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Mt. Tyndall E.L. 9/66

Summary of the 1966/67 Field Season

and Recommendations for the

1967/68 Field Season

R.G. Elms 11/8/67

Mt Lyell Mng + Rail Co

AMG REFERENCE POINTS ADDED

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Mt. Tyndall E.L. 9/66

Summary of the 1966/67 Field Season and Recommendations for the 1967/68 Field Season

Abstract

The following report very briefly summarizes and comments on the activities of the 1966/67 field seasons. The bulk of the report deals with proposals for the 1967/68 field season. The proposals have been subdivided by areas into 2 parts, one east of the Henty River (= area worked in 1966/67 seasons approximately), the other west of the Henty River.

In the eastern area it is proposed to metal another 1½ miles of the existing road, as far north as Newton Creek. Some 33,200 ft. of traverse line is to be cut to per mit additional follow-up I.P. surveying to be carried out.

In the western area it is proposed to build approximately 4 miles of new road and to prepare approximately 34 miles of traverse line. This area will then be surveyed by the Induced Polarisation (I.P.) method to complete the reconnaissance coverage the southern portion of the Cambrian area in E.L. 9/66.

Geological and geochemical work will be carried out in both areas, manpower permitting.

A summary tabulation of expenditure has been included, together with a schedule of activity.

It is hoped to commence work in mid-August and to have all work proposed in this report completed by the end of February, 1968. The exceptions to this will be any diamond drilling undertaken and work connected with it, and possibly some geological mapping.

Estimated expenditure is $101,200.

A map of the area on a scale of 1" = 40 chains has been included to show the main work to be carried out.

Geologists J. Ekstrom's report on geological aspects of the 1966/67 field season is appended.

1. Summary of the 1966/67 Field Season

The work carried out last season was, briefly, as follows: 6.5 miles of road were constructed, 32 miles of geophysical traverse line was cut and surveyed by the I.P. method. A geologist spent two months in the field.

A geophysical report and assessment of results has been supplied by the consultant, and the geologist submitted a report on his work.

The report by McPhar Geophysics Ltd. has already been distributed to Consolidated Syndicate members. It appears to be a well compiled and presented document, and the recommendations contained in it have very largely been followed.

Several points should, however, be noted. Firstly, the conglomerate contact is incorrectly positioned and should be ignored. Secondly, the spacing of reconnaissance lines is one quarter, not one half mile as stated on P. 10 of the McPhar report. Thirdly, the property boundary is misplotted. It should in fact be far north and west of the position shown in drawing number 3252-2.

None of these three points affect the value of the report, and it should be pointed out that these errors are at least as likely to be due to Syndicate representatives as to McPhar.

The geological report written by Geologist J. Ekstrom is appended to this recomm endation. No plans accompany the report. This is due mainly to the lack of progress made with the interpretative side of the job. This in turn may be regarded as due to Ekstrom's inexperience and the difficulty of working in the volcanics. No detailed criticism of Ekstrom's report has been made. As a general comment I would suggest the report be treated as a reasonably useful compilation of data but that the interpretative side be largely discounted.

With a more suitable geologist, and with the results of the geophysical work to draw on, it should be possible to make a greater geological contribution during the 1967/68 field season. For instance, investigation of the marked resistivity contrasts referred to by Hallof could easily point up mappable horizons or rock units.

2. Recommendations for 1967/68 Field Activity

2.1 Introduction

Proposed activities for the coming season will be concentrated on the strip of Cambrian rocks west of the Tyndall Range. Proposed activities will be discussed under two area headings:

(1) East of Henty River

(2) West of Henty River

The first of these broadly corresponds with the area worked in last season. Reference should be made to the accompanying 1 inch equals 2640 feet map which shows features mentioned in the text.

2.2 East of Henty River

2.2.1 Road Work

No extension of the road is proposed. Repairs to the road will be necessary, and metalling as far as Newton Creek will probably be necessary. The estimated cost of this work is $3000 .

Cost of drill site preparation and access roads to them can only be guessed as drill sites have not been located yet. A sum of $5000 is suggested.

2.2.2 Track Cutting

To carry out McPhar Geophysics Ltd.'s recommendations for further work, some 33,200 ft. of track will have to be cut. Details of this together with additional geophysical work, are set out on appended sheets.

A good gang of 4 men should take approximately 6 weeks to complete this track preparation for a cost of about $2,500.

2.2.3 Geophysics

A McPhar Geophysics Ltd. I.P. crew should be located in the area to carry out the detail work listed on the appended pages . This should represent approximately 20 days work. Assuming a charge of $215 per day this equals $4,300. Labouring assistance (3 men at $12 each? per day) should add another $720 approximately.

2.2.4 Further geological mapping can be carried out in the area, with possibly some concurrent geochemical sampling.

2.3 West of Henty River

2.3.1 Road Work

This area has useful access via Howard's timber road already available. By extending this road some 4 miles as shown on the map (in red) excellent access will be provided. It is recommended that a contractor be engaged to carry out this work. Estimated cost of this job is $12,000.

2.3.2 Track Cutting

Proposed new lines are shown on the accompanying map in red.

Scaling from the map gives a figure of 32 miles 08 chains of line cutting which will be required to give coverage over the western strip. This makes no allowance for slope distance so a total of 34 miles is probably closer to the real figure required. Last season's cost for track cutting was approximately $562 per mile. If a figure of $600 per mile is adopted for this season, the estimated cost of track cutting will be $20,400.

A table of traverse lines with suggested extensions follows:-

Line No. (Western Extension)	Approx. length to be cut (chains)
2	160
4	160
6	160
8	172
10	168
12	172
14	168
16	172
18	164
20	164
22	184
24	140
26	132
28	68
30	124
32	68
34	104
36	44
38	44
Total	2568 chains (or 32 miles 08 chains)

If a track cutting rate of 5 chains per day per man is accepted, then approximately 540 man days will be needed for the job. Using a six man crew this means about 15 weeks work.

2.3.3 Geophysics

An I.P. geophysical reconnaissance survey is planned along the same lines as last year's survey. That is, line spacing will be one quarter mile, and the electrode spacing 300'.

Judged on last season's performance, the estimated 34 miles of surveying should take about 40 days including some allowance for delays. Thus cost may be estimated on a daily rate of $215 as $8600.

3. General Considerations

3.1 McPhar Geophysics Ltd. will be approached to carry out the geophysical work outlined. The terms can be similar to those of last year, namely a guaranteed 50 days I.P. surveying at $215 per day.

The McPhar team should be ready to start as soon as possible after 1st January, 1968.

3.2 Geophysics is likely to be the main exploratory tool available and used. This will be particularly so if a suitable geologist again cannot be engaged.

3.3 Given a suitable geologist, mapping of the whole area and some geochemical sampling can be undertaken.

4. Outline Schedule of Work at Tyndall

4.1 Provide contractor with any required assistance on Tyndall road repairs until end of August.

4.2 Beginning September - end September

Four men at Moina to cut geophysical traverse lines.

4.3 Beginning October - mid-November

4.3.1 Cut detail lines on east part Tyndall geophysical survey.

4.3.2 Road construction in west part of Tyndall area (i.e. extending Howard's road).

Additional bushmen to be recruited during this period.

4.4. Mid-November - end February

4.4.1 Track cutting in west part of Tyndall area.

4.4.2 I.P. Crew to start work in east part of Tyndall area as soon as possible after New Year.

4.5 Geological and geochemical work should start as early as possible.

4.6 Any required diamond drilling will also start as early as possible but will probably not be before the beginning of February when detail I.P. surveying on the eastern area will be completed.

