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ANNUAL REPORT

ON

E.L. 10/69

(DORA-HUXLEY AREA)

MICROFILMED

1973-74

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Copies to: General Office
Mine Office (2)
Tas. Mines Department

August, 1974

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- Map 1 Location Map
- Map 2 Geological Map of Licence Area
- Map 3 Geological Map of Little Owen Grid
 showing geophysical anomalies
- Map 4 Geological Map of East End of Mt.
 Lyell

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1. INTRODUCTION

Exploration Licence 10/69 covers an area of 117 square kilometres (45 square miles) from Lake Dora southwards to the King River. (Map 1.)

During the year work was concerned with the following areas:

- (a) Whip Spur - Lyell Highway - geophysics and geological mapping.
- (b) Eastern End of Mt. Lyell - geological mapping.
- (c) S.W. slope of Mt. Sedgwick - geological mapping.

Expenditure over the year amounted to \$22,968 and total expenditure on E.L. 10/69 since 1969 has reached \$72,180. A budget of \$44,700 has been proposed for the 1974-75 season.

2. WORK COMPLETED 1973-74

2.1 Whip Spur - Lyell Highway

2.1.1 Introduction

Reconnaissance geological mapping, in previous years, south of the Lyell Highway, has outlined two zones of sulphide mineralisation:

- (a) The Great Lyell/Duke Lyell area is known to be mineralised with pyrite and chalcopyrite for a distance of at least 6000 ft. (1800 m). Previous small scale geophysical surveys over part of the zone have outlined several anomalies.
- (b) Two large intermediate intrusive bodies occurring to the S.W. of the Great Lyell/Duke Lyell area have haloes of sulphides with both pyrite and chalcopyrite outcropping over widths of approximately 25 ft. (8 m).

Consequently, it was decided to cover the area with a gradient array I.P. survey and

ground magnetics in a similar operation to that carried out over the Henty Fault Zone, Mt. Tyndall area in 1972-73.

2.1.2 Geophysical Grid

A geophysical grid of 100,000 ft. (30,500 m), the Little Owen Grid, was cut and pegged to cover the area of interest between Whip Spur and the Lyell Highway. (Map 3.) The base line of the Mt. Huxley grid was extended northwards 9600 ft. (3000 m) and seventeen N.E. - S.W. lines were established at 600 ft. (180 m) intervals.

The 600 ft. (180 m) line interval was chosen to ensure effective coverage of all the ground, and that any potential orebody would be traversed by at least one line, e.g. the Cape Horn orebody has a surface strike length of approximately 700 ft. (210 m).

2.1.3 Geophysical Survey

The gradient array I.P. survey was commenced on 2nd November, 1973 by Scintrex Pty. Ltd. using an I.P.R.-7. The I.P. system suffered from great difficulties due to electrical interference, originating from the D.C. underground trains at Mt. Lyell. The electrical "noise" caused progress to be very slow, readings being difficult and sometimes impossible to take. These difficulties increased as the survey progressed northwards and the gradient array I.P. system, on this grid, was finally abandoned, on 6th December, 1973, with the three northern most lines (9200N, 9800N and 10400N) incompletd. These three lines were finally completed between the 18th and 20th March, 1974 using an I.P.R.-8 and a moving Schlumberger array. This array although it has less penetration and is more expensive to use, employs a much stronger signal than the gradient array and could

see through the "noise". (A.W.H-R. Scintrex Pty. Ltd., Tas-018A). A magnetometer survey of the grid was completed in March, 1974 by the Mt. Lyell Company using a Geometrics Proton G816 magnetometer. The results were interpreted by Scintrex Pty. Ltd.

Apparent resistivities within the grid area showed only a limited range of values between 1000 and 15,000 ohm - metres and the general levels of chargeability were on the whole a normal 8 to 12 milliseconds. Generally neither set of results defined clear cut boundaries between the various rock units. Similarly the magnetic responses, with the exception of the two large intermediate intrusives, showed only limited variation. However, sixty nine induced polarisation anomalies were recorded and several extensive I.P. anomalous zones in favourable geological environments have been outlined. (Map 3.) Various anomalies were delineated around the margins of the two large intermediate intrusions and over known mineralised areas on the east side of Little Owen and in the Great Lyell/Duke Lyell area. All of these anomalies will require further investigation.

Other I.P. anomalies were recorded on the grid. However, they are considered to be in unfavourable geological environments and/or due to shales, e.g. several anomalies have been outlined over, what are thought to be, shale bands within the Tyndall Group rocks on Whip Spur. These anomalies are not considered worthy of further investigation at the present time.

