GEOLOGY OF THE NICOLA GROUP BETWEEN MISSEZULA LAKE AND ALLISON LAKE

(92H/15E, 10E)

By V. A. Preto

INTRODUCTION

Mapping was continued southward from the area covered in 1973 and an additional 55 square miles was completed (Fig. 1). Of the three belts that had previously been described as comprising the Nicola assemblage in the Aspen Grove area (Preto, 1974), only the Central and Eastern Belts are recognized in the present map-area, and these differ appreciably from their northern counterparts in the composition and/or types of rocks involved. The boundary between the Eastern and Central Belts in the map-area is marked by a major fault system, locally known as the Summers Creek fault, which is the southern extension of the Alleyne-Kentucky fault system.

CENTRAL BELT

As in the Aspen Grove area, the Central Belt is composed of a thick sequence of massive and fragmental volcanic rocks but the individual rock units differ considerably from their northern counterparts. Pyroxene-rich flow units, probably of basaltic to andesitic composition, are still common but no longer predominate. A common type of flow rock is a massive, greenish grey andesite or dacitic andesite with abundant plagioclase and a lesser amount of pyroxene crystals. Fine-grained variations of these rocks are very light green to green-grey in colour and are commonly interlayered with thinly laminated tuffs of similar composition.

The fragmental units also differ from their counterparts to the north. The red and green breccias which are so common in the Aspen Grove area, where they are thought to represent high-density mudflow or landslide deposits, are found only in the extreme north-central part of the present map-area and are rapidly replaced to the south by comparably thick accumulations of flow breccia and rubble breccia derived from nearby flow units. Typical of these breccia units are reaction rims around many of the clasts, and close similarity in composition between clasts and matrix.

The eastern part of the Central Belt consists of dacitic andesite flows and widespread lithic tuff with abundant fragments of grey and light grey fine-grained rhyolitic rocks.

Sedimentary rocks in the Central Belt are limited to small, widely scattered lenses of impure reefoid limestone and to a few layers of generally graded bedded volcanic siltstone, sandstone, and conglomerate.

With the exception of the southern part of a small stock of syenite-monzonite that is found in the extreme northwestern corner of the belt, intrusive rocks in the Central Belt

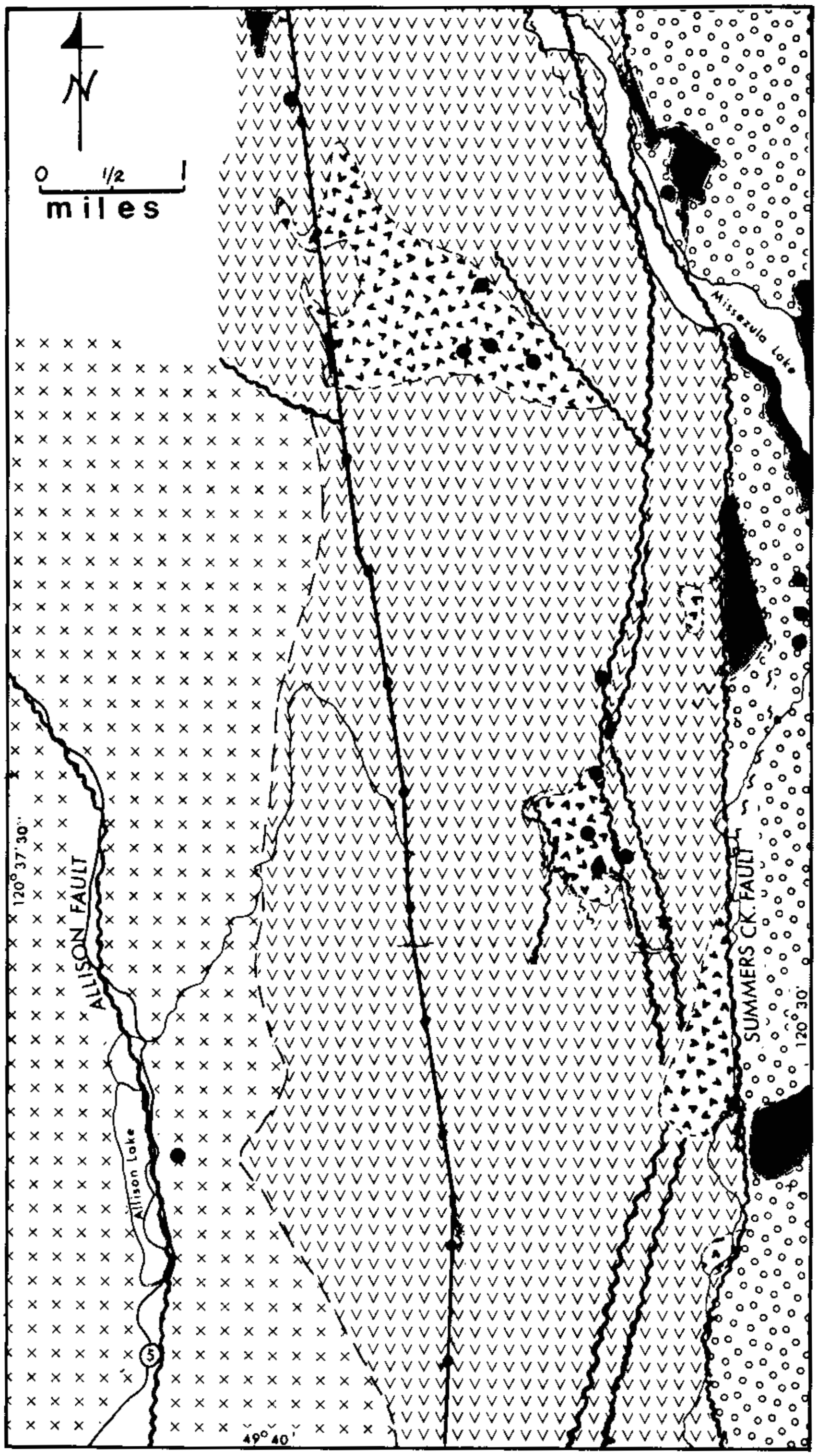

Figure 1. Generalized geology, Missezula-Allison Lake area.

