

Physicochemical analysis of drinking water of Gandhi Nagar area of Bhopal with special reference to pollution

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(Received: February 12, 2010; Accepted: April 04, 2010)

ABSTRACT

Physico-chemical analysis of bore-wells drinking water of Gandhi Nagar area of Bhopal city has studied in different seasons for one year during 2008-09. Two readings in one season have observed to analyze different parameter i.e. temperature, pH, EC, free CO₂, chloride, Total alkalinity, Hardness, Ca-H and Mg-H, The result are found in the range of 26 – 29.5° 6.8 – 7.8 220 – 988 u mhos/cm, 0 – 32.8, 18.2 – 128.28 22.8 – 364 ppm 104.8 – 384, 72 – 312 & 24 – 72.4 ppm. Respectively, While D.O, B.O.D., C.O.D., NO₃⁻¹ and SO₄⁻² are in the range of 1.14 – 2.68, 2.00 – 3.60, 20.8 – 78.8, 3.2 – 12.4 and 323.2 – 70.6ppm The present study has its utmost importance for hygienic point of view in the public interest.

Key words: Physico - chemical analysis, bore - well, Gandhi Nagar, Bhopal.

INTRODUCTION

Bhopal is the capital of Madhya Pradesh. Water samples of bore-wells water are collected in 2 litre clean polythene Jerry-cane after flushing the bore-wells to analyse. The procedure has adopted as prescribed by APHA (1985)¹ NEERI (1986)⁴. Pre-sterilized bottles are used to collect the D.O. & B.O.D. samples, Temperature pH of water samples has measured at the sampling stations, In the present study temperature varied from 25- 28.5°C. pH indicates the intensity of acidity. Electrical conductivity of water samples range from 220 – 988 u mhos/cm that measures the dissolved ions and has the capacity to carry on electrical charge of both cations and anions.

Free CO₂ ranges from 6.0 – 32.8 ppm, chloride, total alkalinity, Total hardness, Ca-H and Mg-H are observed in the range of 18.2 – 128.28, 22.8 – 364, 104.8 – 384, 72 – 312 and 24 – 72.4

ppm respectively at different sampling stations. Higher values of alkalinity are due to leaching of soil during natural filtration of water from sewage. D.O., B.O.D. and C.O.D. range from 1.14 – 2.68, 2.00 – 3.20 and 20.8 – 78.8 ppm respectively as summarized in table – 1. Nitrate concentration in ground water is due to leaching of nitrate with percolation of water. Nitrate in this study varies from 3.2 – 12.4 ppm is well within the permissible limits. Sulphate is an important constituent of hardness with Ca and Mg. Excess amount of sulphate in water has Cathartic effect of human health Rangwala, KS and Rangwala PS (1927)⁵. Sulphate in this study ranges from 32.2 – 70.6ppm The findings are similar with Kataria (1996)² (2000)³. Most of the parameters are found within the permissible limits as recommended by WHO (1978)⁶.

Hence water samples analyzed in the present study has found suitable for drinking purpose after proper required treatment.

Table 1: Physico-chemical analysis of Borewells water of Gandhi Nagar area of Bhopal City 2008-09

Parameters	Mean seasonal values (Winter Summer & Monsoon)								
	Unit	BW 1	BW 2	BW 3	BW 4	BW 5	BW 6	BW 7	BW 8
Temperatrure	°C	24.20	26.00	27.20	27.10	26.50	24.80	25.00	28.40
pH	pH Scale	06.20	06.40	07.20	07.00	07.40	07.50	07.60	07.80
EC	U	320.00	234.00	342.00	248.00	680.00	486.00	560.00	960.00
Free CO ₂	PPm	06.40	11.50	32.40	07.80	20.40	23.50	27.50	32.80
Chloride	PPm	18.20	70.40	39.05	64.80	124.24	112.60	120.40	128.24
Tatal alkalinity	PPm	105.40	178.00	278.00	110.00	272.00	362.00	285.00	184.00
Total hardness	PPm	104.80	128.00	146.00	102.60	286..40	294.60	372.00	384.00
Ca – H	PPm	72.00	86.00	108.00	72.40	346.20	252.40	286.00	213.00
Mg – H	PPm	32.80	42.00	38.00	30.60	40.20	42.20	86.00	76.00
D.O.	PPm	01.14	01.44	02.24	01.60	02.52	01.80	02.42	02.68
B.O.D.	PPm	02.00	03.62	02.82	02.40	01.94	03.60	03.20	03.60
C.O.D.	PPm	20.80	24.28	12.40	74.80	34.00	05.92	68.40	78.80
Nitrate	PPm	03.20	07.54	03.00	06.80	03.68	08.40	09.80	12.40
Sulphate	PPm	32.30	32.40	36.80	48.00	52.80	62.40	69.80	70.60

BW1 = Sagar Institute of Science & Technology

BW3 = Institute of Aeronautics

BW5 = Allahabad Bank

BW7 = Jodhpur Dhawa

BW2 = All Saints College of Science & Technology

BW4 = Parwalia Sadak

BW6 = Modern Krishi Farm, Kawadkhana

BW8 = Jatkhedi

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