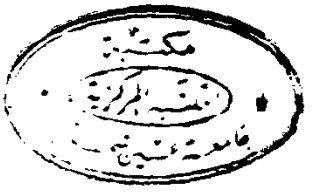
COORDINATIVE GEOPHYSICAL STUDIES IN RELATION TO SUBSURFACE GEOLOGICAL SETTING AND HYDROCARBON POSSIBILITIES IN BELAYIM AREA, GULF OF SUEZ, EGYPT

BY

ADEL ALI FAHMI MOHAMED TAWFIC

(M.Sc.)



A THESIS

SUBMITTED IN FULFILMENT

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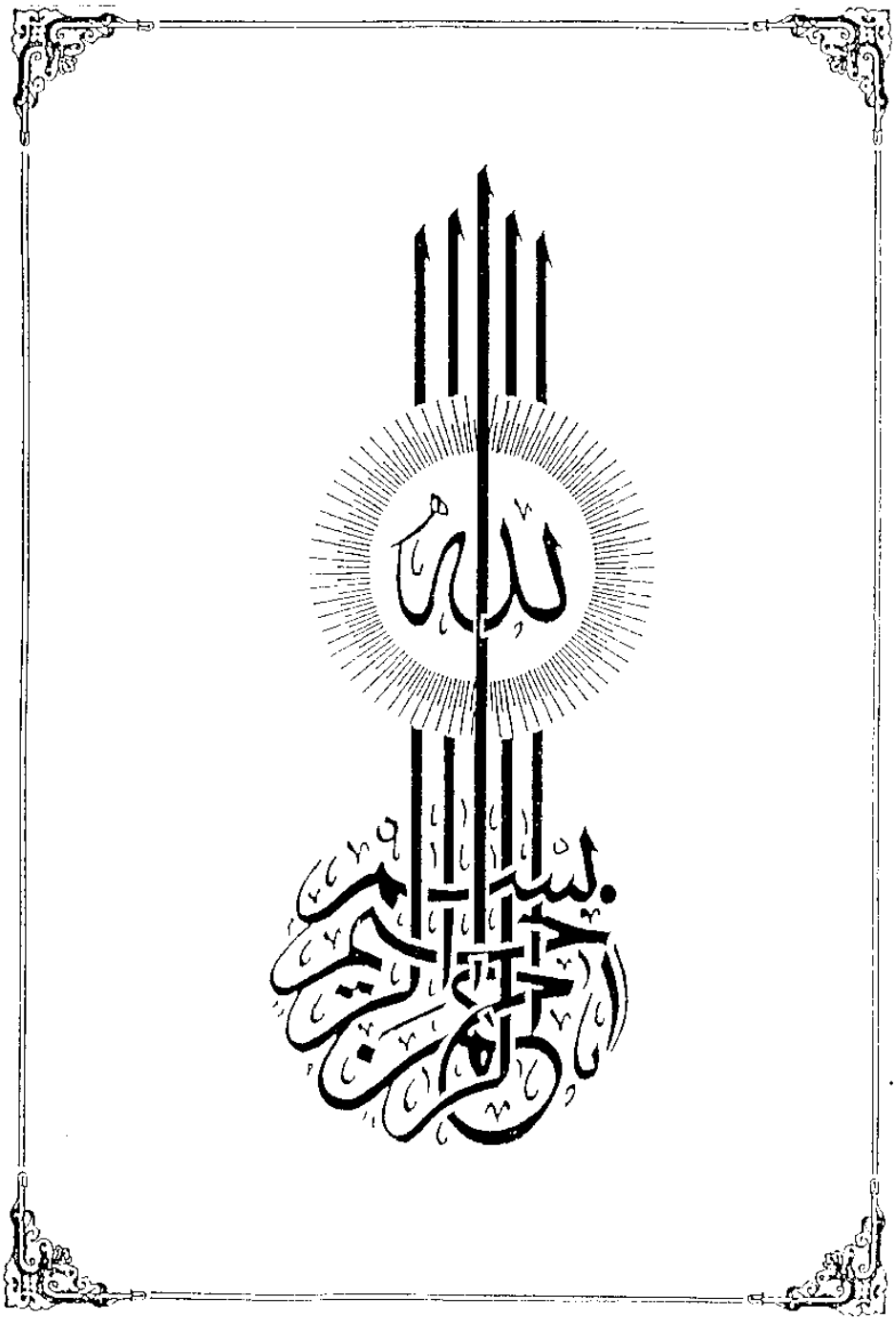

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ABSTRACT

Geophysical data, incident to this investigation, are interpreted to onshore and offshore Belayim area to delineate subsurface structures in an attempt to enhance the hydrocarbonic potentialities in this important area.

Subsurface time maps on tops of : Belayim, Kareem, and the pre-Miocene Unconformity were made. Applications of specific filters were made to improve the data quality.

Gravity and magnetic data were compiled and interpreted to map the basement surface using available borehole geologic data.

The present work deals with the structure from the geophysical and geological data within the Belayim area for the purpose of clarifying the accumulation of hydrocarbon with the area under investigation.

