

Assessment of Chloride from selected ground water resources of South Nanded city

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Abstract: Nanded is growing city from Marathwada region of Maharashtra. The urbanization has increased many times from last decades so many people from Nanded city depend on groundwater for drinking and domestic purposes. the underground water samples were collected from five sampling sites of New Nanded city. The chloride content in underground water resources from different areas of CIDCO of Nanded city were monitored during the period from June 2014 to may 2015.the chloride contents of some sampling sites from underground water resources of New Nanded city area were found above permissible limit.

Keywords: Nanded, Groundwater, Chloride, People , Drinking

1. Introduction:

The growth of human population has increased pressure on natural resources to produce enough food and raw materials to meet the proportional requirement (Smil1999)

In the next decade global population will increase by another 1 billion demanding high proportion of water the water security can be achieved only through improvement in water quality and conservation of water

Among different water resources ground water has turn out to be the main source of water supply for human activities like Domestic, Agricultural and Industrial of many countries. According to the estimate one third population of world directly depend on underground water resources for drinking purposes (UNEP1999).

In the developing countries 80 % of diseases are directly related to poor quality of drinking water and unhygienic condition (Olajire and Imeokparia 2001).

India carries more than 16 % of the earth's human population with only 4 % earth's water resources (Singh 2003)

Nanded is second largest city from marathwada region of Maharashtra with historic background.

Apart from Municipal water which is available for resident of Nanded city particularly of New Nanded area but they also depend on groundwater for drinking and other domestic purposes particularly in summer season.

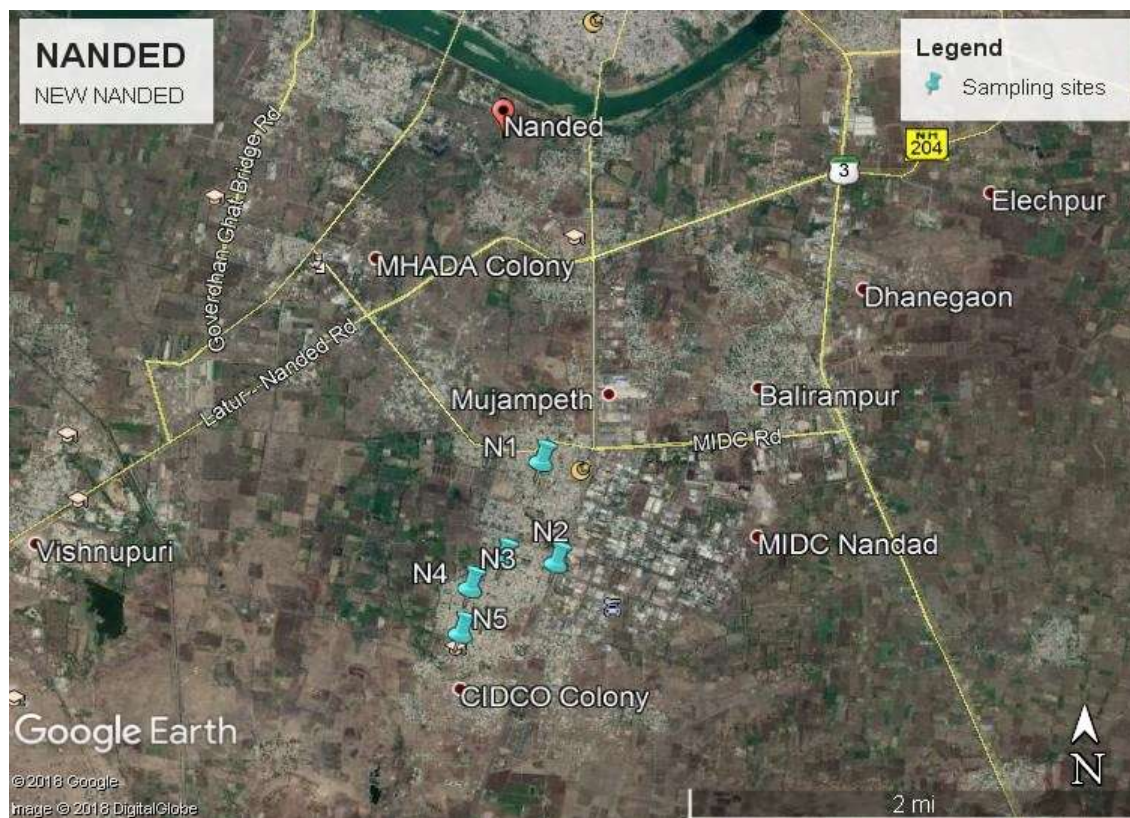
2. Study Area

During the present study New Nanded city was selected for monitoring of Chloride content of ground water resources

Nanded is located on the banks of Godavari River in central west India situated at latitude 19.15°north and longitude 77.30° east

Nanded is built on the Deccan traps lava flows of the upper cretaceous to lower Eocene eras

The soil is mostly formed from igneous rocks



Nanded city has two parts old Nanded 20.62 Square kilometers occupies the north bank of Godavari River. New Nanded to the south of the river 31.14 square kilometers includes waghala and six other villages the selective underground water resources from New Nanded city were selected by using random sampling technique for study of potability of underground water resources with respect to Chloride content The names of selected sampling sites N1(Near Bidi Kamgar Colony),N2(Dnyneshwar Colony),N3(ND32 area),N4(ND116area) & N5 (Near Homeopathic Hospital)

3Materials and Methods

Apart from Municipal water which is available for resident of Nanded city particularly of New Nanded area but they also depend on groundwater for drinking and other domestic purposes

By considering the large area and rapidly expanding population size of Nanded city and particularly size of South Nanded city i.e New Nanded, Five sampling sites were selected for monitoring of underground water quality with respect to Chloride.

