

## Assessment of water quality of Gandhinagar area of Bhopal city, M.P. (India)

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### ABSTRACT

Groundwater represents one of the most important water resources in Indian as it in the rest of the globe and account for over 400 km<sup>3</sup> of the annual utilizable resource in the country. Reliance on ground water resources is particularly strong where dry season surface water levels or low wet season flows are too disruptive to be easily tapped. Many human activities are responsible for the pollution of groundwater, due to mixing of petroleum products, pesticides and herbicides heavy metals, toxic industrial and domestic wastages. Surplus organic material and contagious organism by percolation and infiltration into ground water resources. In the present study temperature, pH, EC, free CO<sub>2</sub>, Chloride, total alkalinity, total hardness, Ca-H, Mg-H, D.O., B.O.D., C.O.D., Nitrate, SO<sub>4</sub><sup>2-</sup>, are analyzed at different sampling stations. This study is very significant worldwide to keep, close water on water quality.

**Keywords:** Groundwater, assessment, parameters, human activities.

### INTRODUCTION

Bhopal is the capital of M.P. It is situated on 23° 16' N Latitude and 77° 26' E longitude on hard pink sandstone of Vindhyan region. Sampling of 9 water resources are collected from Gandhi Nagar area of Bhopal city i.e. densely populated having a population of about 80,000. Water samples were collected seasonally in 2 L clean jerry canes in 2007-2008.

The methods for present study are used as prescribed by APHA (1975) and NEERI (1986). Physico - Chemical parameters has analyzed Volumetrically, titrimetrically as well as spectrophotometrically. For Bacteriological analysis sample is collected in presterilized glass bottles and brought to laboratory in ice-box using multiple tube techniques in presence of Mac'conkey broth medium at 37°C for 48 hrs. MPN of coliform is observed in terms of Index/100 ml by using standard tables. Nine sampling stations are as follows:

- |              |                |
|--------------|----------------|
| 1. Nai Basti | 2. Peepalner   |
| 3. Gondarmau | 4. Tagore Ward |

- |                 |                |
|-----------------|----------------|
| 5. Shivaji Ward | 6. Pratap Ward |
| 7. Abbas Nagar  | 8. Gondiapura  |
| 9. Kabirdham    |                |

In the present study temperature, pH, EC, free CO<sub>2</sub> has a range of 23.4 - 32.0°C, 6.2 - 7.3, 312 - 534, 6.4 - 7.92 ppm respectively. Chloride, total solids, S. S. and T. D. S. ranged from 81.4 - 128.0, 112 - 1264.0, 58.4 - 128.8, 34.8 - 78.8, ppm respectively at different sampling stations. Total alkalinity, T-H, Ca-H and Mg - H has observed in the range of 18.6 - 50.2, 288 - 644, 208 - 538 and 80 - 210 ppm respectively while D. O., B.O.D. and C.O.D. are found in the range of 1.10-2.08, 2.18 - 5.68 and 12.88 - 64.4 ppm respectively. Nitrate, Sulphate and MPN also observed in range of 7.8 - 30.2, 32 - 92.8 ppm and 14.8 - 278 100 ml/ Index in different reasons i.e. Winter, Summer and monsoon. The above findings are similar with those of Handa (1994), Kataria 1995; 200, 2004. The value of MPN (faecal coliforms) recommended 10/100 ml Index by WHO (1984). Most of the parameters are found well within the recommended limits of BIS and some parameters are found beyond the limit.

Table 1: The results are summarized as in Table 1

Parameters	Unit	SS <sub>1</sub>	SS <sub>2</sub>	SS <sub>3</sub>	SS <sub>4</sub>	SS <sub>5</sub>	SS <sub>6</sub>	SS <sub>7</sub>	SS <sub>8</sub>	SS <sub>9</sub>
Temperature	°C	26.2	25.0	23.4*	24.0	32.0	32.0**	30.4	28.4	28.0
pH	-	6.5	6.8	6.2*	6.8	7.0	7.1	7.3**	7.0	6.9
EC	μ mhos/cm	472.0	524.0	498.0	500	534**	519	338	354	312*
Free CO <sub>2</sub>	ppm	6.4*	6.8	7.8	7.2	7.92**	7.0	6.8	7.2	6.8
Chloride	ppm	104.2	106.8	99.8	96.4	81.4*	84.2	128.0**	124.8	127.8
Total Solids	ppm	147.2	149.0	164.0**	140.0	148	209.4	112.0*	130.4	132.0
Suspended Solids	ppm	68.8	58.4*	62.8	64.8	64	64.8	66.2	124.8	128.8**
T.D.S.	ppm	38.4	34.8	99.8	44.8	42.0	38.8	76.0	76.4	78.8**
Total Alkalinity	ppm	30.4	28.8	18.6*	20.8	24.8	25.6	38.0	39.4	50.2**
T-H	ppm	520.0	288*	588	612	634	620	644*	514	508
Ca-H	ppm	312	208*	418	398	538**	486	478	388	298
Mg-H	ppm	208	80*	170	214	96	134	166	126	210**
D.O.	ppm	1.12	1.62	1.26	1.34	1.10*	1.80	2.04	2.08**	1.86
B.O.D.	ppm	2.48	3.12	2.68	2.98	2.28	2.44	2.18*	5.4	5.68**
C.O.D.	ppm	48.6	48.4	28.8	64.4**	60.8	12.88**	32.8	14.30	16.8
Nitrate	ppm	20.4	26.8	7.8*	28.4	25.4	24.8	18.8	29.6	30.2**
Sulphate	ppm	34.8	36.4	32.0*	32.8	72.8	60.4	58.8	64.8	92.8**
MPN	100ml/index	18.0	14.8*	24.8	88.4	110.0	112	128	148	278**

\*Minimum Values,

\*\*Maximum Values

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