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THE CONSOLIDATED SYNDICATE

ANNUAL REPORT

MT. TYNDALL E.L. 9/66

1972 - 73

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1. INTRODUCTION

Work on E.L. 9/66, Mt. Tyndall during the 1972-73 year was concentrated in the Selina area, at Howard's Anomally and in the Henty Fault Zone.

One diamond drill hole was completed during the year, to further test the anomalous zone at Selina. Susceptibility and conductivity tests were undertaken on drill core from Selina and a restricted Turair survey flown over the area. Geological mapping was undertaken at Howard's Anomally and over the Henty Fault Zone, where induced polarization (I.P.) and ground magnetic surveys were also completed.

The exploration programme planned for the 1973-74 year consists of three main activities:

(a) Follow up detailed mapping, geochemistry and geophysics over the induced polarization anomalies of immediate interest in the Henty Fault Zone.

(b) Detailed geological mapping between the Henty Camp and Basin Lake.

(c) Regional mapping over several areas on the lease not yet adequately covered, e.g. Lake Dora, north of Red Hills, west of the Henty River.

Staffing during 1972-73 was provided by the Mt. Lyell Mining and Railway Co. Ltd. The diamond drilling was carried out under contract by A.D.D. Pty. Ltd., all the geophysics was carried out under contract by Scintrex Pty. Ltd., while the road repairs, site clearance and the majority of the trackcutting was undertaken by local contractors.

Expenditure during the 1972-73 year amounted to $77,504 bringing the total expenditure on E.L. 9/66 since 1966 to $620,474. A budget of $93,300 has been recommended for 1973-74.

2. ACKNOWLEDGEMENTS

The basic planning of the years work program was largely carried out by Mr. J.P. McKibben prior to his resignation from The Mount Lyell Mining and Railway Co. Ltd. in October, 1972.

Geologists K.J. Lee and N.W. Sheppard worked on the Mt. Tyndall area for 3 months during the summer field season and the results of their work are embodied within this report.

All draughting associated with E.L. 9/66 was carried out competently by R.G. Wilson.

3. SELINA AREA

3.1 Introduction

Previous work in the Selina area had outlined a zone of pyrite mineralisation over 8000' long, including a zone of strong mineralisation (>12% pyrite) in excess of 1200' long and up to 500' wide, at the northern end. Work this year was concerned with further evaluating the whole zone : D.D.H. Selina 7 was completed during the year and surveys were undertaken to test the amenability of Selina type, disseminated mineralisation to detection by the electromagnetic methods, particularly Turair and to try and locate more conductive axes (possibly associated with copper mineralisation) within the I.P. anomalous zone.

3.2 Diamond Drilling

Using information from D.D.H.'s Selina 4, 5 and 6, and the results of Mr. J.L. Walshe's work on the Co:Ni ratio in pyrites from Selina (see Section 3.5) it was recommended in October, 1972 (Diamond Drilling Programme Proposed at Selina-North for 1972-73 Summer by J.P. McKibben) to drill a 2500' hole to test the I.P. anomalous zone on traverse 112N at 1000' below the surface (previous drilling tested the zone at a maximum depth of 600' below the surface).

D.D.H. Selina 7 was collared at 1990'W on traverse 112N on December 1st, 1972 with a bearing of 253° and a dip of -70° using an F66C rig. (Fig. 3). The hole flattened at a greater rate than expected and consequently the HQ size drilling was continued a further 300' from a planned depth of 500' to 800', where it was reduced to NQ.

From 0' to 769' the hole intersected a dark grey/green, massive, coarse, crystal, lithic tuff consisting of quartz crystals (usually less than 1 mm in diameter) and lithic fragments of acid lava up to 25 mm in a dark green groundmass of chlorite, quartz, some calcite and minor haematite. In general the rock was fairly massive, but in places shearing became more obvious with lithic fragments aligned and streaked out subparallel to the schistosity. Some very minor specks of pyrite were recorded at 758'.

From 769' to 892' a dark grey/green crystal lithic tuff was encountered. This rock was basically the same as the previous unit, but much finer grained with fragments of pinkish lava up to 10 mm. The rock exhibited more intense shearing than the previous type and the rock fragments were often broken and elongated. Minor fine grained specks and veinlets of pyrite were present, usually associated with small quartz veins. The pink acid lava fragments occurring within the tuff become more and more frequent after 887' with gradual transition to a bright pink to buff, hard, dense, siliceous lava, containing clear white quartz phenocrysts up to 5 mm. This rock type which was encountered between 892' and 1083' was extensively fractured (often very strongly), the cracks being filled with chlorite, sericite, calcite and occasional specks of pyrite.

From 1083' to 1195' a grey/green hard siliceous crystal, lithic tuff, very similar to the unit intersected between 0' and 769', was intersected. The rock was slightly more altered and while both pyrite and minor chalcopyrite were present, the total sulphide content remained less than one percent.

A fault zone from 1195' to 1200' separated the previous rock type from a hard, light grey, siliceous tuff. This rock was mineralised with pyrite and minor chalcopyrite occurring as grains and stringers within sericite filled fractures. Sixty five feet of mineralisation was intersected between 1200' and 1265' assaying 0.07% Cu and 10.2% FeS_2, and included 10' of 0.14% Cu between 1240' and 1250'. The hole intersected the faulted contact with the Owen Conglomerate at 1265', and drilling was suspended at a depth of 1347'.

The intersection of the conglomerate contact was some 700' earlier than expected but both the available geological and geophysical evidence was interpreted as indicating a down hole depth of at least 2000' to the contact. Re-examination of the data with respect to the structure indicates that the faulted contact is concealed beneath the button grass swamp (Fig. 3). Typically the Owen Conglomerate outcrops as a prominent topographic feature, but in this instance the contact was only indicated by a minor geophysical inflexion. The substantial increase in resistivity, which usually occurs across the conglomerate contact, was not immediately apparent, but was indicated further to the west. A study of all the available geophysical data from the area is at present being undertaken by Scintrex Pty. Ltd., in an attempt to define the structure more precisely.

3.3 Susceptibility Testing of Core

During the year Scintrex Pty. Ltd. conducted a series of susceptibility, conductivity and some chargeability tests on diamond drill core from the Selina area and Cape Horn orebody (Mt. Lyell). D.D.H.'s Selina 3 and 4, and CH 64, 71, 76, 80 and 84 were tested in November, 1972 and Selina 7 was tested concurrently with the Turair survey of the North Selina area in February, 1973. The object of the tests was to ascertain the geophysical characteristics of a known orebody and of the mineralisation at Selina, in order to determine the most efficient geophysical methods, both magnetic and electrical, available in the search for Lyell-type disseminated sulphide mineralisation.

The results (Appendix 1) suggest that the extensive pyrite development, to even high concentrations of 5-20% such as found at Selina, may not necessarily produce significant conductivity. For example, in D.D.H. Selina 4 between 500' and 660' the pyrite content averages 18.8%, but conductivity values were only slightly higher than background at 0.67 mhos/metre. However, significant conduction was generally recorded in association with copper mineralisation, e.g. in D.D.H. CH 76 high conductivity of 33.5 mhos/metre were recorded over 25' of 5.22% Cu between 80' and 105'. However, not all significant copper mineralisation was associated with high conductivity; the 25' of 5.89% Cu between 105' and 130' in CH 76, immediately following the highly conductive zone, gave a conduction of only 0.28 mhos/metre. Similarly the 40' of 3.58% Cu between 300' and 340' in CH 64, again displayed only background values for conductivity.

Clearly not all copper sulphide mineralisation is conductive. However, Scintrex Pty. Ltd. concluded that a body such as Cape Horn would be conductive as a whole relative to the surrounding host rocks and would be amenable to detection by a Turair - Turam (E.M.) method. Scintrex recommended that geophysical exploration should consist of a ground approach using large spaced reconnaissance gradient array I.P. survey, to define chargeable areas, which should then be surveyed using a Turam method, to define narrow, relatively conductive zones (such as Cape Horn) within such chargeable areas.

3.4 Turair Survey

An orientation Turair airborne electromagnetic survey was carried out by Scintrex Pty. Ltd. on February 27th, 1973 over the North Selina area (Fig. 4a). Fifteen line miles were flown being made up of 12 east-west lines and 4 north-south lines. The east-west lines were nominally 800' apart and flown over the previous geophysical grid lines : ground markers were laid at the ends of the lines as an aid to navigation.

The Turair E.M. system employed a fixed source (a grounded loop) and a moving receiver. The mean terrain clearance of the E.M. bird (receiver coils) was theoretically 200' and measurements of both the electromagnetic and magnetic fields were made and recorded, utilising a Scintrex Turair-11 unit at 400 Hz and a Scintrex MAP-2 nuclear resonance total intensity magnetometer. All the measuring equipment was installed in a Bell 206A Jet Ranger helicopter.

The survey had two objectives : (1) to evaluate the effectiveness of Turair in locating and defining disseminated sulphides. If effective it would provide a cheaper, more rapid reconnaissance geophysical tool than the I.P. methods which have been used to date.

(2) if the Turair was not successful in detecting the broad zone of disseminated mineralisation, it may have delineated more conductive zones,

possibly associated with copper sulphides (see Section 3.3) within the area of mineralisation.

Neither objective was effectively achieved by the Turair survey : "The records are characterised by an extremely high signal amplitude, which is for the most parts just off the scale. This was mainly due to the small loop employed and the highly resistive ground". Before the survey was undertaken, Scintrex knew that the ground was highly resistive through results from other surveys and in the light of this should probably have used a larger loop, which may have given more meaningful results. Scintrex also state that "the records are apparently unaffected by the high signal", but the records are very poor : "There are some extremely weak distortions but they are usually about or less than 0.1 percent and 0.1 degrees, which is usually taken as the noise level of the system. In view of ,.. the lack of other anomalies and the interest of the area these extremely weak distortions are considered". Some doubt remains as to whether Scintrex would have considered these weak distortions had they not known of the pre-existing I.P. anomalies, or if the area had been part of a larger survey.

A total of 27 anomalous electromagnetic responses were recorded by Scintrex Pty. Ltd. (Fig. 4a) but as stated above, all the conductors were very weak. Conductor D is the most promising and this together with conductor C are obviously due to the zone of pyrite mineralisation already outlined. Conductors A, E, F and H occur at the swamp/conglomerate contact (Figs. 4a and 4b) and probably relate to a horizontal current sheet over the swamp. Conductor B could possibly relate to the same source, but it also coincides with a marked resistivity low within the conglomerate (Fig. 3) and is possibly due to a shear.

3.5 Trace Element Study on Sulphides (J.L. Walshe)

The Consolidated Syndicate has made a grant of $2000 p.a. to assist Mr. J.L. Walshe in his study of trace element distribution in Cambrian sulphides (see Section 10.5, Annual Report, Mt. Tyndall E.L. 9/66, 1971-72, J.P. McKibben). The purpose of the project is to examine in detail the trace elements present, and their distribution pattern, in particular orebodies and mineralised zones, in the hope that it will yield information on the processes involved in the formation and location of the mineral deposits, and the existance of any geochemical characteristics which could be useful in the search for similar deposits. To date, the study has largely concentrated on the Prince Lyell orebody at Mt. Lyell, but has also incorporated some data on the Selina mineralisation.

