

UNRECORDED

THE MT. SEDGEWICK GRID & THE GEOLOGY OF THE

MT SEDGEWICK GRID AREA

ORIGINAL

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THE MT. SEDGEWICK GRID & THE GEOLOGY OF THE
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(AGGLOMERATE HILL AREA - KDC)

INTRODUCTION

The Mt. Sedgewick Grid covers a small area (8,400 sq. ft.) on the southwestern flank of Mt. Sedgewick, which forms the northern margin of the Comstock Valley, situated 4 miles north of Queenstown.

The baseline was laid along the strike of a small pyritic body and a geochemical grid was established to test the possibility of economic copper mineralization in the area.

UTM - 5346040-E N 381231.8 E

The grid origin was surveyed (8312.72N, 3168.90W, 1708.92 R.L.) and the baseline bearing at $306^{\circ}37'17''$. The baseline extends 600' north-west of the grid origin and 4 grid lines (00N, 200N, 400N, 600N) extend to distances of 600' east and 800' west of the baseline. Grid points are pegged at 100' intervals along these lines.

Soil sampling and a magnetometer survey was carried out over the grid, an area of approximately 1 square mile surrounding the pyrite body was mapped.

SOIL SAMPLING

Soil samples were collected at each grid point and assayed for copper, lead and zinc plus total gold/silver concentrations.

The copper, lead and zinc values were graphed as shown in diagrams 1, 2 and 3, and significant trends following certain lithologies are apparent.

The major trend follows the outcrop of the altered vesicular lava to the east of the baseline. Here, it is found that lead values are anomalously high and copper and zinc values unusually low. Such a situation reflects that of the Tasman Lode at Comstock. However, galena has not been found in the outcrop.

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MAGNETOMETER SURVEY

Magnetometer readings rarely occurred above +120 γ , and all but a few were positive. No obvious trends were seen to relate to any lithological units and so the results were abandoned.

GEOLOGICAL MAPPING

Introduction

A series of quartz-felspar lapilli tuffs, breccias and lavas, striking at 010° - 335° and dipping from 70° E to near vertical, outcrop in the eastern part of the area and appear to unconformably overlie vertically dipping, and strongly cleaved andesitic lavas, tuffs and agglomerates (breccias ?) with approximate trends at 300° .

A major fault (trend 050°) along the Comstock Valley displaces rock units in the south-west corner about 800' in the horizontal plane.

In most of the rock units, alteration to a green schist facies assemblage has been achieved - felspar may be sericitized, or altered to calcite and quartz, or sometimes fresh albite is developed; pyroxene most often remains unaltered but may be peripherally changed to chlorite. Alteration of a fine-grained felspar-pyroxene groundmass forms a quartz-sericite-uralite-epidote association. Hornblende may be altered to chlorite, and primary quartz remaining unaltered.

LITHOLOGIES

Rocks older than the unconformity.

1. Crystal-lithic tuffs.

This unit outcrops in the south-west corner of the area and has suffered varying degrees of alteration. As the name implies, the tuff contains felspar crystals, rock fragments and minor quartz (ML 165).

2. Pyroxene andesite agglomerates/breccias, lavas.

These rocks are either massive or brecciated, depending on whether they are lavas or agglomerates. In thin section (ML 166; ML 167; ML 168; ML 169) the rocks contain zoned albite and clinopyroxene (augite ?) in a fine grained quartz-sericite-uralite matrix. The secondary quartz has an interlocking texture and gives no indication of the original fabric. Veining is common (ML 170) and are composed of quartz-epidote-chlorite-actinolite. Locally the rocks contain disseminated or weakly veined pyrite. Assays of samples from the main pyrite body show a maximum 13% pyrite and 0.5% copper.

In the agglomeratic or brecciated parts of the unit, a section across two adjacent blocks demonstrates that the blocks are separated by a fine-grained siliceous matrix which was probably glassy and acted as a lubricant allowing the solidified blocks to move as a flow breccia. Alternatively this interfragmental material could be a quickly cooled lava resulting after brecciation of the top of a flow. Similar material is found in (ML 173) and (ML 174).

The unit then appears to be a series of flows and agglomerates which interfinger at the north-western end with felspar-quartz tuffs and at the south-eastern end are truncated by the Comstock fault.

