Ain Shams University

Faculty of Science

Department of Geology

STRUCTURAL AND RADIOMETRIC STUDIES OF UM GURUF AREA, NORTH EASTERN DESERT, EGYPT

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master in Science in Geology

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NOTE

The present thesis is submitted to the Geology Department, Faculty of Science, Ain Shams University in partial fulfillment of the requirements for the Master degree of Science in Geology. Beside the research work materialized in this thesis, the candidate ***Mahmoud Mohammed Salem Mahmoud*** has attended five post-graduate courses for one year in the following topics:

1. Field Geology and Geostatistics
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FOR

MY

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ABSTRACT

The present work aims to study the geology, structure and radioactivity of Um Guruf area to finding the relationships between structural and lithological features with the radioactive mineralizations. Um Guruf area is located in the North Eastern Desert covering an area of about 275 km^2. It includes Neoproterozoic basement rocks of older granitoids (oldest), Dokhan volcanics, Hammamat sedimentary rocks, younger granites and post granite dykes (youngest).

The older granitoids in the study area are mainly represented by granodiorite, which is intruded by younger granites and post granite dykes. Dokhan volcanics are widely distributed in the study area represented by acidic and intermediate lava flows and their associated pyroclastics of tuffs and agglomerates. The Hammamat sedimentary rocks are unconformably overlying the Dokhan volcanics composed of bedded series of conglomerates, breccias, greywackes, sandstones and siltstones with some bands of purple slates. Younger granites represent the main rock type in the present area. They are classified into syeno-to alkali feldspar granites and alkali feldspar granites. They intrude all the previous rock types and are cut by post granite dykes and veins. Post granite dykes are represented by acidic, intermediate and basic types. They cut all the previous rock types with NE-SW and ENE-WSW trends.

The study area is subjected to tectonic events displaying structural features, mainly represented by faults and joints. Faults are represented by strike slip type with some normal and reverse faults. The common fault trends based on their number proportions are NW-SE, NNW-SSE and NE-SW, while based on their length proportions are NNE-SSW and ENE-WSW. The main trends of joints are NE-SW, ENE-WSW, E-W and N-S. The recorded faults

are of compression stresses, while the recorded joints are of tension stresses. The NE-SW is the master trend in the study area controlling the structural and tectonic framework of the area followed by ENE-WSW trend, while the least common trends are NNW-SSE, N-S, NW-SE and WNW-ESE.

The radioactivity in the younger granites is higher than that of other older rocks. The radioactive anomaly is recorded in zoned pegmatite pocket in Hmrat El Sorwhyia alkali feldspar granites. It is structurally controlled by two hematized faults trending NNW-SSE and WNW-ESE and by two strongly hematized and silicified joints striking NNE-SSW and NW-SE. It is controlled by lithology containing U and Th-bearing minerals of uranophane, thorite and zircon in addition to apatite, sphene and iron oxides which capture U and/or Th elements.

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