In the early stages of his research Mr. Walshe found a strong correlation of high cobalt and low nickel concentrations substituting in the pyrite associated with copper bearing mineralised zones. It was initially thought that this high cobalt, low nickel concentration would enable a direct differentiation to be made between pyritic zones containing copper and others with no copper. However, it was soon realised that this picture was too simple and that although high cobalt (1000 ppm or greater) in the pyrite is an indication that copper was present in the mineralising solutions, (and that low cobalt, 500 ppm or less, indicates that there was little copper in the mineralising solutions), the cobalt and copper will not necessarily be deposited in the same place. Copper forms its own phase whereas cobalt preferentially substitutes into the pyrite structure. Deposition will depend on the prevailing physiochemical conditions. Considering the general ubiquity of pyrite it is probable that the pyrite will deposit rather readily, thus ensuring the precipitation of the cobalt. At the same time it is conceivable that the copper would be lost from the system if conditions for the deposition of the chalcopyrite were not suitable.

Prince Lyell

To date eighty five pyrite samples from the 4-5, 5-6, 6-7, 7-8, and a few from the 2-3 cross-cuts on the 830' level have been analysed for cobalt and nickel.

Cobalt : Although the data is still limited several points can be noted (Fig. 5).

1. The zone of high cobalt values (2000 ppm) at the southern end of the orebody (the highest sulphide values occur at the northern end).
2. The greater than 1500 ppm zone extending through the centre of the orebody. It would appear that values drop off rather irregularly into the hanging wall and footwall, with numerous small highs.
3. It is probable that the cut-off Co value for the economic zone will be about 1000 ppm.

The significance of the above results is not yet fully understood. Further work is at present underway to try and clarify the situation.

Nickel : Previously nickel had been assumed to follow cobalt in that the highest concentrations were at the southern end of the ore zone. However, the latest data indicates that the nickel values are highest across 5-6 cross-cut (193 ppm) and drop both to the south, 6-7 (102 ppm), 7-8 (84 ppm), and to the north, 4-5 (145 ppm).

Selina

The average values for cobalt and nickel in pyrites from D.D.H.'s 4, 5 and 6 are listed below.

	Co	Ni (ppm)
Selina 4	(1560 (540'-960') (1260 (all samples)	39
Selina 5	1565	79
Selina 6	1710	152

Clearly both the cobalt and the nickel concentrations are at a maximum on the Selina 6 section and decrease through 5 and 4. The trends are in the opposite direction to the decreasing mineralisation pattern and there is a clear parallel with the Prince Lyell situation (see above).

3.6 Conclusions

Although the results from D.D.H. Selina 7 were disappointing the geological structure of the area is now basically known rather than inferred. Recognition of the general rock sequence in the area and the identification of the rock type at the ends of D.D.H.'s 5 and 6 as a Cambrian granite has helped locate the Selina mineralisation as being lower in the Cambrian sequence than that at Mt. Lyell.

The conductivity tests and the Turair survey undertaken in the area have indicated that electromagnetic reconnaissance surveys are generally not suitable under these conditions as an exploratory tool for disseminated sulphide deposits.

The most encouraging aspect of the years activities in the Selina area are the results of Mr. Walshe's work on the distribution of trace elements within the pyrite. Although D.D.H. Selina 7 has probably finally proved that there is no potential for a near surface economic deposit in the northern part of the Selina anomally, the recognition by Mr. Walshe that the mineralising solutions originally carried significant amounts of copper suggests that the anomally still has potential as an exploration target. Mr. A.W. Howland-Rose of Scintrex Pty. Ltd. is at present undertaking a re-interpretation of the geophysical results in the area and this combined with further geochemical information may lead to additional testing of the zone by diamond drilling, particularly towards the southern end of the anomally where it is covered by the glacial moraine.

4. NEWTON CREEK - HOWARD'S ANOMALLY - BASIN LAKE AREA

4.1 Introduction

Previous mapping in the area indicated a series of pyroclastic rocks intruded by a large hornblende porphyry and unconformably overlain by a series of banded keratophyric tuffs (Comstock Tuffs). An I.P. survey undertaken by McPhar in 1969 outlined a long semi-continuous anomally along the eastern edge of the hornblende porphyry and diamond drilling on line 20 +200'S (H.A. 1 and H.A. 2) in 1971 intersected a series of pyritic tuffs and agglomerates.

It was realised early in the year that D.D.H.'s H.A. 1 and H.A. 2 may not have effectively tested the I.P. anomalous zone which occurs over a strike length of 30,000'. Mapping in other areas indicated that this area is in a broadly similar stratigraphical position, within the Mt. Read Volcanics, as the area of the Mt. Lyell mineralisation.

4.2 Mapping

A lack of manpower precluded the completion of the original mapping programme planned for the area and only the area immediately around Howard's Anomally was covered during the year.

The three costeans constructed in 1971-72 and several logging tracks, previously unmapped, were mapped by a group of four geologists in December, 1972.

Mapping established that the large hornblende-felspar porphyry previously outlined consists of several smaller flows or sills within a sequence of tuffs and agglomerates. Adjacent to the hornblende-felspar porphyries, disseminations and veins of jasper, epidote and pyrite mineralisation (with some minor chalcopyrite) was observed in silicified zones within the pyroclastics.

4.3 Conclusions

The area is of considerable interest due to both its lithology and inferred stratigraphical position. The I.P. anomally is coincident with the observed position of sulphide mineralisation in surface outcrop and in old workings (Tyndall Mine). Geological mapping of the area is far from adequate and more work is required in the area before potential target zones can be delineated.

5. HENTY FAULT ZONE

5.1 Introduction

The reconnaissance exploration coverage of the Henty Fault Zone in the north west corner of the licence area was completed during the year. Fourteen line miles of intermediate grid lines were cut over the area to give a line spacing of approximately 700' and a geophysical grid comprised of thirty line miles. A magnetometer survey and a gradient array I.P. survey were carried out over the grid in February, 1973 and the area was remapped during March, in the light of knowledge gained in other areas.

5.2 Geophysics

In the light of the results obtained from previous geophysical surveys in the area and at Mt. Lyell, along with the results of the core tests (Section 3.3) and due to the difficult terrain conditions in the survey area, it was decided that the most cost effective, reconnaissance geophysical coverage would be obtained using a large current dipole, gradient array, induced polarisation survey. Subsequently the entire grid between lines 42N and 66N (comprised of 150,000 line feet) was surveyed by two operators from Scintrex Pty. Ltd. aided by three field assistants and involved 18 production days in January and February.

Some 98 anomalous chargeability responses were located, of which 17 responses occurring in 8 groups of anomalies are considered to be of primary importance at this stage. (Fig. 6). The depth to the top of the source of the latter anomalies appears to be less than 100 feet. Pole-dipole detail conducted over the anomaly on line 63N indicated the top of the source at a depth of approximately 50 feet below surface. During 1970-71, costeaning adjacent to line 63N exposed veinlets of pyrite and chalcopyrite in a sheared chloritic tuff and chip sampling indicated a zone 40 feet wide assaying 1.22 percent copper.

A broad zone of anomalous responses occurs between lines 54N. and 61N. over a zone known to contain disseminated pyrite. Scintrex Pty. Ltd. have recommended that this zone be subject to a detailed survey using either Turam (electromagnetic) or M.I.P. (magnetic induced polarization) techniques, in order to define the more conductive zones and hence delineate more specific targets for investigation.

The grid was also surveyed using a proton precession magnetometer and the data submitted to Scintrex Pty. Ltd. for processing. The absolute background (total field) is in the order of 62,600 gammas, while the magnetic relief ranges over about 2,000 gammas, but lies for the most part within 300 gammas. No obvious anomalies were detected but the information has been useful in the interpretation of the geology of the area. (See Section 5.3).

5.3 Geological Mapping

Geological mapping of the grid area was undertaken by a party of three geologists in March, 1973. The area is one of high relief and is covered in dense rain forest which makes access difficult and outcrop very sparse. Interpretation of the limited geological data available in the area was aided by the use of the magnetic, resistivity and conductivity data recorded on the geophysical surveys, to differentiate the strike and extent of the major rock units by their electrical characteristics. Major units differentiated by the geophysical surveys coincide quite clearly with major rock units differentiated by mapping and has allowed a more meaningful interpretation of the geology in the area. (Fig. 6).

The older Cambrian rocks in the area are thought to dip steeply westwards, although there are indications that some isoclinal folding occurs. These rocks are overlain unconformably in the south east part of the area by the Comstock Tuffs and Newton Creek Sandstones of the Upper Cambrian, Tyndall Group. These are in turn overlain by the Ordovician Owen Conglomerates of the Gooseneck. None of the rocks above the unconformity appear to have any economic potential.

The oldest Cambrian rocks in the area are the pale coloured, quartz porphyry lavas in the north east part of the area. The rocks have rounded, colourless quartz phenocrysts up to 5 mm in diameter; they are generally unmineralised massive, weakly sheared and occasionally exhibit flow banding and autobrecciation. These lavas extend eastwards to the Darwin Type Rhyolite of Red Hills and are considered to be equivalent to the Sedgwick Type Rhyolites. (See cross-section, Fig. 2).

To the west the quartz porphyry lavas are displaced by the Henty Fault against a series of acid lavas, tuffs and agglomerates. The latter lavas are pale coloured, fine grained and rarely exhibit phenocrysts. The tuffs are white to green and are generally lithic tuffs, often intimately associated with coarse agglomerates, which often contain fragments of acid lava up to several centimetres in diameter. This series is provisionally correlated again with the Sedgwick Type Rhyolites, although it is possible that the series is slightly higher in the Cambrian succession, and could be partly equivalent to the Queenstown Pyroclastics. This sequence is intruded by two small bodies of dark green fine grained andesite of Cambrian age in the centre of the area and to the west by a series of Devonian(?) quartz diorites of unknown extent; which have to date proved to be unmineralised.

Apart from the sheared zone along the Henty Fault, observed mineralisation is limited to scattered occurrences of pyrite and minor chalcopyrite, usually in the pyroclastic units. An area of stronger pyrite mineralisation occurs in the centre of the area and coincides with the Regional I.P. High recorded by Scintrex Pty. Ltd. Along the Henty Fault a narrow zone of strongly sheared chloritic tuffs coincides with the major I.P. anomalies. In places the tuffs contain well developed chalcopyrite and pyrite mineralisation (e.g. line 63N.) and areas of silicification and sericitisation also occur.

5.4 Conclusions

The results of exploration activities in the Henty Fault Zone during the year have been encouraging. Geologically the area shows basic similarities to the Mt. Lyell area, both areas being apparently associated with the interfingering contact between an older rhyolitic sequence and a younger dominantly pyroclastic sequence. Disseminated sulphide mineralisation is known to occur in the area from surface exposures and is also indicated by the anomalous zones outlined by the induced polarization survey. The zone of strong shearing along the Henty Fault includes localised areas of silicification, sericitisation and chloritisation.

Under the rugged physical conditions, the gradient array I.P. survey appears to have been a very cost effective survey and the 8 major anomalies and the broad I.P. high between lines 54N. and 61N. are considered to warrant immediate follow-up investigations. In particular, anomalies 1 to 5, along the Henty Fault Zone, are considered to be of immediate interest and are reasonably accessable for geochemical sampling, costeaning and if necessary additional detailed geophysics in order to further assess their potential and to define targets for testing by diamond drilling.

6. MERCURY VAPOUR SOIL GAS SURVEY

6.1 Introduction

A mercury vapour soil gas test survey was conducted by Scintrex Pty. Ltd. in January, 1973. Three known mineralised areas at Mt. Tyndall : Howard's Anomally, the Henty Fault Zone and Selina were surveyed, in addition to several mineralised zones and orebodies at Mt. Lyell.