INTRODUCTION

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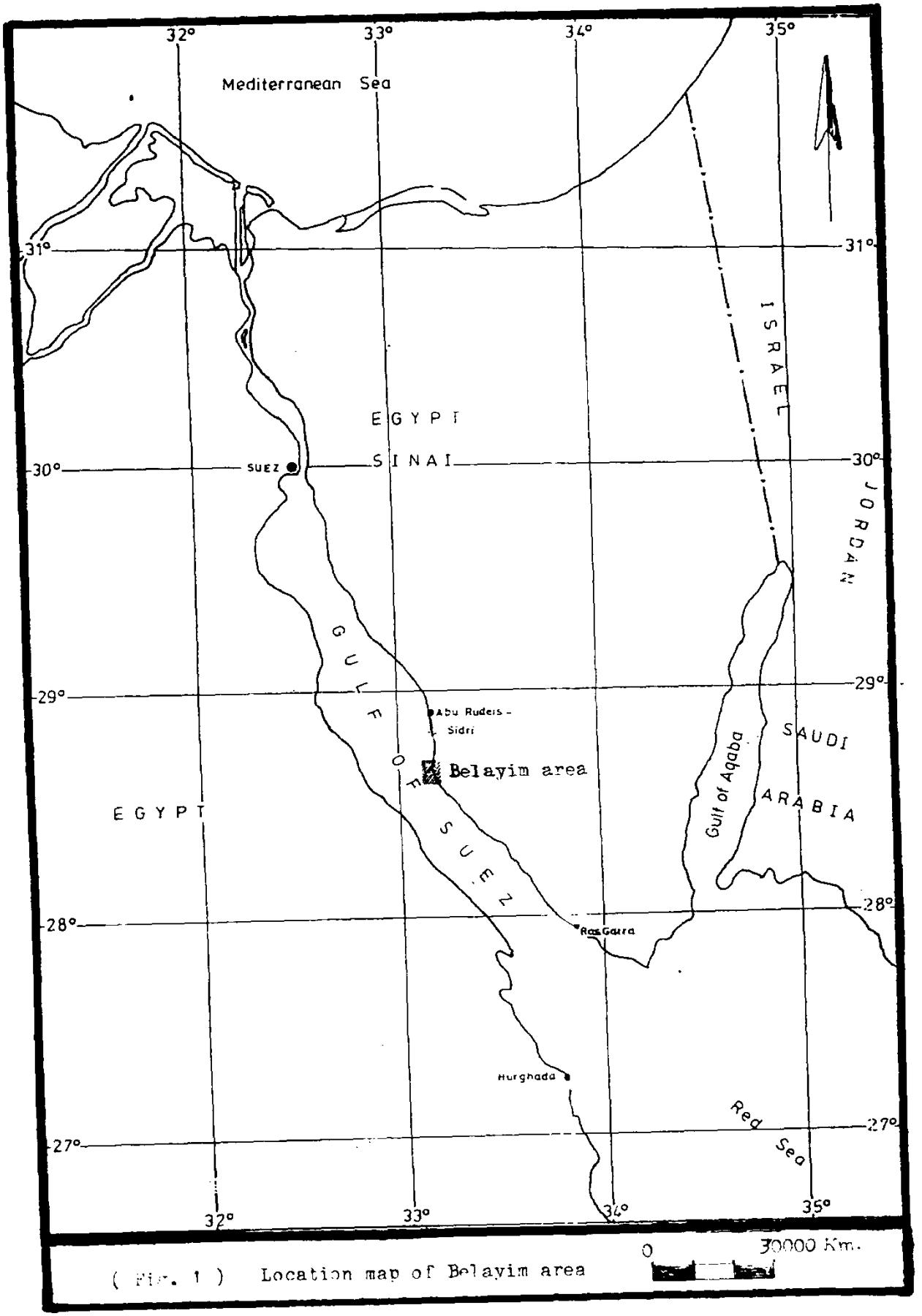
The study area includes the southern part of the Gulf of Suez (marine area), southern-west part of Sinai (land area) and the area in between (shallow marine area). Its surface area reaches about 300 km^2 and is located between latitudes 28° 32' N and 28° 40' 30" N and longitudes 33° 02' E and 32° 15' E (fig. 1) . The land area is flat and bounded by Ekma-Durba mountains from the east, its extension to the west about 25 km. (with marine area).

Many companies have done geophysical surveys in Belayim area like Western Geophysical, Geophysical service Incorporation, Geosource, Prakla ... etc. Among these surveys the more applicable ones are: The seismic method which is based mainly on the reflection phenomena. The seismic data of Belayim area were used in the preparation of the reflection time maps (figs. 13, 14 & 15) on tops of Belayim, Kareem and pre-Miocene. The main purpose of the present work is devoted to make use of existing geophysical and geological data and geologic concepts about the Belayim area in view of the



(Fig. 1) Location map of Belayim area

present seismic, gravity and magnetic study. This is believed to contribute to better understanding of the geology of the Belayim area which would lead to an increase in its oil productivity. However, the achieved geological results is controlled by quality of seismic data and density of seismic profiles. For the major part of the area, the material is of fair quality. So, the constructed seismic maps are considered satisfactory for evaluating the structural relationship of various geologic units in the Belayim area.

At last, the magnetic and gravity methods help in solving some geometry and structural problems besides the seismic methods. The reason for this study is due to the fact that the investigated area is one of the most current and promising productive areas in Egypt for oil.

The reprocessing of seismic data of Belayim marine area, carried out in Agib processing centre in Milan-Italy, leads to remarkable improvement in the quality of such data. Also, the reprocessing carried out in the centre of Geophysical Service Incorporation (GSI) in Cairo, showed a good improvement in the quality of obtained seismic data by applying an adequate processing sequence. But the

reprocessing test of the seismic data of the shallow marine area did not achieve a considerable improvement in the quality of the seismic data, therefore, the primary processed data were used in the interpretation.