The study was carried out during the period i.e. from June 2014 to May 2015 The content of chloride in underground water resources were determined by using titrimetric method as described by Kaul and Gautam (2002). The results were expressed in mg/lit.

4.Results and Discussion

4.1.Chloride

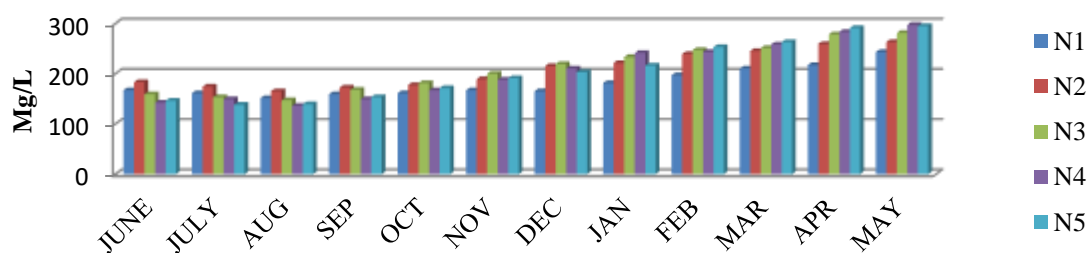
The contamination of chloride in ground water is due to both natural as well as anthropogenic activities.

In drinking water a limit of 250 mg/L chloride has been advised as desirable limit and 1000 mg/L as the permissible limit (BIS, 1991; WHO, 1996 a)

The chloride of underground water resources from different sampling stations of New Nanded area were monitored during one year study period .the results of chloride content were summarized in table 1.1 and fig 1.1 (a).

Table No: 1.1- Monthly variations in Chlorides (mg/L) during June 2014 to April 2015 of sites N1, N2, N3, N4 & N5.

Sampling Sites	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
N1	167	161	151	159	161	167	165	181	197	210	217	243
N2	183	174	165	172	177	189	215	221	239	245	259	263
N3	159	153	147	168	181	200	219	233	247	251	278	281
N4	142	149	136	149	167	188	210	241	243	258	283	297
N5	146	138	139	153	171	191	203	216	253	263	291	295

Fig 1.1(a) Monthly Variation in Chloride (Mg/L) during June 2014 to May 2015 of Sampling sites N1,N2,N3,N4 & N5.

In the Month of June 2014 the value of chlorides is maximum (183 mg/L) from sampling site N2, where as the value of chloride is minimum (142 mg/L) from sampling site N4. In the Month of July 2014 the value of chlorides is maximum (174 mg/L) from sampling site N2, where as the value of chloride is minimum (138 mg/L) from sampling site N5. In the Month of August 2014 the value of chlorides is maximum (165 mg/L) from sampling site N2, where as the value of chloride is minimum (136 mg/L) from sampling site N4. In the Month of September 2014 the value of chlorides is maximum (172 mg/L) from sampling site N1, where as the value of chloride is minimum (149 mg/L) from sampling site N4. In the Month of October 2014 the value of chlorides is maximum (181 mg/L) from sampling site N3, where as the value of chloride is minimum (161 mg/L) from sampling site N1. In the Month of November 2014 the value of chlorides is maximum (200 mg/L) from sampling site N3, where as the value of chloride is minimum (167 mg/L) from sampling site N1. In the Month of December 2014 the value of chlorides is maximum (219 mg/L) from sampling site N3, where as the value of chloride is minimum (165 mg/L) from sampling site N1. In the Month of January 2015 the value of chlorides is maximum (241 mg/L) from sampling site N4, where as the value of chloride is minimum (181 mg/L) from sampling site N1. In the Month of February 2015 the value of chlorides is maximum (253 mg/L) from sampling site N5, where as the value of chloride is minimum (197 mg/L) from sampling site N1. In the Month of March 2015 the value of chlorides is maximum (263 mg/L) from sampling site N5, where as the value of chloride is minimum (210 mg/L) from sampling site N1. In the Month of April 2015 the value of chlorides is maximum (291 mg/L) from sampling site N5, where as the value of chloride is minimum (217 mg/L) from sampling site N1. In the Month of May 2015 the value of chlorides is maximum (297 mg/L) from sampling site N4, where as the value of chloride is minimum (243 mg/L) from sampling site N1.

Chandrasekhar and Aryappan (2006) have studied the impact of municipal solid waste dumping on contamination of groundwater and reported the chloride range from 180-1262 mg/l

In the present observation the chloride content of all the five sites during the twelve months monitoring period found the values below permissible limit i.e. < 250 mg/lit but in few sampling sites due to lacking of

proper solid waste disposal system and unhygienic condition surrounding the borewell may be one of the reasons for high chloride content.

Conclusion

The chloride contents of some sampling sites from underground water resources of New Nanded city area were found above permissible limit.

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