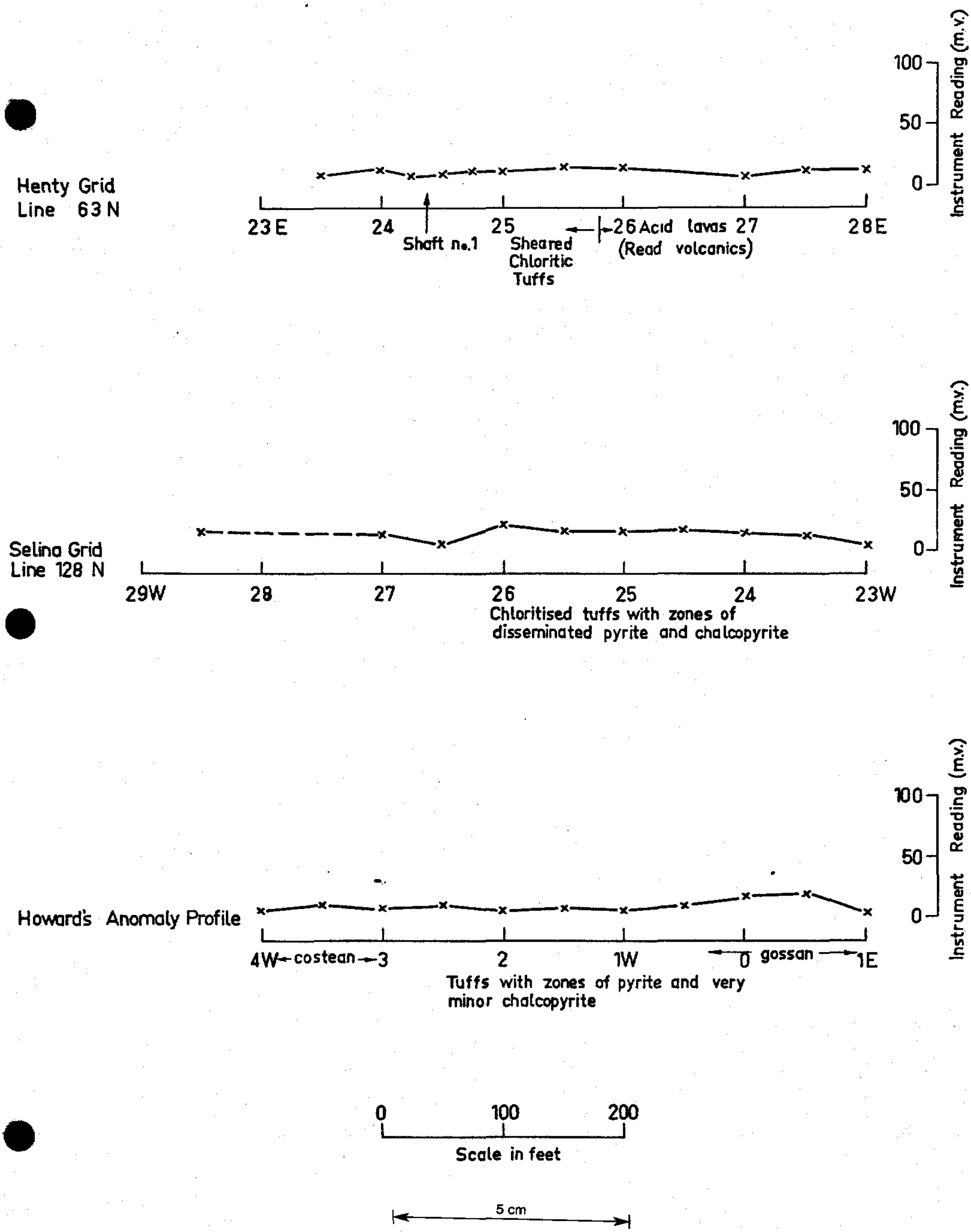
The survey was conducted using a Scintrex HGG-3 mercury vapour soil gas spectrometer. The instrument expresses readings in millivolts, where one millivolt is approximately equivalent to a mercury vapour concentration of 10 nanograms/m^3 in the gas inside the spectrometer sample cell.

6.2 Survey

From the profiles it can be seen that no significant results were obtained from the surveys over mineralised zones at Mt. Tyndall. Most of the results measured were in the range of 10 to 15 millivolts, which is near the lower detection limit for the instrument.

In the Howard's Anomally area a traverse was undertaken from the gossan near line 20 +200'S, westwards along the side of the costean to the contact between the mineralised pyroclastics and a hornblende-felspar porphyry. Over the gossan individual readings of 30 and 25 millivolts were recorded, elsewhere the values ranged from 0 to 15 millivolts.

A traverse was undertaken along line 63N. over the sheared, mineralised, chloritic tuffs along the Henty Fault adjacent to an old mine shaft. Apart from readings of 65 and 80 millivolts obtained on the old mine dump, all the readings were below 20 millivolts, and directly above exposed pyrite/chalcopyrite veins the readings were only 10 to 15 millivolts.



MERCURY VAPOUR SOIL GAS

SURVEY PROFILES

In the Selina area, line 28N. was surveyed over the axis of the I.P. anomally and again the readings were all less than 20 millivolts.

6.3 Conclusions

The failure of the mercury vapour analyser to adequately detect mineralised zones in the Mt. Tyndall area can probably be attributed to three main factors:

1. Analysis of mercury vapour in soil gas requires, that above the mercury source there be developed a good soil profile, which must be damp in order to retain the mercury vapour. In the Tyndall area the soils are often poorly developed and not deep enough to hold a reservoir of mercury vapour.

2. Although soils must be damp to retain the gas, waterlogged areas do not allow the sulphide minerals to oxidise and give off their mercury. Much of the ground at Tyndall is extremely wet and probably does not allow the necessary oxidation of any mercury bearing sulphides (this probably accounts for an anomally being detected in the mine dump on line 63N. Henty Fault Zone but not in the soil).

3. The main reason for the lack of success is more fundamental. Measurements taken over several of the orebodies at Mt. Lyell illustrates that not all the mineralisation contains significant amounts of mercury. The more massive bodies of Tasman Crown, Twelve West and Crown Three contain large amounts of easily volatilisable mercury (responses over 3,000 millivolts above Crown Three) but the more disseminated bodies such as Cape Horn and Prince Lyell give off little free mercury. Most of the mineralisation so far detected at Mt. Tyndall is of the disseminated type, e.g. Selina, and possibly contains little mercury.

Mercury vapour soil gas surveys would appear to be unsuitable in the search for disseminated sulphides in Western Tasmania.

7. SUMMARY OF REGIONAL GEOLOGY

During the year a significant advance in the understanding of the Mt. Read Volcanics was achieved with the development of a preliminary stratigraphic model for the Dundas Trough (Corbett et al, in press) with particular emphasis on the volcanic complex and associated rocks. Briefly the complex is considered to consist of a central core of older rhyolites, flanked and overlain by pyroclastic sequences which interfinger with the trough sequences of sediments and volcanics (see page).

More detailed mapping of sections of E.L. 9/66 (Section 8.1.4) should enable their relative positions within the succession to be located with a greater degree of confidence. The oldest volcanics in the area are considered to be the Darwin Type Rhyolites of Red Hills, characteristically mineralised by chlorite-hematite-pyrite-chalcopyrite veins and minor disseminations. This style of mineralisation may represent the "root zones" of sulphide deposits at higher levels in the succession. The Lake Dora mineralisation, although not yet mapped in detail, is thought to be slightly higher in the succession. The Selina mineralisation is considered to be further out on the flanks of the volcanic pile, but lower in the sequence than the mineralisation of the Henty Fault and Howard's Anomally-Basin Lake zones, which are thought to be closer to the Mt. Lyell mineralised horizon, located in the upper levels of the sequence. If further mapping confirms this stratigraphic model, the area of volcanics, unconformably overlain by the Tyndall Group, on the western side of the West Coast Range from Basin Lake to the Henty Fault Zone is enhanced as an exploration target.

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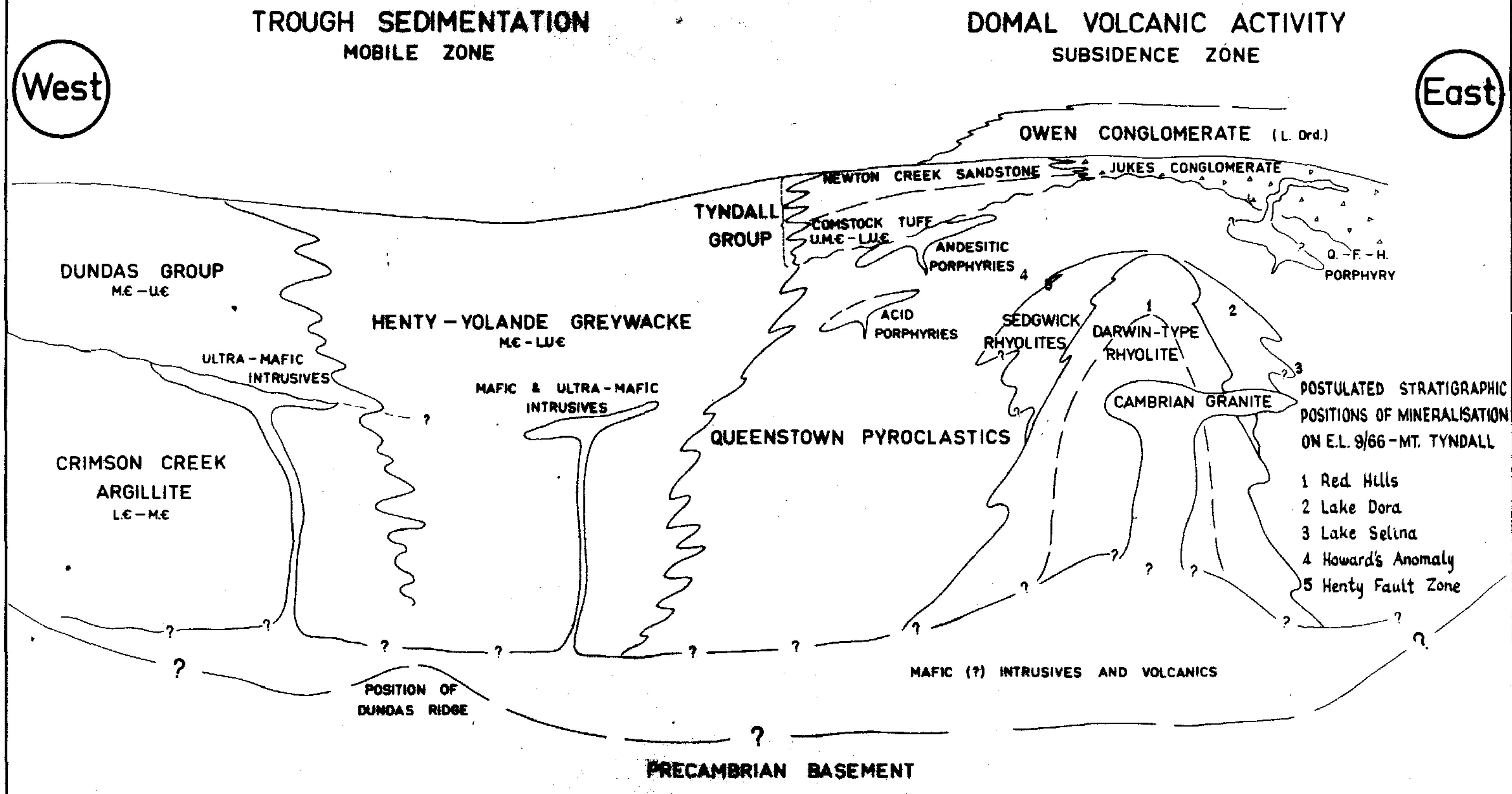
DUNDAS TROUGH

VOLCANO – SEDIMENTARY STRATIGRAPHIC RELATIONSHIPS



In previous years the exploration philosophy at Mt. Tyndall was to cover all the Cambrian rocks with geophysics (Fig. 7) and geochemical sampling, with little regard to the detailed geology, in the belief that the whole of the Cambrian succession had similar potential as hosts to economic sulphide deposits. The current stratigraphic and metallogenic model (Reid, 1973) indicates that the more significant metal sulphide deposits are developed in the higher sections of the Queenstown Pyroclastics beneath the Tyndall Group. Assuming that the model is substantiated by further work it could lead to the more selective application of relatively expensive ground techniques subsequent to regional mapping programmes in other areas of the Mt. Read Volcanic belt.