2.1.4 Geological Mapping

As part of the more comprehensive exploration programme of the area, detailed geological mapping of the Little Owen Grid was commenced in January, 1974. However, due to the

limited manpower available, this coverage is as yet incomplete and to date mapping has been undertaken on lines 8N to 50N and in an area north of the grid between the Lyell Highway and Conglomerate Creek.

Mapping to date has generally confirmed previous work in the area (Annual Report, E.L. 10/69, Dora-Huxley Area, 1972-73 by K.J. Lee). The Darwin Type Rhyolite which outcrops to the east of Whip Spur appears to be a discrete body in the core of an anticline, surrounded by younger acid pyroclastics and lavas of the Huxley Type. On the eastern side, the Darwin Type Rhyolite is overlain by a bed of coarse breccia up to 50 ft. (15 m) wide containing angular fragments of the Darwin Type Rhyolite up to 8 inches (20 cm) in length, in a dark green chloritic groundmass. To the east of this bed, massive fine grained pink lava is strongly sheared and is similar in appearance to the Darwin Type lava. However, the strong shearing makes identification difficult and the structure suggests that it is younger than the Darwin Type; it has therefore been tentatively correlated with the younger acid lavas.

The position of the graded waterlain tuffs on Whip Spur within the Cambrian succession has always been conjectural and previously had been correlated with the Queenstown Pyroclastics which outcrop further west. However, detailed mapping has shown that these tuffs unconformably overlie the Darwin Type and Huxley Type Rhyolites (Map 3) suggesting that in fact these graded tuffs are part of the Tyndall Group. Tyndall Group rocks also occur to the north. To the west of the Lyell Highway, a narrow zone of Comstock Tuff and Jukes Conglomerate appear to lie conformably beneath the Ordovician Pioneer Beds, and unconformably on massive well-jointed medium grained acid lavas.

To the east of the "tongue" of Gordon Limestone which crosses Conglomerate Creek, an extensive area of intermediate fine to coarse grained sub-aqueous pyroclastics occur. Andesite lavas and/or intrusives from 2 ft. (0.6 m) to 50 ft. (15 m) in width also occur, generally striking in a N.W.-S.E. direction. These andesitic dykes also intrude the massive acid lavas further west.

2.1.5 Conclusions

The results of exploration activities in the Little Owen Grid area during the year have been encouraging. The thick sequence of acid lavas and pyroclastics, which are host to the Mt. Lyell orebodies, appear to extend down into this area and contain zones of disseminated and massive sulphide mineralisation, which have been outlined by the induced polarisation survey.

The rugged nature of the terrain and the electrical interference from the Mt. Lyell underground trains in particular made the geophysical coverage of the area slow and expensive. However, no quicker, cheaper geophysical technique, effective under such conditions, appears to be available at the present time.

The detailed geological mapping programme in the area will need to be completed early in the 1974-75 field season. All the I.P. anomalies outlined on Map 3 will require detailed follow up work to define diamond drilling targets within the anomalous I.P. zones. The Great Lyell/Duke Lyell I.P. anomaly and the I.P. anomaly to the west of the northern most intermediate intrusive, are both open to the north. The Little Owen Grid will need to be extended northwards to enable work to be undertaken to close off these anomalies.

2.2 East End of Mt. Lyell

The results of geophysical soundings undertaken over the Cambrian compartment on the East End of Mt. Lyell during the 1972-73 field season had been assumed to be due to inhomogeneities within the Jukes Conglomerate, which was thought to comprise the whole of the Cambrian outcrop in the area. However, geological mapping undertaken in January, 1974 has shown that the Cambrian rocks in this area are comprised of Jukes Conglomerate and Comstock Tuff unconformably overlying a sequence of acid lavas and pyroclastics. The soundings undertaken in 1972-73 appear to have been detecting the contact between the Comstock Tuff and the underlying acid lavas.

Structurally Mt. Lyell appears to be a faulted pericline (elongate dome) with a steep eastward plunge (Map 4). All the rocks dip radially away from a core of acid lavas and pyroclastics which are faulted to the east against Tyndall Group rocks (Comstock Tuff and Jukes Conglomerate), but overlain unconformably on the north, west and south by Comstock Tuffs. These are in turn overlain by Jukes Conglomerate, which underlies the Owen Conglomerate.

