Peaks at 2950W. and 1900W.	As line 6N. 2900W. - 2200W.	Secondary. Twice normal background chargeability, with 20 millisecond peaks at 2950W. and 1900W., depths 100', widths 50' - 80'? Between 1850W. and 2050W. there is a depression in resistivity from 3,000 - 1,000 ohm-m. Sources of both anomalies are probably disseminated sulphides of the order of 1% over the source width.
Line 6N. 150W.	Acid lavas, ? and minor ignimbrites, foliated and altered in part and containing disseminated pyrite. Sample from old track about 300' north of anomaly assayed 2.8% FeS_2, 0.19% Cu. H.Y. 89 (about 2000' S.W. of anomaly) gave an anomalous Zn value of 80 ppm.	Primary. An 18 - 20 millisecond anomaly, depth 100', width 50' - 70', possibly dips steeply east, 60% in resistivity to still very high levels. This zone is represented on line 12N. by a broad increase in chargeability between 600W. and 050W. peaking at 200W. No northerly extension on line 12N. (faulted out?) but extends southwards onto the West Sedgwick Grid proper.
Line 6N. 2550E.	Area covered by glacial moraine almost certainly 25'+ thick. Solid sequence probably as line 6N. 150W.	Secondary. 13 millisecond anomaly, no real change in resistivity, appears to die out to the north. Both this anomaly and the one at line 6N. 150W. extend southwards onto the West Sedgwick Grid proper (for details see 4.3 1973-74 annual report, and in the Appendix of this report, West Sedgwick Grid line 00 5300E. - 5600E. and line 00 2820E. respectively).

045

526046

WEST SEDGWICK GRID EXTENSION (SOUTH-WESTERN SUB-GRID)

I.P. Anomaly Location	Geology	Geophysics
Line 84S. 1400W.-1000E. Major peaks at 300E., 460E. + several minor ones	Blue/grey and black shales with minor crystal tuffs. Because of local folding the rock strike is probably sub-parallel to the line.	Zone of chargeability twice normal background. Primary. A 10 millisecond response at 300E., depth and width less than 50', no decrease in resistivity, steep west dip inferred. Primary. 30 millisecond peak at 460E., width 50', depth probably less than 25', narrow 60% depression in resistivity to less than 1,000 ohm-m, 'massive' section of source is surrounded by a more 'disseminated' halo. Both anomalies are open to the north.
Line 90S. 1600W.-400E. Peaks at 1200W., 700W., 050W.-250W.	Probably mainly acid pyroclastics including ignimbrites, with possibly some minor shale units.	Zone of twice normal chargeability. Secondary. A 12 millisecond anomaly at 1200W., no reduction in resistivity, may correlate with minor anomalies at 1250W. on line 84 and line 96.
	As line 84S. 300E. 460E. Intermediate porphyry forms the western boundary?	Primary. 20 millisecond anomaly coincident with a 50% depression in resistivity at 700W., depth 100' or less, width 150', dip west, no sharp boundaries.
	As line 84S. 300E. 460E.	Primary. A 25 millisecond response with a resistivity depressed to 60[illegible] ohm-m at 050W. - 250W., source forms a sharp boundary with the enclosing material, depth less than 50'. Sulphide content averaged over the width of the source is 3% - 6%. This anomaly probably correlates with line 84S. 300E. and 460E.
Line 96S. 900W.-550E. Peaks at 850W., 250W.-600W.	About 150' to the south of the line, about on strike with 1000W., is a 10' wide pyrite lens averaging 30% FeS_2. This sulphide body is flanked to the west by weathered andesitic? lavas, and to the east by shales?	Zone of twice normal chargeability. Primary. 20 millisecond response, no depression in resistivity at 850W., source less than 25', depth 100' or less.
	As line 84S. 300E. 460E.	Primary. 25 millisecond anomaly, accompanied by a significant depression in resistivity at 250W. - 600W., maximum depth on western edge 50' - 70', and on eastern boundary less than 200'. Sulphide content as for line 90S. 050W. - 250W. This anomaly may correlate with line 90 700W. and line 84 300E. 450E. Zone dies out (faulted?) to the south.

046

526047

I.P. Anomaly Location	Geology	Geophysics
Line 102S. 660W.	As line 84S. 300E. 460E.	Primary. An anomaly of nearly 30 millisecond, maximum depth 100', less than 50' wide, associated with an increase in resistivity of about 100%, perhaps caused by silicification of enclosing rock unit. May correlate with line 96 850W. Zone dies our (faulted?) to the south.
Line 96 850E.	Argillaceous sediments and crystal tuffs, close to the western boundary of a small intermediate porphyry body.	Secondary. 10 millisecond anomaly, no change in resistivity.
Line 108S. 1200W.-800W.	Acid pyroclastics and minor shales, often strongly sheared and veined with quartz, possibly flanked to the west by andesitic lava. Adjacent to position of postulated major W.S.W. striking fault.	Secondary. An 8 millisecond response, no change in resistivity, maximum depth 100' at 800W.
Line 108S. 550E.	Acid ignimbrites, possibly also some tuff and shale horizons.	Primary. 20 millisecond anomaly with a depression of about 40% in resistivity to 1,600 ohm-m, width 25' or less, maximum depth 50', probably dips east.
Line 114S. 1050W.	Graded crystal tuffs and shales. May be flanked to west by andesitic lava.	Primary. 30 millisecond anomaly, no significant change in resistivity, width less than 50', depth less than 100', probably dips steeply east.
Line 120S. 2200W.	Acid pyroclastics? possibly flanked to west by acid or intermediate lavas.	Secondary. 10 millisecond anomaly, depression of about 60% in resistivity to about 1,000 ohm-m, maximum depth 100', does not form a sharp boundary with enclosing material.
Line 120S. 1400W.	Graded crystal tuffs and shales? Adjacent to major N.W. striking fault.	Secondary. As line 120S. 2200W., may correlate with line 114S. 1050W.

APPENDIX 5

WEST SEDGWICK GRID

I.P. Anomaly Location and Overall Grading of Anomaly	Geology	Geophysics	Geochemistry
1. Line 00 2825E. Primary/Secondary	Pink, grey and fawn acid lavas, foliated and altered in part and containing disseminated pyrite. A sample of the altered rock from 2900E. assayed 2.0% FeS_2, 0.006% Cu.	Secondary. 10 millisecond response, width less than 60', depth less than 50', no depression in resistivity. This anomaly correlates with ones at line 06N. 150W. and line 06S. 2600E. - 2800E.	Pb anomaly of 105 ppm at 2800E. (4 - 5 times background) and 85 ppm at 2900E., accompanied by minor rises in Cu and Zn. H.Y. 94 (800' S.W. of anomaly) gave anomalous Pb values of 110 ppm and on resampling, 70 ppm. The anomalous 230 ppm Cu value was not repeated (see 4.1.5).
2. Line 06 2600E. - 2800E. Secondary	As line 00 2825E.	Secondary. 7 millisecond anomaly, resistivity slightly depressed to 2,000 ohm-m.	No soil anomaly over the I.P. response. A 70 ppm Pb anomaly (3 - 4 times background) is accompanied by minor rises in Cu and Zn, but is located upslope of the I.P. response, at 2950E.
3. Line 00 5300E. - 5575E. Secondary	Glacial moraine and/or conglomerate scree, thickness estimated at 25' - 50'. Solid geology probably as line 125 5400E., 5650E. - 6000E.	Secondary. 7 millisecond anomaly, no appreciable reduction in resistivity, depth 'shallow'. This anomalous zone extends north to line 06N. 2550E. and south to line 18S. 5450E. - 5900E.	No response to either soil or stream sediment geochemistry, presumably because of drift cover.
4. Line 06S. 5700E. - 5850E., 6050E. - 6200E. Primary/Secondary	As line 00 5300E. - 5575E., drift cover probably less than 25' thick. Sample taken 250' to the south of 5800E., in a creek, assayed 9.4% FeS_2, 0.065% Cu, 0.15% Zn.	Primary/Secondary. 15 millisecond response at 5750E. and 10 millisecond response at 6100E., resistivity slightly depressed to 1,500 ohm-m.	As line 00 5300E. - 5575E. However 'anomalous' responses for Pb, Cu and Zn, particularly the former, were recorded at 6250E. and 6300E. (105 ppm Pb, 35 ppm Cu and 35 ppm Zn) upslope of the I.P. anomaly. Anomaly is open to the east.