8. RECOMMENDATIONS AND BUDGET 1973-74

8.1 Exploration Programmes

The exploration programme for 1973-74 includes both routine and more detailed investigations of the results of the 1972-73 programme. It can be most conveniently discussed under the following headings:

1. Selina Area.
2. Henty Camp - Newton Creek - Basin Lake Area.
3. Henty Fault Zone.
4. Regional Mapping.

8.1.1 Selina Area

A re-interpretation of the geophysical data from the Selina - Rolleston area is at present being undertaken by Mr. A.W. Howland-Rose of Scintrex Pty. Ltd. and it is recommended that a proton magnetometer survey be undertaken on lines 80N. to 16S. to aid with this re-interpretation.

Work by Mr. J.L. Walshe will be directed towards the definition of the physiochemical factors operating at the time of deposition. Copper deposition is dependent upon temperature and pH. Temperature can be theoretically calculated by the amount and distribution of magnetite, which crystallises at high temperatures unsuitable for the deposition of copper. The pH can be assessed by examining the oxidation states of manganese in chlorites. It therefore becomes important to take a detailed look at mineralogy and also to undertake some probe work, to define more clearly the trace element variation, along with some spectral studies on the manganese in chlorites.

It is recommended that no further work be undertaken on the Selina area until Mr. Walshe's studies are further advanced and the re-interpretation of the geophysics is received. If both reports are favourable it is recommended that the southern end of the anomally be tested with a diamond drill hole, probably early in 1974-75.

8.1.2 Henty Camp - Newton Creek - Basin Lake Area

Previous work in this area has shown it to be one of extreme interest. It is recommended that detailed mapping be undertaken from the Henty Camp (southern end of the Henty Fault Zone) southwards to the southern boundary of the exploration licence, between the Owen Conglomerate of the West Coast Range and the Henty River. Previous mapping programmes in the area have been too limited and have not provided the complete understanding of the stratigraphy and structure in the area, considered necessary to fully evaluate the potential of the area.

8.1.3 Henty Fault Zone

Work during 1973-74 will be concerned with evaluating the potential of all the main I.P. anomalies in the area. Anomalies 1 to 5 along the Henty Fault are considered to be of primary interest and it is recommended that work be concentrated on these initially.

Anomaly 1 on line 63N. has been detailed by pole-dipole and the source of the anomaly has been shown to be 50 feet below the surface. Costeaning, adjacent to line 63N., in 1970-71 exposed veinlets of pyrite and chalcopyrite in a sheared green chloritic tuff. Chip sampling of the costean revealed 40 feet of 1.22% Cu. It is recommended that a 700 foot hole be drilled early in the year from 2600E on line 63N., with a dip of -30^{o}, to drill beneath the mine shaft and to intersect the anomaly at 200 feet below the surface. If this hole intersects significant mineralisation further drilling should be undertaken to the north. However, a firm recommendation will depend largely on the results from the first hole.

Detailed geochemical soil sampling programmes will be conducted over anomalies 1 to 8 using a general sample interval of 50 feet; this will be reduced to 25 feet immediately above the anomalies. Subsequently costeans will be established where anomalous values are recorded, to facilitate detailed mapping and chip sampling.

At this stage results will determine the desirability of further testing by diamond drilling using relatively short holes of the order of 700 foot to 1000 foot in length, initially to test the source of the anomaly prior to deeper drilling for depth extensions of mineralisation.

As indicated above a drilling target has already been established on anomally 1 and the follow-up investigations will concentrate initially on anomalies 1 to 5 of which anomalies 1 and 5 are immediately accessible for costeaning. The geophysical response indicates a relatively shallow source for all of the above anomalies.

Anomalies 6 to 8 will be subjected to similar soil sampling programmes but due to their relative inaccessibility, further investigations or testing by costeaning and/or diamond drilling will require careful assessment of the results in the light of the results of the drilling to be completed over anomalies 1 to 5.

The regional I.P. high between lines 54N. and 61N. needs to be detailed to try and find more conductive zones within it, suitable for drilling targets. Either a Turam or M.I.P. survey has been suggested by Scintrex Pty. Ltd. However, it is strongly recommended that such techniques be first employed over a traverse where the response of a relatively narrow zone to conventional I.P. techniques is already known, e.g. line 63N.; in order to evaluate the most efficient method.

8.1.4 Regional Mapping

From Fig. 2 it can be seen that several areas of Cambrian rocks within the boundaries of E.L. 9/66 are largely undifferentiated. It is important that these areas be mapped, not only in order to assess the potential of the ground but also in order to complete the thorough re-appraisal of the succession and structure of the Mt. Read Volcanics, between Rosebery and Queenstown, at present underway.

It is recommended that the following areas be mapped on a reconnaissance basis during the year:

1. Lake Dora area.
2. The area north of Red Hills.
3. The area west of the Henty River.

8.2 Access and Camp Construction

Geophysical anomalies 2, 3 and 4 in the Henty Fault Zone are at present relatively inaccessible and road construction (6,000 ft.) will be required in order to facilitate the costeaning and diamond drilling.

Present access to the major part of the Tyndall lease is via a 4-wheel drive track which traverses the steep water-shed between the Langdon and Henty Rivers. Sections of this track have deteriorated markedly since 1970 and it is probable that certain sections may be washed away entirely in the not too distant future. To repair or re-negotiate access around one particular area could prove to be very expensive apart from being inconvenient during the field season.

A proposal has been made by Mr. E. Triffet of Western Distributors, who hold the timber lease to the west of the Henty River, that a metalled road be constructed by him from his logging road to the road north of the Henty Camp, the costs to be divided evenly between Western Distributors and The Consolidated Syndicate.

Timber tracks constructed by Western Distributors are presently within ½ mile of the Henty Road and it is recommended that this proposal be accepted, ($2,000 has been allocated for this work and included in the Outside Services budget).

The new road will make access to E.L. 9/66 much easier and quicker and allow heavy equipment, e.g. diamond drill rigs, to be trucked directly into the area rather than dragged in by a bulldozer which is slow and expensive, also the cost of road maintenance will be significantly reduced.

Several sections of the present road, particularly the "zig-zag" to Rolleston and the road north of the Henty Camp, have deteriorated badly and will need repairing before the field season commences. Several costeans will need to be excavated over I.P. anomalies in the Henty Fault Zone and the preparation of some drill sites will also be necessary.

No trackcutting is envisaged on the licence area at this time.

The established camps at Henty and Rolleston are satisfactory in size and standard for the present. However, it is recommended that the Mt. Lyell caravans be established on the site of the old Pickands Mather camp in the south west part of the lease, as a base for work in the Newton Creek - Basin Lake area early in the season and later transferred to the White Spur area for work west of the Henty River after Christmas.

8.3 Staffing

Requirements for 1973-74 are similar to those of 1972-73. One geologist and two field assistants will be required for work connected with E.L. 9/66 throughout the year. From December to March this number should be increased to two geologists and four field assistants. It is envisaged that during the summer field season three of the field assistants will be university students.

8.4 Budget

A total budget of $93,300 for E.L. 9/66 has been proposed for 1973-74.

This budget has been compiled as follows:

1. Salaries

A total of $25,200 has been budgetted to include the following salaries:

		$
Senior Geologist - Exploration	(35%)	4,800
Exploration Geologist	(65%)	7,570
Exploration Foreman	(30%)	2,630
Draughtsman	(30%)	2,600
Field Assistant	(50%)	3,100
		$20,700

These estimates include a 55% loading to cover overhead expenses.

Three student field assistants (24%) - $4,500 including a 25% loading to cover overhead expenses.

2. Materials

A total of $2,000 has been budgetted to cover the cost of all stores and non-returnable items, including camp equipment and food, gas, fuel, and field equipment, etc.

3. Outside Services

For the hire of contractors to conduct road construction and repairs, costeaning, site preparation and re-location of diamond drill rigs a total of $8,100 has been estimated.

4. Diamond Drilling

It is estimated that a minimum of 3,500 feet (1,061 metres) of diamond drilling will be needed to test targets in the Henty Fault Zone. This has been estimated as costing in the order of $35,000. However, it is to be noted that this is a minimum estimate and diamond drilling in the order of 6,000 feet could be required to adequately test the 5 major anomalies along the Henty Fault. The cost for this would be in the order of $60,000; no allowance for this has been made in the current budget estimates.

5. Geophysics

An initial estimate of $9,000 has been allocated to cover the cost of the re-assessment of all the previous geophysics on E.L. 9/66 and the cost of detailing some of the anomalous I.P. responses in the Henty Fault Zone. However, subsequent discussions with Scintrex Pty. Ltd. have shown that several of the anomalies in the Henty Fault Zone will require no further geophysical detailing. It is estimated that probably $3,000 will cover the cost of geophysics in 1973-74, the other $6,000, originally budgetted in February, 1973, to be allocated to diamond drilling.

6. <u>Geology</u>

An amount of $4,000 has been allocated to cover geological and geochemical costs. This includes $2,000 for all geochemical analyses, petrographic and consultant expenses (Mr. J.D. Campbell) and $2,000 for the continued grant to Mr. J.L. Walshe.

7. <u>General Costs</u>

To cover the cost of vehicle operating, plant maintenance, surveying, assaying costs and for the hire of equipment such as caravans and miscellaneous minor items a total of $4,000 is budgetted.

8. <u>Capital</u>

$6,000 is allocated for the replacement of the Syndicates L.W.B. Toyota flat tray (T.C.S.1) and S.W.B. Toyota Land-cruiser (T.C.S.2) prior to the commencement of the 1973-74 field season.

