



# “WATER QUALITY ASSESSMENT OF RIVER TAPTI, NEAR WATER PUMPING STATION, BHUSAWAL. (MAHARASHTRA) INDIA”.

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**Abstract** To ensure, the continuous supply of clean and safe drinking water a detailed Physical and Chemical analysis of drinking water, samples were collected from River Tapti, near Water Pumping Station, Bhusawal. A number of parameters such as temperature, PH, Total Dissolve Solid, Free CO<sub>2</sub>, Alkalinity, Dissolve O<sub>2</sub>, C.O.D., Chloride, Nitrate, Phosphate, Magnesium and Hardness were analyzed. The finding revealed that the values obtained are within the range prescribed by B.I.S. From the result it was found that water of Tapti river near **Water Pumping Station, Bhusawal, is good for drinking, cooking and domestic purposes** after filtration. A care must be taken to stay away from human interaction as much as probable to save the water quality along with biodiversity and keep away from further corrosion.

**Key words:** Assessment, Physico-Chemical Parameters, Tapti River, B.I.S., water pumping station

**Introduction:** Water is Universal solvent and is most essential commodity for human consumption and is one of the most important renewable resources, which must be conserved and prevented from deterioration of quality. Tapti River is an important means of water supply to Bhusawal (M.S) Due to various reasons the river posses heavy and varied pollutants which leads to deterioration of water quality and depletion of aquatic biota, during present investigation, the Physico-Chemical parameters of Tapti river like temperature, PH, Total Dissolve Solid, Free CO<sub>2</sub>, Alkalinity, Dissolve O<sub>2</sub>, C.O.D., Chloride, Nitrate, Phosphate, Magnesium and Hardness were studied. Because it's have a significant role in determining the portability of drinking water. Water serve to consume must be free from disease; water contains impurities of various kinds such as dissolved gases, mineral and suspended matter. These natural impurities are in very low amount. But due to the pressure of increasing population, industrial growth of urbanization, energy intensive life-style, loss of forest cover, lack of environmental awareness, untreated effluent discharge from industries and municipalities, use of non-biodegradable pesticides/ fungicides/ herbicides/insecticides, use of chemical fertilizers instead of organic manures etc. are causes of water pollution. Also, many unwanted substances are introduced in water and it gets polluted. Polluted water may have undesirable colour, odour, taste, turbidity, organic matter contents, harmful chemical contents, toxic and heavy metals, oily matters, industrial waste products, radioactivity, domestic sewage contents, virus, bacteria, protozoa, rotifer, worms etc. due to this reasons the water is bad smelling unpleasant and unfit for drinking, bath and other purposes. They cause harmful diseases and have adverse human health. Rivers are one the important source of water. Almost all the rivers in India are polluted. India and China are counted among the water hot spot, primarily because of their large population that have to be provided with

food and drinking water. Therefore it is necessary that the quality of drinking water should be checked at regular time of interval.

**Materials and Methods:-**Water samples were collected from river Tapti near **Water Pumping Station, Bhusawal**, once in a month from January to June 2013 between 8 to 10 a.m in clean sterilized acid washed polyethylene can. Water temperature was recorded immediately by using mercury centigrade thermometer at depth of 4 cm to 6 cm from the surface layer of water, PH of water was examined using universal PH meter also checked by using digital PH meter. For estimation of dissolved oxygen separate sample was collected in 250ml BOD glass bottle and fixed at the collection site only. Total dissolve solid, Free Co<sub>2</sub>, Alkalinity, Dissolve O<sub>2</sub>, COD, Chloride, Nitrate, Phosphate, Magnesium and Hardness were measured in the laboratory following A.P.H.A. (1998) and Trivedy and Goel (1986).The data were statistically analyzed following Mungikar (2003).The value of these parameters were compared with standard values of given by B.I.S. (2004).