047

526049

I.P. Anomaly Location and Overall Grading of Anomaly	Geology	Geophysics	Geochemistry
5. Line 12S. 5450E., 5650E. - 6000E. Primary/Secondary	Thin, patchy cover of moraine with occasional outcrops of purple/grey, grey/green and pink, foliated and altered acid lavas containing disseminated pyrite. Sample from 5500E. assayed 2.8% FeS_2, 0.023% Cu.	Primary. 19 millisecond anomaly at 5450E., 50' - 60' wide, coincident with a slight increase in resistivity. Between 5600E. and 6000E. there is a broad 10 - 17 millisecond response with slight depression in resistivity. A 600 gamma magnetic anomaly is located at 5700E.	No response to soil geochemistry, possibly because of drift cover.
6. Line 18S. 5450E. - 5900E. Secondary	As line 00 5300E. - 5575E., drift cover probably less than 25' thick.	Secondary. A broad 10 millisecond response, with a slight increase in resistivity.	As line 00 5300E. - 5575E.
7. Line 18S. 1250E., 1500E. Secondary	No known outcrop in the vicinity of the anomaly, but extrapolation suggests an acid lava and ignimbrite sequence with possible minor shales. Ni values of greater than 5 ppm infer the presence of intermediate rocks between 1450E. and 1650E.	Primary/Secondary. Narrow, shallow 10 millisecond response at 1250E. and about 5 millisecond anomaly at 1500E., coincident with a braod 60% depression in resistivity, to 1,500 ohm-m.	Several Cu, Pb and Zn peaks between 1250E. and 1650E. inclusive. Maximum values are Pb 45 ppm, Cu 40 ppm and Zn 20 ppm (4x, 4x and 2x background respectively) at 1550E. (base of slope anomaly). Background values are imperfectly known.
8. Line 30S. 2900E. - 3350E. Secondary	Predominantly acid ignimbrites with minor acid lavas and shale bands.	Secondary. 11 millisecond anomaly at 2900E. superimposed on a zone of twice background chargeability, no change in resistivity, maximum depth 70' - 100'?	Broad zone of above background values from 2850E. - 3300E. Maximum Pb and Zn values at 2950E. (85 ppm Pb, x4 B; 60 ppm Zn, x3 B), maximum Cu value (70 ppm, x3 B) at 3100E. H.Y. 91 and 92, from creeks just west of the I.P. anomaly, gave HIMO enhanced anomalous values of 50 ppm Pb, 50 ppm Zn, and 80 ppm Pb, 90 ppm Zn, respectively.

050

526050

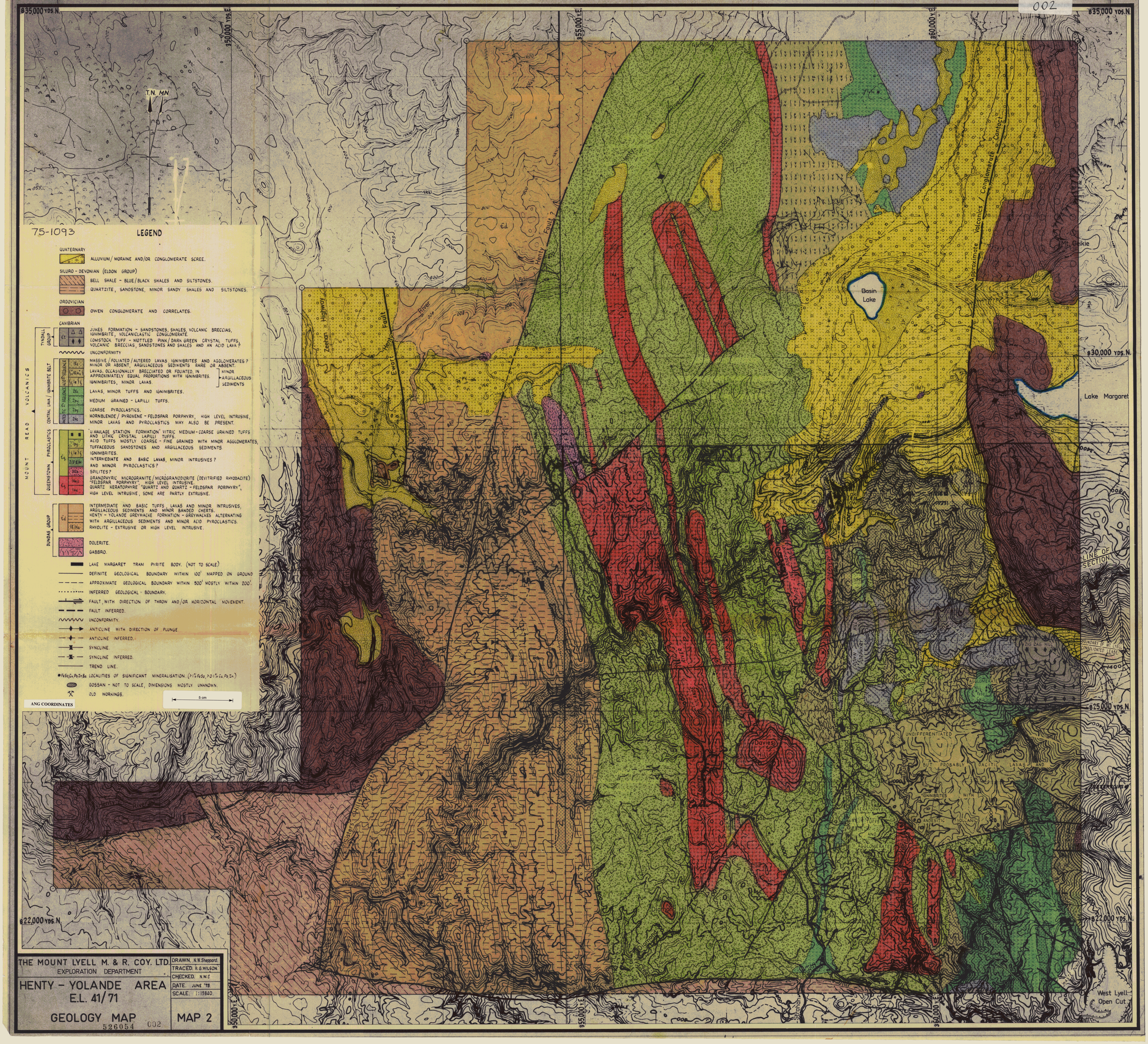
I.P. Anomaly Location and Overall Grading of Anomaly	Geology	Geophysics	Geochemistry
9. Line 42S. 550E. Primary/Secondary	Lapilli ignimbritic tuffs with minor acid lavas, and shale bands?	Primary. 20 millisecond anomaly coupled with a minor decrease in resistivity, width less than 100', maximum depth less than 50', probably dips steeply east.	No soil anomaly apart from a minor Zn peak (55 ppm, x2 B) at 450E. H.Y. 86, from Swan Creek just west of the I.P. anomaly, gave HIMO enhanced values of 50 ppm Pb, 55 ppm Zn. A dispersion train, partially HIMO enhanced, exists downstream. H.Y. 163, 600' to the north and approximately along strike, gave an anomalous 70 ppm Pb value.
10. Line 48S. 1650E. Secondary	Acid ignimbrites with minor lavas and shales, flanked to the east by an intermediate porphyry. Soil Ni values suggest porphyry contact at 1400E., but definite soil colour change and first porphyry outcrop not until about 1700E.	Primary. 10 millisecond response with some reduction in resistivity, less than 50' wide, less than 50' deep, dips steeply east.	No soil anomaly. H.Y. 87, from a creek 1,500' to the west, gave HIMO enhanced values of 85 ppm Cu, 115 ppm Pb and 160 ppm Zn.
11. Line 48S. 2950E. Secondary	Coarse grained-lapilli tuffs (ignimbritic? in part), and acid lavas (foliated in part) flanked to the west by an intermediate porphyry. Soil colour and Ni values suggest porphyry contact at about 3000E., but this anomaly, like the one at line 48S. 1650E., may lie along the contact rather than within the porphyry.	Secondary. 8 millisecond response with some reduction in resistivity, maximum depth 100', possibly dips east.	A Pb anomaly of 390 ppm (x4 - x6 B) is accompanied by smaller Cu (75 ppm, x2 B) and Zn (80 ppm, x3 B) peaks. Background imperfectly known. H.Y. 100 and 104, from the West Queen River, 1,200' and 1,800' to the south, gave HIMO enhanced values of 65 ppm Cu, 90 ppm Pb, 85 ppm Zn, and 45 ppm Cu, 75 ppm Pb, 85 ppm Zn, respectively.