3. Interbedded intermediate tuffs and vesicular lavas.

In outcrop the lavas are highly sheared and have a dark blue groundmass studded with yellow amygdales. In thin section (ML 174; ML 175; ML 176; ML 177; ML 178) the vesicles (up to 0.5 cm) contain quartz-chlorite-natrolite, quartz-chlorite or simply chlorite, are drawn out parallel to the schistosity and sit in a fine grained chlorite-sericite groundmass together with sericitized feldspars and the occasional embayed quartz grain. Pyrite, seems to occur in patches and veins, also occurs dispersed in the groundmass. Quartz-rutile-limonite veining is found in some outcrops.

The tuffs have a similar composition; thin sections (ML 179; ML 180) showing albite crystals and small angular quartz grains in a fine grained chlorite matrix.

The vesicular lavas have limited extent and seem to be small flows within the surrounding tuffs.

Occasionally the tuffs have been pyritized and ML 183; ML 184 assayed 0.07% copper and 0.04% copper respectively with negligible Pb/Zn values.

4. Hornblende andesitic agglomerates/breccias ? lavas.
(Hornblende-felspar porphyry).

Outcrop varies from an unaltered massive porphyry containing hornblende-albite and some minor corroded and embayed quartz (ML 185), through a silicified chloritized brecciated porphyry (similar to pyroxene-andesite in outcrop) containing an occasional speck of chalcopyrite (ML 186) to a highly silicified and pyritized variety displaying replacement of hornblende by fine-grained pyrite (ML 187; ML 187a).

Quartz-chlorite-epidote-albite-actinolite veins are common and the groundmass is generally altered to a felspar-quartz-chlorite association which shows relict basaltic texture.

Mapping has not reached a stage to demonstrate the concordancy or otherwise of the hornblende-felspar porphyries so that an extrusive or intrusive nature of the body cannot be proven. However, as is the case for the pyroxene andesite, the outcrop varies from having a massive form to having the appearance of an agglomerate or breccia.

Alignment of hornblende phenocrysts is common in all outcrops and this is indicative of flow, which in turn allows that the body may be a shallow sill or flow. On the other hand, an extrusive origin is suggested by the occurrence of brecciated or agglomeratic outcrops -

large rectangular blocks, up to 60 cm long are arranged parallel to their long axes in a fine grained matrix (ML 188). On one outcrop (ML 189) differential weathering of the blocky fragments has outlined the hornblende crystals and a definite alignment of these phenocrysts is evident. More importantly the net orientation of the crystals varies from block to block and this may be indicative of brecciation of a lava on extrusion.

There is in this area strong evidence to suggest that these porphyries are of extrusive rather than intrusive origin and are likely to be a series of flows with brecciated tops. It is possible for such flows to disturb surrounding unconsolidated sediments (tuffs etc.) resulting in non-concordancy with the bedding.

Rocks younger than the unconformity.

5. Volcanic breccia.

Outcrops of this unit are restricted to small lenses but its significance lies in the fact that it is probably the first sediment to be laid down after the erosional time-break. It is probably water-lain since it contains rounded quartz grains (up to 0.3 cm) along with angular feldspathic and rhyolitic fragments (ML 190).

Further away from the unconformity the rock becomes more siliceous and takes on the appearance of a greywacke (). Variations from greywacke to conglomerate occur along the strike.

6. Felspar quartz lapilli tuff/breccia-conglomerate.

This unit comprises a completely inter-digitating sequence of albite-quartz lapilli tuffs (keratophyric composition), breccias and conglomerates, and black and grey shales.

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Basically the unit is a lapilli tuff which along strike varies in content of angular fragmental material (shale, rhyolitic and felspathic blocks) as well as rounded quartz grains.

Where the outcrop is free of angular material the rock may be called a lapilli tuff (ML 193; ML 194) though sometimes appearing banded (ML 195).

Overlying these beds a grey shale composed of ash material is fairly continuous in the south-eastern part of the area (ML 197).

Black shales are found in small lenses at a few localities (ML 198) within the felspar quartz tuffs and conglomerates.

To the east of these units conglomerate, breccia, and lapilli tuff beds interfinger indeterminately (ML 199; ML 200). Horneblende is just recognizable in some of these outcrops (ML 201) and is most likely derived from erosion of the horneblende andesite body.

It appears that this sequence was formed in a marine ? environment. Tuffaceous material of constant size was deposited and local influxes of coarse material have resulted in conglomerate lenses within the lapilli tuffs.

G. Meats

(Translated by K.J. Lee)

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