The sequence of acid lavas and pyroclastics forming the core of the pericline consists of : rhyolites, rhyolite breccias, agglomerates, tuffs and minor sediments. The rhyolites are generally porphyritic with quartz phenocrysts up to 5 mm in diameter, within a white-pink groundmass of quartz, feldspar and sericite. They are generally strongly weathered and highly sheared, similarly the agglomerates are strongly leached and sheared. The rhyolite breccias consist of angular fragments of rhyolite within a fresh rhyolitic matrix (autobrecciation?) and are generally fresher than the rhyolite lavas. The tuffs are generally crystal tuffs and the sediments probably consist of fine grained waterlain ash fall tuffs. Some pyrite mineralisation and associated chloritic alteration occurs within a highly sheared rhyolite breccia.

The Comstock Tuff generally consists of a red/green crystal lithic tuff forming rounded, smooth tor-like outcrops. Minor bedded and graded sedimentary units also occur. Small areas of quartz porphyry occur within the Comstock Tuff and may represent minor intrusions and/or lavas. The Jukes Conglomerate is a distinctive but variable lithological unit. In general it consists of an open framework greywacke breccio-conglomerate, poorly bedded and occasionally graded. Fragments consist of angular pieces of sheared Cambrian quartz porphyry lava and rounded Precambrian fragments of quartzite, schist and phyllite.

The mineralised area observed within the rhyolitic core may warrant further work in the future but it is not contemplated during the 1974-75 field season.

2.3 S.W. Slope of Mt. Sedgwick

Work in this area is only at a very preliminary stage at the present time. A compilation has been made of previous work undertaken in the area and some preliminary mapping undertaken.

Work to date suggests that Mt. Sedgwick is a northward plunging anticlinalorium, the core being composed of rhyolitic to dacitic quartz porphyry lavas. Younger rocks such as the Comstock Tuff and Jukes Conglomerate are preserved in the cores of small flanking synclines. The axes of all the folds strike north-south and the structure is terminated to the south, probably by faulting on the northern side of the Comstock Valley; structures from the Comstock Valley southwards striking generally east-west. However, the exact relationship between the two sets of structures is not clear, the contact being obscured by large areas of Pleistocene moraine and gravels.

Further mapping will be required in the area in order to clarify the geological structure. This mapping coverage will also need to be extended eastwards along the southern face of Mt. Sedgwick in order to cover the last area of Cambrian rocks in the vicinity of Queenstown still largely undifferentiated.

3. RECOMMENDATIONS AND BUDGET 1974-75

3.1 Exploration Programme

The exploration programme for 1974-75 includes both routine and more detailed investigations of the results of the 1973-74 programme. It can be most conveniently discussed under the following headings:

- (a) Area south of the Lyell Highway.
- (b) Mt. Sedgwick/Lake Dora area.
- (c) Airborne E.M. Survey.

3.1.1 Area South of the Lyell Highway

This area includes the Little Owen Grid and the area between Mt. Huxley and Whip Spur.

The detailed mapping of the Little Owen Grid will need to be completed early in the field season as an aid in assessing the I.P. anomalies outlined during 1973-74. Two of these anomalies : one over the Great Lyell/Duke Lyell mineralised zone and the other to the west of the northern most intermediate intrusive, are open to the north and the Little Owen Grid will need to be extended northwards to close off these anomalous zones. All of the anomalous I.P. zones considered to be in favourable geological environments (Map 3) will need to be further evaluated in order to outline suitable drilling targets.

The anomalies S.W. of the Little Owen ridge will probably be amenable to geochemical soil sampling, although care will be required in the interpretation of the results due to the possibility of contamination from the old Mt. Lyell smelter. N.E. of the Little Owen ridge the natural soil cover has been removed and soil sampling is not possible, any further evaluation will have to be by means of pole-dipole I.P. Anomalies

confirmed by the detailed mapping, geochemistry and detailed I.P. are scheduled to be tested by diamond drilling in 1975-76.

The geology of the area to the south of the Little Owen Grid, between Whip Spur and Mt. Huxley needs to be rechecked. Subsequent work in other areas has cast doubt on some of the geological conclusions reached when the area was mapped in 1971-72. This checking should consist of approximately four to five traverses in order to check on the position of the geological boundaries. This work will take approximately one week and will be carried out when time and manpower permit.

3.1.2 Mt. Sedgwick/Lake Dora Area

A geological mapping programme in this area was proposed for the 1973-74 field season, but due to the lack of manpower, only minor work was completed, on the S.W. slope of Mt. Sedgwick (see Section 2.3).