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5. Summary of Proposed Expenditure

(Mt. Tyndall E.L. 9/66)

			$
5.1	Salaries, included supervision (Geologist, Gunton, Elms)		6,000
5.2	Vehicle operating (300 miles/week, 25¢/mile, for 25 weeks)		1,900
5.3	Equipment		500
5.4	Field Expenditure	(1) East 3 men, 20 days, $12/day	720
	(Labour for McPhar	(2) West 3 men, 40 days $12/day	1,440
		(3) Delays due to weather (20%)	440
5.5	Surveying (Tyndall road)		400
5.6	Consultant's Expenses (Campbell, geochemistry?)		1,000
5.7	Geophysics	(1) East	4,300
		(2) West	8,600
5.8	Geochemistry		2,000
5.9	Travelling Expenses		500
5.10	Track Cutting	(1) East	2,500
		(2) West	20,400
5.11	Access Roads	(1) East	18,000
	(includes drill sites)	(2) West	12,000
5.12	Miscellaneous		500
5.13	Diamond Drilling 3,000 ft. at $10/foot.		30,000
		Total:	$101,200

11th August, 1967

Robert G. Elms.

Chief Geologist

Mt. Lyell Mining & Railway Co. Ltd.

APPENDIX

Details of line cutting required in east portion of area

Note that in case of detail work footages listed refer to distances to be surveyed, not to limits of electrode positions.

Line	Position of extra work recommended	Remarks	Line Cutting Required
2	-		
4	44E - 64E	Resurvey, use 100 ft. electrode intervals	
6	41E - 51E	Resurvey, use 100 ft. electrode intervals	
	41E - 51E	Cut 2 parallel lines over 40E - 52E. One 200 ft. north, one 200 ft. south of line 6. Survey using 100 ft. electrode intervals	2 x 1000 ft. = 2,000 ft.
6	9W - 8E	Check, use 200 ft. intervals and odd numbered stations.	
	8W - 7E	Cut 2 parallel lines over 8W - 7E. One to 400 ft. north, one 400 ft. south of line 6. Survey using 200 ft. electrode intervals.	2 x 1500 ft. = 3,000 ft.
8	-		
10	32E - 42E	Resurvey, using 100 ft. electrode intervals	
	30E - 42E	Cut 2 parallel lines over 30E - 42E, one 200 ft. north, one 200 ft. south of line. Survey using 100 ft. electrode intervals.	2 x1200 ft. = 2400 ft.
12	20E - 32E	Resurvey, using 100 ft. electrode intervals.	
	18E - 33E	Cut 2 parallel lines over 20E - 32E, one 200 ft. north, one 200 ft. south, Survey using 100 ft. electrode intervals.	2 x 1,500 ft. = 3,000 ft.

Line	Position of extra work recommended	Remarks	Line Cutting Required
14	6E - 21E	Cut 2 parallel lines over 6E -21E, one 300 ft. north, one 200 ft. south of line 14. Survey with 300 ft. electrode intervals.	2 x 1,500 ft. = 3,000 ft.
16	0 - 12E	Resurvey, using 100 ft. electrode intervals Cut 2 parallel lines over 0 - 12E, one 200 ft. north and one 200 ft. south of line 16.	2 x 1,200 ft. = 2,400 ft.
16	18E - 26E	Cut 2 parallel lines north of line 16 over 18E - 26E. One 100 ft. north, the other 200 ft. north. Survey with 100 ft. spreads.	
	18E - 26E	Similarly cut 2 parallel lines south of line 16 over 18E - 26E. One 100 ft. south, the other 200 ft. south. Survey with 100 ft. spreads.	4 x 800 ft. = 3,200 ft.
18	6W - 3E	Resurvey, using 100 ft. electrode intervals	
	7W - 3E	Cut 2 parallel lines over 7W - 3E, one 200 ft. north, the other 200 ft. south of lines 18. Survey with 100 ft. spreads.	2 x 1,000 ft. = 2,000 ft.
20	-		
22	26W - 20W	Resurvey, using 100 ft. electrode intervals.	
	13W - 28W	Cut 2 parallel lines north of line 22 over 13W - 28W. One 200 ft. north, one 400 ft. north. Survey with 200 ft. electrode intervals.	2 x 1500 ft. = 3,000 ft.
	13W - 28W	Similarly cut 2 parallel lines north of line 22, one 200 ft. south, the other 400 ft. south. Survey with 200 ft. electrode intervals.	2 x 1500 ft. = 3,000 ft.

Line	Position of extra work recommended	Remarks	Line Cutting Required
24	27W - 18W	Resurvey with 100 ft. spreads. Cut 2 parallel lines over 28W - 18W, one 200 ft. north of lines 24, the other 200 ft. south. Survey using 100 ft. electrode intervals.	2 x 1000 ft. = 2,000 ft.
26	-		
28	35W - 25W	Resurvey with 100 ft. electrode intervals	
	36W - 26W	Cut 2 parallel lines over 36W - 26W, one 200 ft. north of line 28, the other 200 ft. south. Survey using 100 ft. electrode intervals.	2 x 1,000 ft. = 2,000 ft.
30	1W - 8R	Resurvey with 100 ft. electrode intervals	
	35W - 25W	Resurvey with 100 ft. electrode intervals	
32	3E - 12E	Resurvey with 100 ft. electrode intervals.	
34	25W - 15W	Resurvey with 100 ft. electrode intervals. Cut 2 parallel lines over 26W - 15W, one 200 ft. north of line 34, the other 200 ft. south. Survey with 100 ft. electrode intervals.	2 x 1,100 ft. = 2,200 ft.
36	30W - 18W	Resurvey with 100 ft. electrode intervals.	
38	45W - 30W	Resurvey with 100 ft. electrode intervals.	
	16W - 8W	Resurvey with 100 ft. electrode intervals.	
		TOTAL	33,200 ft.

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Mt TYNDALL PROSPECT
E.L. 9/66 Mt Lyell 164C12

17th April, 1967

REPORT ON MT. TYNDALL FIELD WORK 1966/67

INTRODUCTION

The Mt. Tyndall prospect is the south-western part of the seventy-seven square mile area applied for by Renison Ltd. in 1966. Copper was the main ore of interest and means of prospecting consisted of an Induced Polarization survey conducted by McPhar Geophysical Pty. Ltd. of Adelaide and surface mapping by J. Ekstrom of N.C.G.F.A.

A grid of east-west running tracks, approximately one quarter mile apart, was cut in the scrub to enable the McPhar team and geologists to carry out the field work. All geophysical equipment was carried in by back-pack from the road which was built to bisect the grid as nearly as possible. Field personnel lived in a camp established near the southern boundary of the lease.

LOCATION

The area of interest is a north-south trending strip about six miles north of Queenstown. It is nearly nine miles long by two miles wide. That part investigated to date is located mainly between the Tyndall Range on the east and the Henty River on the west. Access is by a four wheel drive track which runs north through the centre of the prospected area. This track is an extension of Bradshaws logging road which starts on the Queenstown-Zeehan road about ten miles from Queenstown. The distance from Queenstown to the base camp is twenty miles. Also available is a H.E.C. footpath which follows the power transmission lines from Queenstown to Rosebery. The power line parallels the base of the Tyndall range.

TOPOGRAPHY

The area is primarily an undulating plain, of 1600 to 1800 feet elevation, dissected by many small creeks which flow into one of three tributaries of the Henty River or into the Henty directly. Much of the plain is covered by thick peat which becomes a swamp after heavy rain. This peat supports only Button grass and some small shrubs. Thick patches of Horizontal scrub, Myrtle, Sassafras, Pepperwood and King William Pine cover the balance of the plain as well as the steep slope to the Henty River. Steep, narrow and deep gullies are common on the flank of this slope. Most of these gullies like much of the Henty River are fault controlled and oriented in a NNE - SSW direction. The elevation from the level of the plain to the level of the Henty River changes from 1600 to 600 feet in as short a distance as 2000 feet. In some places the angle of slope is 50°.

The head of the Henty River is Lake Julia, situated east of the Tyndall Range in the north-east corner of the area investigated. On the eastern side of the plain is the steep Tyndall Range with a maximum elevation of 3,800 feet. Vegetation on these hills is predominantly small scrub, confined to hollows and water courses.