K. Wells

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BUDGET 1973-74

MT. TYNDALL PROSPECT

Period No. :		1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
No. of Working Days	Mine	20	20	20	20	20	20	14	19	20	19	19	19	20	250
	Mill	28	28	28	28	28	28	21	28	28	28	28	28	28	357
Salaries		700	600	600	600	1100	2600	4000	4000	3900	2300	2100	1400	1300	25200
Materials		50	50	100	100	100	200	400	400	200	100	100	100	100	2000
Outside Services						2100	3000	3000							8100
Diamond Drilling							10000	10000	10000	5000					35000
Geophysics				1500	1500					6000					9000
Geology		800		400		400		800		400		400		800	4000
General Costs		200	200	200	200	400	500	500	400	400	400	200	200	200	4000
Capital				6000											6000
TOTAL COST MT. TYNDALL PROSPECT		1750	850	8800	2400	4100	16300	18700	14800	15900	2800	2800	1700	2400	93300
JOINT VENTURE															
1/3 Mt. Lyell cost as above		583	283	2933	800	1368	5433	6233	4933	5300	933	933	568	800	31100
TOTAL JOINT VENTURE COST		583	283	2933	800	1368	5433	6233	4933	5300	933	933	568	800	31100

REFERENCES

Diamond Drilling Programme Proposed at Selina North for 1972-73 Summer	-	J.P. McKibben, Oct. 1972
Annual Report 1971-72 Mt. Tyndall Area E.L. 9/66	-	J.P. McKibben, July 1972
Report on Proposed Ph.D. Studies at Mt. Lyell Mines and Renison Ltd.	-	J.L. Walshe, March 1972
Report on the Trace Studies of Lake Selina Sulphide Mineralisation	-	J.L. Walshe, Feb. 1973
Trace Element Study of Sulphides from the Prince Lyell Ore Zone (830')	-	J.L. Walshe, June 1973
Report on Conductivity, Susceptibility, Chargeability and Resistivity Tests of Diamond Drill Core	-	A.W. Howland-Rose, Nov. 1972 Scintrex Pty. Ltd.
A Report on I.P. Surveys over the Mt. Tyndall Grid, Queenstown Area, N.W. Tasmania	-	A.W. Howland-Rose, Feb. 1973 Scintrex Pty. Ltd.
Report on a Mercury Vapour Soil Gas Survey, Queenstown Area, N.W. Tasmania	-	P. Robertshaw and A.W. Howland-Rose, Feb. 1973 Scintrex Pty. Ltd.
Report on Turair Airborne E.M. - Magnetic Survey, Lake Selina Prospect, Queenstown, Tasmania	-	J.G. Linford, June 1973 Scintrex Pty. Ltd.

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New Data on the Stratigraphy and Palaeogeography of the Cambrian Mt. Read Volcanics in the Queenstown Area, Tasmania - K.D. Corbett, E.B. Corbett, G.R. Green, K.O. Reid, K. Wells, N.W. Sheppard (in press)

The Relationship of the Cambrian Mineralisation to Stratigraphy and Lithofacies in the Mt. Read Volcanic Complex and Associated Rocks of the Dundas Trough in Western Tasmania - K.O. Reid, August 1973 Mt. Lyell Co. Report

TABLE I

Notes:

0 = negligible

* = less than 0.1%

Magnetite in % by volume

SAMPLE (Depth)	CONDUCTIVITY (mhos/meter)	SUSCEPTIBILITY ($x 10^{-6}$)	MAGNETITE	% Cu	% FeS_2
Drill Hole No. CH 71					
323'		34.1	*	N.A.	
333'		24.5	0	N.A.	
343'		29	0	0.05	9.50
353'		19.5	0	N.A.	
364'		115	*	N.A.	
375'		68	*	N.A.	
385'	CORE SIZE TOO LARGE FOR CONDUCTIVITY MEASUREMENTS	10	0	N.A.	
396'		10	0	N.A.	
408.5'		58	*	N.A.	
418'		19	0	N.A.	
427'		24.5	0	N.A.	
435.5'		24.5	0	N.A.	
448'		14.5	0	N.A.	
453.5'		29	0	N.A.	
463.5'		29	0	N.A.	
474'		14.5	0	N.A.	
485'		24.5	0	N.A.	
494'		19.5	0	N.A.	
504'		330	0.23%	N.A.	
514'		39	*	N.A.	
524'		18	0	N.A.	
533'		15	0	N.A.	
543'		15	0	0.18	
553'		245	0.18%	0.11	
565'		135	0.11%	4.05	
574'		74	*	4.29	

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SAMPLE (Depth)	CONDUCTIVITY (mhos/meter)	SUSCEPTIBILITY ($x 10^{-6}$)	MAGNETITE	% Cu	% FeS_2
585'	CORE SIZE TOO LARGE FOR CONDUCTIVITY MEASUREMENTS	34	*	6.57	
595'		49	*	3.21	
605'		44	*	2.45	
615'		10	0	2.45	
625'		39	*	0.98	
635'		44	*	0.59	
644'		40	*	1.35	
654'		34	*	1.15	

Drill Hole No. CH 86

691'	0.20	150	0.12%	0.06	1.30
705'	0.31	24.5	0	0.06	2.30
715'	0.47	19.5	0	0.16	3.60
720'	0.38	19.5	0	0.10	4.90
725'	0.38	30	*	0.96	10.50
730'	0.25	14.5	0	0.20	7.90
734'	0.52	10	0	0.12	8.80
740'	0.68	49	*	0.15	9.70
745'	0.35	5	0	0.10	3.60
755'	0.41	5	0	0.05	4.70
765'	0.25	5	0	0.08	4.30
775'	0.57	8	0	0.05	3.40
780'	0.59	5	0	0.03	5.60
785'	0.41	5	0	0.03	5.60
790'	0.47	0	0	0.02	6.20
800'	0.38	10	0	0.06	9.40
810'	0.47	0	0	0.13	12.40
820'	0.59	0	0	0.06	4.50
830'	0.42	15	0	0.23	4.70
840'	0.52	10	0	0.07	3.90
850'	0.47	10	0	0.18	8.80
855'	0.35	10	0	0.02	3.40
858'	0.37	10	0	0.10	3.00

SAMPLE (Depth)	CONDUCTIVITY (mhos/meter)	SUSCEPTIBILITY (x 10^{-6})	MAGNETITE	% Cu	% FeS_2
870'	0.49	19.5	0	0.11	7.70
875'	0.15	19.5	0	0.22	5.80
880'	0.24	15	0	0.45	5.60
890'	0.37	10	0	0.28	10.30
900'	0.19	5	0	0.70	4.50
906'	0.25	10	0	0.71	7.10
909'	0.24	19.5	0	0.71	7.10
915'	0.19	29	0	1.01	8.80
920'	0.13	39	*	0.83	6.20
925'	0.21	10	0	0.39	2.60

Drill Hole No. CH 64

140'	0.30	10	0	0.30	10.30
150'	0.11	10	0	0.05	14.80
160'	0.18	24.5	0	0.03	Nil
170'	0.18	34	*	0.07	2.30
180'	0.25	10	0	0.15	2.50
190'	0.28	5	0	0.13	1.30
200'	0.14	0	0	0.06	3.60
210'	0.35	18	0	0.10	1.10
220'	0.31	10	0	0.08	Nil
230'	0.16	5	0	0.16	Nil
240'	0.13	24.5	0	0.10	8.40
250'	0.28	10	0	0.08	3.20
260'	0.11	20.5	0	0.05	1.90
270'	0.23	29	*	0.08	Nil
280'	0.14	19.5	0	0.08	4.10
290'	0.16	11	0	0.92	1.70
300'	0.16	19.5	0	0.77	1.90
305'	1.60	15	0	2.43	1.70
310'	0.25	10	0	3.05	10.70
315'	0.25	10	0	4.23	Nil

SAMPLE (Depth)	CONDUCTIVITY (mhos/meter)	SUSCEPTIBILITY (x 10^{-6})	MAGNETITE	% Cu	% FeS_2
320'	0.51	12	0	3.91	5.80
325'	1.13	8	0	3.80	7.90
330'	0.34	15	0	4.97	3.00
335'	0.23	34	*	3.44	5.40
340'	0.34	24.5	0	2.80	3.20
350'	0.09	5	0	0.16	Nil
360'	31.20	1000	0.58%	0.40	5.80
370'	0.16	205	0.16%	0.37	3.90
380'	0.71	5	0	0.56	6.60
385'	0.25	70	*	0.42	4.30
390'	0.13	5	0	0.58	8.60
400'	0.095	0	0	0.54	2.40
410'	0.16	5	0	0.19	9.40
420'	0.13	15	0	0.22	4.30
430'	0.09	5	0	0.05	4.30
440'	0.34	31.5	*	N.A.	
450'	0	10	0	N.A.	
460'	0.34	15	0	N.A.	
470'	0	10	0	N.A.	
480'	0.34	19.5	0	N.A.	
490'	0.58	990	0.58%	N.A.	
495'	0.46	39	*	N.A.	
500'	0.42	730	0.46%	N.A.	
505'	0.34	10	0	N.A.	
516'	0	5	0	N.A.	

<u>Drill Hole No. CH 80</u>

5'	0.11	19.5	0	N.A.	
10'	0.09	10	0	N.A.	
15'	0.45	19.5	0	N.A.	
20'	1.98	64	*	N.A.	
25'	0.16	15	0	N.A.	
30'	0.13	19.5	0	N.A.	

SAMPLE (Depth)	CONDUCTIVITY (mhos/meter)	SUSCEPTIBILITY ($x 10^{-6}$)	MAGNETITE	% Cu	% FeS_2
35'	0.16	31.5	*	N.A.	
40'	0.18	11	0	N.A.	
45'	0.28	5	0	N.A.	
50'	0.13	19.5	0	N.A.	
55'	0.13	15	0	0.05	4.50
60'	0.16	5	0	0.05	2.30
65'	0	10	0	0.16	3.60
70'	0	59	*	1.02	5.80
75'	0.13	34	*	0.34	0.90
85'	0.10	29	0	0.81	0.40
95'	0	10	0	0.87	2.60
100'	0	5	0	0.41	6.70
106'	0.10	10	0	0.20	6.50
117'	0.16	29	0	0.65	1.90
126'	0.16	39	*	0.27	0.06
135'	0.10	10	0	0.99	3.50
145'	0	10	0	1.66	0.60
150'	0.23	10	0	1.66	3.80
160'	0.20	10	0	1.40	1.60
170'	0.18	19.5	0	1.41	6.40
180'	2	10	0	0.75	8.50
190'	0.13	15	0	0.46	6.30
200'	0.10	15	0	0.07	0.90
210'	0.10	10	0	N.A.	
219'	0	5	0	N.A.	

Drill Hole No. CH 76

20'	0.16	15	0	N.A.	
30'	0.13	275	0.2%	N.A.	
40'	0.34	78	*	N.A.	
50'	0.38	19.5	0	N.A.	
60'	0	29	0	0.15	1.90

SAMPLE (Depth)	CONDUCTIVITY (mhos/meter)	SUSCEPTIBILITY (x 10^{-6})	MAGNETITE	% Cu	% FeS_2
65'	0.06	5	0	0.28	1.20
70'	0.16	94	*	3.38	0.50
75'	0.23	49	*	5.18	3.90
80'	35.4	940	0.56%	5.47	2.60
85'	28.3	770	0.48%	5.49	1.20
90'	36.8	1400	0.78%	4.94	2.30
95'	38.2	1550	0.84%	5.39	Nil
100'	29.7	890	0.52%	4.82	1.20
105'	?	2900	1.4%	5.09	1.50
110'	0.2	69	*	6.10	1.60
115'	0.31	15	0	6.89	4.30
125'	0.38	29	0	4.79	4.60
130'	0.23	29	0	6.57	Nil
140'	0.34	34	*	0.31	1.70
150'	0.37	10	0	1.61	7.60
160'	0.24	10	0	0.70	3.30
170'	0.14	0	0	0.48	7.80
180'	0.31	5	0	1.09	1.20
185'	0.37	10	0	0.88	1.80
190'	29.7	1550	0.84%	1.20	2.70
195'	0.37	29	0	1.30	3.40
200'	0.31	54	*	0.41	2.30
210'	0.23	44	*	1.01	5.05
220'	0.20	39	*	0.62	0.62
230'	36.8	74	*	0.50	1.23
235'	0.25	10	0	1.04	3.42
240'	0.31	19.5	0	0.63	16.76
250'	0.37	5	0	0.33	7.84
260'	0.23	5	0	0.36	19.05
270'	0.20	0	0	0.38	10.44
280'	0.40	0	0	0.05	2.71
290'	0.13	0	0	0.26	8.32

SAMPLE (Depth)	CONDUCTIVITY (mhos/meter)	SUSCEPTIBILITY ($x 10^{-6}$)	MAGNETITE	% Cu	% FeS_2
300'	0.20	5	0	1.33	13.76
310'	0.20	54	*	0.97	15.62
320'	0.25	19.5	0	N.A.	
330'	0.18	19.5	0	N.A.	
340'	0.25	19.5	0	N.A.	

