

Assessment of Groundwater in Missan Governorate for Drinking and Agriculture

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Abstract:

Due to climate changes that are outside human control such as drought and scarcity Rain and fluctuation. However, water management must face these problems by maintaining available water or by looking for new sources of water. 18 wells were selected from various areas of Maysan Governorate and at times throughout the year and in depths ranging between (28-100) m in 2014 and was conducted All chemical and physical tests of groundwater were as follows: High water salinity in the area may be due to a high concentration of calcium . There should be an inspection of the water quality to detect any changes occurring over time. Physical and chemical properties showed that they are suitable in most locations for human consumption as drinking water after treatment because the values of their basic chemical devices were within the permissible limits. The climatic elements have a direct effect on some water needs, especially the availability of the rain and its absence, temperature, humidity and wind, It is urgent to look for an alternative source of surface water represented by groundwater.

INTRODUCTION

Groundwater is located in the form of free ground water at a depth of 1-5 meters below the surface of the earth in the shallow parts and valleys of the rivers. The depth of the surface of the groundwater increases further in the hills. Groundwater moves towards the rivers and basins to drain. Rainwater leaks in the winter to nourish underground water Free. In the summer, irrigation water leaks to it(6). The groundwater level changes and concentrates according to the clouds for irrigation and land use, and provides a sewerage system or the presence of a nearby river canal. The hydrological cycle, called the water cycle in nature, is to maintain the mass between water storage by precipitation, precipitation, storage, evaporation and groundwater and surface flow to rivers and seas. The first process of purification of ground water begins through the soil as the soil is a porous medium that has the potential for natural filtration of water. Research has shown that the maximum depth of pollutants reaches 2

meters from the surface of the earth.(7). For the purpose of using water to drink, it must have characteristics and characteristics that have been adopted by WHO as a guide to the criteria and determinants of drinking water (WHO, 2011) and thus followed by the countries of the world and each country has its own guide according to the water quality in that country. The standards and determinants of potable water are divided into three physical, chemical and biological criteria. Physical include temperature - lingering materials - color - taste and smell. The biological characteristics are divided into two viral and bacterial indicators, and only bacteria are examined in water because viruses need living organism to reproduce and transmit them(2). Therefore, since the land has been inhabited by groundwater in areas where there are no sources of surface water (dry areas), it has been forced to watch some animals digging the ground in search of water and start imitating it by digging wells to make use of its water in all aspects of its life. A number of wells have magical powers to heal and erected temples near some wells and

became the cult of the wells popular in ancient times and benefited from those waters in the field of agriculture is widespread, where researchers report that the greatest agricultural renaissance in the history of humans began in the Levant and Turkey was the main source The ancient Egyptians dug a well about 100 meters deep in 2000 BC.(4)

Objective Of Study

By knowStandard Specification for the Use of Groundwater for Drinking Purposes

There is a global scale and another local (standardization and quality control device) where the permissible limits of the treated and dissolved chemical elements can be used. Groundwater can be used for drinking purposes without any risk, as shown in the table below: wing the hydro chemical of the water, it is possible to determine the quality of the water and the extent of its use and use for different purposes, as the importance of water lies not only in its availability, but also in quality. The water in nature is not pure because it contains substances derived from nature or through human activities and activities. Therefore, it is necessary to know its chemical composition and its contents, which in turn determine the quality and salinity of this water and reflect some information about the conditions of the aquifer and the movement Water in it and feed it.

Case Study

Topography: Iraq was divided into several plates that were studied from all geological aspects. The province of Maysan was marked with two plates (AliGharbi, which includes the northern and north-eastern borders, starting from the borders of Ali al-Gharbi with Wasit governorate and ending at al-

Fakha, 47 43 and46 30) and two showrooms (32 0 0 and 32 50) see fig.(10). The second painting is the building plate covering the rest of the territory of Maysan governorate within the administrative borders In the sedimentary plain, which is characterized by salty groundwater can not be used in the field of irrigation and Agriculture. Therefore, the remaining interest of the land, which lies in the eastern and northeastern part of the governorate, is concentrated from the treasury and the saffron in the district of Ali al-Gharbi to the al-Fakha area in the area of al-Mashharh, which lies outside the sedimentary plain. Of the twentieth century in that region and relying on foreign companies and geological experts working in the Iraqi Geological Survey.

