INTRODUCTION

1- GENERAL OUTLINE:

One of the promising areas for development in southern Sinai is El-Tor, due to its good soil as well as the available groundwater resources. The investigated area lies within the southern part of El Qaa plain between latitudes 28° 10′ and 28° 20′ N, and longitudes 33° 35′ and 33° 40′ E (Fig.1). El Qaa′ plain is characterized by arid climate, where the mean maximum temperature is 34.8 °C during August, while the mean minimum temperature is 8.9 °C during February. The highest humidity is about 64% during September, while the minimum value is about 58% during March. The maximum amount of rainfall is about 11 mm/year,(Geofizika, 1963)[1]

Fifty-one water wells were drilled by inhabitants during the last few years at depths reach 23.1 m (32 hand dug and 19 drilled) as well as two springs are recognized. All water wells are tapping the Quaternary aquifer in the investigated area. The extracted water is used for domestic , Touristic purposes as well as irrigation on a small scale.

2- PREVIOUS WORK :

Much information is available on the geomorphology, geology and hydrogeology and of the investigated area. Mentioned in the works from (1961) to (2003). Pavlov and Ayouti (1961)[2] came to the conclusion that the rate of infiltration in El-Qaa plain is about 10% of the total annual rainfall. Geofizica (1963)[1] get different from (Pavlov and Ayouti,1961)[2] concerning such high infiltration ratio 10% due to the high aridity of El-Qaa plain.

Said (1962)[3] , Webster and Ritson (1982)[4] , Bunter (1982)[5] and El-Refai (1984)[6] indicated that, the succession in El-Qaa plain includes, generally, rocks ranging in age from Paleozoic to Quaternary, Kassem (1980)[7], Hammad (1980)[8] and Shendi (1984)[9] were studied the geomorphology of El-Qaa plain and divided the area into three parts, the eastern mountain part which is characterized by high relief and composed of igneous and metamorphic rocks, the western part which is characterized by a thick sedimentary section and the central part which is not perfectly flat and is dissected by wadi courses and alluvial fans. Desert Institute (1979)[10], RIGWA (1986)[11] and Dames and Moor (1985)[12] studied the groundwater of El-Qaa plain their studies were concentrated in the northern part of the plain and El-Tor area. They came to the conclusion that:-

1- The groundwater in southern Sinai is mainly associated with the wadi fill at depth ranging from 2 to 25m and with fractures in the igneous rocks.

2- Groundwater in El-Qaa plain was tapped at El-Tor and El-Gobeil (6km to the south of El-Tor)The depth to water in El-Gobeil area is from 1 to 2 m.

3- The total groundwater salinity ranges from 300 to 2500 ppm

Gomaa (2003)[13] studied the groundwater quality at El-Gobeil area. Abdel-Lattif, et al (2002)[14], studied the geoelectrical resistivety in El-Gobeil area, South Sinai, they came to the conclusion that the Quaternary deposits in the southern area of El Qaa' plain are divided into three units. The upper unit is composed of gravels and sands, the middle unit consists of medium to coarse sands, gravels and clay intercalation and the lower unit is mainly consisted of sands and gravels (it is partially penetrated by several wells).

Few informations about hydrochemistry in the study area are encountered such as, Mazor, et al (1973)[15] studied the origin of mineral springs and the shallow wells in Suez rift valley compared with water in the Jordan rift valley. A water sample from El-Qaa plain is cold and the chemical composition is $Na^+ > Ca^{2+} > Mg^{2+}$ and $SO_4^{2-} > Cl^- > HCO_3^{2-}$ and the water is fresh cyclic type.

El-Refai (1984)[6] came to the conclusion that, the groundwater of El-Qaa plain have different geneses, namely continental (water type is the Na_2SO_4), marine and old marine (water type $MgCl_2$, $CaSO_4$, $MgCl_2$

and $Mg(HCO_3)_2$, and the hydrochemical variations at El-Qaa plain are attributed to the rate of meteoric water percolation. , Hamed.M.F (2001)[16] studied the Hydrogeophysical properties and occurrence of the groundwater in the middle part of El-Qaa plain, West Sinai and collect some water samples from this area. He came to that the groundwater have different geneses namely continental and marine. Abdel-Lattif (2003)[17] study the water types of the shallow aquifer from several hand-dug wells in El-Tor area which indicate that the water types are Na_2SO_4 of meteoric genesis, $MgCl_2$ of marine genesis and $CaCl_2$ of old marine genesis.

3- SCOPE OF THE PRESENT WORK :

The present work is mainly devoted to study the present hydrochemistry of the Quaternary groundwater in El-Tor area and its vaccinates. The following activities were performed through the field and laboratorial works, which have been carried out in the period from 2000 to 2005.

3.1 – The Field activities :

a- A reconnaissance of the various geomorphological and geological features in the area.

b- Investigation of all hydrogeological conditions of water points.

c- Collecting all groundwater samples representing the Quaternary aquifer.