Drill Hole No. Selina (LS3)

SAMPLE (Depth)	CONDUCTIVITY (mhos/meter)	SUSCEPTIBILITY ($x 10^{-6}$)	MAGNETITE	% Cu	% FeS_2
45'	0	10	0	N.A.	
60'	0	10	0	N.A.	
80'	0	80	*	N.A.	
90'	0	280	0.2%	N.A.	
100'	0	170	0.13%	N.A.	
110'	0	12	0	N.A.	
120'	0	8	0	N.A.	
140'	0	19.5	0	N.A.	
160'	0	39	*	N.A.	
180'	0	10	0	N.A.	
200'	0	30	*	N.A.	
220'	0	49	*	0.03	0.75
240'	0	24.5	0	0.06	1.87
260'	0	15	0	0.04	0.37
280'	0	24.5	0	0.74	1.12
300'	0	49	*	0.02	0.19
320'	0	59	*	0.04	0.19
340'	0	39	*	0.04	1.12
366'	0	24.5	0	0.09	2.25
380'	0	680	0.42%	0.08	0.75
390'	0	70	*	0.05	0.37
400'	0.11	24.5	0	0.08	0.55
420'	0	29	0	0.10	0.55
440'	0	19.5	0	0.02	0.19
460'	0	54	*	0.01	0.75

SAMPLE (Depth)	CONDUCTIVITY (mhos/meter)	SUSCEPTIBILITY (x 10^{-6})	MAGNETITE	% Cu	% FeS_2
480'	0	600	0.38%	0.02	0.55
500'	1.7	940	0.54%	0.11	0.37
520'	?	6200	2.6%	N.A.	
540'	15.6	1400	0.78%	N.A.	
560'	1.8	1600	0.86%	N.A.	
580'	0	370	0.25%	N.A.	
600'	0	360	0.25%	N.A.	
620'	0	15	0	N.A.	
640'	0	250	0.19%	N.A.	
660'	0	720	0.44%	N.A.	
680'	0	15	0	N.A.	
700'	0	110	*	N.A.	
720'	0	54	*	N.A.	
740'	3.1	320	0.23%	N.A.	
760'	5.8	850	0.52%	N.A.	
780'	5.4	800	0.48%	N.A.	
800'	0	19.5	0	N.A.	
820'	0	19.5	0	N.A.	
840'	0	15	0	N.A.	
860'	0.09	24.5	0	N.A.	
880'	0	11	0	N.A.	
900'	0	19.5	0	N.A.	
920'	0	10	0	N.A.	

Drill Hole No. Selina 4

280'	0.19	44	*	N.A.	
300'	0.22	8	0	N.A.	
320'	0.06	75	*	N.A.	
340'	0.09	12	0	N.A.	
360'	0.06	60	*	N.A.	
380'	0.07	39	*	N.A.	
400'	0	21.5	0	N.A.	
410'	0	10	0	N.A.	

045

664046

SAMPLE (Depth)	CONDUCTIVITY (mhos/meter)	SUSCEPTIBILITY (x 10^{-6})	MAGNETITE	% Cu	% FeS_2
415'	0.06	65	*	0.06	14.4
420'	2	5	0	0.06	21.9
430'	0.39	10	0	0.05	16.4
440'	16.8	160	0.13	0.02	20.9
460'	2.34	29.5	0	0.03	17.8
480'	16.8	7000	3%	0.05	8.4
500'	?	1120	0.64%	0.05	6.8
520'	2.7	3900	1.8%	0.05	19.3
530'	1.12	15	0	0.05	24.1
540'	0.93	10	0	0.05	24.5
560'	0.54	5	0	0.02	8.9
580'	0.17	5	0	0.03	21.6
600'	0.60	39	*	0.04	21.3
620'	0.20	18	0	0.05	25.5
640'	0.06	15	0	0.05	15.4
660'	0.07	5	0	0.12	14.3
680'	0.06	29	0	0.13	9.8
700'	0	10	0	0.03	9.7
720'	0	10	0	0.06	4.0
740'	0.06	24.5	0	0.06	8.3
760'	0.11	29	0	0.10	21.69
780'	0.13	31	*	0.09	5.43
800'	0.06	49.5	*	0.04	11.88
820'	0.24	15	0	0.04	13.62
840'	0.09	90	*	0.05	10.53
860'	0.07	480	0.34%	0.14	13.75
880'	0.60	10	0	0.03	14.57
900'	0.17	260	0.19%	0.05	6.20
920'	0.19	10	0	0.04	13.50
940'	0.16	10	0	0.05	12.40
960'	?	10	0	0.10	15.30
980'	0	19.5	0	0.17	7.20

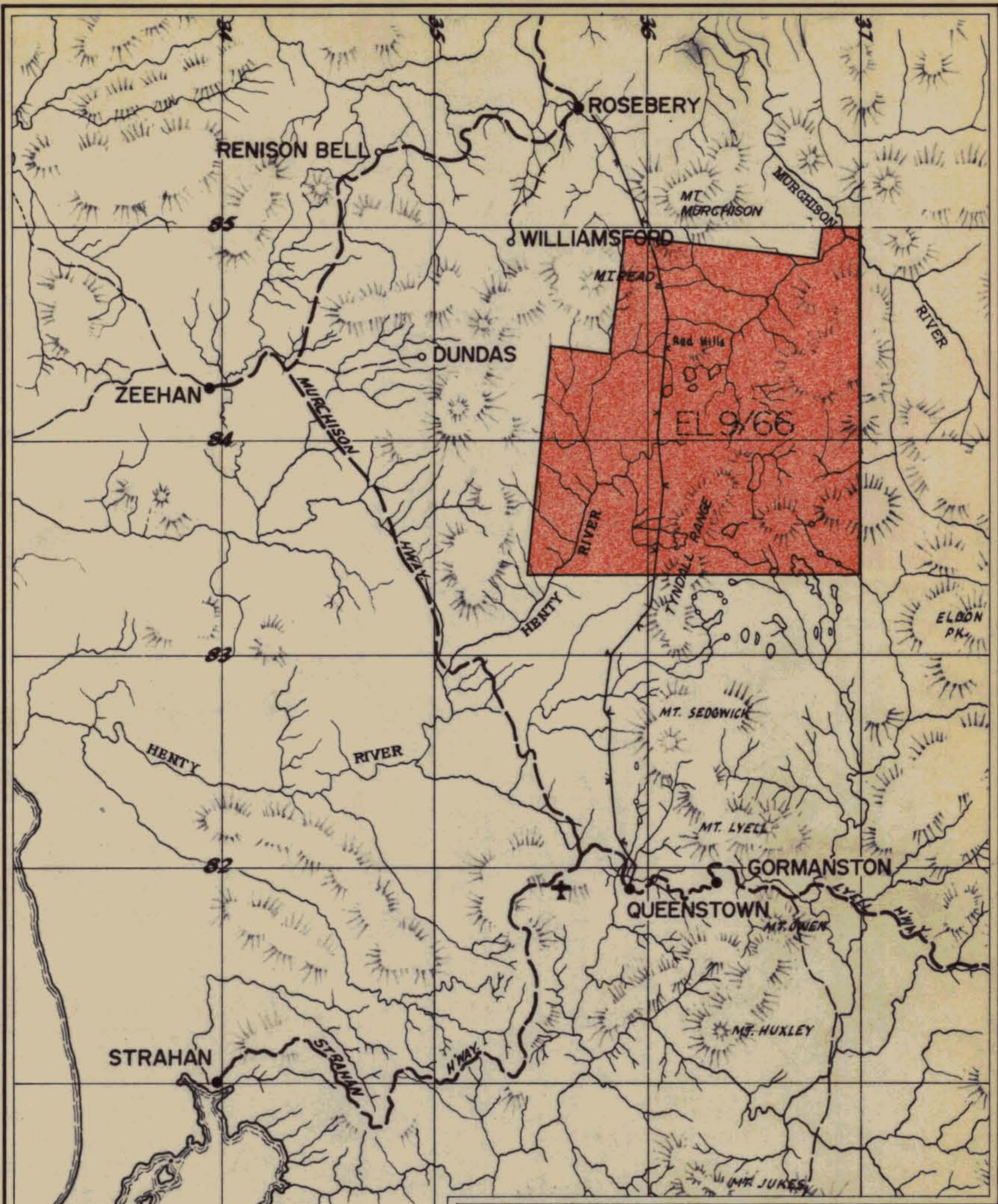
SAMPLE (Depth)	CONDUCTIVITY (mhos/meter)	SUSCEPTIBILITY (x 10^{-6})	MAGNETITE	% Cu	% FeS_2
1000'	3.4	400	0.27%	0.09	20.30
1020'	12.6	1300	0.72%	0.10	2.90
1040'	18.2	580	0.37%	N.A.	
1059'	0.06	15	0	N.A.	

TABLE II

SAMPLE (Depth)	RESISTIVITY (ohm/meters)	CHARGEABILITY (milliseconds)	L/M	% Cu	% FeS_2
Drill Hole No. CH 86					
875'	420	40.8	0.88	0.22	5.80
906'	2046	16.4	1.57	0.71	7.10
909'	808	68	0.97	0.71	7.10
911.5'	345	84	0.99	1.01	8.80
915'	224	130.5	0.58	1.01	8.80
920'	1605	25.2	1.4	0.83	6.20
925'	1191	17.2	1.6	0.39	2.60

047

73-970



THE MOUNT LYELL M. & R. CO. LTD. EXPLORATION DEPARTMENT.	
MT. TYNDALL AREA EL 9/66. LOCALITY PLAN	Drawn: CLB Checked: K. Wells Date: July 1973 Scale: 1"=4miles.