Practical and field aspects

The method of research was based on the collection of water samples from eighteen wells drilled in the area of Tayeb and Mashharh in Mohsen Maysan and at depths ranging from 28 to 100 m for one year. Sterilized plastic bottles (100 cm 3) were used for collecting and preserving sample Chemical and ionic estimates: The degree of reaction and the determination of conduction and dissolved ions were measured.

Standard Specification for the Use of Groundwater for Drinking Purposes

There is a global scale and another local (standardization and quality control device) where the permissible limits of the treated and dissolved chemical elements can be used. Groundwater can be used for drinking purposes without any risk, as shown in the table below (1)

Parameter(mg/l)	IQS2009	WHO2007
TDS	1000	1000
PH	6.5-8.5	6.5-8.5
Ca+	150	75
Mg	100	125
Na	200	200

K		12
Cl	350	250
SO ₄	400	250
NO ₃	50	50
HCO ₃	50-45	

6- Standard Specification for the Use of Groundwater for Irrigation Proposed by FAO (2)

Parameters	Degree of restrictions
PH	6-9
E.C	700-3000
TDS	450-2000
SAR	6-15
CL	100-350
SO ₄	200-1000
HCO ₃	1.5-8.5
NO ₃	5-30

Table(1) shows the physical and chemical properties of samples

Well No.	Ca ²⁺ (mg/l)	Mg ²⁺ (mg/l)	Na ⁺ (mg/l)	K + (mg/l)	Cl ⁻ (mg/l)	SO ₄ 2- (mg/l)	TDS (mg/l)	pH	EC μ S/cm
1.	200	100	146	5.8	500	400	2040	6	4090
2.	96	40	25	5.8	40	210	520	7	1047
3.	96	40	26	1.8	60	200	575	7	1152
4.	800	600	204	17.8	2000	2500	7950	7	15900
5.	600	425	132	13.3	350	1000	4610	7	9310
6.	840	25	136	5.7	1100	800	2890	7	5420
7.	1120	50	128	1.7	1350	1920	3160	7	6330
8.	640	275	98	3.8	1550	1688	3180	7	6350
9.	2080	700	1500	150	7500	2500	9480	9	10580
10.	800	500	219	34	2200	920	4950	6.5	9760
11.	1040	850	204	39	2300	660	5240	6.8	9120
12.	1440	800	270	36	4100	300	7290	7	12081
13.	1200	650	400	67	5000	540	7800	6.5	12330

14.	960	200	264	32	2300	660	5520	6.8	9423
15.	400	150	200	15.3	500	300	2728	6.8	4000
16.	960	650	234	30	2900	1050	5820	6.3	9550
17.	1200	100	900	40	1700	2000	5000	6.3	9000
18.	600	250	300	60	4000	400	7470	7	11303