HISTORY

Mining and prospecting records of the immediate area are sketchy and incomplete. A small mine south of Lake Julia, near Newton Creek, was known to exist. Possible names were Newton Mine or Mt. Tyndall Copper Mine, In that area, what appears to be a sluice, has been dug to follow the natural contours. It is about 500' long and in two places meets the creek where it probably crossed via wooden sluice boxes. The reason for its existence is obscure, as it has no definite place of origin or termination, it just fades out. The mine was presumably located on or near the contact of the Cambrian and Ordovician and probably covered a sizeable area, but other than the "sluice", no evidence of a mine has been found.

Twelvetrees (1900) mentions the Mt. Tyndall Copper Mine, on the western slope of Mt. Tyndall, seven miles south-east of Mt. Read. The lease covered an area of eighty acres and its reference was Section 3709 - 93M. Galena, blende, copper and iron pyrite in a quartz lode were traced. The course of the lode was trenched for about 300 feet. A possibility of the above mentioned mines being one and the same arises, except for the fact that the trenches are different sizes. The Mt. Tyndall Mine trench was supposedly one chain in width, whereas the trench on Newton creek is only two to three feet wide. More investigation in the area and possibly more research into the records is necessary for this determination.

A small digging was discovered by the foreman of the track cutters fifty feet from line 28 at the 6000 foot mark. It is in thick scrub, forty or fifty feet above the creek, on the side of a steep, fault controlled gully. No shaft, as such, is in evidence, only a narrow, semi-cleared talus area below a shallow, trench-shaped opening, which may be the remnant of a collapsed shaft. The area is in a slight catchment and during, or after rain, thick, muddy, limonitic coloured water is emitted. The colour is probably due to the leaching of iron from pyrite or chalcopyrite, mineralisation is chiefly in the form of sphalerite and galena with minor pyrite and traces of chalcopyrite. Information regarding this working is lacking.

Nearly 900' further along line 28, a narrow trench six feet long by five feet deep was dug into the slate. A small creek within a foot of the hole seemed barren of ore minerals, so the reason for this hole is unknown. A vertical, square-shaped shaft, of about fifteen feet in depth was found on line 18. It was dug into alluvium on a rise, west of what is called "Bridge Creek". Nothing of interest was found in the cuttings surrounding the hole; however, a small I.P. anomaly was recorded within the area of the hole and will be discussed in a subequent section.

GEOPHYSICAL AND GEOCHEMICAL SURVEYS

Rio Tinto Australian Exploration Pty. Ltd. conducted a geophysical and geochemical survey north-west of Mt. Tyndall in the areathey called "Howard". The work was done during 1957-59.

Electrical surveys (probably EM) recorded four dominant anomalies, and a gravimetric survey over each of them "implied structures and/or geological contacts". (Table 111 1958?)

A geochemical survey recorded "the best geochemical anomaly of West Tasmania" with spectroanalysis results of 1.5% Pb and 0.5% Zn. A second anomaly shows a "medium degree of mineralisation". Both these geochemical anomalies can be corelated with two of the stronger geophysical anomalies and are believed to be "on or near the northern extension of the Mt. Lyell Shear (Owen Rift)".

Bonniwell recommended a drill-hole on station 8 E of line 48 of the "Howard" geophysical grid,the site of the strongest anomaly. The "Howard" file is missing so the exact location of this anomaly is not known, but by referring to available maps, it is estimated to be between line No. 26 and No. 30 and ¼ to ½ mile east of the road. This places the anomaly in the area of the Newton Creek Mine.

GEOLOGY

CAMBRIAN:

The Cambrian sequence of the Mt. Tyndall prospect begins with porphyritic and fine grained schists which show varying degrees of schistosity and are composed of hornblende, plagioclase and quartz. These rocks are found along fault zones and grade into unsheared porphyries of the same composition. The porphyries differ in mineral content and size of phenocrysts, depending on locality and placement within the flow or flows; i.e. the southern area is hornblende rich and quartz poor, whereas the contrary is true of the rocks in the northern area. This would indicate either an increase in acidity of the magma towards the north or at least two flows of differing composition; one soda rich and the other quartz rich. Regarding placement within the sequence, hornblende phenocrysts seem to be larger and better developed in the lower part of the flow while the plagioclase phenocrysts are larger and better developed near the top of the flow. This may be due to differentiation or, more probably, to different flows.

Nomenclature of these porphyries varies, the hornblende-plagioclase rich rocks are termed Hornblende Porphyries, Albite Porphyries or Albite Hornblende Porphyries. The quartz rich rocks are termed Quartz Porphyry, Rhyolite-Porphyry, and/or Keratophyres. (Solomon)

Above the porphyry, tuffs and tuffaceous sandstones grade into and mingle with agglomerates. In some areas the agglomerates may overlay the porphyry directly. The agglomerates are believed to be the top of the Cambrian in the southern two thirds of the area while north of Newton Creek, dark grey argillit es and slates overlay the Green Schists and Agglomerates. These may be the equivalent of the Lynch Siltstones.

Schists

In the southern third of the area, i.e. Lines 2 to 10, outcrops of green schists and schistose rocks are numerous at the western ends of the lines. On lines 12 to 18, these disappear but on line 20 reappear as slightly sheared rocks and also occur on lines 22 to 38.

Schists throughout the area are described as quartz, sericitic, feldspathic with chlorite and/or hornblende. As mentioned previously, location within the sequence seems to be a factor in size, amount, and degree of crystal development. Generally, the schists of the northern area contain more quartz and less hornblende; however, chlorite is common. Many rocks contain anhedral, partially decomposed chlorite crystals and almost every sample has a mottled green colour. Some contain large green phenocrysts with dark green-black centres which undoubtedly represent alteration of hornblende to chlorite. Only those near the top of the flow, which are found on the eastern ends of the lines, have very little green colouration.

The hornblende of the southern schists usually occurs as large black, subhedral crystals. Occasionally, euhedral, striated crystals up to 0.25" are found. These are found away from fault zones in the less-sheared rocks. In the northern area, quartz phenocrysts are more numerous, larger and better developed, than in the south. Those that have not been destroyed by shearing are subhedral to euhedral and clear. Occasionally crystals reach 0.15 inches in size , whereas the southern quartz is fine grained to aphanitic.

Another variation between the rocks of the two areas concerns the size and composition of the feldspar. Feldspar in the south varies from white to pinkish white and rarely salmon pink. It is generally considered to be albite in composition.

In two specimens of slightly sheared rock from the walls of the Henty River gorge, on Line 38, the feldspar occurs as large (max. 0.40 inches) subhedral to euhedral orange phenocrysts. This could possibly be orthoclase; a further indication of rocks becoming more acidic towards the north. In some areas, particularly near fault zones, the schists are mineralized with disseminated pyrite. In appearance, they are similar to the Mt. Lyell schists.

The above variations in rock types, except the one concerning the "orange", orthoclase are also noted in the overlying porphyries of these areas. It is therefore believed the schists are results of the aforementioned faulting.

Slates

The slates vary from green to purple in colour and range from a well sheared, "true slate" to partially sheared argillites. The "true slate" is found in and near, very steep, fault controlled gullies. Less-sheared argillites are found away from the fault zones. The slates all appear to be similar in composition and are found in both the north and south and could represent an interflow unconformity between the less-acid, hornblende-albite flows and the more acid keratophyre flows. One outcrop of slate on Line 20 was found as bedrock in a narrow creek and fifty feet above the creek was an outcrop of rhyolite porphyry. No definite contacts between the slates, schists, or porphyries have been found; however, indication of the unconformity is there. If this idea is correct the difference in mineral composition and texture of the porphyries is more readily understood.

Porphyries

It is believed at least two periods of extrusion are represented; the earliest being the soda rich, hornblende porphyries, the upper being the quartz rich Rhyolite Porphyries. Of the latter, two textural types are noted and although these are similar in composition they are possibly two separate flows. The textural change could have been due to differentiation as well.

In the soda rich porphyries, the hornblende is dark green-black, striated and euhdral to non-striated and subhedral reaching a maximum of 0.30 inches in size. Alteration to chlorite is common.

