

CHAPTER (I)

INTRODUCTION

1.1 Introduction

During the last decades, many developmental planes, especially agricultural areas, have been started in many parts in Egypt, either in southern or northern parts; however. These developmental planes will not be completely achieved until more water resources are found, where the surface water, has proven itself to be inadequate alone. Therefore, groundwater has become Egypt's an essential and vital source of water, especially in new desert areas. One of these areas is the west of the Nile Delta, where the practical experience assures that the searching for groundwater resources is of prime importance.

For this purpose, the present research was planed in order to evaluate the groundwater aquifers using geological, hydrogeological and geoelectric methods. In the field of groundwater exploration, the geoelectrical survey is considered one of the most exploration tools.

In the present study, the geoelectric resistivity sounding method using Schlumberger array is used. The measured resistance values at the surface reflect the vertical distribution of resistivity values in a geoelectrical cross-section. The geoelectrical field survey gives knowledge about the surface and structural geology of the studied area, an identification of aquifer geometry and extent, some information about the groundwater quality and few about the lithology of the formations. These data are needed essentially to support and emphasize the interpretation of the field measurements. Therefore, money, effort and

time can be saved by using this exploration method through the reduction of the amount of drilling of wells.

1.2 Location of the study area

The area under investigation is located west of the Nile Delta between longitudes 29° 50' 00" E, 30° 20' 00" E and latitudes 30° 30' 00" N, 31° 00' 00" N; (Fig.1-1). It represents part of new reclaimed land in Beheira governorate.

El Nasr canal cuts the study area and divides it into almost two parts. Furthermore, Cairo- Alexandria road, El Nubariya and EL Markaziya cities are remarks on the area of investigation. It is bounded from the south by Wadi EL Natrun depression, and from the north and the northern east by EL Nubariya canal; (Fig.1-2).

1.3 Climatic condition

The west of Nile Delta occupies a portion of the sub arid belt of Africa, where it is characterized by a long dry summer and a short winter of low temperature and a rain fall period from October to March (RIGW/IWACO, 1991).

In general, the climate is hot dry with low rainfall (40 mm/year to 100 mm/year) (Fig.1-3), and the mean monthly temperature ranging between 13 °C in winter and 27 °C in summer.

The average evaporation is about 1600 mm/year with maximum evaporation in summer reaching 10 mm/day in desert areas.

There are many meteorological stations located around the study area. The most important ones are El Hammam, Burg EL Arab, Damanhour, Alexandria and Wadi El Natrun stations.