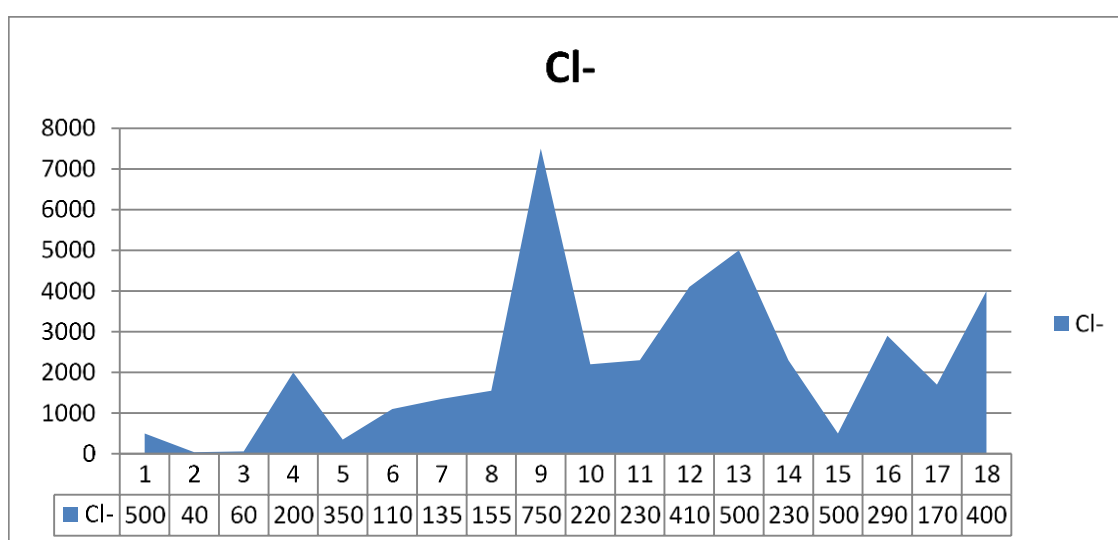


Fig.(1)

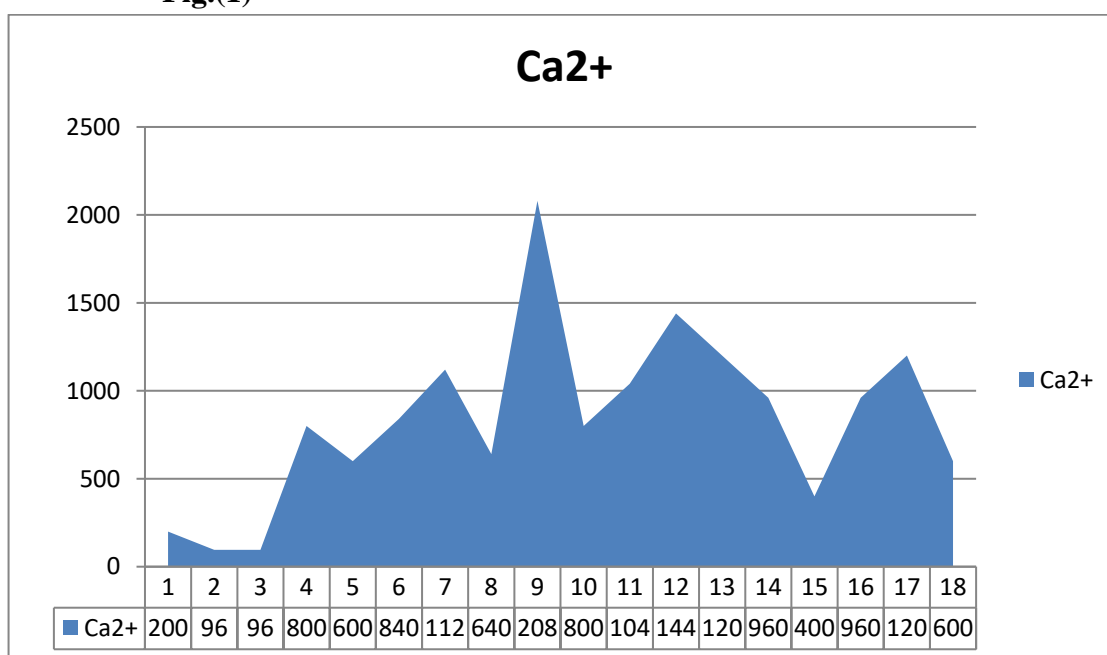


Fig.(2)