The feldspar is generally white but occasionally pinkish white to salmon pink. Weathered surfaces are always pinkish white and appear kaolinised. Twinning is common in subhedral to euhedral crystals. Maximum crystal size is 0.25 inches.

Quartz is commonly fine grained but occasionally crystals of 0.10 inches occur. Crystals are generally subhedral and clear. The matrix is always green to dark green and mottled with white or pink feldspar. The darkening of the green colour probably indicates higher chlorite content. Chlorite is always present, either indicated by colouration of matrix or in green flaky crystals.

The weathered appearance is generally grey and/or green with a mottled pink surface. Samples of rocks deep in the sequence, i.e. the western end of the lines, exhibit large hornblende crystals and small albite crystals whereas the higher part of the sequence, (eastern end) is characterized by larger albite than hornblende.

On two lines, 14 and 16, a possible repetition was noted. The large hornblende crystals decreased in size toward the east and then repeated the sequence of larger to smaller crystals. This is possibly due to faulting as the repetition was not noted on other lines. The acidic porphyries exhibit two different but gradational textures which may represent differentation. The lower one is almost wholly aphanitic with small and scattered anhedral, clear, quartz phenocrysts. It is, according to Solomon, a "Keratophyre". The texture of the upper, differs by having larger quartz crystals which are commonly euhedral and the rock is known as a "Quartz Keratophyre". The average thickness of this upper type is unknown, but at one place between lines 26 - 28, it is only about fifteen to twenty feet. This is only an estimate as the two types grade in and out of each other.

The different textural types can sometimes be distinguished by the appearance of the weathered exterior. The quartz Keratophyre has generally an orange colour whereas the smaller porphyritic keratophyre has a brownish orange to grey brown colour.

Tuffs, Tuffaceous Argillites, Agglomerates

General:

From lines 20 to 38, green tuffs and green and pink agglomerates have an almost indistinguishable contact with the underlying soda porphyries and/or quartz porphyries. They were evidently ejected soon after the fluid phase and contain large but generally anhedral and fractured pink and dark green to black phenocrysts of feldspar and hornblende (and/or chlorite) respectively. The agglomerate phenocrysts grade down to the porphyries to the extent the agglomerate at times is difficult to distinguish from the porphyries.

Very little difference exists between the agglomerates. Most are derived from the soda-Rhyolites and contain abundant hornblende as mentioned above. Only a few examples of the Quartz Keratophyre agglomerate were found and these contain definite quartz phenocrysts.

Texture, size and shape of phenocrysts and degree of weathering of the rock are the main criteria for distinguishing agglomerate from porphyry when the contact is unavailable. Phenocrysts in agglomerate usually have a cloudy or hazy appearance and are fractured. They are usually larger (0.4" to 1.0") than those in the porphyries and but not so well developed. Occasionally a black euhedral hornblende crystal can be identified. Most feldspar occurs as large, anhedral, pink blobs or small (0.05" - 0.20") round, anhedral, whitish blobs.

The agglomerate matrix varies from light green to dark green. This description is also applicable to the coarser grained tuffaceous sediments.

Tuffs are determined by texture and are generally slightly vesicular. Occasionally a light green, siliceous, dense, tuffaceous mudstone is associated with the coarser grained types. The silica may have migrated from the coarser grained rocks.

Argillite

The top of the Cambrian consists of grey to dark grey, finely banded, occasionally pyritic (due to faulting) silty mudstone, known as the "Lynch Siltstones" and outcrops on the road between lines 28 - 30 and lines 34 - 36. A thin bed of brown sheared siltstones is associated with these but the shearing is due to faulting. Outcrops are small, generally about 50' - 150', and are mostly on the road where the dozer has cut into the bank and removed the soil cover. Thickness of beds and relationship to the underlying tuffs and agglomerates are unknown. The beds dip very steeply E.N.E. and are partially to intensely sheared. The degree of shearing varies over a distance of a few feet. Pyrite occurs on shear planes and joints. In most outcrops of the mudstone, which show little disturbance, small thrust faults are clearly visible. The slates show no primary structures. Where these rocks are not eroded, they form the top of the Cambrian sequence.

ORDOVICIAN

Very little work was done on Ordovician rocks and they will only be mentioned briefly, as they are considered to be economically unimportant. The contact of the Cambrian and Ordovician is considered the most likely place for ore bodies and the determination of this contact is the only reason for examining the Owen. No outcroping contact between the two series was found; however, the contact from line 16 - 38 can be estimated to within 150 feet. From lines 2 - 16, the line is interpretted from aerial photographs.

The base of the sequence was thought to be Jukes Breccia which is unconformable beneath the Owen series. The Owen is the top of the Ordovician in the prospect area and is primarily a conglomerate with interbedded graywacke sandstone.

Jukes Breccia

Jukes Breccia may not be present as no rock fitting the standard description was found. However, a grey, small conglomerate was found in outcrop below the basal conglomerate of the Owen formation in the northern area near the road between lines 34 and 38. This is possibly part of the Owen and due to complex folding and faulting, which will be discussed later, as it is exposed in an "apparent" lower part of the sequence.

The Jukes Breccia varies little from the overlying Owen conglomerate. Pebbles are small ($\frac{1}{2}$ - 1$\frac{3}{4}$"), of quartz and quartzite with a grey quartz feldspathic matrix.

Owen Conglomerate

Overlying the Jukes Breccia, the Owen conglomerate contains pebbles and cobbles ($\frac{1}{4}$" to 6-7") of white and pink quartz and quartzite which are commonly brecciated. Matrix varies from white silicious to red hematitic sand.

Sandstones of varying textures from fine grained to grit, and composed of quartz feldspar, and/or Kaolin, and yellow brown mica are interbedded with the conglomerate.

Structure

Because the structures encountered in the Mt. Tyndall Prospect are very similar to those discussed by Wade and Solomon in "Geology of the Mt. Lyell Mine, Tas." Economic Geology 1958, and by Campana and King, 1960, R.T.A.E. report on "Western Tasmania", only a brief outline of the sequence of events with comparisons and correlations of the two areas will be made.

The Owen Conglomerate of the Tyndall Range represents one of the "locally unique developments" of the W & S report. Originally it was a north-west trending anticline which was dragged to a north-south trend due to enormous north-east compressional forces, which created the "Lyell shear" or "Owen Rift" of Campana. This same Middle Devonian movement produced the south-east trending asymmetrical, faultfolds which are evinced immediately north of Newton Creek. Wade & Solomon mention NW - SE trending fault-folds as being common and very influential in ore deposition.

During the upper Devonian, forces from the N.N.E. "wrenched" the "Mt. Read Block" horizontally to the west. (Campana & King). These forces could also have been responsible for tilting the northern Tyndall area, thus producing the south-east trending, plunging syncline, which is evinced north of Newton Creek between lines 28E, 30E. A thrust fault, termed "The Tyndall Fault" possibly wrenched as well, about one half mile from the eastern ends of lines 10 - 14 and near the top of the Tyndall range, may also have resulted from this movement. Displacement appears to be only a few hundred feet and the northern end seems to have moved more than the southern end. This is estimated by photo inspection.

EVIDENCE OF FAULTING

Other than the visible thrust fault on the Tyndall Anticline and apparent movement, north side to the east, along the Newton Creek Fault, evidence of faulting consists primarily of lineation of creeks and gullies in photos and on the ground, sheared rocks exhibiting various degrees of schistosity and slickensided and polished rock surfaces.

Lineation on photos is very pronounced and in many cases sheared rocks are found along traces where little evidence can be seen on the ground. Most of the small faults were plotted from photo lineation. Conversely, some very small gullies containing slates and schists are not visible on photos because of thick vegetational cover.