The area includes quartz keratophyric rocks of the Central Lara belt sequence, which are mineralised in the Lake Dora area by veins and disseminations of pyrite, chalcopyrite, magnetite, haematite and traces of galena, while the bold outcrop on the S.E. flank of Mt. Sedgwick is veined by magnetite and haematite. While the potential of the area for the location of a disseminated copper sulphide deposit is generally considered to be limited, the geology is only poorly known. Consequently, a programme of reconnaissance geological mapping, geochemical stream and colluvial sampling is proposed in order to indicate any zones of greater potential.

3.1.3 Airborne E.M. Survey

The McPhar H-400 helicopter E.M. system will be available for use in West Tasmania

in October, 1974. It is proposed to survey the Cambrian succession south of the Lyell Highway using this system.

- a) The sediment/pyroclastic sequence S.W. of Whip Spur, adjacent to the acid volcanic pile, east of Whip Spur, is considered to be an environment suitable for the development of a massive sulphide orebody of the Rosebery type. This type of orebody is an ideal target for an airborne E.M. system. The survey will provide a reconnaissance geophysical coverage of the Cambrian rocks south of Whip Spur which will aid in the final evaluation of the area. If no significant responses are recorded, the area can be relinquished.
- b) The area of the Little Owen Grid will be covered during the survey enabling a direct comparison of the ground I.P. (undertaken in 1973-74) and the airborne E.M. to be undertaken. If the results are comparable the airborne system may provide a quicker, cheaper reconnaissance geophysical tool than the ground I.P. presently employed. Alternatively the E.M. may detect more conductive zones, possibly associated with economic base metal sulphides within the anomalous I.P. areas.

3.2 Access

The majority of the anomalous I.P. zones of the Little Owen Grid have no vehicular access. New roads totalling approximately 2½ miles (4 km) will be required to facilitate detailed investigations and the diamond drilling to be undertaken early in the 1975-76 financial year. Road access to the Great Lyell/Duke Lyell area is currently being investigated : The alternative routes are via Conglomerate Creek or an extension of the proposed road across the Little Owen ridge. In addition, the present roads to the top of Little Owen and

the old P.M.I. road, off the old dam road, are in a very bad state of repair and will require maintenance and reconstruction totalling approximately 1½ miles (1.9 km).

Two new grid lines each approximately 6000' (1830 m) in length will be required on the Little Owen Grid in order to check the northward extension of the two I.P. zones still open to the north.

3.3 Staffing

To complete the proposed exploration programme, one geologist and one field assistant will be required for the whole field season, supplemented occasionally by other personnel for specific assignments.

3.4 Proposed Budget

A total budget of \$44,700 for E.L. 10/69 was proposed in February, 1974 for 1974-75. This comprised:

<u>Item</u>	<u>Cost</u>
Salaries (Geologist and field assistant)	\$12,200
Outside Services (bulldozing, etc.)	\$ 4,400
Diamond Drilling	\$22,000
Geology (slide preparation, etc.)	\$ 2,200
Materials	\$ 1,700
General Costs	\$ 2,200
Total	<u>\$44,700</u>

The diamond drilling originally envisaged for 1974-75 will now be undertaken early in the 1975-76 year and it is proposed to utilise the money originally budgetted for the diamond drilling to undertake any detailed I.P. required on the Little Owen Grid and the airborne E.M. survey.

K. Wells.

DORA-HUXLEY PROSPECT

BUDGET 1974-75

PERIODS	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
Salaries	1000	300	200	1400	1800	1500	1200	1400	700	500	400	800	1000	12200
Materials	100			200	200	200	200	200	200	100	100	100	100	1700
Outside Services					1600	2200	600							4400
Diamond Drilling						11000	11000							22000
Geology	100	100	200	200	200	200	200	200	200	200	200	100	100	2200
General Costs	100	100	200	200	300	300	200	300	100	100	100	100	100	2200
TOTAL COST	1300	500	600	2000	4100	15400	13400	2100	1200	900	800	1100	1300	44700

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K.J. LEE, Annual Report on E.L. 10/69, 1972-73
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K.J. LEE, The Cambrian Rocks of Mt. Lyell
(February, 1974)
Mt. Lyell Mining and Railway Co. Ltd.