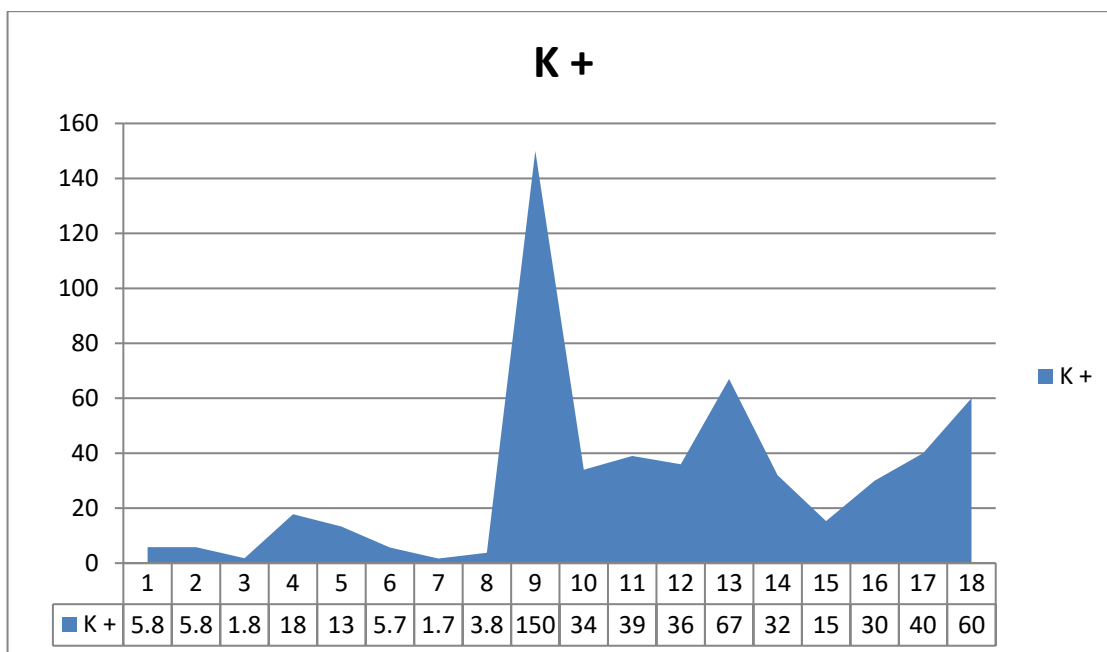


Fig.(3)

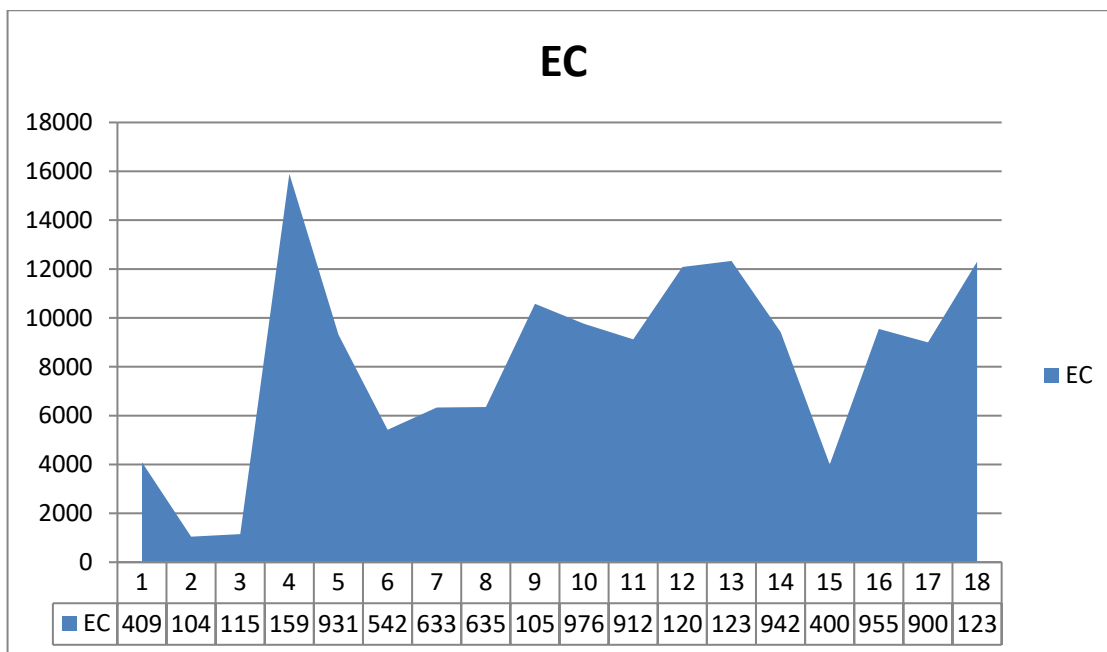


Fig.(4)