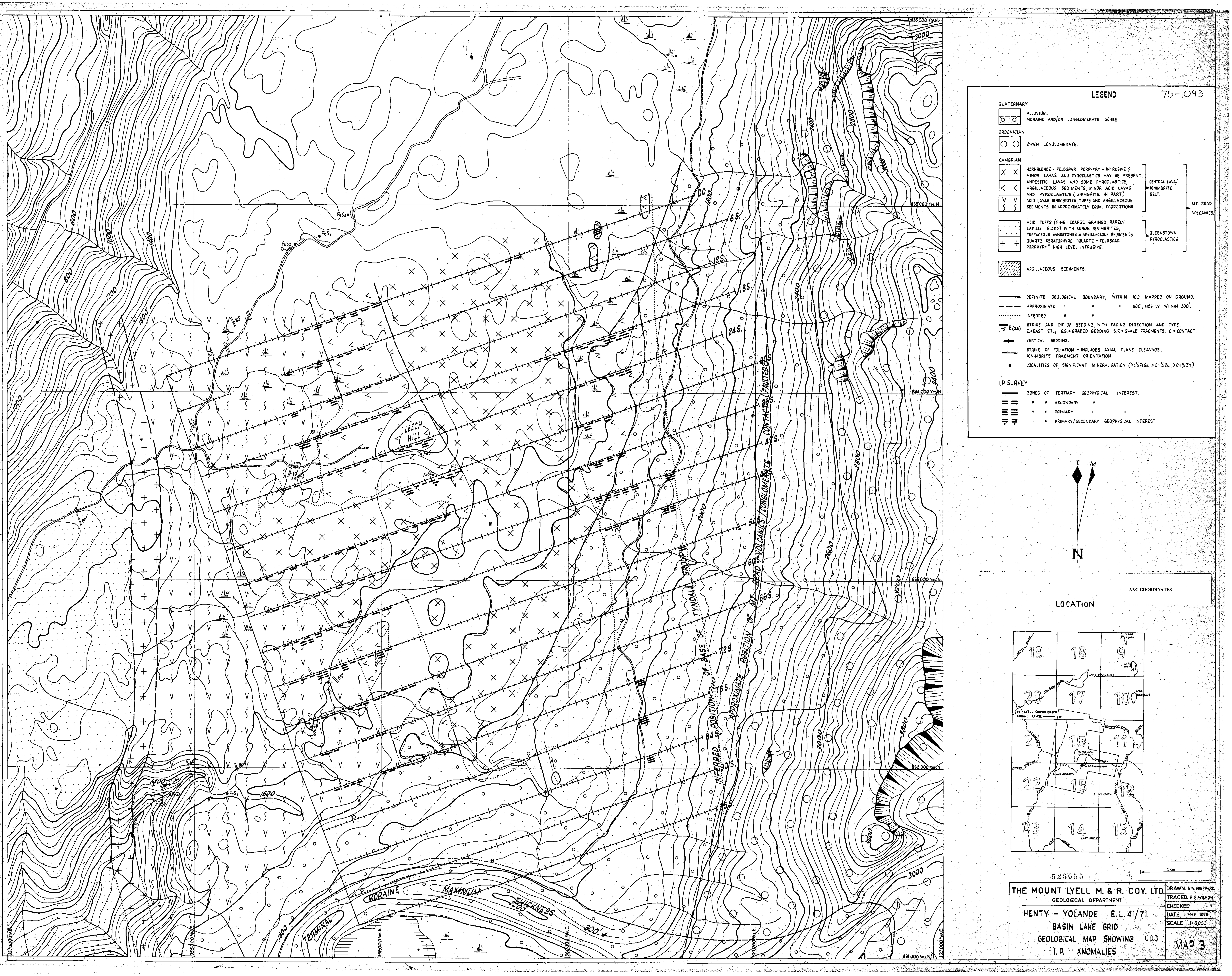
526051

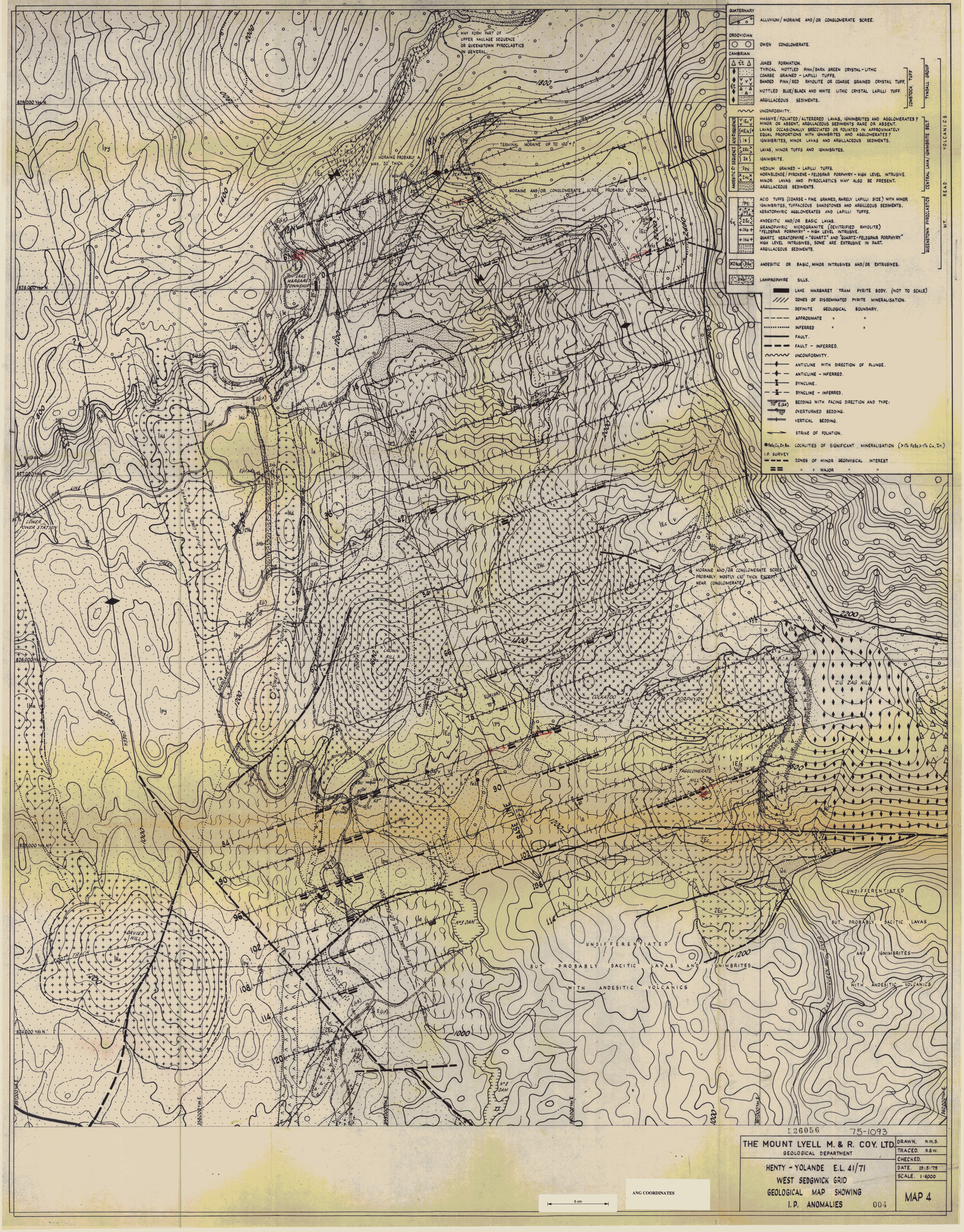
I.P. Anomaly Location and Overall Grading of Anomaly	Geology	Geophysics	Geochemistry
12. Line 84S. 225E. - 380E. Primary	Graded crystal and crystal/lithic lapilli-medium grained tuffs and shales, and possibly ignimbrites.	Primary. 16 millisecond anomaly with minor reduction in resistivity, probably dips east.	Broad zone of Pb anomalies from 325E. - 650E. with major peaks at 325E. (1250 ppm, x25 B), 450E. (380 ppm, x8 B) and 550E. (200 ppm, x4 B). Minor Cu and Zn anomalies accompany these peaks, the largest values recorded being 85 ppm Cu at 425E. and 550E. (x4 B) and 65 ppm Zn at 600E. (x4 B). H.Y. 152, from the West Queen River, about 700' to the W.S.W., gave a HIMO enhanced 55 ppm Pb anomaly.
13. Line 84S. 1050E. - 1200E. Primary	Solid geology is obscured by glacial moraine, thickness probably less than 25', filling the valley. Extrapolation suggests a sequence of acid lavas, ignimbrites, other pyroclastics?' and a shale unit, with the western boundary (faulted?) of an intermediate porphyry at about 1600E.	Primary. 25 millisecond response with some depression in resistivity, dip near vertical.	A horizon sampling (because of general absence of B and C horizons) produced three Cu, Pb, Zn anomalies at 1100E., 1200E., 1275E. But B horizon samples from 1100E. yielded only near background values, so these anomalies are suspect. However moraine cover makes all soil sampling results difficult to interpret.