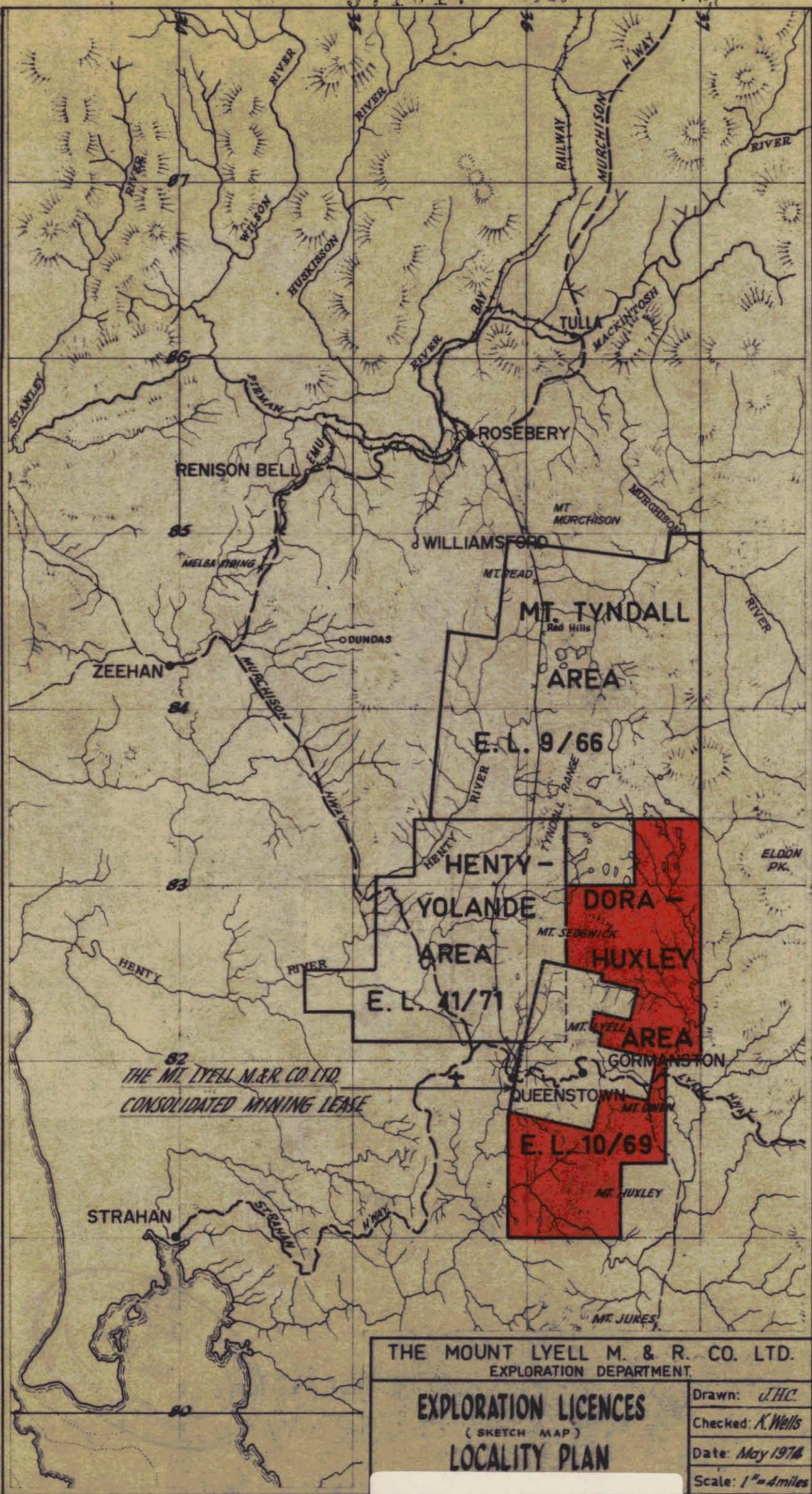
A.W. HOWLAND-ROSE, Report on Gradient and Schlumberger
Array Electrical Induced Polarisation
Surveys over the Little Owen (Dora-
Huxley) Grid on behalf of the Mt.
Lyell Mining and Railway Co. Ltd.
Scintrex Pty. Ltd. Tas-018A, Nov.
73 - March 74.