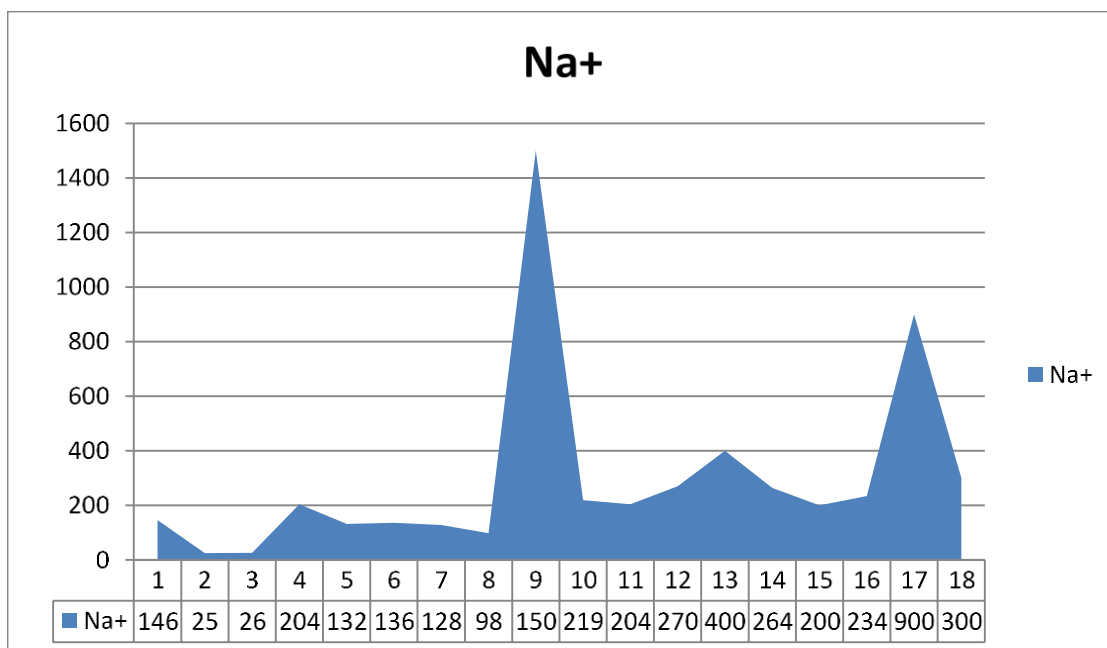


Fig.(5)