14. Line 90S. 600E. - 1550E. Secondary	Acid lavas, with minor proportions of shales?, pyroclastics? and ignimbrites?	Secondary. Zone of about twice background chargeability, reaching a peak at about 1050E. Slight decrease in resistivity over western half of anomaly. Probably correlates with anomalies on line 84S. at 225E. - 375E. and/or 1050E. - 1200E.	Broad zone betwen 1100E. and 1700E.+ of minor Cu, Pb and Zn anomalies. Pb peaks of 385 ppm (x8 B) and 360 ppm (x7 B) are located at 1350E. and 1550E. respectively.

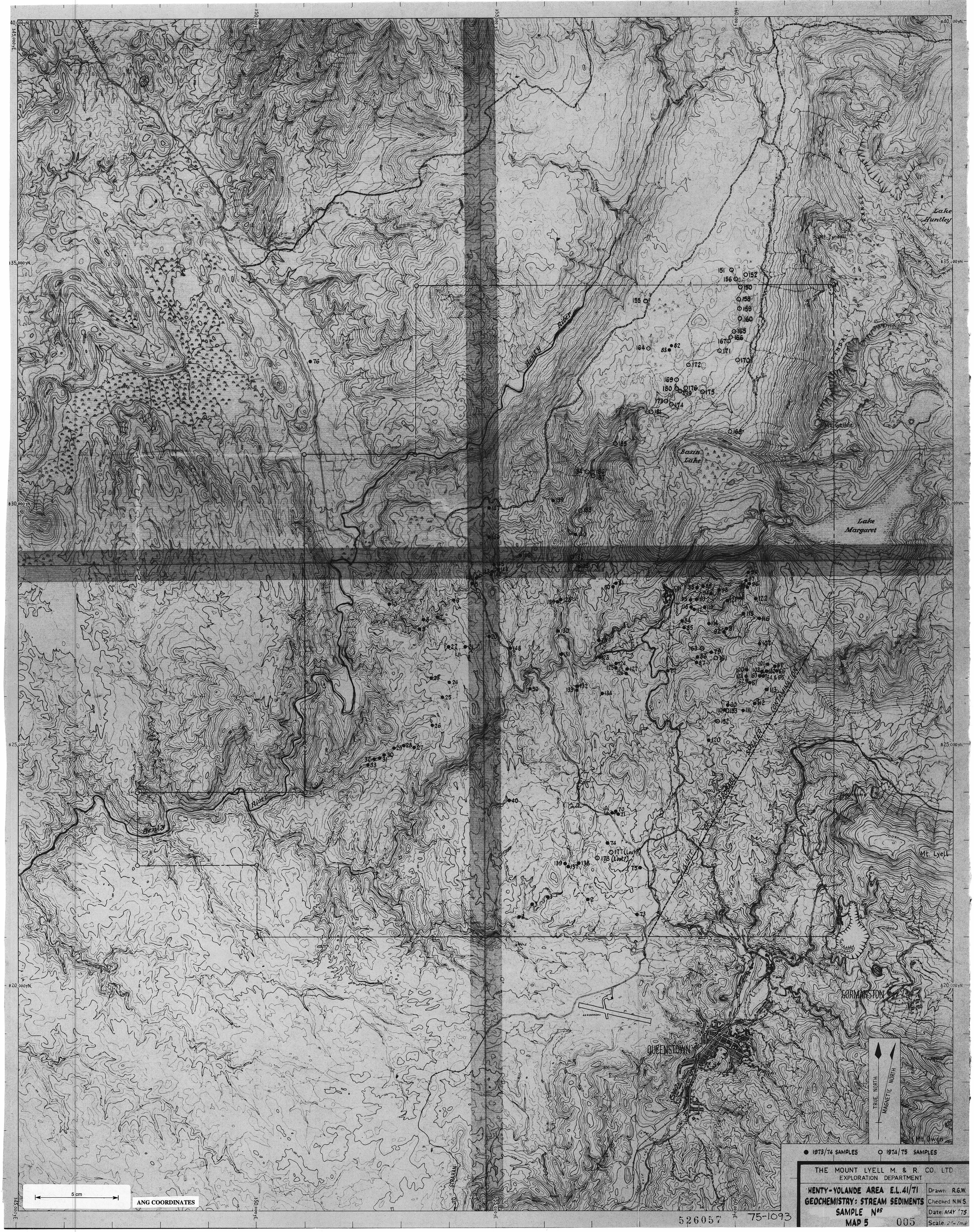
I.P. Anomaly Location and Qverall Grading of Anomaly	Geology	Geophysics	Geochemistry
15. Line 96S. 2650E. - 2800E. Secondary	Acid lavas and pyroclastics (ignimbrites?), interdigitating with or in contact with at 2800E., intermediate tuffs and minor lavas to the east.	Secondary. 5 - 7 millisecond anomaly with only a slight depression in resistivity, maximum depth less than 50' on eastern margin.	Pb anomaly at 2900E. of 220 ppm (x4 B?). Minor Cu, Pb and Zn anomalies from 2800E. - 3100E.+, may only be an expression of higher backgrounds over the intermediate lava/tuff sequence.
16. Line 102S. 3650E. - 4050E. Primary	Altered and foliated acid lavas and ignimbrites, located between the Comstock Tuffs to the east (contact at about 4100E.) and a massive, fresh andesitic lava + minor pyroclastic sequence to the west (contact at about 3400E.). Some massive pyrite/chalcopyrite veins at 3100E. Stratigraphically and soil geochemically, location appears to be an analogue of Queen Lyell.	Secondary. Zone of about twice background chargeability (10 millisecond anomaly) with a little reduction in resistivity.	Pb anomalies at 3400E. (380 ppm, x5 B) and 3900E. (740 ppm, x10 B), Cu and Zn appear to be non-anomalous although background levels for these elements are uncertain.