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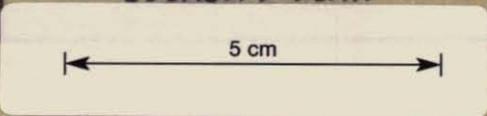
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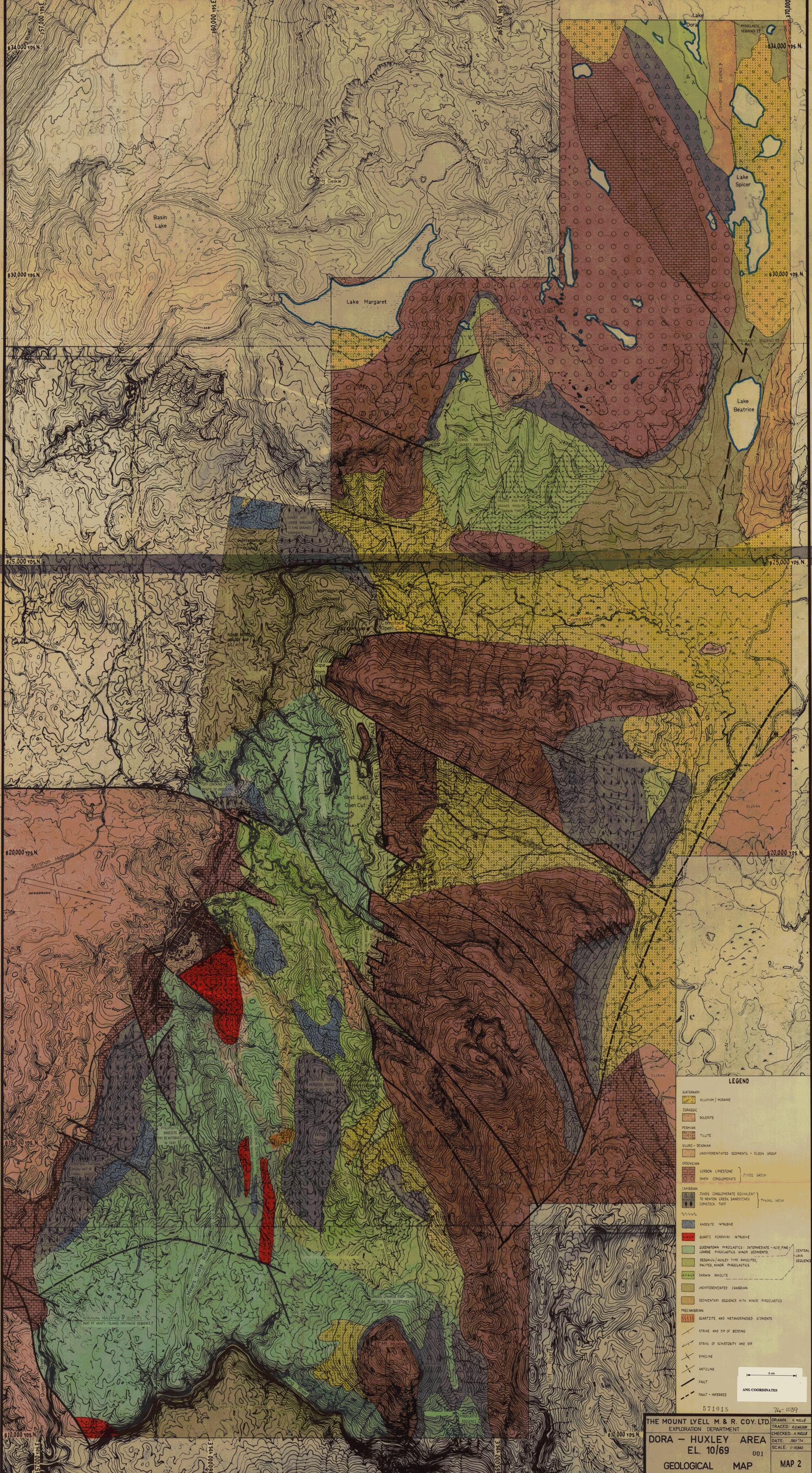


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EXPLORATION LICENCES (SKETCH MAP) LOCALITY PLAN	Drawn: JHC.
	Checked: K. Wells
	Date: May 1974
Scale: 1" = 4 miles	



MAP 1



LEGEND

- QUATERNARY
 - ALLUVIUM / MORAINES
- JURASSIC
 - DOLERITE
- PERMIAN
 - TILLITE
- SILURO-DEVONIAN
 - UNDIFFERENTIATED SEDIMENTS - ELDON GROUP
- OROVIVIAN
 - GORDON LIMESTONE
 - OWEN CONGLOMERATE
- CAMBRIAN
 - JUNES CONGLOMERATE EQUIVALENT
 - TO NEWTON GREEN SANDSTONES
 - CONDOR TUFF
- ANDESITE INTRUSIVE
- QUARTZ PORPHYRY INTRUSIVE
- QUEENSTOWN PYROCLASTICS - INTERMEDIATE - ACID FINE
- LIABSE PYROCLASTICS MINOR SEDIMENTS
- SEDGWICK HUXLEY TYPE RHYOLITES
- DALITES MINOR PYROCLASTICS
- DARWIN RHYOLITE
- UNDIFFERENTIATED CAMBRIAN
- SEDIMENTARY SEQUENCE WITH MINOR PYROCLASTICS
- PRECAMBRIAN
 - QUARTZITE AND METAMORPHOSSED SEDIMENTS