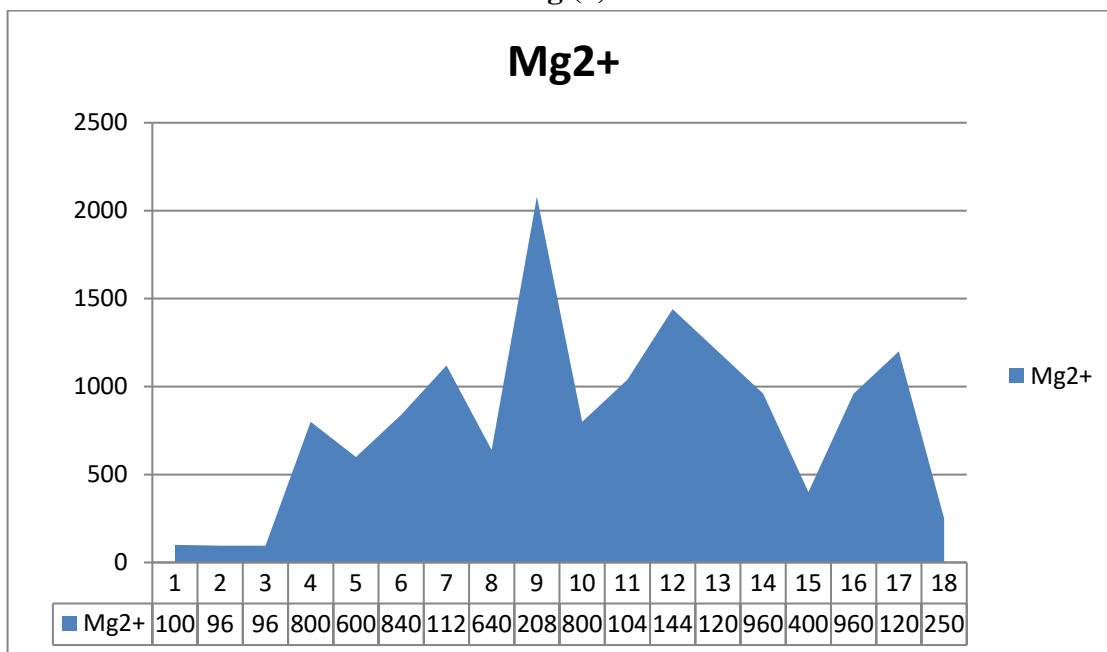


Fig.(6)

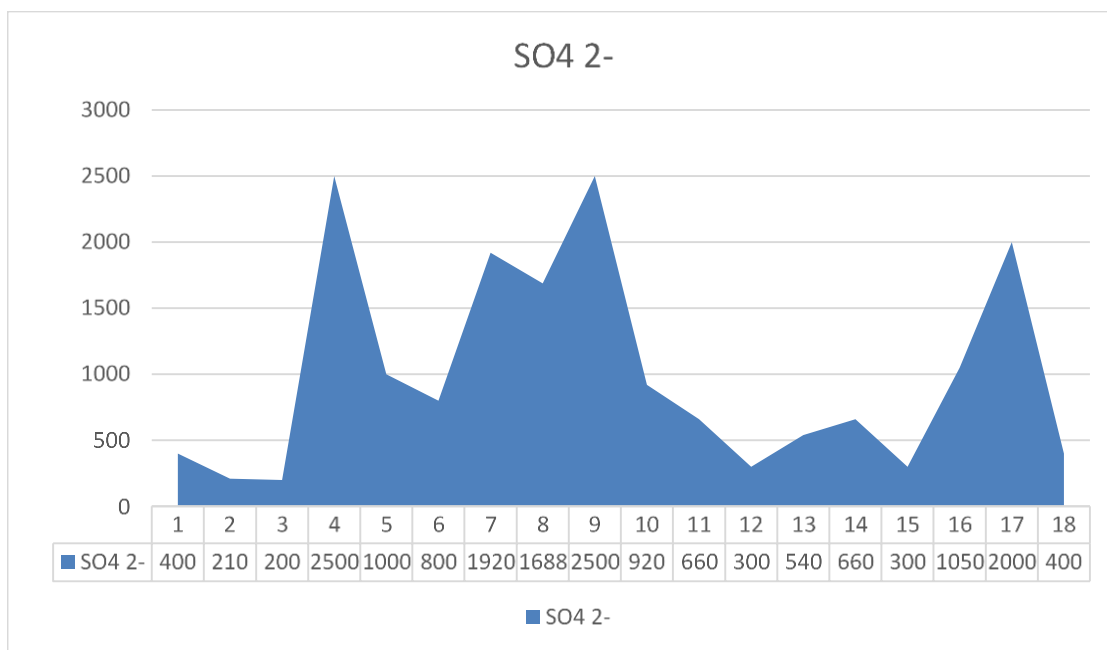


Fig.(7)