Henty River
Lake Huntley
Mt Tyndall
Mt Geikie
Basin Lake
Lake Margaret
Mt Lyell
GORMANSTON
QUEENSTOWN
Mt Owen
TRUE NORTH
MAGNETIC NORTH
LEGEND
ANG COORDINATES
HIGHWAYS
FOUR WHEEL DRIVE TRACKS
FOOT AND MINOR VEHICULAR TRACKS (* OVERGROWN AT LEAST IN PART)
GRID LINES
5 cm
526053
75-1093
THE MOUNT LYELL M. & R. CO. LTD.
EXPLORATION DEPARTMENT
001
E.L. 41/71
HENTY-YOLANDE
ACCESS
MAP 1
Drawn: R.G.W.
Checked: N.W.S
Date: MAY '75
Scale: 2"=1mile


002
75-1093
LEGEND
QUATERNARY
ALLUVIUM / MORAINE AND/OR CONGLOMERATE SCREE.
SILURO - DEVONIAN (ELDON GROUP)
BELL SHALE - BLUE/BLACK SHALES AND SILTSTONES.
QUARTZITE, SANDSTONE, MINOR SANDY SHALES AND SILTSTONES.
ORDOVICIAN
OWEN CONGLOMERATE AND CORRELATES.
CAMBRIAN
TYNDALL GROUP
Єt
JUKES FORMATION - SANDSTONES, SHALES, VOLCANIC BRECCIAS, IGNIMBRITE, VOLCANICLASTIC CONGLOMERATE.
COMSTOCK TUFF - MOTTLED PINK/DARK GREEN CRYSTAL TUFFS, VOLCANIC BRECCIAS, SANDSTONES AND SHALES AND AN ACID LAVA?
UNCONFORMITY
MOUNT READ VOLCANICS
CENTRAL LAVA / IGNIMBRITE BELT
ACID Єc SEQUENCE
1Єc
MASSIVE / FOLIATED / ALTERED LAVAS, IGNIMBRITES AND AGGLOMERATES? MINOR OR ABSENT, ARGILLACEOUS SEDIMENTS RARE OR ABSENT.
LAVAS, OCCASIONALLY BRECCIATED OR FOLIATED, IN APPROXIMATELY EQUAL PROPORTIONS WITH IGNIMBRITES.
IGNIMBRITES, MINOR LAVAS.
MINOR ARGILLACEOUS SEDIMENTS
ANDESITIC Єc SEQUENCE
2Єc
LAVAS, MINOR TUFFS AND IGNIMBRITES.
2py
MEDIUM GRAINED - LAPILLI TUFFS.
2py
COARSE PYROCLASTICS.
2Hc
HORNBLENDE / PYROXENE - FELDSPAR PORPHYRY, HIGH LEVEL INTRUSIVE, MINOR LAVAS AND PYROCLASTICS MAY ALSO BE PRESENT.
QUEENSTOWN PYROCLASTICS
Єq
"U. HAULAGE STATION FORMATION" VITRIC MEDIUM - COARSE GRAINED TUFFS AND LITHIC CRYSTAL LAPILLI TUFFS.
1py
ACID TUFFS MOSTLY COARSE - FINE GRAINED WITH MINOR AGGLOMERATES, TUFFACEOUS SANDSTONES AND ARGILLACEOUS SEDIMENTS.
IGNIMBRITES.
2/3 E/H
INTERMEDIATE AND BASIC LAVAS, MINOR INTRUSIVES? AND MINOR PYROCLASTICS?
3Eb
SPILITES?
Єq
1Ha/c
GRANOPHYRIC MICROGRANITE / MICROGRANODIORITE (DEVITRIFIED RHYODACITE) "FELDSPAR PORPHYRY", HIGH LEVEL INTRUSIVE.
1Hd
QUARTZ KERATOPHYRE "QUARTZ AND QUARTZ - FELDSPAR PORPHYRY", HIGH LEVEL INTRUSIVE, SOME ARE PARTLY EXTRUSIVE.
DUNDAS GROUP
Єd
INTERMEDIATE AND BASIC TUFFS, LAVAS AND MINOR INTRUSIVES, ARGILLACEOUS SEDIMENTS AND MINOR BANDED CHERTS.
HENTY - YOLANDE GREYWACKE FORMATION - GREYWACKES ALTERNATING WITH ARGILLACEOUS SEDIMENTS AND MINOR ACID PYROCLASTICS.
1E/Ha
RHYOLITE - EXTRUSIVE OR HIGH LEVEL INTRUSIVE.
DOLERITE.
GABBRO.
LAKE MARGARET TRAM PYRITE BODY. (NOT TO SCALE)
DEFINITE GEOLOGICAL BOUNDARY WITHIN 100' MAPPED ON GROUND
APPROXIMATE GEOLOGICAL BOUNDARY WITHIN 500' MOSTLY WITHIN 200'.
INFERRED GEOLOGICAL - BOUNDARY.
FAULT, WITH DIRECTION OF THROW AND/OR HORIZONTAL MOVEMENT.
FAULT INFERRED.
UNCONFORMITY.
ANTICLINE WITH DIRECTION OF PLUNGE.
ANTICLINE INFERRED.
SYNCLINE.
SYNCLINE INFERRED.
TREND LINE.
FeS2, Cu, Pb, Zn, Ba. LOCALITIES OF SIGNIFICANT MINERALISATION. (>1% FeS2, >0·1% Cu, Pb, Zn.)
GOSSAN - NOT TO SCALE, DIMENSIONS MOSTLY UNKNOWN.
OLD WORKINGS.
ANG COORDINATES
5 cm
835,000 YDS. N.
835,000 YDS. N.
830,000 YDS. N.
825,000 YDS. N.
822,000 YDS. N.
822,000 YDS. N.
350,000 YDS. E.
355,000 YDS. E.
360,000 E.
350,000 Y.E.
355,000 Y.E.
360,000 E.
T.N. MN.
Basin Lake
Lake Margaret
LINE OF SECTION
West Lyell Open Cut
THE MOUNT LYELL M. & R. COY. LTD.
EXPLORATION DEPARTMENT
HENTY - YOLANDE AREA
E.L. 41/71
GEOLOGY MAP
526054 002
DRAWN. N.W. Sheppard.
TRACED. R.G. WILSON.
CHECKED. N.W.S.
DATE. JUNE '75
SCALE. 1:15840.
MAP 2