Sr. No	Parameters.	Jan.	Feb.	Mar.	Apr.	May	June	Range	Mean standard. Deviation	B.I.S.
1	Air temp	29	27	32	33	44	27	27-44	6.387488	-
2	Water temp	18	18	18	25	23	15	15-25	3.72827	-
3	PH	7.2	7.16	7.10	7.4	7.4	7.4	7.2-7.16	0.138804	6.5-8.5
4	T.D.S.	315	452.0	413.0	390.0	319.0	416.0	315-452	55.6971	500-2000
5	Co <sub>2</sub>	4.0	4.5	4.7	4.2	4.1	6.1	4.0-6.1	0.779744	-
6	Alkalinity	112.0	98.0	75.0	78.0	90.0	101.0	75-112	14.1798	200-600
7	Dissolved O <sub>2</sub>	5.5	5.0	6.0	4.3	4.1	6.9	4.1-6.9	1.060189	-
8	C.O.D.	18	9.0	5.0	22.0	16.0	20.0	5.0-22.0	6.63325	-
9	Chloride	135.0	103.0	120.0	105.0	126.0	61.0	61-135	26.22721	250-1000
10	Nitrate	12.0	4.9	4.2	18.0	7.0	5.0	4.2-18.0	5.448823	45-100
11	Phosphate	0.741	0.856	0.800	0.857	0.460	0.598	0.460-0.857	0.15911	-
12	Magnesium	2.92	5.85	5.30	3.92	1.60	2.92	1.60-5.85	1.602603	30-100
13	Hardness	50.0	80.0	36.0	75.0	46.0	50.0	36.0-80.0	17.37143	300-600

Table-1 Monthly variations in physico-chemical Parameters of water collected near **Water Pumping Station, Bhusawal**,

All values of parameters are presented in mg/lit except- temperature (in °C) and PH.

**Results and Discussion:** The atmospheric temperature during the course of investigation fluctuated from 27<sup>0</sup>c to 44<sup>0</sup>c while that of water from 15<sup>0</sup>c to 25<sup>0</sup>c. The water temperature was always lower than atmospheric temperature. Similar results were reported by Chandrasekhar (1996) and Manjaramkar and Deshmukh (2011). PH fluctuated within limits of 7.2 to 7.16 indicating sometime slightly alkaline condition. The average PH of the river reported during present study is slightly alkaline condition and within the permissible limits recommended by BIS. (2004). Total Dissolve Solids ranges from 315 to 452 ppm, with average values of 383.5 ppm., which might be due to human interference. Free CO<sub>2</sub> was in a range of 4.0 to 6.1 is a acceptable value of B.I.S. (2004). The values for total alkalinity were between 75 to 112 mg/lit with average value 93.5 mg/lit indicating productive nature of river water. Similar results were reported by Manjaramkar, et. al. (2011). The dissolved oxygen (D.O) ranged from 4.1 to 6.9 mg/lit with average values of 5.5 (table-1) similar observations have been reported by Mishra and Yadav (1978), Deshmukh and Ambore (2006), Adebisi (1991), Chandanshive, et.al.

(2008) and Nazneen Md., et al. (2011). The D.O was acceptable in view of the use of water for drinking purpose. COD values ranged from 5.0 to 22.0 mg/lit with average values of 13.5 (table-1). Minimum COD in the month of March i.e. 5 mg/lit and Maximum in April respectively, was probably due to settlement of organic matter. Similar results were reported by Ingole, et.al. (2009). Chloride content ranged from 61 to 135 mg/lit with average values 98 mg/lit. Chloride of this river water was not high during the investigation period. The amount found in the sample minimum permissible limit for drinking water prescribed by B.I.S. Nitrate content ranged from 4.2 to 18.0 mg/lit with average values of 11.1 mg/lit. In all months Nitrate values are found very less than the range of B.I.S. Phosphate values ranged from 0.460 to 0.857 mg/lit. Very low values of phosphate were observed which might be due to utilization of phosphate as nutrients by algae and other aquatic plants. Magnesium content ranged from 1.60 to 5.85 mg/lit with average values 3.725 mg/lit. This amount of magnesium found in the sample did not exceed minimum permissible limit for drinking water prescribed by B.I.S. Hardness is the property of water which prevents the lather formation with soap and increases boiling point of water (Trivedi and Goel 1986). Hardness of water mainly depends upon the amount of Calcium or Magnesium salts. (Murhekar, 2011). Mean average hardness value by sample analyzed was 58 mg/ lit. The hardness values fluctuated in between 36-80 mg/lit. In all month's hardness value found below the range prescribed by B.I.S.

**In conclusion**, on the basis of result obtained (table-1). It may be concluded that, the values are within the range prescribed by B.I.S. (2004) standard for drinking water. Thus the **water is good for drinking** only after refinement. A care must be taken to stay away from human interaction as much as probable to save the water. Then it is safe for drinking, cooking and domestic purposes after filtration.

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