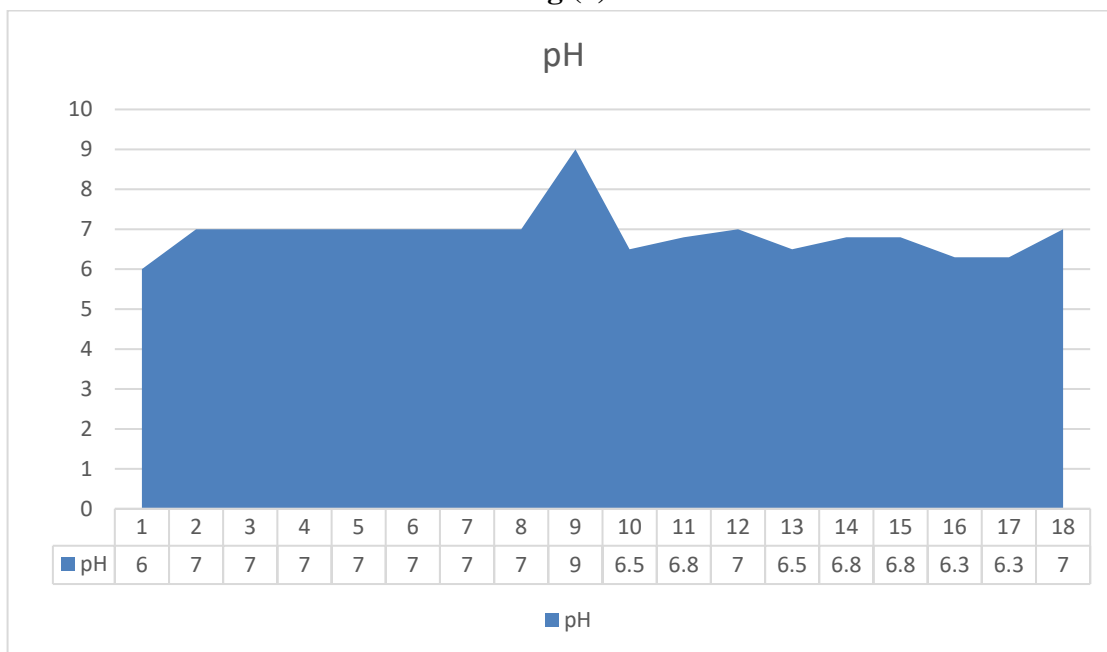


Fig.(8)

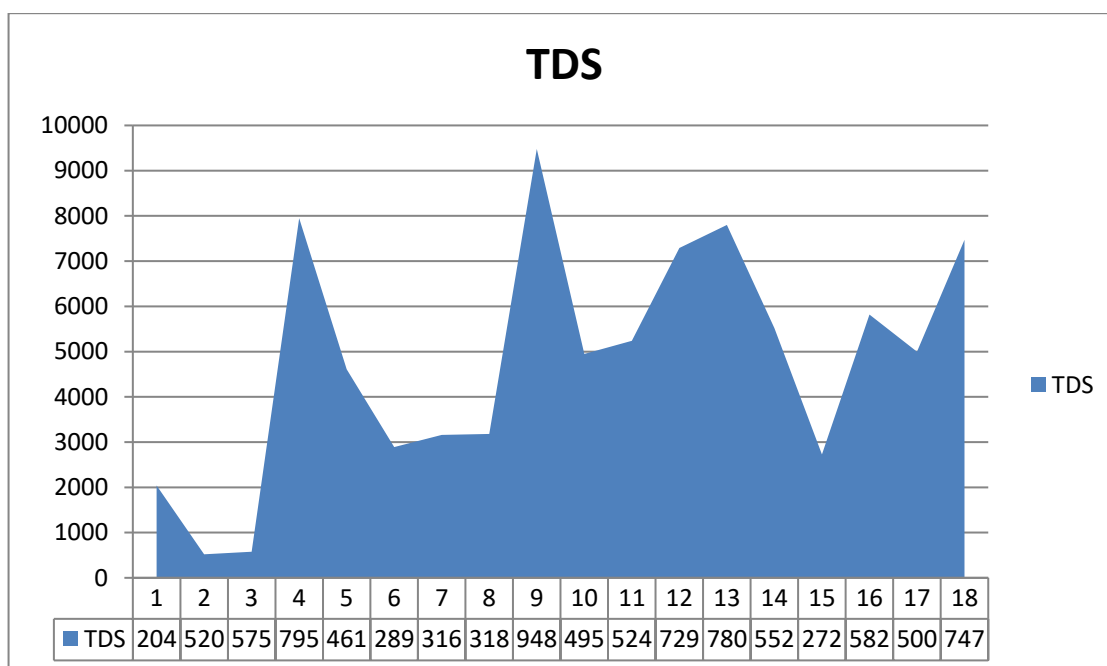


Fig.(9)