The degree of shearing seems to be an indication of the degree of mineralisation as seen in the dark grey "Lynch Siltstones". On the road, near line 28, the relatively unsheared dark grey argillites, contain no pyrite, whereas the same type of rock about 300' north underwent strong shearing and is impregnated with pyrite along shear planes and joint planes. Schists and slates in other areas are equally impregnated. These metamorphics all strike N20°W to N30°W. Two examples of slickensides were found in the Henty Gorge near line 36 and indicated horizontal movement. This supports Campana as he believed the Henty fault to be the southern border of the "Mt. Read Block", the "Block" having moved to the southwest.

Polished surfaces are very common and generally are aligned in a N.N.W. direction Wade & Solomon suggest the reason for this strong and common alignment of schists and slates to be due to the N.N.E. compressional forces which folded or faulted the harder Ordovician but mainly sheared the softer sediments of the Cambrian. Some folding of the Cambrian did take place however, as evinced by the presence of the overturned green and dark grey argillites near Newton Creek. The relative softness of the argillites must be admitted from the evidence of numerous very small thrust faults which pass out into weakly sheared rocks.

OBSERVATIONS

Some field observations have not been dealt with adequately, mainly through lack of time, therefore, a list of the main field observations has been prepared to help in further investigations or to help explain any queries which may arise.

(A) STRATIGRAPHY

1. Green hornblende porphyry grades to hornblende-albite porphyry and/or albite porphyry towards the east and possibly represents the lowest member of the Cambrian sequence. Green porphyries seem to grade into Keratophyres.

2. Green porphyries gradually change to green agglomerates to such an extent that one is difficult to distinguish from the other.

3. Agglomerate intermingled with green tuffs and tuffaceous sandstones, Exposures of green tuffs etc. appear on road between lines 6 - 10 and lines 18 - 28; they occur within 25 - 50' of each other.

4. Keratophyres (Rhyolite porphyries) appear as outliers east of the road from lines 12 - 38 (See rock type).

5. Keratophyres grade into and out of quartz keratophyres indescriminately but seem to be the lower member of the Keratophyres i.e. (Quartz Keratophyres, Quartz, Rhyolite porphyries) more prominent in the northern area.

6. Dark grey, well bedded shales seem to overlie green tuffaceous sediments and meta sediments in the area north of Newton Creek.
   (a) These green sediments are similar and at first were thought to be the same as those mentioned in No. 2.

7. The Tyndall Range trends north - south. Bedding dips S40°W to S70°W at 15° - 20° near top 45° - 50° near base.

(B) STRUCTURE

1. Owen Rift - parallel to Tyndall Range, possible fault trace seen on photos. Other minor N - S faults result from the Owen Rift.

2. N.W. - N.N.W. - resulting from Mid Devonian S.W. compressional stresses and seen both on ground (N.N.W. aligned slates) and lineation on photos. Numerous brown slate outcrops occur near the contact or possibly at the contact of Ordóvician & Cambrian. These slates have been found in various places near the Cambrian - Ordovician contact from lines 16 to 38. Shear planes are predominantly vertical.

3. N.E. Fault - Henty River Wrench (Campana)

   (a) Sheared rocks, polished surfaces and slickensides are seen in the Henty Gorge.

   (b) Newton Creek - strong photo lineation and apparent movement of about 600 ft. with north side to the east (near stream ford).

FOLDING

1. Plunging synclinal axis S25°E to S35°E. Possibly turns to S.E. Asymmetrical folds, overturning, overthrusts noted. Examples seen immediately north of Newton Creek.

1(a) Between lines 36 - 38, Cambrian agglomerates outcrop east of conglomerate. Both outcrops appear to be in situ.

2. Topography from Newton Creek slopes gradually upward. Possibly represents gradient of plunging syncline.

CONCLUSIONS

(A) Surface Geology

1. The "diggings" or the indication of prospecting which was found at the 6,000' point, near line 28, containing sphalerite and galena should be investigated further. Induced Polarization was run within fifty feet to the south of the spot but the highest metal factor was three, with a "frequency effect" of two. Whether the "ore"body is very small or I.P. is not as good as assumed, is not determined. Probably the easiest and cheapest way to obtain an idea of value is to enlarge the hole by blasting.

2. The above area was noted by the presence of "rusty water". Other areas with these signs were found in the east wall of the Henty Gorge near line 22, in small NNW trending creeks on lines 14, 34 or 36 and near the dark grey pyritic slates on the road between lines 28 - 30 and 31 - 38. No mineralization similar to that mentioned in (1) was found.

(B) Induced Polarization

Anomalies of varying intensity were found on many lines, though in comparison with the values found in the Comstock area of Mt. Lyell the best ones encountered are only "average" to "good". Detailed work has been done on two of our best anomalies but at the time of writing, results were not known. According to J. Christie of McPhar these anomalies are probably mineralized fault zones. This is determined by high "metal factors" and "Frequency Effects" and "low resistivity". They both represent NNW fault zones; the best being that of the Tyndall Range thrust fault.

RECOMMENDATIONS

1. Bulldozing trenches over some of the best anomalies to determine rock types and the cause of the anomalies will be necessary and should work for shallow anomalies, but deeper ones, which include the best anomalies, will

have to be approached by different means. This will probably have to be decided by a geophysicist.

2. The only reliable method of determining the cause of the anomalies is by diamond drilling. The best anomaly (M.F. 262) is on line 22 between 1800 - 2100'. The second best (M.F. 142) is on line 4 between 5600 - 5800.

The necessary roads for the drill rigs could be easily and cheaply built. The one on line 22 could be reached by paralleling "Bridge" Creek. The distance would be less than half a mile.

A road to the second one is predominantly on level ground, but because of the thick peat in that area may create a problem.

Before considering a drilling programme, it would be wise to use other geophysical means or even the trenching idea. As previously stated these anomalies are weak compared to Comstock.

JOHN EKSTROM

APPENDIX

Field Notes Tyndall 1966/67 Field Season

All Measurements begin on Eastern ends of lines. All compass readings based on Magnetic North.

LINE 2

Footage	Sample No.	
5715E	2 - 8	Feldspar porphyry; medium dark grey matrix; white feldspar (0.5") slightly striated, possible twinning; small quartz crystals on border. (Possible intrusion).
5100E	2 - 7	As above.
4700E	2 - 6	Hornblende porphyry; Hornblende, black striated, subhedral - euhedral, (0.175"), possibly oriented due to flow; Feldspar (albite) flesh pink - salmon pink, striated, euhedral (0.1") oriented as Hornblende.
150E	2 - 1	Schistose, tuff; vesicular, siliceous dark grey, bedded.
40W	2 - 5	Same as 2 - 6 except Hornblende crystals are (0.5") and Feldspar (0.1").
1230W	2 - 2	Schistose, tuff; dark green, vesicular, siliceous.
1280W	2 - 3	Same as above; only brown.
1400W	2 - 4	Schistose, tuff; scattered, small (0.001" - 0.005") anhedral quartz; Abundant white anhedral feldspar (0.05").

LINE 4

2400-3300E	4 - 6	Feldspar porphyry; same description as 2 - 7 & 8.
500E	4 - 7	Quartz, sericitic, schist; light green-greenish-grey matrix; hornblende, subhedral elongated, randomly oriented, striated (0.02" - 0.2"); quartz, small and equals about 60 - 80% of rock.
750W	4 - 5	Tuffaceous schist; light green-grey to grey, trace salmon pink; (difficult to distinguish from rhyolite).

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1300W	4 - 1	Quartz sericite schist; white to light brown (possibly due to weathering) well sheared; schistosity planes strike N32°W.
1575W	4 - 2	Quartz sericite schist; same as above. Schistosity N30-35°W.
1595W	4 - 3	
1800W	4 - 4	

LINE 6

3900E	6 - 1	Quartz sericite chlorite schist; Fine-medium grain, blue-green (possibly tuffaceous schist).
3800E		Quartz sericite, chlorite schist; quartz, subhedral, medium - large.
0	-	Tuffaceous sandstone; green, medium - coarse, occasionally vesicular.
300W	-	Tuffaceous schist; blue-green, fine grain.
2400W	6 - 2 6 - 3	Same as "300W".
2700	6 - 4	Schistose tuffs; pale brown, aphanitic.