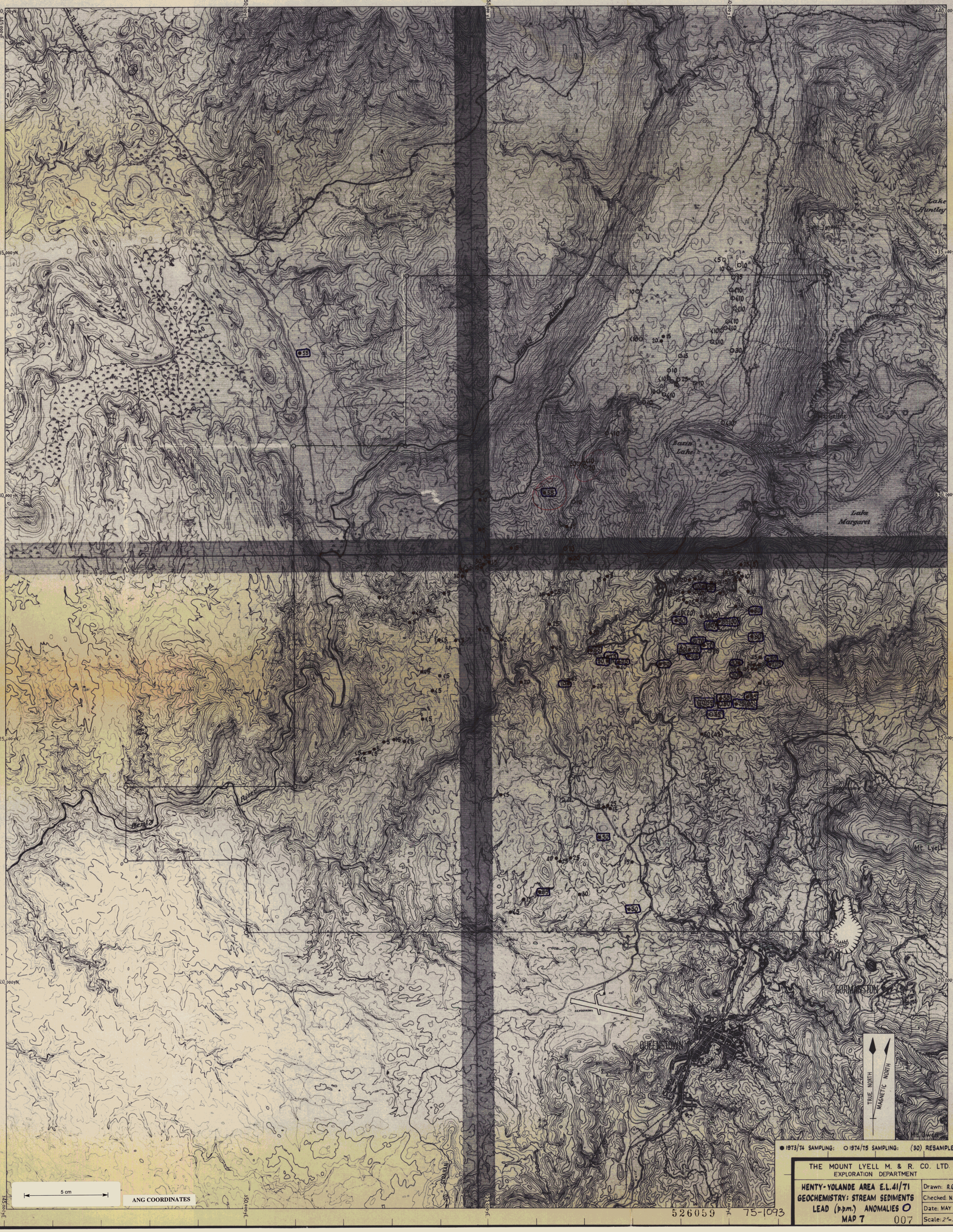

LEECH HILL
FeS2
MORAINE MAXIMUM THICKNESS 300'+
TERMINAL
INFERRED POSITION OF BASE OF TYNDALL GROUP
APPROXIMATE POSITION OF MT. READ VOLCANICS / CONGLOMERATE CONTACT (FAULTED?)
6S.
12S.
18S.
24S.
30S.
36S.
42S.
48S.
54S.
60S.
66S.
72S.
78S.
84S.
90S.
96S.
836,000 Yds. N.
835,000 Yds. N.
834,000 Yds. N.
833,000 Yds. N.
832,000 Yds. N.
831,000 Yds. N.
LEGEND
75-1093
QUATERNARY
ALLUVIUM.
MORAINE AND/OR CONGLOMERATE SCREE.
ORDOVICIAN
OWEN CONGLOMERATE.
CAMBRIAN
HORNBLENDE - FELDSPAR PORPHYRY - INTRUSIVE ? MINOR LAVAS AND PYROCLASTICS MAY BE PRESENT.
ANDESITIC LAVAS AND SOME PYROCLASTICS, ARGILLACEOUS SEDIMENTS, MINOR ACID LAVAS AND PYROCLASTICS (IGNIMBRITIC IN PART.)
ACID LAVAS, IGNIMBRITES, TUFFS AND ARGILLACEOUS SEDIMENTS IN APPROXIMATELY EQUAL PROPORTIONS.
CENTRAL LAVA/ IGNIMBRITE BELT.
ACID TUFFS (FINE - COARSE GRAINED, RARELY LAPILLI SIZED) WITH MINOR IGNIMBRITES, TUFFACEOUS SANDSTONES & ARGILLACEOUS SEDIMENTS.
QUARTZ KERATOPHYRE "QUARTZ - FELDSPAR PORPHYRY" HIGH LEVEL INTRUSIVE.
QUEENSTOWN PYROCLASTICS.
MT. READ VOLCANICS.
ARGILLACEOUS SEDIMENTS.
DEFINITE GEOLOGICAL BOUNDARY, WITHIN 100' MAPPED ON GROUND.
APPROXIMATE " " " 500', MOSTLY WITHIN 200'.
INFERRED " "
STRIKE AND DIP OF BEDDING, WITH FACING DIRECTION AND TYPE; E.= EAST ETC; G.B. = GRADED BEDDING: S.F. = SHALE FRAGMENTS: C. = CONTACT.
VERTICAL BEDDING.
STRIKE OF FOLIATION - INCLUDES AXIAL PLANE CLEAVAGE, IGNIMBRITE FRAGMENT ORIENTATION.
LOCALITIES OF SIGNIFICANT MINERALISATION (>1% FeS2, >0·1% Cu, >0·1% Zn)
I.P. SURVEY
ZONES OF TERTIARY GEOPHYSICAL INTEREST.
" " SECONDARY " "
" " PRIMARY " "
" " PRIMARY/SECONDARY GEOPHYSICAL INTEREST.
T
M
N
ANG COORDINATES
LOCATION
19
18
9
20
17
10
21
16
11
22
15
12
23
14
13
LAKE MARGARET
MT. HUXLEY
KING RIVER
5 cm
526055
THE MOUNT LYELL M. & R. COY. LTD.
GEOLOGICAL DEPARTMENT
HENTY - YOLANDE E.L. 41/71
BASIN LAKE GRID
GEOLOGICAL MAP SHOWING 003
I.P. ANOMALIES
DRAWN. N.W. SHEPPARD.
TRACED. R.G. WILSON.
CHECKED.
DATE. MAY 1975
SCALE. 1:6,000
MAP 3