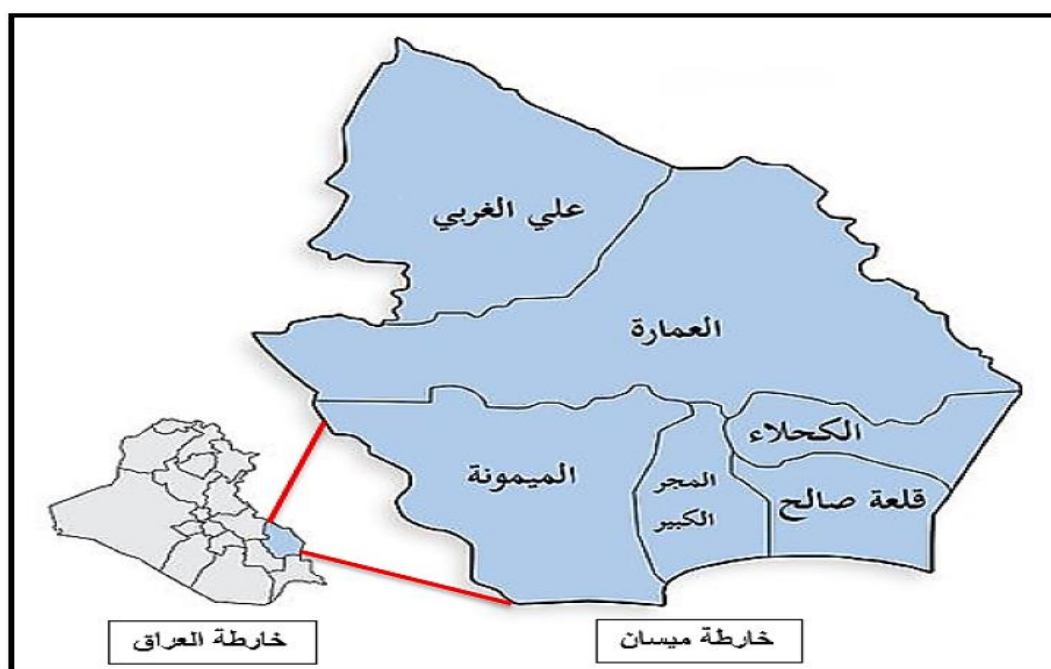


Fig.(10) Case study

Conclusions

The following specific findings can be drawn(Fig.1 to Fig.9) from this study:

- 1- Groundwater in the study area is generally good for drinking, good, household and other purposes.
- 2- Water can be considered alkaline type

High water salinity in the region may be due to a high concentration of calcium.

- 3- There should be monitoring of water quality to detect any changes occurring over time.
- 4- Physical and chemical properties have been shown to be favorable in most locations for human

consumption as drinking water after treatment because the values of their basic chemical agents were within the permissible limits.

6- The climate elements have a direct impact on some water needs, especially the availability of the airport and its lack of temperature, humidity and wind. This indicates that there is an urgent need to search for an alternative source of surface water.

Recommendations

1- Expanding the investment of underground water for agricultural purposes, where thousands of dunums of fertile agricultural land are located along the eastern and northeastern borders of the governorate. It is characterized by a good groundwater reservoir. Its water can be used for agriculture. There are currently very few wells etched for this purpose. And the groundwater reservoir and this depends on the departments of agriculture and agricultural extension in the province by urging farmers in those areas to invest in groundwater and not rely on agriculture and the use of modern irrigation techniques

2- Investment of groundwater in the establishment of a green belt in the eastern regions to improve the environment and reduce the phenomenon of desertification

3- Investment of underground water for the purpose of establishing green oases, reserves and palm stations to be a tourist resort for the sons of the province as is currently in the Zubeidat area

4- Establish plants for drinking water

5- Use of water harvesting techniques in feeding groundwater reservoirs

6- Use of artificial feeding method for underground reservoirs

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