5 cm

664048

FIG. 1

001

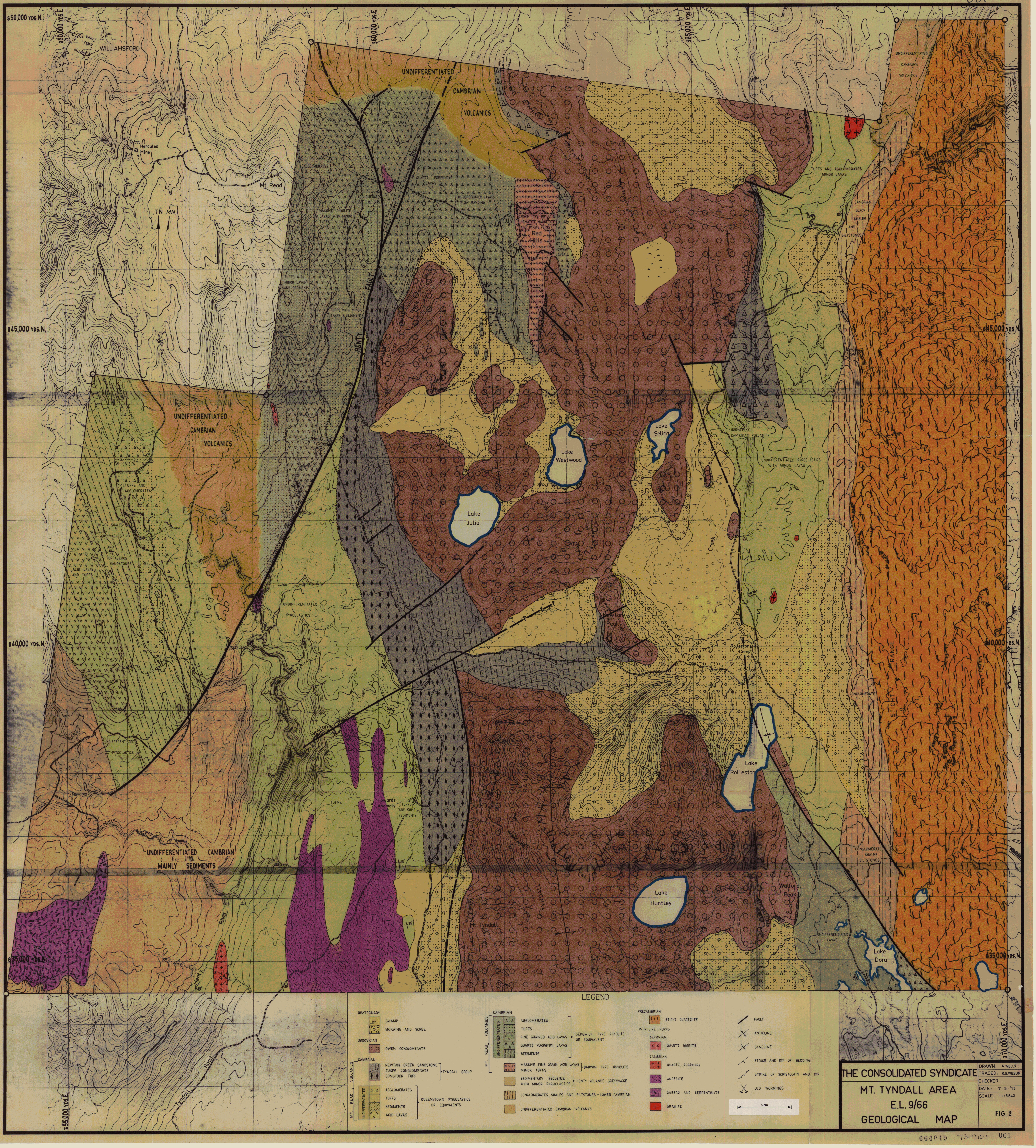
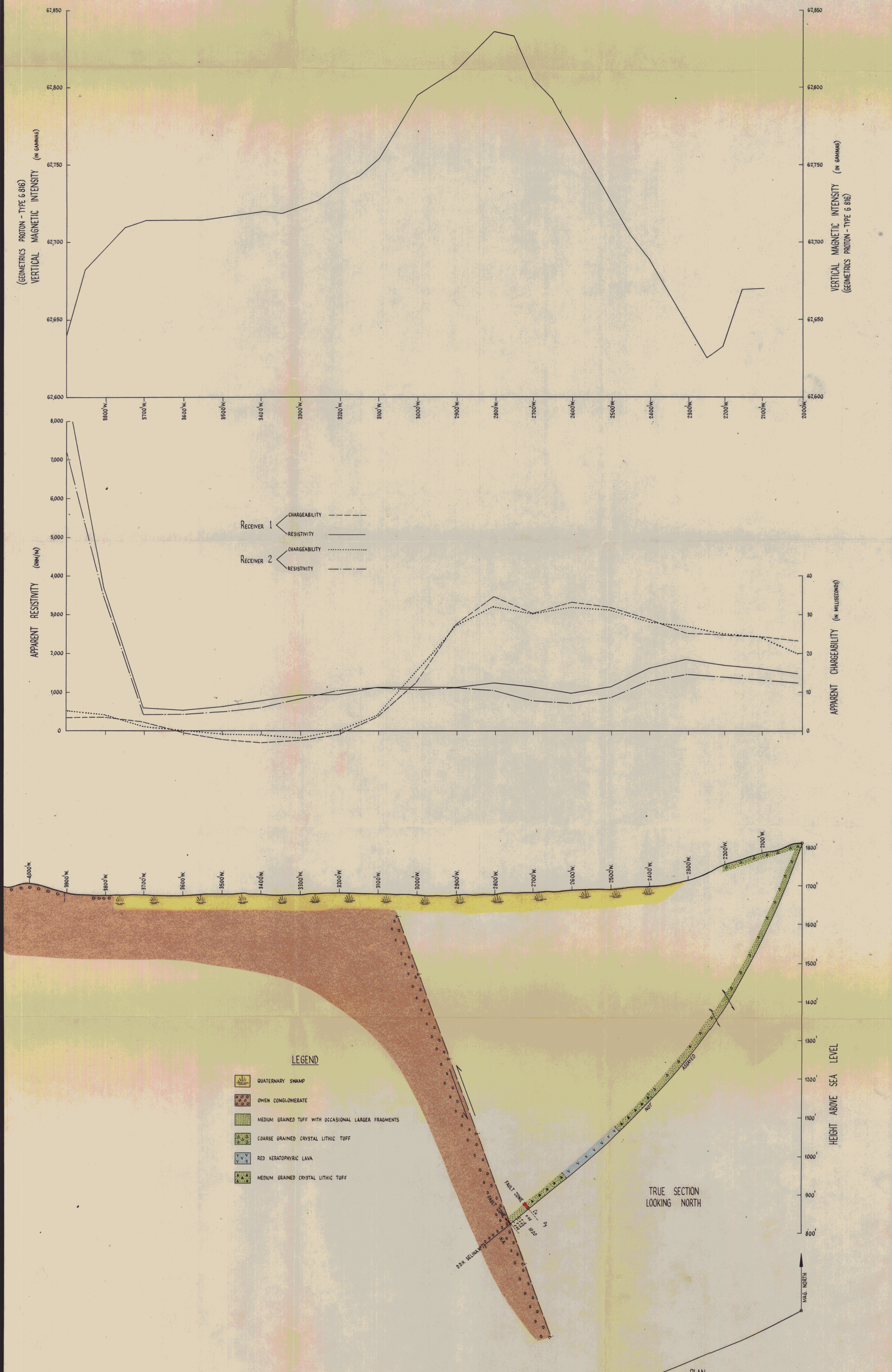


FIG. 2

664049 73-970 001

NOTE : LEGEND AS FOR GEOLOGICAL MAP – Fig 2

THE CONSOLIDATED SYNDICATE	
MT. TYNDALL E.L. 9/66	DRAWN: K.W.
COMPOSITE CROSS SECTION	CHECKED: K.W.
NORTH MT. TYNDALL AREA	DATE: JULY 73
FIG. 2	SCALE: AS SHOWN

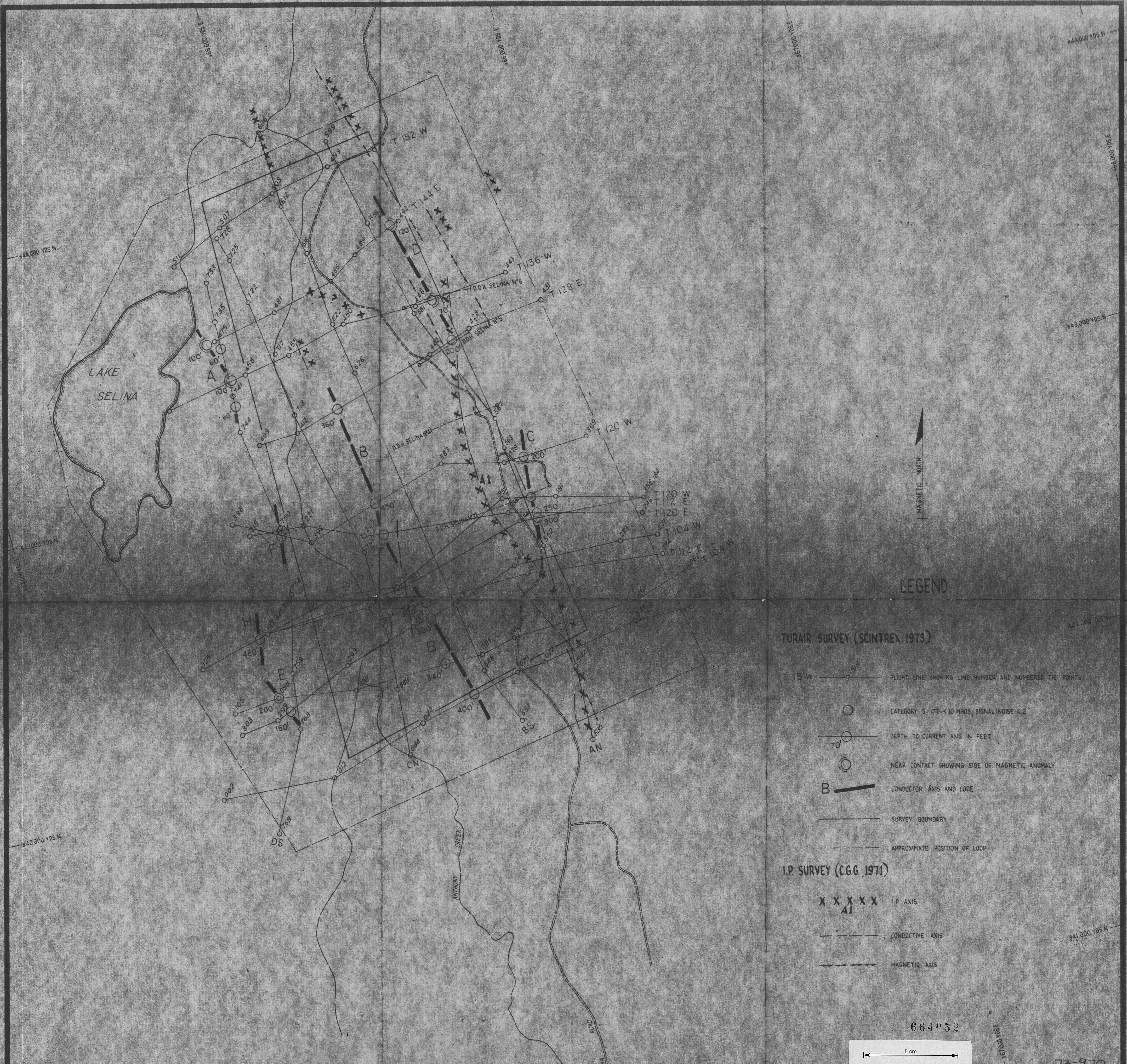


664051

73-970

THE CONSOLIDATED SYNDICATE	DRAWN. R.G. WILSON
	TRACED. R.G. WILSON
LAKE SELINA GRID	CHECKED. K. WELLS
LINE 112 N.	DATE. 2-12-'72
	SCALE. 1" = 100'
GEOPHYSICAL GEOCHEMICAL & DRILLING RESULTS	FIG. 3