STRUCTURAL FEATURES:

- STRIKE AND DIP OF BEDDING
- STRIKE OF SCHISTOSITY AND DIP
- SYNCLINE
- ANTICLINE
- FAULT
- FAULT - INFERRED

Scale: 5 cm

ANG COORDINATES

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DORA - HUXLEY AREA
EL. 10/69

GEOLOGICAL MAP MAP 2

DRAWN: K. NELLE
TRACED: J. NELSON
CHECKED: K. NELLE
DATE: JULY 74
SCALE: 1/12500

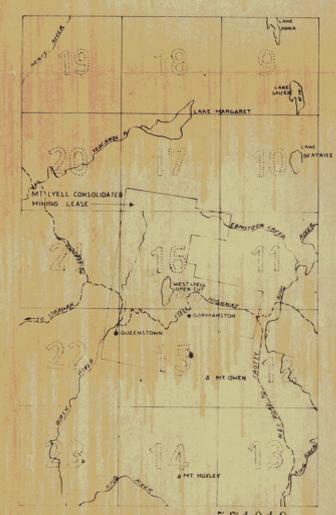


LEGEND

- QUATERNARY
 - MORANE AND/OR SCREE
- ORDOVICIAN
 - GORDON LIMESTONE
 - PIONEER BEDS
 - CONGLOMERATE
- CAMBRIAN
 - INTERBEDDED TUFFS AND SEDIMENTS
 - PYROCLASTICS AND SEDIMENTS
 - INTERMEDIATE PYROCLASTICS (FINE-COARSE) AND LAVAS AND/OR INTRUSIVES
 - INTERBEDDED FINE GRAINED TUFFS AND ARGILLACEOUS SEDIMENTS
 - ACID LAVAS AND PYROCLASTICS (FINE-COARSE) MINOR INTERMEDIATE INTRUSIVES (S.A. VOLCANIC BRECCIA)
 - DARWIN TYPE RHYOLITE
 - UNDIFFERENTIATED CAMBRIAN VOLCANICS
- TYNDALL GROUP
- QUEENSTOWN PYROCLASTICS
- CENTRAL LAVAS
- QUARTZ PORPHYRY
- PYROXENE FELDSPAR PORPHYRY (INTERMEDIATE)
- FAULT
- SCHISTOSITY
- BEDDING
- ABANDONED WORKINGS
- GEOPHYSICAL ANOMALIES