LINE 8

4200E	8 - 1	Albite porphyry; Albite (0.15") flesh pink, occasionally striated, subhedral and occasionally isolated euhedral hornblende crystal (0.15"); dark grey matrix.
4100E	8 - 2	Albite porphyry; same as 8 - 1, with thin band of serpentinization; also possible epidote - or because chlorite crystals are near could possibly be an alteration product.
0	-	Schistose tuffs; green, fine to coarse, occasionally aphanitic, trace dark grey shale.
500W		Quartz, chlorite, sericite schist; green - grey - blue green, aphanitic, medium grain, white, subhedral. Lineation = N30°W.
1300W		Quartz, chlorite, sericite schist; as above.

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LINE 10

3600E	-	Albite porphyry schist; Albite (0.15") white.
3200E	10 - 1	Hornblende, albite porphyry; Hornblende poorly developed subhedral (0.20" - 0.25"), black; Feldspar, white-pink, small (0.05"), subhedral; blue green matrix.
2900E	10 - 2	Hornblende, albite porphyry; Same as 10 - 1.
1050E	10 - 3	Hornblende, albite porphyry; Hornblende (0.15") albite (0.10" - 0.15") white (no pink); quartz = 5 - 10% of rock; dark green matrix.
1200-1800W		No outcrop; only brown clayey soil (Possible shear zone).
2200W		Quartz, sericite, chlorite schist; blue green, euhedral - subhedral, black striated chlorite crystals (Creek bed).
3300W	10 - 2	Quartz, sericite, chlorite schist; varying sizes chlorite, quartz, feldspar lineation N30°W.

LINE 12

3600E	12 - 13	Albite porphyry schist; albite (0.15") white.
3700E	12 - 11	Feldspar quartz, hornblende, rhyolite; same 12 - 10, with more numerous smaller feldspar crystals; no Hornblende and only minor quartz.
2700E	12 - 10	Feldspar, quartz, hornblende rhyolite; Feldspar, (0.1" - 0.15") pink occasionally orange subhedral; quartz, small (0.05") anhedral clear; hornblende rare but well developed (0.1") narrow; chlorite present.
2400E	12 - 9	Quartz rhyolite; abundant quartz; (0.05" - 0.075"); feldspar, white-flesh pink, euhedral (0.05" - 0.075").
2150E	12 - 8	Agglomerate, coarse (0.50" - 1.00"); green and pink matrix; occasional vesicles with sericite and iron oxide border.
1950E	12 - 7	Agglomerate, medium (0.25" - 0.50") green and pink.
1900E	12 - 6	Feldspar porphyry; feldspar, small (0.1") well

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1900E cont.		developed and more numerous than hornblende which are (0.1" - 0.15") decomposing to chlorite; green grey matrix (probably near top of flow as has agglomerate like appearance - except for good clear feldspar).
1200E	12 - 5	Hornblende and albite porphyry hornblende (0.30" x 0.15"). Albite, white-pink, subhedral, no twinning, (0.1"); blue green matrix.
850E	12 - 4	Hornblende and Albite porphyry. Same as above; slight pinkish tinge. Trace of alignment possibly due to flow.
375E	12 - 3	Hornblende and quartz porphyry; hornblende (0.2") poorly developed small crystals (0.05" - 0.1") quartz, anhedral (0.20") frosted possibly secondary; rock has been disturbed and may be near fault zone; feldspar rare and occasionally subhedral (0.1").
200E	12 - 2	Hornblende porphyry; hornblende (0.3") narrow euhedral well developed. Feldspar, poorly developed almost indistinguishable, maximum size of one crystal = (0.075"); blue-green matrix.
15E	12 - 1	Hornblende porphyry; hornblende (0.15"), subhedral nonaligned; feldspar, small (0.05"); otherwise same as 12 - 2.
500W	12 - 12	
1500W	12 - 13	Hornblende, albite porphyry; hornblende (0.15") subhedral, nonaligned, albite, white-pinkish white (0.015") subhedral to anhedral, possible albite twinning; matrix blue green near border and blue grey towards centre. Phenocrysts same size throughout.
1700W	12 - 14	Hornblende albite porphyry; as above.
2400W	12 - 15	Albite porphyry; albite (0.05") pink and white, no twinning; no quartz; hornblende is small (0.005") to indistinct; matrix is blue green.
3000W	12 - 16	Schistose agglomerate or feldspar, hornblende porphyry; hornblende elongated, acicular and aligned in what appears to be horizontal position; albite, very fine anhedral, pinkish white, and slightly sericitized; matrix becoming greener; possibly aligned N45°W.

LINE 14

1700E	14 - 12	Feldspar porphyry; same as 12 - 6; except for hornblende (0.15") and feldspar white.
1690E	14 - 13	Feldspar, quartz, hornblende rhyolite; same as 12 - 10; except chlorite has salmon pink halo surrounding it.
1675E	14 - 14	Agglomerate; or possibly Feldspar porphyry Feldspar (0.5") and Quartz (0.1").
1500E	14 - 11	Hornblende, albite porphyry; hornblende and albite crystals (0.15"), matrix pale grey green.
650W	14 - 1	Hornblende and albite porphyry (0.1") (0.15" - 0.20' respectively. Pyrite impregnating sample.
750W	14 - 8	Hornblende and albite porphyry as above.
800W	14 - 2	Hornblende porphyry; hornblende (0.10" - 0.15").
1175W	14 - 3	Hornblende porphyry; as above with (0.5") sporadic pyrite.
1275W	14 - 4	Hornblende porphyry as above with secondary quartz infilling. Possibly carried pyrite.
1350W	14 - 5	Hornblende porphyry; as above.
1650W	14 - 6	Schistose hornblende porphyry; as above.
2000WA	14 - 7	Hornblende, albite porphyry. Same as 14 - 4.
3100W	14 - 8	Hornblende, albite porphyry; as above.
3825W	14 - 10	Albite, hornblende, rhyolite; albite pink-pink white (0.1"). Hornblende small; scarce, anhedral; Blue green.

LINE 16

2800E	16 - 2	Feldspar rhyolite; feldspar, flesh pink, well developed but small (0.25"). Occasional large fractured pieces of pink feldspar and subrounded fragments. Possible agglomerate.
2400E	16 - 1	Feldspar rhyolite; same as 16 - 2.

1820E	16 - 3)	
1815E	16 - 4)	Agglomerate; greenish matrix.
1725E	16 - 5)	
1350E	16 - 6	Rhyolite; aphanitic, matrix green grey one small anhedral quartz crystal.
400E		Albite porphyry; same as 14 - 12.
600W	16 - 7	Hornblende albite; porphyry; same as 12 - 13 (Trace of pyrite).
1825W	16 - 10	Hornblende, albite, porphyry; same as 12 - 13.
2500W	16 - 12	Feldspar rhyolite; blue green, aphanitic white feldspar, amorphous.
4300W	16 - 13	Schistose rhyolite; feldspar, white subhedral small (0.02" - 0.005"). No hornblende; quartz very small anhedral (0.005").

LINE 18

1800E	18 - 8	Agglomerate; quartz, black tinge - possible overlying hornblende (probably sheared) strike N30 - 35°W.
1525E	18 - 5	Quartz rhyolite; probably top of flow. Feldspar, white; pyrite.
1350E	18 - 4	Agglomerate. Brownish grey weathered surface. Strike N35°W.
2900W	18 - 1	Hornblende albite porphyry; hornblende (0.15") anhedral, black-dark green (probably chloritized); albite, pink,white pink; quartz, anhedral (0.1") clear and about 20 - 25% of rock, matrix green.
2950W	18 - 2	Hornblende, albite porphyry; same as 18 - 1 except hornblende crystals (0.15" - 0.20").
5000W	18 - 3	No outcrop - light grey-brown clay.