002

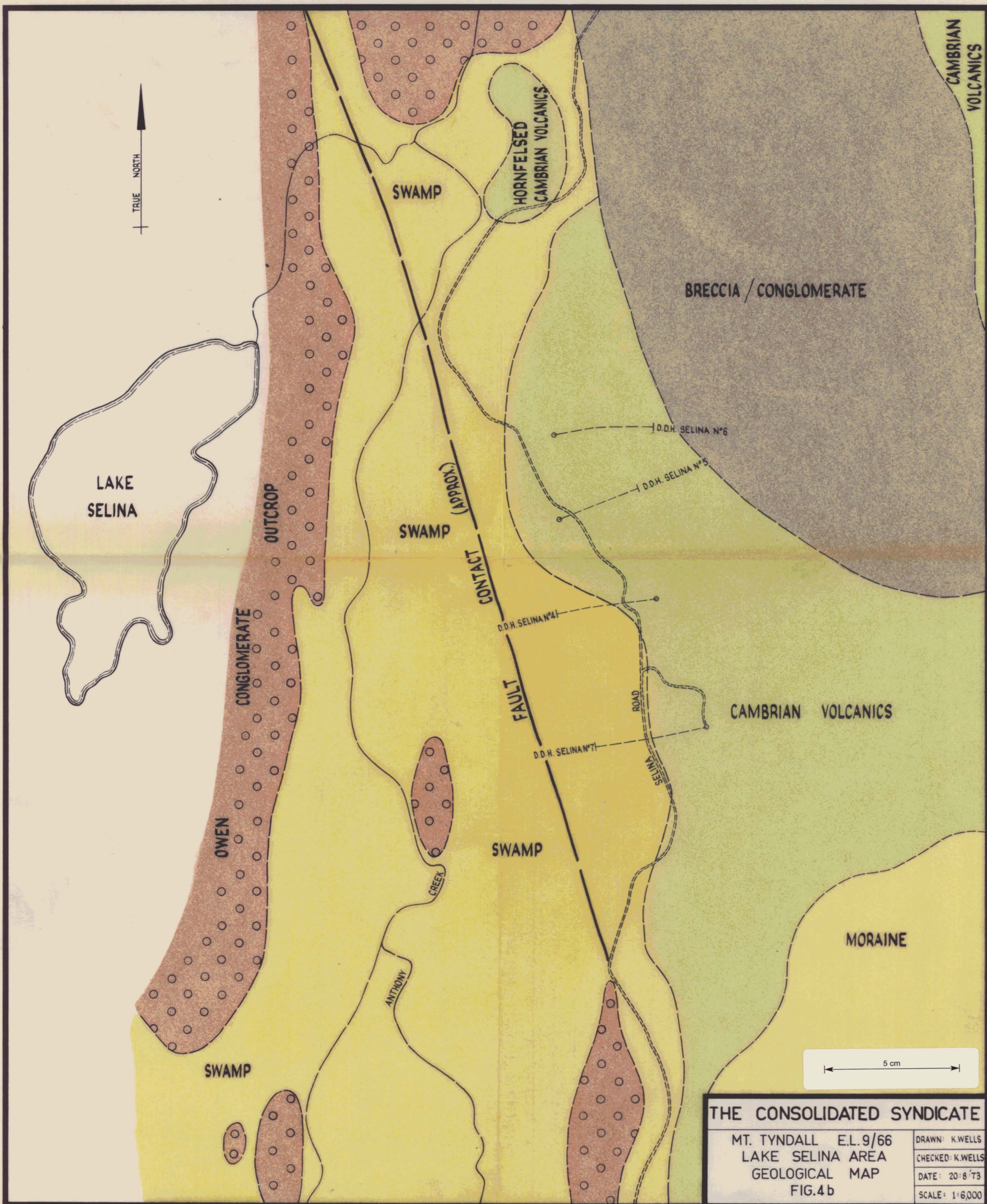


664052

73-970

THE CONSOLIDATED SYNDICATE	DRAWN: R.G.WILSON
MT. TYNDALL E.L. 9/66	TRACED: R.G.WILSON
LAKE SELINA AREA	CHECKED: K.WELLS
TURAIR (E.M.) COVERAGE	DATE: 24-7-73
AND I.P. ANOMALIES	SCALE: 1:6,000
003	FIG. 4a

73-970



664053

004

MOUNT LYELL M. & R. CO. LTD. MINE DEPARTMENT	Drawn	J.L.W.	Approved	
	Checked		Approved	
Date: 26/6/73 — Scale: 1:500	Checked		Approved	

PRINCE LYELL MINE

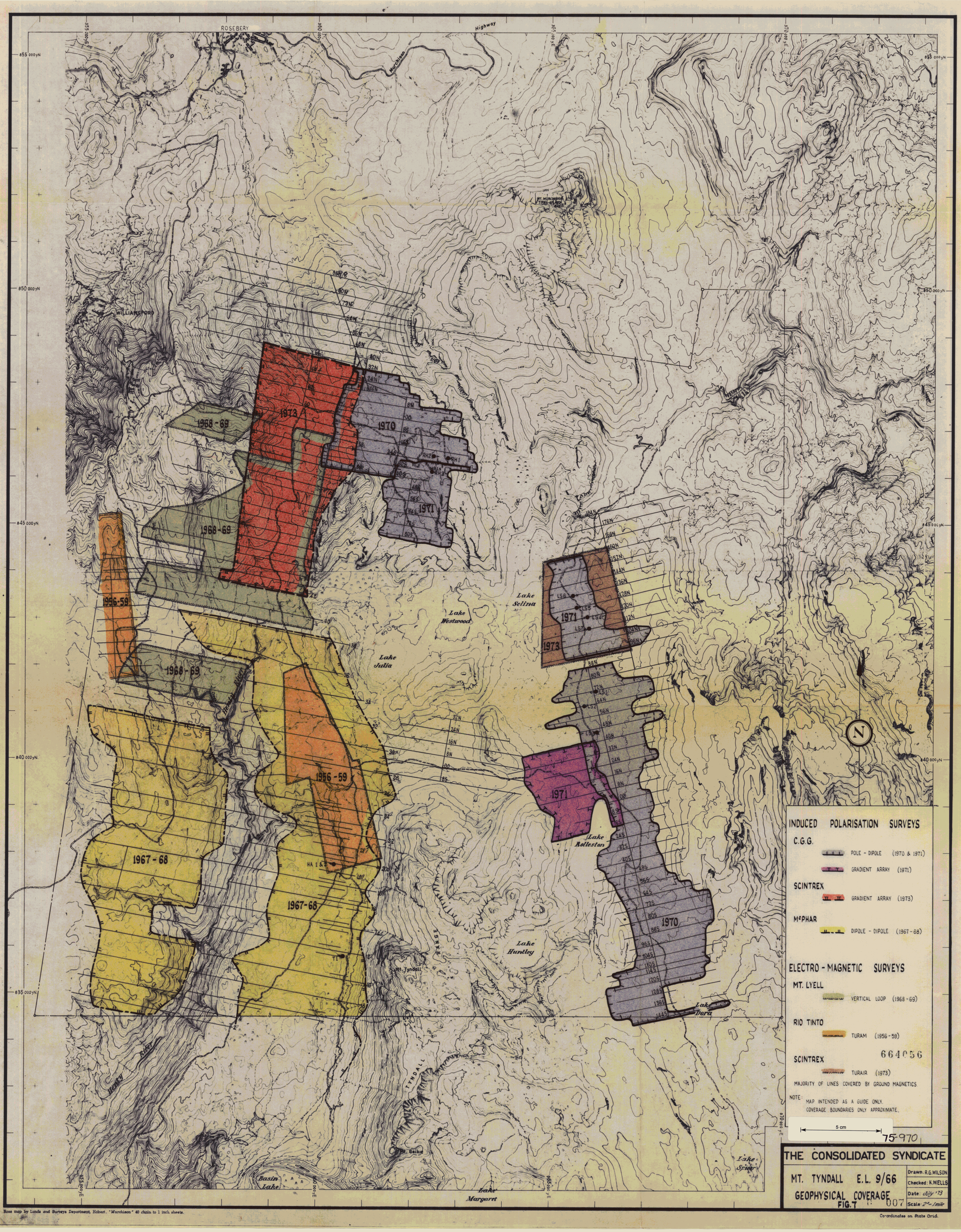
830' LEVEL
COBALT

73-970

DRAWING No
FIG. 5
005

Indexed


LEASE BOUNDARY
FINE GRAINED ACID LAVAS
FINE GRAINED ACID LAVAS OCCASIONAL SMALL PHENOCRYSTS OF QUARTZ OR FELSPAR
AGGLOMERATES
AGGLOMERATES AND TUFFS
MINOR LAVAS AND SEDIMENTS
MASSIVE RHYOLITE LAVAS
TUFFS
MASSIVE RHYOLITE LAVAS
PALE QUARTZ PORPHYRY ACID LAVAS
STRONGLY SHEARED CHLORITIC TUFFS ALONG FAULT ZONE
PALE QUARTZ PORPHYRY ACID LAVAS
OWEN CONGLOMERATE
TUFFS AND AGGLOMERATES
TUFF WITH MINOR LAVAS AND SEDIMENTS
COMSTOCK TUFF
MASSIVE RHYOLITE LAVAS
QUARTZ DIORITE
NEWTON CREEK SANDSTONES
BASE LINE
LEGEND
DEVONIAN
QUARTZ DIORITE INTRUSIVE
ORDOVICIAN
OWEN CONGLOMERATE
CAMBRIAN
NEWTON CREEK SANDSTONE
COMSTOCK TUFF
TYNDALL GROUP
MT. READ VOLCANICS
ANDESITE (?) INTRUSIVE
ACID TUFFS WITH MINOR LAVAS AND SEDIMENTS
AGGLOMERATES
FINE GRAINED ACID LAVAS AND MINOR TUFFS
STRONGLY SHEARED FINE GRAINED CHLORITIC TUFFS ALONG FAULT ZONE
MASSIVE QUARTZ PORPHYRY LAVAS
MAJOR INDUCED POLARISATION ANOMALIES
REGIONAL INDUCED POLARISATION HIGHS
TRUE NORTH
MAGNETIC NORTH
664055
73-970
5 cm
THE CONSOLIDATED SYNDICATE
MT. TYNDALL AREA E.L. 9/66
HENTY FAULT ZONE
GEOLOGICAL MAP AND
MAJOR I.P. ANOMALIES
006
DRAWN: K.WELLS.
TRACED: R.G.WILSON
CHECKED: K. Wells
DATE: 17 - 7 - '73
SCALE: 1:6,000
FIG. 6


ROSEBERY
Highway
855 000 yN
850 000 yN
845 000 yN
840 000 yN
835 000 yN
WILLIAMSFORD
1973
1970
1971
1968 - 69
1956 - 59
1967 - 68
Lake Selina
Lake Westwood
Lake Julia
Lake Rolleston
Lake Huntley
Lake Dora
Lake Margaret
Basin Lake
Lake Spicer
Mt. Tyndall
TYNDALL
RANGE
INDUCED POLARISATION SURVEYS
C.G.G.
POLE - DIPOLE (1970 & 1971)
GRADIENT ARRAY (1971)
SCINTREX
GRADIENT ARRAY (1973)
McPHAR
DIPOLE - DIPOLE (1967 - 68)
ELECTRO - MAGNETIC SURVEYS
MT. LYELL
VERTICAL LOOP (1968 - 69)
RIO TINTO
TURAM (1956 - 59)
664056
SCINTREX
TURAIR (1973)
MAJORITY OF LINES COVERED BY GROUND MAGNETICS.
NOTE: MAP INTENDED AS A GUIDE ONLY.
COVERAGE BOUNDARIES ONLY APPROXIMATE.
5 cm
75-970
THE CONSOLIDATED SYNDICATE
MT. TYNDALL E.L. 9/66
GEOPHYSICAL COVERAGE
FIG.7
007
Drawn. R.G.WILSON
Checked: K.WELLS
Date: July '73
Scale: 2" = 1 mile
Co-ordinates on State Grid.
Base map by Lands and Surveys Department, Hobart. "Murchison" 40 chain to 1 inch sheets.