QUATERNARY
ALLUVIUM / MORAINE AND/OR CONGLOMERATE SCREE.
ORDOVICIAN
OWEN CONGLOMERATE.
CAMBRIAN
JUKES FORMATION.
TYPICAL MOTTLED PINK/DARK GREEN CRYSTAL - LITHIC COARSE GRAINED - LAPILLI TUFFS.
BANDED PINK/RED RHYOLITE OR COARSE GRAINED CRYSTAL TUFF.
MOTTLED BLUE/BLACK AND WHITE LITHIC CRYSTAL LAPILLI TUFF.
ARGILLACEOUS SEDIMENTS.
COMSTOCK TUFF
TYNDALL GROUP
UNCONFORMITY.
ACID SEQUENCE
MASSIVE/FOLIATED/ALTERERED LAVAS, IGNIMBRITES AND AGGLOMERATES? MINOR OR ABSENT, ARGILLACEOUS SEDIMENTS RARE OR ABSENT.
LAVAS OCCASIONALLY BRECCIATED OR FOLIATED IN APPROXIMATELY EQUAL PROPORTIONS WITH IGNIMBRITES AND AGGLOMERATES?
IGNIMBRITES, MINOR LAVAS AND ARGILLACEOUS SEDIMENTS.
ANDESITIC SEQUENCE
LAVAS, MINOR TUFFS AND IGNIMBRITES.
IGNIMBRITE.
MEDIUM GRAINED - LAPILLI TUFFS.
HORNBLENDE/PYROXENE - FELDSPAR PORPHYRY - HIGH LEVEL INTRUSIVE MINOR LAVAS AND PYROCLASTICS MAY ALSO BE PRESENT.
ARGILLACEOUS SEDIMENTS.
CENTRAL LAVA/IGNIMBRITE BELT
ACID TUFFS (COARSE - FINE GRAINED, RARELY LAPILLI SIZE) WITH MINOR IGNIMBRITES, TUFFACEOUS SANDSTONES AND ARGILLEOUS SEDIMENTS.
KERATOPHYRIC AGGLOMERATES AND LAPILLI TUFFS.
ANDESITIC AND/OR BASIC LAVAS.
GRANOPHYRIC MICROGRANITE (DEVITRIFIED RHYOLITE) "FELDSPAR PORPHYRY" - HIGH LEVEL INTRUSIVE.
QUARTZ KERATOPHYRE - "QUARTZ" AND "QUARTZ-FELDSPAR PORPHYRY" HIGH LEVEL INTRUSIVES, SOME ARE EXTRUSIVE IN PART.
ARGILLACEOUS SEDIMENTS.
QUEENSTOWN PYROCLASTICS
MT. READ VOLCANICS
ANDESITIC OR BASIC, MINOR INTRUSIVES AND/OR EXTRUSIVES.
LAMPROPHYRE SILLS.
LAKE MARGARET TRAM PYRITE BODY. (NOT TO SCALE)
ZONES OF DISSEMINATED PYRITE MINERALISATION.
DEFINITE GEOLOGICAL BOUNDARY.
APPROXIMATE " "
INFERRED " "
FAULT.
FAULT - INFERRED.
UNCONFORMITY.
ANTICLINE WITH DIRECTION OF PLUNGE.
ANTICLINE - INFERRED.
SYNCLINE.
SYNCLINE - INFERRED.
BEDDING WITH FACING DIRECTION AND TYPE:
OVERTURNED BEDDING.
VERTICAL BEDDING.
STRIKE OF FOLIATION.
FeS2, Cu, Zn, Ba. LOCALITIES OF SIGNIFICANT MINERALISATION (>1% FeS2 >·1% Cu, Zn.)
I.P. SURVEY
ZONES OF MINOR GEOPHYSICAL INTEREST
" " MAJOR " "
MAY FORM PART OF UPPER HAULAGE SEQUENCE OR QUEENSTOWN PYROCLASTICS IN GENERAL.
TERMINAL MORAINE UP TO 100'+?
MORAINE PROBABLY MAX. 20' THICK
MORAINE AND/OR CONGLOMERATE SCREE, PROBABLY <10' THICK
LAKE MARGARET TOWNSHIP
MORAINE AND/OR CONGLOMERATE SCREE PROBABLY MOSTLY <10' THICK EXCEPT NEAR CONGLOMERATE
ZIG ZAG HILL
PORPHYRY
CONGLOMERATE HILL
UNDIFFERENTIATED BUT PROBABLY DACITIC LAVAS AND IGNIMBRITES WITH ANDESITIC VOLCANICS
DAVIES HILL
361,000 Yds. E.
362,000 Yds. E.
526056
75-1093
THE MOUNT LYELL M. & R. COY. LTD.
GEOLOGICAL DEPARTMENT
HENTY - YOLANDE E.L. 41/71
WEST SEDGWICK GRID
GEOLOGICAL MAP SHOWING
I.P. ANOMALIES
004
DRAWN. N.W.S.
TRACED. R.G.W.
CHECKED.
DATE. 29:5:'75
SCALE. 1:6000
MAP 4
ANG COORDINATES

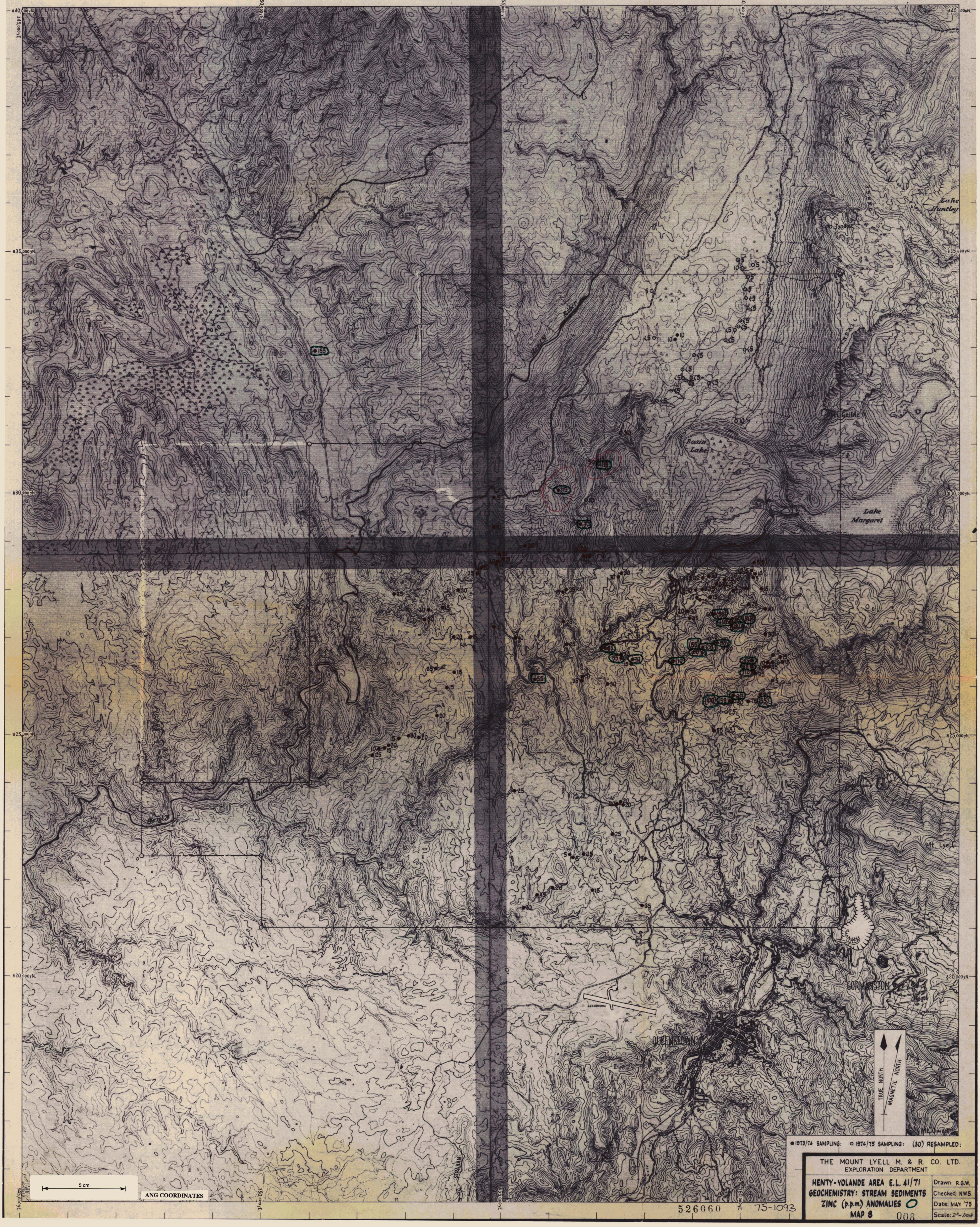


Lake Huntley
Basin Lake
Lake Margaret
Mt. Lyell
GORMANSTON
QUEENSTOWN
Mt. Owen
TRUE NORTH
MAGNETIC NORTH
● 1973/74 SAMPLES
○ 1974/75 SAMPLES
THE MOUNT LYELL M. & R. CO. LTD
EXPLORATION DEPARTMENT
HENTY-YOLANDE AREA E.L. 41/71
GEOCHEMISTRY: STREAM SEDIMENTS
SAMPLE N^os
MAP 5
005
Drawn R.G.W.
Checked N.W.S.
Date: MAY '75
Scale: 2" = 1 mile
5 cm
ANG COORDINATES
526057
75-1093

