“GEOPHYSICAL EXPLORATION FOR MINERAL ORE DEPOSITS AT KORABKANSI, SOUTH EASTERN DESERT AND ABU ZENEIMA, SOUTH SINAI, EGYPT”

A Thesis

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NOTES

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Under the title:

"ORE MINERAL INVESTIGATION BY USING MAGNETIC AND GEOELECTRIC DATA: CASE STUDY, MANGANESE-IRON ORE IN WADI AL SAHU, EAST SINAI, EGYPT"

This paper presents the most important results of the interpretation of the magnetic data on the area of Wadi Al Sahu, East Sinai, Egypt, which discussed in details in the present thesis.

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ABSTRACT

The present study deals with the application of geophysical investigations for mineral exploration purpose especially Titanomagnetite and manganese-iron ores. Two selected areas of different geological setting, the first study area is bounded by latitudes 22° 31′ 06.4″and 22° 38′ 46.4″ N and longitude 34° 58′ 35.86″ and 35° 2′ 47.08″ E, the second area selected for this study is bounded by latitudes 28º 58′ 13″ and 28º 59′ 5″ N and longitude 33º 22′ 15″ and 33º 23′ 4.5″ E. located west Sinai near to Abu Zeneima town, Egypt.

Magnetic qualitative interpretation is made for both areas for location and depth detection for supposed minerals, include the Reduction to pole and different filters like First vertical derivative, Magnetic susceptibility, analytical signal, Downward continuation at various depths, and source edge detection to detect the exact location of magnetic contacts

Quantitative magnetic processing is made for both areas to calculate the depth of the detected magnetic anomalies supposed to be ore bodies, I used 2-D extended Euler deconvolution ,2-D analytical signal, magnetic profile inversion, 3-d Euler deconvolution, source parameters imaging, and 3-d analytical signal

Vertical electrical sounding is used in the first area to detect maximum depth for low resistivity bodies assumed to be Titanomagnetite, inversion and modeling is need to estimate the equivalent geo-electric layer for each VES.

Electrical resistivity and induced polarization tomography have been made over selected profiles to detect zones of of massive ore bodies charactarized by low resistivity and high chargeability ,and zones of dessiminated ore bodies charactarized by moderate to high resistivity and moderate to high chargeability ,also a modeling process needed to estimate the equivalent earth model.

The subsurface presence of titanomagnetite at Korabkansi area is confirmed using different geophysical techneques magnetic and geoelectric, I can assume two differente zone enriched with the ore, The presence of manganese-iron ore in the subsurface also has been detected using both tools magnetic and geo-electric methods

The results of both qualitative and quantitative interpretations of magnetic and geo-electric data are combined to get the general view of the ore deposits abundance in both areas and there highlight there economic potentiality.