

**NOTE****Monitoring of Drinking Water Quality of Nagpur City, Maharashtra, India During August to October 2001**

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Nagpur city is an important city in India. The largest industrial estate in Asia of approx. 6,000 hectares is being developed at Butibori, close to Nagpur. So different kinds of pollution, viz., water pollution, air pollution, soil pollution have been created due to lack of knowledge, negligence and illiteracy. It is observed that the study of water quality is of enormous educational value for the quality of water. Hence it was thought interesting to study the physico-chemical parameters of water. The suitability of water for drinking and other domestic purposes is studied by collecting samples from wells situated in various zones of Nagpur city (Maharashtra). The parameters were analysed and compared with standard values prescribed by American Public Health Association (APHA) and World Health Organisation (WHO).

**Key Words:** Monitoring, Drinking water quality, Nagpur.

Nagpur city is an important city in India. The largest industrial estate (Five Star MIDS) in Asia of approx. 6000 hectares is being developed at Butibori, close to Nagpur. The population of Nagpur city is 26,00,000 approx. The area of Nagpur city is 900 sq. miles approximately. but due to lack of knowledge, negligence and illiteracy, most of the citizens are not aware of the different kinds of pollution, viz., water pollution, air pollution, soil pollution, etc. So it was thought interesting to study its physico-chemical parameters<sup>1-8</sup> of water and monitoring of drinking water quality of Nagpur city. The samples were collected from wells situated in various zones of Nagpur city. The parameters studied were pH, temperature, conductance, total alkalinity, total hardness, calcium hardness, magnesium hardness, chloride, fluoride, DO, COD and BOD. These parameters were compared

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with standard values prescribed by APHA and WHO. The present work was done during August 2001 to October 2001.

All the chemicals used during analysis were of AnalaR grade. Glass bottles were used for the collection of water samples. Before sampling the bottles were treated with dilute mineral acids for two days and they were washed with distilled water (not acidic to litmus). Nearly one litre of sample water was collected early in the morning and in late afternoon.

A mercury thermometer having least count of  $0.1^{\circ}\text{C}$  was used to measure temperature at the site itself. Testronix digital pH-meter model no. 511 with platinum and calomel electrode assembly was used for measurement of pH. It was standardised frequently before use with standard KHP solution ( $\text{pH} = 4$ ). Equiptronics conductivity meter model no. 667 with conductivity cell and magnetic stirrer was used for measurement of conductance. DO and BOD by Wrinkler's method. Total alkalinity, total hardness, calcium hardness, magnesium hardness, chloride, fluoride, COD were analysed titrimetrically and by using spectrophotometer method<sup>1-8</sup>. The physico-chemical parameters studied are given in Table-1.

TABLE-1  
PHYSICO-CHEMICAL ANALYSIS OF WELL WATER FOR DRINKING  
PURPOSE OF NAGPUR CITY DURING AUGUST 2001 TO OCTOBER 2001

Sr. No.	Parameters	Unit	Seasonal mean value		
			S1	S2	S3
1.	pH	—	6.5	7.2	7.5
2.	Temperature	$0^{\circ}$	29.5	30.1	31.0
3.	Conductance	$\mu\text{mhos/cm}$	182.0	195.0	210.0
4.	Total alkalinity	mg/L	140.0	175.0	198.0
5.	Total hardness	mg/L	290.0	320.0	360.0
6.	Calcium	mg/L	72.0	80.0	90.0
7.	Magnesium	mg/L	218.0	240.0	270.0
8.	Chloride	mg/L	35.7	50.5	66.4
9.	Fluoride	mg/L	1.2	1.8	1.9
10.	DO	mg/L	5.2	6.2	6.2
11.	BOD	mg/L	5.9	5.3	5.9
12.	COD	mg/L	45.0	43.8	48.2

S1—Sample from Dighori well; S2—Sample from Nandanvan well; S3—Sample from Chinch Bhavan well.

The present work aims to identify the status of drinking water quality of Nagpur city with special reference to well water from various zones of Nagpur city. The pH value of well water as of all drinking waters is an important index of acidity and alkalinity. pH below 6.2 starts corrosion. In the present work pH ranged from 6.5 to 7.5. The specific conductivity was found from 182 to 210  $\mu\text{mhos/cm}$ . The total alkalinity of water is due to salts of weak acids. In the present study total alkalinity ranging from 140.0 to 198.0 mg/L has been found. Total hardness ranged from 290 to 360 mg/L which was found to be very high. Calcium

and magnesium hardness ranged from 70.2 to 90.2 mg/L and 218.0 to 270.0 mg/L, respectively. Chlorides were found ranging from 35.7 to 66.4 mg/L. Fluoride limits in drinking water from 0.6 to 1.2 mg/L. But in the present study fluoride ranged from 1.2 to 1.9 mg/L, which is very high and may cause fluororosis and affect the cement construction strength. In the present study DO, BOD, COD ranged from 5.2 to 6.2 mg/L, 5.3 to 5.9 mg/L and 43.08 to 48.2 mg/L respectively.

The chemical parameters indicate that in the present work total alkalinity, total hardness, calcium hardness and magnesium hardness have higher value, which make it very harmful as drinking water for human beings. Similarly fluoride has very much higher value which makes it very harmful for drinking water purposes as well as for strength of cement construction.

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