

Geology of subsheets T and U of Bure map sheet (NC 37 - 5)

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ABSTRACT

The study area is located in northwestern Ethiopian plateau, Oromia National Regional State, Eastern Wellega zone. It is bounded by 36°15' and 36°45' E longitudes and 10°00' and 10°15' N latitudes and covers a total area of 1458 square kms.

Generally Precambrian basement to Cenozoic volcanic rocks and superficial deposits cover the study area. It can be broadly classified in to Precambrian high-grade and low-grade metamorphic rocks and pre- to post-tectonic intrusive rocks, Paleozoic to Mesozoic sedimentary rocks, Tertiary volcanics and Quaternary superficial deposits. The high grade Precambrian rock contains gneisses, migmatites and minor amount of schists, whereas the low-grade metamorphic rocks are dominated by metavolcanic. And the intrusive bodies are granitic in composition. The high-grade rocks are classified in to three mappable units. These are: Undifferentiated gneisses and schists, granitic gneiss and biotite gneiss, and migmatized, banded and layered granite and biotite gneisses. The low-grade metamorphic rock is mapped as metarhyolite and amphibole schist. The intrusive rocks are of two types. These are: Post tectonic and Pre- to Syn tectonic granite.

The Paleozoic-Mesozoic rocks uncomfortably overlie the Precambrian basement rocks and represented by sandstone with minor amount of siltstone and shale. Cenozoic volcanic eruptions and Quaternary eluvial soils are also found. Tertiary volcanics exists in a small amount.

The main structures observed in the study area include metamorphic layering and banding, folds, faults, shear fabrics, fractures and joints, and photo-lineaments. On the bases of deformation style, metamorphic layering and banding, gneissosity, foliation and the associated structural trends of the Precambrian rocks, it is possible to identify four phases of deformation. The first phase of deformation gives rise to the formation of S₁-foliation. The second phase of deformation is responsible for the formation of both antiform and synform folds. The third type of deformation event is due to the development of shear fabrics and is well-developed and intense in schistose rocks. The shear fabrics include

foliation, asymmetric augen and boudinages in addition to minor mineral lineation or alignment. The fourth deformation event is a dextral strike slip fault.

The rocks in the study area are affected by three phases of metamorphism. These are high grade (M_1), low grade (M_2), and retrograde metamorphism (M_3). The first and the second type are regional metamorphism and the last is due to hydrothermal reaction along fractures and joints as a result of fluid introduction to the system.