LINE 20

300W	20 - 1	Agglomerate; medium grained (0.25") hornblende; albite, salmon pink, sericitized or kaolinized.

350W	20 - 2	Agglomerate; same as 20 - 1.
575W	20 - 3	Agglomerate; same as 20 - 1; smaller phenocrysts and quartz is clear.
600W	20 - 12	Agglomerate or feldspathic tuff.
640W	20 - 4	Agglomerate with keratophyre pebble. Matrix blue with quartz (0.1") phenocrysts; rare feldspar (0.1").
2400W	20 - 5	Agglomerate (or near top of flow); same as 20 - 4.
2500W	20 - 6	Schistose agglomerate; same as 20 - 4.
4900W	20 - 7	Rhyolite; feldspar (0.005") anhedral, light grey - greenish grey matrix.
5400W	20 - 8	Schistose rhyolite; blue green matrix probably due to chlorite.
5700W	20 - 9	Chloritic rhyolite; Quartz (0.05").
6000W	20 - 10	Tuffaceous schist; feldspar (0.2") weathered. Trace hornblende.
6300W	20 - 11	Tuffaceous schist; same as 20 - 10.

<u>LINE 22</u>

600E	22 - 1	Agglomerate; same as 20 - 1.
875W	22 - 1½	Schistose feldspar and chlorite porphyry; feldspar (0.05") white - pink, well developed. Chlorite (0.3") green.
1400W	22 - 2	Quartz chlorite, sericite schist.
1500W	22 - 3	Quartz, chlorite, sericite, schist.
1950W	22 - 4	Rhyolite; vesicular, white-tan, aphantic matrix.
2200W	22 - 5	Quartz chlorite schist; same as 22 - 2.
4150W	22 - 6	
4200W	22 - 7	Feldspar schist; feldspar (0.2"), white.
Henty River	22 - 8	Rhyolite, pink, fine grained, fine grained anhedral quartz.

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LINE 24

675E	24 - 22	Quartz, rhyolite; porphyry; quartz (0.10") anhedral to subhedral clear, crystals scattered throughout and mades up 10 - 15%; matrix is aphanitic purplish-orange brown; (Same as 28 - 7 = rock type).
300E	24 - 21	Agglomerate; feldspathic, quartzose - looks like granite.
	24 - 1	Same as 24 - 22.
1000W	24 - 2	Feldspar, chlorite rhyolite; feldspars pink - white (0.05"). Chlorite (0.15").
1220W	24 - 3	Feldspar, chlorite rhyolite; same as 24 - 2.
2150W	24 - 4	Hornblende, feldspar porphyry; hornblende subhedral. Good striations, (0.25") feldspars (0.15"), euhedral white green (weathered) untwinned; quartz in traces - anhedral, clear; possibly sheared. Strike N20°W.
2725W	24 - 5	Hornblende, feldspar, porphyry; same as 24 - 4; pyrite.
3950W	24 - 6	Schist; quartz chlorite schist.
5200W	24 - 8	Porphyritic hornblende and feldspar schist; hornblende (0.15"). Feldspar; fine - anhedral - subhedral; quartz disseminated.
5730W	24 - 15	Quartz rhyolite; same as 28 - 7; smaller phenocrysts.
5850W	24 - 16	Quartz rhyolite schist; matrix aphanitic. Light grey brown.
6225W	24 - 17	Hornblende, chlorite schist; same as 24 - 8. Aligned N35°W.
7150W	24 - 18	Chlorite, Schist; same as 24 - 17.
7400W	24 - 19	Sericite schist; lenticular shaped vesicles filled with light grey "potch" opal.
7415W	24 - 20	Tuffaceous schist; or possibly sandstone schist.

LINE 26

1200E	26 - 12	Quartz keratophyre; same as 28 - 7.

290E	26 - 15	Agglomerate; quartz; coarse (0.3") basically a quartz keratophyre composition.
285E	26 - 14	Claystone; tan - light brown sheared.
260E		Quartz, keratophyre; phenocrysts (0.1")same as 28 - 7.
200E		Quartz, keratophyre; same as 28 - 7.
300W	26 - 11	Keratophyre, white.
1400W	26 - 10	Quartz keratophyre; same as 28 - 7.
1500W	26 - 9	Feldspar porphyry; feldspar white - pink, green-grey matrix; crystal (0.15") trace of twinning.
1500W	26 - 8	Feldspar porphyry; same as above.
1900W	26 - 7	Feldspar, chloritic schist; quartz and hornblende crystals.
3150W	26 - 6	Feldspar, hornblende and quartz porphyry; hornblende and feldspar both (0.15") quartz (0.15").
3500W	26 - 5	Quartz keratophyre; feldspars, white (0.05"); quartz (0.05"). Hornblende poorly developed.
5200W	26 - 4	Rhyolite Schist; same as 26 - 16.
7300W	26 - 2	
7700W	26 - 3	Chlorite schist.
7720W	26 - 4	Chlorite schist.

LINE 28

900W	28 - 8	Keratophyre; similar to 28 - 7 - quartz is smaller.
1250W	28 - 2	Quartz keratophyre; quartz; dark anhedral-subhedral; ferro-magnesian minerals; feldspar, white; probable chlorite matrix.
1325W	28 - 3	Quartz keratophyre; same as 28 - 2; trace of pyrite.
1400W	28 - 4	Quartz keratophyre; same as 28 - 2; no pyrite.
1500W	28 - 5	Rhyolite; quartz, aphanitic; feldspar medium grained

1500W cont.		subhedral - anhedral, peach-pink occasionally white. Possible N15°W alignment due to shearing.
1800W	28 - 7	Quartz keratophyre; quartz (0.10") clear, subhedral. Matrix purplish-orange brown.
1825W	28 - 6	Schistose Quartz keratophyre; same as 28 - 7; alignment N20°W.
3050W	28 - 10	Sandstone; medium grey, fine grained micaceous - found near base of knoll - probably alluvium.
5100W	28 - 10	Sandstone as in 28 - 9; found in small creek bed - probably alluvium.
5900W	28 - 11	Quartz keratophyre; same as 28 - 7.
6000W	28 - 12	Quartz keratophyre; same as 28 - 7.

"DIGGINGS" Location will be in reference to "Mine"

6000 50'N of Line	28 - 13	Slate; dark grey.
10'N of Mine	28 - 14	Quartz sericite schist; medium - steel grey; rock is loose - no alignment.
50'E of Mine	28 - 15	Quartz schist; light green.
20-30'N of "	28 - 16	Possible contact (abundant talus)between schist as 28 - 7. Galena in traces. N50°W alignment.
25'W of Mine	28 - 18	Quartz sericite schist; grey green,pyrite impregnated N60°W alignment.
50'N of Mine	28 - 19	Quartz sericite schist; same as 28 - 15. Forms cliff face; N40° - 50°W alignment.
40'N of Mine	28 - 20	Quartz sericite schist; trace of pyrite.

LINE 30

6200	28 - 22	Albite, hornblende schist; medium green.
6550	28 - 23	Quartz, sericite schist, green. N28°W.
6850	28 - 24	Slate; purple.
6950	28 - 25	Slate; purple with minor green.

7200	28 - 26	Chlorite schist; pyrite impregnated; blue-green.
7250	28 - 27	Chlorite schist; minor pyrite.
7500	28 - 28	Vein quartz, barren.
7875	28 - 29	Chlorite sericite schist, same as 28 - 26.
Road 0		Slate; dark grey, pyrite impregnated.
300 ±	30 - 1	Agglomerate; feldspar and minor hornblende; green matrix.
2700	30 - 6	Agglomerate; same as 30 - 1.
3550	30 - 7	Agglomerate; same as 30-1.
5700	30 - 9	Slate; green and purple.
6000	30 - 8	Slate; purple; trace of pyrite on shear planes.

