CHAPTER ONE

INTRODUCTION

1.1. General statement

The northern portion of Western Desert of Egypt is characterized by simple surface geologic features, contrary to its complicated subsurface image. The geophysical and geological studies revealed that this area has a thick sedimentary sequence, ranging in age from Cambrian to Recent. The sedimentary section is differentiated into a number of sedimentary basins. The importance of these basins comes from the discovery of many oil and gas fields. One of the most important basins in the Western Desert is El-Gindy basin, where Qarun field has been discovered in 1994.

1.2. Location of the Study Area

The Qarun area Fig. (1-1) is located some 85 kilometers southwest of Cairo along El Wahat road, in the Western Desert of Egypt. The study area is bounded by Latitudes 30° 20 ' 30 ° 37' N and Longitudes 28° 30 ' – 29° 30 ' E. Many wells were drilled in this area but without any proven reserves. Only some oil shows were detected in some wells. This indicates the presence of oil accumulations in the area, which needs more effort to be exerted. The evaluation of subsurface setting of the area and its oil potentialities implies the interpretation of the available geophysical seismic

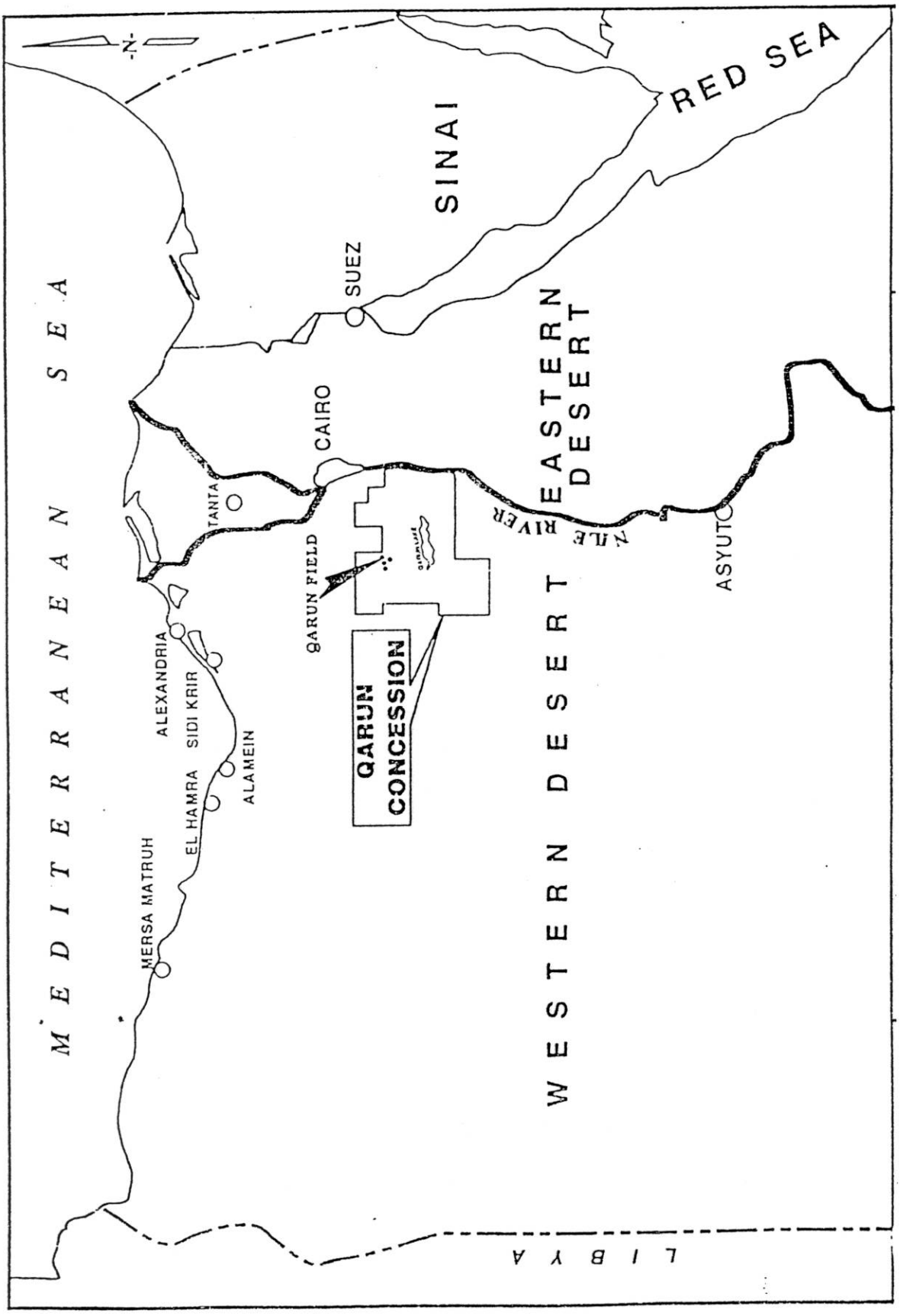

FIG. (1.1) LOCATION MAP OF THE STUDY AREA (NEMEC, 1996)

and well logging data of six wells. These wells are Falouka-1X, Harun-1X, Kamel-1X, NE G.Rissu-1X, Sakr-2X, and Qarun-1X.

1.3. Scope of Study

The main objective of the present study is to achieve comprehensive evaluation of the Upper and Lower Bahariya Formations of Cretaceous age including seismic interpretation, well log analysis and subsurface geological study.

The data used in this work are a group of seismic sections covering partially the studied area and a complete set of logs. The seismic sections were precisely interpreted with the helpful of available well velocity surveys and sonic log data . The end product of this interpretation is the delineation of subsurface structural settings and consequently the construction of some two-way time contour maps representing different stratigraphic tops (Abu Roash, Bahariya and Alamein), as well as the presentation of several structural seismic cross sections to clarify the types of the structural elements.

The well log data are collected from the following logs; electric resistivity (deep & shallow), gamma ray, neutron (CNL), density, sonic (BHC) and caliper, in addition to composite logs.

The computer facilities have been used to transform precisely the downhole measurements of six wells into accurate petrophysical

parameters that give complete evaluation of lithology, porosity and fluid saturation. These parameters can be used to figure out the reservoir geometry and trends that help to find more hydrocarbons in the study area.

In the present work, the following topics are concerned with evaluation of the Upper and Lower Bahariya Formation in Qarun area, Western Desert of Egypt.

1- Compilation of the available geological and geophysical information about the study area using the published researches and reports.

2- Regional interpretation of the seismic reflection data, in order to delineate the aerial distributions of the reservoir rocks.

3- Extraction of the maximum stratigraphical features from the seismic data.

4- Construction of final geologic model based on interpreted seismic and petrophysical data.

5- Identification of some physical parameters of the studied intervals required for well log interpretation using statistical methods.

6- Determination of shale content, effective porosity and saturation.

7- Evaluation of the petrophysical parameter results in the vertical and horizontal directions, to illustrate the reservoir characteristics.

8- Display of subsurface maps of depth, thickness and facies variation to describe depositional basin.

9- Study of the commulative of seismic interpretation, well log and subsurface data, to conclude the factors affecting the hydrocarbon distribution in the area.