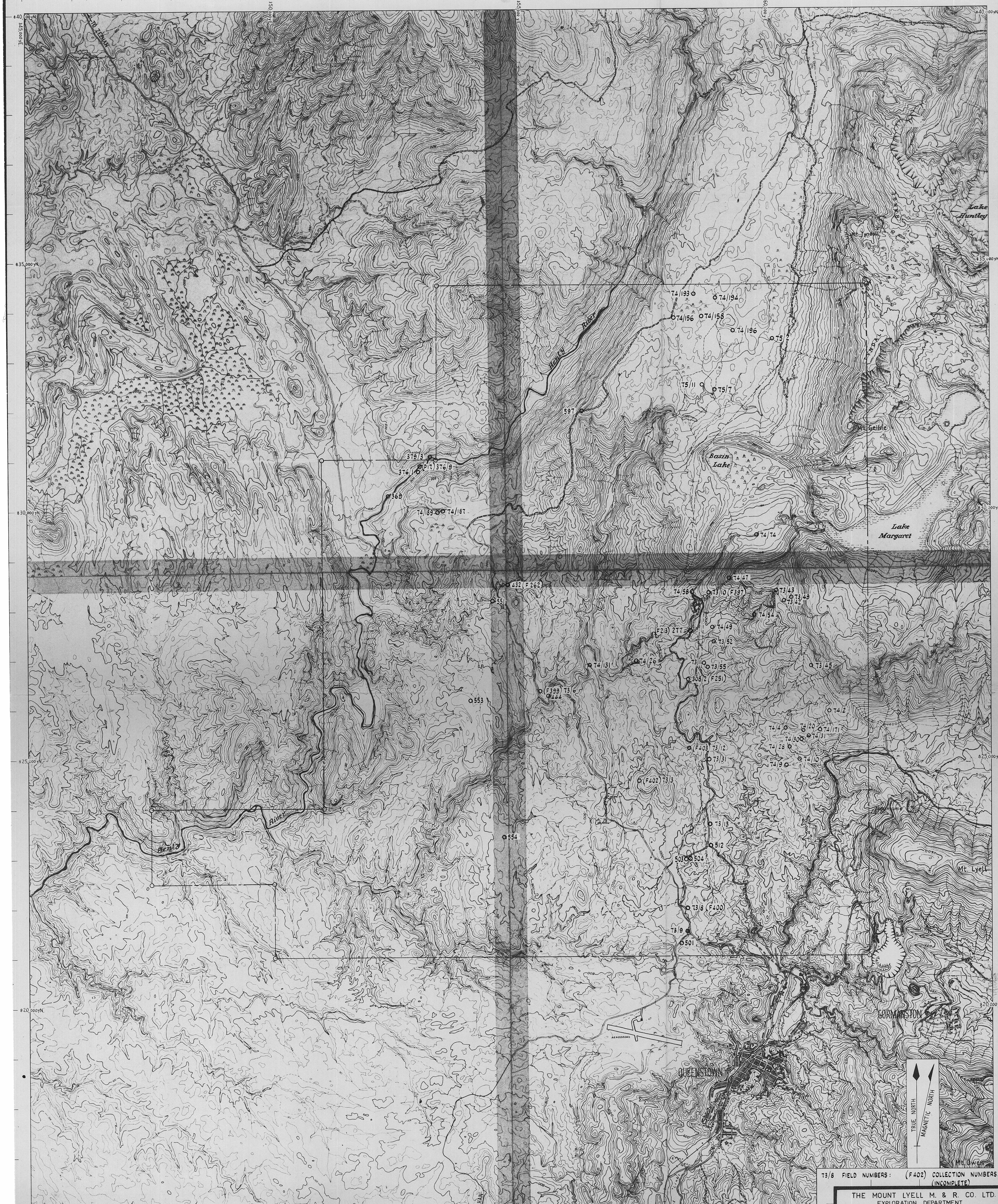

Lake Huntley
Basin Lake
Lake Margaret
Mt. Lyell
GORMANSTON
QUEENSTOWN
TRUE NORTH
MAGNETIC NORTH
Mt. Owen
5 cm
ANG COORDINATES
● 1973/74 SAMPLING: ○ 1974/75 SAMPLING: (30) RESAMPLED:
THE MOUNT LYELL M. & R. CO. LTD.
EXPLORATION DEPARTMENT
HENTY-YOLANDE AREA E.L. 41/71
GEOCHEMISTRY: STREAM SEDIMENTS
COPPER (p.p.m.) ANOMALIES
MAP 6
006
Drawn: R.G.W.
Checked: N.W.S.
Date: MAY '75
Scale: 2" = 1 mile
526058
75-1093



Lake Huntley
Lake Margaret
Sante Lake
Mt. Lyell
GORMANSTON
QUEENSTOWN
TRUE NORTH
MAGNETIC NORTH
Mt. Owen
5 cm
ANG COORDINATES
● 1973/74 SAMPLING: ○ 1974/75 SAMPLING: (30) RESAMPLED:
THE MOUNT LYELL M. & R. CO. LTD.
EXPLORATION DEPARTMENT
HENTY-YOLANDE AREA E.L.41/71
GEOCHEMISTRY: STREAM SEDIMENTS
LEAD (p.p.m.) ANOMALIES O
MAP 7
007
Drawn: R.G.W.
Checked: N.W.S.
Date: MAY '75
Scale: 2"=1mile
526059
75-1093



526060 75-1093 008


Lake Huntley
Lake Margaret
Basin Lake
Mt. Geikie
Mt. Lyell
Mt. Owen
GORMANSTON
QUEENSTOWN
AERODROME
Henty River
TRUE NORTH
MAGNETIC NORTH
820,000yN.
825,000yN.
830,000yN.
835,000yN.
840,000yN.
T4/193
T4/194
T4/156
T4/158
T4/196
T5/11
T5/7
597
379/3
376/1
376/9
369
T4/189
T4/187
T4/74
T4/47
432 (F262)
551
T4/58
T3/10
F397
T3/43
T3/49
T4/54
T4/49
T3/52
T4/131
T4/26
T3/55
308/2 (F251)
T3/45
553
F399
T4/2
T4/20
T4/171
T4/31
T4/28
T4/10
(F403) T3/12
T3/31
(F402) T3/3
T3/13
512
554
503
504
T3/8 (F400)
T3/9
501
5 cm
ANG COORDINATES
73/8 FIELD NUMBERS: (F402) COLLECTION NUMBERS. (INCOMPLETE)
THE MOUNT LYELL M. & R. CO. LTD.
EXPLORATION DEPARTMENT
E. L. 41/71
009
HENTY - YOLANDE
THIN SECTION - SAMPLE LOCATIONS.
APPENDIX 2
Drawn: R.G.W.
Checked:
Date: 4:6:'75
Scale: 2" = 1mile
526003
75-1093