LINE 32

1200E		Conglomerate and S.S.
900W	32 - 1	Quartz keratophyre; same as 28 - 7.
1200W	32 - 2	Quartz keratophyre; same as 28 - 7.
3050W	32 - 3	Schistose chloritic rhyolite; feldspar, sericite; dark green matrix.
3350W	32 - 4	Feldspar porphyry; feldspar, pink - white, subhedral (0.1"); green matrix.
3610W	32 - 5	Rhyolite; same as 32 - 4.
4250W	32 - 6	Slate; green with trace of pyrite. N25°W.
4600W	32 - 7	Slate; purple; no pyrite; N10°W.
5150W		Slate; purple grades into green at 5175.
5800W	32 - 8	Quartz, feldspar, chlorite schist; quartz (0.05"), feldspar (0.005") white, trace of subhedral pyrite on shear plane N45 - 55°W.

LINE 34

450E	34 - 7	Slate; grey, micaceous possibly quartzitic. No mineralisation; N28°W.

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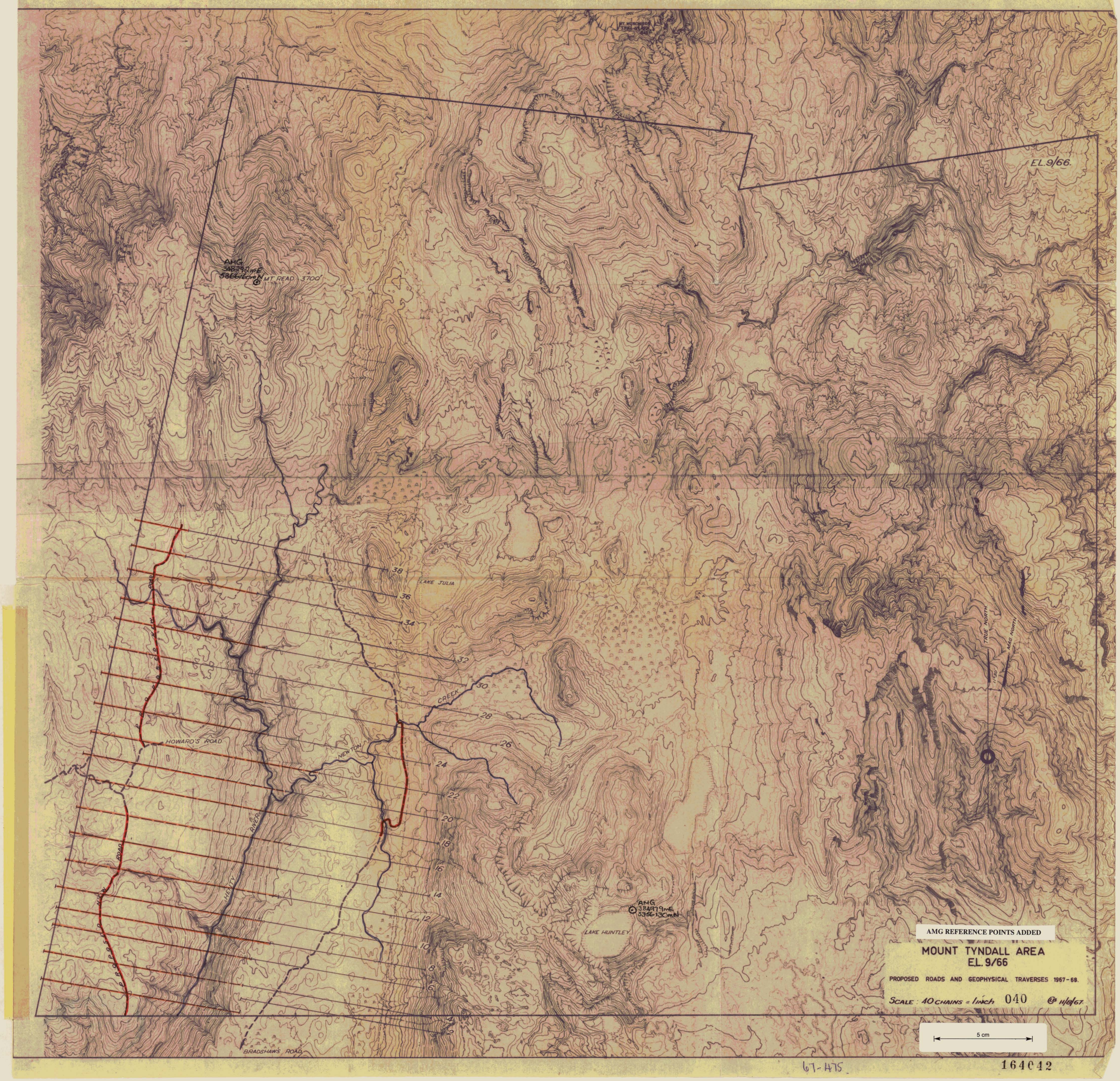
500W	34 - 1	Quartz keratophyre; quartz (0.1") same as 28 - 7.
800W	34 - 1½	Quartz keratophyre; same as 28 - 7.
1250W	34 - 2	Quartz keratophyre; same as 28 - 7; trace of flow structure; matrix battle ship grey.
1500W	34 - 3	Quartz keratophyre; same as 28 - 7.
4110WA	34 - 4	Slate; purple.
4250W	34 - 5	Slate; purple but green along cleavage.
4260W		Slate; purple.
4775W	34 - 6	Schist; Feldspar, salmon pink - orange.

LINE 36

500E	36 - 3	Agglomerate; quartz and quartzite. Pebbles predominantly elongated.
425E	36 - 1	Quartz keratophyre; quartz (0.1") subhedral euhedral; feldspar, white-pink trace of flow structure.
300W	36 - 1	Quartz keratophyre; same as 36 - 1.
550W	36 - 2	Agglomerate; pink and green matrix contains pebble of quartz keratophyre as 28 - 7.
650W	36 - 3	Schistose agglomerate; same as 36 - 2.
900W	36 - 4	Feldspathic quartz keratophyre; light grey-green.
1500W		Quartz keratophyre; becoming quartzose less feldspathic and greener.
2200W	36 - 5	Slate; dark green-grey; thin bands of light green schist.
3000W	36 - 6	Schist, tuffaceous sandstone, dark green.
3950W	36 - 7	Schistose agglomerate, green, feldspathic, possibly alluvial.
4100W	36 - 8	Agglomerate; green and pink, chlorite along joints.
4150W	36 - 9	Chlorite schist; light to dark green.

LINE 38

650E	38 - 2	Jukes Breccia; medium grey exterior.
350E	38 - 3	Quartz keratophyre; quartz (0.15"), clear to cloudy, euhedral; feldspar, pink-white small (0.05")
300E	38 - 4	Quartz keratophyre; same as 38 - 3.
Road 0	38 - 5	Slate; dark grey, pyrite impregnated.
50W	38 - 6	Agglomerate or quartz keratophyre; quartz (0.05" - 0.1") clear, possible euhedral, feldspar, white soft; chlorite, dark green (0.10" - 0.20").
700W	38 - 7	Quartz keratophyre (0.05" - 0.1") scattered, clear, phenocrysts; light green - white matrix.
Henty River 2400W	38 - 8	Keratophyre schist; siliceous looking feldspar (0.05") elongated, pink; chlorite along shear planes. N15° - 20°W.
2500W	38 - 9	Slate; light grey brown.
5400W	38 - 10	Schist; well weathered - fine grained quartzose, feldspathic sandstone.
5850W	38 - 11	Schistose agglomerate; feldspar - orange (0.4") Hornblende or chlorite - anhedral, dark green.
6000W	38 - 12	Schistose agglomerate; same as 38 - 11.


EL. 9/66.
AMG
MT READ 3700'
LAKE JULIA
CREEK
HOWARD'S ROAD
NEWTON
RIVER
LAKE HUNTLEY
AMG
BRADSHAWS ROAD
AMG REFERENCE POINTS ADDED
MOUNT TYNDALL AREA
EL. 9/66
PROPOSED ROADS AND GEOPHYSICAL TRAVERSES 1967-68.
SCALE : 40 CHAINS = 1inch 040
5 cm
67-475
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