LOCATION



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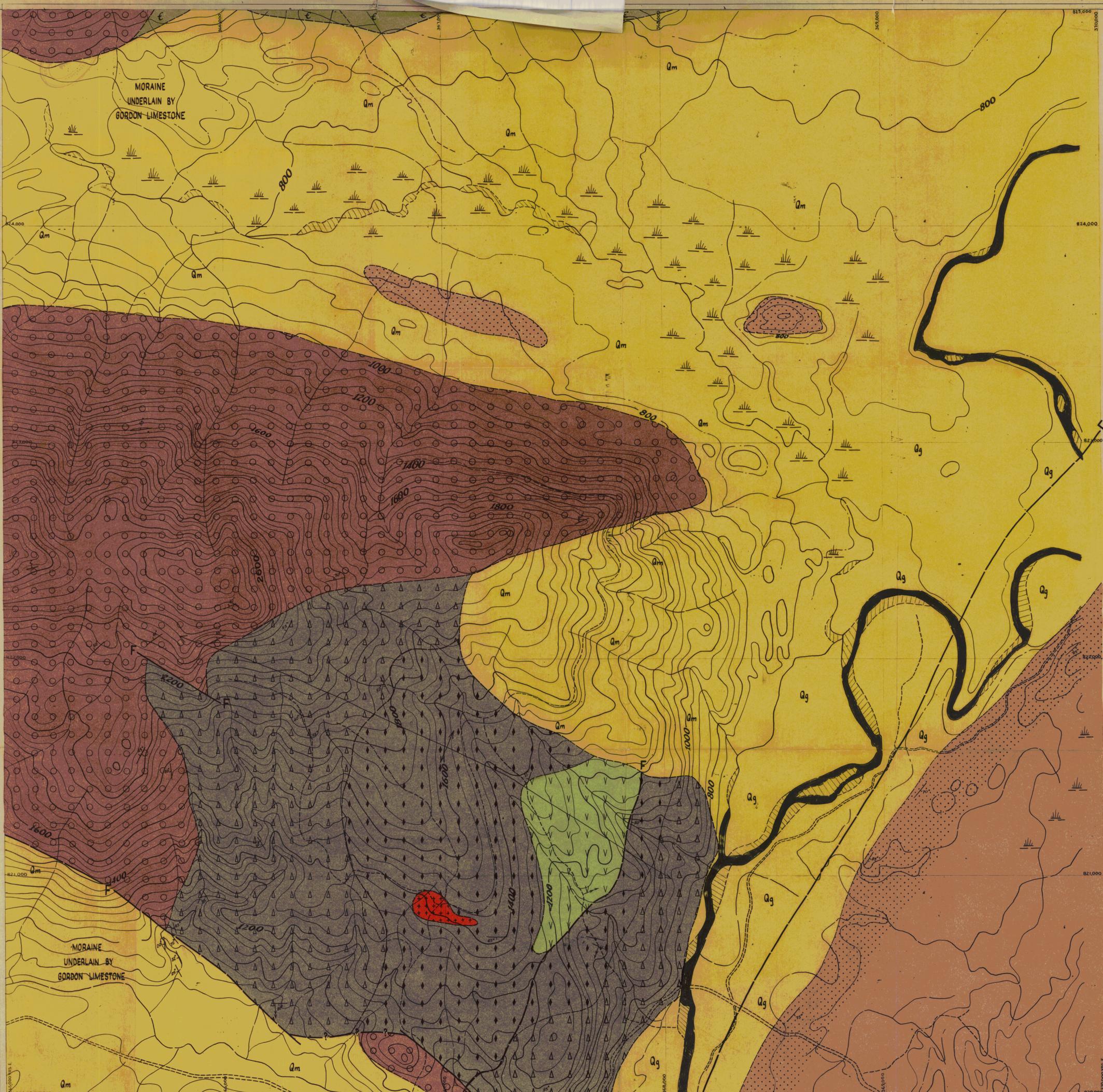
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 GEOLOGICAL DEPARTMENT

DORA - HUXLEY AREA
 E.L. 10/69 002

GEOLOGICAL MAP OF LITTLE OWEN GRID
 SHOWING GEOPHYSICAL ANOMALIES

DRAWN K.WELLS
 TRACED R.G.WILSON
 CHECKED K.WELLS
 DATE JULY '74
 SCALE 1" = 500'
 1" = 6000'

MAP 3

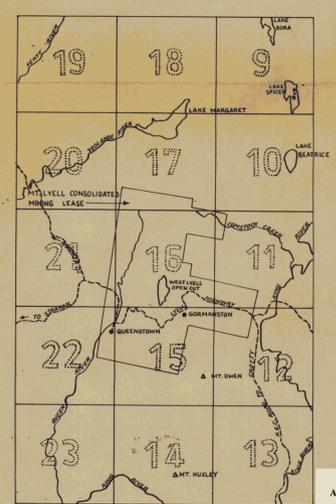


LEGEND

- QUATERNARY
 - Qm MORaine
 - Qg FLUVO-GLACIALS AND GRAVELS
- SILURIAN
 - SEDIMENTS (SHALES / SANDSTONES)
- ORDOVICIAN
 - OWEN CONGLOMERATE
- CAMBRIAN
 - JUKES CONGLOMERATE (GREYWACKE BRECCIAS) } TYNDAL GROUP
 - COMSTOCK TUFF (LAPILLI TUFF) }
 - RYHOLITE UNIT (RYHOLITES, BRECCIAS AND AGGLOMERATES) } CENTRAL LAVAS
 - QUARTZ PORPHYRY INTRUSIVE AND/OR LAVA
 - UNDIFFERENTIATED CAMBRIAN



LOCATION



571020



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DORA - HUXLEY AREA
 E.L. 10/69
 SHEET 11 003
 INTERPRETATIVE MAP

74-1039
 DRAWN. K.J. LEE
 TRACED. R.G. WILSON
 CHECKED. K.J. LEE
 DATE. 17.5.74
 SCALE. 1" = 500
 1:6000
 MAP 4