LEGEND

JURASSIC

ALLISON LAKE INTRUSIVE BODY

RED GRANITE AND QUARTZ MONZONITE, GREY GRANODIORITE, DIORITE, AND QUARTZ DIORITE

UPPER TRIASSIC

NICOLA GROUP

EASTERN BELT

MEDIUM-GRAINED PORPHYRITIC SYENITE AND MONZONITE; LAHAR DEPOSITS, VOLCANIC CONGLOMERATE, AND SANDSTONE; MINOR FLOWS AND TUFF

CENTRAL BELT

MEDIUM-GRAINED GREY MONZONITE AND DIORITE

ANDESITIC AND DACITIC FLOWS, FLOW BRECCIA, RUBBLE BRECCIA, AND TUFF; MINOR VOLCANIC SEDIMENTS AND IMPURE LIMESTONE

SYMBOLS

MINERAL SHOWINGS

FAULT

POWER TRANSMISSION LINE

are a rather uniform, grey, medium-grained pyroxene monzonite and diorite that form five distinct plutons. Most of the mineral occurrences in the belt are associated with these plutons. Areas of pink K-feldspar flooding and associated brecciation are common in the largest of these intrusive bodies and are closely associated with copper mineralization.

EASTERN BELT

Rocks within this belt occur east of the Summers Creek fault along the eastern boundary of the map-area and differ considerably from their counterparts a short distance to the north.

During the previous field season (Preto, 1974, p. 3) it was found that some flow units and an increasing amount of crystal tuff appeared in a section of generally well-bedded, fine-grained volcaniclastic rocks east and southeast of Bluey Lake. During the course of the present mapping it was found that these flow and pyroclastic units rapidly and almost entirely replaced volcaniclastic rocks immediately northeast of Missezula Lake. They centre, both in distribution and structurally, around an elongated body of microsyenite and syenite breccia which is thought to represent a shallowly eroded volcanic dome. The clasts in the pyroclastic and conglomeratic units around this dome are almost exclusively syenite from the dome. The composition of the flow units in this area is at this time not exactly known, but appears also to correlate fairly well with that of the intrusive, the lavas being mostly trachytic andesites and/or basalts which in places probably contain phenocrysts of analcite.

Further to the south, three more similar syenitic stocks were mapped in the belt, and the volcanic rocks surrounding them were found to consist almost exclusively of a thick succession of volcanic conglomerate, greywacke, and lahar deposits with abundant syenite clasts. Sedimentary rocks in the Eastern Belt consist of a few small lenses of impure limestone, calcareous sandstone, and grit with some tuffaceous siltstone and argillite northeast of Missezula Lake.

ALLISON LAKE INTRUSIVE BODY

This post-Nicola pluton occupies the western part of the map-area and has been previously described as consisting of red granodiorite (Rice, 1947, p. 39). The intrusive was found to consist of abundant red granite and quartz monzonite, reddish grey granodiorite, grey diorite, and quartz diorite, and also to contain large inclusions, or roof pendants, of metavolcanic rocks. North of Allison Lake the intrusive rocks are cut by a large number of dark-coloured basic dykes, many of which trend northeasterly, indicating a zone of widespread tension in the pluton.

STRUCTURE

The structure in the map-area is dominated by the Allison fault to the west and by the Summers Creek fault and its subsidiaries to the east. The Summers Creek fault marks the boundary between the Eastern and the Central Belts. With the exception of the area northeast of Missezula Lake, where structures in the stratified rocks are dominated and controlled by the syenite pluton, rocks of the Eastern Belt dip moderately to steeply to the west.

Within most of the Central Belt, layered rocks exhibit moderate to steep east and northeast or vertical dips, but in the vicinity of Missezula Mountain several westerly dips occur, indicating the presence of either a northerly trending syncline or some severely tilted fault panels. Lack of clearly recognizable stratigraphic markers and suitable minor structures preclude the positive identification of a major fold structure in this area.

Another major structural feature in the map-area is a large northerly trending zone of intense shearing and faulting which marks the western boundary of Summers Creek fault system. This shear zone has been mapped from Missezula Lake to the southern boundary of the map-area and continues to the south. It ranges in width from a few feet to more than one thousand feet and the rocks within it are reduced to highly fissile greenschist and sericite schist with a strong foliation that dips steeply to the west.

MINERAL DEPOSITS

Within the Central Belt, copper mineralization consists of disseminations and minor replacements of pyrite and chalcopyrite and, occasionally, some chalcocite. Mineralized occurrences are confined almost exclusively to dioritic and monzonitic intrusions or to volcanic rocks along faults of the Summers Creek system.

Within the Eastern Belt, copper occurrences are best exemplified by the showings at the Shamrock prospect south of Missezula Lake where disseminations and minor replacements of chalcocite and some native copper occur in volcanic conglomerate and lahar deposits.

ACKNOWLEDGMENTS

The help and cooperation of S. J. Atkinson, J. Nebocat, and L. K. Robertson during the 1974 field season was greatly appreciated.

REFERENCES

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